BUKTI KORESPONDENSI

ARTIKEL JURNAL INTERNASIONAL BEREPUTASI

Judul artikel : Multilocation Test of Prospective Composite Sticky Corn Varieties With High Production in Indonesia

Jurnal : International Journal of Agronomy 2024, volume 2024 (1): 1-12

Penulis : Edy dkk.

No.	Perihal	Tanggal
1	Bukti konfirmasi submit artikel dan artikel yang disubmit	26 Januari 2024
2	Bukti konfirmasi review dan hasil review pertama berkaitan file suplamentary	31 Januari 2024
3	Bukti informasi bahwa artikel sukses disubmit	2 Februari 2024
4	Bukti konfirmasi submit revisi pertama, respon kepada reviewer, dan file suplementary diresubmit	9 Februari 2024
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7	Bukti konfirmasi submit revisi ketiga, respon kepada reviewer, dan file supplementary diresubmit	23 Februari 2024
8	Bukti konfirmasi submit revisi keempat, respon kepada reviewer, dan file supplementary diresubmit	1 Maret 2024
9	Bukti konfirmasi editor terhadap email author	10 April 2024
10	Bukti konfirmasi submit revisi kelima, respon kepada reviewer, dan file artikel diresubmit	16 April 2024
11	Bukti konfirmasi editor terhadap email author	27 Mei 2024
12	Bukti konfirmasi submit revisi keenam, respon kepada reviewer, dan file perbaikan plagiasi artikel diresubmit	11 Juli 2024

13	Bukti konfirmasi submit revisi ketujuh, respon kepada reviewer, dan file perbaikan artikel dan plagiasi artikel diresubmit	22 Agustus 2024
14	Bukti konfirmasi artikel accepted	2 November 2024
15	Bukti konfirmasi artikel jika masih ada yang akan diperbaiki sekaitan nama author, afiliasi, dan perbaikannya sudah diresubmit	29 November 2024
16	Bukti konfirmasi bahwa artikel sudah lengkap dan siap untuk di publish online	11 Desember 2024
17	Bukti artikel published pertama online	27 Desember 2024

1. Bukti konfirmasi submit artikel dan artikel yang disubmit

(26 Januari 2024)

41 dari banyak

Dari: **International Journal of Agronomy** <ija@hindawi.com>
Tanggal: Jum, 26 Jan 2024 pukul 12.40
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Multilocation Test of Prospective Composite Sticky Corn Varieties with High Production in Indonesia

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Abstract

National staple food needs are increasing along with the increase in population. Therefore, he needs a delicious alternative staple food, one of which is glutinous corn. To anticipate the increasing demand for glutinous corn, efforts are needed to increase productivity by using new superior varieties that are able to adapt to specific and wider environments and are resistant to pests and diseases. The aim of this research is to produce varieties with high productivity with high amylopectin levels. The method used in this research was the adaptation testing of 4 prospective varieties of composite sticky (JPI-1, JPI-2, JPI-3, JPI-4) and 3 comparative varieties (Sticky Uri, Srikandi Putih, and local Sticky Takalar) carried out in 6 districts in Indonesia as research locations. Each location was designed using a randomized block design, with 4 replications to obtain 28 experimental units at each location. Observation data were analyzed using analysis of variance (ANOVA). If there is a difference in the mean value of the varieties in the F test, continue with the Least Significant Difference (LSD) test at the 5% level. Data analysis using the DSAASTAT program. Analysis of the stability of the results used the additive mean effect multiplicative interaction (AMMI) multivariate analysis model using the PBSTAT program. Testing for resistance to downy mildew, rust and leaf blight was carried out in a randomized block design with 4 replications. Proximate analysis testing was carried out at the Animal Husbandry Integrated Biotechnology Laboratory, Faculty of Animal Husbandry, Hasanuddin University. The results of the research show that the prospective composite corn varieties JPI-1, JPI-2, JPI-3, and JPI-4 have the potential for yields that are significantly superior to the three comparative varieties, respectively, with each of 8.88 t.ha-1 ; 8.54 t.ha-1; 8.57 t.ha-1; 8.67 tha-1. Based on the results of the results stability analysis, JPI-1 and JPI-4 show stable results in all environments, and JPI-3 shows increasingly better results in the optimum environment. Prospective varieties JPI-1, JPI-2 JPI-3 and JPI-4 show the criteria for resistance to Downy mildew disease Peronosclerospora maydis, Peronosclerospora philippinensis type, Bipolaris maydis type blight, and also resistance to the leaf rust disease type Puccinia polysora. Based on the approximate test JPI-1, JPI-3, and JPI-4 have superior protein content than the three comparative varieties, namely 11.64, 11.69% - 11.86%. The prospective variety JPI-1 has a high amylopectin content (85.10%) equivalent to the amylopectin content of local Sticky parents and higher than the two comparative varieties. JPI-2, JPI-3, and JPI-4 have higher amylopectin content than the two comparative varieties.

Keywords: adaptation, corn composite, productivity, disease resistance, proximate

Introduction

Corn (*Zea mays* L.) is one of the most important carbohydrate-producing food crops in the world, besides wheat and rice [1]. Corn is an important food in Indonesia and is even the second cereal commodity grown in Indonesia after rice. The role of corn is central in Indonesian society as both an alternative staple food, snacks and various other foods, as well as in the animal feed industry and others. In some areas, corn is used as a staple food by the community. Moreover, corn is also a main component in animal feed and other industries such as raw materials for producing bioethanol. Corn is currently beginning to develop as a functional food because it contains dietary fiber [1].

Sticky or waxy sticky corn (*Zea mays ceratina* L.) is a special type of corn that has the potential as a source of food diversification and industrial materials. In Japan, this corn is used as a source of amylopectin, a raw material for food products, textiles, glue, and the paper industry. Sticky corn is a source of germplasm for developing new cultivars through plant breeding [2]. Sticky corn, like sweet corn, can be consumed as a fresh or boiled vegetable because it has a soft and delicious taste. Glutinous corn contains starch in the form of amylopectin, which almost reaches 100% [3]. The high level of amylopectin in sticky corn is suitable for the diet of diabetics and to increase the weight of livestock. The sticky corn is generally consumed as corn porridge and snacks. Due to its poor production and vulnerability to downy mildew, it is rarely used as a staple food and therefore extremely scarce. Sticky corn, however, has a low potential yield. It only produces small cobs with a diameter of 10–11 mm, production less than 2 tons/ha, and is highly vulnerable to downy mildew attack [4].

Sticky corn is a typical food ingredient in Sulawesi, Indonesia. Domestic demand for sticky corn continues to increase, but supply is still insufficient. Furthermore, the national need for corn is increasing along with the increase in population and the development of the food and feed industry. Data for the 2018-2022 period show that corn production has increased along with the increase in harvested area, unfortunately, there has been a particular production decline in 2021. The effort to provide glutinous corn as an alternative staple food requires the release of appropriate variety. It must express a high-yielding high amylopectin content and adapt to environmental changes.

The proposed composite corn genotype is a line assembled and developed from a cross between a variety that has a high protein content and high production and a local sticky variety that contains amylopectin. The composite corn genotype assembly program goes through several breeding stages to obtain a combination of traits resulting from the cross. This requires continuous identification, characterization, and evaluation. One of the stages in testing the results of the genotype assembly is the multi-location test. The aim of this research is to produce varieties with high productivity with high amylopectin levels.

Materials and Methods

This study evaluated the performance of the adaptation test of four prospective composite corn varieties and three comparative varieties. The four prospective composite corn varieties consisted of JPI-1, JPI-2, JPI-3, and JPI-4, while the three comparative varieties are Sticky Uri (JPI-5), White *Srikandi* (JPI-6) and Local *Sticky Takalar* (JPI- 7). JPI-1, JPI-2, JPI-3 and JPI-4 originate from a cross between the White *Srikandi* variety (as the female parent) and the local Sticky *Takalar* (as the male parent). The crossover process was conducted from 2017 to 2022 through the eighth generation.

Testing Time and Location

The adaptation test was carried out during the 2023 planting season (PS) from March to September 2023 in 6 districts. Four districts were located in South Sulawesi (Gowa Regency, Takalar Regency, Bantaeng Regency, Maros Regency) and two districts from other provinces (Lombok Regency, West Nusa Tenggara Province and Kediri Regency, East Java Province). Disease resistance tests were carried out in 2 districts, namely Gowa Regency (3 locations: location 1, leaf rust test, location 2 leaf blight test and location 3, downy mildew test specific for the species *Peronosclerospora philippinensis* which often attacks corn in Sulawesi) and Malang Regency, East Java Province (specifically the specific downy mildew test for the *Peronosclerospora maydis* species which often attacks corn in Java). Descriptions of adaptation test locations and disease resistance tests for prospective composite varieties are presented in Tables 1a and 1b.

The plot area used for each experimental unit was 5 m x 3 m with a planting space of 75 cm x 20 cm. Number of plants per plot 100 plants in 4 rows of plants. The samples used came from the two middle rows which were randomly taken as many as 10 plants per plot. The type and dose of fertilizer used was 300 kg/ha of urea and 400 kg/ha of Nitrogen, Phosphorus and Potassium. Fertilization was carried out two times, when the plants are 7 days old and 30 days after planting, each administered 50% of the dose. The water was applied when the rain stopped for a week.

Adaptation Test Method

The research was carried out using a randomized block design, consisting of seven varieties, repeated 4 times so that there were 28 experimental units at each adaptation test location (Table 1). Observation data were analyzed using analysis of variance (ANOVA). If there was a difference in the mean value of the varieties in the F test, test was continued with the Least Significant Difference (LSD) test at the 5% level. The results were presented only paired comparatives between prospective and comparative varieties. Data analysis using the DSAASTAT program. Analysis of the stability of the results used the additive mean effect multiplicative interaction multivariate analysis model using the PBSTAT program.

Table 1: Description of adaptation test locations for prospective composite corn varieties in sx districts.

No.	Location	Soil type	Altitude (a.s.l)	Climate type	Planting date	Harvest date
1.	Bajeng Gowa, South Sulawesi	Alluvial, land paddy field	89	D	06 May 2023	20 August 2023
2.	Sinoa, Bantaeng, South Sulawesi	Latosol, land dry	500	B	17 May 2023	10 September 2023
3.	Lembar Lombok Barat, NTB	Alluvial, Land dry	14	D3	21 May 2023	05 September 2023
4.	Kepung, Kediri, East Java	Alluvial, Land dry	67	C2	22 May 2023	07 September 2023
5	Galesong, Takalar, South Sulawesi	Alluvial, Land paddy field	20	C2	24 May 2023	09 September 2023
6.	Lau, Maros, South Sulawesi	Alluvial, Land Paddy field	25	C2	21 June 2023	06 October 2023

Tabel 1b: Description of disease resistance test locations for prospective composite corn varieties in 2 districts.

No.	Location	Soil type	Altitude (mdpl)	Climate type	Planting date	Harvest date	Information
1	Bajeng, Gowa, South Sulawesi	Alluvial, Land dry	89	D	11 June 2023	26 August 2023	Leaf rust
					17 June 2023	02 Sept 2023	Hover down
					24 June 2023	10 August 2023	Bubbles *(P. philippinensis*)
2	Gondang legi, Malang, East Java	Inceptisol, Land paddy field	400.1	C2	12 June 2023	31 July 2023	Bubbles (*P. maydis*)

Results and Discussion

Adaptation Test

Overview Adaptation test

Data collected from each location were analyzed for combined variance. Combined analysis of variance was used to determine the influence of environment, genotype, and interaction of genotype and environment. The results of the combined variance analysis of yield and agronomic characteristics of four prospective composite corn varieties and three comparative varieties are presented in Table 2. The combined variance analysis shows that location has a strong effect on all observed variables except for leaf width, male flowering age, cob appearance, grade harvest water. The effect of location indicates the environment characteristic of the study sites is quite diverse.

The effect of genotype was significant on all observed variables, except leaf length. Each prospective variety has a different genetic potential in expressing traits or characters. Another study reported that the lines tested differ significantly in all characters, indicating that there are differences in genetic potential between the lines tested [5].

Table 2: Middle square of agronomic characters, yield components, and yield of prospective JPI composite corn varieties at several locations.

Variable	Middle Quadrate Tengah				
	Location	Loc/R	Genotype	Genotype x Lok	Error
Plant Growth (%)	222.52 **	27.88	76.72**	8.70	13.77
Plant Height (cm)	10549.10**	464.98	2218.36**	381.10*	240.09
Cob Height (cm)	2257.33 **	456.68	547.79 **	148.34 *	79.78
Stem Fall (%)	0.00 **	0.00	0.00 **	0.00	0.00
Root Reduction (%)	0.00 **	0.00	0.00 **	0.00 **	0.00
Number of leaves	0.15 7 **	0.01	0.08 **	0.01	0.02
Leaf angle (^{o})	23.98 **	1.50	5.80 **	0.67	0.67
Leaf length (cm)	15.12 **	0.93	1.41	1.67 *	0.94
Leaf width (cm)	10.01	9.34	24.05 *	7.29	6.61
Age of male flowering (DAP)	0.31	0.24	0.53 *	0.20	0.17
Female flowering age (DAT)	163.09 **	2.32	95.97 **	3.22	2.55
Harvest age (DAP)	173.52 **	1.91	104.23 **	3.31 **	1.59
Plant Appearance Aspects (score)	149.72 **	1.80	780.59 **	6.33 **	0.80
Closing husk (score)	2.87 **	0.35	0.22 **	0.02	0.02
Cob Performance (score)	0.19	0.07	2.50 **	0.02	0.02

Blight Score (score)	0.71**	0.03	0.17**	0.04	0.04
Rust Disease Score (score)	0.00 **	0.00	0.00 **	0.00	0.00
Number of harvested plants	0.00 *	0.00	0.00 **	0.00	0.00
Number of harvested cobs (cobs)	64.71**	1.97	7.57**	0.81	0.66
Harvest cob weight (kg)	42.28 **	0.82	7.61**	1.20	0.88
Seed yield (%)	8.09 **	0.35	40.93 **	0.48 **	0.22
Harvest Water Content (%)	2.94	2.40	44.66 **	1.60	2.51
Cob length (cm)	12.26 **	2.12	21.98 **	1.55	2.31
Cob diameter (cm)	49.94 **	1.00	65.23 **	0.67 *	0.37
Number of Seed rows (rows)	5.39 7 **	0.03	2.49 **	0.07 **	0.03
Number of seeds per row (Seeds)	6.76 **	0.72	54.88 **	1.44 **	0.60
Weight of 1000 seeds (g)	277.67 **	10.76	310.58 **	0.93	5.16
seed yield (f/ha)	7.52	0.28	43.51 **	0.40 *	0.22

** = very significant effect at the F test level of 1%; * = significant effect at the F test level of 5%; tn = no real effect

Average and Potential Results

The results of the tests of the average and potential yields in prospective and comparative varieties, prospective varieties JPI-1, JPI-2, JPI-3 and JPI-4 showed that the average yield was significantly superior to the three comparative varieties (Sticky Uri-1, White Srikandi and local Sticky), at 6 test locations respectively 8.16 t/ha, 7.88 t/ha-, 7.74 t/ha, 7.62 t/ha and the respective comparative varieties amounting to 6.48 t/ha-, 7.75 t/ha, 4.33 t/ha (Table 3).

The prospective variety JPI-1 showed that it was significantly superior in all locations to the comparative variety, especially the Sticky Uri and Sticky Local varieties. Especially in the Maros location, the prospective JPI-1 variety is clearly superior to all comparative varieties. The prospective varieties JPI-2, JPI-3, and JPI-4 showed that they were significantly superior for all locations compared to the comparative varieties, especially the Sticky Uri and Sticky Lokal varieties. Changes in the rank of a genotype at each test location indicate a genotype x environment interaction [6].

Table 3: Average yield (t/ha) of JPI corn seeds and comparative varieties at each test site in MT 2023.

Genotype	Yield at 15% moisture content (t/ha)						
	Gowa	Takalar	Bantaeng	Maros	Lombok	Kediri	Average
JPI-1	8.11 ac	7.70 ac	7.36 ac	8.45 abc	8.88 ac	8.48 ac	8.16 abc
JPI-2	7.192 ac	7.87 ac	7.20 ac	8.11 ac	8.54 ac	7.63 c	7.88 ac
JPI-3	7.95 ac	7.54 ac	6.56 ac	7.69 ac	8.57 ac	8.14 ac	7.74 ac
JPI-4	7.71 ac	7.47 c	6.71 ac	7.61 ac	8.67 ac	7.56 c	7.62 ac
Sticky Uri (a)	5.61	6.85	5.53	6.02	7.73	7.12	6.48
Srikandi Putih (b)	7.82	7.74	6.97	7.88	8.36	7.76	7.75
Sticky lokal Takalar (c)	4.38	3.92	3.97	4.41	4.77	4.55	4.33
Average	7.07	7.01	6.33	7.17	7.93	7.32	7.14
SE	0.17	0.21	0.26	0.16	0.27	0.30	0.13
LSD 5%	0.49	0.63	0.78	0.46	0.80	0.89	0.37
KK	4.7	6.1	8.3	4.3	6.7	8.2	6.6

a= significantly superior to Sticky *Uri*-1, b=significantly superior to White *Srikandi*, c=significantly superior to Sticky Local in the LSD 5% test.

Results Stability Analysis

The results of the combined analysis of variance on seed yields of 4 prospective varieties and 3 comparative varieties at 6 test locations showed a very significant genotype x location interaction (Table 4). The very real interaction of genotype x location on crop yield causes the seed yield of each prospective variety to be different in each testing environment. The results of the research state that the interaction of genotype with the environment will result in the inconsistent appearance of a trait under different environmental conditions. This causes differences in yield in various planting environments [7]. The interaction of genotype and environment is a component that influences results and phenotypic expression [8], so stability and adaptability tests are needed to determine the level of stability of a genotype in each testing environment.

Table 4: Analysis of variance of the combination of environmental x outcome characters in 6 test locations (districts) in MT 2023.

Source of diversity	DF	SQ	MQ	F Hit	Prob F	
Location	5	37.58	7.52	27.06	0.00	**
L/R	18	5.00	0.28	1.27	0.22	
Genotypee	6	261.04	43.51	108.15	0.00	**
Genotypee x Location	30	12.07	0.40	1.84	0.01	*
SD	108	23.61	0.22			
Total	167	339.31	2.03			

** = very real based on an F test of 1%. * = significantly different based on the 5% F test; DF= degrees of freedom; SQ= sum of squares; MQ= middle square

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The variation in crop yield characteristics (t/ha) was caused by a location factor of 7.52 and a genotype factor of 43.50 as well as a genotype x location interaction factor of 0.40 that can be seen in the middle square value (Table 4). Based on this proportion, it can be seen that the genotype makes the largest contribution to the diversity of the characteristics of the crop yield. Stability analysis is used to see the effect of the interaction of genotype and environment effectively so that the level of stability and adaptability of the proposed variety prospective can be determined.

Table 5 shows that the JPI-1 and JPI-4 genotypes with bi values are not significantly different from 1 and the average yield is higher than the general average so that the performance of these prospective varieties is stable in all environments, both optimum and suboptimal. For the prospective variety, JPI-3 shows that the bi value is significantly different from 1 so that the genotype is adaptive to the optimum environment, while JPI-2 shows that the bi value is smaller and significantly different from 1 so that this genotype will produce increased yields along with plant processing and the growing environment. better.

Table 5: Average and stability of composite corn yields (KA 15%) based on the combined analysis of six test locations (districts) in MT 2023.

Genotype	Yield (t/ha) min	max	mean	Slope	SE	MQ MS-TXL	MQ MS-REG	MQ MS-DEV	R**2(%)
JPI-1	7.36	8.88	8.16	1.01	0.20	0.04	0.00	0.05	0
JPI-2	7.20	8.54	7.88	0.77*	0.20	0.06	0.07	0.05	25
JPI-3	6.56	8.57	7.74	1.26*	0.19	0.06	0.09	0.05	34
JPI-4	6.71	8.67	7.62	1.17	0.14	0.03	0.04	0.03	25
Sticky Uri (a)	5.53	7.73	6.48	1.40	0.50	0.31	0.21	0.34	14
Srikandi Putih (b)	6.97	8.36	7.75	0.83	0.11	0.02	0.04	0.02	35
Sticky lokal Takalar (c)	3.92	4.77	4.33	0.55	0.17	0.08	0.27	0.04	64
Rerata umum			7.36						

bi = regression slope of the average variety in the environmental index, * = bi value is significantly different from 1; SE = standard error, MQ -HXL = Contribution of each genotype to the mean square of the interaction, MQ-Reg = Contribution of each genotype to the regression component in the interaction between genotype x location interaction; MQ-Dev = Middle square deviation (deviation of the interaction regression components), R ** 2 (%) = squared correlation between the residuals of the main effects of the model and the environmental index.

Agronomic Components and Yield Components

Plant growth, flowering time, harvest time, plant height, and cob height

Table 6 shows information on plant growth capacity, male and female flowering age, harvest age, plant height, and cob location. Based on the statistical test the percentage of prospective corn varieties growth was significantly higher from the comparative variety, except JPI-4 variety. It was not significantly different from the comparative variety, though the percentage of plants grew above 85%. The flowering times for male and female of prospective varieties JPI-1, JPI-2, JPI-3, and JPI-4 were significantly faster than White *Srikandi* variety. The harvest time for the prospective varieties JPI-1, JPI-2, JPI-3, and JPI-4 was significantly paster from the comparative varieties Sticky Uri and White Srikandi. Plant genetic factors are one of the causes of differences between one plant and another [9]. Corn plants have a short maturity ranging from 75-90 days after planting, medium maturity between 90-120 days after planting, and more than 120 days after planting [10]. The JPI-2 genotype showed plant height yields that were significantly superior to local Sticky, while JPI-4 showed plant height yields superior to White Srikandi and local Takalar Sticky. For cob height, JPI-2 was significantly superior to local Sticky, namely 85.35 cm, while JPI-4 shows a position height superior to White Srikandi and Local Takalar Sticky. The correct position of the cob can reduce the intensity of rat pest attacks. If the height of the cob is located more or less in the middle of the plant, it will reduce the intensity of root and stem lodging.

The characteristics of plant height and cob location are closely related to the suitability of the planting environment. Environments with high altitudes that have the potential for strong winds are suitable for shorter plants, while plant tall with suitable cobs are needed in areas that are susceptible of pests attacks, such as mice. Most plant breeders concentrate selection on shorter plants to be able to withstand lodging caused by strong winds [11]. Selection is also done the characteristics of plant height and ear height. Several cases show a decrease in ear height along with an increase in plant height [12].

Table 6: Average plant growth, age, plant height and position of test composite corn cobs and comparative varieties in 6 test locations (districts) in MT 2023.

Genotype	Growth	Flowering (DAP)		Harvesting (DAP)	Height (cm)	Ear Height (cm)
		Female	Male			
JPI-1	91.83^{ab}	56.87^{b}	55.16^{b}	102.21^{ab}	186.42	89.35
JPI-2	91.63^{ab}	57.20^{b}	55.45^{b}	102.79^{ab}	175.59^{c}	85.35^{c}
JPI-3	92.33^{ab}	57.20^{b}	55.50^{b}	103.50^{ab}	187.27	92.23
JPI-4	88.67	57.12^{b}	55.25^{b}	106.39^{ab}	166.70^{bc}	80.20^{bc}
Sticky Uri (a)	88.32	56.87	54.69	110.15	171.42	83.75
Srikandi Putih (b)	89.15	59.12	57.52	110.49	186.86	91.16
Sticky lokal (c)	92.21	52.29	50.87	93.17	192.23	92.65
Means	90.59	56.67	54.92	104.18	180.93	87.81
SE	0.60	0.37	0.36	0.51	3.98	2.46

LSD 5%	1.73	1.07	1.05	1.48	11.50	7.18
CD (%)	4.10	2.20	2.90	0.90	8.60	10.20

a = significantly superior to Sticky Uri, b = significantly superior to Srikandi Putih, c = significantly superior to Sticky Local Takalar in the 5% LSD test, CD = Diversity coefficient.

Stem diameter, angle, length, and width of leaves, and percentage of leaf fall. Based on the results in Table 7, it shows that the prospective varieties JPI-1, JPI-2, JPI-3 and JPI-4 have stem diameters of 2.38 cm, 2.35 cm, and 2.36 cm and 2.32 cm respectively. Those were clearly superior to the local Takalar Sticky with a diameter of only 2.22 cm. A large stem diameter makes the plant stronger and stronger so that the intensity of lodging can be reduced. The character of leaf angle, length, and width of leaves can be used to develop a new variety.

Table 7: Mean stem diameter, angle, length, and width of leaves, as well as percentage of stem and root fall of maize composite test and comparative varieties in six locations.

Genotype	stem diameter	Leave angle	Leave length	Leave wide	Rebah batang	Rebah akar
JPI-1	2.38ac	26.89	96.42abc	9.443ac	0.017abc	0.02abc
JPI-2	2.35ac	26.59	95.00c	9.29c	0.02abc	0.01abc
JPI-3	2.36ac	26.55	94.72	9.40c	0.02abc	0.02abc
JPI-4	2.32c	26.82	94.14	9.20	0.02abc	0.02abc
Sticky Uri (a)	2.30	27.00	94.50	9.16	0.04	0.03
Srikandi Putih (b)	2.39	26.90	94.12	9.34	0.04	0.03
Sticky lokal (c)	2.22	26.32	93.17	9.02	0.06	0.06
Average	2.30	26.72	94.13	9.18	0.04	0.04
SE	0.02	0.26	0.55	0.09	0.00	0.00
LSD 5%	0.05	0.76	1.59	0.27	0.01	0.01
CV	5.70	3.60	2.70	4.50	34.80	24.30

a= significantly superior to Sticky Uri, b= significantly superior to White Srikandi, c=significantly superior to Sticky Local in the 5% LSD test, CV= Coefficient of variation.

The leaf angles of the four prospective varieties JPI-1, JPI-2, JPI-3 and JPI-4 did not show significant differences with the comparative varieties Sticky Uri, Srikandi Putih and Sticky Lokal. The leaf angles of the prospective varieties and the comparative varieties were all less than 30°. Leaf angles ranging from 21.1°-50° include moderate leaf angles [13]. The angle of the leaves between small and medium has a straight or bent leaf pattern, which is included in the erect leaf category [14]. Erect-type plants with small to medium leaf angles can increase the number of planted populations.

The average leaf length character of the prospective variety JPI-1 showed superior results and was significantly different from the comparative varieties Sticky Uri, Srikandi Putih and local Sticky. The leaf length of JPI-2 is superior and significantly different from that of Local Sticky. The average leaf diameter character of the prospective variety JPI-1 showed superior results and was significantly different from the comparative varieties Sticky Uri and local Sticky. The leaf diameter of JPI-2 is superior and significantly different from that of Local Sticky.

The size of the leaves greatly influences the results of photosynthesis. The wider the leaves, the more photosynthesis or biomass they need, and this biomass is really needed by plants. The percentage of stem and root lodging for all prospective varieties was lower and significantly different from all comparative varieties.

Plant and Ear Appearance, Husk Closure, Leaf Rust, and Leaf Blight

The characteristics of the plant appearance, the closure of the husk, the appearance of the cob and the attacks of the disease were qualitatively observed by scoring. The average assessment of plant appearance, husk closure, cob appearance, blight, and leaf rust attacks is presented in Table 8. Based on statistical analysis, the prospective varieties JPI-1, JPI-2, JPI-3, and JPI-4 show good plant performance with mean values respective scores of 1.77; 1.85; 1.83 and 1.82, which values are significantly different from the three comparative varieties. The appearance of plants with good scores indicates that the plants have good uniformity and sturdy stems when planted in 6 adaptation testing locations. According to [15], plants that are more uniform, especially in terms of plant height and cob height, can facilitate the application of mechanization in plant management.

Table 8: Average plant and ear appearance, husk closure, leaf rust, and leaf blight at 6 test locations in MT 2022.

Genotype	Plant performance	Husk closure	Ear appearance	Leaf rust	Leaf blight
JPI-1	1.77abc	2.06ab	1.30ab	0.02aabc	0.03abc
JPI-2	1.85ac	2.13ab	1.34ab	0.02abc	0.03abc
JPI-3	1.83ac	2.13ab	1.31ab	0.02abc	0.03abc
JPI-4	1.82ac	2.11ab	1.37a	0.02abc	0.03abc
Sticky Uri (a)	1.97	2.26	1.53	0.05	0.05
Srikandi Putih (b)	1.91	2.28	1.48	0.04	0.05
Sticky lokal Takalar (c)	2.05	1.33	1.43	0.06	0.07
Average	1.98	1.96	1.48	0.05	0.06
SE	0.03	0.03	0.04	0.00	0.00
LSD 5%	0.09	0.09	0.12	0.01	0.01
CV	7.90	6.80	13.90	7.00	9.80

Note: score value 1 is the best and 5 is the worst, a= significantly superior to Sticky Uri, b= significantly superior to Srikandi Putih, c=significantly superior to local Sticky in the 5% LSD test, CV = Diversity coefficient.

The prospective varieties had perfect husk closure with a mean score of 2.06; 2.13; 2.13; 2.11 respectively. The closure of the husks is significantly different from the comparative varieties Sticky Uri and Srikandi Putih, which close well and tightly. However, the local sticky still has a better husk closure score.

Figure 1: Appearance of Clot Closure: (a.) JPI-1, (b.) JPI-2, (c.) JPI-3, (d.) IPI-4, (e.) Sticky Uri, White Srikandi, g, Local Sticky.

Properly and tightly husk closure can protect the cobs from weather effects, pest attacks, especially the powder beetle (*Sitophillus zeamais),* and cob rot infections. This is in agreement with [16], tightly closing husks can reduce the intensity of water seeping into the cob so that it can prevent seed germination and growth of pathogenic fungi and protect the cob and seeds from attack by the *Sitophillus zeamais* pest. The appearance of the husk closure can be seen in Figure 1.

The appearance of cobs is related to the uniformity of size, seed color, seed filling, and seed damage due to pests and diseases. The cob performances of JPI-1, JPI-2, JPI-3 showed good performance with an average score of 1.30; 1.34; 1.31 is significantly different from the comparative varieties Sticky Uri and White Srikandi; however, JPI-4 shows that the appearance of the cob is only significantly different from the comparative variety Sticky Uri. The appearance of a cob that has good size uniformity, the seeds are completely filled to the tip of the cob, a straight grain arrangement and an attractive seed color will be preferred by consumers or farmers. The appearance of the cob can be seen in Figure 2.

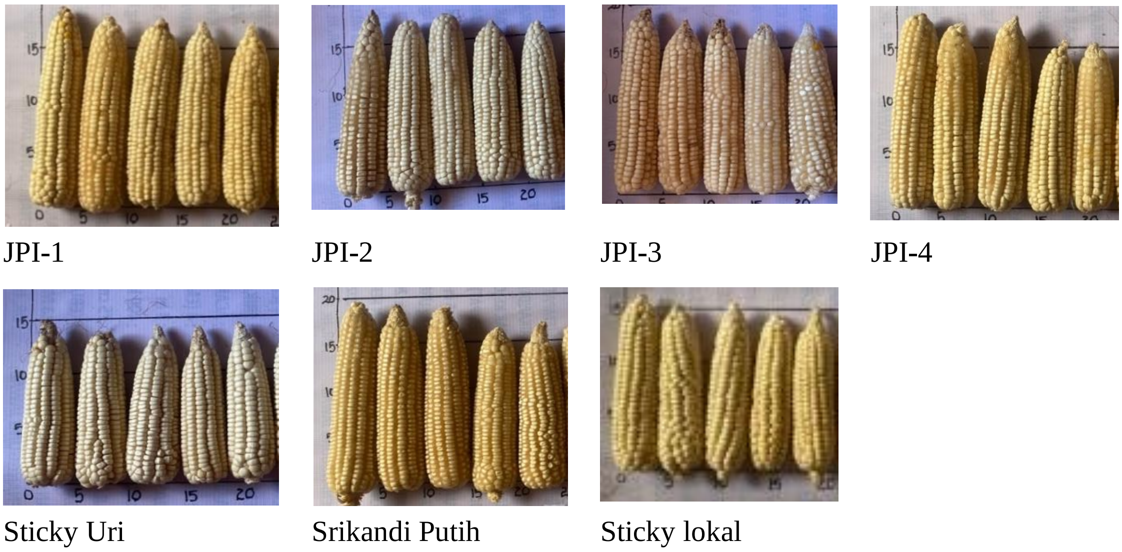

Figure 2: Cob appearance between test genotypes (JPI-1, JPI-2, JPI-3, IPI-4) and comparative varieties (Sticky Uri, Srikandi Putih, and Sticky local).

The scoring of leaf rust disease attacks for prospective varieties JPI-1, JPI-2, JPI-3, and JPI-4 showed a small average of 0.02 each, which is a significantly different value from the comparative variety, while leaf blight attacks on JPI-1, JPI-2, JPI-3 and JPI-4 showed the smallest mean score, namely 0.03. This value was also significantly different from the three comparative varieties. The score for blight and leaf rust infections is less than 1 for prospective varieties, indicating good resistance to disease.

Number of Plants and Harvested Ears, Weight of Harvested Ears, Length and Diameter of Ears

Table 9 presents the average number of plants and ears harvested, weight of harvested ears, length, and diameter of the ears. The statistical test showed significant differences between the prospective and the comparative varieties on the characteristics of number of harvested plants, number of harvested ears, weight of harvested ears, length of ears, and diameter of ears. The yield component is caused not only by the genetic potential of each prospective variety, but also by differences in plant population, number of harvested ears, weight of harvested ears, length, and diameter of the ears. The number of harvest pieces produced by a plant is related to the production of that plant. Under optimum conditions, more than two cob shoots can develop for some genotypes [17].

All prospective varieties showed that the average harvest ear weight, ear length, and ear diameter were superior to the comparative varieties Sticky Uri and local Sticky. Long cobs produce a higher number of seeds and assimilate, which affect the weight of the crop and if the diameter of the cob is large, the yield obtained is small and vice versa [18].

Table 9: Average number of plants and harvested ears, weight of harvested ears, length and diameter of ears in six test locations (districts) in MT 2023.

Genotype	Number of harvested plants	Number of harvested ears	Weight of harvested ears (kg)	Length of harvested ears (cm)	Diameter of ears (cm)
JPI-1	47.66ac	48.62ac	8.57ac	18.21ac	4.41ac
JPI-2	47.41ac	48.16c	8.41ac	17.69ac	4.33ac
JPI-3	47.83ac	48.541ac	8.29ac	17.83ac	4.4ac
JPI-4	47.25ac	48.50ac	8.18ac	18.31ac	4.23ac
Sticky Uri (a)	46.54	47.54	7.07	15.33	4.00
White	47.54	48.17	8.41	17.97	4.47

Srikandi (b)					
Sticky local Takalar (c)	46.38	47.13	4.97	14.13	3.57
Average	46.82	47.61	6.82	15.81	4.01
SE	0.18	0.22	0.14	0.17	0.05
LSD 5%	0.53	0.65	0.41	0.48	0.15
KK	1.70	1.90	6.10	3.60	4.00

Note: a= significantly superior to Sticky Uri, b= significantly superior to White Srikandi, c=significantly superior to local Sticky in the 5% LSD test, KK= Coefficient of Diversity.

Water Content, Number of Rows of Seeds, Number of Seeds per Row, Seed Yield and Weight of 1000 Seeds KA 15%

The results of statistical tests on the variables water content, number of seed rows, number of seeds per row, seed yield, and weight of 1000 KA 15% seeds are presented in Table 10. The average water content in JPI-1 shows a lower water content and is significantly different from the comparative of all varieties. JPI-2, JPI-3, and JPI-4 showed lower water content and were significantly different from the comparative varieties Sticky Uri and Sticky Lokal. The characteristics of the number of seed rows and the number of seeds per row in the four prospective varieties were superior and significantly different from the two comparative varieties, namely Sticky Uri and Sticky Lokal. Moreover, the average weight of 1000 seeds with a water content of 15% JPI-1 showed superior results and was significantly different compared to Sticky Uri and Sticky Local. JPI-2 and JPI-3 show superiority and are significantly different from Sticky Local. JPI-4 showed superiority and was significantly different from all comparative varieties.

Table 10: Average water content, number of rows of seeds, number of seeds per row, seed yield, and weight of 1000 KA 15% seeds at 6 test locations in MT 2023.

Genotype	Seed moisture content (%)	Number of seed rows	Number of seed per row	Seed yield (%)	Weight 1000 seeds KA 15% (g)
JPI-1	23.33abc	14.86ac	32.91ac	79.13abc	287.14ac
JPI-2	23.52bc	14.27ac	33.16ac	78.04ac	281.76c
JPI-3	23.80bc	15.09ac	32.77ac	78.00ac	283.78c
JPI-4	22.95abc	14.70ac	31.08ac	77.14c	289.72abc
Sticky Uri (a)	24.15	13.47	28.04	71.02	279.29
Srikandi Putih (b)	24.95	14.81	33.08	78.28	282.47
Sticky lokal Takalar (c)	25.67	10.80	23.67	74.86	274.95
Average	24.92	13.02	28.26	76.72	278.90
SE	0.25	0.25	0.20	0.26	1.80
LSD 5%	0.73	0.71	0.57	0.75	5.19
KK	6.30	5.50	7.40	2.00	4.20

Note: a= significantly superior to Sticky Uri, b= significantly superior to White Srikandi, c=significantly superior to local Sticky in the 5% LSD test, CV = coefficient of diversity.

Testing for Major Diseases

The results of observations on the intensity of downy mildew attacks (P. philippinensis) in Bajeng Gowa at the ages of 14, 21, 28, 35 and 42 days after planting (DAP) are presented in Table 11.

Table 11: Average percentage of downy mildew pathogen infections in Bajeng, Gowa 2023.

Genotype	Average percentage of downy mildew infections (%)	Reaction

	14 DAP	21 DAP	28 DAP	35 DAP	42 DAP	
JPI-1	0.0	3.5	5.3	5.8	5.8	R
JPI-2	0.0	4.6	7.1	8.2	8.2	R
JPI-3	0.6	6.2	11.2	11.7	11.7	R
JPI-4	4.1	12.5	27.7	27.7	27.7	AT
Sticky Uri	0.0	4.1	8.5	9.1	9.1	R
Srikandi Putih	0.0	3.5	5.4	5.4	5.4	R
Sticky Lokal	0.0	7.2	30.5	37.3	41.6	S
Anoman	7.5	64.2	80.9	98.4	92.2	VS

Information: R = resistant; M = Moderate; V = Vulnerable; VV = very vulnerable

Table 11 shows that none of the prospective varieties tested showed a susceptible reaction to downy mildew, although the check plants (susceptible plants) of the Anoman variety reacted very susceptible to downy mildew with a percentage of attacks at 42 days after reaching 92.2%, as did the local Sticky susceptible with an intensity of 39.6%. The comparative varieties Sticky Uri and White Srikandi showed a resistant reaction to downy mildew in Bajeng with an average percentage of infection of 9.1% and 5.4%, respectively, at 42 dap observations.

Table 11 also shows that the Anoman and local sticky varieties have started to become quite heavily infected with downy mildew pathogens since 21 DAP. This shows that the level of resistance of prospective varieties to *P. philippinensis* in Bajeng is relatively good, although JPI-4 reacts somewhat resistant.

The results of the test of prospective varieties against downy mildew (*P. maydis*) carried out in Malang are presented in Table 12. Table 12 shows that the four prospective composite varieties tested showed a resistant reaction to *P. maydis*, with an average percentage of attacks at 42 days after planting, ranging between 9.61% and 10.42%. All comparative varieties, apart from the check plants (susceptible plants) of the Anoman variety, showed a resistant reaction to *P. maydis* except for the local sticky that reacted somewhat resistantly. The average percentage of infection with downy mildew pathogen in check plants (susceptible plants) of Varetas Anoman is 83.75%, which means that the reaction is very susceptible. The Anoman variety has started to be infected with the heavy downy mildew pathogen since 21 DAP.

Table 12: Average percentage of downy mildew pathogen infections in Malang in 2023.

Genotype	Average percentage of infections (%)					Response
	14 DAP	21 DAP	28 DAP	35 DAP	42 DAP	
JPI-1	0.00	0.00	9.21	9.61	9.61	T
JPI-2	0.00	0.00	10.21	10.42	10.42	T
JPI-3	3.00	6.50	8.37	9.75	9.75	T
JPI-4	4.00	7.67	8.67	18.00	18.00	T
Sticky Uri	0.33	4.13	9.21	10.60	10.60	T
Srikandi Putih	2.25	6.27	8.37	9.18	9.18	T
Sticky Lokal	1.00	8.00	10.06	25.42	25.42	M
Anoman	20.62	52.28	71.91	79.57	83.75	SR

Information: T = Hold; AT = Somewhat Resistant; R= Vulnerable; SR = very vulnerable.

The results of observations of maydis leaf blight infection in all test genotypes showed that all prospective varieties tested reacted with resistance with an average percentage of attacks at 75 DAP ranging from 18.0% to 20.8% (Table 13). Similarly, all the resistant comparative varieties showed a resistant reaction to Maydis leaf blight. However, the check plants (susceptible plants) of the Anoman variety reacted very susceptiblely with an average attack percentage of 68.5%.

Table 13: Average percentage of Maydis leaf blight infection in test lines and comparative varieties at 45, 60 and 75 DAP Bajeng, Gowa, 2023.

Genotype	Average percentage of infections (%)			Response
	45 DAP	60 DAP	75 DAP	
JPI-1	1.50	15.60	18.80	R
JPI-2	5.70	18.20	19.60	R
JPI-3	12.70	17.30	18.00	R

JPI-4	12.3	18.40	18.80	R
Sticky Uri	0.00	16.00	20.00	R
Srikandi Putih	5.30	17.30	19.20	R
Sticky Lokal	4.70	15.00	20.30	R
Anoman	1.30	39.30	68.50	VV

Information: T = Hold; AT = Somewhat Resistant; SR = Very Vulnerable.

Maydis leaf blight, like most other leaf diseases of corn, is a late-season disease where the most severe disease development occurs post anthesis [19]. Therefore, observations of the intensity of leaf blight attacks were carried out during that period. Furthermore, [19] stated that leaf blight can occur in corn plants with different intensities and one of the main factors that really influences it apart from climate and planting conditions is the level of resistance of a plant.

The results of observations on the intensity of rust infection carried out in Bajeng are shown in Table 14. Table 14 shows that of the four prospective varieties tested, all comparative varieties except check plants (susceptible plants), the Anamon variety, which acted very susceptible with a value of 68.2%, showed a resistant reaction.

Table 14: Average percentage of attacks with maydis leaf rust in test lines and comparative varieties at 60 and 75 DAP in Bajeng, Gowa 2023.

Genotype	Average percentage of infections (%)		Response
	60 DAP	75 DAP	
JPI-1	15.5	20.1	R
JPI-2	16.9	19.7	R
JPI-3	18.3	20.0	R
JPI-4	14.3	18.0	R
Sticky Uri	16.8	20.3	R
Srikandi Putih	14.3	18.0	R
Sticky Lokal	14.5	20.4	R
Anoman	22.5	68.2	VV

Information: T = Hold; AT = Somewhat Resistant; R= Vulnerable; SR = Very Vulnerable

Nutritional Content

Based on the results of laboratory analysis shown in Table 15, it is known that all prospective varieties show a high carbohydrate content compared to all comparative varieties. According to [20], the main nutritional content of corn is carbohydrates, which range from 72-73% and are mostly concentrated in the endosperm. The composition of carbohydrates in the form of starch consisting of amylose and amylopectin in seeds is genetically controlled. These components influence the functional properties of corn. In general, the physical, chemical, and functional properties of carbohydrates can provide guidance in selecting appropriate corn varieties for the desired product. From this description, prospective varieties that have high carbohydrate content are suitable for use as food and raw materials for the production of bioethanol.

In addition to being a source of carbohydrates, corn also contains other macronutrients such as fat and protein. According to [20], the fat content of corn kernels is genetically controlled, ranging from 3-18%. Based on laboratory test results, all prospective varieties and comparatives have relatively high fat content. Generally, corn contains 3.5% fat found in the kernel part [21]. Corn kernel protein generally ranges between 8-11% [20]. The test results showed that all prospective varieties had a higher protein content compared to all comparative varieties except the Srikandi Putih variety.

The amylopectin content in all prospective varieties is relatively high (>80%) compared to the two comparative varieties, namely Sticky Uri and Srikandi Putih, but the amylopectin content in the local sticky is generally equivalent to all prospective varieties, especially JPI-1. High amylopectin is a determinant of the level of fluffier taste. The higher the amylopectin content in the corn kernels, the more suitable it is for use as an alternative staple food. This shows that the high amylopectin character of local sticky Takalar parents has generally been inherited in the four genotypes of prospective varieties through the development of the Dreher method. This is in line with research results that corn with special characteristics can be formed through repeated and programmed plant breeding programs [22]. In sticky corn there is a recessive wx gene in a homozygous state (wxwx) that affects the chemical composition of starch causing a delicious and savory taste. The backcross breeding method can be applied to introgress donor genes from special corn with high amylopectin content to corn with high protein to obtain corn that has special characteristics.

Table 15: Results of analysis of carbohydrate, fat, protein, and amylopectin content in corn seeds of prospective varieties and comparative varieties in MT 2023.

Genotype	Protein (%)	Fat (%)	Carbohydrate (%)	Amylopectin (%)
JPI-1	11.64	4.85	75.74	85.10
JPI-2	11.54	5.72	74.51	82.80
JPI-3	11.69	6.63	74.49	82.45
JPI-4	11.86	5.76	73.46	80.90
Sticky Uri (a)	10.97	5.55	72.65	55.95
Srikandi Putih (b)	11.63	4.76	73.04	38.80
Sticky lokal Takalar (c)	10.24	5.08	72.56	85.40

Source: Lab analysis. Integrated Biotechnology in Animal Husbandry, Department of Nutrition and Animal Feed, Faculty of Animal Husbandry, UNHAS

Conclusion

The conclusions that can be drawn from the results of this research are as follows.

1. Prospective composite corn varieties JPI-1 and JPI-2, JPI-3, and JPI-4 have the potential for higher productivity (respectively: 8.88; 8.54; 8.57, 8.67 t/ha) compared to the three comparative varieties (respectively: 7.73; 8.36; 4.77 t/ha).
2. Prospective composite corn varieties JPI-1 and JPI-2, have higher average yields (8.16 and 7.88 t/ha) than the three comparative varieties (6.48; 7.75 and 4.33 t/ha) Ha).
3. Prospective composite corn varieties JPI-1, JPI-2, JPI-3, and JPI-4 show the criteria for resistance to downy mildew, P. maydis, P. philippinensis (except JPI-4 which is somewhat resistant), type H blight. maydis, and P. polysora leaf rust disease,
4. The prospective JPI-1 composite corn variety has a higher protein content than the three comparative varieties, namely 11.64%,
5. The JPI-1 prospective composite corn variety is included in the genotype category that is stable in various environmental conditions with a higher average yield compared to the overall average, while JPI-2 has high productivity due to improved environmental conditions.
6. Prospective composite corn varieties JPI-1 and JPI-2 have a relatively high amylopectin content of 85.10% and 82.80% respectively.
7. Prospective varieties JP-1 and JPI-2 have met the eligibility requirements to be released as new superior varieties based on productivity and amylopectin content.

Data Availability

A data availability statement is compulsory for research articles and clinical trials. Here, authors must describe how readers can access the data underlying the findings of the study, giving links to online repositories and providing deposition codes where applicable. For more information on how to compose a data availability statement, including template examples, please visit: https://www.hindawi.com/research.data/#statement.

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Funding Statement

Authors should state how the research and publication of their article was funded, by naming financially supporting bodies followed by any associated grant numbers in square brackets.

Acknowledgments

The authors thank the Ministry of Education and Culture of Indonesia for supporting this study.

Supplementary Materials

If Supplementary Materials are provided (e.g., audio files, video clips or datasets) they should be described here. Note that authors are responsible for providing the final Supplementary Materials files that will be published along with the article, which are not modified by our production team. You should remember to reference the Supplementary Materials’ contents at appropriate points within the manuscript. We recommend citing specific items, rather than referring to the Supplementary Materials in general, for example: “See Figures S1-S10 in the Supplementary Material for comprehensive image analysis.”

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Kind regards,
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International Journal of Agronomy

Bukti perbaikan supplementary files

Data downy mildew infection in Bajeng Gowa, 2023

Age 14 DAP

genotype	replicate				
	I	II	III	IV	Average
JPI-1	0.0	0.0	0.0	0.0	0.0
JPI-2	0.0	0.0	0.0	0.0	0.0
JPI-3	0.0	0.4	1.0	0.8	0.6
JPI-4	4.2	5.2	3.8	3.0	4.1
Pulut Uri	0.0	0.0	0.0	0.0	0.0
Srikandi Putih	0.0	0.0	0.0	0.0	0.0
Pulut lokal	0.0	0.0	0.0	0.0	0.0
Anoman	7.2	6.8	8.2	7.8	7.5

Umur 21 DAP (Gowa)

Genotype	Replicate				
	I	II	III	IV	Rataan
JPI-1	3.8	3.2	3.4	3.7	3.5
JPI-2	4.7	5.0	4.2	4.4	4.6
JPI-3	5.8	6.4	5.9	6.7	6.2
JPI-4	11.9	12.8	12.6	12.7	12.5
Pulut Uri	3.6	4.1	4.5	4.2	4.1
Srikandi Putih	4.0	3.2	3.6	3.2	3.5
Pulut lokal	7.0	8.2	6.4	7.2	7.2
Anoman	69.2	60.4	60.8	66.2	64.2

Umur 28 DAP (Gowa)

Genotype	Replicate				
	I	II	III	IV	Rataan
JPI-1	5.1	5.6	5.2	5.4	5.3
JPI-2	7.8	7.2	7.1	6.4	7.1
JPI-3	11.0	12.0	10.4	11.2	11.2
JPI-4	28.2	27.4	26.8	28.4	27.7
Pulut Uri	8.8	8.3	7.8	8.9	8.5
Srikandi Putih	5.2	5.3	6.0	5.0	5.4
Pulut lokal	32.5	30.2	30.0	29.3	30.5
Anoman	82.4	80.1	78.6	82.5	80.9

Umur 35 DAP (Gowa)

Genotype	Replicate				
	I	II	III	IV	Rataan
JPI-1	5.8	5.6	5.2	6.4	5.8
JPI-2	9.0	7.2	8.1	8.4	8.2
JPI-3	11.0	12.0	12.4	11.2	11.7
JPI-4	28.2	27.4	26.8	28.4	27.7
Pulut Uri	8.8	8.7	9.8	8.9	9.1
Srikandi Putih	5.2	5.3	6.0	5.0	5.4
Pulut lokal	32.5	38.2	39.0	39.3	37.3
Anoman	97.4	98.1	98.6	99.5	98.4

Umur 42 HST (Gowa)

Genotip	Ulangan				
	I	II	III	IV	Rataan
JPI-1	5.8	5.6	5.2	6.4	5.8
JPI-2	9.0	7.2	8.1	8.4	8.2
JPI-3	11.0	12.0	12.4	11.2	11.7
JPI-4	28.2	27.4	26.8	28.4	27.7
Pulut Uri	8.8	8.7	9.8	8.9	9.1
Srikandi Putih	5.2	5.3	6.0	5.0	5.4
Pulut lokal	38.5	40.2	39.4	40.3	39.6
Anoman	90.4	95.1	90.6	92.5	92.2

Tabel 1. Rata-rata persentase infeksi patogrn bulai di Bajeng Gowa 2023

Genotip	Insidensi penyakit bulai (%) pada umur (HST)					Reaksi
	14	21	28	35	42	
JPI-1	0.0	3.5	5.3	5.8	5.8	Tahan T)
JPI-2	0.0	4.6	7.1	8.2	8.2	Tahan (T)
JPI-3	0.6	6.2	11.2	11.7	11.7	Tahan (T)
JPI-4	4.1	12.5	27.7	27.7	27.7	agak Tahan AT)
Pulut Uri	0.0	4.1	8.5	9.1	9.1	Tahan (T)
Srikandi Putih	0.0	3.5	5.4	5.4	5.4	Tahan (T)
Pulut lokal	0.0	7.2	30.5	37.3	39.6	Rentan ®
Anoman	7.5	64.2	80.9	98.4	92.2	Sangat rentan (SR)

Data downy mildew infection in Malang, Jatim, 2023

Age 14 DAP

genotype	replicate				
	I	II	III	IV	Average
JPI-1	0.0	0.0	0.0	0.0	0.0
JPI-2	0.0	0.0	0.0	0.0	0.0
JPI-3	2.4	3.8	2.4	3.4	3.0
JPI-4	4.0	4.2	4.3	3.6	4.0
Pulut Uri	0.5	0.2	0.2	0.4	0.3
Srikandi Putih	2.0	2.3	2.6	2.1	2.3
Pulut lokal	1.2	1.1	1.0	0.7	1.0
Anoman	23.1	20.2	19.6	19.6	20.6

Umur 21 DAP (Malang)

Genotype	Replicate				
	I	II	III	IV	Rataan
JPI-1	0.0	0.0	0.0	0.0	0.0
JPI-2	0.0	0.0	0.0	0.0	0.0
JPI-3	6.4	6.6	5.9	6.9	6.5
JPI-4	8.1	7.4	7.8	7.4	7.7
Pulut Uri	4.6	4.1	3.8	4.0	4.1
Srikandi Putih	5.9	7.0	6.4	5.8	6.3
Pulut lokal	8.7	7.8	7.4	8.1	8.0
Anoman	52.3	50.4	53.0	53.4	52.3

Umur 28 DAP (Malang)

Genotype	Replicate				
	I	II	III	IV	Rataan
JPI-1	9.1	9.2	10.0	8.5	9.2
JPI-2	10.4	10.7	9.9	9.8	10.2
JPI-3	8.4	9.0	8.3	7.8	8.4
JPI-4	9.0	8.6	8.5	8.6	8.7
Pulut Uri	9.6	9.3	8.8	9.1	9.2
Srikandi Putih	8.4	8.8	7.9	8.4	8.4
Pulut lokal	11.0	9.2	10.0	10.1	10.1
Anoman	72.5	72.5	74.3	68.4	71.9

Umur 35 DAP (Malang)

Genotype	Replicate				
	I	II	III	IV	Rataan
JPI-1	9.9	8.9	9.7	10.0	9.6
JPI-2	11.1	10.3	10.7	9.6	10.4
JPI-3	9.8	9.8	10.1	9.3	9.8
JPI-4	19.0	18.1	17.3	17.6	18.0
Pulut Uri	10.6	10.3	11.3	10.2	10.6
Srikandi Putih	10.0	9.1	9.2	8.4	9.2
Pulut lokal	25.4	27.1	24.2	25.0	25.4
Anoman	80.3	80.6	77.9	79.5	79.6

Umur 42 HST (Malang)

Genotip	Ulangan				
	I	II	III	IV	Rataan
JPI-1	9.9	8.9	9.7	10.0	9.6
JPI-2	11.1	10.3	10.7	9.6	10.4
JPI-3	9.8	9.8	10.1	9.3	9.8
JPI-4	19.0	18.1	17.3	17.6	18.0
Pulut Uri	10.6	10.3	11.3	10.2	10.6
Srikandi Putih	10.0	9.1	9.2	8.4	9.2
Pulut lokal	25.4	27.1	24.2	25.0	25.4
Anoman	82.2	86.2	80.5	86.1	83.7

Tabel 2. Rata-rata persentase infeksi patogrn bulai di Malang Jatim- 2023

Genotip	Insidensi penyakit bulai (%) pada umur (HST)					Reaksi
	14	21	28	35	42	
JPI-1	0.0	0.0	9.2	9.6	9.6	Tahan T)
JPI-2	0.0	0.0	10.2	10.4	10.4	Tahan (T)
JPI-3	3.0	6.5	8.4	9.8	9.8	Tahan (T)
JPI-4	4.0	7.7	8.7	18.0	18.0	agak Tahan (AT)
Pulut Uri	0.3	4.1	9.2	10.6	10.6	Tahan (T)
Srikandi Putih	2.3	6.3	8.4	9.2	9.2	Tahan (T)
Pulut lokal	1.0	8.0	10.1	25.4	25.4	agak tahan (AT)
Anoman	20.6	52.3	71.9	79.6	83.7	Sangat rentan (SR)

Data leaf blight infection in Bajeng, Gowa, 2023

Age 45 DAP

genotype	replicate				
	I	II	III	IV	Average
JPI-1	1.60	2.00	1.20	1.30	1.53
JPI-2	6.10	5.80	5.40	5.30	5.65
JPI-3	13.10	12.60	12.70	12.40	12.70
JPI-4	12.40	12.60	12.20	12.00	12.30
Pulut Uri	0.00	0.00	0.00	0.00	0.00
Srikandi Putih	6.20	5.40	5.11	4.50	5.30
Pulut lokal	4.70	5.10	4.20	4.80	4.70
Anoman	1.30	1.60	1.11	1.20	1.30

Umur 60 DAP (gowa)

Genotype	Replicate				
	I	II	III	IV	Rataan
JPI-1	16.50	16.80	14.20	14.90	15.60
JPI-2	18.40	18.80	17.30	18.20	18.18
JPI-3	18.10	16.60	17.20	17.10	17.25
JPI-4	18.80	19.20	18.20	17.40	18.40
Pulut Uri	16.30	17.00	15.10	15.60	16.00
Srikandi Putih	17.50	18.20	16.30	17.20	17.30
Pulut lokal	15.10	15.40	14.50	15.00	15.00
Anoman	38.40	40.10	38.80	39.90	39.30

Umur 75 DAP (gowa)

Genotype	Replicate				
	I	II	III	IV	Rataan
JPI-1	18.50	18.40	19.10	19.20	18.80
JPI-2	22.20	20.60	20.10	19.50	20.60
JPI-3	19.20	18.20	17.60	17.00	18.00
JPI-4	22.40	20.80	20.40	19.60	20.80
Pulut Uri	21.30	20.40	18.10	20.20	20.00
Srikandi Putih	19.70	18.31	19.10	19.70	19.20
Pulut lokal	21.30	21.60	20.20	20.10	20.80
Anoman	70.20	70.40	68.10	65.30	68.50

Tabel 3. Rata-rata persentase hawar daun di Bajeng-Gowa- 2023

Genotype	Insidensi penyakit bulai (%) pada umur (DAP)			Reaksi
	45	60	70	
JPI-1	1.53	15.60	18.80	Tahan T)
JPI-2	5.65	18.18	20.60	Tahan (T)
JPI-3	12.70	17.25	18.00	Tahan (T)
JPI-4	12.30	18.40	20.80	Tahan (T)
Pulut Uri	0.00	16.00	20.00	Tahan (T)
Srikandi Putih	5.30	17.30	19.20	Tahan (T)
Pulut lokal	4.70	15.00	20.80	Tahan (T)
Anoman	1.30	39.30	68.50	Sangat rentan (SR)

Leaf rust infection data in Bajeng, Gowa, 2023

Umur 60 DAP

Genotype	Replicate		
	I	II	III
JPI-1	16.30	14.40	15.80
JPI-2	16.40	17.20	16.80
JPI-3	18.10	18.00	20.00
JPI-4	14.80	15.00	13.20
Pulut Uri	17.50	16.70	16.80
Srikandi Putih	14.70	15.00	14.00
Pulut lokal	14.80	14.30	15.10
Anoman	23.10	23.50	21.80

Umur 70 DAP (gowa)

Genotype	Replicate		
	I	II	III
JPI-1	21.70	22.40	19.40
JPI-2	20.20	19.80	19.80
JPI-3	22.20	20.20	18.40
JPI-4	18.50	17.30	19.20
Pulut Uri	21.80	21.60	18.60
Srikandi Putih	18.40	18.20	17.40
Pulut lokal	21.20	21.00	19.30
Anoman	66.80	70.60	67.20

Tabel 4. Average percentage of leaf rust in Bajeng-Gowa- 2(

Genotype	Leaf rust percentage (%) at age (DAP)		
	45	60	70
JPI-1		15.50	20.70
JPI-2		16.90	19.68
JPI-3		18.30	19.98
JPI-4		14.30	18.00
Pulut Uri		16.80	20.30
Srikandi Putih		14.30	18.00
Pulut lokal		14.50	20.00
Anoman		22.50	68.20

IV		Average
	15.50	15.50
	17.20	16.90
	17.10	18.30
	14.20	14.30
	16.20	16.80
	13.50	14.30
	13.80	14.50
	21.60	22.50

IV		Average
	19.30	20.70
	18.90	19.68
	19.10	19.98
	17.00	18.00
	19.20	20.30
	18.00	18.00
	18.50	20.00
	68.20	68.20

)23

Reaksi
Tahan T)
Tahan (T)
Tahan (T)
Tahan (T)
Tahan (T)
Tahan (T)
Tahan (T)
Sangat rentan (SR)

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If you have any questions then please let me know.

Best Regards,

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Bukti perbaikan Supplementary file

Data Takalar

S1 Growth percentage (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	92.0	94.0	90.0	95.0	92.8
JPI-2	91.0	93.0	92.0	93.0	92.3
JPI-3	94.0	94.0	94.0	90.0	93.0
JPI-4	93.0	89.0	85.0	91.0	89.5
JPI-5	95.0	93.0	88.0	79.0	88.8
JPI-6	95.0	86.0	91.0	90.0	90.5
JPI-7	98.0	98.0	94.0	86.0	94.0

S2 Male flower age (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	51.0	51.0	51.0	51.0	51.0
JPI-2	51.0	53.0	51.0	51.0	51.5
JPI-3	51.0	51.0	51.0	58.0	52.8
JPI-4	51.0	51.0	52.0	51.0	51.3
JPI-5	52.0	53.0	55.0	52.0	53.0
JPI-6	56.0	54.0	51.0	56.0	54.3
JPI-7	47.0	49.0	48.0	46.0	47.5

S3 Pest attack (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.05	0.04	0.04	0.04	0.04
JPI-2	0.04	0.05	0.06	0.04	0.05
JPI-3	0.04	0.05	0.06	0.05	0.05
JPI-4	0.05	0.04	0.05	0.05	0.05
JPI-5	0.06	0.06	0.07	0.07	0.07
JPI-6	0.06	0.05	0.06	0.06	0.06
JPI-7	0.07	0.08	0.08	0.08	0.08

S4 Cob diameter (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	4.2	4.3	4.4	4.3	4.3
JPI-2	4.0	4.0	4.1	4.1	4.1
JPI-3	4.4	4.1	4.2	4.2	4.3
JPI-4	3.8	4.0	3.8	4.3	4.0
JPI-5	3.6	3.7	3.9	3.9	3.8
JPI-6	4.0	4.4	4.5	4.3	4.3
JPI-7	3.8	3.6	3.6	3.5	3.6

S5 Harvest time (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	101.9	102.3	102.7	102.5	102.4
JPI-2	102.7	102.1	104.3	102.9	103.0

S7 Plant height (cm)

Treatment	
	I
JPI -1	219.8
JPI -2	193.8
JPI -3	169.4
JPI -4	154.6
JPI -5	204.2
JPI -6	233.6
JPI -7	219.4

S8 Female flower age

Treatment	
	I
JPI-1	53.0
JPI-2	53.0
JPI-3	53.0
JPI-4	53.0
JPI-5	54.0
JPI-6	58.0
JPI-7	46.0

S9 Downy mildew atta

Treatment	
	I
JPI-1	0.02
JPI-2	0.03
JPI-3	0.02
JPI-4	0.03
JPI-5	0.02
JPI-6	0.03
JPI-7	0.05

S10 Number of rows p

Treatment	
	I
JPI-1	15.0
JPI-2	13.0
JPI-3	15.0
JPI-4	15.0
JPI-5	12.0
JPI-6	15.0
JPI-7	11.0

S11 Number of plants

Treatment	
	I
JPI-1	46.0
JPI-2	47.0

JPI-3	102.9	104.9	104.9	103.3	104.0
JPI-4	105.9	107.1	107.7	105.7	106.6
JPI-5	112.5	110.7	109.0	110.5	110.7
JPI-6	112.7	112.9	110.5	110.7	111.7
JPI-7	92.7	93.9	94.0	93.7	93.6

JPI-3	48.0
JPI-4	46.0
JPI-5	45.0
JPI-6	46.0
JPI-7	45.0

S6 Cob closure

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	2.0	2.0	2.2	2.2	2.1
JPI-2	2.4	2.2	2.2	2.2	2.3
JPI-3	2.2	2.0	2.2	2.0	2.1
JPI-4	2.2	2.0	2.0	2.4	2.2
JPI-5	2.4	2.4	2.2	2.4	2.4
JPI-6	2.2	2.4	2.4	2.4	2.4
JPI-7	1.4	1.6	1.4	1.2	1.4

S12 Cob appearance

Treatment	
	I
JPI-1	1.4
JPI-2	1.4
JPI-3	1.2
JPI-4	1.4
JPI-5	1.6
JPI-6	1.4
JPI-7	1.4

replicate			Average
II	III	IV	
228.0	196.0	219.6	215.9
173.8	163.2	182.0	178.2
200.2	245.2	241.6	214.1
162.2	169.0	173.2	164.8
204.8	162.6	200.2	193.0
190.2	180.0	239.6	210.9
228.0	219.6	222.0	222.3

S13 Number of leaves

Treatment	replicate		
	I	II	III
JPI-1	14.4	11.0	10.6
JPI-2	11.2	10.8	9.6
JPI-3	10.2	11.0	11.2
JPI-4	9.2	9.6	10.0
JPI-5	11.4	9.8	8.2
JPI-6	12.0	10.0	9.0
JPI-7	10.0	10.0	10.4

(hari)

replicate			Average
II	III	IV	
53.0	53.0	53.0	53.0
55.0	53.0	53.0	53.5
53.0	53.0	60.0	54.8
53.0	54.0	53.0	53.3
55.0	57.0	54.0	55.0
56.0	53.0	58.0	56.3
46.0	50.0	48.0	47.5

S14 Root down

Treatment	replicate		
	I	II	III
JPI-1	0.03	0.02	0.02
JPI-2	0.02	0.03	0.01
JPI-3	0.02	0.03	0.02
JPI-4	0.02	0.03	0.03
JPI-5	0.03	0.04	0.04
JPI-6	0.03	0.03	0.04
JPI-7	0.07	0.06	0.07

ıct (%)

replicate			Average
II	III	IV	
0.02	0.03	0.02	0.02
0.03	0.03	0.03	0.03
0.02	0.03	0.02	0.02
0.03	0.03	0.03	0.03
0.05	0.06	0.04	0.04
0.05	0.05	0.04	0.04
0.07	0.07	0.06	0.06

S15 Middle 2 row cob weights (kg)

Treatment	replicate		
	I	II	III
JPI-1	5.60	4.95	4.88
JPI-2	5.52	5.42	5.02
JPI-3	5.22	6.40	4.67
JPI-4	4.51	5.10	4.74
JPI-5	4.08	4.09	3.60
JPI-6	5.21	5.21	5.27
JPI-7	2.79	2.69	2.81

ıer cob

replicate			Average
II	III	IV	
14.0	15.0	15.0	14.8
15.0	14.0	14.0	14.0
15.0	15.0	14.0	14.8
16.0	15.0	15.0	15.3
15.0	13.0	14.0	13.5
15.0	14.0	15.0	14.8
11.0	9.0	11.0	10.5

S16 Number of seeds per row

Treatment	replicate		
	I	II	III
JPI-1	33.5	33.0	34.5
JPI-2	31.5	33.0	40.5
JPI-3	34.5	34.0	32.5
JPI-4	27.0	30.0	35.5
JPI-5	31.0	28.5	31.5
JPI-6	34.0	34.0	33.5
JPI-7	22.0	25.5	26.0

2 middle rows

replicate			Average
II	III	IV	
48.0	49.0	48.0	47.8
46.0	48.0	48.0	47.3

S17 Number of cobs 2 middle rows

Treatment	replicate		
	I	II	III
JPI-1	48.00	49.00	49.00
JPI-2	49.00	49.00	49.00

47.0	49.0	47.0	47.8
48.0	48.0	47.0	47.3
48.0	46.0	46.0	46.3
48.0	49.0	46.0	47.3
47.0	46.0	45.0	45.8

JPI-3	49.00	50.00	50.00
JPI-4	49.00	49.00	50.00
JPI-5	47.00	49.00	49.00
JPI-6	48.00	48.00	49.00
JPI-7	47.00	47.00	46.00

replicate			Average
II	III	IV	
1.6	1.2	1.4	1.4
1.4	1.4	1.4	1.4
1.4	1.4	1.6	1.4
1.2	1.6	1.4	1.4
1.6	1.8	1.6	1.7
1.6	1.6	1.4	1.5
1.4	1.4	1.4	1.4

S18 Seed row appearance

Treatment	replicate		
	I	II	III
JPI-1	1.2	1.4	1.2
JPI-2	1.4	1.2	1.4
JPI-3	1.2	1.2	1.4
JPI-4	1.2	1.4	1.4
JPI-5	1.6	1.6	1.8
JPI-6	1.4	1.6	1.4
JPI-7	1.6	1.8	1.8

IV	Average
10.4	11.6
10.4	10.5
12.0	11.1
9.6	9.6
10.2	9.9
12.8	11.0
9.4	10.0

S19 Cob height (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	89.8	95.2	78.2	88.8	88.0
JPI-2	62.8	72.4	63.8	94.0	73.3
JPI-3	93.4	83.0	121.4	88.0	96.5
JPI-4	70.8	74.0	70.0	77.0	73.0
JPI-5	88.8	83.2	74.0	94.4	85.1
JPI-6	84.4	86.8	91.4	106.4	92.3
JPI-7	77.8	108.8	91.0	106.4	96.0

IV	Average
0.02	0.02
0.02	0.02
0.02	0.02
0.04	0.03
0.04	0.04
0.05	0.04
0.08	0.07

S20 Stem rot

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.02	0.02	0.01	0.01	0.015
JPI-2	0.02	0.03	0.02	0.02	0.0225
JPI-3	0.01	0.02	0.03	0.02	0.02
JPI-4	0.03	0.03	0.02	0.03	0.0275
JPI-5	0.03	0.05	0.05	0.05	0.045
JPI-6	0.04	0.04	0.05	0.05	0.045
JPI-7	0.08	0.07	0.06	0.07	0.07

IV	Average
4.86	5.07
5.04	5.25
4.66	5.24
4.75	4.78
3.60	3.84
5.28	5.24
2.81	2.77

S21 Cob length (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	18.2	18.2	19.0	18.4	19.5
JPI-2	17.4	18.4	17.8	18.0	18.7
JPI-3	17.6	17.2	18.2	18.0	19.3
JPI-4	19.2	19.2	19.0	18.8	18.4
JPI-5	14.4	16.2	16.2	15.2	15.6
JPI-6	16.0	17.6	17.8	19.2	19.7
JPI-7	13.8	13.6	14.0	15.0	14.9

IV	Average
34.0	33.8
33.0	34.5
34.0	33.8
35.5	32.0
25.5	29.1
36.0	34.4
23.5	24.3

S22 Weight of 1000 seeds kA 15% y ogk

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	283.62	296.82	304.94	308.12	298.38
JPI-2	285.93	278.26	298.53	286.59	287.33
JPI-3	295.80	297.88	279.67	297.16	292.63
JPI-4	309.53	289.55	307.41	295.80	300.57
JPI-5	291.53	287.16	290.54	309.53	294.69
JPI-6	305.29	280.33	258.00	288.34	282.99
JPI-7	290.21	277.54	281.56	259.02	277.08

IV	Average
48.00	48.50
49.00	49.00

S23 Appearance due to Pests

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.8	2.0	2.0	2.0	2.0
JPI-2	1.8	2.4	1.8	1.8	2.0

48.00	49.25
48.00	49.00
49.00	48.50
47.00	48.00
49.00	47.25

JPI-3	1.8	2.6	1.8	2.0	2.1
JPI-4	2.2	2.0	2.0	1.8	2.0
JPI-5	2.2	2.2	2.2	2.4	2.3
JPI-6	2.0	2.4	2.2	2.0	2.2
JPI-7	2.2	2.4	2.2	2.4	2.3

IV	Average
1.2	1.3
1.2	1.3
1.4	1.3
1.4	1.4
1.4	1.6
1.4	1.5
1.8	1.8

S24 Production (t/ha KA 15%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	10.34	9.64	8.86	9.17	9.50
JPI-2	10.79	10.46	9.28	9.69	10.05
JPI-3	11.86	14.15	8.76	8.93	10.92
JPI-4	8.44	9.12	9.04	8.64	8.81
JPI-5	9.52	8.20	7.21	7.10	8.01
JPI-6	9.89	10.01	8.36	9.57	9.46
JPI-7	5.59	5.28	5.57	5.82	5.57

5. Bukti informasi kembali bahwa artikel sukses disubmit

(13 Februari 2024)

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Subjek: Manuscript submitted to International Journal of Agronomy
Ke: Edy Edy <edy@umi.ac.id>

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Dear Dr. Edy,

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———————————

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Data Gowa

S1 Growth percentage (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	95	94	89	96	93.5
JPI-2	94	93	92	93	93.0
JPI-3	94	94	97	90	93.8
JPI-4	93	87	85	91	89.0
JPI-5	95	93	86	79	88.3
JPI-6	95	86	91	84	89.0
JPI-7	98	98	94	84	93.5

S2 Male flower age (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	58	56	55	56	56.3
JPI-2	57	57	56	56	56.5
JPI-3	55	56	57	57	56.3
JPI-4	57	56	56	55	56.0
JPI-5	54	57	56	56	55.8
JPI-6	59	58	57	57	57.8
JPI-7	52	53	51	51	51.8

S3 Pest attack (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.04	0.02	0.04	0.02	0.03
JPI-2	0.03	0.03	0.05	0.03	0.035
JPI-3	0.03	0.01	0.03	0.02	0.0225
JPI-4	0.02	0.03	0.04	0.02	0.0275
JPI-5	0.05	0.04	0.05	0.06	0.05
JPI-6	0.05	0.05	0.05	0.03	0.045
JPI-7	0.05	0.05	0.08	0.05	0.0575

S4 Cob diameter (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	4.7	4.7	4.8	4.7	4.8
JPI-2	4.4	4.9	4.7	4.7	4.7
JPI-3	4.6	5.0	4.4	4.7	4.7
JPI-4	4.4	4.4	4.5	4.4	4.4
JPI-5	4.2	4.5	4.1	4.1	4.2
JPI-6	4.8	4.9	5.0	5.0	4.9
JPI-7	3.7	3.7	3.7	3.5	3.6

S5 Harvest time (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	100.4	100.8	101.2	101.0	100.9
JPI-2	101.2	100.6	102.8	101.4	101.5
JPI-3	101.4	103.4	103.4	101.8	102.5
JPI-4	103.9	105.6	106.2	104.2	105.0
JPI-5	111.0	109.2	110.0	109.0	109.8
JPI-6	111.2	111.4	109.0	109.2	110.2
JPI-7	91.2	92.4	91.4	92.2	91.8

S6 Cob closure

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	2.0	2.2	2.2	2.4	2.2
JPI-2	2.2	2.2	2.2	2.2	2.2
JPI-3	2.2	2.2	2.4	2.2	2.25
JPI-4	2.2	2.2	2.2	2.4	2.25
JPI-5	2.6	2.4	2.4	2.4	2.45
JPI-6	2.2	2.4	2.6	2.6	2.45
JPI-7	1.2	1.4	1.6	1.6	1.45

S7 Number of plants 2 middle rows

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	47.0	48.0	49.0	48.0	48.0
JPI-2	47.0	48.0	49.0	48.0	48.0
JPI-3	48.0	48.0	49.0	49.0	48.5
JPI-4	48.0	49.0	47.0	48.0	48.0
JPI-5	46.0	48.0	48.0	48.0	47.5
JPI-6	46.0	48.0	49.0	49.0	48.0
JPI-7	47.0	46.0	47.0	47.0	46.8

S8 Cob appearance

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.6	1.8	1.4	1.6	1.6
JPI-2	1.6	1.6	1.6	1.6	1.6
JPI-3	1.4	1.6	1.6	1.8	1.6
JPI-4	1.6	1.4	1.8	1.6	1.6
JPI-5	1.8	1.8	2.0	1.8	1.9
JPI-6	1.6	1.8	1.8	1.6	1.7
JPI-7	1.6	1.6	1.6	1.6	1.6

S9 Plant height (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI -1	217.4	209	216.8	207.4	212.65
JPI -2	223.8	220.6	198.8	209.6	213.2
JPI -3	189	228.2	209.8	214.8	210.45
JPI -4	196	174.2	204.4	193.2	191.95
JPI -5	196.2	178.4	178.4	182.2	183.8
JPI -6	204.6	214.6	225.6	226.2	217.75
JPI -7	207	208.6	205.6	197.8	204.75

S10 Female flower age (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	60	57	57	57	57.8
JPI-2	58	59	58	58	58.3
JPI-3	57	58	58	58	57.8
JPI-4	59	58	58	57	58.0
JPI-5	56	59	58	58	57.8
JPI-6	63	60	59	59	60.3
JPI-7	54	55	52	53	53.5

S11 Downy mildew attact (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.03	0.02	0.03	0.03	0.0275
JPI-2	0.03	0.03	0.02	0.03	0.0275
JPI-3	0.01	0.03	0.02	0.02	0.02
JPI-4	0.02	0.02	0.03	0.02	0.0225
JPI-5	0.03	0.05	0.07	0.04	0.0475
JPI-6	0.02	0.04	0.04	0.03	0.0325
JPI-7	0.04	0.07	0.01	0.07	0.0475

S12 Number of rows per cob

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	14	13	15	14	14.0
JPI-2	12	14	13	13	13.0
JPI-3	14	14	16	14	14.5
JPI-4	14	14	13	14	13.8
JPI-5	12	14	12	14	13.0
JPI-6	13	14	14	16	14.3
JPI-7	9	9	9	11	9.5

S13 Number of cobs 2 middle rows

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	49	48	50	49	49
JPI-2	49	48	49	48	48.5
JPI-3	50	49	48	47	48.5
JPI-4	50	49	50	49	49.5
JPI-5	48	47	48	47	47.5
JPI-6	48	48	50	48	48.5
JPI-7	47	47	45	47	46.5

S14 Seed row appearance

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.4	1.6	1.4	1.4	1.5
JPI-2	1.6	1.4	1.6	1.4	1.5
JPI-3	1.4	1.4	1.6	1.6	1.5
JPI-4	1.4	1.6	1.6	1.6	1.6
JPI-5	1.8	1.8	2.0	1.6	1.8
JPI-6	1.6	1.8	1.6	1.6	1.7
JPI-7	1.8	2.0	2.0	2.0	2.0

S15 Appearance due to Pests

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	2.0	2.2	2.2	2.2	2.2
JPI-2	2.2	2.4	2.0	2.2	2.2
JPI-3	2.2	2.4	2.2	2.4	2.3
JPI-4	2.0	2.2	2.4	2.2	2.2
JPI-5	2.4	2.4	2.2	2.6	2.4
JPI-6	2.4	2.6	2.2	2.4	2.4
JPI-7	2.2	2.6	2.6	2.6	2.5

S16 Production(t/ha KA 15%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	10.56	8.98	8.88	8.61	9.26
JPI-2	9.94	9.96	9.34	9.38	9.66
JPI-3	9.49	11.68	8.26	8.27	9.42
JPI-4	8.24	9.24	8.39	8.63	8.62
JPI-5	7.53	7.85	6.82	6.83	7.26
JPI-6	9.48	9.45	9.72	9.63	9.57
JPI-7	5.19	5.09	5.25	5.55	5.27

S17 Number of leaves

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	11.8	11.2	11.6	10.2	11.2
JPI-2	12.6	13.0	10.4	12.4	12.1
JPI-3	11.6	12.8	11.0	12.2	11.9
JPI-4	11.2	9.8	11.2	10.8	10.8
JPI-5	10.8	11.0	10.4	10.2	10.6
JPI-6	12.4	11.6	11.2	11.2	11.6
JPI-7	9.8	10.2	10.0	10.6	10.2

S18 Root rot

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.02	0.03	0.02	0.01	0.02
JPI-2	0.01	0.02	0.01	0.01	0.0125
JPI-3	0.02	0.02	0.02	0.01	0.0175
JPI-4	0.02	0.02	0.02	0.02	0.02
JPI-5	0.04	0.04	0.03	0.04	0.0375
JPI-6	0.03	0.04	0.03	0.05	0.0375
JPI-7	0.06	0.06	0.05	0.06	0.0575

S19 Middle 2 row cob weights (kg)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	5.60	4.95	4.88	4.86	5.07
JPI-2	5.52	5.42	5.02	5.04	5.25
JPI-3	5.22	6.40	4.67	4.66	5.24
JPI-4	4.51	5.10	4.74	4.75	4.78
JPI-5	4.08	4.09	3.60	3.60	3.84
JPI-6	5.21	5.21	5.27	5.28	5.24
JPI-7	2.79	2.69	2.81	2.81	2.77

S20 Number of seeds per row

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	33.5	33.0	34.5	34.0	33.8
JPI-2	31.5	33.0	40.5	33.0	34.5
JPI-3	34.5	34.0	32.5	34.0	33.8
JPI-4	27.0	30.0	35.5	35.5	32.0
JPI-5	31.0	28.5	31.5	25.5	29.1
JPI-6	34.0	34.0	33.5	36.0	34.4
JPI-7	22.0	25.5	26.0	23.5	24.3

S21 Cob height (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	89.5	99.0	99.5	96.5	96.1
JPI-2	95.5	103.0	95.0	91.0	96.1
JPI-3	91.0	94.5	98.5	91.0	93.8
JPI-4	88.5	93.5	101.0	97.0	95.0
JPI-5	84.5	89.0	82.0	89.0	86.1
JPI-6	95.0	88.0	92.5	95.0	92.6
JPI-7	104.0	93.5	93.0	91.0	95.4

S22 Stem rot

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.03	0.02	0.01	0.01	0.0175
JPI-2	0.03	0.02	0.03	0.03	0.0275
JPI-3	0.02	0.03	0.04	0.01	0.025
JPI-4	0.03	0.03	0.03	0.03	0.03
JPI-5	0.04	0.04	0.04	0.04	0.04
JPI-6	0.04	0.05	0.04	0.06	0.0475
JPI-7	0.06	0.06	0.07	0.07	0.065

S23 Cob length (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	19.9	19.3	19.0	19.9	19.5
JPI-2	17.9	19.7	18.0	19.3	18.7
JPI-3	18.4	20.9	19.3	18.5	19.3
JPI-4	18.6	17.7	18.3	19.2	18.4
JPI-5	16.3	16.1	14.9	15.1	15.6
JPI-6	19.7	20.0	19.5	19.8	19.7
JPI-7	15.1	15.6	14.5	14.4	14.9

S24 Weight of 1000 seeds kA 15% y ogk

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	308.53	312.71	301.55	307.84	307.66
JPI-2	302.57	316.55	320.00	312.71	312.96
JPI-3	314.76	316.55	303.31	304.35	309.74
JPI-4	303.99	313.07	310.62	306.45	308.53
JPI-5	321.12	272.54	307.48	310.63	302.94
JPI-6	312.27	328.10	321.98	292.99	313.83
JPI-7	295.08	308.83	298.26	304.60	301.69

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S25 Growth percentage (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	92.0	94.0	90.0	95.0	92.8
JPI-2	91.0	93.0	92.0	93.0	92.3
JPI-3	94.0	94.0	94.0	90.0	93.0
JPI-4	93.0	89.0	85.0	91.0	89.5
JPI-5	95.0	93.0	88.0	79.0	88.8
JPI-6	95.0	86.0	91.0	90.0	90.5
JPI-7	98.0	98.0	94.0	86.0	94.0

S26 Male flower age (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	51.0	51.0	51.0	51.0	51.0
JPI-2	51.0	53.0	51.0	51.0	51.5
JPI-3	51.0	51.0	51.0	58.0	52.8
JPI-4	51.0	51.0	52.0	51.0	51.3
JPI-5	52.0	53.0	55.0	52.0	53.0
JPI-6	56.0	54.0	51.0	56.0	54.3
JPI-7	47.0	49.0	48.0	46.0	47.5

S27 Pest attack (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.05	0.04	0.04	0.04	0.04
JPI-2	0.04	0.05	0.06	0.04	0.05
JPI-3	0.04	0.05	0.06	0.05	0.05
JPI-4	0.05	0.04	0.05	0.05	0.05
JPI-5	0.06	0.06	0.07	0.07	0.07
JPI-6	0.06	0.05	0.06	0.06	0.06
JPI-7	0.07	0.08	0.08	0.08	0.08

S28 Cob diameter (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	4.2	4.3	4.4	4.3	4.3
JPI-2	4.0	4.0	4.1	4.1	4.1
JPI-3	4.4	4.1	4.2	4.2	4.3
JPI-4	3.8	4.0	3.8	4.3	4.0
JPI-5	3.6	3.7	3.9	3.9	3.8
JPI-6	4.0	4.4	4.5	4.3	4.3
JPI-7	3.8	3.6	3.6	3.5	3.6

S29 Harvest time (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	101.9	102.3	102.7	102.5	102.4
JPI-2	102.7	102.1	104.3	102.9	103.0
JPI-3	102.9	104.9	104.9	103.3	104.0
JPI-4	105.9	107.1	107.7	105.7	106.6
JPI-5	112.5	110.7	109.0	110.5	110.7
JPI-6	112.7	112.9	110.5	110.7	111.7
JPI-7	92.7	93.9	94.0	93.7	93.6

S30 Cob closure

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	2.0	2.0	2.2	2.2	2.1
JPI-2	2.4	2.2	2.2	2.2	2.3
JPI-3	2.2	2.0	2.2	2.0	2.1
JPI-4	2.2	2.0	2.0	2.4	2.2
JPI-5	2.4	2.4	2.2	2.4	2.4
JPI-6	2.2	2.4	2.4	2.4	2.4
JPI-7	1.4	1.6	1.4	1.2	1.4

S31 Plant height (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI -1	219.8	228.0	196.0	219.6	215.9
JPI -2	193.8	173.8	163.2	182.0	178.2
JPI -3	169.4	200.2	245.2	241.6	214.1
JPI -4	154.6	162.2	169.0	173.2	164.8
JPI -5	204.2	204.8	162.6	200.2	193.0
JPI -6	233.6	190.2	180.0	239.6	210.9
JPI -7	219.4	228.0	219.6	222.0	222.3

S32 Female flower age (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	53.0	53.0	53.0	53.0	53.0
JPI-2	53.0	55.0	53.0	53.0	53.5
JPI-3	53.0	53.0	53.0	60.0	54.8
JPI-4	53.0	53.0	54.0	53.0	53.3
JPI-5	54.0	55.0	57.0	54.0	55.0
JPI-6	58.0	56.0	53.0	58.0	56.3
JPI-7	46.0	46.0	50.0	48.0	47.5

S33 Downy mildew attact (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.02	0.02	0.03	0.02	0.02
JPI-2	0.03	0.03	0.03	0.03	0.03
JPI-3	0.02	0.02	0.03	0.02	0.02
JPI-4	0.03	0.03	0.03	0.03	0.03
JPI-5	0.02	0.05	0.06	0.04	0.04
JPI-6	0.03	0.05	0.05	0.04	0.04
JPI-7	0.05	0.07	0.07	0.06	0.06

S34 Number of rows per cob

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	15.0	14.0	15.0	15.0	14.8
JPI-2	13.0	15.0	14.0	14.0	14.0
JPI-3	15.0	15.0	15.0	14.0	14.8
JPI-4	15.0	16.0	15.0	15.0	15.3
JPI-5	12.0	15.0	13.0	14.0	13.5
JPI-6	15.0	15.0	14.0	15.0	14.8
JPI-7	11.0	11.0	9.0	11.0	10.5

S35 Number of plants 2 middle rows

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	46.0	48.0	49.0	48.0	47.8
JPI-2	47.0	46.0	48.0	48.0	47.3
JPI-3	48.0	47.0	49.0	47.0	47.8
JPI-4	46.0	48.0	48.0	47.0	47.3
JPI-5	45.0	48.0	46.0	46.0	46.3
JPI-6	46.0	48.0	49.0	46.0	47.3
JPI-7	45.0	47.0	46.0	45.0	45.8

S36 Cob appearance

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.4	1.6	1.2	1.4	1.4
JPI-2	1.4	1.4	1.4	1.4	1.4
JPI-3	1.2	1.4	1.4	1.6	1.4
JPI-4	1.4	1.2	1.6	1.4	1.4
JPI-5	1.6	1.6	1.8	1.6	1.7
JPI-6	1.4	1.6	1.6	1.4	1.5
JPI-7	1.4	1.4	1.4	1.4	1.4

S37 Number of leaves

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	14.4	11.0	10.6	10.4	11.6
JPI-2	11.2	10.8	9.6	10.4	10.5
JPI-3	10.2	11.0	11.2	12.0	11.1
JPI-4	9.2	9.6	10.0	9.6	9.6
JPI-5	11.4	9.8	8.2	10.2	9.9
JPI-6	12.0	10.0	9.0	12.8	11.0
JPI-7	10.0	10.0	10.4	9.4	10.0

S38 Root down

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.03	0.02	0.02	0.02	0.02
JPI-2	0.02	0.03	0.01	0.02	0.02
JPI-3	0.02	0.03	0.02	0.02	0.02
JPI-4	0.02	0.03	0.03	0.04	0.03
JPI-5	0.03	0.04	0.04	0.04	0.04
JPI-6	0.03	0.03	0.04	0.05	0.04
JPI-7	0.07	0.06	0.07	0.08	0.07

S39 Middle 2 row cob weights (kg)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	5.60	4.95	4.88	4.86	5.07
JPI-2	5.52	5.42	5.02	5.04	5.25
JPI-3	5.22	6.40	4.67	4.66	5.24
JPI-4	4.51	5.10	4.74	4.75	4.78
JPI-5	4.08	4.09	3.60	3.60	3.84
JPI-6	5.21	5.21	5.27	5.28	5.24
JPI-7	2.79	2.69	2.81	2.81	2.77

S40 Number of seeds per row

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	33.5	33.0	34.5	34.0	33.8
JPI-2	31.5	33.0	40.5	33.0	34.5
JPI-3	34.5	34.0	32.5	34.0	33.8
JPI-4	27.0	30.0	35.5	35.5	32.0
JPI-5	31.0	28.5	31.5	25.5	29.1
JPI-6	34.0	34.0	33.5	36.0	34.4
JPI-7	22.0	25.5	26.0	23.5	24.3

S41 Number of cobs 2 middle rows

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	48.00	49.00	49.00	48.00	48.50
JPI-2	49.00	49.00	49.00	49.00	49.00
JPI-3	49.00	50.00	50.00	48.00	49.25
JPI-4	49.00	49.00	50.00	48.00	49.00
JPI-5	47.00	49.00	49.00	49.00	48.50
JPI-6	48.00	48.00	49.00	47.00	48.00
JPI-7	47.00	47.00	46.00	49.00	47.25

S42 Seed row appearance

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.2	1.4	1.2	1.2	1.3
JPI-2	1.4	1.2	1.4	1.2	1.3
JPI-3	1.2	1.2	1.4	1.4	1.3
JPI-4	1.2	1.4	1.4	1.4	1.4
JPI-5	1.6	1.6	1.8	1.4	1.6
JPI-6	1.4	1.6	1.4	1.4	1.5
JPI-7	1.6	1.8	1.8	1.8	1.8

S43 Cob height (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	89.8	95.2	78.2	88.8	88.0
JPI-2	62.8	72.4	63.8	94.0	73.3
JPI-3	93.4	83.0	121.4	88.0	96.5
JPI-4	70.8	74.0	70.0	77.0	73.0
JPI-5	88.8	83.2	74.0	94.4	85.1
JPI-6	84.4	86.8	91.4	106.4	92.3
JPI-7	77.8	108.8	91.0	106.4	96.0

S44 Stem rot

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.02	0.02	0.01	0.01	0.015
JPI-2	0.02	0.03	0.02	0.02	0.0225
JPI-3	0.01	0.02	0.03	0.02	0.02
JPI-4	0.03	0.03	0.02	0.03	0.0275
JPI-5	0.03	0.05	0.05	0.05	0.045
JPI-6	0.04	0.04	0.05	0.05	0.045
JPI-7	0.08	0.07	0.06	0.07	0.07

S45 Cob length (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	18.2	18.2	19.0	18.4	19.5
JPI-2	17.4	18.4	17.8	18.0	18.7
JPI-3	17.6	17.2	18.2	18.0	19.3
JPI-4	19.2	19.2	19.0	18.8	18.4
JPI-5	14.4	16.2	16.2	15.2	15.6
JPI-6	16.0	17.6	17.8	19.2	19.7
JPI-7	13.8	13.6	14.0	15.0	14.9

S46 Weight of 1000 seeds kA 15% y ogk

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	283.62	296.82	304.94	308.12	298.38
JPI-2	285.93	278.26	298.53	286.59	287.33
JPI-3	295.80	297.88	279.67	297.16	292.63
JPI-4	309.53	289.55	307.41	295.80	300.57
JPI-5	291.53	287.16	290.54	309.53	294.69
JPI-6	305.29	280.33	258.00	288.34	282.99
JPI-7	290.21	277.54	281.56	259.02	277.08

S47 Appearance due to Pests

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.8	2.0	2.0	2.0	2.0
JPI-2	1.8	2.4	1.8	1.8	2.0
JPI-3	1.8	2.6	1.8	2.0	2.1
JPI-4	2.2	2.0	2.0	1.8	2.0
JPI-5	2.2	2.2	2.2	2.4	2.3
JPI-6	2.0	2.4	2.2	2.0	2.2
JPI-7	2.2	2.4	2.2	2.4	2.3

S48 Production (t/ha KA 15%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	10.34	9.64	8.86	9.17	9.50
JPI-2	10.79	10.46	9.28	9.69	10.05
JPI-3	11.86	14.15	8.76	8.93	10.92
JPI-4	8.44	9.12	9.04	8.64	8.81
JPI-5	9.52	8.20	7.21	7.10	8.01
JPI-6	9.89	10.01	8.36	9.57	9.46
JPI-7	5.59	5.28	5.57	5.82	5.57

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S49 Growth percentage (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-2	86.5	88.4	87.4	88.4	87.6
JPI-3	89.3	89.3	89.3	85.5	88.4
JPI-4	88.4	84.6	84.0	86.5	85.8
JPI-5	86.0	88.4	83.6	80.0	84.5
JPI-6	90.3	81.7	86.5	85.5	86.0
JPI-7	80.0	88.0	85.0	81.7	83.7

S50 Male flower age (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	58.0	58.0	58.0	59.0	58.3
JPI-2	59.0	58.0	59.0	58.0	58.5
JPI-3	58.0	58.0	58.0	59.0	58.3
JPI-4	59.0	59.0	58.0	58.0	58.5
JPI-5	59.0	70.2	60.0	59.0	62.0
JPI-6	60.0	61.0	59.0	71.6	62.9
JPI-7	54.0	56.0	55.0	54.0	54.8

S51 Pest attack (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.030	0.040	0.040	0.040	0.038
JPI-2	0.050	0.040	0.050	0.050	0.048
JPI-3	0.050	0.050	0.050	0.040	0.048
JPI-4	0.060	0.040	0.050	0.050	0.050
JPI-5	0.070	0.060	0.070	0.060	0.065
JPI-6	0.070	0.050	0.070	0.060	0.063
JPI-7	0.080	0.080	0.090	0.080	0.083

S52 Cob diameter (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	3.6	3.7	3.7	3.7	3.7
JPI-2	3.7	3.4	3.5	3.5	3.5
JPI-3	3.8	3.5	3.6	3.6	3.6
JPI-4	3.3	3.6	3.2	3.6	3.4
JPI-5	3.0	3.2	3.3	3.3	3.2
JPI-6	3.4	3.7	3.8	3.7	3.7
JPI-7	3.2	3.0	3.1	3.0	3.1

S53 Harvest time (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	45.0	45.0	47.0	44.0	45.3
JPI-2	44.0	43.0	46.0	45.0	44.5
JPI-3	45.0	44.0	46.0	44.0	44.8
JPI-4	43.0	45.0	45.0	44.0	44.3
JPI-5	42.0	45.0	43.0	43.0	43.3
JPI-6	44.0	45.0	46.0	45.0	45.0
JPI-7	42.0	44.0	43.0	42.0	42.8

S54 Cob closure

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.2	1.4	1.0	1.2	1.2
JPI-2	1.2	1.4	1.2	1.2	1.3
JPI-3	1.0	1.2	1.2	1.2	1.2
JPI-4	1.2	1.2	1.4	1.2	1.3
JPI-5	1.4	1.2	1.4	1.4	1.4
JPI-6	1.2	1.2	1.2	1.4	1.3
JPI-7	1.2	1.4	1.4	1.4	1.4

S55 Plant height (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI -2	155.0	139.0	130.6	145.6	142.6
JPI -3	135.5	160.2	196.2	193.3	171.3
JPI -4	167.0	129.8	135.2	138.6	142.6
JPI -5	163.4	163.8	130.1	160.2	154.4
JPI -6	186.9	152.2	144.0	191.7	168.7
JPI -7	164.0	160.0	175.7	170.0	167.4

S56 Female flower age (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	60.0	60.0	60.0	61.0	60.3
JPI-2	61.0	60.0	61.0	60.0	60.5
JPI-3	60.0	60.0	61.0	61.0	60.5
JPI-4	61.0	61.0	60.0	60.0	60.5
JPI-5	61.0	62.0	62.0	61.0	61.5
JPI-6	62.0	63.0	61.0	63.0	62.2
JPI-7	56.0	58.0	57.0	56.0	56.8

S57 Downy mildew attact (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.030	0.030	0.040	0.030	0.033
JPI-2	0.030	0.030	0.040	0.040	0.035
JPI-3	0.030	0.030	0.040	0.030	0.033
JPI-4	0.040	0.040	0.040	0.040	0.040
JPI-5	0.060	0.060	0.060	0.050	0.058
JPI-6	0.060	0.060	0.060	0.050	0.058
JPI-7	0.080	0.080	0.080	0.070	0.078

S58 Number of rows per cob

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	14.0	14.0	14.0	14.0	14.0
JPI-2	13.0	15.0	14.0	14.0	14.0
JPI-3	14.0	15.0	14.0	13.0	14.0
JPI-4	14.0	15.0	15.0	14.0	14.5
JPI-5	12.0	13.0	13.0	13.0	12.8
JPI-6	14.0	14.0	14.0	14.0	14.0
JPI-7	10.0	9.0	9.0	9.0	9.3

S59 Number of plants 2 middle rows

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	47.0	47.0	47.0	45.0	46.5
JPI-2	46.0	44.0	46.0	46.0	45.5
JPI-3	46.0	47.0	47.0	45.0	46.3
JPI-4	46.0	46.0	47.0	45.0	46.0
JPI-5	46.0	43.0	44.0	46.0	44.8
JPI-6	45.0	47.0	46.0	47.0	46.3
JPI-7	44.0	44.0	43.0	46.0	44.3

S60 Cob appearance

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.2	1.4	1.2	1.2	1.3
JPI-2	1.4	1.2	1.2	1.2	1.3
JPI-3	1.2	1.2	1.4	1.4	1.3
JPI-4	1.0	1.2	1.4	1.2	1.2
JPI-5	1.2	1.4	1.4	1.4	1.4
JPI-6	1.4	1.2	1.2	1.2	1.3
JPI-7	1.2	1.8	1.4	1.4	1.5

S61 Number of leaves

Treatment	replicate				Average
	I	II	III	IV	
JPI-2	10.1	9.7	8.6	9.4	9.5
JPI-3	9.2	9.9	10.1	10.8	10.0
JPI-4	9.6	8.6	9.0	8.6	9.0
JPI-5	10.3	8.8	7.4	9.2	8.9
JPI-6	10.8	9.0	8.1	11.5	9.9
JPI-7	9.0	8.5	9.4	8.5	8.8

S62 Root down

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.02	0.03	0.03	0.03	0.03
JPI-2	0.03	0.04	0.02	0.03	0.03
JPI-3	0.03	0.04	0.03	0.03	0.03
JPI-4	0.03	0.04	0.04	0.05	0.04
JPI-5	0.04	0.05	0.05	0.05	0.05
JPI-6	0.04	0.04	0.05	0.06	0.05
JPI-7	0.08	0.07	0.08	0.09	0.08

S63 Middle 2 row cob weights (kg)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	4.52	4.05	3.93	4.00	4.12
JPI-2	4.46	5.30	4.14	3.88	4.45
JPI-3	4.26	4.96	3.65	3.81	4.17
JPI-4	3.71	3.39	3.89	3.86	3.71
JPI-5	3.29	3.37	2.85	2.96	3.12
JPI-6	4.27	3.57	3.98	4.18	4.00
JPI-7	2.36	2.27	2.36	2.37	2.34

S64 Number of seeds per row

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	264.10	281.11	285.57	293.44	281.05
JPI-2	269.78	266.47	285.36	256.24	269.46
JPI-3	278.57	268.44	254.50	281.96	270.87
JPI-4	296.97	278.82	291.68	278.57	286.51
JPI-5	264.97	276.01	268.32	277.78	271.77
JPI-6	286.44	274.36	258.73	263.41	270.73
JPI-7	268.78	276.07	278.08	256.74	269.92

S65 Number of cobs 2 middle rows

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.6	1.2	2.0	2.0	1.7
JPI-2	1.8	1.6	2.0	1.8	1.8
JPI-3	1.8	1.4	2.0	2.2	1.9
JPI-4	1.6	1.2	2.2	2.2	1.8
JPI-5	2.2	1.6	2.2	2.2	2.1
JPI-6	1.8	1.0	2.2	2.4	1.9
JPI-7	2.0	1.6	2.4	2.4	2.1

S66 Seed row appearance

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	6.75	6.42	5.78	6.15	6.28
JPI-2	7.09	8.36	6.26	5.93	6.91
JPI-3	7.07	7.97	5.50	5.95	6.62
JPI-4	5.69	5.24	6.04	6.13	5.78
JPI-5	4.88	5.54	4.48	4.78	4.92
JPI-6	6.58	5.52	5.72	6.41	6.05
JPI-7	3.93	3.71	3.88	3.94	3.86

S67 Cob height (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-2	76.0	65.2	67.0	84.6	73.2
JPI-3	84.1	74.7	109.3	79.2	86.8
JPI-4	63.7	66.6	63.0	69.3	65.7
JPI-5	79.9	74.9	66.6	85.0	76.6
JPI-6	76.0	78.1	82.3	95.8	83.0
JPI-7	70.0	77.0	81.9	78.0	76.7

S68 Stem rot

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.03	0.03	0.02	0.02	0.03
JPI-2	0.03	0.04	0.03	0.02	0.03
JPI-3	0.02	0.03	0.04	0.02	0.03
JPI-4	0.04	0.04	0.03	0.03	0.04
JPI-5	0.04	0.06	0.06	0.05	0.05
JPI-6	0.05	0.05	0.06	0.05	0.05
JPI-7	0.07	0.07	0.07	0.07	0.07

S69 Cob length (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	15.5	15.5	16.2	15.6	15.7
JPI-2	14.8	15.6	15.1	15.3	15.2
JPI-3	15.0	14.6	15.5	15.3	15.0
JPI-4	16.3	16.3	16.2	16.0	16.3
JPI-5	12.2	13.8	13.8	12.9	13.3
JPI-6	13.6	15.0	15.1	16.3	14.6
JPI-7	11.7	11.6	11.9	12.7	11.7

S70 Weight of 1000 seeds kA 15% y ogk

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	108.5	106.8	107.3	107.1	107.4
JPI-2	108.3	106.6	109.0	107.5	107.9
JPI-3	108.8	109.6	109.6	107.9	109.0
JPI-4	111.7	111.9	112.6	110.5	111.7
JPI-5	114.5	112.8	113.6	112.5	113.4
JPI-6	114.9	115.1	112.5	112.8	113.8
JPI-7	98.4	97.9	96.9	97.7	97.7

S71 Appearance due to Pests

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	2.0	2.0	2.0	2.0	2.0
JPI-2	2.2	2.0	2.0	2.2	2.1
JPI-3	2.2	2.2	2.2	2.0	2.2
JPI-4	2.0	2.0	2.2	2.2	2.1
JPI-5	2.0	2.2	2.4	2.2	2.2
JPI-6	2.2	2.0	2.4	2.2	2.2
JPI-7	1.2	1.8	1.6	1.2	1.5

S72 Production (t/ha KA 15%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	26.0	25.5	27.0	26.5	26.3
JPI-2	24.0	25.5	33.0	25.5	27.0
JPI-3	27.0	26.5	25.0	26.5	26.3
JPI-4	19.5	22.5	28.0	28.0	24.5
JPI-5	23.5	21.0	24.0	18.0	21.6
JPI-6	26.5	26.5	26.0	28.5	26.9
JPI-7	15.5	18.0	18.5	18.5	17.6

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S73 Growth percentage (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	90.2	92.1	88.2	93.1	90.9
JPI-2	89.2	91.1	90.2	91.1	90.4
JPI-3	92.1	92.1	92.1	88.2	91.1
JPI-4	91.1	87.2	83.3	89.2	87.7
JPI-5	91.1	91.1	86.2	84.3	88.2
JPI-6	90.2	84.3	89.2	88.2	88.0
JPI-7	96.0	96.0	92.1	84.3	92.1

S74 Male flower age (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	53.00	53.00	53.00	53.00	53.00
JPI-2	53.00	55.00	52.00	53.00	53.25
JPI-3	53.00	53.00	53.00	54.00	53.25
JPI-4	53.00	53.00	54.00	53.00	53.25
JPI-5	54.00	55.00	53.00	54.00	54.00
JPI-6	55.00	55.00	53.00	55.00	54.50
JPI-7	48.00	50.00	48.00	46.00	48.00

S75 Pest attack (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.03	0.04	0.05	0.03	0.0375
JPI-2	0.03	0.03	0.04	0.04	0.035
JPI-3	0.03	0.04	0.04	0.04	0.0375
JPI-4	0.04	0.03	0.06	0.05	0.045
JPI-5	0.05	0.06	0.07	0.07	0.0625
JPI-6	0.04	0.06	0.07	0.05	0.055
JPI-7	0.06	0.07	0.09	0.08	0.075

S76 Cob diameter (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	4.2	4.3	4.4	4.3	4.3
JPI-2	4.3	4.0	4.1	4.1	4.1
JPI-3	4.4	4.1	4.2	4.2	4.3
JPI-4	3.9	4.2	4.5	4.3	4.2
JPI-5	3.6	3.7	3.9	3.9	3.8
JPI-6	4.0	4.4	4.5	4.3	4.3
JPI-7	3.8	3.6	3.6	3.5	3.6

S77 Harvest time (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	104.7	102.0	100.3	101.5	102.1
JPI-2	104.1	101.1	102.0	102.4	102.4
JPI-3	101.8	102.6	102.6	100.9	102.0
JPI-4	104.7	104.9	105.6	103.5	104.7
JPI-5	105.8	105.8	106.6	105.5	105.9
JPI-6	107.9	106.4	104.9	103.4	105.7
JPI-7	95.0	95.4	95.3	92.2	94.5

S78 Cob closure

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.8	2.0	2.2	2.0	2.0
JPI-2	2.0	2.0	2.2	2.2	2.1
JPI-3	2.0	2.2	2.4	2.0	2.2
JPI-4	1.8	2.0	2.4	2.2	2.1
JPI-5	1.8	2.2	2.6	2.2	2.2
JPI-6	2.0	2.0	2.6	2.2	2.2
JPI-7	1.2	1.8	1.8	1.2	1.5

S79 Plant height (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI -1	197.8	205.2	176.4	197.6	194.3
JPI -2	174.4	182.7	180.0	163.8	175.2
JPI -3	152.5	180.2	220.7	217.4	192.7
JPI -4	180.0	182.0	179.1	173.9	178.7
JPI -5	183.8	184.3	146.3	180.2	173.7
JPI -6	210.2	171.2	162.0	215.6	189.8
JPI -7	197.5	205.2	197.6	199.8	200.0

S80 Female flower age (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	55.00	55.00	54.00	54.00	54.50
JPI-2	55.00	56.00	54.00	55.00	55.00
JPI-3	55.00	55.00	56.00	55.00	55.25
JPI-4	55.00	55.00	55.00	54.00	54.75
JPI-5	56.00	56.00	55.00	56.00	55.75
JPI-6	57.00	57.00	55.00	57.00	56.50
JPI-7	50.00	51.00	50.00	48.00	49.75

S81 Downy mildew attact (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.02	0.02	0.01	0.03	0.02
JPI-2	0.02	0.02	0.01	0.02	0.0175
JPI-3	0.02	0.02	0.01	0.03	0.02
JPI-4	0.03	0.03	0.02	0.02	0.025
JPI-5	0.04	0.04	0.02	0.04	0.035
JPI-6	0.03	0.03	0.02	0.03	0.0275
JPI-7	0.05	0.05	0.04	0.05	0.0475

S82 Number of rows per cob

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	15.0	15.0	14.0	15.0	14.8
JPI-2	14.0	16.0	15.0	14.0	14.8
JPI-3	15.0	16.0	15.0	15.0	15.3
JPI-4	15.0	15.0	15.0	15.0	15.0
JPI-5	14.0	13.0	14.0	14.0	13.8
JPI-6	15.0	16.0	15.0	15.0	15.3
JPI-7	11.0	9.0	10.0	11.0	10.3

S83 Number of plants 2 middle rows

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	47.0	47.0	48.0	50.0	48.0
JPI-2	49.0	47.0	49.0	49.0	48.5
JPI-3	49.0	48.0	50.0	48.0	48.8
JPI-4	48.0	47.0	49.0	48.0	48.0
JPI-5	46.0	49.0	47.0	47.0	47.3
JPI-6	47.0	49.0	50.0	47.0	48.3
JPI-7	46.0	48.0	47.0	46.0	46.8

S84 Cob appearance

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.2	1.2	1.0	1.2	1.2
JPI-2	1.2	1.2	1.2	1.2	1.2
JPI-3	1.0	1.2	1.2	1.2	1.2
JPI-4	1.2	1.2	1.4	1.2	1.3
JPI-5	1.4	1.2	1.4	1.4	1.4
JPI-6	1.2	1.2	1.0	1.4	1.2
JPI-7	1.2	1.4	1.2	1.4	1.3

S85 Number of leaves

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	13.8	10.6	10.2	10.0	11.1
JPI-2	10.8	10.4	9.6	10.0	10.2
JPI-3	9.8	10.6	10.8	11.5	10.7
JPI-4	10.6	11.5	9.6	11.5	10.8
JPI-5	10.9	9.6	10.6	9.8	10.2
JPI-6	11.5	9.6	10.6	12.3	11.0
JPI-7	10.6	11.5	10.0	9.6	10.4

S86 Root down

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.01	0.01	0.02	0.03	0.0175
JPI-2	0.01	0.02	0.02	0.02	0.0175
JPI-3	0.01	0.02	0.02	0.02	0.0175
JPI-4	0.01	0.03	0.02	0.03	0.0225
JPI-5	0.01	0.03	0.02	0.03	0.0225
JPI-6	0.01	0.02	0.03	0.02	0.02
JPI-7	0.03	0.05	0.04	0.06	0.045

S87 Middle 2 row cob weights (kg)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	5.68	5.03	4.78	4.77	5.07
JPI-2	5.55	6.58	4.97	4.92	5.50
JPI-3	5.29	6.19	4.55	4.73	5.19
JPI-4	4.68	4.21	4.82	4.79	4.63
JPI-5	3.94	3.97	3.70	3.67	3.82
JPI-6	5.30	4.45	4.84	5.21	4.95
JPI-7	2.92	2.81	2.92	2.93	2.90

S88 Number of seeds per row

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	34.5	33.5	37.0	38.0	35.8
JPI-2	32.5	34.0	38.5	34.0	34.8
JPI-3	35.5	34.5	35.5	35.0	35.1
JPI-4	28.0	31.0	36.5	36.5	33.0
JPI-5	32.0	29.5	32.5	26.5	30.1
JPI-6	35.0	34.5	34.5	37.0	35.3
JPI-7	23.0	26.5	27.0	24.5	25.3

S89 Number of cobs 2 middle rows

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	47.0	49.0	50.0	51.0	49.3
JPI-2	50.0	47.0	49.0	50.0	49.0
JPI-3	49.0	48.0	49.0	49.0	48.8
JPI-4	50.0	50.0	51.0	49.0	50.0
JPI-5	48.0	50.0	50.0	48.0	49.0
JPI-6	49.0	49.0	51.0	48.0	49.3
JPI-7	47.0	48.0	47.0	50.0	48.0

S90 Seed row appearance

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.2	1.4	1.2	1.2	1.3
JPI-2	1.2	1.2	1.2	1.2	1.2
JPI-3	1.2	1.2	1.4	1.4	1.3
JPI-4	1.0	1.0	1.4	1.2	1.2
JPI-5	1.2	1.4	1.4	1.4	1.4
JPI-6	1.2	1.0	1.2	1.2	1.2
JPI-7	1.0	1.6	1.4	1.4	1.4

S91 Cob height (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	86.21	91.39	75.07	85.25	84.48
JPI-2	60.29	69.50	61.25	90.24	70.32
JPI-3	89.66	79.68	116.54	84.48	92.59
JPI-4	67.97	71.04	67.20	73.92	70.03
JPI-5	85.25	79.87	71.04	90.62	81.70
JPI-6	81.02	83.33	87.74	98.30	87.60
JPI-7	74.69	104.45	87.36	102.14	92.16

S92 Stem rot

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.01	0.03	0.02	0.02	0.02
JPI-2	0.01	0.02	0.02	0.02	0.0175
JPI-3	0.01	0.03	0.03	0.01	0.02
JPI-4	0.01	0.02	0.02	0.01	0.015
JPI-5	0.01	0.04	0.02	0.02	0.0225
JPI-6	0.01	0.02	0.03	0.02	0.02
JPI-7	0.04	0.04	0.07	0.01	0.04

S93 Cob length (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	18.9	18.9	19.8	19.1	19.2
JPI-2	18.1	19.1	18.5	18.7	18.6
JPI-3	18.3	17.9	18.9	18.7	18.5
JPI-4	20.0	20.0	19.8	19.6	19.8
JPI-5	16.0	16.8	16.8	15.8	16.4
JPI-6	18.7	19.9	18.0	20.0	19.1
JPI-7	14.3	14.1	14.6	15.6	14.7

S94 Weight of 1000 seeds kA 15% y ogk

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	268.74	285.65	290.45	292.97	284.45
JPI-2	275.18	271.51	279.92	275.65	275.56
JPI-3	283.20	273.91	259.47	286.47	275.76
JPI-4	298.90	282.94	296.34	283.20	290.35
JPI-5	259.34	265.94	285.35	281.97	273.15
JPI-6	291.29	283.35	257.82	277.77	277.56
JPI-7	272.05	279.44	281.62	259.94	273.26

S95 Appearance due to Pests

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	2.2	1.4	2.2	2.0	2.0
JPI-2	2.2	1.8	2.0	1.8	2.0
JPI-3	2.2	1.6	2.4	2.0	2.1
JPI-4	2.0	1.4	2.4	2.0	2.0
JPI-5	2.4	1.6	2.2	1.8	2.0
JPI-6	2.2	1.4	2.4	2.0	2.0
JPI-7	2.2	1.6	2.6	2.4	2.2

S96 Production (t/ha KA 15%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	10.03	9.40	8.31	8.51	9.06
JPI-2	10.40	12.22	8.55	9.09	10.07
JPI-3	10.36	11.77	8.12	8.71	9.74
JPI-4	8.37	7.65	8.84	9.00	8.47
JPI-5	6.63	7.30	7.18	6.99	7.03
JPI-6	9.65	8.13	8.05	9.44	8.82
JPI-7	5.71	5.39	5.64	5.73	5.62

Data NTB

97 Growth percentage (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	96.0	93.0	94.0	93.0	94.0
JPI-2	94.0	95.0	95.0	94.0	94.5
JPI-3	96.0	96.0	95.0	97.0	96.0
JPI-4	95.0	94.0	96.0	94.0	94.8
JPI-5	94.0	97.0	94.0	92.0	94.3
JPI-6	96.0	95.0	96.0	92.0	94.8
JPI-7	96.0	97.0	95.0	95.0	95.8

S98 Male flower age (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	59.0	56.0	55.0	55.0	56.3
JPI-2	56.0	56.0	57.0	57.0	56.5
JPI-3	56.0	57.0	55.0	57.0	56.3
JPI-4	57.0	57.0	56.0	56.0	56.5
JPI-5	52.0	52.0	53.0	52.0	52.3
JPI-6	61.0	56.0	56.0	59.0	58.0
JPI-7	51.0	51.0	52.0	52.0	51.5

S99 Pest attack (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.02	0.04	0.04	0.03	0.03
JPI-2	0.01	0.04	0.04	0.04	0.03
JPI-3	0.01	0.03	0.03	0.03	0.03
JPI-4	0.01	0.03	0.03	0.03	0.03
JPI-5	0.04	0.01	0.04	0.06	0.04
JPI-6	0.07	0.08	0.04	0.05	0.06
JPI-7	0.04	0.12	0.09	0.08	0.08

S100 Cob diameter (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	4.7	4.9	4.5	4.6	4.6
JPI-2	4.8	4.8	4.7	4.8	4.8
JPI-3	4.9	4.8	4.9	4.9	4.9
JPI-4	4.7	4.9	4.5	4.7	4.7
JPI-5	4.3	4.8	4.7	4.3	4.5
JPI-6	4.9	4.8	4.9	4.6	4.8
JPI-7	3.6	3.8	3.7	3.3	3.6

S101 Harvest time (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	50.0	49.0	49.0	49.0	49.3
JPI-2	49.0	48.0	48.0	48.0	48.3
JPI-3	50.0	49.0	49.0	48.0	49.0
JPI-4	49.0	48.0	48.0	47.0	48.0
JPI-5	47.0	47.0	48.0	47.0	47.3
JPI-6	48.0	49.0	48.0	48.0	48.3
JPI-7	49.0	49.0	49.0	49.0	49.0

S102 Cob closure

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.8	2.0	2.0	2.2	2.0
JPI-2	2.2	2.2	2.0	2.2	2.2
JPI-3	2.0	2.0	2.0	2.0	2.0
JPI-4	2.0	2.0	2.2	2.0	2.1
JPI-5	2.2	2.2	2.2	2.2	2.2
JPI-6	2.2	2.2	2.2	2.2	2.2
JPI-7	1.2	1.0	1.0	1.2	1.1

S103 Plant height (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	170.2	183.6	182.0	120.2	164.0
JPI-2	167.4	192.0	180.0	179.0	179.6
JPI-3	184.0	188.0	175.0	160.0	176.8
JPI-4	174.0	179.0	164.0	154.0	167.8
JPI-5	188.6	185.6	176.2	155.0	176.4
JPI-6	186.4	175.6	168.0	160.6	172.7
JPI-7	180.6	202.2	188.0	168.4	184.8

S104 Female flower age (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	61.0	57.0	57.0	57.0	58.0
JPI-2	58.0	57.0	58.0	58.0	57.8
JPI-3	57.0	58.0	56.0	58.0	57.3
JPI-4	59.0	59.0	58.0	57.0	58.3
JPI-5	54.0	53.0	54.0	53.0	53.5
JPI-6	63.0	57.0	57.0	60.0	59.3
JPI-7	52.0	52.0	54.0	53.0	52.8

S105 Downy mildew attact (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.01	0.02	0.03	0.02	0.02
JPI-2	0.03	0.02	0.03	0.03	0.03
JPI-3	0.01	0.03	0.02	0.03	0.02
JPI-4	0.02	0.02	0.04	0.04	0.03
JPI-5	0.01	0.04	0.08	0.05	0.05
JPI-6	0.03	0.03	0.03	0.07	0.04
JPI-7	0.01	0.02	0.05	0.07	0.04

S106 Number of rows per cob

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	14.0	14.0	15.0	15.0	14.5
JPI-2	14.0	14.0	14.0	14.0	14.0
JPI-3	13.0	14.0	16.0	13.0	14.0
JPI-4	14.0	14.0	14.0	15.0	14.3
JPI-5	12.5	14.0	14.0	13.0	13.4
JPI-6	14.0	14.0	15.0	14.0	14.3
JPI-7	13.0	12.0	12.5	13.0	12.6

S107 Number of plants 2 middle rows

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	241.24	244.28	243.91	237.47	241.72
JPI-2	239.86	245.20	233.92	235.03	238.50
JPI-3	240.91	249.23	244.18	239.18	243.37
JPI-4	254.21	256.69	244.23	235.28	247.60
JPI-5	231.10	232.04	247.92	222.87	233.48
JPI-6	242.05	242.29	249.92	231.39	241.41
JPI-7	212.29	224.27	246.38	235.82	229.69

S108 Cob appearance

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.2	1.2	1.2	1.2	1.2
JPI-2	1.4	1.2	1.4	1.2	1.3
JPI-3	1.2	1.4	1.4	1.2	1.3
JPI-4	1.4	1.4	1.4	1.4	1.4
JPI-5	1.6	1.2	1.4	1.4	1.4
JPI-6	1.2	1.4	1.2	1.2	1.3
JPI-7	1.2	1.4	1.4	1.6	1.4

S109 Number of leaves

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	12.4	12.4	12.6	12.4	12.5
JPI-2	12.2	12.8	12.8	12.0	12.5
JPI-3	13.0	12.6	12.6	12.0	12.6
JPI-4	12.4	12.8	12.0	12.4	12.4
JPI-5	13.2	12.0	12.2	11.2	12.2
JPI-6	12.6	12.4	12.4	12.2	12.4
JPI-7	12.8	11.6	11.2	11.8	11.9

S110 Root down

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.01	0.01	0.02	0.02	0.015
JPI-2	0.01	0.03	0.01	0.01	0.015
JPI-3	0.02	0.02	0.02	0.02	0.02
JPI-4	0.01	0.02	0.02	0.02	0.0175
JPI-5	0.03	0.03	0.03	0.02	0.0275
JPI-6	0.01	0.04	0.01	0.03	0.0225
JPI-7	0.02	0.05	0.04	0.02	0.0325

S111 Middle 2 row cob weights (kg)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	6.15	5.34	5.49	5.49	5.61
JPI-2	6.33	7.11	5.40	5.40	6.06
JPI-3	5.91	6.08	5.40	5.40	5.69
JPI-4	5.73	5.70	5.18	5.18	5.45
JPI-5	5.92	5.33	5.05	5.05	5.34
JPI-6	6.06	6.15	5.17	5.17	5.63
JPI-7	3.83	2.91	3.74	3.74	3.55

S112 Number of seeds per row

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	37.0	32.0	35.0	33.0	34.3
JPI-2	35.5	32.0	34.5	33.0	33.8
JPI-3	36.0	33.0	35.0	32.0	34.0
JPI-4	33.5	32.5	33.0	33.0	33.0
JPI-5	28.5	31.5	29.0	27.5	29.1
JPI-6	36.5	32.5	33.0	31.0	33.3
JPI-7	26.0	26.5	27.0	26.0	26.4

S113 Number of cobs 2 middle rows

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	99.6	99.8	100.4	100.2	100.0
JPI-2	100.4	100.0	101.6	100.8	100.7
JPI-3	100.8	101.0	101.8	102.2	101.5
JPI-4	105.0	105.0	105.4	104.8	105.1
JPI-5	109.8	110.0	111.2	110.8	110.5
JPI-6	110.4	111.0	110.2	111.4	110.8
JPI-7	92.2	93.6	91.8	92.6	92.6

S114 Seed row appearance

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.0	1.0	1.2	1.2	1.1
JPI-2	1.2	1.2	1.2	1.0	1.2
JPI-3	1.2	1.2	1.0	1.2	1.2
JPI-4	1.2	1.2	1.2	1.0	1.2
JPI-5	1.2	1.4	1.4	1.0	1.3
JPI-6	1.2	1.2	1.0	1.2	1.2
JPI-7	1.4	1.4	1.4	1.4	1.4

S115 Cob height (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	126.2	98.8	109.8	72.4	101.8
JPI-2	130.4	121.0	105.8	105.6	115.7
JPI-3	109.0	106.4	95.4	70.6	95.4
JPI-4	114.2	114.2	78.0	74.2	95.2
JPI-5	109.8	105.4	89.6	81.0	96.5
JPI-6	139.4	113.0	85.8	79.8	104.5
JPI-7	117.0	118.4	107.8	94.4	109.4

S116 Stem rot

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.01	0.03	0.02	0.00	0.02
JPI-2	0.03	0.03	0.01	0.01	0.02
JPI-3	0.03	0.01	0.02	0.02	0.02
JPI-4	0.01	0.01	0.01	0.02	0.01
JPI-5	0.01	0.05	0.02	0.01	0.02
JPI-6	0.01	0.05	0.04	0.03	0.03
JPI-7	0.02	0.02	0.06	0.07	0.04

S117 Cob length (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	19.0	18.4	17.1	16.5	17.7
JPI-2	17.9	17.7	17.4	16.4	17.3
JPI-3	18.4	18.4	16.9	16.9	17.6
JPI-4	17.1	18.5	17.0	16.9	17.4
JPI-5	15.4	14.8	14.4	14.2	14.7
JPI-6	17.8	18.0	17.3	16.7	17.4
JPI-7	14.8	13.7	14.0	13.2	13.9

S118 Weight of 1000 seeds kA 15% y ogk

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	49.0	48.0	49.0	49.0	48.8
JPI-2	48.0	48.0	48.0	48.0	48.0
JPI-3	48.0	49.0	49.0	48.0	48.5
JPI-4	47.0	48.0	48.0	47.0	47.5
JPI-5	47.0	47.0	48.0	47.0	47.3
JPI-6	48.0	49.0	48.0	48.0	48.3
JPI-7	49.0	49.0	49.0	49.0	49.0

S119 Appearance due to Pests

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.6	1.4	1.4	1.2	1.4
JPI-2	1.8	1.6	1.6	1.4	1.6
JPI-3	1.4	1.4	1.2	1.2	1.3
JPI-4	1.6	1.4	1.6	1.6	1.6
JPI-5	1.6	1.8	1.4	1.4	1.6
JPI-6	1.6	1.6	1.6	1.4	1.6
JPI-7	1.8	1.8	1.6	1.4	1.7

S120 Production (t/ha KA 15%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	10.22	8.89	9.21	9.91	9.56
JPI-2	10.98	11.65	8.95	9.41	10.25
JPI-3	9.35	10.40	9.16	8.59	9.38
JPI-4	9.81	9.83	8.94	9.26	9.46
JPI-5	10.28	8.40	8.91	9.26	9.21
JPI-6	10.34	10.19	9.00	8.72	9.57
JPI-7	6.04	4.62	6.24	5.92	5.71

Data Kediri

S121 Growth percentage (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	94.0	92.0	86.0	95.0	91.8
JPI-2	93.0	93.0	91.0	91.0	92.0
JPI-3	93.0	95.0	97.0	82.0	91.8
JPI-4	91.0	75.0	84.0	91.0	85.3
JPI-5	94.0	92.0	85.0	73.0	86.0
JPI-6	88.0	84.0	90.0	85.0	86.8
JPI-7	98.0	99.0	95.0	85.0	94.3

S122 Male flower age (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	58.0	56.0	55.0	56.0	56.3
JPI-2	57.0	57.0	56.0	56.0	56.5
JPI-3	55.0	56.0	57.0	57.0	56.3
JPI-4	57.0	56.0	56.0	55.0	56.0
JPI-5	54.0	57.0	56.0	56.0	55.8
JPI-6	59.0	58.0	57.0	57.0	57.8
JPI-7	52.0	53.0	51.0	51.0	51.8

S123 Pest attack (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.03	0.02	0.04	0.02	0.03
JPI-2	0.02	0.03	0.05	0.03	0.03
JPI-3	0.03	0.02	0.03	0.02	0.03
JPI-4	0.02	0.03	0.04	0.02	0.03
JPI-5	0.04	0.04	0.05	0.04	0.04
JPI-6	0.04	0.05	0.05	0.03	0.04
JPI-7	0.05	0.06	0.08	0.05	0.06

S124 Cob diameter (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	4.8	4.8	4.9	4.6	4.8
JPI-2	4.7	5.0	4.8	4.7	4.8
JPI-3	4.5	4.8	5.4	4.7	4.9
JPI-4	4.6	4.6	4.7	4.8	4.7
JPI-5	4.9	4.4	4.5	4.3	4.5
JPI-6	4.9	5.0	4.8	4.9	4.9
JPI-7	3.4	4.3	3.9	3.9	3.9

S125 Harvest time (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	307.11	327.18	337.72	266.31	309.58
JPI-2	316.49	342.94	290.97	276.75	306.79
JPI-3	299.99	337.02	324.20	280.19	310.35
JPI-4	318.74	353.80	286.18	260.43	304.79
JPI-5	316.87	323.31	309.81	248.83	299.71
JPI-6	317.44	326.99	324.91	263.81	308.29
JPI-7	302.77	321.62	324.54	243.23	298.04

S126 Cob closure

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.4	1.6	1.6	1.4	1.5
JPI-2	1.6	1.8	1.4	1.6	1.6
JPI-3	1.6	1.4	1.4	1.4	1.5
JPI-4	1.4	1.6	1.4	1.4	1.5
JPI-5	1.4	1.6	1.6	1.6	1.6
JPI-6	1.4	1.6	1.4	1.6	1.5
JPI-7	1.6	1.6	1.4	1.6	1.6

S127 Plant height (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	165.2	162.0	167.2	142.0	159.1
JPI-2	162.8	173.6	159.0	163.8	164.8
JPI-3	164.8	168.2	170.2	130.4	158.4
JPI-4	154.4	158.2	156.2	148.8	154.4
JPI-5	158.8	163.2	140.0	127.8	147.5
JPI-6	175.2	163.0	148.2	159.6	161.5
JPI-7	190.8	182.0	164.0	159.8	174.2

S128 Female flower age (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	60.0	57.0	57.0	57.0	57.8
JPI-2	58.0	59.0	58.0	58.0	58.3
JPI-3	57.0	58.0	58.0	58.0	57.8
JPI-4	59.0	58.0	58.0	57.0	58.0
JPI-5	56.0	59.0	58.0	58.0	57.8
JPI-6	63.0	60.0	59.0	59.0	60.3
JPI-7	54.0	55.0	52.0	53.0	53.5

S129 Downy mildew attact (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.02	0.02	0.03	0.02	0.02
JPI-2	0.02	0.03	0.03	0.02	0.03
JPI-3	0.02	0.03	0.03	0.03	0.03
JPI-4	0.03	0.02	0.04	0.03	0.03
JPI-5	0.04	0.03	0.08	0.04	0.05
JPI-6	0.03	0.03	0.04	0.04	0.04
JPI-7	0.06	0.06	0.08	0.08	0.07

S130 Number of rows per cob

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	16.0	14.0	15.0	14.0	14.8
JPI-2	14.0	15.0	13.0	13.0	13.8
JPI-3	14.0	14.0	16.0	14.0	14.5
JPI-4	13.0	13.0	13.0	14.0	13.3
JPI-5	13.0	13.0	12.0	14.0	13.0
JPI-6	15.0	14.0	14.0	16.0	14.8
JPI-7	10.0	11.0	9.0	11.0	10.3

S131 Number of plants 2 middle rows

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	48.0	49.0	48.0	48.0	48.3
JPI-2	48.0	48.0	49.0	48.0	48.3
JPI-3	49.0	48.0	49.0	49.0	48.8
JPI-4	48.0	49.0	49.0	48.0	48.5
JPI-5	47.0	48.0	48.0	48.0	47.8
JPI-6	48.0	48.0	49.0	49.0	48.5
JPI-7	48.0	47.0	47.0	47.0	47.3

S132 Cob appearance

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.2	1.4	1.4	1.2	1.3
JPI-2	1.4	1.2	1.2	1.4	1.3
JPI-3	1.4	1.2	1.2	1.4	1.3
JPI-4	1.6	1.2	1.4	1.2	1.4
JPI-5	1.8	1.4	1.6	1.6	1.6
JPI-6	1.4	1.6	1.4	3.4	2.0
JPI-7	1.2	1.6	1.6	1.6	1.5

S133 Number of leaves

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	11.8	11.2	10.6	10.6	11.1
JPI-2	11.0	11.0	10.4	10.6	10.8
JPI-3	11.8	11.8	11.4	10.8	11.5
JPI-4	11.2	10.6	10.6	10.4	10.7
JPI-5	11.6	10.6	10.6	10.0	10.7
JPI-6	12.8	11.6	11.2	11.4	11.8
JPI-7	10.0	10.4	8.4	8.2	9.3

S134 Root down

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.02	0.03	0.01	0.01	0.0175
JPI-2	0.01	0.02	0.01	0.01	0.0125
JPI-3	0.01	0.01	0.02	0.01	0.0125
JPI-4	0.02	0.02	0.01	0.02	0.0175
JPI-5	0.04	0.02	0.02	0.03	0.0275
JPI-6	0.02	0.03	0.02	0.04	0.0275
JPI-7	0.04	0.06	0.06	0.04	0.05

S135 Middle 2 row cob weights (kg)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	5.85	5.20	5.67	5.84	5.64
JPI-2	6.73	5.65	5.09	5.09	5.64
JPI-3	6.25	5.21	6.93	5.93	6.08
JPI-4	5.80	5.18	5.09	5.09	5.29
JPI-5	4.85	4.94	4.52	4.12	4.60
JPI-6	6.75	6.46	5.74	5.74	6.17
JPI-7	2.53	3.08	3.71	3.71	3.26

S136 Number of seeds per row

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	33.5	33.0	34.5	34.0	33.8
JPI-2	31.5	33.0	40.5	33.0	34.5
JPI-3	34.5	34.0	32.5	34.0	33.8
JPI-4	27.0	30.0	35.5	35.5	32.0
JPI-5	31.0	28.5	31.5	25.5	29.1
JPI-6	34.0	34.0	33.5	36.0	34.4
JPI-7	22.0	25.5	26.0	23.5	24.3

S137 Number of cobs 2 middle rows

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	49.0	50.0	49.0	49.0	49.3
JPI-2	49.0	49.0	48.0	49.0	48.8
JPI-3	50.0	50.0	50.0	48.0	49.5
JPI-4	49.0	48.0	49.0	48.0	48.5
JPI-5	48.0	48.0	49.0	48.0	48.3
JPI-6	49.0	50.0	47.0	49.0	48.8
JPI-7	48.0	47.0	47.0	49.0	47.8

S138 Seed row appearance

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.0	1.2	1.0	1.2	1.1
JPI-2	1.2	1.0	1.2	1.0	1.1
JPI-3	1.2	1.0	1.2	1.2	1.2
JPI-4	1.0	1.4	1.2	1.0	1.2
JPI-5	1.4	1.4	1.6	1.0	1.4
JPI-6	1.4	1.2	1.2	1.2	1.3
JPI-7	1.6	1.6	1.6	1.4	1.6

S139 Cob height (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	104.0	76.5	88.5	77.0	86.5
JPI-2	96.5	80.8	72.5	84.5	83.6
JPI-3	84.8	91.3	89.5	88.3	88.4
JPI-4	90.3	76.8	87.8	75.0	82.4
JPI-5	88.0	82.8	66.5	69.0	76.6
JPI-6	96.3	87.5	74.0	90.3	87.0
JPI-7	101.3	85.3	79.3	79.3	86.3

S140 Stem rot

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.02	0.02	0.01	0.01	0.02
JPI-2	0.03	0.01	0.01	0.01	0.02
JPI-3	0.02	0.02	0.01	0.01	0.02
JPI-4	0.02	0.02	0.01	0.03	0.02
JPI-5	0.03	0.04	0.01	0.04	0.03
JPI-6	0.03	0.05	0.02	0.03	0.03
JPI-7	0.05	0.02	0.07	0.06	0.05

S141 Cob length (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	19.1	19.0	18.3	18.6	18.7
JPI-2	17.5	18.2	19.8	18.3	18.4
JPI-3	18.7	18.6	19.0	18.9	18.8
JPI-4	18.8	20.0	18.9	18.7	19.1
JPI-5	17.4	16.0	15.5	17.9	16.7
JPI-6	18.9	20.0	17.8	18.8	18.9
JPI-7	14.5	15.5	15.2	15.8	15.2

S142 Weight of 1000 seeds kA 15% y ogk

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	100.0	100.4	101.0	100.6	100.5
JPI-2	101.0	100.0	102.4	101.8	101.3
JPI-3	101.0	102.8	102.4	102.4	102.2
JPI-4	103.8	106.0	106.2	105.6	105.4
JPI-5	110.6	110.4	112.0	110.0	110.8
JPI-6	110.6	111.4	109.8	111.6	110.9
JPI-7	91.8	93.0	92.2	93.0	92.5

S143 Appearance due to Pests

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	2.0	2.0	2.2	2.2	2.1
JPI-2	2.2	2.0	1.8	2.0	2.0
JPI-3	2.2	2.2	2.0	2.2	2.2
JPI-4	1.8	2.2	2.0	2.2	2.1
JPI-5	2.4	2.0	2.0	2.2	2.2
JPI-6	2.2	2.4	2.0	2.4	2.3
JPI-7	1.2	1.0	1.2	1.0	1.1

S144 Production (t/ha KA 15%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	9.18	9.63	9.52	11.22	9.89
JPI-2	9.79	9.81	9.11	9.62	9.58
JPI-3	10.03	9.00	10.31	10.17	9.88
JPI-4	9.21	8.12	9.15	8.74	8.80
JPI-5	8.44	9.95	7.72	7.00	8.28
JPI-6	9.27	10.15	9.12	9.02	9.39
JPI-7	3.48	5.66	7.56	6.86	5.89

Data downy mildew infection in Bajeng Gowa, 2023

S145 Age 14 DAP

genotype	replicate				
	I	II	III	IV	Average
JPI-1	0.0	0.0	0.0	0.0	0.0
JPI-2	0.0	0.0	0.0	0.0	0.0
JPI-3	0.0	0.4	1.0	0.8	0.6
JPI-4	4.2	5.2	3.8	3.0	4.1
Pulut Uri	0.0	0.0	0.0	0.0	0.0
Srikandi Putih	0.0	0.0	0.0	0.0	0.0
Pulut lokal	0.0	0.0	0.0	0.0	0.0
Anoman	7.2	6.8	8.2	7.8	7.5

S146 Umur 21 D (Gowa)

Genotype	Replicate				
	I	II	III	IV	Rataan
JPI-1	3.8	3.2	3.4	3.7	3.5
JPI-2	4.7	5.0	4.2	4.4	4.6
JPI-3	5.8	6.4	5.9	6.7	6.2
JPI-4	11.9	12.8	12.6	12.7	12.5
Pulut Uri	3.6	4.1	4.5	4.2	4.1
Srikandi Putih	4.0	3.2	3.6	3.2	3.5
Pulut lokal	7.0	8.2	6.4	7.2	7.2
Anoman	69.2	60.4	60.8	66.2	64.2

S147 Umur 28 D (Gowa)

Genotype	Replicate				
	I	II	III	IV	Rataan
JPI-1	5.1	5.6	5.2	5.4	5.3
JPI-2	7.8	7.2	7.1	6.4	7.1
JPI-3	11.0	12.0	10.4	11.2	11.2
JPI-4	28.2	27.4	26.8	28.4	27.7
Pulut Uri	8.8	8.3	7.8	8.9	8.5
Srikandi Putih	5.2	5.3	6.0	5.0	5.4
Pulut lokal	32.5	30.2	30.0	29.3	30.5
Anoman	82.4	80.1	78.6	82.5	80.9

S148 Umur 35 D (Gowa)

Genotype	Replicate				
	I	II	III	IV	Rataan
JPI-1	5.8	5.6	5.2	6.4	5.8
JPI-2	9.0	7.2	8.1	8.4	8.2
JPI-3	11.0	12.0	12.4	11.2	11.7
JPI-4	28.2	27.4	26.8	28.4	27.7
Pulut Uri	8.8	8.7	9.8	8.9	9.1
Srikandi Putih	5.2	5.3	6.0	5.0	5.4

Pulut lokal	32.5	38.2	39.0	39.3	37.3
Anoman	97.4	98.1	98.6	99.5	98.4

S149 Umur 42 H (Gowa)

Genotip	Ulangan				
	I	II	III	IV	Rataan
JPI-1	5.8	5.6	5.2	6.4	5.8
JPI-2	9.0	7.2	8.1	8.4	8.2
JPI-3	11.0	12.0	12.4	11.2	11.7
JPI-4	28.2	27.4	26.8	28.4	27.7
Pulut Uri	8.8	8.7	9.8	8.9	9.1
Srikandi Putih	5.2	5.3	6.0	5.0	5.4
Pulut lokal	38.5	40.2	39.4	40.3	39.6
Anoman	90.4	95.1	90.6	92.5	92.2

S150 Tabel 1. Rata-rata persentase infeksi patogrn bulai di Bajeng Gowa 2023

Genotip	Insidensi penyakit bulai (%) pada umur (HST)					Reaksi
	14	21	28	35	42	
JPI-1	0.0	3.5	5.3	5.8	5.8	Tahan T)
JPI-2	0.0	4.6	7.1	8.2	8.2	Tahan (T)
JPI-3	0.6	6.2	11.2	11.7	11.7	Tahan (T)
JPI-4	4.1	12.5	27.7	27.7	27.7	agak Tahan AT)
Pulut Uri	0.0	4.1	8.5	9.1	9.1	Tahan (T)
Srikandi Putih	0.0	3.5	5.4	5.4	5.4	Tahan (T)
Pulut lokal	0.0	7.2	30.5	37.3	39.6	Rentan ®
Anoman	7.5	64.2	80.9	98.4	92.2	Sangat rentan (SR)

Data downy mildew infection in Malang, Jatim, 2023

S151 Age 14 DAP

genotype	replicate				
	I	II	III	IV	Average
JPI-1	0.0	0.0	0.0	0.0	0.0
JPI-2	0.0	0.0	0.0	0.0	0.0
JPI-3	2.4	3.8	2.4	3.4	3.0
JPI-4	4.0	4.2	4.3	3.6	4.0
Pulut Uri	0.5	0.2	0.2	0.4	0.3
Srikandi Putih	2.0	2.3	2.6	2.1	2.3
Pulut lokal	1.2	1.1	1.0	0.7	1.0
Anoman	23.1	20.2	19.6	19.6	20.6

S152 Umur 21 D (Malang)

Genotype	Replicate				
	I	II	III	IV	Rataan
JPI-1	0.0	0.0	0.0	0.0	0.0
JPI-2	0.0	0.0	0.0	0.0	0.0
JPI-3	6.4	6.6	5.9	6.9	6.5
JPI-4	8.1	7.4	7.8	7.4	7.7

Pulut Uri	4.6	4.1	3.8	4.0	4.1
Srikandi Putih	5.9	7.0	6.4	5.8	6.3
Pulut lokal	8.7	7.8	7.4	8.1	8.0
Anoman	52.3	50.4	53.0	53.4	52.3

S153 Umur 28 DA (Malang)

Genotype	Replicate				
	I	II	III	IV	Rataan
JPI-1	9.1	9.2	10.0	8.5	9.2
JPI-2	10.4	10.7	9.9	9.8	10.2
JPI-3	8.4	9.0	8.3	7.8	8.4
JPI-4	9.0	8.6	8.5	8.6	8.7
Pulut Uri	9.6	9.3	8.8	9.1	9.2
Srikandi Putih	8.4	8.8	7.9	8.4	8.4
Pulut lokal	11.0	9.2	10.0	10.1	10.1

S154 Umur 35 DA (Malang)

Genotype	Replicate				
	I	II	III	IV	Rataan
JPI-1	9.9	8.9	9.7	10.0	9.6
JPI-2	11.1	10.3	10.7	9.6	10.4
JPI-3	9.8	9.8	10.1	9.3	9.8
JPI-4	19.0	18.1	17.3	17.6	18.0
Pulut Uri	10.6	10.3	11.3	10.2	10.6
Srikandi Putih	10.0	9.1	9.2	8.4	9.2
Pulut lokal	25.4	27.1	24.2	25.0	25.4

S155 Umur 42 HS (Malang)

Genotip	Ulangan				
	I	II	III	IV	Rataan
JPI-1	9.9	8.9	9.7	10.0	9.6
JPI-2	11.1	10.3	10.7	9.6	10.4
JPI-3	9.8	9.8	10.1	9.3	9.8
JPI-4	19.0	18.1	17.3	17.6	18.0
Pulut Uri	10.6	10.3	11.3	10.2	10.6
Srikandi Putih	10.0	9.1	9.2	8.4	9.2
Pulut lokal	25.4	27.1	24.2	25.0	25.4

S156 Tabel 2. Rata-rata persentase infeksi patogrn bulai di Malang Jatim- 2023

Genotip	Insidensi penyakit bulai (%) pada umur (HST)					Reaksi
	14	21	28	35	42	
JPI-1	0.0	0.0	9.2	9.6	9.6	Tahan T)
JPI-2	0.0	0.0	10.2	10.4	10.4	Tahan (T)
JPI-3	3.0	6.5	8.4	9.8	9.8	Tahan (T)
JPI-4	4.0	7.7	8.7	18.0	18.0	agak Tahan (AT)
Pulut Uri	0.3	4.1	9.2	10.6	10.6	Tahan (T)
Srikandi Putih	2.3	6.3	8.4	9.2	9.2	Tahan (T)
Pulut lokal	1.0	8.0	10.1	25.4	25.4	agak tahan (AT)
Anoman	20.6	52.3	71.9	79.6	83.7	Sangat rentan (SR)

SS 161 Lea
Umur 60 D

Genotype
JPI-1
JPI-2
JPI-3
JPI-4
Pulut Uri
Srikandi Pu
Pulut lokal
Anoman

SS 162 Lea
Umur 70 D

Genotype
JPI-1
JPI-2
JPI-3
JPI-4
Pulut Uri
Srikandi

SS 163 Ave

Genotype
JPI-1
JPI-2
JPI-3
JPI-4
Pulut Uri
Srikandi Pu
Pulut lokal

Data leaf blight infection in Bajeng, Gowa, 2023
S157 Age 45 DAP

genotype	replicate				
	I	II	III	IV	Average
JPI-1	1.60	2.00	1.20	1.30	1.53
JPI-2	6.10	5.80	5.40	5.30	5.65
JPI-3	13.10	12.60	12.70	12.40	12.70
JPI-4	12.40	12.60	12.20	12.00	12.30
Pulut Uri	0.00	0.00	0.00	0.00	0.00
Srikandi Putih	6.20	5.40	5.11	4.50	5.30
Pulut lokal	4.70	5.10	4.20	4.80	4.70
Anoman	1.30	1.60	1.11	1.20	1.30

S158 Umur 60 DA (gowa)

Genotype	Replicate				
	I	II	III	IV	Rataan
JPI-1	16.50	16.80	14.20	14.90	15.60
JPI-2	18.40	18.80	17.30	18.20	18.18
JPI-3	18.10	16.60	17.20	17.10	17.25
JPI-4	18.80	19.20	18.20	17.40	18.40
Pulut Uri	16.30	17.00	15.10	15.60	16.00
Srikandi Putih	17.50	18.20	16.30	17.20	17.30
Pulut lokal	15.10	15.40	14.50	15.00	15.00
Anoman	38.40	40.10	38.80	39.90	39.30

S159 Umur 75 DA (gowa)

Genotype	Replicate				
	I	II	III	IV	Rataan
JPI-1	18.50	18.40	19.10	19.20	18.80
JPI-2	22.20	20.60	20.10	19.50	20.60
JPI-3	19.20	18.20	17.60	17.00	18.00
JPI-4	22.40	20.80	20.40	19.60	20.80
Pulut Uri	21.30	20.40	18.10	20.20	20.00
Srikandi Putih	19.70	18.31	19.10	19.70	19.20
Pulut lokal	21.30	21.60	20.20	20.10	20.80
Anoman	70.20	70.40	68.10	65.30	68.50

S160 Tabel 3. Rata-rata persentase hawar daun di Bajeng-Gowa- 2023

Genotype	nsi penyakit bulai (%) pada umur			Reaksi
	45	60	70	
JPI-1	1.53	15.60	18.80	Tahan T)
JPI-2	5.65	18.18	20.60	Tahan (T)
JPI-3	12.70	17.25	18.00	Tahan (T)
JPI-4	12.30	18.40	20.80	Tahan (T)
Pulut Uri	0.00	16.00	20.00	Tahan (T)
Srikandi Putih	5.30	17.30	19.20	Tahan (T)
Pulut lokal	4.70	15.00	20.80	Tahan (T)
Anoman	1.30	39.30	68.50	gat rentan (SR)

f rust infection data in Bajeng, Gowa, 2023
AP

	Replicate			
I	II	III	IV	Average
16.30	14.40	15.80	15.50	15.50
16.40	17.20	16.80	17.20	16.90
18.10	18.00	20.00	17.10	18.30
14.80	15.00	13.20	14.20	14.30
17.50	16.70	16.80	16.20	16.80
14.70	15.00	14.00	13.50	14.30
14.80	14.30	15.10	13.80	14.50
23.10	23.50	21.80	21.60	22.50

f rust infection data in Bajeng, Gowa, 2023
(gowa)

	Replicate			
I	II	III	IV	Average
21.70	22.40	19.40	19.30	20.70
20.20	19.80	19.80	18.90	19.68
22.20	20.20	18.40	19.10	19.98
18.50	17.30	19.20	17.00	18.00
21.80	21.60	18.60	19.20	20.30
18.40	18.20	17.40	18.00	18.00
21.20	21.00	19.30	18.50	20.00
66.80	70.60	67.20	68.20	68.20

rage percentage of leaf rust in Bajeng-Gowa- 2023

	Leaf rust percentage (%) at age (DAP)			Reaksi
	45	60	70	
		15.50	20.70	Tahan T)
		16.90	19.68	Tahan (T)
		18.30	19.98	Tahan (T)
		14.30	18.00	Tahan (T)
		16.80	20.30	Tahan (T)
tih		14.30	18.00	Tahan (T)
		14.50	20.00	Tahan (T)
		22.50	68.20	angat rentan (SR)

SS 164 Compilation data

		Pengamatan				
Genotype	Location	Observation	Tan height	Number of lea	UB male	UB female
1	Gowa	95	217.4	11.8	58	60
1		94	223.8	12.6	57	58
1		94	189	11.6	55	57
1		93	196	11.2	57	59
1		95	196.2	10.8	54	56
1		95	204.6	12.4	59	63
1		98	207	9.8	52	54
2		94	209	11.2	56	57
2		93	220.6	13.0	57	59
2		94	228.2	12.8	56	58
2		87	174.2	9.8	56	58
2		93	178.4	11.0	57	59
2		86	214.6	11.6	58	60
2		98	208.6	10.2	53	55
3		89	216.8	11.6	55	57
3		92	198.8	10.4	56	58
3		97	209.8	11.0	57	58
3		85	204.4	11.2	56	58
3		86	178.4	10.4	56	58
3		91	225.6	11.2	57	59
3		94	205.6	10.0	51	52
4		96	207.4	10.2	56	57
4		93	209.6	12.4	56	58
4		90	214.8	12.2	57	58
4		91	193.2	10.8	55	57
4		79	182.2	10.2	56	58
4		84	226.2	11.2	57	59
4		84	197.8	10.6	51	53
1	Takalar	92.0	219.8	14.4	51.0	53.0
1		91.0	193.8	11.2	51.0	53.0
1		94.0	169.4	10.2	51.0	53.0
1		93.0	154.6	9.2	51.0	53.0
1		95.0	204.2	11.4	52.0	54.0
1		95.0	233.6	12.0	56.0	58.0
1		98.0	219.4	10.0	47.0	46.0
2		94.0	228.0	11.0	51.0	53.0
2		93.0	173.8	10.8	53.0	55.0
2		94.0	200.2	11.0	51.0	53.0
2		89.0	162.2	9.6	51.0	53.0
2		93.0	204.8	9.8	53.0	55.0
2		86.0	190.2	10.0	54.0	56.0
2		98.0	228.0	10.0	49.0	46.0
3		90.0	196.0	10.6	51.0	53.0
3		92.0	163.2	9.6	51.0	53.0
3		94.0	245.2	11.2	51.0	53.0
3		85.0	169.0	10.0	52.0	54.0
3		88.0	162.6	8.2	55.0	57.0

		Pengamatan				
Genotype	Location	Observation	Tan height	Number of lea	UB male	UB female
3	Takalar	91.0	180.0	9.0	51.0	53.0
3		94.0	219.6	10.4	48.0	50.0
4		95.0	219.6	10.4	51.0	53.0
4		93.0	182.0	10.4	51.0	53.0
4		90.0	241.6	12.0	58.0	60.0
4		91.0	173.2	9.6	51.0	53.0
4		79.0	200.2	10.2	52.0	54.0
4		90.0	239.6	12.8	56.0	58.0
4		86.0	222.0	9.4	46.0	48.0
1	Bantaeng	87.4	175.8	13.0	58.0	60.0
1		86.5	155.0	10.1	59.0	61.0
1		89.3	135.5	9.2	58.0	60.0
1		88.4	167.0	9.6	59.0	61.0
1		86.0	163.4	10.3	59.0	61.0
1		90.3	186.9	10.8	60.0	62.0
1		80.0	164.0	9.0	54.0	56.0
2		89.3	182.4	9.9	58.0	60.0
2		88.4	139.0	9.7	58.0	60.0
2		89.3	160.2	9.9	58.0	60.0
2		84.6	129.8	8.6	59.0	61.0
2		88.4	163.8	8.8	51.8	62.0
2		81.7	152.2	9.0	61.0	63.0
2		88.0	160.0	8.5	56.0	58.0
3		85.5	156.8	9.5	58.0	60.0
3		87.4	130.6	8.6	59.0	61.0
3		89.3	196.2	10.1	58.0	61.0
3		84.0	135.2	9.0	58.0	60.0
3		83.6	130.1	7.4	60.0	62.0
3		86.5	144.0	8.1	59.0	61.0
3		85.0	175.7	9.4	55.0	57.0
4		90.3	175.7	9.4	59.0	61.0
4		88.4	145.6	9.4	58.0	60.0
4		85.5	193.3	10.8	59.0	61.0
4		86.5	138.6	8.6	58.0	60.0
4		80.0	160.2	9.2	59.0	61.0
4		85.5	191.7	11.5	71.6	63.0
4		81.7	170.0	8.5	54.0	56.0
1	Maros	90.2	197.8	13.8	53.00	55.00
1		89.2	174.4	10.8	53.00	55.00
1		92.1	152.5	9.8	53.00	55.00
1		91.1	180.0	10.6	53.00	55.00
1		91.1	183.8	10.9	54.00	56.00
1		90.2	210.2	11.5	55.00	57.00
1		96.0	197.5	10.6	48.00	50.00
2		92.1	205.2	10.6	53.00	55.00
2		91.1	182.7	10.4	55.00	56.00
2		92.1	180.2	10.6	53.00	55.00
2		87.2	182.0	11.5	53.00	55.00

		Pengamatan				
Genotype	Location	Observation	Tan height	Number of lea	UB male	UB female
2	Maros	91.1	184.3	9.6	55.00	56.00
2		84.3	171.2	9.6	55.00	57.00
2		96.0	205.2	11.5	50.00	51.00
3		88.2	176.4	10.2	53.00	54.00
3		90.2	180.0	9.6	52.00	54.00
3		92.1	220.7	10.8	53.00	56.00
3		83.3	179.1	9.6	54.00	55.00
3		86.2	146.3	10.6	53.00	55.00
3		89.2	162.0	10.6	53.00	55.00
3		92.1	197.6	10.0	48.00	50.00
4		93.1	197.6	10.0	53.00	54.00
4		91.1	163.8	10.0	53.00	55.00
4		88.2	217.4	11.5	54.00	55.00
4		89.2	173.9	11.5	53.00	54.00
4		84.3	180.2	9.8	54.00	56.00
4		88.2	215.6	12.3	55.00	57.00
4		84.3	199.8	9.6	46.00	48.00
1	Lombok (NTB)	96.0	170.2	12.4	59.0	61.0
1		94.0	167.4	12.2	56.0	58.0
1		96.0	184.0	13.0	56.0	57.0
1		95.0	174.0	12.4	57.0	59.0
1		94.0	188.6	13.2	52.0	54.0
1		96.0	186.4	12.6	61.0	63.0
1		96.0	180.6	12.8	51.0	52.0
2		93.0	183.6	12.4	56.0	57.0
2		95.0	192.0	12.8	56.0	57.0
2		96.0	188.0	12.6	57.0	58.0
2		94.0	179.0	12.8	57.0	59.0
2		97.0	185.6	12.0	52.0	53.0
2		95.0	175.6	12.4	56.0	57.0
2		97.0	202.2	11.6	51.0	52.0
3		94.0	182.0	12.6	55.0	57.0
3		95.0	180.0	12.8	57.0	58.0
3		95.0	175.0	12.6	55.0	56.0
3		96.0	164.0	12.0	56.0	58.0
3		94.0	176.2	12.2	53.0	54.0
3		96.0	168.0	12.4	56.0	57.0
3		95.0	188.0	11.2	52.0	54.0
4		93.0	120.2	12.4	55.0	57.0
4		94.0	179.0	12.0	57.0	58.0
4		97.0	160.0	12.0	57.0	58.0
4		94.0	154.0	12.4	56.0	57.0
4		92.0	155.0	11.2	52.0	53.0
4		92.0	160.6	12.2	59.0	60.0
4		95.0	168.4	11.8	52.0	53.0
1	Kediri	94.0	165.2	11.8	58.0	60.0
1		93.0	162.8	11.0	57.0	58.0
1		93.0	164.8	11.8	55.0	57.0

		Pengamatan				
Genotype	Location	Observation	Tan height	Number of lea	UB male	UB female
1	Kediri	91.0	154.4	11.2	57.0	59.0
1		94.0	158.8	11.6	54.0	56.0
1		88.0	175.2	12.8	59.0	63.0
1		98.0	190.8	10.0	52.0	54.0
2		92.0	162.0	11.2	56.0	57.0
2		93.0	173.6	11.0	57.0	59.0
2		95.0	168.2	11.8	56.0	58.0
2		75.0	158.2	10.6	56.0	58.0
2		92.0	163.2	10.6	57.0	59.0
2		84.0	163.0	11.6	58.0	60.0
2		99.0	182.0	10.4	53.0	55.0
3		86.0	167.2	10.6	55.0	57.0
3		91.0	159.0	10.4	56.0	58.0
3		97.0	170.2	11.4	57.0	58.0
3		84.0	156.2	10.6	56.0	58.0
3		85.0	140.0	10.6	56.0	58.0
3		90.0	148.2	11.2	57.0	59.0
3		95.0	164.0	8.4	51.0	52.0
4		95.0	142.0	10.6	56.0	57.0
4		91.0	163.8	10.6	56.0	58.0
4		82.0	130.4	10.8	57.0	58.0
4		91.0	148.8	10.4	55.0	57.0
4		73.0	127.8	10.0	56.0	58.0
4		85.0	159.6	11.4	57.0	59.0
4		85.0	159.8	8.2	51.0	53.0

Note	
1	JPI-1
2	JPI-2
3	JPI-3
4	JPI-4
5	JPI-5
6	JPI-6
7	JPI-7

		Pengamatan						
Genotype	Location	Observatio	Tan height	Weight 50	Acting cob	D cob	Number of	Number of
1	Gowa	95	217.4	8.96	19.9	4.7	14	33.5
1		94	223.8	8.84	17.9	4.4	12	31.5
1		94	189	8.35	18.4	4.6	14	34.5
1		93	196	8.12	18.6	4.4	14	27.0
1		95	196.2	6.53	16.3	4.2	12	31.0
1		95	204.6	8.33	19.7	4.8	13	34.0
1		98	207	5.01	15.1	3.7	9	22.0
2		94	209	8.42	19.3	4.7	13	33.0
2		93	220.6	8.68	19.7	4.9	14	33.0
2		94	228.2	8.95	20.9	5.0	14	34.0
2		87	174.2	8.16	17.7	4.4	14	30.0
2		93	178.4	6.54	16.1	4.5	14	28.5
2		86	214.6	8.33	20.0	4.9	14	34.0
2		98	208.6	4.83	15.6	3.7	9	25.5
3		89	216.8	8.05	19.0	4.8	15	34.5
3		92	198.8	8.03	18.0	4.7	13	40.5
3		97	209.8	8.87	19.3	4.4	16	32.5
3		85	204.4	8.54	18.3	4.5	13	35.5
3		86	178.4	5.75	14.9	4.1	12	31.5
3		91	225.6	8.43	19.5	5.0	14	33.5
3		94	205.6	5.06	14.5	3.7	9	26.0
4		96	207.4	8.27	19.9	4.7	15	34.0
4		93	209.6	8.07	19.3	4.7	13	33.0
4		90	214.8	7.69	18.5	4.7	16	34.0
4		91	193.2	8.08	19.2	4.4	13	35.5
4		79	182.2	5.75	15.1	4.1	12	25.5
4		84	226.2	8.45	19.8	5.0	14	36.0
4		84	197.8	5.05	14.4	3.5	9	23.5
1	Takalar	92.0	219.8	8.96	18.2	4.2	15.0	33.5
1		91.0	193.8	8.84	17.4	4.0	13.0	31.5
1		94.0	169.4	8.35	17.6	4.4	15.0	34.5
1		93.0	154.6	8.12	19.2	3.8	15.0	27.0
1		95.0	204.2	6.94	14.4	3.6	12.0	31.0
1		95.0	233.6	8.33	16.0	4.0	15.0	34.0
1		98.0	219.4	4.46	13.8	3.8	11.0	22.0
2		94.0	228.0	7.93	18.2	4.3	14.0	33.0
2		93.0	173.8	8.68	18.4	4.0	15.0	33.0
2		94.0	200.2	8.95	17.2	4.1	15.0	34.0
2		89.0	162.2	8.16	19.2	4.0	16.0	30.0
2		93.0	204.8	7.77	16.2	3.7	15.0	28.5
2		86.0	190.2	8.33	17.6	4.4	15.0	34.0
2		98.0	228.0	4.30	13.6	3.6	11.0	25.5
3		90.0	196.0	7.81	19.0	4.4	15.0	34.5
3		92.0	163.2	8.03	17.8	4.1	14.0	40.5
3		94.0	245.2	7.47	18.2	4.2	15.0	32.5
3		85.0	169.0	8.06	19.0	3.8	15.0	35.5
3		88.0	162.6	7.91	16.2	3.9	13.0	31.5

		Pengamatan						
Genotype	Location	Observatio	Tan height	Weight 50	Acting cob	D cob	Number of	Number of
3	Takalar	91.0	91.4	8.43	17.8	4.5	14.0	33.5
3		94.0	91.0	4.50	14.0	3.6	9.0	26.0
4		95.0	88.8	7.78	18.4	4.3	15.0	34.0
4		93.0	94.0	8.07	18.0	4.1	14.0	33.0
4		90.0	88.0	7.46	18.0	4.2	14.0	34.0
4		91.0	77.0	7.94	18.8	4.3	15.0	35.5
4		79.0	94.4	7.19	15.2	3.9	14.0	25.5
4		90.0	106.4	8.45	19.2	4.3	15.0	36.0
4		86.0	106.4	4.49	15.0	3.5	11.0	23.5
1	Bantaeng	87.4	80.8	7.68	15.5	3.6	14.0	26.0
1		86.5	76.0	8.48	14.8	3.7	13.0	24.0
1		89.3	84.1	8.09	15.0	3.8	14.0	27.0
1		88.4	63.7	7.06	16.3	3.3	14.0	19.5
1		86.0	79.9	6.26	12.2	3.0	12.0	23.5
1		90.3	76.0	8.10	13.6	3.4	14.0	26.5
1		80.0	70.0	4.48	11.7	3.2	10.0	15.5
2		89.3	85.7	8.10	15.5	3.7	14.0	25.5
2		88.4	65.2	8.48	15.6	3.4	15.0	25.5
2		89.3	74.7	6.45	14.6	3.5	15.0	26.5
2		84.6	66.6	6.79	16.3	3.6	15.0	22.5
2		88.4	74.9	6.41	13.8	3.2	13.0	21.0
2		81.7	78.1	7.86	15.0	3.7	14.0	26.5
2		88.0	77.0	4.55	11.6	3.0	9.0	18.0
3		85.5	70.4	7.07	16.2	3.7	14.0	27.0
3		87.4	67.0	7.04	15.1	3.5	14.0	33.0
3		89.3	109.3	6.94	15.5	3.6	14.0	25.0
3		84.0	63.0	7.38	16.2	3.2	15.0	28.0
3		83.6	66.6	5.70	13.8	3.3	13.0	24.0
3		86.5	82.3	7.55	15.1	3.8	14.0	26.0
3		85.0	81.9	4.49	11.9	3.1	9.0	18.5
4		90.3	79.9	8.79	15.6	3.7	14.0	26.5
4		88.4	84.6	7.36	15.3	3.5	14.0	25.5
4		85.5	79.2	7.24	15.3	3.6	13.0	26.5
4		86.5	69.3	7.33	16.0	3.6	14.0	28.0
4		80.0	85.0	5.92	12.9	3.3	13.0	18.0
4		85.5	95.8	7.95	16.3	3.7	14.0	28.5
4		81.7	78.0	5.22	12.7	3.0	9.0	18.5
1	Maros	90.2	86.2	8.52	18.9	4.2	15.0	34.5
1		89.2	60.3	8.32	18.1	4.3	14.0	32.5
1		92.1	89.7	8.47	18.3	4.4	15.0	35.5
1		91.1	68.0	7.95	20.0	3.9	15.0	28.0
1		91.1	85.2	6.70	16.0	3.6	14.0	32.0
1		90.2	81.0	8.48	18.7	4.0	15.0	35.0
1		96.0	74.7	4.96	14.3	3.8	11.0	23.0
2		92.1	91.39	8.55	18.9	4.3	15.0	33.5
2		91.1	69.50	8.55	19.1	4.0	16.0	34.0
2		92.1	79.68	8.05	17.9	4.1	16.0	34.5
2		87.2	71.04	8.00	20.0	4.2	15.0	31.0

		Pengamatan						
Genotype	Location	Observatio	Tan height	Weight 50	Acting cob	D cob	Number of	Number of
2	Maros	91.1	79.87	6.75	16.8	3.7	13.0	29.5
2		84.3	83.33	8.02	19.9	4.4	16.0	34.5
2		96.0	104.45	4.78	14.1	3.6	9.0	26.5
3		88.2	75.07	8.89	19.8	4.4	14.0	37.0
3		90.2	61.25	8.44	18.5	4.1	15.0	38.5
3		92.1	116.54	7.74	18.9	4.2	15.0	35.5
3		83.3	67.20	8.20	19.8	4.5	15.0	36.5
3		86.2	71.04	6.29	16.8	3.9	14.0	32.5
3		89.2	87.74	8.23	18.0	4.5	15.0	34.5
3		92.1	87.36	4.97	14.6	3.6	10.0	27.0
4		93.1	85.25	8.87	19.1	4.3	15.0	38.0
4		91.1	90.24	8.37	18.7	4.1	14.0	34.0
4		88.2	84.48	8.04	18.7	4.2	15.0	35.0
4		89.2	73.92	8.15	19.6	4.3	15.0	36.5
4		84.3	90.62	6.24	15.8	3.9	14.0	26.5
4		88.2	98.30	8.86	20.0	4.3	15.0	37.0
4		84.3	102.14	4.99	15.6	3.5	11.0	24.5
1	Lombok (N	96.0	126.2	9.83	19.0	4.7	14.0	37.0
1		94.0	130.4	9.80	17.9	4.8	14.0	35.5
1		96.0	109.0	9.45	18.4	4.9	13.0	36.0
1		95.0	114.2	9.16	17.1	4.7	14.0	33.5
1		94.0	109.8	9.47	15.4	4.3	12.5	28.5
1		96.0	139.4	9.70	17.8	4.9	14.0	36.5
1		96.0	117.0	4.80	14.8	3.6	13.0	26.0
2		93.0	98.8	9.82	18.4	4.9	14.0	32.0
2		95.0	121.0	9.77	17.7	4.8	14.0	32.0
2		96.0	106.4	9.72	18.4	4.8	14.0	33.0
2		94.0	114.2	9.12	18.5	4.9	14.0	32.5
2		97.0	105.4	8.52	14.8	4.8	14.0	31.5
2		95.0	113.0	9.83	18.0	4.8	14.0	32.5
2		97.0	118.4	5.30	13.7	3.8	12.0	26.5
3		94.0	109.8	8.78	17.1	4.5	15.0	35.0
3		95.0	105.8	8.64	17.4	4.7	14.0	34.5
3		95.0	95.4	8.64	16.9	4.9	16.0	35.0
3		96.0	78.0	9.63	17.0	4.5	14.0	33.0
3		94.0	89.6	8.08	14.4	4.7	14.0	29.0
3		96.0	85.8	8.26	17.3	4.9	15.0	33.0
3		95.0	107.8	5.98	14.0	3.7	12.5	27.0
4		93.0	72.4	8.78	16.5	4.6	15.0	33.0
4		94.0	105.6	8.64	16.4	4.8	14.0	33.0
4		97.0	70.6	8.64	16.9	4.9	13.0	32.0
4		94.0	74.2	9.63	16.9	4.7	15.0	33.0
4		92.0	81.0	8.08	14.2	4.3	13.0	27.5
4		92.0	79.8	8.26	16.7	4.6	14.0	31.0
4		95.0	94.4	5.98	13.2	3.3	13.0	26.0
1	Kediri	94.0	104.0	8.78	19.1	4.8	16.0	33.5
1		93.0	96.5	9.19	17.5	4.7	14.0	31.5
1		93.0	84.8	9.38	18.7	4.5	14.0	34.5

		Pengamatan						
Genotype	Location	Observatio	Tan height	Weight 50	Acting cob	D cob	Number of	Number of
1	Kediri	91.0	90.3	8.70	18.8	4.6	13.0	27.0
1		94.0	88.0	8.78	17.4	4.9	13.0	31.0
1		88.0	96.3	7.73	18.9	4.9	15.0	34.0
1		98.0	101.3	5.29	14.5	3.4	10.0	22.0
2		92.0	76.5	8.85	19.0	4.8	14.0	33.0
2		93.0	80.8	8.48	18.2	5.0	15.0	33.0
2		95.0	91.3	7.82	18.6	4.8	14.0	34.0
2		75.0	76.8	8.82	20.0	4.6	13.0	30.0
2		92.0	82.8	7.70	16.0	4.4	13.0	28.5
2		84.0	87.5	8.64	20.0	5.0	14.0	34.0
2		99.0	85.3	4.62	15.5	4.3	11.0	25.5
3		86.0	88.5	9.55	18.3	4.9	15.0	34.5
3		91.0	72.5	7.63	19.8	4.8	13.0	40.5
3		97.0	89.5	9.50	19.0	5.4	16.0	32.5
3		84.0	87.8	7.64	18.9	4.7	13.0	35.5
3		85.0	66.5	6.77	15.5	4.5	12.0	31.5
3		90.0	74.0	8.61	17.8	4.8	14.0	33.5
3		95.0	79.3	5.57	15.2	3.9	9.0	26.0
4		95.0	77.0	8.75	18.6	4.6	14.0	34.0
4		91.0	84.5	7.63	18.3	4.7	13.0	33.0
4		82.0	88.3	8.90	18.9	4.7	14.0	34.0
4		91.0	75.0	7.64	18.7	4.8	14.0	35.5
4		73.0	69.0	7.67	17.9	4.3	14.0	25.5
4		85.0	90.3	8.61	18.8	4.9	16.0	36.0
4		85.0	79.3	5.57	15.8	3.9	11.0	23.5

		Pengamatan						
Genotype	Location	Observatio	Weight100	Number of	Number of	harvest ag	Ser. Hama	serbulai
1	Gowa	95	308.53	47.0	49	100.4	0.04	0.03
1		94	302.57	47.0	49	101.2	0.03	0.03
1		94	314.76	48.0	50	101.4	0.03	0.01
1		93	303.99	48.0	50	103.9	0.02	0.02
1		95	321.12	46.0	48	111.0	0.05	0.03
1		95	312.27	46.0	48	111.2	0.05	0.02
1		98	295.08	47.0	47	91.2	0.05	0.04
2		94	312.71	48.0	48	100.8	0.02	0.02
2		93	316.55	48.0	48	100.6	0.03	0.03
2		94	316.55	48.0	49	103.4	0.01	0.03
2		87	313.07	49.0	49	105.6	0.03	0.02
2		93	272.54	48.0	47	109.2	0.04	0.05
2		86	328.10	48.0	48	111.4	0.05	0.04
2		98	308.83	46.0	47	92.4	0.05	0.07
3		89	301.55	49.0	50	101.2	0.04	0.03
3		92	320.00	49.0	49	102.8	0.05	0.02
3		97	303.31	49.0	48	103.4	0.03	0.02
3		85	310.62	47.0	50	106.2	0.04	0.03
3		86	307.48	48.0	48	110.0	0.05	0.07
3		91	321.98	49.0	50	109.0	0.05	0.04
3		94	298.26	47.0	45	91.4	0.08	0.01
4		96	307.84	48.0	49	101.0	0.02	0.03
4		93	312.71	48.0	48	101.4	0.03	0.03
4		90	304.35	49.0	47	101.8	0.02	0.02
4		91	306.45	48.0	49	104.2	0.02	0.02
4		79	310.63	48.0	47	109.0	0.06	0.04
4		84	292.99	49.0	48	109.2	0.03	0.03
4		84	304.60	47.0	47	92.2	0.05	0.07
1	Takalar	92.0	283.62	46.0	48.00	101.9	0.05	0.02
1		91.0	285.93	47.0	49.00	102.7	0.04	0.03
1		94.0	295.80	48.0	49.00	102.9	0.04	0.02
1		93.0	309.53	46.0	49.00	105.9	0.05	0.03
1		95.0	291.53	45.0	47.00	112.5	0.06	0.02
1		95.0	305.29	46.0	48.00	112.7	0.06	0.03
1		98.0	290.21	45.0	47.00	92.7	0.07	0.05
2		94.0	296.82	48.0	49.00	102.3	0.04	0.02
2		93.0	278.26	46.0	49.00	102.1	0.05	0.03
2		94.0	297.88	47.0	50.00	104.9	0.05	0.02
2		89.0	289.55	48.0	49.00	107.1	0.04	0.03
2		93.0	287.16	48.0	49.00	110.7	0.06	0.05
2		86.0	280.33	48.0	48.00	112.9	0.05	0.05
2		98.0	277.54	47.0	47.00	93.9	0.08	0.07
3		90.0	304.94	49.0	49.00	102.7	0.04	0.03
3		92.0	298.53	48.0	49.00	104.3	0.06	0.03
3		94.0	279.67	49.0	50.00	104.9	0.06	0.03
3		85.0	307.41	48.0	50.00	107.7	0.05	0.03
3		88.0	290.54	46.0	49.00	109.0	0.07	0.06

		Pengamatan						
Genotype	Location	Observatio	Weight100	Number of	Number of	harvest ag	Ser. Hama	serbulai
3	Takalar	91.0	258.00	49.0	49.00	110.5	0.06	0.05
3		94.0	281.56	46.0	46.00	94.0	0.08	0.07
4		95.0	308.12	48.0	48.00	102.5	0.04	0.02
4		93.0	286.59	48.0	49.00	102.9	0.04	0.03
4		90.0	297.16	47.0	48.00	103.3	0.05	0.02
4		91.0	295.80	47.0	48.00	105.7	0.05	0.03
4		79.0	309.53	46.0	49.00	110.5	0.07	0.04
4		90.0	288.34	46.0	47.00	110.7	0.06	0.04
4		86.0	259.02	45.0	49.00	93.7	0.08	0.06
1	Bantaeng	87.4	264.10	45.0	47.0	108.5	0.030	0.030
1		86.5	269.78	44.0	46.0	108.3	0.050	0.030
1		89.3	278.57	45.0	46.0	108.8	0.050	0.030
1		88.4	296.97	43.0	46.0	111.7	0.060	0.040
1		86.0	264.97	42.0	46.0	114.5	0.070	0.060
1		90.3	286.44	44.0	45.0	114.9	0.070	0.060
1		80.0	268.78	42.0	44.0	98.4	0.080	0.080
2		89.3	281.11	45.0	47.0	106.8	0.040	0.030
2		88.4	266.47	43.0	44.0	106.6	0.040	0.030
2		89.3	268.44	44.0	47.0	109.6	0.050	0.030
2		84.6	278.82	45.0	46.0	111.9	0.040	0.040
2		88.4	276.01	45.0	43.0	112.8	0.060	0.060
2		81.7	274.36	45.0	47.0	115.1	0.050	0.060
2		88.0	276.07	44.0	44.0	97.9	0.080	0.080
3		85.5	285.57	47.0	47.0	107.3	0.040	0.040
3		87.4	285.36	46.0	46.0	109.0	0.050	0.040
3		89.3	254.50	46.0	47.0	109.6	0.050	0.040
3		84.0	291.68	45.0	47.0	112.6	0.050	0.040
3		83.6	268.32	43.0	44.0	113.6	0.070	0.060
3		86.5	258.73	46.0	46.0	112.5	0.070	0.060
3		85.0	278.08	43.0	43.0	96.9	0.090	0.080
4		90.3	293.44	44.0	45.0	107.1	0.040	0.030
4		88.4	256.24	45.0	46.0	107.5	0.050	0.040
4		85.5	281.96	44.0	45.0	107.9	0.040	0.030
4		86.5	278.57	44.0	45.0	110.5	0.050	0.040
4		80.0	277.78	43.0	46.0	112.5	0.060	0.050
4		85.5	263.41	45.0	47.0	112.8	0.060	0.050
4		81.7	256.74	42.0	46.0	97.7	0.080	0.070
1	Maros	90.2	268.74	47.0	47.0	104.7	0.03	0.02
1		89.2	275.18	49.0	50.0	104.1	0.03	0.02
1		92.1	283.20	49.0	49.0	101.8	0.03	0.02
1		91.1	298.90	48.0	50.0	104.7	0.04	0.03
1		91.1	259.34	46.0	48.0	105.8	0.05	0.04
1		90.2	291.29	47.0	49.0	107.9	0.04	0.03
1		96.0	272.05	46.0	47.0	95.0	0.06	0.05
2		92.1	285.65	47.0	49.0	102.0	0.04	0.02
2		91.1	271.51	47.0	47.0	101.1	0.03	0.02
2		92.1	273.91	48.0	48.0	102.6	0.04	0.02
2		87.2	282.94	47.0	50.0	104.9	0.03	0.03

		Pengamatan						
Genotype	Location	Observatio	Weight100	Number of	Number of	harvest ag	Ser. Hama	serbulai
2	Maros	91.1	265.94	49.0	50.0	105.8	0.06	0.04
2		84.3	283.35	49.0	49.0	106.4	0.06	0.03
2		96.0	279.44	48.0	48.0	95.4	0.07	0.05
3		88.2	290.45	48.0	50.0	100.3	0.05	0.01
3		90.2	279.92	49.0	49.0	102.0	0.04	0.01
3		92.1	259.47	50.0	49.0	102.6	0.04	0.01
3		83.3	296.34	49.0	51.0	105.6	0.06	0.02
3		86.2	285.35	47.0	50.0	106.6	0.07	0.02
3		89.2	257.82	50.0	51.0	104.9	0.07	0.02
3		92.1	281.62	47.0	47.0	95.3	0.09	0.04
4		93.1	292.97	50.0	51.0	101.5	0.03	0.03
4		91.1	275.65	49.0	50.0	102.4	0.04	0.02
4		88.2	286.47	48.0	49.0	100.9	0.04	0.03
4		89.2	283.20	48.0	49.0	103.5	0.05	0.02
4		84.3	281.97	47.0	48.0	105.5	0.07	0.04
4		88.2	277.77	47.0	48.0	103.4	0.05	0.03
4		84.3	259.94	46.0	50.0	92.2	0.08	0.05
1	Lombok (N	96.0	241.24	49.0	50.0	99.6	0.02	0.01
1		94.0	239.86	48.0	49.0	100.4	0.01	0.03
1		96.0	240.91	48.0	50.0	100.8	0.01	0.01
1		95.0	254.21	47.0	49.0	105.0	0.01	0.02
1		94.0	231.10	47.0	47.0	109.8	0.04	0.01
1		96.0	242.05	48.0	48.0	110.4	0.07	0.03
1		96.0	212.29	49.0	49.0	92.2	0.04	0.01
2		93.0	244.28	48.0	49.0	99.8	0.04	0.02
2		95.0	245.20	48.0	48.0	100.0	0.04	0.02
2		96.0	249.23	49.0	49.0	101.0	0.03	0.03
2		94.0	256.69	48.0	48.0	105.0	0.03	0.02
2		97.0	232.04	47.0	47.0	110.0	0.01	0.04
2		95.0	242.29	49.0	49.0	111.0	0.08	0.03
2		97.0	224.27	49.0	49.0	93.6	0.12	0.02
3		94.0	243.91	49.0	49.0	100.4	0.04	0.03
3		95.0	233.92	48.0	48.0	101.6	0.04	0.03
3		95.0	244.18	49.0	49.0	101.8	0.03	0.02
3		96.0	244.23	48.0	48.0	105.4	0.03	0.04
3		94.0	247.92	48.0	48.0	111.2	0.04	0.08
3		96.0	249.92	48.0	48.0	110.2	0.04	0.03
3		95.0	246.38	49.0	49.0	91.8	0.09	0.05
4		93.0	237.47	49.0	49.0	100.2	0.03	0.02
4		94.0	235.03	48.0	48.0	100.8	0.04	0.03
4		97.0	239.18	48.0	48.0	102.2	0.03	0.03
4		94.0	235.28	47.0	47.0	104.8	0.03	0.04
4		92.0	222.87	47.0	47.0	110.8	0.06	0.05
4		92.0	231.39	48.0	48.0	111.4	0.05	0.07
4		95.0	235.82	49.0	49.0	92.6	0.08	0.07
1	Kediri	94.0	307.11	48.0	49.0	100.0	0.03	0.02
1		93.0	316.49	48.0	49.0	101.0	0.02	0.02
1		93.0	299.99	49.0	50.0	101.0	0.03	0.02

		Pengamatan						
Genotype	Location	Observatio	Weight100	Number of	Number of	harvest ag	Ser. Hama	serbulai
1	Kediri	91.0	318.74	48.0	49.0	103.8	0.02	0.03
1		94.0	316.87	47.0	48.0	110.6	0.04	0.04
1		88.0	317.44	48.0	49.0	110.6	0.04	0.03
1		98.0	302.77	48.0	48.0	91.8	0.05	0.06
2		92.0	327.18	49.0	50.0	100.4	0.02	0.02
2		93.0	342.94	48.0	49.0	100.0	0.03	0.03
2		95.0	337.02	48.0	50.0	102.8	0.02	0.03
2		75.0	353.80	49.0	48.0	106.0	0.03	0.02
2		92.0	323.31	48.0	48.0	110.4	0.04	0.03
2		84.0	326.99	48.0	50.0	111.4	0.05	0.03
2		99.0	321.62	47.0	47.0	93.0	0.06	0.06
3		86.0	337.72	48.0	49.0	101.0	0.04	0.03
3		91.0	290.97	49.0	48.0	102.4	0.05	0.03
3		97.0	324.20	49.0	50.0	102.4	0.03	0.03
3		84.0	286.18	49.0	49.0	106.2	0.04	0.04
3		85.0	309.81	48.0	49.0	112.0	0.05	0.08
3		90.0	324.91	49.0	47.0	109.8	0.05	0.04
3		95.0	324.54	47.0	47.0	92.2	0.08	0.08
4		95.0	266.31	48.0	49.0	100.6	0.02	0.02
4		91.0	276.75	48.0	49.0	101.8	0.03	0.02
4		82.0	280.19	49.0	48.0	102.4	0.02	0.03
4		91.0	260.43	48.0	48.0	105.6	0.02	0.03
4		73.0	248.83	48.0	48.0	110.0	0.04	0.04
4		85.0	263.81	49.0	49.0	111.6	0.03	0.04
4		85.0	243.23	47.0	49.0	93.0	0.05	0.08

		Pengamatan						
Genotype	Location	Observatio	appearanc	Closing of t	Snuff the h	Seed rowe	Dampen th	Lower the
1	Gowa	95	2.0	2.0	1.6	1.4	0.02	0.03
1		94	2.2	2.2	1.6	1.6	0.01	0.03
1		94	2.2	2.2	1.4	1.4	0.02	0.02
1		93	2.0	2.2	1.6	1.4	0.02	0.03
1		95	2.4	2.6	1.8	1.8	0.04	0.04
1		95	2.4	2.2	1.6	1.6	0.03	0.04
1		98	2.2	1.2	1.6	1.8	0.06	0.06
2		94	2.2	2.2	1.8	1.6	0.03	0.02
2		93	2.4	2.2	1.6	1.4	0.02	0.02
2		94	2.4	2.2	1.6	1.4	0.02	0.03
2		87	2.2	2.2	1.4	1.6	0.02	0.03
2		93	2.4	2.4	1.8	1.8	0.04	0.04
2		86	2.6	2.4	1.8	1.8	0.04	0.05
2		98	2.6	1.4	1.6	2.0	0.06	0.06
3		89	2.2	2.2	1.4	1.4	0.02	0.01
3		92	2.0	2.2	1.6	1.6	0.01	0.03
3		97	2.2	2.4	1.6	1.6	0.02	0.04
3		85	2.4	2.2	1.8	1.6	0.02	0.03
3		86	2.2	2.4	2.0	2.0	0.03	0.04
3		91	2.2	2.6	1.8	1.6	0.03	0.04
3		94	2.6	1.6	1.6	2.0	0.05	0.07
4		96	2.2	2.4	1.6	1.4	0.01	0.01
4		93	2.2	2.2	1.6	1.4	0.01	0.03
4		90	2.4	2.2	1.8	1.6	0.01	0.01
4		91	2.2	2.4	1.6	1.6	0.02	0.03
4		79	2.6	2.4	1.8	1.6	0.04	0.04
4		84	2.4	2.6	1.6	1.6	0.05	0.06
4		84	2.6	1.6	1.6	2.0	0.06	0.07
1	Takalar	92.0	1.8	2.0	1.4	1.2	0.03	0.02
1		91.0	1.8	2.4	1.4	1.4	0.02	0.02
1		94.0	1.8	2.2	1.2	1.2	0.02	0.01
1		93.0	2.2	2.2	1.4	1.2	0.02	0.03
1		95.0	2.2	2.4	1.6	1.6	0.03	0.03
1		95.0	2.0	2.2	1.4	1.4	0.03	0.04
1		98.0	2.2	1.4	1.4	1.6	0.07	0.08
2		94.0	2.0	2.0	1.6	1.4	0.02	0.02
2		93.0	2.4	2.2	1.4	1.2	0.03	0.03
2		94.0	2.6	2.0	1.4	1.2	0.03	0.02
2		89.0	2.0	2.0	1.2	1.4	0.03	0.03
2		93.0	2.2	2.4	1.6	1.6	0.04	0.05
2		86.0	2.4	2.4	1.6	1.6	0.03	0.04
2		98.0	2.4	1.6	1.4	1.8	0.06	0.07
3		90.0	2.0	2.2	1.2	1.2	0.02	0.01
3		92.0	1.8	2.2	1.4	1.4	0.01	0.02
3		94.0	1.8	2.2	1.4	1.4	0.02	0.03
3		85.0	2.0	2.0	1.6	1.4	0.03	0.02
3		88.0	2.2	2.2	1.8	1.8	0.04	0.05

		Pengamatan						
Genotype	Location	Observatio	appearanc	Closing of t	Snuff the h	Seed rowe	Dampen th	Lower the
3	Takalar	91.0	2.2	2.4	1.6	1.4	0.04	0.05
3		94.0	2.2	1.4	1.4	1.8	0.07	0.06
4		95.0	2.0	2.2	1.4	1.2	0.02	0.01
4		93.0	1.8	2.2	1.4	1.2	0.02	0.02
4		90.0	2.0	2.0	1.6	1.4	0.02	0.02
4		91.0	1.8	2.4	1.4	1.4	0.04	0.03
4		79.0	2.4	2.4	1.6	1.4	0.04	0.05
4		90.0	2.0	2.4	1.4	1.4	0.05	0.05
4		86.0	2.4	1.2	1.4	1.8	0.08	0.07
1	Bantaeng	87.4	1.6	2.0	1.2	1.2	0.02	0.03
1		86.5	1.8	2.2	1.2	1.4	0.03	0.03
1		89.3	1.8	2.2	1.0	1.2	0.03	0.02
1		88.4	1.6	2.0	1.2	1.0	0.03	0.04
1		86.0	2.2	2.0	1.4	1.2	0.04	0.04
1		90.3	1.8	2.2	1.2	1.4	0.04	0.05
1		80.0	2.0	1.2	1.2	1.2	0.08	0.07
2		89.3	1.2	2.0	1.4	1.4	0.03	0.03
2		88.4	1.6	2.0	1.4	1.2	0.04	0.04
2		89.3	1.4	2.2	1.2	1.2	0.04	0.03
2		84.6	1.2	2.0	1.2	1.2	0.04	0.04
2		88.4	1.6	2.2	1.2	1.4	0.05	0.06
2		81.7	1.0	2.0	1.2	1.2	0.04	0.05
2		88.0	1.6	1.8	1.4	1.8	0.07	0.07
3		85.5	2.0	2.0	1.0	1.2	0.03	0.02
3		87.4	2.0	2.0	1.2	1.2	0.02	0.03
3		89.3	2.0	2.2	1.2	1.4	0.03	0.04
3		84.0	2.2	2.2	1.4	1.4	0.04	0.03
3		83.6	2.2	2.4	1.4	1.4	0.05	0.06
3		86.5	2.2	2.4	1.2	1.2	0.05	0.06
3		85.0	2.4	1.6	1.4	1.4	0.08	0.07
4		90.3	2.0	2.0	1.2	1.2	0.03	0.02
4		88.4	1.8	2.2	1.2	1.2	0.03	0.02
4		85.5	2.2	2.0	1.2	1.4	0.03	0.02
4		86.5	2.2	2.2	1.2	1.2	0.05	0.03
4		80.0	2.2	2.2	1.4	1.4	0.05	0.05
4		85.5	2.4	2.2	1.4	1.2	0.06	0.05
4		81.7	2.4	1.2	1.4	1.4	0.09	0.07
1	Maros	90.2	2.2	1.8	1.2	1.2	0.01	0.01
1		89.2	2.2	2.0	1.2	1.2	0.01	0.01
1		92.1	2.2	2.0	1.0	1.2	0.01	0.01
1		91.1	2.0	1.8	1.2	1.0	0.01	0.01
1		91.1	2.4	1.8	1.4	1.2	0.01	0.01
1		90.2	2.2	2.0	1.2	1.2	0.01	0.01
1		96.0	2.2	1.2	1.2	1.0	0.03	0.04
2		92.1	1.4	2.0	1.2	1.4	0.01	0.03
2		91.1	1.8	2.0	1.2	1.2	0.02	0.02
2		92.1	1.6	2.2	1.2	1.2	0.02	0.03
2		87.2	1.4	2.0	1.2	1.0	0.03	0.02

		Pengamatan						
Genotype	Location	Observatio	appearanc	Closing of t	Snuff the h	Seed rowe	Dampen th	Lower the
2	Maros	91.1	1.6	2.2	1.2	1.4	0.03	0.04
2		84.3	1.4	2.0	1.2	1.0	0.02	0.02
2		96.0	1.6	1.8	1.4	1.6	0.05	0.04
3		88.2	2.2	2.2	1.0	1.2	0.02	0.02
3		90.2	2.0	2.2	1.2	1.2	0.02	0.02
3		92.1	2.4	2.4	1.2	1.4	0.02	0.03
3		83.3	2.4	2.4	1.4	1.4	0.02	0.02
3		86.2	2.2	2.6	1.4	1.4	0.02	0.02
3		89.2	2.4	2.6	1.0	1.2	0.03	0.03
3		92.1	2.6	1.8	1.2	1.4	0.04	0.07
4		93.1	2.0	2.0	1.2	1.2	0.03	0.02
4		91.1	1.8	2.2	1.2	1.2	0.02	0.02
4		88.2	2.0	2.0	1.2	1.4	0.02	0.01
4		89.2	2.0	2.2	1.2	1.2	0.03	0.01
4		84.3	1.8	2.2	1.4	1.4	0.03	0.02
4		88.2	2.0	2.2	1.4	1.2	0.02	0.02
4		84.3	2.4	1.2	1.4	1.4	0.06	0.01
1	Lombok (N	96.0	1.6	1.8	1.2	1.0	0.01	0.01
1		94.0	1.8	2.2	1.4	1.2	0.01	0.03
1		96.0	1.4	2.0	1.2	1.2	0.02	0.03
1		95.0	1.6	2.0	1.4	1.2	0.01	0.01
1		94.0	1.6	2.2	1.6	1.2	0.03	0.01
1		96.0	1.6	2.2	1.2	1.2	0.01	0.01
1		96.0	1.8	1.2	1.2	1.4	0.02	0.02
2		93.0	1.4	2.0	1.2	1.0	0.01	0.03
2		95.0	1.6	2.2	1.2	1.2	0.03	0.03
2		96.0	1.4	2.0	1.4	1.2	0.02	0.01
2		94.0	1.4	2.0	1.4	1.2	0.02	0.01
2		97.0	1.8	2.2	1.2	1.4	0.03	0.05
2		95.0	1.6	2.2	1.4	1.2	0.04	0.05
2		97.0	1.8	1.0	1.4	1.4	0.05	0.02
3		94.0	1.4	2.0	1.2	1.2	0.02	0.02
3		95.0	1.6	2.0	1.4	1.2	0.01	0.01
3		95.0	1.2	2.0	1.4	1.0	0.02	0.02
3		96.0	1.6	2.2	1.4	1.2	0.02	0.01
3		94.0	1.4	2.2	1.4	1.4	0.03	0.02
3		96.0	1.6	2.2	1.2	1.0	0.01	0.04
3		95.0	1.6	1.0	1.4	1.4	0.04	0.06
4		93.0	1.2	2.2	1.2	1.2	0.02	0.00
4		94.0	1.4	2.2	1.2	1.0	0.01	0.01
4		97.0	1.2	2.0	1.2	1.2	0.02	0.02
4		94.0	1.6	2.0	1.4	1.0	0.02	0.02
4		92.0	1.4	2.2	1.4	1.0	0.02	0.01
4		92.0	1.4	2.2	1.2	1.2	0.03	0.03
4		95.0	1.4	1.2	1.6	1.4	0.02	0.07
1	Kediri	94.0	1.4	2.0	1.2	1.0	0.02	0.02
1		93.0	1.6	2.2	1.4	1.2	0.01	0.03
1		93.0	1.6	2.2	1.4	1.2	0.01	0.02

		Pengamatan						
Genotype	Location	Observatio	appearanc	Closing of t	Snuff the h	Seed rowe	Dampen th	Lower the
1	Kediri	91.0	1.4	1.8	1.6	1.0	0.02	0.02
1		94.0	1.4	2.4	1.8	1.4	0.04	0.03
1		88.0	1.4	2.2	1.4	1.4	0.02	0.03
1		98.0	1.6	1.2	1.2	1.6	0.04	0.05
2		92.0	1.6	2.0	1.4	1.2	0.03	0.02
2		93.0	1.8	2.0	1.2	1.0	0.02	0.01
2		95.0	1.4	2.2	1.2	1.0	0.01	0.02
2		75.0	1.6	2.2	1.2	1.4	0.02	0.02
2		92.0	1.6	2.0	1.4	1.4	0.02	0.04
2		84.0	1.6	2.4	1.6	1.2	0.03	0.05
2		99.0	1.6	1.0	1.6	1.6	0.06	0.02
3		86.0	1.6	2.2	1.4	1.0	0.01	0.01
3		91.0	1.4	1.8	1.2	1.2	0.01	0.01
3		97.0	1.4	2.0	1.2	1.2	0.02	0.01
3		84.0	1.4	2.0	1.4	1.2	0.01	0.01
3		85.0	1.6	2.0	1.6	1.6	0.02	0.01
3		90.0	1.4	2.0	1.4	1.2	0.02	0.02
3		95.0	1.4	1.2	1.6	1.6	0.06	0.07
4		95.0	1.4	2.2	1.2	1.2	0.01	0.01
4		91.0	1.6	2.0	1.4	1.0	0.01	0.01
4		82.0	1.4	2.2	1.4	1.2	0.01	0.01
4		91.0	1.4	2.2	1.2	1.0	0.02	0.03
4		73.0	1.6	2.2	1.6	1.0	0.03	0.04
4		85.0	1.6	2.4	3.4	1.2	0.04	0.03
4		85.0	1.6	1.0	1.6	1.4	0.04	0.06

		Pengamatan							
Genoty	Locatior	Observ	Productic	Rendemen	Water cont	Leaf corner	Stem diamete	Long leaves	Leaf sheet
1	Gowa	95	10.56	79.11	23.4	26.7	2.4	98.4	9.3
1		94	9.94	77.49	23.4	29.7	2.4	99.2	8.3
1		94	9.49	76.26	23.4	24.8	2.1	95.0	8.7
1		93	8.24	78.76	21.8	26.7	2.1	93.7	9.0
1		95	7.53	76.67	23.6	30.6	2.1	95.7	9.0
1		95	9.48	77.03	24.8	28.2	2.1	92.3	9.6
1		98	5.19	73.95	25.0	26.4	2.0	99.0	9.0
2		94	8.98	80.49	22.8	27.8	2.4	97.0	9.7
2		93	9.96	79.43	23.8	28.5	2.4	91.7	9.7
2		94	11.68	78.06	22.4	24.4	2.1	98.3	9.3
2		87	9.24	75.38	24.0	28.3	2.1	99.7	9.6
2		93	7.85	77.05	24.6	27.8	2.1	89.0	9.2
2		86	9.45	76.67	22.6	28.5	2.4	95.0	9.7
2		98	5.09	75.34	26.4	27.6	2.0	97.7	8.3
3		89	8.88	80.37	24.0	30.2	2.1	99.0	9.0
3		92	9.34	79.65	22.8	27.0	2.1	98.3	9.7
3		97	8.26	78.43	25.6	29.2	2.4	94.3	9.3
3		85	8.39	77.69	22.8	29.3	2.4	93.7	9.6
3		86	6.82	78.85	25.2	27.7	2.4	89.0	9.7
3		91	9.72	79.59	24.0	30.7	2.4	92.3	9.0
3		94	5.25	75.99	25.2	24.2	2.1	91.0	9.7
4		96	8.61	79.55	22.6	29.5	2.1	95.7	9.7
4		93	9.38	77.44	24.0	28.6	2.1	93.0	9.7
4		90	8.27	80.50	22.4	28.3	2.4	89.7	10.0
4		91	8.63	78.52	23.4	30.3	2.4	90.3	9.7
4		79	6.83	76.10	24.8	28.1	2.1	93.0	9.4
4		84	9.63	78.52	23.6	30.3	2.1	97.0	9.2
4		84	5.55	75.19	25.4	24.35	2.1	89.7	9.0
1	Takalar	92.0	10.34	79.45	24.6	27.1	2.3	94.3	9.7
1		91.0	10.79	78.50	23.4	25.8	2.3	97.0	9.0
1		94.0	11.86	79.31	23.5	25.8	2.1	95.7	9.7
1		93.0	8.44	74.44	22.3	27.8	2.2	97.0	9.0
1		95.0	9.52	76.10	23.9	27.8	2.3	91.0	8.7
1		95.0	9.89	76.61	25.7	25.8	2.6	91.0	9.0
1		98.0	5.59	75.30	25.3	26.4	2.2	91.0	9.1
2		94.0	9.64	77.97	23.0	27.8	2.6	95.0	9.7
2		93.0	10.46	76.76	21.9	26.4	2.6	97.7	9.3
2		94.0	14.15	78.38	24.2	27.1	2.3	90.3	9.5
2		89.0	9.12	79.35	24.4	26.4	2.3	91.0	9.5
2		93.0	8.20	75.04	22.8	26.4	2.3	97.0	9.3
2		86.0	10.01	78.75	25.0	27.1	2.3	94.3	9.7
2		98.0	5.28	74.61	25.3	27.8	2.3	93.7	9.3
3		90.0	8.86	80.71	24.1	27.1	2.4	89.7	9.6
3		92.0	9.28	74.63	22.1	26.4	2.3	95.7	9.7
3		94.0	8.76	77.12	23.2	27.1	2.6	90.3	9.6
3		85.0	9.04	76.33	22.8	25.8	2.4	92.3	9.5
3		88.0	7.21	77.47	24.4	27.1	2.2	94.3	9.7

		Pengamatan							
Genoty	Locatior	Observ	Productic	Rendemen	Water cont	Leaf corner	Stem diamete	Long leaves	Leaf sheet
3	Takalar	91.0	8.36	77.61	24.6	25.8	2.3	95.0	9.7
3		94.0	5.57	77.40	27.8	27.1	2.2	93.0	9.3
4		95.0	9.17	78.12	22.5	25.8	2.4	97.7	9.6
4		93.0	9.69	79.75	24.0	27.8	2.6	97.7	9.7
4		90.0	8.93	76.69	22.8	27.8	2.3	91.0	9.7
4		91.0	8.64	77.80	23.5	27.1	2.3	95.7	9.7
4		79.0	7.10	77.56	22.7	27.8	2.3	95.7	9.2
4		90.0	9.57	80.79	24.8	26.4	2.6	91.0	9.3
4		86.0	5.82	75.20	23.9	27.8	2.3	93.0	9.1
1	Bantaen	87.4	6.75	79.78	25.0	25.8	2.3	97.7	9.0
1		86.5	7.09	77.11	23.8	26.4	2.5	95.7	9.7
1		89.3	7.07	79.59	23.9	25.8	2.3	99.0	9.0
1		88.4	5.69	75.22	22.1	27.1	2.3	91.7	9.0
1		86.0	4.88	74.11	24.0	27.1	2.3	97.7	8.7
1		90.3	6.58	78.40	24.3	27.1	2.3	91.0	8.7
1		80.0	3.93	73.55	28.1	27.1	2.3	94.3	8.7
2		89.3	6.42	76.59	23.4	26.4	2.5	96.3	9.7
2		88.4	8.36	75.40	22.3	26.4	2.4	92.3	9.3
2		89.3	7.97	79.45	25.7	26.4	2.4	93.0	9.3
2		84.6	5.24	78.62	21.8	26.4	2.5	97.7	9.7
2		88.4	5.54	78.28	24.4	27.1	2.4	95.0	9.3
2		81.7	5.52	77.35	26.8	27.1	2.3	91.7	9.0
2		88.0	3.71	75.12	25.7	25.8	2.3	94.3	9.0
3		85.5	5.78	78.27	24.5	25.8	2.5	95.7	9.7
3		87.4	6.26	78.69	22.5	27.1	2.3	89.7	8.7
3		89.3	5.50	75.75	27.2	27.1	2.5	92.3	9.7
3		84.0	6.04	79.18	23.2	25.8	2.4	91.0	9.3
3		83.6	4.48	77.92	25.8	27.1	2.3	91.7	8.7
3		86.5	5.72	75.82	31.4	25.8	2.5	95.7	9.7
3		85.0	3.88	76.03	26.5	27.1	2.4	89.7	9.3
4		90.3	6.15	77.14	22.9	26.4	2.4	93.0	9.3
4		88.4	5.93	78.34	28.8	27.1	2.3	92.3	9.0
4		85.5	5.95	75.33	23.2	25.8	2.5	97.0	9.7
4		86.5	6.13	77.33	23.9	27.1	2.5	93.0	9.7
4		80.0	4.78	77.10	23.3	26.4	2.3	92.3	9.0
4		85.5	6.41	78.83	26.8	27.1	2.5	94.3	9.7
4		81.7	3.94	73.58	29.7	25.8	2.2	93.0	9.3
1	Maros	90.2	10.03	78.34	22.4	25.8	2.3	97.0	8.7
1		89.2	10.40	79.29	21.3	26.4	2.3	93.7	9.7
1		92.1	10.36	80.13	21.4	27.8	2.3	94.3	9.7
1		91.1	8.37	77.05	24.1	26.4	2.7	92.3	8.7
1		91.1	6.63	76.83	25.0	27.1	2.3	96.3	9.0
1		90.2	9.65	78.03	25.2	26.4	2.7	95.0	8.7
1		96.0	5.71	75.15	25.8	27.1	2.2	97.0	8.7
2		92.1	9.40	78.75	20.9	27.8	2.5	98.3	10.0
2		91.1	12.22	77.53	20.0	26.4	2.4	93.0	9.7
2		92.1	11.77	79.21	25.1	26.4	2.4	94.3	8.7
2		87.2	7.65	75.44	22.9	27.1	2.3	99.0	8.7

		Pengamatan							
Genoty	Locatior	Observ	Productic	Rendemen	Water cont	Leaf corner	Stem diamete	Long leaves	Leaf sheet
2	Maros	91.1	7.30	77.33	24.5	25.8	2.4	97.7	8.7
2		84.3	8.13	79.54	24.0	27.1	2.3	92.3	9.0
2		96.0	5.39	76.31	23.5	25.8	2.3	91.7	9.3
3		88.2	8.31	77.72	21.9	26.4	2.6	98.3	9.0
3		90.2	8.55	78.16	23.3	25.8	2.3	93.0	10.0
3		92.1	8.12	77.89	24.3	25.8	2.4	98.3	9.0
3		83.3	8.84	77.10	20.8	26.4	2.3	97.0	9.0
3		86.2	7.18	78.26	22.4	25.8	2.7	93.0	9.7
3		89.2	8.05	77.96	23.5	27.1	2.3	94.3	9.7
3		92.1	5.64	75.38	25.3	26.4	2.3	92.3	8.7
4		93.1	8.51	81.66	22.1	26.4	2.5	93.0	9.3
4		91.1	9.09	80.55	24.2	27.1	2.6	93.7	9.3
4		88.2	8.71	77.45	20.8	25.8	2.5	95.7	8.7
4		89.2	9.00	79.51	21.4	27.1	2.3	94.3	8.7
4		84.3	6.99	76.49	21.7	27.1	2.4	99.7	8.7
4		88.2	9.44	78.90	22.8	27.8	2.7	94.3	8.7
4		84.3	5.73	77.04	25.0	27.8	2.3	91.0	9.7
1	Lombok	96.0	10.22	79.52	24.8	27.8	2.3	97.0	8.7
1		94.0	10.98	75.72	22.8	25.8	2.4	91.0	9.3
1		96.0	9.35	78.54	24.6	25.8	2.5	99.0	10.0
1		95.0	9.81	79.69	28.1	27.8	2.2	91.0	8.7
1		94.0	10.28	75.97	23.0	27.8	2.4	94.3	9.3
1		96.0	10.34	78.86	26.5	26.4	2.5	90.3	9.7
1		96.0	6.04	76.31	24.6	27.8	2.4	93.7	9.3
2		93.0	8.89	80.21	23.2	25.8	2.5	99.0	10.0
2		95.0	11.65	79.49	25.7	25.8	2.5	93.0	10.0
2		96.0	10.40	80.38	25.5	27.8	2.3	97.7	9.0
2		94.0	9.83	76.62	21.9	25.8	2.4	98.3	9.3
2		97.0	8.40	74.46	22.8	27.1	2.5	99.0	10.0
2		95.0	10.19	80.66	24.8	27.1	2.4	97.0	9.3
2		97.0	4.62	72.14	25.7	25.8	2.2	98.3	8.7
3		94.0	9.21	79.13	22.7	27.8	2.4	96.3	9.3
3		95.0	8.95	78.06	23.7	26.4	2.3	98.3	9.0
3		95.0	9.16	77.71	22.5	27.8	2.5	91.7	9.7
3		96.0	8.94	77.14	24.8	26.4	2.3	93.7	9.0
3		94.0	8.91	74.68	25.6	27.8	2.2	91.0	8.7
3		96.0	9.00	76.82	23.7	27.8	2.5	96.3	9.7
3		95.0	6.24	74.22	25.9	25.8	2.2	91.0	8.7
4		93.0	9.91	77.61	21.5	26.4	2.3	98.3	9.0
4		94.0	9.41	78.31	24.2	26.4	2.3	98.3	9.0
4		97.0	8.59	78.08	22.5	25.8	2.3	94.3	9.0
4		94.0	9.26	76.09	20.6	26.4	2.2	96.3	8.7
4		92.0	9.26	78.89	24.8	26.4	2.3	97.0	9.0
4		92.0	8.72	78.06	24.3	26.4	2.2	91.0	8.7
4		95.0	5.92	72.28	24.0	25.8	2.5	91.0	10.0
1	Kediri	94.0	9.18	78.24	24.8	27.1	2.4	97.0	9.7
1		93.0	9.79	73.72	25.8	25.1	2.4	97.5	8.7
1		93.0	10.03	77.14	24.0	26.4	2.3	93.9	9.3

		Pengamatan							
Genoty	Locatior	Observ	Productic	Rendemen	Water cont	Leaf corner	Stem diamete	Long leaves	Leaf sheet
1	Kediri	91.0	9.21	74.44	22.4	26.4	2.4	94.3	9.7
1		94.0	8.44	79.76	24.3	26.4	2.2	92.0	9.0
1		88.0	9.27	77.29	25.3	25.8	2.4	96.3	9.7
1		98.0	3.48	73.69	25.2	24.4	2.0	92.3	8.3
2		92.0	9.63	80.39	22.5	26.4	2.4	96.3	9.7
2		93.0	9.81	77.45	20.6	26.4	2.1	96.3	8.7
2		95.0	9.00	75.30	25.0	24.4	2.5	97.2	10.0
2		75.0	8.12	74.11	24.0	24.4	2.5	91.0	10.0
2		92.0	9.95	77.86	25.3	24.4	2.5	96.1	10.0
2		84.0	10.15	79.55	23.7	24.4	2.2	97.0	9.0
2		99.0	5.66	75.55	26.0	25.1	2.3	91.7	9.3
3		86.0	9.52	78.98	25.0	25.8	2.3	97.8	9.3
3		91.0	9.11	81.14	24.2	24.4	2.4	95.7	8.7
3		97.0	10.31	78.17	26.6	27.1	2.5	95.5	10.0
3		84.0	9.15	78.35	22.3	26.4	2.1	94.3	8.7
3		85.0	7.72	79.59	24.2	26.4	2.2	96.3	9.0
3		90.0	9.12	80.11	27.0	25.1	2.5	95.9	10.0
3		95.0	7.56	72.59	27.1	27.1	2.0	96.3	8.3
4		95.0	11.22	81.20	25.6	25.8	2.5	96.3	10.0
4		91.0	9.62	80.43	26.3	25.1	2.3	96.3	9.3
4		82.0	10.17	77.29	21.4	27.1	2.3	95.4	9.3
4		91.0	8.74	77.29	21.4	25.1	2.1	91.0	8.7
4		73.0	7.00	76.06	26.5	25.1	2.2	94.3	9.0
4		85.0	9.02	76.94	23.6	24.4	2.5	98.3	10.0
4		85.0	6.86	74.72	23.7	25.8	2.0	90.3	8.3

7. Bukti konfirmasi submit revisi ketiga, respon kepada reviewer, dan file supplementary diresubmit
(23 Februari 2024)

Dari: **Arunachalam Anbalagan** <arunachalam.anbalagan@hindawi.com>
Tanggal: Jum, 23 Feb 2024 pukul 10.05
Subjek: Re: 5511045: Author Data Needed (1st Reminder)
Ke: <edy@umi.ac.id>
CC: <andi056@brin.go.id>, <aminahmuchdar486@gmail.com>, <st.subaedah@umi.ac.id>

Dear Dr. Edy,

Please confirm the receipt of my previous email and provide your response as soon as possible.

An early response would be appreciated to avoid any further delays.

Best Regards,

Arunachalam

———————————

Arunachalam Anbalagan
Editorial Screener

arunachalam.anbalagan@hindawi.com

Hindawi

On Fri, 16 Feb at 4:06 AM , Arunachalam Anbalagan <arunachalam.anbalagan@hindawi.com> wrote:
Dear Dr. Edy,

This is regarding manuscript 5511045 titled "Multilocation Test of Prospective Composite Sticky Corn Varieties with High Production in Indonesia" to "International Journal of Agronomy".

Please address the following concerns and provide us with the updated manuscript and supplementary file back to us so that we can proceed further.

1 - While checking your manuscript, you mentioned two different email addresses for the author Dr. Edy Edy. The email address on the system is given as "edy@umi.ac.id", whereas, in the PDF file you have mentioned "edy.umi.1967@gmail.com". According to our guidelines, the email address should be the same in both the system and the manuscript file. Can you please confirm and update only the preferred email address in both the system and the manuscript file?

2 - While checking your supplementary file (supplementary material 13 Feb.pdf), we found that the table SS161-SS163 seems to be overlapping on different pages, kindly provide us a revised supplementary file with all the tables properly aligned.

After addressing all the concerns, provide the updated manuscript as an attachment to this email so that we can complete our internal checks and proceed further.

Looking forward top hearing from you.

Best Regards,

Arunachalam

Bukti perbaikan file supplementary

Data Gowa

S1 Growth percentage (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	95	94	89	96	93.5
JPI-2	94	93	92	93	93.0
JPI-3	94	94	97	90	93.8
JPI-4	93	87	85	91	89.0
JPI-5	95	93	86	79	88.3
JPI-6	95	86	91	84	89.0
JPI-7	98	98	94	84	93.5

S2 Male flower age (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	58	56	55	56	56.3
JPI-2	57	57	56	56	56.5
JPI-3	55	56	57	57	56.3
JPI-4	57	56	56	55	56.0
JPI-5	54	57	56	56	55.8
JPI-6	59	58	57	57	57.8
JPI-7	52	53	51	51	51.8

S3 Pest attack (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.04	0.02	0.04	0.02	0.03
JPI-2	0.03	0.03	0.05	0.03	0.035
JPI-3	0.03	0.01	0.03	0.02	0.0225
JPI-4	0.02	0.03	0.04	0.02	0.0275
JPI-5	0.05	0.04	0.05	0.06	0.05
JPI-6	0.05	0.05	0.05	0.03	0.045
JPI-7	0.05	0.05	0.08	0.05	0.0575

S4 Cob diameter (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	4.7	4.7	4.8	4.7	4.8
JPI-2	4.4	4.9	4.7	4.7	4.7
JPI-3	4.6	5.0	4.4	4.7	4.7
JPI-4	4.4	4.4	4.5	4.4	4.4
JPI-5	4.2	4.5	4.1	4.1	4.2
JPI-6	4.8	4.9	5.0	5.0	4.9
JPI-7	3.7	3.7	3.7	3.5	3.6

S5 Harvest time (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	100.4	100.8	101.2	101.0	100.9
JPI-2	101.2	100.6	102.8	101.4	101.5
JPI-3	101.4	103.4	103.4	101.8	102.5
JPI-4	103.9	105.6	106.2	104.2	105.0
JPI-5	111.0	109.2	110.0	109.0	109.8
JPI-6	111.2	111.4	109.0	109.2	110.2
JPI-7	91.2	92.4	91.4	92.2	91.8

S6 Cob closure

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	2.0	2.2	2.2	2.4	2.2
JPI-2	2.2	2.2	2.2	2.2	2.2
JPI-3	2.2	2.2	2.4	2.2	2.25
JPI-4	2.2	2.2	2.2	2.4	2.25
JPI-5	2.6	2.4	2.4	2.4	2.45
JPI-6	2.2	2.4	2.6	2.6	2.45
JPI-7	1.2	1.4	1.6	1.6	1.45

S7 Number of plants 2 middle rows

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	47.0	48.0	49.0	48.0	48.0
JPI-2	47.0	48.0	49.0	48.0	48.0
JPI-3	48.0	48.0	49.0	49.0	48.5
JPI-4	48.0	49.0	47.0	48.0	48.0
JPI-5	46.0	48.0	48.0	48.0	47.5
JPI-6	46.0	48.0	49.0	49.0	48.0
JPI-7	47.0	46.0	47.0	47.0	46.8

S8 Cob appearance

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.6	1.8	1.4	1.6	1.6
JPI-2	1.6	1.6	1.6	1.6	1.6
JPI-3	1.4	1.6	1.6	1.8	1.6
JPI-4	1.6	1.4	1.8	1.6	1.6
JPI-5	1.8	1.8	2.0	1.8	1.9
JPI-6	1.6	1.8	1.8	1.6	1.7
JPI-7	1.6	1.6	1.6	1.6	1.6

S9 Plant height (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI -1	217.4	209	216.8	207.4	212.65
JPI -2	223.8	220.6	198.8	209.6	213.2
JPI -3	189	228.2	209.8	214.8	210.45
JPI -4	196	174.2	204.4	193.2	191.95
JPI -5	196.2	178.4	178.4	182.2	183.8
JPI -6	204.6	214.6	225.6	226.2	217.75
JPI -7	207	208.6	205.6	197.8	204.75

S10 Female flower age (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	60	57	57	57	57.8
JPI-2	58	59	58	58	58.3
JPI-3	57	58	58	58	57.8
JPI-4	59	58	58	57	58.0
JPI-5	56	59	58	58	57.8
JPI-6	63	60	59	59	60.3
JPI-7	54	55	52	53	53.5

S11 Downy mildew attact (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.03	0.02	0.03	0.03	0.0275
JPI-2	0.03	0.03	0.02	0.03	0.0275
JPI-3	0.01	0.03	0.02	0.02	0.02
JPI-4	0.02	0.02	0.03	0.02	0.0225
JPI-5	0.03	0.05	0.07	0.04	0.0475
JPI-6	0.02	0.04	0.04	0.03	0.0325
JPI-7	0.04	0.07	0.01	0.07	0.0475

S12 Number of rows per cob

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	14	13	15	14	14.0
JPI-2	12	14	13	13	13.0
JPI-3	14	14	16	14	14.5
JPI-4	14	14	13	14	13.8
JPI-5	12	14	12	14	13.0
JPI-6	13	14	14	16	14.3
JPI-7	9	9	9	11	9.5

S13 Number of cobs 2 middle rows

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	49	48	50	49	49
JPI-2	49	48	49	48	48.5
JPI-3	50	49	48	47	48.5
JPI-4	50	49	50	49	49.5
JPI-5	48	47	48	47	47.5
JPI-6	48	48	50	48	48.5
JPI-7	47	47	45	47	46.5

S14 Seed row appearance

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.4	1.6	1.4	1.4	1.5
JPI-2	1.6	1.4	1.6	1.4	1.5
JPI-3	1.4	1.4	1.6	1.6	1.5
JPI-4	1.4	1.6	1.6	1.6	1.6
JPI-5	1.8	1.8	2.0	1.6	1.8
JPI-6	1.6	1.8	1.6	1.6	1.7
JPI-7	1.8	2.0	2.0	2.0	2.0

S15 Appearance due to Pests

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	2.0	2.2	2.2	2.2	2.2
JPI-2	2.2	2.4	2.0	2.2	2.2
JPI-3	2.2	2.4	2.2	2.4	2.3
JPI-4	2.0	2.2	2.4	2.2	2.2
JPI-5	2.4	2.4	2.2	2.6	2.4
JPI-6	2.4	2.6	2.2	2.4	2.4
JPI-7	2.2	2.6	2.6	2.6	2.5

S16 Production(t/ha KA 15%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	10.56	8.98	8.88	8.61	9.26
JPI-2	9.94	9.96	9.34	9.38	9.66
JPI-3	9.49	11.68	8.26	8.27	9.42
JPI-4	8.24	9.24	8.39	8.63	8.62
JPI-5	7.53	7.85	6.82	6.83	7.26
JPI-6	9.48	9.45	9.72	9.63	9.57
JPI-7	5.19	5.09	5.25	5.55	5.27

S17 Number of leaves

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	11.8	11.2	11.6	10.2	11.2
JPI-2	12.6	13.0	10.4	12.4	12.1
JPI-3	11.6	12.8	11.0	12.2	11.9
JPI-4	11.2	9.8	11.2	10.8	10.8
JPI-5	10.8	11.0	10.4	10.2	10.6
JPI-6	12.4	11.6	11.2	11.2	11.6
JPI-7	9.8	10.2	10.0	10.6	10.2

S18 Root rot

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.02	0.03	0.02	0.01	0.02
JPI-2	0.01	0.02	0.01	0.01	0.0125
JPI-3	0.02	0.02	0.02	0.01	0.0175
JPI-4	0.02	0.02	0.02	0.02	0.02
JPI-5	0.04	0.04	0.03	0.04	0.0375
JPI-6	0.03	0.04	0.03	0.05	0.0375
JPI-7	0.06	0.06	0.05	0.06	0.0575

S19 Middle 2 row cob weights (kg)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	5.60	4.95	4.88	4.86	5.07
JPI-2	5.52	5.42	5.02	5.04	5.25
JPI-3	5.22	6.40	4.67	4.66	5.24
JPI-4	4.51	5.10	4.74	4.75	4.78
JPI-5	4.08	4.09	3.60	3.60	3.84
JPI-6	5.21	5.21	5.27	5.28	5.24
JPI-7	2.79	2.69	2.81	2.81	2.77

S20 Number of seeds per row

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	33.5	33.0	34.5	34.0	33.8
JPI-2	31.5	33.0	40.5	33.0	34.5
JPI-3	34.5	34.0	32.5	34.0	33.8
JPI-4	27.0	30.0	35.5	35.5	32.0
JPI-5	31.0	28.5	31.5	25.5	29.1
JPI-6	34.0	34.0	33.5	36.0	34.4
JPI-7	22.0	25.5	26.0	23.5	24.3

S21 Cob height (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	89.5	99.0	99.5	96.5	96.1
JPI-2	95.5	103.0	95.0	91.0	96.1
JPI-3	91.0	94.5	98.5	91.0	93.8
JPI-4	88.5	93.5	101.0	97.0	95.0
JPI-5	84.5	89.0	82.0	89.0	86.1
JPI-6	95.0	88.0	92.5	95.0	92.6
JPI-7	104.0	93.5	93.0	91.0	95.4

S22 Stem rot

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.03	0.02	0.01	0.01	0.0175
JPI-2	0.03	0.02	0.03	0.03	0.0275
JPI-3	0.02	0.03	0.04	0.01	0.025
JPI-4	0.03	0.03	0.03	0.03	0.03
JPI-5	0.04	0.04	0.04	0.04	0.04
JPI-6	0.04	0.05	0.04	0.06	0.0475
JPI-7	0.06	0.06	0.07	0.07	0.065

S23 Cob length (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	19.9	19.3	19.0	19.9	19.5
JPI-2	17.9	19.7	18.0	19.3	18.7
JPI-3	18.4	20.9	19.3	18.5	19.3
JPI-4	18.6	17.7	18.3	19.2	18.4
JPI-5	16.3	16.1	14.9	15.1	15.6
JPI-6	19.7	20.0	19.5	19.8	19.7
JPI-7	15.1	15.6	14.5	14.4	14.9

S24 Weight of 1000 seeds kA 15% y ogk

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	308.53	312.71	301.55	307.84	307.66
JPI-2	302.57	316.55	320.00	312.71	312.96
JPI-3	314.76	316.55	303.31	304.35	309.74
JPI-4	303.99	313.07	310.62	306.45	308.53
JPI-5	321.12	272.54	307.48	310.63	302.94
JPI-6	312.27	328.10	321.98	292.99	313.83
JPI-7	295.08	308.83	298.26	304.60	301.69

Data Takalar

S25 Growth percentage (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	92.0	94.0	90.0	95.0	92.8
JPI-2	91.0	93.0	92.0	93.0	92.3
JPI-3	94.0	94.0	94.0	90.0	93.0
JPI-4	93.0	89.0	85.0	91.0	89.5
JPI-5	95.0	93.0	88.0	79.0	88.8
JPI-6	95.0	86.0	91.0	90.0	90.5
JPI-7	98.0	98.0	94.0	86.0	94.0

S26 Male flower age (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	51.0	51.0	51.0	51.0	51.0
JPI-2	51.0	53.0	51.0	51.0	51.5
JPI-3	51.0	51.0	51.0	58.0	52.8
JPI-4	51.0	51.0	52.0	51.0	51.3
JPI-5	52.0	53.0	55.0	52.0	53.0
JPI-6	56.0	54.0	51.0	56.0	54.3
JPI-7	47.0	49.0	48.0	46.0	47.5

S27 Pest attack (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.05	0.04	0.04	0.04	0.04
JPI-2	0.04	0.05	0.06	0.04	0.05
JPI-3	0.04	0.05	0.06	0.05	0.05
JPI-4	0.05	0.04	0.05	0.05	0.05
JPI-5	0.06	0.06	0.07	0.07	0.07
JPI-6	0.06	0.05	0.06	0.06	0.06
JPI-7	0.07	0.08	0.08	0.08	0.08

S28 Cob diameter (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	4.2	4.3	4.4	4.3	4.3
JPI-2	4.0	4.0	4.1	4.1	4.1
JPI-3	4.4	4.1	4.2	4.2	4.3
JPI-4	3.8	4.0	3.8	4.3	4.0
JPI-5	3.6	3.7	3.9	3.9	3.8
JPI-6	4.0	4.4	4.5	4.3	4.3
JPI-7	3.8	3.6	3.6	3.5	3.6

S29 Harvest time (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	101.9	102.3	102.7	102.5	102.4
JPI-2	102.7	102.1	104.3	102.9	103.0
JPI-3	102.9	104.9	104.9	103.3	104.0
JPI-4	105.9	107.1	107.7	105.7	106.6
JPI-5	112.5	110.7	109.0	110.5	110.7
JPI-6	112.7	112.9	110.5	110.7	111.7
JPI-7	92.7	93.9	94.0	93.7	93.6

S30 Cob closure

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	2.0	2.0	2.2	2.2	2.1
JPI-2	2.4	2.2	2.2	2.2	2.3
JPI-3	2.2	2.0	2.2	2.0	2.1
JPI-4	2.2	2.0	2.0	2.4	2.2
JPI-5	2.4	2.4	2.2	2.4	2.4
JPI-6	2.2	2.4	2.4	2.4	2.4
JPI-7	1.4	1.6	1.4	1.2	1.4

S31 Plant height (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI -1	219.8	228.0	196.0	219.6	215.9
JPI -2	193.8	173.8	163.2	182.0	178.2
JPI -3	169.4	200.2	245.2	241.6	214.1
JPI -4	154.6	162.2	169.0	173.2	164.8
JPI -5	204.2	204.8	162.6	200.2	193.0
JPI -6	233.6	190.2	180.0	239.6	210.9
JPI -7	219.4	228.0	219.6	222.0	222.3

S32 Female flower age (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	53.0	53.0	53.0	53.0	53.0
JPI-2	53.0	55.0	53.0	53.0	53.5
JPI-3	53.0	53.0	53.0	60.0	54.8
JPI-4	53.0	53.0	54.0	53.0	53.3
JPI-5	54.0	55.0	57.0	54.0	55.0
JPI-6	58.0	56.0	53.0	58.0	56.3
JPI-7	46.0	46.0	50.0	48.0	47.5

S33 Downy mildew attact (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.02	0.02	0.03	0.02	0.02
JPI-2	0.03	0.03	0.03	0.03	0.03
JPI-3	0.02	0.02	0.03	0.02	0.02
JPI-4	0.03	0.03	0.03	0.03	0.03
JPI-5	0.02	0.05	0.06	0.04	0.04
JPI-6	0.03	0.05	0.05	0.04	0.04
JPI-7	0.05	0.07	0.07	0.06	0.06

S34 Number of rows per cob

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	15.0	14.0	15.0	15.0	14.8
JPI-2	13.0	15.0	14.0	14.0	14.0
JPI-3	15.0	15.0	15.0	14.0	14.8
JPI-4	15.0	16.0	15.0	15.0	15.3
JPI-5	12.0	15.0	13.0	14.0	13.5
JPI-6	15.0	15.0	14.0	15.0	14.8
JPI-7	11.0	11.0	9.0	11.0	10.5

S35 Number of plants 2 middle rows

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	46.0	48.0	49.0	48.0	47.8
JPI-2	47.0	46.0	48.0	48.0	47.3
JPI-3	48.0	47.0	49.0	47.0	47.8
JPI-4	46.0	48.0	48.0	47.0	47.3
JPI-5	45.0	48.0	46.0	46.0	46.3
JPI-6	46.0	48.0	49.0	46.0	47.3
JPI-7	45.0	47.0	46.0	45.0	45.8

S36 Cob appearance

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.4	1.6	1.2	1.4	1.4
JPI-2	1.4	1.4	1.4	1.4	1.4
JPI-3	1.2	1.4	1.4	1.6	1.4
JPI-4	1.4	1.2	1.6	1.4	1.4
JPI-5	1.6	1.6	1.8	1.6	1.7
JPI-6	1.4	1.6	1.6	1.4	1.5
JPI-7	1.4	1.4	1.4	1.4	1.4

S37 Number of leaves

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	14.4	11.0	10.6	10.4	11.6
JPI-2	11.2	10.8	9.6	10.4	10.5
JPI-3	10.2	11.0	11.2	12.0	11.1
JPI-4	9.2	9.6	10.0	9.6	9.6
JPI-5	11.4	9.8	8.2	10.2	9.9
JPI-6	12.0	10.0	9.0	12.8	11.0
JPI-7	10.0	10.0	10.4	9.4	10.0

S38 Root down

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.03	0.02	0.02	0.02	0.02
JPI-2	0.02	0.03	0.01	0.02	0.02
JPI-3	0.02	0.03	0.02	0.02	0.02
JPI-4	0.02	0.03	0.03	0.04	0.03
JPI-5	0.03	0.04	0.04	0.04	0.04
JPI-6	0.03	0.03	0.04	0.05	0.04
JPI-7	0.07	0.06	0.07	0.08	0.07

S39 Middle 2 row cob weights (kg)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	5.60	4.95	4.88	4.86	5.07
JPI-2	5.52	5.42	5.02	5.04	5.25
JPI-3	5.22	6.40	4.67	4.66	5.24
JPI-4	4.51	5.10	4.74	4.75	4.78
JPI-5	4.08	4.09	3.60	3.60	3.84
JPI-6	5.21	5.21	5.27	5.28	5.24
JPI-7	2.79	2.69	2.81	2.81	2.77

S40 Number of seeds per row

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	33.5	33.0	34.5	34.0	33.8
JPI-2	31.5	33.0	40.5	33.0	34.5
JPI-3	34.5	34.0	32.5	34.0	33.8
JPI-4	27.0	30.0	35.5	35.5	32.0
JPI-5	31.0	28.5	31.5	25.5	29.1
JPI-6	34.0	34.0	33.5	36.0	34.4
JPI-7	22.0	25.5	26.0	23.5	24.3

S41 Number of cobs 2 middle rows

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	48.00	49.00	49.00	48.00	48.50
JPI-2	49.00	49.00	49.00	49.00	49.00
JPI-3	49.00	50.00	50.00	48.00	49.25
JPI-4	49.00	49.00	50.00	48.00	49.00
JPI-5	47.00	49.00	49.00	49.00	48.50
JPI-6	48.00	48.00	49.00	47.00	48.00
JPI-7	47.00	47.00	46.00	49.00	47.25

S42 Seed row appearance

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.2	1.4	1.2	1.2	1.3
JPI-2	1.4	1.2	1.4	1.2	1.3
JPI-3	1.2	1.2	1.4	1.4	1.3
JPI-4	1.2	1.4	1.4	1.4	1.4
JPI-5	1.6	1.6	1.8	1.4	1.6
JPI-6	1.4	1.6	1.4	1.4	1.5
JPI-7	1.6	1.8	1.8	1.8	1.8

S43 Cob height (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	89.8	95.2	78.2	88.8	88.0
JPI-2	62.8	72.4	63.8	94.0	73.3
JPI-3	93.4	83.0	121.4	88.0	96.5
JPI-4	70.8	74.0	70.0	77.0	73.0
JPI-5	88.8	83.2	74.0	94.4	85.1
JPI-6	84.4	86.8	91.4	106.4	92.3
JPI-7	77.8	108.8	91.0	106.4	96.0

S44 Stem rot

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.02	0.02	0.01	0.01	0.015
JPI-2	0.02	0.03	0.02	0.02	0.0225
JPI-3	0.01	0.02	0.03	0.02	0.02
JPI-4	0.03	0.03	0.02	0.03	0.0275
JPI-5	0.03	0.05	0.05	0.05	0.045
JPI-6	0.04	0.04	0.05	0.05	0.045
JPI-7	0.08	0.07	0.06	0.07	0.07

S45 Cob length (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	18.2	18.2	19.0	18.4	19.5
JPI-2	17.4	18.4	17.8	18.0	18.7
JPI-3	17.6	17.2	18.2	18.0	19.3
JPI-4	19.2	19.2	19.0	18.8	18.4
JPI-5	14.4	16.2	16.2	15.2	15.6
JPI-6	16.0	17.6	17.8	19.2	19.7
JPI-7	13.8	13.6	14.0	15.0	14.9

S46 Weight of 1000 seeds kA 15% y ogk

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	283.62	296.82	304.94	308.12	298.38
JPI-2	285.93	278.26	298.53	286.59	287.33
JPI-3	295.80	297.88	279.67	297.16	292.63
JPI-4	309.53	289.55	307.41	295.80	300.57
JPI-5	291.53	287.16	290.54	309.53	294.69
JPI-6	305.29	280.33	258.00	288.34	282.99
JPI-7	290.21	277.54	281.56	259.02	277.08

S47 Appearance due to Pests

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.8	2.0	2.0	2.0	2.0
JPI-2	1.8	2.4	1.8	1.8	2.0
JPI-3	1.8	2.6	1.8	2.0	2.1
JPI-4	2.2	2.0	2.0	1.8	2.0
JPI-5	2.2	2.2	2.2	2.4	2.3
JPI-6	2.0	2.4	2.2	2.0	2.2
JPI-7	2.2	2.4	2.2	2.4	2.3

S48 Production (t/ha KA 15%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	10.34	9.64	8.86	9.17	9.50
JPI-2	10.79	10.46	9.28	9.69	10.05
JPI-3	11.86	14.15	8.76	8.93	10.92
JPI-4	8.44	9.12	9.04	8.64	8.81
JPI-5	9.52	8.20	7.21	7.10	8.01
JPI-6	9.89	10.01	8.36	9.57	9.46
JPI-7	5.59	5.28	5.57	5.82	5.57

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S49 Growth percentage (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-2	86.5	88.4	87.4	88.4	87.6
JPI-3	89.3	89.3	89.3	85.5	88.4
JPI-4	88.4	84.6	84.0	86.5	85.8
JPI-5	86.0	88.4	83.6	80.0	84.5
JPI-6	90.3	81.7	86.5	85.5	86.0
JPI-7	80.0	88.0	85.0	81.7	83.7

S50 Male flower age (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	58.0	58.0	58.0	59.0	58.3
JPI-2	59.0	58.0	59.0	58.0	58.5
JPI-3	58.0	58.0	58.0	59.0	58.3
JPI-4	59.0	59.0	58.0	58.0	58.5
JPI-5	59.0	70.2	60.0	59.0	62.0
JPI-6	60.0	61.0	59.0	71.6	62.9
JPI-7	54.0	56.0	55.0	54.0	54.8

S51 Pest attack (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.030	0.040	0.040	0.040	0.038
JPI-2	0.050	0.040	0.050	0.050	0.048
JPI-3	0.050	0.050	0.050	0.040	0.048
JPI-4	0.060	0.040	0.050	0.050	0.050
JPI-5	0.070	0.060	0.070	0.060	0.065
JPI-6	0.070	0.050	0.070	0.060	0.063
JPI-7	0.080	0.080	0.090	0.080	0.083

S52 Cob diameter (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	3.6	3.7	3.7	3.7	3.7
JPI-2	3.7	3.4	3.5	3.5	3.5
JPI-3	3.8	3.5	3.6	3.6	3.6
JPI-4	3.3	3.6	3.2	3.6	3.4
JPI-5	3.0	3.2	3.3	3.3	3.2
JPI-6	3.4	3.7	3.8	3.7	3.7
JPI-7	3.2	3.0	3.1	3.0	3.1

S53 Harvest time (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	45.0	45.0	47.0	44.0	45.3
JPI-2	44.0	43.0	46.0	45.0	44.5
JPI-3	45.0	44.0	46.0	44.0	44.8
JPI-4	43.0	45.0	45.0	44.0	44.3
JPI-5	42.0	45.0	43.0	43.0	43.3
JPI-6	44.0	45.0	46.0	45.0	45.0
JPI-7	42.0	44.0	43.0	42.0	42.8

S54 Cob closure

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.2	1.4	1.0	1.2	1.2
JPI-2	1.2	1.4	1.2	1.2	1.3
JPI-3	1.0	1.2	1.2	1.2	1.2
JPI-4	1.2	1.2	1.4	1.2	1.3
JPI-5	1.4	1.2	1.4	1.4	1.4
JPI-6	1.2	1.2	1.2	1.4	1.3
JPI-7	1.2	1.4	1.4	1.4	1.4

S55 Plant height (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI -2	155.0	139.0	130.6	145.6	142.6
JPI -3	135.5	160.2	196.2	193.3	171.3
JPI -4	167.0	129.8	135.2	138.6	142.6
JPI -5	163.4	163.8	130.1	160.2	154.4
JPI -6	186.9	152.2	144.0	191.7	168.7
JPI -7	164.0	160.0	175.7	170.0	167.4

S56 Female flower age (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	60.0	60.0	60.0	61.0	60.3
JPI-2	61.0	60.0	61.0	60.0	60.5
JPI-3	60.0	60.0	61.0	61.0	60.5
JPI-4	61.0	61.0	60.0	60.0	60.5
JPI-5	61.0	62.0	62.0	61.0	61.5
JPI-6	62.0	63.0	61.0	63.0	62.2
JPI-7	56.0	58.0	57.0	56.0	56.8

S57 Downy mildew attact (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.030	0.030	0.040	0.030	0.033
JPI-2	0.030	0.030	0.040	0.040	0.035
JPI-3	0.030	0.030	0.040	0.030	0.033
JPI-4	0.040	0.040	0.040	0.040	0.040
JPI-5	0.060	0.060	0.060	0.050	0.058
JPI-6	0.060	0.060	0.060	0.050	0.058
JPI-7	0.080	0.080	0.080	0.070	0.078

S58 Number of rows per cob

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	14.0	14.0	14.0	14.0	14.0
JPI-2	13.0	15.0	14.0	14.0	14.0
JPI-3	14.0	15.0	14.0	13.0	14.0
JPI-4	14.0	15.0	15.0	14.0	14.5
JPI-5	12.0	13.0	13.0	13.0	12.8
JPI-6	14.0	14.0	14.0	14.0	14.0
JPI-7	10.0	9.0	9.0	9.0	9.3

S59 Number of plants 2 middle rows

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	47.0	47.0	47.0	45.0	46.5
JPI-2	46.0	44.0	46.0	46.0	45.5
JPI-3	46.0	47.0	47.0	45.0	46.3
JPI-4	46.0	46.0	47.0	45.0	46.0
JPI-5	46.0	43.0	44.0	46.0	44.8
JPI-6	45.0	47.0	46.0	47.0	46.3
JPI-7	44.0	44.0	43.0	46.0	44.3

S60 Cob appearance

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.2	1.4	1.2	1.2	1.3
JPI-2	1.4	1.2	1.2	1.2	1.3
JPI-3	1.2	1.2	1.4	1.4	1.3
JPI-4	1.0	1.2	1.4	1.2	1.2
JPI-5	1.2	1.4	1.4	1.4	1.4
JPI-6	1.4	1.2	1.2	1.2	1.3
JPI-7	1.2	1.8	1.4	1.4	1.5

S61 Number of leaves

Treatment	replicate				Average
	I	II	III	IV	
JPI-2	10.1	9.7	8.6	9.4	9.5
JPI-3	9.2	9.9	10.1	10.8	10.0
JPI-4	9.6	8.6	9.0	8.6	9.0
JPI-5	10.3	8.8	7.4	9.2	8.9
JPI-6	10.8	9.0	8.1	11.5	9.9
JPI-7	9.0	8.5	9.4	8.5	8.8

S62 Root down

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.02	0.03	0.03	0.03	0.03
JPI-2	0.03	0.04	0.02	0.03	0.03
JPI-3	0.03	0.04	0.03	0.03	0.03
JPI-4	0.03	0.04	0.04	0.05	0.04
JPI-5	0.04	0.05	0.05	0.05	0.05
JPI-6	0.04	0.04	0.05	0.06	0.05
JPI-7	0.08	0.07	0.08	0.09	0.08

S63 Middle 2 row cob weights (kg)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	4.52	4.05	3.93	4.00	4.12
JPI-2	4.46	5.30	4.14	3.88	4.45
JPI-3	4.26	4.96	3.65	3.81	4.17
JPI-4	3.71	3.39	3.89	3.86	3.71
JPI-5	3.29	3.37	2.85	2.96	3.12
JPI-6	4.27	3.57	3.98	4.18	4.00
JPI-7	2.36	2.27	2.36	2.37	2.34

S64 Number of seeds per row

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	264.10	281.11	285.57	293.44	281.05
JPI-2	269.78	266.47	285.36	256.24	269.46
JPI-3	278.57	268.44	254.50	281.96	270.87
JPI-4	296.97	278.82	291.68	278.57	286.51
JPI-5	264.97	276.01	268.32	277.78	271.77
JPI-6	286.44	274.36	258.73	263.41	270.73
JPI-7	268.78	276.07	278.08	256.74	269.92

S65 Number of cobs 2 middle rows

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.6	1.2	2.0	2.0	1.7
JPI-2	1.8	1.6	2.0	1.8	1.8
JPI-3	1.8	1.4	2.0	2.2	1.9
JPI-4	1.6	1.2	2.2	2.2	1.8
JPI-5	2.2	1.6	2.2	2.2	2.1
JPI-6	1.8	1.0	2.2	2.4	1.9
JPI-7	2.0	1.6	2.4	2.4	2.1

S66 Seed row appearance

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	6.75	6.42	5.78	6.15	6.28
JPI-2	7.09	8.36	6.26	5.93	6.91
JPI-3	7.07	7.97	5.50	5.95	6.62
JPI-4	5.69	5.24	6.04	6.13	5.78
JPI-5	4.88	5.54	4.48	4.78	4.92
JPI-6	6.58	5.52	5.72	6.41	6.05
JPI-7	3.93	3.71	3.88	3.94	3.86

S67 Cob height (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-2	76.0	65.2	67.0	84.6	73.2
JPI-3	84.1	74.7	109.3	79.2	86.8
JPI-4	63.7	66.6	63.0	69.3	65.7
JPI-5	79.9	74.9	66.6	85.0	76.6
JPI-6	76.0	78.1	82.3	95.8	83.0
JPI-7	70.0	77.0	81.9	78.0	76.7

S68 Stem rot

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.03	0.03	0.02	0.02	0.03
JPI-2	0.03	0.04	0.03	0.02	0.03
JPI-3	0.02	0.03	0.04	0.02	0.03
JPI-4	0.04	0.04	0.03	0.03	0.04
JPI-5	0.04	0.06	0.06	0.05	0.05
JPI-6	0.05	0.05	0.06	0.05	0.05
JPI-7	0.07	0.07	0.07	0.07	0.07

S69 Cob length (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	15.5	15.5	16.2	15.6	15.7
JPI-2	14.8	15.6	15.1	15.3	15.2
JPI-3	15.0	14.6	15.5	15.3	15.0
JPI-4	16.3	16.3	16.2	16.0	16.3
JPI-5	12.2	13.8	13.8	12.9	13.3
JPI-6	13.6	15.0	15.1	16.3	14.6
JPI-7	11.7	11.6	11.9	12.7	11.7

S70 Weight of 1000 seeds kA 15% y ogk

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	108.5	106.8	107.3	107.1	107.4
JPI-2	108.3	106.6	109.0	107.5	107.9
JPI-3	108.8	109.6	109.6	107.9	109.0
JPI-4	111.7	111.9	112.6	110.5	111.7
JPI-5	114.5	112.8	113.6	112.5	113.4
JPI-6	114.9	115.1	112.5	112.8	113.8
JPI-7	98.4	97.9	96.9	97.7	97.7

S71 Appearance due to Pests

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	2.0	2.0	2.0	2.0	2.0
JPI-2	2.2	2.0	2.0	2.2	2.1
JPI-3	2.2	2.2	2.2	2.0	2.2
JPI-4	2.0	2.0	2.2	2.2	2.1
JPI-5	2.0	2.2	2.4	2.2	2.2
JPI-6	2.2	2.0	2.4	2.2	2.2
JPI-7	1.2	1.8	1.6	1.2	1.5

S72 Production (t/ha KA 15%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	26.0	25.5	27.0	26.5	26.3
JPI-2	24.0	25.5	33.0	25.5	27.0
JPI-3	27.0	26.5	25.0	26.5	26.3
JPI-4	19.5	22.5	28.0	28.0	24.5
JPI-5	23.5	21.0	24.0	18.0	21.6
JPI-6	26.5	26.5	26.0	28.5	26.9
JPI-7	15.5	18.0	18.5	18.5	17.6

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S73 Growth percentage (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	90.2	92.1	88.2	93.1	90.9
JPI-2	89.2	91.1	90.2	91.1	90.4
JPI-3	92.1	92.1	92.1	88.2	91.1
JPI-4	91.1	87.2	83.3	89.2	87.7
JPI-5	91.1	91.1	86.2	84.3	88.2
JPI-6	90.2	84.3	89.2	88.2	88.0
JPI-7	96.0	96.0	92.1	84.3	92.1

S74 Male flower age (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	53.00	53.00	53.00	53.00	53.00
JPI-2	53.00	55.00	52.00	53.00	53.25
JPI-3	53.00	53.00	53.00	54.00	53.25
JPI-4	53.00	53.00	54.00	53.00	53.25
JPI-5	54.00	55.00	53.00	54.00	54.00
JPI-6	55.00	55.00	53.00	55.00	54.50
JPI-7	48.00	50.00	48.00	46.00	48.00

S75 Pest attack (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.03	0.04	0.05	0.03	0.0375
JPI-2	0.03	0.03	0.04	0.04	0.035
JPI-3	0.03	0.04	0.04	0.04	0.0375
JPI-4	0.04	0.03	0.06	0.05	0.045
JPI-5	0.05	0.06	0.07	0.07	0.0625
JPI-6	0.04	0.06	0.07	0.05	0.055
JPI-7	0.06	0.07	0.09	0.08	0.075

S76 Cob diameter (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	4.2	4.3	4.4	4.3	4.3
JPI-2	4.3	4.0	4.1	4.1	4.1
JPI-3	4.4	4.1	4.2	4.2	4.3
JPI-4	3.9	4.2	4.5	4.3	4.2
JPI-5	3.6	3.7	3.9	3.9	3.8
JPI-6	4.0	4.4	4.5	4.3	4.3
JPI-7	3.8	3.6	3.6	3.5	3.6

S77 Harvest time (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	104.7	102.0	100.3	101.5	102.1
JPI-2	104.1	101.1	102.0	102.4	102.4
JPI-3	101.8	102.6	102.6	100.9	102.0
JPI-4	104.7	104.9	105.6	103.5	104.7
JPI-5	105.8	105.8	106.6	105.5	105.9
JPI-6	107.9	106.4	104.9	103.4	105.7
JPI-7	95.0	95.4	95.3	92.2	94.5

S78 Cob closure

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.8	2.0	2.2	2.0	2.0
JPI-2	2.0	2.0	2.2	2.2	2.1
JPI-3	2.0	2.2	2.4	2.0	2.2
JPI-4	1.8	2.0	2.4	2.2	2.1
JPI-5	1.8	2.2	2.6	2.2	2.2
JPI-6	2.0	2.0	2.6	2.2	2.2
JPI-7	1.2	1.8	1.8	1.2	1.5

S79 Plant height (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI -1	197.8	205.2	176.4	197.6	194.3
JPI -2	174.4	182.7	180.0	163.8	175.2
JPI -3	152.5	180.2	220.7	217.4	192.7
JPI -4	180.0	182.0	179.1	173.9	178.7
JPI -5	183.8	184.3	146.3	180.2	173.7
JPI -6	210.2	171.2	162.0	215.6	189.8
JPI -7	197.5	205.2	197.6	199.8	200.0

S80 Female flower age (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	55.00	55.00	54.00	54.00	54.50
JPI-2	55.00	56.00	54.00	55.00	55.00
JPI-3	55.00	55.00	56.00	55.00	55.25
JPI-4	55.00	55.00	55.00	54.00	54.75
JPI-5	56.00	56.00	55.00	56.00	55.75
JPI-6	57.00	57.00	55.00	57.00	56.50
JPI-7	50.00	51.00	50.00	48.00	49.75

S81 Downy mildew attact (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.02	0.02	0.01	0.03	0.02
JPI-2	0.02	0.02	0.01	0.02	0.0175
JPI-3	0.02	0.02	0.01	0.03	0.02
JPI-4	0.03	0.03	0.02	0.02	0.025
JPI-5	0.04	0.04	0.02	0.04	0.035
JPI-6	0.03	0.03	0.02	0.03	0.0275
JPI-7	0.05	0.05	0.04	0.05	0.0475

S82 Number of rows per cob

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	15.0	15.0	14.0	15.0	14.8
JPI-2	14.0	16.0	15.0	14.0	14.8
JPI-3	15.0	16.0	15.0	15.0	15.3
JPI-4	15.0	15.0	15.0	15.0	15.0
JPI-5	14.0	13.0	14.0	14.0	13.8
JPI-6	15.0	16.0	15.0	15.0	15.3
JPI-7	11.0	9.0	10.0	11.0	10.3

S83 Number of plants 2 middle rows

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	47.0	47.0	48.0	50.0	48.0
JPI-2	49.0	47.0	49.0	49.0	48.5
JPI-3	49.0	48.0	50.0	48.0	48.8
JPI-4	48.0	47.0	49.0	48.0	48.0
JPI-5	46.0	49.0	47.0	47.0	47.3
JPI-6	47.0	49.0	50.0	47.0	48.3
JPI-7	46.0	48.0	47.0	46.0	46.8

S84 Cob appearance

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.2	1.2	1.0	1.2	1.2
JPI-2	1.2	1.2	1.2	1.2	1.2
JPI-3	1.0	1.2	1.2	1.2	1.2
JPI-4	1.2	1.2	1.4	1.2	1.3
JPI-5	1.4	1.2	1.4	1.4	1.4
JPI-6	1.2	1.2	1.0	1.4	1.2
JPI-7	1.2	1.4	1.2	1.4	1.3

S85 Number of leaves

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	13.8	10.6	10.2	10.0	11.1
JPI-2	10.8	10.4	9.6	10.0	10.2
JPI-3	9.8	10.6	10.8	11.5	10.7
JPI-4	10.6	11.5	9.6	11.5	10.8
JPI-5	10.9	9.6	10.6	9.8	10.2
JPI-6	11.5	9.6	10.6	12.3	11.0
JPI-7	10.6	11.5	10.0	9.6	10.4

S86 Root down

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.01	0.01	0.02	0.03	0.0175
JPI-2	0.01	0.02	0.02	0.02	0.0175
JPI-3	0.01	0.02	0.02	0.02	0.0175
JPI-4	0.01	0.03	0.02	0.03	0.0225
JPI-5	0.01	0.03	0.02	0.03	0.0225
JPI-6	0.01	0.02	0.03	0.02	0.02
JPI-7	0.03	0.05	0.04	0.06	0.045

S87 Middle 2 row cob weights (kg)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	5.68	5.03	4.78	4.77	5.07
JPI-2	5.55	6.58	4.97	4.92	5.50
JPI-3	5.29	6.19	4.55	4.73	5.19
JPI-4	4.68	4.21	4.82	4.79	4.63
JPI-5	3.94	3.97	3.70	3.67	3.82
JPI-6	5.30	4.45	4.84	5.21	4.95
JPI-7	2.92	2.81	2.92	2.93	2.90

S88 Number of seeds per row

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	34.5	33.5	37.0	38.0	35.8
JPI-2	32.5	34.0	38.5	34.0	34.8
JPI-3	35.5	34.5	35.5	35.0	35.1
JPI-4	28.0	31.0	36.5	36.5	33.0
JPI-5	32.0	29.5	32.5	26.5	30.1
JPI-6	35.0	34.5	34.5	37.0	35.3
JPI-7	23.0	26.5	27.0	24.5	25.3

S89 Number of cobs 2 middle rows

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	47.0	49.0	50.0	51.0	49.3
JPI-2	50.0	47.0	49.0	50.0	49.0
JPI-3	49.0	48.0	49.0	49.0	48.8
JPI-4	50.0	50.0	51.0	49.0	50.0
JPI-5	48.0	50.0	50.0	48.0	49.0
JPI-6	49.0	49.0	51.0	48.0	49.3
JPI-7	47.0	48.0	47.0	50.0	48.0

S90 Seed row appearance

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.2	1.4	1.2	1.2	1.3
JPI-2	1.2	1.2	1.2	1.2	1.2
JPI-3	1.2	1.2	1.4	1.4	1.3
JPI-4	1.0	1.0	1.4	1.2	1.2
JPI-5	1.2	1.4	1.4	1.4	1.4
JPI-6	1.2	1.0	1.2	1.2	1.2
JPI-7	1.0	1.6	1.4	1.4	1.4

S91 Cob height (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	86.21	91.39	75.07	85.25	84.48
JPI-2	60.29	69.50	61.25	90.24	70.32
JPI-3	89.66	79.68	116.54	84.48	92.59
JPI-4	67.97	71.04	67.20	73.92	70.03
JPI-5	85.25	79.87	71.04	90.62	81.70
JPI-6	81.02	83.33	87.74	98.30	87.60
JPI-7	74.69	104.45	87.36	102.14	92.16

S92 Stem rot

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.01	0.03	0.02	0.02	0.02
JPI-2	0.01	0.02	0.02	0.02	0.0175
JPI-3	0.01	0.03	0.03	0.01	0.02
JPI-4	0.01	0.02	0.02	0.01	0.015
JPI-5	0.01	0.04	0.02	0.02	0.0225
JPI-6	0.01	0.02	0.03	0.02	0.02
JPI-7	0.04	0.04	0.07	0.01	0.04

S93 Cob length (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	18.9	18.9	19.8	19.1	19.2
JPI-2	18.1	19.1	18.5	18.7	18.6
JPI-3	18.3	17.9	18.9	18.7	18.5
JPI-4	20.0	20.0	19.8	19.6	19.8
JPI-5	16.0	16.8	16.8	15.8	16.4
JPI-6	18.7	19.9	18.0	20.0	19.1
JPI-7	14.3	14.1	14.6	15.6	14.7

S94 Weight of 1000 seeds kA 15% y ogk

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	268.74	285.65	290.45	292.97	284.45
JPI-2	275.18	271.51	279.92	275.65	275.56
JPI-3	283.20	273.91	259.47	286.47	275.76
JPI-4	298.90	282.94	296.34	283.20	290.35
JPI-5	259.34	265.94	285.35	281.97	273.15
JPI-6	291.29	283.35	257.82	277.77	277.56
JPI-7	272.05	279.44	281.62	259.94	273.26

S95 Appearance due to Pests

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	2.2	1.4	2.2	2.0	2.0
JPI-2	2.2	1.8	2.0	1.8	2.0
JPI-3	2.2	1.6	2.4	2.0	2.1
JPI-4	2.0	1.4	2.4	2.0	2.0
JPI-5	2.4	1.6	2.2	1.8	2.0
JPI-6	2.2	1.4	2.4	2.0	2.0
JPI-7	2.2	1.6	2.6	2.4	2.2

S96 Production (t/ha KA 15%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	10.03	9.40	8.31	8.51	9.06
JPI-2	10.40	12.22	8.55	9.09	10.07
JPI-3	10.36	11.77	8.12	8.71	9.74
JPI-4	8.37	7.65	8.84	9.00	8.47
JPI-5	6.63	7.30	7.18	6.99	7.03
JPI-6	9.65	8.13	8.05	9.44	8.82
JPI-7	5.71	5.39	5.64	5.73	5.62

Data NTB

97 Growth percentage (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	96.0	93.0	94.0	93.0	94.0
JPI-2	94.0	95.0	95.0	94.0	94.5
JPI-3	96.0	96.0	95.0	97.0	96.0
JPI-4	95.0	94.0	96.0	94.0	94.8
JPI-5	94.0	97.0	94.0	92.0	94.3
JPI-6	96.0	95.0	96.0	92.0	94.8
JPI-7	96.0	97.0	95.0	95.0	95.8

S98 Male flower age (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	59.0	56.0	55.0	55.0	56.3
JPI-2	56.0	56.0	57.0	57.0	56.5
JPI-3	56.0	57.0	55.0	57.0	56.3
JPI-4	57.0	57.0	56.0	56.0	56.5
JPI-5	52.0	52.0	53.0	52.0	52.3
JPI-6	61.0	56.0	56.0	59.0	58.0
JPI-7	51.0	51.0	52.0	52.0	51.5

S99 Pest attack (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.02	0.04	0.04	0.03	0.03
JPI-2	0.01	0.04	0.04	0.04	0.03
JPI-3	0.01	0.03	0.03	0.03	0.03
JPI-4	0.01	0.03	0.03	0.03	0.03
JPI-5	0.04	0.01	0.04	0.06	0.04
JPI-6	0.07	0.08	0.04	0.05	0.06
JPI-7	0.04	0.12	0.09	0.08	0.08

S100 Cob diameter (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	4.7	4.9	4.5	4.6	4.6
JPI-2	4.8	4.8	4.7	4.8	4.8
JPI-3	4.9	4.8	4.9	4.9	4.9
JPI-4	4.7	4.9	4.5	4.7	4.7
JPI-5	4.3	4.8	4.7	4.3	4.5
JPI-6	4.9	4.8	4.9	4.6	4.8
JPI-7	3.6	3.8	3.7	3.3	3.6

S101 Harvest time (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	50.0	49.0	49.0	49.0	49.3
JPI-2	49.0	48.0	48.0	48.0	48.3
JPI-3	50.0	49.0	49.0	48.0	49.0
JPI-4	49.0	48.0	48.0	47.0	48.0
JPI-5	47.0	47.0	48.0	47.0	47.3
JPI-6	48.0	49.0	48.0	48.0	48.3
JPI-7	49.0	49.0	49.0	49.0	49.0

S102 Cob closure

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.8	2.0	2.0	2.2	2.0
JPI-2	2.2	2.2	2.0	2.2	2.2
JPI-3	2.0	2.0	2.0	2.0	2.0
JPI-4	2.0	2.0	2.2	2.0	2.1
JPI-5	2.2	2.2	2.2	2.2	2.2
JPI-6	2.2	2.2	2.2	2.2	2.2
JPI-7	1.2	1.0	1.0	1.2	1.1

S103 Plant height (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	170.2	183.6	182.0	120.2	164.0
JPI-2	167.4	192.0	180.0	179.0	179.6
JPI-3	184.0	188.0	175.0	160.0	176.8
JPI-4	174.0	179.0	164.0	154.0	167.8
JPI-5	188.6	185.6	176.2	155.0	176.4
JPI-6	186.4	175.6	168.0	160.6	172.7
JPI-7	180.6	202.2	188.0	168.4	184.8

S104 Female flower age (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	61.0	57.0	57.0	57.0	58.0
JPI-2	58.0	57.0	58.0	58.0	57.8
JPI-3	57.0	58.0	56.0	58.0	57.3
JPI-4	59.0	59.0	58.0	57.0	58.3
JPI-5	54.0	53.0	54.0	53.0	53.5
JPI-6	63.0	57.0	57.0	60.0	59.3
JPI-7	52.0	52.0	54.0	53.0	52.8

S105 Downy mildew attact (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.01	0.02	0.03	0.02	0.02
JPI-2	0.03	0.02	0.03	0.03	0.03
JPI-3	0.01	0.03	0.02	0.03	0.02
JPI-4	0.02	0.02	0.04	0.04	0.03
JPI-5	0.01	0.04	0.08	0.05	0.05
JPI-6	0.03	0.03	0.03	0.07	0.04
JPI-7	0.01	0.02	0.05	0.07	0.04

S106 Number of rows per cob

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	14.0	14.0	15.0	15.0	14.5
JPI-2	14.0	14.0	14.0	14.0	14.0
JPI-3	13.0	14.0	16.0	13.0	14.0
JPI-4	14.0	14.0	14.0	15.0	14.3
JPI-5	12.5	14.0	14.0	13.0	13.4
JPI-6	14.0	14.0	15.0	14.0	14.3
JPI-7	13.0	12.0	12.5	13.0	12.6

S107 Number of plants 2 middle rows

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	241.24	244.28	243.91	237.47	241.72
JPI-2	239.86	245.20	233.92	235.03	238.50
JPI-3	240.91	249.23	244.18	239.18	243.37
JPI-4	254.21	256.69	244.23	235.28	247.60
JPI-5	231.10	232.04	247.92	222.87	233.48
JPI-6	242.05	242.29	249.92	231.39	241.41
JPI-7	212.29	224.27	246.38	235.82	229.69

S108 Cob appearance

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.2	1.2	1.2	1.2	1.2
JPI-2	1.4	1.2	1.4	1.2	1.3
JPI-3	1.2	1.4	1.4	1.2	1.3
JPI-4	1.4	1.4	1.4	1.4	1.4
JPI-5	1.6	1.2	1.4	1.4	1.4
JPI-6	1.2	1.4	1.2	1.2	1.3
JPI-7	1.2	1.4	1.4	1.6	1.4

S109 Number of leaves

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	12.4	12.4	12.6	12.4	12.5
JPI-2	12.2	12.8	12.8	12.0	12.5
JPI-3	13.0	12.6	12.6	12.0	12.6
JPI-4	12.4	12.8	12.0	12.4	12.4
JPI-5	13.2	12.0	12.2	11.2	12.2
JPI-6	12.6	12.4	12.4	12.2	12.4
JPI-7	12.8	11.6	11.2	11.8	11.9

S110 Root down

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.01	0.01	0.02	0.02	0.015
JPI-2	0.01	0.03	0.01	0.01	0.015
JPI-3	0.02	0.02	0.02	0.02	0.02
JPI-4	0.01	0.02	0.02	0.02	0.0175
JPI-5	0.03	0.03	0.03	0.02	0.0275
JPI-6	0.01	0.04	0.01	0.03	0.0225
JPI-7	0.02	0.05	0.04	0.02	0.0325

S111 Middle 2 row cob weights (kg)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	6.15	5.34	5.49	5.49	5.61
JPI-2	6.33	7.11	5.40	5.40	6.06
JPI-3	5.91	6.08	5.40	5.40	5.69
JPI-4	5.73	5.70	5.18	5.18	5.45
JPI-5	5.92	5.33	5.05	5.05	5.34
JPI-6	6.06	6.15	5.17	5.17	5.63
JPI-7	3.83	2.91	3.74	3.74	3.55

S112 Number of seeds per row

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	37.0	32.0	35.0	33.0	34.3
JPI-2	35.5	32.0	34.5	33.0	33.8
JPI-3	36.0	33.0	35.0	32.0	34.0
JPI-4	33.5	32.5	33.0	33.0	33.0
JPI-5	28.5	31.5	29.0	27.5	29.1
JPI-6	36.5	32.5	33.0	31.0	33.3
JPI-7	26.0	26.5	27.0	26.0	26.4

S113 Number of cobs 2 middle rows

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	99.6	99.8	100.4	100.2	100.0
JPI-2	100.4	100.0	101.6	100.8	100.7
JPI-3	100.8	101.0	101.8	102.2	101.5
JPI-4	105.0	105.0	105.4	104.8	105.1
JPI-5	109.8	110.0	111.2	110.8	110.5
JPI-6	110.4	111.0	110.2	111.4	110.8
JPI-7	92.2	93.6	91.8	92.6	92.6

S114 Seed row appearance

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.0	1.0	1.2	1.2	1.1
JPI-2	1.2	1.2	1.2	1.0	1.2
JPI-3	1.2	1.2	1.0	1.2	1.2
JPI-4	1.2	1.2	1.2	1.0	1.2
JPI-5	1.2	1.4	1.4	1.0	1.3
JPI-6	1.2	1.2	1.0	1.2	1.2
JPI-7	1.4	1.4	1.4	1.4	1.4

S115 Cob height (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	126.2	98.8	109.8	72.4	101.8
JPI-2	130.4	121.0	105.8	105.6	115.7
JPI-3	109.0	106.4	95.4	70.6	95.4
JPI-4	114.2	114.2	78.0	74.2	95.2
JPI-5	109.8	105.4	89.6	81.0	96.5
JPI-6	139.4	113.0	85.8	79.8	104.5
JPI-7	117.0	118.4	107.8	94.4	109.4

S116 Stem rot

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.01	0.03	0.02	0.00	0.02
JPI-2	0.03	0.03	0.01	0.01	0.02
JPI-3	0.03	0.01	0.02	0.02	0.02
JPI-4	0.01	0.01	0.01	0.02	0.01
JPI-5	0.01	0.05	0.02	0.01	0.02
JPI-6	0.01	0.05	0.04	0.03	0.03
JPI-7	0.02	0.02	0.06	0.07	0.04

S117 Cob length (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	19.0	18.4	17.1	16.5	17.7
JPI-2	17.9	17.7	17.4	16.4	17.3
JPI-3	18.4	18.4	16.9	16.9	17.6
JPI-4	17.1	18.5	17.0	16.9	17.4
JPI-5	15.4	14.8	14.4	14.2	14.7
JPI-6	17.8	18.0	17.3	16.7	17.4
JPI-7	14.8	13.7	14.0	13.2	13.9

S118 Weight of 1000 seeds kA 15% y ogk

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	49.0	48.0	49.0	49.0	48.8
JPI-2	48.0	48.0	48.0	48.0	48.0
JPI-3	48.0	49.0	49.0	48.0	48.5
JPI-4	47.0	48.0	48.0	47.0	47.5
JPI-5	47.0	47.0	48.0	47.0	47.3
JPI-6	48.0	49.0	48.0	48.0	48.3
JPI-7	49.0	49.0	49.0	49.0	49.0

S119 Appearance due to Pests

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.6	1.4	1.4	1.2	1.4
JPI-2	1.8	1.6	1.6	1.4	1.6
JPI-3	1.4	1.4	1.2	1.2	1.3
JPI-4	1.6	1.4	1.6	1.6	1.6
JPI-5	1.6	1.8	1.4	1.4	1.6
JPI-6	1.6	1.6	1.6	1.4	1.6
JPI-7	1.8	1.8	1.6	1.4	1.7

S120 Production (t/ha KA 15%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	10.22	8.89	9.21	9.91	9.56
JPI-2	10.98	11.65	8.95	9.41	10.25
JPI-3	9.35	10.40	9.16	8.59	9.38
JPI-4	9.81	9.83	8.94	9.26	9.46
JPI-5	10.28	8.40	8.91	9.26	9.21
JPI-6	10.34	10.19	9.00	8.72	9.57
JPI-7	6.04	4.62	6.24	5.92	5.71

Data Kediri

S121 Growth percentage (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	94.0	92.0	86.0	95.0	91.8
JPI-2	93.0	93.0	91.0	91.0	92.0
JPI-3	93.0	95.0	97.0	82.0	91.8
JPI-4	91.0	75.0	84.0	91.0	85.3
JPI-5	94.0	92.0	85.0	73.0	86.0
JPI-6	88.0	84.0	90.0	85.0	86.8
JPI-7	98.0	99.0	95.0	85.0	94.3

S122 Male flower age (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	58.0	56.0	55.0	56.0	56.3
JPI-2	57.0	57.0	56.0	56.0	56.5
JPI-3	55.0	56.0	57.0	57.0	56.3
JPI-4	57.0	56.0	56.0	55.0	56.0
JPI-5	54.0	57.0	56.0	56.0	55.8
JPI-6	59.0	58.0	57.0	57.0	57.8
JPI-7	52.0	53.0	51.0	51.0	51.8

S123 Pest attack (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.03	0.02	0.04	0.02	0.03
JPI-2	0.02	0.03	0.05	0.03	0.03
JPI-3	0.03	0.02	0.03	0.02	0.03
JPI-4	0.02	0.03	0.04	0.02	0.03
JPI-5	0.04	0.04	0.05	0.04	0.04
JPI-6	0.04	0.05	0.05	0.03	0.04
JPI-7	0.05	0.06	0.08	0.05	0.06

S124 Cob diameter (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	4.8	4.8	4.9	4.6	4.8
JPI-2	4.7	5.0	4.8	4.7	4.8
JPI-3	4.5	4.8	5.4	4.7	4.9
JPI-4	4.6	4.6	4.7	4.8	4.7
JPI-5	4.9	4.4	4.5	4.3	4.5
JPI-6	4.9	5.0	4.8	4.9	4.9
JPI-7	3.4	4.3	3.9	3.9	3.9

S125 Harvest time (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	307.11	327.18	337.72	266.31	309.58
JPI-2	316.49	342.94	290.97	276.75	306.79
JPI-3	299.99	337.02	324.20	280.19	310.35
JPI-4	318.74	353.80	286.18	260.43	304.79
JPI-5	316.87	323.31	309.81	248.83	299.71
JPI-6	317.44	326.99	324.91	263.81	308.29
JPI-7	302.77	321.62	324.54	243.23	298.04

S126 Cob closure

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.4	1.6	1.6	1.4	1.5
JPI-2	1.6	1.8	1.4	1.6	1.6
JPI-3	1.6	1.4	1.4	1.4	1.5
JPI-4	1.4	1.6	1.4	1.4	1.5
JPI-5	1.4	1.6	1.6	1.6	1.6
JPI-6	1.4	1.6	1.4	1.6	1.5
JPI-7	1.6	1.6	1.4	1.6	1.6

S127 Plant height (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	165.2	162.0	167.2	142.0	159.1
JPI-2	162.8	173.6	159.0	163.8	164.8
JPI-3	164.8	168.2	170.2	130.4	158.4
JPI-4	154.4	158.2	156.2	148.8	154.4
JPI-5	158.8	163.2	140.0	127.8	147.5
JPI-6	175.2	163.0	148.2	159.6	161.5
JPI-7	190.8	182.0	164.0	159.8	174.2

S128 Female flower age (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	60.0	57.0	57.0	57.0	57.8
JPI-2	58.0	59.0	58.0	58.0	58.3
JPI-3	57.0	58.0	58.0	58.0	57.8
JPI-4	59.0	58.0	58.0	57.0	58.0
JPI-5	56.0	59.0	58.0	58.0	57.8
JPI-6	63.0	60.0	59.0	59.0	60.3
JPI-7	54.0	55.0	52.0	53.0	53.5

S129 Downy mildew attact (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.02	0.02	0.03	0.02	0.02
JPI-2	0.02	0.03	0.03	0.02	0.03
JPI-3	0.02	0.03	0.03	0.03	0.03
JPI-4	0.03	0.02	0.04	0.03	0.03
JPI-5	0.04	0.03	0.08	0.04	0.05
JPI-6	0.03	0.03	0.04	0.04	0.04
JPI-7	0.06	0.06	0.08	0.08	0.07

S130 Number of rows per cob

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	16.0	14.0	15.0	14.0	14.8
JPI-2	14.0	15.0	13.0	13.0	13.8
JPI-3	14.0	14.0	16.0	14.0	14.5
JPI-4	13.0	13.0	13.0	14.0	13.3
JPI-5	13.0	13.0	12.0	14.0	13.0
JPI-6	15.0	14.0	14.0	16.0	14.8
JPI-7	10.0	11.0	9.0	11.0	10.3

S131 Number of plants 2 middle rows

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	48.0	49.0	48.0	48.0	48.3
JPI-2	48.0	48.0	49.0	48.0	48.3
JPI-3	49.0	48.0	49.0	49.0	48.8
JPI-4	48.0	49.0	49.0	48.0	48.5
JPI-5	47.0	48.0	48.0	48.0	47.8
JPI-6	48.0	48.0	49.0	49.0	48.5
JPI-7	48.0	47.0	47.0	47.0	47.3

S132 Cob appearance

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.2	1.4	1.4	1.2	1.3
JPI-2	1.4	1.2	1.2	1.4	1.3
JPI-3	1.4	1.2	1.2	1.4	1.3
JPI-4	1.6	1.2	1.4	1.2	1.4
JPI-5	1.8	1.4	1.6	1.6	1.6
JPI-6	1.4	1.6	1.4	3.4	2.0
JPI-7	1.2	1.6	1.6	1.6	1.5

S133 Number of leaves

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	11.8	11.2	10.6	10.6	11.1
JPI-2	11.0	11.0	10.4	10.6	10.8
JPI-3	11.8	11.8	11.4	10.8	11.5
JPI-4	11.2	10.6	10.6	10.4	10.7
JPI-5	11.6	10.6	10.6	10.0	10.7
JPI-6	12.8	11.6	11.2	11.4	11.8
JPI-7	10.0	10.4	8.4	8.2	9.3

S134 Root down

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.02	0.03	0.01	0.01	0.0175
JPI-2	0.01	0.02	0.01	0.01	0.0125
JPI-3	0.01	0.01	0.02	0.01	0.0125
JPI-4	0.02	0.02	0.01	0.02	0.0175
JPI-5	0.04	0.02	0.02	0.03	0.0275
JPI-6	0.02	0.03	0.02	0.04	0.0275
JPI-7	0.04	0.06	0.06	0.04	0.05

S135 Middle 2 row cob weights (kg)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	5.85	5.20	5.67	5.84	5.64
JPI-2	6.73	5.65	5.09	5.09	5.64
JPI-3	6.25	5.21	6.93	5.93	6.08
JPI-4	5.80	5.18	5.09	5.09	5.29
JPI-5	4.85	4.94	4.52	4.12	4.60
JPI-6	6.75	6.46	5.74	5.74	6.17
JPI-7	2.53	3.08	3.71	3.71	3.26

S136 Number of seeds per row

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	33.5	33.0	34.5	34.0	33.8
JPI-2	31.5	33.0	40.5	33.0	34.5
JPI-3	34.5	34.0	32.5	34.0	33.8
JPI-4	27.0	30.0	35.5	35.5	32.0
JPI-5	31.0	28.5	31.5	25.5	29.1
JPI-6	34.0	34.0	33.5	36.0	34.4
JPI-7	22.0	25.5	26.0	23.5	24.3

S137 Number of cobs 2 middle rows

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	49.0	50.0	49.0	49.0	49.3
JPI-2	49.0	49.0	48.0	49.0	48.8
JPI-3	50.0	50.0	50.0	48.0	49.5
JPI-4	49.0	48.0	49.0	48.0	48.5
JPI-5	48.0	48.0	49.0	48.0	48.3
JPI-6	49.0	50.0	47.0	49.0	48.8
JPI-7	48.0	47.0	47.0	49.0	47.8

S138 Seed row appearance

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.0	1.2	1.0	1.2	1.1
JPI-2	1.2	1.0	1.2	1.0	1.1
JPI-3	1.2	1.0	1.2	1.2	1.2
JPI-4	1.0	1.4	1.2	1.0	1.2
JPI-5	1.4	1.4	1.6	1.0	1.4
JPI-6	1.4	1.2	1.2	1.2	1.3
JPI-7	1.6	1.6	1.6	1.4	1.6

S139 Cob height (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	104.0	76.5	88.5	77.0	86.5
JPI-2	96.5	80.8	72.5	84.5	83.6
JPI-3	84.8	91.3	89.5	88.3	88.4
JPI-4	90.3	76.8	87.8	75.0	82.4
JPI-5	88.0	82.8	66.5	69.0	76.6
JPI-6	96.3	87.5	74.0	90.3	87.0
JPI-7	101.3	85.3	79.3	79.3	86.3

S140 Stem rot

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.02	0.02	0.01	0.01	0.02
JPI-2	0.03	0.01	0.01	0.01	0.02
JPI-3	0.02	0.02	0.01	0.01	0.02
JPI-4	0.02	0.02	0.01	0.03	0.02
JPI-5	0.03	0.04	0.01	0.04	0.03
JPI-6	0.03	0.05	0.02	0.03	0.03
JPI-7	0.05	0.02	0.07	0.06	0.05

S141 Cob length (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	19.1	19.0	18.3	18.6	18.7
JPI-2	17.5	18.2	19.8	18.3	18.4
JPI-3	18.7	18.6	19.0	18.9	18.8
JPI-4	18.8	20.0	18.9	18.7	19.1
JPI-5	17.4	16.0	15.5	17.9	16.7
JPI-6	18.9	20.0	17.8	18.8	18.9
JPI-7	14.5	15.5	15.2	15.8	15.2

S142 Weight of 1000 seeds kA 15% y ogk

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	100.0	100.4	101.0	100.6	100.5
JPI-2	101.0	100.0	102.4	101.8	101.3
JPI-3	101.0	102.8	102.4	102.4	102.2
JPI-4	103.8	106.0	106.2	105.6	105.4
JPI-5	110.6	110.4	112.0	110.0	110.8
JPI-6	110.6	111.4	109.8	111.6	110.9
JPI-7	91.8	93.0	92.2	93.0	92.5

S143 Appearance due to Pests

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	2.0	2.0	2.2	2.2	2.1
JPI-2	2.2	2.0	1.8	2.0	2.0
JPI-3	2.2	2.2	2.0	2.2	2.2
JPI-4	1.8	2.2	2.0	2.2	2.1
JPI-5	2.4	2.0	2.0	2.2	2.2
JPI-6	2.2	2.4	2.0	2.4	2.3
JPI-7	1.2	1.0	1.2	1.0	1.1

S144 Production (t/ha KA 15%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	9.18	9.63	9.52	11.22	9.89
JPI-2	9.79	9.81	9.11	9.62	9.58
JPI-3	10.03	9.00	10.31	10.17	9.88
JPI-4	9.21	8.12	9.15	8.74	8.80
JPI-5	8.44	9.95	7.72	7.00	8.28
JPI-6	9.27	10.15	9.12	9.02	9.39
JPI-7	3.48	5.66	7.56	6.86	5.89

Data downy mildew infection in Bajeng Gowa, 2023
S145 Age 14 DAP

genotype	replicate				
	I	II	III	IV	Average
JPI-1	0.0	0.0	0.0	0.0	0.0
JPI-2	0.0	0.0	0.0	0.0	0.0
JPI-3	0.0	0.4	1.0	0.8	0.6
JPI-4	4.2	5.2	3.8	3.0	4.1
Pulut Uri	0.0	0.0	0.0	0.0	0.0
Srikandi Putih	0.0	0.0	0.0	0.0	0.0
Pulut lokal	0.0	0.0	0.0	0.0	0.0
Anoman	7.2	6.8	8.2	7.8	7.5

S146 Umur 21 D (Gowa)

Genotype	Replicate				
	I	II	III	IV	Rataan
JPI-1	3.8	3.2	3.4	3.7	3.5
JPI-2	4.7	5.0	4.2	4.4	4.6
JPI-3	5.8	6.4	5.9	6.7	6.2
JPI-4	11.9	12.8	12.6	12.7	12.5
Pulut Uri	3.6	4.1	4.5	4.2	4.1
Srikandi Putih	4.0	3.2	3.6	3.2	3.5
Pulut lokal	7.0	8.2	6.4	7.2	7.2
Anoman	69.2	60.4	60.8	66.2	64.2

S147 Umur 28 D (Gowa)

Genotype	Replicate				
	I	II	III	IV	Rataan
JPI-1	5.1	5.6	5.2	5.4	5.3
JPI-2	7.8	7.2	7.1	6.4	7.1
JPI-3	11.0	12.0	10.4	11.2	11.2
JPI-4	28.2	27.4	26.8	28.4	27.7
Pulut Uri	8.8	8.3	7.8	8.9	8.5
Srikandi Putih	5.2	5.3	6.0	5.0	5.4
Pulut lokal	32.5	30.2	30.0	29.3	30.5
Anoman	82.4	80.1	78.6	82.5	80.9

S148 Umur 35 D (Gowa)

Genotype	Replicate				
	I	II	III	IV	Rataan
JPI-1	5.8	5.6	5.2	6.4	5.8
JPI-2	9.0	7.2	8.1	8.4	8.2
JPI-3	11.0	12.0	12.4	11.2	11.7
JPI-4	28.2	27.4	26.8	28.4	27.7
Pulut Uri	8.8	8.7	9.8	8.9	9.1
Srikandi Putih	5.2	5.3	6.0	5.0	5.4

Pulut lokal	32.5	38.2	39.0	39.3	37.3
Anoman	97.4	98.1	98.6	99.5	98.4

S149 Umur 42 H (Gowa)

Genotip	Ulangan				
	I	II	III	IV	Rataan
JPI-1	5.8	5.6	5.2	6.4	5.8
JPI-2	9.0	7.2	8.1	8.4	8.2
JPI-3	11.0	12.0	12.4	11.2	11.7
JPI-4	28.2	27.4	26.8	28.4	27.7
Pulut Uri	8.8	8.7	9.8	8.9	9.1
Srikandi Putih	5.2	5.3	6.0	5.0	5.4
Pulut lokal	38.5	40.2	39.4	40.3	39.6
Anoman	90.4	95.1	90.6	92.5	92.2

S150 Tabel 1. Rata-rata persentase infeksi patogrn bulai di Bajeng Gowa 2023

Genotip	Insidensi penyakit bulai (%) pada umur (HST)					Reaksi
	14	21	28	35	42	
JPI-1	0.0	3.5	5.3	5.8	5.8	Tahan T)
JPI-2	0.0	4.6	7.1	8.2	8.2	Tahan (T)
JPI-3	0.6	6.2	11.2	11.7	11.7	Tahan (T)
JPI-4	4.1	12.5	27.7	27.7	27.7	agak Tahan AT)
Pulut Uri	0.0	4.1	8.5	9.1	9.1	Tahan (T)
Srikandi Putih	0.0	3.5	5.4	5.4	5.4	Tahan (T)
Pulut lokal	0.0	7.2	30.5	37.3	39.6	Rentan ®
Anoman	7.5	64.2	80.9	98.4	92.2	Sangat rentan (SR)

Data downy mildew infection in Malang, Jatim, 2023

S151 Age 14 DAP

genotype	replicate				
	I	II	III	IV	Average
JPI-1	0.0	0.0	0.0	0.0	0.0
JPI-2	0.0	0.0	0.0	0.0	0.0
JPI-3	2.4	3.8	2.4	3.4	3.0
JPI-4	4.0	4.2	4.3	3.6	4.0
Pulut Uri	0.5	0.2	0.2	0.4	0.3
Srikandi Putih	2.0	2.3	2.6	2.1	2.3
Pulut lokal	1.2	1.1	1.0	0.7	1.0
Anoman	23.1	20.2	19.6	19.6	20.6

S152 Umur 21 D (Malang)

Genotype	Replicate				
	I	II	III	IV	Rataan
JPI-1	0.0	0.0	0.0	0.0	0.0
JPI-2	0.0	0.0	0.0	0.0	0.0
JPI-3	6.4	6.6	5.9	6.9	6.5
JPI-4	8.1	7.4	7.8	7.4	7.7

Pulut Uri	4.6	4.1	3.8	4.0	4.1
Srikandi Putih	5.9	7.0	6.4	5.8	6.3
Pulut lokal	8.7	7.8	7.4	8.1	8.0
Anoman	52.3	50.4	53.0	53.4	52.3

S153 Umur 28 DA (Malang)

Genotype	Replicate				
	I	II	III	IV	Rataan
JPI-1	9.1	9.2	10.0	8.5	9.2
JPI-2	10.4	10.7	9.9	9.8	10.2
JPI-3	8.4	9.0	8.3	7.8	8.4
JPI-4	9.0	8.6	8.5	8.6	8.7
Pulut Uri	9.6	9.3	8.8	9.1	9.2
Srikandi Putih	8.4	8.8	7.9	8.4	8.4
Pulut lokal	11.0	9.2	10.0	10.1	10.1

S154 Umur 35 DA (Malang)

Genotype	Replicate				
	I	II	III	IV	Rataan
JPI-1	9.9	8.9	9.7	10.0	9.6
JPI-2	11.1	10.3	10.7	9.6	10.4
JPI-3	9.8	9.8	10.1	9.3	9.8
JPI-4	19.0	18.1	17.3	17.6	18.0
Pulut Uri	10.6	10.3	11.3	10.2	10.6
Srikandi Putih	10.0	9.1	9.2	8.4	9.2
Pulut lokal	25.4	27.1	24.2	25.0	25.4

S155 Umur 42 HS (Malang)

Genotip	Ulangan				
	I	II	III	IV	Rataan
JPI-1	9.9	8.9	9.7	10.0	9.6
JPI-2	11.1	10.3	10.7	9.6	10.4
JPI-3	9.8	9.8	10.1	9.3	9.8
JPI-4	19.0	18.1	17.3	17.6	18.0
Pulut Uri	10.6	10.3	11.3	10.2	10.6
Srikandi Putih	10.0	9.1	9.2	8.4	9.2
Pulut lokal	25.4	27.1	24.2	25.0	25.4

SS 161 Lea Umur 60 D

Genotype
JPI-1
JPI-2
JPI-3
JPI-4
Pulut Uri
Srikandi Pu
Pulut lokal
Anoman

SS 162 Lea Umur 70 D

Genotype
JPI-1
JPI-2
JPI-3
JPI-4
Pulut Uri
Srikandi

SS 163 Ave

Genotype
JPI-1
JPI-2
JPI-3
JPI-4
Pulut Uri
Srikandi Pu

S156 Tabel 2. Rata-rata persentase infeksi patogrn bulai di Malang Jatim- 2023

Genotip	Insidensi penyakit bulai (%) pada umur (HST)					Reaksi
	14	21	28	35	42	
JPI-1	0.0	0.0	9.2	9.6	9.6	Tahan T)
JPI-2	0.0	0.0	10.2	10.4	10.4	Tahan (T)
JPI-3	3.0	6.5	8.4	9.8	9.8	Tahan (T)
JPI-4	4.0	7.7	8.7	18.0	18.0	agak Tahan (AT)
Pulut Uri	0.3	4.1	9.2	10.6	10.6	Tahan (T)
Srikandi Putih	2.3	6.3	8.4	9.2	9.2	Tahan (T)
Pulut lokal	1.0	8.0	10.1	25.4	25.4	agak tahan (AT)
Anoman	20.6	52.3	71.9	79.6	83.7	Sangat rentan (SR)

Data leaf blight infection in Bajeng, Gowa, 2023
S157 Age 45 DAP

genotype	replicate				
	I	II	III	IV	Average
JPI-1	1.60	2.00	1.20	1.30	1.53
JPI-2	6.10	5.80	5.40	5.30	5.65
JPI-3	13.10	12.60	12.70	12.40	12.70
JPI-4	12.40	12.60	12.20	12.00	12.30
Pulut Uri	0.00	0.00	0.00	0.00	0.00
Srikandi Putih	6.20	5.40	5.11	4.50	5.30
Pulut lokal	4.70	5.10	4.20	4.80	4.70
Anoman	1.30	1.60	1.11	1.20	1.30

S158 Umur 60 DA (gowa)

Genotype	Replicate				
	I	II	III	IV	Rataan
JPI-1	16.50	16.80	14.20	14.90	15.60
JPI-2	18.40	18.80	17.30	18.20	18.18
JPI-3	18.10	16.60	17.20	17.10	17.25
JPI-4	18.80	19.20	18.20	17.40	18.40
Pulut Uri	16.30	17.00	15.10	15.60	16.00
Srikandi Putih	17.50	18.20	16.30	17.20	17.30
Pulut lokal	15.10	15.40	14.50	15.00	15.00
Anoman	38.40	40.10	38.80	39.90	39.30

S159 Umur 75 DA (gowa)

Genotype	Replicate				
	I	II	III	IV	Rataan
JPI-1	18.50	18.40	19.10	19.20	18.80
JPI-2	22.20	20.60	20.10	19.50	20.60
JPI-3	19.20	18.20	17.60	17.00	18.00
JPI-4	22.40	20.80	20.40	19.60	20.80
Pulut Uri	21.30	20.40	18.10	20.20	20.00
Srikandi Putih	19.70	18.31	19.10	19.70	19.20
Pulut lokal	21.30	21.60	20.20	20.10	20.80
Anoman	70.20	70.40	68.10	65.30	68.50

S160 Tabel 3. Rata-rata persentase hawar daun di Bajeng-Gowa- 2023

Genotype	nsi penyakit bulai (%) pada umur			Reaksi
	45	60	70	
JPI-1	1.53	15.60	18.80	Tahan T)
JPI-2	5.65	18.18	20.60	Tahan (T)
JPI-3	12.70	17.25	18.00	Tahan (T)
JPI-4	12.30	18.40	20.80	Tahan (T)
Pulut Uri	0.00	16.00	20.00	Tahan (T)
Srikandi Putih	5.30	17.30	19.20	Tahan (T)
Pulut lokal	4.70	15.00	20.80	Tahan (T)
Anoman	1.30	39.30	68.50	gat rentan (SR)

f rust infection data in Bajeng, Gowa, 2023
AP

Replicate				
I	II	III	IV	Average
16.30	14.40	15.80	15.50	15.50
16.40	17.20	16.80	17.20	16.90
18.10	18.00	20.00	17.10	18.30
14.80	15.00	13.20	14.20	14.30
17.50	16.70	16.80	16.20	16.80
14.70	15.00	14.00	13.50	14.30
14.80	14.30	15.10	13.80	14.50
23.10	23.50	21.80	21.60	22.50

f rust infection data in Bajeng, Gowa, 2023
(gowa)

Replicate				
I	II	III	IV	Average
21.70	22.40	19.40	19.30	20.70
20.20	19.80	19.80	18.90	19.68
22.20	20.20	18.40	19.10	19.98
18.50	17.30	19.20	17.00	18.00
21.80	21.60	18.60	19.20	20.30
18.40	18.20	17.40	18.00	18.00
21.20	21.00	19.30	18.50	20.00
66.80	70.60	67.20	68.20	68.20

rage percentage of leaf rust in Bajeng-Gowa- 2023

	Leaf rust percentage (%) at age (DAP)			Reaksi
	45	60	70	
		15.50	20.70	Tahan T)
		16.90	19.68	Tahan (T)
		18.30	19.98	Tahan (T)
		14.30	18.00	Tahan (T)
		16.80	20.30	Tahan (T)
tih		14.30	18.00	Tahan (T)
		14.50	20.00	Tahan (T)
		22.50	68.20	angat rentan (SR)

SS 164 Compilation data

		Observation				
Genotype	Location	Observation	Tan height	Number of lea	UB male	UB female
1	Gowa	95	217.4	11.8	58	60
1		94	223.8	12.6	57	58
1		94	189	11.6	55	57
1		93	196	11.2	57	59
1		95	196.2	10.8	54	56
1		95	204.6	12.4	59	63
1		98	207	9.8	52	54
2		94	209	11.2	56	57
2		93	220.6	13.0	57	59
2		94	228.2	12.8	56	58
2		87	174.2	9.8	56	58
2		93	178.4	11.0	57	59
2		86	214.6	11.6	58	60
2		98	208.6	10.2	53	55
3		89	216.8	11.6	55	57
3		92	198.8	10.4	56	58
3		97	209.8	11.0	57	58
3		85	204.4	11.2	56	58
3		86	178.4	10.4	56	58
3		91	225.6	11.2	57	59
3		94	205.6	10.0	51	52
4		96	207.4	10.2	56	57
4		93	209.6	12.4	56	58
4		90	214.8	12.2	57	58
4		91	193.2	10.8	55	57
4		79	182.2	10.2	56	58
4		84	226.2	11.2	57	59
4		84	197.8	10.6	51	53
1	Takalar	92.0	219.8	14.4	51.0	53.0
1		91.0	193.8	11.2	51.0	53.0
1		94.0	169.4	10.2	51.0	53.0
1		93.0	154.6	9.2	51.0	53.0
1		95.0	204.2	11.4	52.0	54.0
1		95.0	233.6	12.0	56.0	58.0
1		98.0	219.4	10.0	47.0	46.0
2		94.0	228.0	11.0	51.0	53.0
2		93.0	173.8	10.8	53.0	55.0
2		94.0	200.2	11.0	51.0	53.0
2		89.0	162.2	9.6	51.0	53.0
2		93.0	204.8	9.8	53.0	55.0
2		86.0	190.2	10.0	54.0	56.0
2		98.0	228.0	10.0	49.0	46.0
3		90.0	196.0	10.6	51.0	53.0
3		92.0	163.2	9.6	51.0	53.0
3		94.0	245.2	11.2	51.0	53.0
3		85.0	169.0	10.0	52.0	54.0
3		88.0	162.6	8.2	55.0	57.0

		Observation				
Genotype	Location	Observation	Tan height	Number of lea	UB male	UB female
3	Takalar	91.0	180.0	9.0	51.0	53.0
3		94.0	219.6	10.4	48.0	50.0
4		95.0	219.6	10.4	51.0	53.0
4		93.0	182.0	10.4	51.0	53.0
4		90.0	241.6	12.0	58.0	60.0
4		91.0	173.2	9.6	51.0	53.0
4		79.0	200.2	10.2	52.0	54.0
4		90.0	239.6	12.8	56.0	58.0
4		86.0	222.0	9.4	46.0	48.0
1	Bantaeng	87.4	175.8	13.0	58.0	60.0
1		86.5	155.0	10.1	59.0	61.0
1		89.3	135.5	9.2	58.0	60.0
1		88.4	167.0	9.6	59.0	61.0
1		86.0	163.4	10.3	59.0	61.0
1		90.3	186.9	10.8	60.0	62.0
1		80.0	164.0	9.0	54.0	56.0
2		89.3	182.4	9.9	58.0	60.0
2		88.4	139.0	9.7	58.0	60.0
2		89.3	160.2	9.9	58.0	60.0
2		84.6	129.8	8.6	59.0	61.0
2		88.4	163.8	8.8	51.8	62.0
2		81.7	152.2	9.0	61.0	63.0
2		88.0	160.0	8.5	56.0	58.0
3		85.5	156.8	9.5	58.0	60.0
3		87.4	130.6	8.6	59.0	61.0
3		89.3	196.2	10.1	58.0	61.0
3		84.0	135.2	9.0	58.0	60.0
3		83.6	130.1	7.4	60.0	62.0
3		86.5	144.0	8.1	59.0	61.0
3		85.0	175.7	9.4	55.0	57.0
4		90.3	175.7	9.4	59.0	61.0
4		88.4	145.6	9.4	58.0	60.0
4		85.5	193.3	10.8	59.0	61.0
4		86.5	138.6	8.6	58.0	60.0
4		80.0	160.2	9.2	59.0	61.0
4		85.5	191.7	11.5	71.6	63.0
4		81.7	170.0	8.5	54.0	56.0
1	Maros	90.2	197.8	13.8	53.00	55.00
1		89.2	174.4	10.8	53.00	55.00
1		92.1	152.5	9.8	53.00	55.00
1		91.1	180.0	10.6	53.00	55.00
1		91.1	183.8	10.9	54.00	56.00
1		90.2	210.2	11.5	55.00	57.00
1		96.0	197.5	10.6	48.00	50.00
2		92.1	205.2	10.6	53.00	55.00
2		91.1	182.7	10.4	55.00	56.00
2		92.1	180.2	10.6	53.00	55.00
2		87.2	182.0	11.5	53.00	55.00

		Observation				
Genotype	Location	Observation	Tan height	Number of lea	UB male	UB female
2	Maros	91.1	184.3	9.6	55.00	56.00
2		84.3	171.2	9.6	55.00	57.00
2		96.0	205.2	11.5	50.00	51.00
3		88.2	176.4	10.2	53.00	54.00
3		90.2	180.0	9.6	52.00	54.00
3		92.1	220.7	10.8	53.00	56.00
3		83.3	179.1	9.6	54.00	55.00
3		86.2	146.3	10.6	53.00	55.00
3		89.2	162.0	10.6	53.00	55.00
3		92.1	197.6	10.0	48.00	50.00
4		93.1	197.6	10.0	53.00	54.00
4		91.1	163.8	10.0	53.00	55.00
4		88.2	217.4	11.5	54.00	55.00
4		89.2	173.9	11.5	53.00	54.00
4		84.3	180.2	9.8	54.00	56.00
4		88.2	215.6	12.3	55.00	57.00
4		84.3	199.8	9.6	46.00	48.00
1	Lombok (NTB)	96.0	170.2	12.4	59.0	61.0
1		94.0	167.4	12.2	56.0	58.0
1		96.0	184.0	13.0	56.0	57.0
1		95.0	174.0	12.4	57.0	59.0
1		94.0	188.6	13.2	52.0	54.0
1		96.0	186.4	12.6	61.0	63.0
1		96.0	180.6	12.8	51.0	52.0
2		93.0	183.6	12.4	56.0	57.0
2		95.0	192.0	12.8	56.0	57.0
2		96.0	188.0	12.6	57.0	58.0
2		94.0	179.0	12.8	57.0	59.0
2		97.0	185.6	12.0	52.0	53.0
2		95.0	175.6	12.4	56.0	57.0
2		97.0	202.2	11.6	51.0	52.0
3		94.0	182.0	12.6	55.0	57.0
3		95.0	180.0	12.8	57.0	58.0
3		95.0	175.0	12.6	55.0	56.0
3		96.0	164.0	12.0	56.0	58.0
3		94.0	176.2	12.2	53.0	54.0
3		96.0	168.0	12.4	56.0	57.0
3		95.0	188.0	11.2	52.0	54.0
4		93.0	120.2	12.4	55.0	57.0
4		94.0	179.0	12.0	57.0	58.0
4		97.0	160.0	12.0	57.0	58.0
4		94.0	154.0	12.4	56.0	57.0
4		92.0	155.0	11.2	52.0	53.0
4		92.0	160.6	12.2	59.0	60.0
4		95.0	168.4	11.8	52.0	53.0
1	Kediri	94.0	165.2	11.8	58.0	60.0
1		93.0	162.8	11.0	57.0	58.0
1		93.0	164.8	11.8	55.0	57.0

		Observation				
Genotype	Location	Observation	Tan height	Number of lea	UB male	UB female
1	Kediri	91.0	154.4	11.2	57.0	59.0
1		94.0	158.8	11.6	54.0	56.0
1		88.0	175.2	12.8	59.0	63.0
1		98.0	190.8	10.0	52.0	54.0
2		92.0	162.0	11.2	56.0	57.0
2		93.0	173.6	11.0	57.0	59.0
2		95.0	168.2	11.8	56.0	58.0
2		75.0	158.2	10.6	56.0	58.0
2		92.0	163.2	10.6	57.0	59.0
2		84.0	163.0	11.6	58.0	60.0
2		99.0	182.0	10.4	53.0	55.0
3		86.0	167.2	10.6	55.0	57.0
3		91.0	159.0	10.4	56.0	58.0
3		97.0	170.2	11.4	57.0	58.0
3		84.0	156.2	10.6	56.0	58.0
3		85.0	140.0	10.6	56.0	58.0
3		90.0	148.2	11.2	57.0	59.0
3		95.0	164.0	8.4	51.0	52.0
4		95.0	142.0	10.6	56.0	57.0
4		91.0	163.8	10.6	56.0	58.0
4		82.0	130.4	10.8	57.0	58.0
4		91.0	148.8	10.4	55.0	57.0
4		73.0	127.8	10.0	56.0	58.0
4		85.0	159.6	11.4	57.0	59.0
4		85.0	159.8	8.2	51.0	53.0

Note	
1	JPI-1
2	JPI-2
3	JPI-3
4	JPI-4
5	JPI-5
6	JPI-6
7	JPI-7

		Observation						
Genotype	Location	Observatio	Tan height	Weight 50	Acting cob	D cob	Number of	Number of
1	Gowa	95	217.4	8.96	19.9	4.7	14	33.5
1		94	223.8	8.84	17.9	4.4	12	31.5
1		94	189	8.35	18.4	4.6	14	34.5
1		93	196	8.12	18.6	4.4	14	27.0
1		95	196.2	6.53	16.3	4.2	12	31.0
1		95	204.6	8.33	19.7	4.8	13	34.0
1		98	207	5.01	15.1	3.7	9	22.0
2		94	209	8.42	19.3	4.7	13	33.0
2		93	220.6	8.68	19.7	4.9	14	33.0
2		94	228.2	8.95	20.9	5.0	14	34.0
2		87	174.2	8.16	17.7	4.4	14	30.0
2		93	178.4	6.54	16.1	4.5	14	28.5
2		86	214.6	8.33	20.0	4.9	14	34.0
2		98	208.6	4.83	15.6	3.7	9	25.5
3		89	216.8	8.05	19.0	4.8	15	34.5
3		92	198.8	8.03	18.0	4.7	13	40.5
3		97	209.8	8.87	19.3	4.4	16	32.5
3		85	204.4	8.54	18.3	4.5	13	35.5
3		86	178.4	5.75	14.9	4.1	12	31.5
3		91	225.6	8.43	19.5	5.0	14	33.5
3		94	205.6	5.06	14.5	3.7	9	26.0
4		96	207.4	8.27	19.9	4.7	15	34.0
4		93	209.6	8.07	19.3	4.7	13	33.0
4		90	214.8	7.69	18.5	4.7	16	34.0
4		91	193.2	8.08	19.2	4.4	13	35.5
4		79	182.2	5.75	15.1	4.1	12	25.5
4		84	226.2	8.45	19.8	5.0	14	36.0
4		84	197.8	5.05	14.4	3.5	9	23.5
1	Takalar	92.0	219.8	8.96	18.2	4.2	15.0	33.5
1		91.0	193.8	8.84	17.4	4.0	13.0	31.5
1		94.0	169.4	8.35	17.6	4.4	15.0	34.5
1		93.0	154.6	8.12	19.2	3.8	15.0	27.0
1		95.0	204.2	6.94	14.4	3.6	12.0	31.0
1		95.0	233.6	8.33	16.0	4.0	15.0	34.0
1		98.0	219.4	4.46	13.8	3.8	11.0	22.0
2		94.0	228.0	7.93	18.2	4.3	14.0	33.0
2		93.0	173.8	8.68	18.4	4.0	15.0	33.0
2		94.0	200.2	8.95	17.2	4.1	15.0	34.0
2		89.0	162.2	8.16	19.2	4.0	16.0	30.0
2		93.0	204.8	7.77	16.2	3.7	15.0	28.5
2		86.0	190.2	8.33	17.6	4.4	15.0	34.0
2		98.0	228.0	4.30	13.6	3.6	11.0	25.5
3		90.0	196.0	7.81	19.0	4.4	15.0	34.5
3		92.0	163.2	8.03	17.8	4.1	14.0	40.5
3		94.0	245.2	7.47	18.2	4.2	15.0	32.5
3		85.0	169.0	8.06	19.0	3.8	15.0	35.5
3		88.0	162.6	7.91	16.2	3.9	13.0	31.5

		Observation						
Genotype	Location	Observatio	Tan height	Weight 50	Acting cob	D cob	Number of	Number of
3	Takalar	91.0	91.4	8.43	17.8	4.5	14.0	33.5
3		94.0	91.0	4.50	14.0	3.6	9.0	26.0
4		95.0	88.8	7.78	18.4	4.3	15.0	34.0
4		93.0	94.0	8.07	18.0	4.1	14.0	33.0
4		90.0	88.0	7.46	18.0	4.2	14.0	34.0
4		91.0	77.0	7.94	18.8	4.3	15.0	35.5
4		79.0	94.4	7.19	15.2	3.9	14.0	25.5
4		90.0	106.4	8.45	19.2	4.3	15.0	36.0
4		86.0	106.4	4.49	15.0	3.5	11.0	23.5
1	Bantaeng	87.4	80.8	7.68	15.5	3.6	14.0	26.0
1		86.5	76.0	8.48	14.8	3.7	13.0	24.0
1		89.3	84.1	8.09	15.0	3.8	14.0	27.0
1		88.4	63.7	7.06	16.3	3.3	14.0	19.5
1		86.0	79.9	6.26	12.2	3.0	12.0	23.5
1		90.3	76.0	8.10	13.6	3.4	14.0	26.5
1		80.0	70.0	4.48	11.7	3.2	10.0	15.5
2		89.3	85.7	8.10	15.5	3.7	14.0	25.5
2		88.4	65.2	8.48	15.6	3.4	15.0	25.5
2		89.3	74.7	6.45	14.6	3.5	15.0	26.5
2		84.6	66.6	6.79	16.3	3.6	15.0	22.5
2		88.4	74.9	6.41	13.8	3.2	13.0	21.0
2		81.7	78.1	7.86	15.0	3.7	14.0	26.5
2		88.0	77.0	4.55	11.6	3.0	9.0	18.0
3		85.5	70.4	7.07	16.2	3.7	14.0	27.0
3		87.4	67.0	7.04	15.1	3.5	14.0	33.0
3		89.3	109.3	6.94	15.5	3.6	14.0	25.0
3		84.0	63.0	7.38	16.2	3.2	15.0	28.0
3		83.6	66.6	5.70	13.8	3.3	13.0	24.0
3		86.5	82.3	7.55	15.1	3.8	14.0	26.0
3		85.0	81.9	4.49	11.9	3.1	9.0	18.5
4		90.3	79.9	8.79	15.6	3.7	14.0	26.5
4		88.4	84.6	7.36	15.3	3.5	14.0	25.5
4		85.5	79.2	7.24	15.3	3.6	13.0	26.5
4		86.5	69.3	7.33	16.0	3.6	14.0	28.0
4		80.0	85.0	5.92	12.9	3.3	13.0	18.0
4		85.5	95.8	7.95	16.3	3.7	14.0	28.5
4		81.7	78.0	5.22	12.7	3.0	9.0	18.5
1	Maros	90.2	86.2	8.52	18.9	4.2	15.0	34.5
1		89.2	60.3	8.32	18.1	4.3	14.0	32.5
1		92.1	89.7	8.47	18.3	4.4	15.0	35.5
1		91.1	68.0	7.95	20.0	3.9	15.0	28.0
1		91.1	85.2	6.70	16.0	3.6	14.0	32.0
1		90.2	81.0	8.48	18.7	4.0	15.0	35.0
1		96.0	74.7	4.96	14.3	3.8	11.0	23.0
2		92.1	91.39	8.55	18.9	4.3	15.0	33.5
2		91.1	69.50	8.55	19.1	4.0	16.0	34.0
2		92.1	79.68	8.05	17.9	4.1	16.0	34.5
2		87.2	71.04	8.00	20.0	4.2	15.0	31.0

		Pengamatan						
Genotype	Location	Observatio	Tan height	Weight 50	Acting cob	D cob	Number of	Number of
2	Maros	91.1	79.87	6.75	16.8	3.7	13.0	29.5
2		84.3	83.33	8.02	19.9	4.4	16.0	34.5
2		96.0	104.45	4.78	14.1	3.6	9.0	26.5
3		88.2	75.07	8.89	19.8	4.4	14.0	37.0
3		90.2	61.25	8.44	18.5	4.1	15.0	38.5
3		92.1	116.54	7.74	18.9	4.2	15.0	35.5
3		83.3	67.20	8.20	19.8	4.5	15.0	36.5
3		86.2	71.04	6.29	16.8	3.9	14.0	32.5
3		89.2	87.74	8.23	18.0	4.5	15.0	34.5
3		92.1	87.36	4.97	14.6	3.6	10.0	27.0
4		93.1	85.25	8.87	19.1	4.3	15.0	38.0
4		91.1	90.24	8.37	18.7	4.1	14.0	34.0
4		88.2	84.48	8.04	18.7	4.2	15.0	35.0
4		89.2	73.92	8.15	19.6	4.3	15.0	36.5
4		84.3	90.62	6.24	15.8	3.9	14.0	26.5
4		88.2	98.30	8.86	20.0	4.3	15.0	37.0
4		84.3	102.14	4.99	15.6	3.5	11.0	24.5
1	Lombok (N	96.0	126.2	9.83	19.0	4.7	14.0	37.0
1		94.0	130.4	9.80	17.9	4.8	14.0	35.5
1		96.0	109.0	9.45	18.4	4.9	13.0	36.0
1		95.0	114.2	9.16	17.1	4.7	14.0	33.5
1		94.0	109.8	9.47	15.4	4.3	12.5	28.5
1		96.0	139.4	9.70	17.8	4.9	14.0	36.5
1		96.0	117.0	4.80	14.8	3.6	13.0	26.0
2		93.0	98.8	9.82	18.4	4.9	14.0	32.0
2		95.0	121.0	9.77	17.7	4.8	14.0	32.0
2		96.0	106.4	9.72	18.4	4.8	14.0	33.0
2		94.0	114.2	9.12	18.5	4.9	14.0	32.5
2		97.0	105.4	8.52	14.8	4.8	14.0	31.5
2		95.0	113.0	9.83	18.0	4.8	14.0	32.5
2		97.0	118.4	5.30	13.7	3.8	12.0	26.5
3		94.0	109.8	8.78	17.1	4.5	15.0	35.0
3		95.0	105.8	8.64	17.4	4.7	14.0	34.5
3		95.0	95.4	8.64	16.9	4.9	16.0	35.0
3		96.0	78.0	9.63	17.0	4.5	14.0	33.0
3		94.0	89.6	8.08	14.4	4.7	14.0	29.0
3		96.0	85.8	8.26	17.3	4.9	15.0	33.0
3		95.0	107.8	5.98	14.0	3.7	12.5	27.0
4		93.0	72.4	8.78	16.5	4.6	15.0	33.0
4		94.0	105.6	8.64	16.4	4.8	14.0	33.0
4		97.0	70.6	8.64	16.9	4.9	13.0	32.0
4		94.0	74.2	9.63	16.9	4.7	15.0	33.0
4		92.0	81.0	8.08	14.2	4.3	13.0	27.5
4		92.0	79.8	8.26	16.7	4.6	14.0	31.0
4		95.0	94.4	5.98	13.2	3.3	13.0	26.0
1	Kediri	94.0	104.0	8.78	19.1	4.8	16.0	33.5
1		93.0	96.5	9.19	17.5	4.7	14.0	31.5
1		93.0	84.8	9.38	18.7	4.5	14.0	34.5

		Observation						
Genotype	Location	Observatio	Tan height	Weight 50	Acting cob	D cob	Number of	Number of
1	Kediri	91.0	90.3	8.70	18.8	4.6	13.0	27.0
1		94.0	88.0	8.78	17.4	4.9	13.0	31.0
1		88.0	96.3	7.73	18.9	4.9	15.0	34.0
1		98.0	101.3	5.29	14.5	3.4	10.0	22.0
2		92.0	76.5	8.85	19.0	4.8	14.0	33.0
2		93.0	80.8	8.48	18.2	5.0	15.0	33.0
2		95.0	91.3	7.82	18.6	4.8	14.0	34.0
2		75.0	76.8	8.82	20.0	4.6	13.0	30.0
2		92.0	82.8	7.70	16.0	4.4	13.0	28.5
2		84.0	87.5	8.64	20.0	5.0	14.0	34.0
2		99.0	85.3	4.62	15.5	4.3	11.0	25.5
3		86.0	88.5	9.55	18.3	4.9	15.0	34.5
3		91.0	72.5	7.63	19.8	4.8	13.0	40.5
3		97.0	89.5	9.50	19.0	5.4	16.0	32.5
3		84.0	87.8	7.64	18.9	4.7	13.0	35.5
3		85.0	66.5	6.77	15.5	4.5	12.0	31.5
3		90.0	74.0	8.61	17.8	4.8	14.0	33.5
3		95.0	79.3	5.57	15.2	3.9	9.0	26.0
4		95.0	77.0	8.75	18.6	4.6	14.0	34.0
4		91.0	84.5	7.63	18.3	4.7	13.0	33.0
4		82.0	88.3	8.90	18.9	4.7	14.0	34.0
4		91.0	75.0	7.64	18.7	4.8	14.0	35.5
4		73.0	69.0	7.67	17.9	4.3	14.0	25.5
4		85.0	90.3	8.61	18.8	4.9	16.0	36.0
4		85.0	79.3	5.57	15.8	3.9	11.0	23.5

		Observation						
Genotype	Location	Observatio	Weight100	Number of	Number of	harvest ag	Ser. Hama	serbulai
1	Gowa	95	308.53	47.0	49	100.4	0.04	0.03
1		94	302.57	47.0	49	101.2	0.03	0.03
1		94	314.76	48.0	50	101.4	0.03	0.01
1		93	303.99	48.0	50	103.9	0.02	0.02
1		95	321.12	46.0	48	111.0	0.05	0.03
1		95	312.27	46.0	48	111.2	0.05	0.02
1		98	295.08	47.0	47	91.2	0.05	0.04
2		94	312.71	48.0	48	100.8	0.02	0.02
2		93	316.55	48.0	48	100.6	0.03	0.03
2		94	316.55	48.0	49	103.4	0.01	0.03
2		87	313.07	49.0	49	105.6	0.03	0.02
2		93	272.54	48.0	47	109.2	0.04	0.05
2		86	328.10	48.0	48	111.4	0.05	0.04
2		98	308.83	46.0	47	92.4	0.05	0.07
3		89	301.55	49.0	50	101.2	0.04	0.03
3		92	320.00	49.0	49	102.8	0.05	0.02
3		97	303.31	49.0	48	103.4	0.03	0.02
3		85	310.62	47.0	50	106.2	0.04	0.03
3		86	307.48	48.0	48	110.0	0.05	0.07
3		91	321.98	49.0	50	109.0	0.05	0.04
3		94	298.26	47.0	45	91.4	0.08	0.01
4		96	307.84	48.0	49	101.0	0.02	0.03
4		93	312.71	48.0	48	101.4	0.03	0.03
4		90	304.35	49.0	47	101.8	0.02	0.02
4		91	306.45	48.0	49	104.2	0.02	0.02
4		79	310.63	48.0	47	109.0	0.06	0.04
4		84	292.99	49.0	48	109.2	0.03	0.03
4		84	304.60	47.0	47	92.2	0.05	0.07
1	Takalar	92.0	283.62	46.0	48.00	101.9	0.05	0.02
1		91.0	285.93	47.0	49.00	102.7	0.04	0.03
1		94.0	295.80	48.0	49.00	102.9	0.04	0.02
1		93.0	309.53	46.0	49.00	105.9	0.05	0.03
1		95.0	291.53	45.0	47.00	112.5	0.06	0.02
1		95.0	305.29	46.0	48.00	112.7	0.06	0.03
1		98.0	290.21	45.0	47.00	92.7	0.07	0.05
2		94.0	296.82	48.0	49.00	102.3	0.04	0.02
2		93.0	278.26	46.0	49.00	102.1	0.05	0.03
2		94.0	297.88	47.0	50.00	104.9	0.05	0.02
2		89.0	289.55	48.0	49.00	107.1	0.04	0.03
2		93.0	287.16	48.0	49.00	110.7	0.06	0.05
2		86.0	280.33	48.0	48.00	112.9	0.05	0.05
2		98.0	277.54	47.0	47.00	93.9	0.08	0.07
3		90.0	304.94	49.0	49.00	102.7	0.04	0.03
3		92.0	298.53	48.0	49.00	104.3	0.06	0.03
3		94.0	279.67	49.0	50.00	104.9	0.06	0.03
3		85.0	307.41	48.0	50.00	107.7	0.05	0.03
3		88.0	290.54	46.0	49.00	109.0	0.07	0.06

		Observation						
Genotype	Location	Observatio	Weight100	Number of	Number of	harvest ag	Ser. Hama	serbulai
3	Takalar	91.0	258.00	49.0	49.00	110.5	0.06	0.05
3		94.0	281.56	46.0	46.00	94.0	0.08	0.07
4		95.0	308.12	48.0	48.00	102.5	0.04	0.02
4		93.0	286.59	48.0	49.00	102.9	0.04	0.03
4		90.0	297.16	47.0	48.00	103.3	0.05	0.02
4		91.0	295.80	47.0	48.00	105.7	0.05	0.03
4		79.0	309.53	46.0	49.00	110.5	0.07	0.04
4		90.0	288.34	46.0	47.00	110.7	0.06	0.04
4		86.0	259.02	45.0	49.00	93.7	0.08	0.06
1	Bantaeng	87.4	264.10	45.0	47.0	108.5	0.030	0.030
1		86.5	269.78	44.0	46.0	108.3	0.050	0.030
1		89.3	278.57	45.0	46.0	108.8	0.050	0.030
1		88.4	296.97	43.0	46.0	111.7	0.060	0.040
1		86.0	264.97	42.0	46.0	114.5	0.070	0.060
1		90.3	286.44	44.0	45.0	114.9	0.070	0.060
1		80.0	268.78	42.0	44.0	98.4	0.080	0.080
2		89.3	281.11	45.0	47.0	106.8	0.040	0.030
2		88.4	266.47	43.0	44.0	106.6	0.040	0.030
2		89.3	268.44	44.0	47.0	109.6	0.050	0.030
2		84.6	278.82	45.0	46.0	111.9	0.040	0.040
2		88.4	276.01	45.0	43.0	112.8	0.060	0.060
2		81.7	274.36	45.0	47.0	115.1	0.050	0.060
2		88.0	276.07	44.0	44.0	97.9	0.080	0.080
3		85.5	285.57	47.0	47.0	107.3	0.040	0.040
3		87.4	285.36	46.0	46.0	109.0	0.050	0.040
3		89.3	254.50	46.0	47.0	109.6	0.050	0.040
3		84.0	291.68	45.0	47.0	112.6	0.050	0.040
3		83.6	268.32	43.0	44.0	113.6	0.070	0.060
3		86.5	258.73	46.0	46.0	112.5	0.070	0.060
3		85.0	278.08	43.0	43.0	96.9	0.090	0.080
4		90.3	293.44	44.0	45.0	107.1	0.040	0.030
4		88.4	256.24	45.0	46.0	107.5	0.050	0.040
4		85.5	281.96	44.0	45.0	107.9	0.040	0.030
4		86.5	278.57	44.0	45.0	110.5	0.050	0.040
4		80.0	277.78	43.0	46.0	112.5	0.060	0.050
4		85.5	263.41	45.0	47.0	112.8	0.060	0.050
4		81.7	256.74	42.0	46.0	97.7	0.080	0.070
1	Maros	90.2	268.74	47.0	47.0	104.7	0.03	0.02
1		89.2	275.18	49.0	50.0	104.1	0.03	0.02
1		92.1	283.20	49.0	49.0	101.8	0.03	0.02
1		91.1	298.90	48.0	50.0	104.7	0.04	0.03
1		91.1	259.34	46.0	48.0	105.8	0.05	0.04
1		90.2	291.29	47.0	49.0	107.9	0.04	0.03
1		96.0	272.05	46.0	47.0	95.0	0.06	0.05
2		92.1	285.65	47.0	49.0	102.0	0.04	0.02
2		91.1	271.51	47.0	47.0	101.1	0.03	0.02
2		92.1	273.91	48.0	48.0	102.6	0.04	0.02
2		87.2	282.94	47.0	50.0	104.9	0.03	0.03

		Observation						
Genotype	Location	Observatio	Weight100	Number of	Number of	harvest ag	Ser. Hama	serbulai
2	Maros	91.1	265.94	49.0	50.0	105.8	0.06	0.04
2		84.3	283.35	49.0	49.0	106.4	0.06	0.03
2		96.0	279.44	48.0	48.0	95.4	0.07	0.05
3		88.2	290.45	48.0	50.0	100.3	0.05	0.01
3		90.2	279.92	49.0	49.0	102.0	0.04	0.01
3		92.1	259.47	50.0	49.0	102.6	0.04	0.01
3		83.3	296.34	49.0	51.0	105.6	0.06	0.02
3		86.2	285.35	47.0	50.0	106.6	0.07	0.02
3		89.2	257.82	50.0	51.0	104.9	0.07	0.02
3		92.1	281.62	47.0	47.0	95.3	0.09	0.04
4		93.1	292.97	50.0	51.0	101.5	0.03	0.03
4		91.1	275.65	49.0	50.0	102.4	0.04	0.02
4		88.2	286.47	48.0	49.0	100.9	0.04	0.03
4		89.2	283.20	48.0	49.0	103.5	0.05	0.02
4		84.3	281.97	47.0	48.0	105.5	0.07	0.04
4		88.2	277.77	47.0	48.0	103.4	0.05	0.03
4		84.3	259.94	46.0	50.0	92.2	0.08	0.05
1	Lombok (N	96.0	241.24	49.0	50.0	99.6	0.02	0.01
1		94.0	239.86	48.0	49.0	100.4	0.01	0.03
1		96.0	240.91	48.0	50.0	100.8	0.01	0.01
1		95.0	254.21	47.0	49.0	105.0	0.01	0.02
1		94.0	231.10	47.0	47.0	109.8	0.04	0.01
1		96.0	242.05	48.0	48.0	110.4	0.07	0.03
1		96.0	212.29	49.0	49.0	92.2	0.04	0.01
2		93.0	244.28	48.0	49.0	99.8	0.04	0.02
2		95.0	245.20	48.0	48.0	100.0	0.04	0.02
2		96.0	249.23	49.0	49.0	101.0	0.03	0.03
2		94.0	256.69	48.0	48.0	105.0	0.03	0.02
2		97.0	232.04	47.0	47.0	110.0	0.01	0.04
2		95.0	242.29	49.0	49.0	111.0	0.08	0.03
2		97.0	224.27	49.0	49.0	93.6	0.12	0.02
3		94.0	243.91	49.0	49.0	100.4	0.04	0.03
3		95.0	233.92	48.0	48.0	101.6	0.04	0.03
3		95.0	244.18	49.0	49.0	101.8	0.03	0.02
3		96.0	244.23	48.0	48.0	105.4	0.03	0.04
3		94.0	247.92	48.0	48.0	111.2	0.04	0.08
3		96.0	249.92	48.0	48.0	110.2	0.04	0.03
3		95.0	246.38	49.0	49.0	91.8	0.09	0.05
4		93.0	237.47	49.0	49.0	100.2	0.03	0.02
4		94.0	235.03	48.0	48.0	100.8	0.04	0.03
4		97.0	239.18	48.0	48.0	102.2	0.03	0.03
4		94.0	235.28	47.0	47.0	104.8	0.03	0.04
4		92.0	222.87	47.0	47.0	110.8	0.06	0.05
4		92.0	231.39	48.0	48.0	111.4	0.05	0.07
4		95.0	235.82	49.0	49.0	92.6	0.08	0.07
1	Kediri	94.0	307.11	48.0	49.0	100.0	0.03	0.02
1		93.0	316.49	48.0	49.0	101.0	0.02	0.02
1		93.0	299.99	49.0	50.0	101.0	0.03	0.02

		Observation						
Genotype	Location	Observatio	Weight100	Number of	Number of	harvest ag	Ser. Hama	serbulai
1	Kediri	91.0	318.74	48.0	49.0	103.8	0.02	0.03
1		94.0	316.87	47.0	48.0	110.6	0.04	0.04
1		88.0	317.44	48.0	49.0	110.6	0.04	0.03
1		98.0	302.77	48.0	48.0	91.8	0.05	0.06
2		92.0	327.18	49.0	50.0	100.4	0.02	0.02
2		93.0	342.94	48.0	49.0	100.0	0.03	0.03
2		95.0	337.02	48.0	50.0	102.8	0.02	0.03
2		75.0	353.80	49.0	48.0	106.0	0.03	0.02
2		92.0	323.31	48.0	48.0	110.4	0.04	0.03
2		84.0	326.99	48.0	50.0	111.4	0.05	0.03
2		99.0	321.62	47.0	47.0	93.0	0.06	0.06
3		86.0	337.72	48.0	49.0	101.0	0.04	0.03
3		91.0	290.97	49.0	48.0	102.4	0.05	0.03
3		97.0	324.20	49.0	50.0	102.4	0.03	0.03
3		84.0	286.18	49.0	49.0	106.2	0.04	0.04
3		85.0	309.81	48.0	49.0	112.0	0.05	0.08
3		90.0	324.91	49.0	47.0	109.8	0.05	0.04
3		95.0	324.54	47.0	47.0	92.2	0.08	0.08
4		95.0	266.31	48.0	49.0	100.6	0.02	0.02
4		91.0	276.75	48.0	49.0	101.8	0.03	0.02
4		82.0	280.19	49.0	48.0	102.4	0.02	0.03
4		91.0	260.43	48.0	48.0	105.6	0.02	0.03
4		73.0	248.83	48.0	48.0	110.0	0.04	0.04
4		85.0	263.81	49.0	49.0	111.6	0.03	0.04
4		85.0	243.23	47.0	49.0	93.0	0.05	0.08

		Observation						
Genotype	Location	Observatio	appearanc	Closing of t	Snuff the h	Seed rowe	Dampen th	Lower the
1	Gowa	95	2.0	2.0	1.6	1.4	0.02	0.03
1		94	2.2	2.2	1.6	1.6	0.01	0.03
1		94	2.2	2.2	1.4	1.4	0.02	0.02
1		93	2.0	2.2	1.6	1.4	0.02	0.03
1		95	2.4	2.6	1.8	1.8	0.04	0.04
1		95	2.4	2.2	1.6	1.6	0.03	0.04
1		98	2.2	1.2	1.6	1.8	0.06	0.06
2		94	2.2	2.2	1.8	1.6	0.03	0.02
2		93	2.4	2.2	1.6	1.4	0.02	0.02
2		94	2.4	2.2	1.6	1.4	0.02	0.03
2		87	2.2	2.2	1.4	1.6	0.02	0.03
2		93	2.4	2.4	1.8	1.8	0.04	0.04
2		86	2.6	2.4	1.8	1.8	0.04	0.05
2		98	2.6	1.4	1.6	2.0	0.06	0.06
3		89	2.2	2.2	1.4	1.4	0.02	0.01
3		92	2.0	2.2	1.6	1.6	0.01	0.03
3		97	2.2	2.4	1.6	1.6	0.02	0.04
3		85	2.4	2.2	1.8	1.6	0.02	0.03
3		86	2.2	2.4	2.0	2.0	0.03	0.04
3		91	2.2	2.6	1.8	1.6	0.03	0.04
3		94	2.6	1.6	1.6	2.0	0.05	0.07
4		96	2.2	2.4	1.6	1.4	0.01	0.01
4		93	2.2	2.2	1.6	1.4	0.01	0.03
4		90	2.4	2.2	1.8	1.6	0.01	0.01
4		91	2.2	2.4	1.6	1.6	0.02	0.03
4		79	2.6	2.4	1.8	1.6	0.04	0.04
4		84	2.4	2.6	1.6	1.6	0.05	0.06
4		84	2.6	1.6	1.6	2.0	0.06	0.07
1	Takalar	92.0	1.8	2.0	1.4	1.2	0.03	0.02
1		91.0	1.8	2.4	1.4	1.4	0.02	0.02
1		94.0	1.8	2.2	1.2	1.2	0.02	0.01
1		93.0	2.2	2.2	1.4	1.2	0.02	0.03
1		95.0	2.2	2.4	1.6	1.6	0.03	0.03
1		95.0	2.0	2.2	1.4	1.4	0.03	0.04
1		98.0	2.2	1.4	1.4	1.6	0.07	0.08
2		94.0	2.0	2.0	1.6	1.4	0.02	0.02
2		93.0	2.4	2.2	1.4	1.2	0.03	0.03
2		94.0	2.6	2.0	1.4	1.2	0.03	0.02
2		89.0	2.0	2.0	1.2	1.4	0.03	0.03
2		93.0	2.2	2.4	1.6	1.6	0.04	0.05
2		86.0	2.4	2.4	1.6	1.6	0.03	0.04
2		98.0	2.4	1.6	1.4	1.8	0.06	0.07
3		90.0	2.0	2.2	1.2	1.2	0.02	0.01
3		92.0	1.8	2.2	1.4	1.4	0.01	0.02
3		94.0	1.8	2.2	1.4	1.4	0.02	0.03
3		85.0	2.0	2.0	1.6	1.4	0.03	0.02
3		88.0	2.2	2.2	1.8	1.8	0.04	0.05

		Observation						
Genotype	Location	Observatio	appearanc	Closing of t	Snuff the h	Seed rowe	Dampen th	Lower the
3	Takalar	91.0	2.2	2.4	1.6	1.4	0.04	0.05
3		94.0	2.2	1.4	1.4	1.8	0.07	0.06
4		95.0	2.0	2.2	1.4	1.2	0.02	0.01
4		93.0	1.8	2.2	1.4	1.2	0.02	0.02
4		90.0	2.0	2.0	1.6	1.4	0.02	0.02
4		91.0	1.8	2.4	1.4	1.4	0.04	0.03
4		79.0	2.4	2.4	1.6	1.4	0.04	0.05
4		90.0	2.0	2.4	1.4	1.4	0.05	0.05
4		86.0	2.4	1.2	1.4	1.8	0.08	0.07
1	Bantaeng	87.4	1.6	2.0	1.2	1.2	0.02	0.03
1		86.5	1.8	2.2	1.2	1.4	0.03	0.03
1		89.3	1.8	2.2	1.0	1.2	0.03	0.02
1		88.4	1.6	2.0	1.2	1.0	0.03	0.04
1		86.0	2.2	2.0	1.4	1.2	0.04	0.04
1		90.3	1.8	2.2	1.2	1.4	0.04	0.05
1		80.0	2.0	1.2	1.2	1.2	0.08	0.07
2		89.3	1.2	2.0	1.4	1.4	0.03	0.03
2		88.4	1.6	2.0	1.4	1.2	0.04	0.04
2		89.3	1.4	2.2	1.2	1.2	0.04	0.03
2		84.6	1.2	2.0	1.2	1.2	0.04	0.04
2		88.4	1.6	2.2	1.2	1.4	0.05	0.06
2		81.7	1.0	2.0	1.2	1.2	0.04	0.05
2		88.0	1.6	1.8	1.4	1.8	0.07	0.07
3		85.5	2.0	2.0	1.0	1.2	0.03	0.02
3		87.4	2.0	2.0	1.2	1.2	0.02	0.03
3		89.3	2.0	2.2	1.2	1.4	0.03	0.04
3		84.0	2.2	2.2	1.4	1.4	0.04	0.03
3		83.6	2.2	2.4	1.4	1.4	0.05	0.06
3		86.5	2.2	2.4	1.2	1.2	0.05	0.06
3		85.0	2.4	1.6	1.4	1.4	0.08	0.07
4		90.3	2.0	2.0	1.2	1.2	0.03	0.02
4		88.4	1.8	2.2	1.2	1.2	0.03	0.02
4		85.5	2.2	2.0	1.2	1.4	0.03	0.02
4		86.5	2.2	2.2	1.2	1.2	0.05	0.03
4		80.0	2.2	2.2	1.4	1.4	0.05	0.05
4		85.5	2.4	2.2	1.4	1.2	0.06	0.05
4		81.7	2.4	1.2	1.4	1.4	0.09	0.07
1	Maros	90.2	2.2	1.8	1.2	1.2	0.01	0.01
1		89.2	2.2	2.0	1.2	1.2	0.01	0.01
1		92.1	2.2	2.0	1.0	1.2	0.01	0.01
1		91.1	2.0	1.8	1.2	1.0	0.01	0.01
1		91.1	2.4	1.8	1.4	1.2	0.01	0.01
1		90.2	2.2	2.0	1.2	1.2	0.01	0.01
1		96.0	2.2	1.2	1.2	1.0	0.03	0.04
2		92.1	1.4	2.0	1.2	1.4	0.01	0.03
2		91.1	1.8	2.0	1.2	1.2	0.02	0.02
2		92.1	1.6	2.2	1.2	1.2	0.02	0.03
2		87.2	1.4	2.0	1.2	1.0	0.03	0.02

		Observation						
Genotype	Location	Observatio	appearanc	Closing of t	Snuff the h	Seed rowe	Dampen th	Lower the
2	Maros	91.1	1.6	2.2	1.2	1.4	0.03	0.04
2		84.3	1.4	2.0	1.2	1.0	0.02	0.02
2		96.0	1.6	1.8	1.4	1.6	0.05	0.04
3		88.2	2.2	2.2	1.0	1.2	0.02	0.02
3		90.2	2.0	2.2	1.2	1.2	0.02	0.02
3		92.1	2.4	2.4	1.2	1.4	0.02	0.03
3		83.3	2.4	2.4	1.4	1.4	0.02	0.02
3		86.2	2.2	2.6	1.4	1.4	0.02	0.02
3		89.2	2.4	2.6	1.0	1.2	0.03	0.03
3		92.1	2.6	1.8	1.2	1.4	0.04	0.07
4		93.1	2.0	2.0	1.2	1.2	0.03	0.02
4		91.1	1.8	2.2	1.2	1.2	0.02	0.02
4		88.2	2.0	2.0	1.2	1.4	0.02	0.01
4		89.2	2.0	2.2	1.2	1.2	0.03	0.01
4		84.3	1.8	2.2	1.4	1.4	0.03	0.02
4		88.2	2.0	2.2	1.4	1.2	0.02	0.02
4		84.3	2.4	1.2	1.4	1.4	0.06	0.01
1	Lombok (N	96.0	1.6	1.8	1.2	1.0	0.01	0.01
1		94.0	1.8	2.2	1.4	1.2	0.01	0.03
1		96.0	1.4	2.0	1.2	1.2	0.02	0.03
1		95.0	1.6	2.0	1.4	1.2	0.01	0.01
1		94.0	1.6	2.2	1.6	1.2	0.03	0.01
1		96.0	1.6	2.2	1.2	1.2	0.01	0.01
1		96.0	1.8	1.2	1.2	1.4	0.02	0.02
2		93.0	1.4	2.0	1.2	1.0	0.01	0.03
2		95.0	1.6	2.2	1.2	1.2	0.03	0.03
2		96.0	1.4	2.0	1.4	1.2	0.02	0.01
2		94.0	1.4	2.0	1.4	1.2	0.02	0.01
2		97.0	1.8	2.2	1.2	1.4	0.03	0.05
2		95.0	1.6	2.2	1.4	1.2	0.04	0.05
2		97.0	1.8	1.0	1.4	1.4	0.05	0.02
3		94.0	1.4	2.0	1.2	1.2	0.02	0.02
3		95.0	1.6	2.0	1.4	1.2	0.01	0.01
3		95.0	1.2	2.0	1.4	1.0	0.02	0.02
3		96.0	1.6	2.2	1.4	1.2	0.02	0.01
3		94.0	1.4	2.2	1.4	1.4	0.03	0.02
3		96.0	1.6	2.2	1.2	1.0	0.01	0.04
3		95.0	1.6	1.0	1.4	1.4	0.04	0.06
4		93.0	1.2	2.2	1.2	1.2	0.02	0.00
4		94.0	1.4	2.2	1.2	1.0	0.01	0.01
4		97.0	1.2	2.0	1.2	1.2	0.02	0.02
4		94.0	1.6	2.0	1.4	1.0	0.02	0.02
4		92.0	1.4	2.2	1.4	1.0	0.02	0.01
4		92.0	1.4	2.2	1.2	1.2	0.03	0.03
4		95.0	1.4	1.2	1.6	1.4	0.02	0.07
1	Kediri	94.0	1.4	2.0	1.2	1.0	0.02	0.02
1		93.0	1.6	2.2	1.4	1.2	0.01	0.03
1		93.0	1.6	2.2	1.4	1.2	0.01	0.02

		Observation						
Genotype	Location	Observatio	appearanc	Closing of t	Snuff the h	Seed rowe	Dampen th	Lower the
1	Kediri	91.0	1.4	1.8	1.6	1.0	0.02	0.02
1		94.0	1.4	2.4	1.8	1.4	0.04	0.03
1		88.0	1.4	2.2	1.4	1.4	0.02	0.03
1		98.0	1.6	1.2	1.2	1.6	0.04	0.05
2		92.0	1.6	2.0	1.4	1.2	0.03	0.02
2		93.0	1.8	2.0	1.2	1.0	0.02	0.01
2		95.0	1.4	2.2	1.2	1.0	0.01	0.02
2		75.0	1.6	2.2	1.2	1.4	0.02	0.02
2		92.0	1.6	2.0	1.4	1.4	0.02	0.04
2		84.0	1.6	2.4	1.6	1.2	0.03	0.05
2		99.0	1.6	1.0	1.6	1.6	0.06	0.02
3		86.0	1.6	2.2	1.4	1.0	0.01	0.01
3		91.0	1.4	1.8	1.2	1.2	0.01	0.01
3		97.0	1.4	2.0	1.2	1.2	0.02	0.01
3		84.0	1.4	2.0	1.4	1.2	0.01	0.01
3		85.0	1.6	2.0	1.6	1.6	0.02	0.01
3		90.0	1.4	2.0	1.4	1.2	0.02	0.02
3		95.0	1.4	1.2	1.6	1.6	0.06	0.07
4		95.0	1.4	2.2	1.2	1.2	0.01	0.01
4		91.0	1.6	2.0	1.4	1.0	0.01	0.01
4		82.0	1.4	2.2	1.4	1.2	0.01	0.01
4		91.0	1.4	2.2	1.2	1.0	0.02	0.03
4		73.0	1.6	2.2	1.6	1.0	0.03	0.04
4		85.0	1.6	2.4	3.4	1.2	0.04	0.03
4		85.0	1.6	1.0	1.6	1.4	0.04	0.06

		Observation							
Genoty	Locatior	Observ	Productic	Rendemen	Water cont	Leaf corner	Stem diamete	Long leaves	Leaf sheet
1	Gowa	95	10.56	79.11	23.4	26.7	2.4	98.4	9.3
1		94	9.94	77.49	23.4	29.7	2.4	99.2	8.3
1		94	9.49	76.26	23.4	24.8	2.1	95.0	8.7
1		93	8.24	78.76	21.8	26.7	2.1	93.7	9.0
1		95	7.53	76.67	23.6	30.6	2.1	95.7	9.0
1		95	9.48	77.03	24.8	28.2	2.1	92.3	9.6
1		98	5.19	73.95	25.0	26.4	2.0	99.0	9.0
2		94	8.98	80.49	22.8	27.8	2.4	97.0	9.7
2		93	9.96	79.43	23.8	28.5	2.4	91.7	9.7
2		94	11.68	78.06	22.4	24.4	2.1	98.3	9.3
2		87	9.24	75.38	24.0	28.3	2.1	99.7	9.6
2		93	7.85	77.05	24.6	27.8	2.1	89.0	9.2
2		86	9.45	76.67	22.6	28.5	2.4	95.0	9.7
2		98	5.09	75.34	26.4	27.6	2.0	97.7	8.3
3		89	8.88	80.37	24.0	30.2	2.1	99.0	9.0
3		92	9.34	79.65	22.8	27.0	2.1	98.3	9.7
3		97	8.26	78.43	25.6	29.2	2.4	94.3	9.3
3		85	8.39	77.69	22.8	29.3	2.4	93.7	9.6
3		86	6.82	78.85	25.2	27.7	2.4	89.0	9.7
3		91	9.72	79.59	24.0	30.7	2.4	92.3	9.0
3		94	5.25	75.99	25.2	24.2	2.1	91.0	9.7
4		96	8.61	79.55	22.6	29.5	2.1	95.7	9.7
4		93	9.38	77.44	24.0	28.6	2.1	93.0	9.7
4		90	8.27	80.50	22.4	28.3	2.4	89.7	10.0
4		91	8.63	78.52	23.4	30.3	2.4	90.3	9.7
4		79	6.83	76.10	24.8	28.1	2.1	93.0	9.4
4		84	9.63	78.52	23.6	30.3	2.1	97.0	9.2
4		84	5.55	75.19	25.4	24.35	2.1	89.7	9.0
1	Takalar	92.0	10.34	79.45	24.6	27.1	2.3	94.3	9.7
1		91.0	10.79	78.50	23.4	25.8	2.3	97.0	9.0
1		94.0	11.86	79.31	23.5	25.8	2.1	95.7	9.7
1		93.0	8.44	74.44	22.3	27.8	2.2	97.0	9.0
1		95.0	9.52	76.10	23.9	27.8	2.3	91.0	8.7
1		95.0	9.89	76.61	25.7	25.8	2.6	91.0	9.0
1		98.0	5.59	75.30	25.3	26.4	2.2	91.0	9.1
2		94.0	9.64	77.97	23.0	27.8	2.6	95.0	9.7
2		93.0	10.46	76.76	21.9	26.4	2.6	97.7	9.3
2		94.0	14.15	78.38	24.2	27.1	2.3	90.3	9.5
2		89.0	9.12	79.35	24.4	26.4	2.3	91.0	9.5
2		93.0	8.20	75.04	22.8	26.4	2.3	97.0	9.3
2		86.0	10.01	78.75	25.0	27.1	2.3	94.3	9.7
2		98.0	5.28	74.61	25.3	27.8	2.3	93.7	9.3
3		90.0	8.86	80.71	24.1	27.1	2.4	89.7	9.6
3		92.0	9.28	74.63	22.1	26.4	2.3	95.7	9.7
3		94.0	8.76	77.12	23.2	27.1	2.6	90.3	9.6
3		85.0	9.04	76.33	22.8	25.8	2.4	92.3	9.5
3		88.0	7.21	77.47	24.4	27.1	2.2	94.3	9.7

		Observation							
Genoty	Locatior	Observ	Productic	Rendemen	Water cont	Leaf corner	Stem diamete	Long leaves	Leaf sheet
3	Takalar	91.0	8.36	77.61	24.6	25.8	2.3	95.0	9.7
3		94.0	5.57	77.40	27.8	27.1	2.2	93.0	9.3
4		95.0	9.17	78.12	22.5	25.8	2.4	97.7	9.6
4		93.0	9.69	79.75	24.0	27.8	2.6	97.7	9.7
4		90.0	8.93	76.69	22.8	27.8	2.3	91.0	9.7
4		91.0	8.64	77.80	23.5	27.1	2.3	95.7	9.7
4		79.0	7.10	77.56	22.7	27.8	2.3	95.7	9.2
4		90.0	9.57	80.79	24.8	26.4	2.6	91.0	9.3
4		86.0	5.82	75.20	23.9	27.8	2.3	93.0	9.1
1	Bantaen	87.4	6.75	79.78	25.0	25.8	2.3	97.7	9.0
1		86.5	7.09	77.11	23.8	26.4	2.5	95.7	9.7
1		89.3	7.07	79.59	23.9	25.8	2.3	99.0	9.0
1		88.4	5.69	75.22	22.1	27.1	2.3	91.7	9.0
1		86.0	4.88	74.11	24.0	27.1	2.3	97.7	8.7
1		90.3	6.58	78.40	24.3	27.1	2.3	91.0	8.7
1		80.0	3.93	73.55	28.1	27.1	2.3	94.3	8.7
2		89.3	6.42	76.59	23.4	26.4	2.5	96.3	9.7
2		88.4	8.36	75.40	22.3	26.4	2.4	92.3	9.3
2		89.3	7.97	79.45	25.7	26.4	2.4	93.0	9.3
2		84.6	5.24	78.62	21.8	26.4	2.5	97.7	9.7
2		88.4	5.54	78.28	24.4	27.1	2.4	95.0	9.3
2		81.7	5.52	77.35	26.8	27.1	2.3	91.7	9.0
2		88.0	3.71	75.12	25.7	25.8	2.3	94.3	9.0
3		85.5	5.78	78.27	24.5	25.8	2.5	95.7	9.7
3		87.4	6.26	78.69	22.5	27.1	2.3	89.7	8.7
3		89.3	5.50	75.75	27.2	27.1	2.5	92.3	9.7
3		84.0	6.04	79.18	23.2	25.8	2.4	91.0	9.3
3		83.6	4.48	77.92	25.8	27.1	2.3	91.7	8.7
3		86.5	5.72	75.82	31.4	25.8	2.5	95.7	9.7
3		85.0	3.88	76.03	26.5	27.1	2.4	89.7	9.3
4		90.3	6.15	77.14	22.9	26.4	2.4	93.0	9.3
4		88.4	5.93	78.34	28.8	27.1	2.3	92.3	9.0
4		85.5	5.95	75.33	23.2	25.8	2.5	97.0	9.7
4		86.5	6.13	77.33	23.9	27.1	2.5	93.0	9.7
4		80.0	4.78	77.10	23.3	26.4	2.3	92.3	9.0
4		85.5	6.41	78.83	26.8	27.1	2.5	94.3	9.7
4		81.7	3.94	73.58	29.7	25.8	2.2	93.0	9.3
1	Maros	90.2	10.03	78.34	22.4	25.8	2.3	97.0	8.7
1		89.2	10.40	79.29	21.3	26.4	2.3	93.7	9.7
1		92.1	10.36	80.13	21.4	27.8	2.3	94.3	9.7
1		91.1	8.37	77.05	24.1	26.4	2.7	92.3	8.7
1		91.1	6.63	76.83	25.0	27.1	2.3	96.3	9.0
1		90.2	9.65	78.03	25.2	26.4	2.7	95.0	8.7
1		96.0	5.71	75.15	25.8	27.1	2.2	97.0	8.7
2		92.1	9.40	78.75	20.9	27.8	2.5	98.3	10.0
2		91.1	12.22	77.53	20.0	26.4	2.4	93.0	9.7
2		92.1	11.77	79.21	25.1	26.4	2.4	94.3	8.7
2		87.2	7.65	75.44	22.9	27.1	2.3	99.0	8.7

		Observation							
Genoty	Locatior	Observ	Productic	Rendemen	Water cont	Leaf corner	Stem diamete	Long leaves	Leaf sheet
2	Maros	91.1	7.30	77.33	24.5	25.8	2.4	97.7	8.7
2		84.3	8.13	79.54	24.0	27.1	2.3	92.3	9.0
2		96.0	5.39	76.31	23.5	25.8	2.3	91.7	9.3
3		88.2	8.31	77.72	21.9	26.4	2.6	98.3	9.0
3		90.2	8.55	78.16	23.3	25.8	2.3	93.0	10.0
3		92.1	8.12	77.89	24.3	25.8	2.4	98.3	9.0
3		83.3	8.84	77.10	20.8	26.4	2.3	97.0	9.0
3		86.2	7.18	78.26	22.4	25.8	2.7	93.0	9.7
3		89.2	8.05	77.96	23.5	27.1	2.3	94.3	9.7
3		92.1	5.64	75.38	25.3	26.4	2.3	92.3	8.7
4		93.1	8.51	81.66	22.1	26.4	2.5	93.0	9.3
4		91.1	9.09	80.55	24.2	27.1	2.6	93.7	9.3
4		88.2	8.71	77.45	20.8	25.8	2.5	95.7	8.7
4		89.2	9.00	79.51	21.4	27.1	2.3	94.3	8.7
4		84.3	6.99	76.49	21.7	27.1	2.4	99.7	8.7
4		88.2	9.44	78.90	22.8	27.8	2.7	94.3	8.7
4		84.3	5.73	77.04	25.0	27.8	2.3	91.0	9.7
1	Lombok	96.0	10.22	79.52	24.8	27.8	2.3	97.0	8.7
1		94.0	10.98	75.72	22.8	25.8	2.4	91.0	9.3
1		96.0	9.35	78.54	24.6	25.8	2.5	99.0	10.0
1		95.0	9.81	79.69	28.1	27.8	2.2	91.0	8.7
1		94.0	10.28	75.97	23.0	27.8	2.4	94.3	9.3
1		96.0	10.34	78.86	26.5	26.4	2.5	90.3	9.7
1		96.0	6.04	76.31	24.6	27.8	2.4	93.7	9.3
2		93.0	8.89	80.21	23.2	25.8	2.5	99.0	10.0
2		95.0	11.65	79.49	25.7	25.8	2.5	93.0	10.0
2		96.0	10.40	80.38	25.5	27.8	2.3	97.7	9.0
2		94.0	9.83	76.62	21.9	25.8	2.4	98.3	9.3
2		97.0	8.40	74.46	22.8	27.1	2.5	99.0	10.0
2		95.0	10.19	80.66	24.8	27.1	2.4	97.0	9.3
2		97.0	4.62	72.14	25.7	25.8	2.2	98.3	8.7
3		94.0	9.21	79.13	22.7	27.8	2.4	96.3	9.3
3		95.0	8.95	78.06	23.7	26.4	2.3	98.3	9.0
3		95.0	9.16	77.71	22.5	27.8	2.5	91.7	9.7
3		96.0	8.94	77.14	24.8	26.4	2.3	93.7	9.0
3		94.0	8.91	74.68	25.6	27.8	2.2	91.0	8.7
3		96.0	9.00	76.82	23.7	27.8	2.5	96.3	9.7
3		95.0	6.24	74.22	25.9	25.8	2.2	91.0	8.7
4		93.0	9.91	77.61	21.5	26.4	2.3	98.3	9.0
4		94.0	9.41	78.31	24.2	26.4	2.3	98.3	9.0
4		97.0	8.59	78.08	22.5	25.8	2.3	94.3	9.0
4		94.0	9.26	76.09	20.6	26.4	2.2	96.3	8.7
4		92.0	9.26	78.89	24.8	26.4	2.3	97.0	9.0
4		92.0	8.72	78.06	24.3	26.4	2.2	91.0	8.7
4		95.0	5.92	72.28	24.0	25.8	2.5	91.0	10.0
1	Kediri	94.0	9.18	78.24	24.8	27.1	2.4	97.0	9.7
1		93.0	9.79	73.72	25.8	25.1	2.4	97.5	8.7
1		93.0	10.03	77.14	24.0	26.4	2.3	93.9	9.3

		Observation							
Genoty	Locatior	Observ	Productic	Rendemen	Water cont	Leaf corner	Stem diamete	Long leaves	Leaf sheet
1	Kediri	91.0	9.21	74.44	22.4	26.4	2.4	94.3	9.7
1		94.0	8.44	79.76	24.3	26.4	2.2	92.0	9.0
1		88.0	9.27	77.29	25.3	25.8	2.4	96.3	9.7
1		98.0	3.48	73.69	25.2	24.4	2.0	92.3	8.3
2		92.0	9.63	80.39	22.5	26.4	2.4	96.3	9.7
2		93.0	9.81	77.45	20.6	26.4	2.1	96.3	8.7
2		95.0	9.00	75.30	25.0	24.4	2.5	97.2	10.0
2		75.0	8.12	74.11	24.0	24.4	2.5	91.0	10.0
2		92.0	9.95	77.86	25.3	24.4	2.5	96.1	10.0
2		84.0	10.15	79.55	23.7	24.4	2.2	97.0	9.0
2		99.0	5.66	75.55	26.0	25.1	2.3	91.7	9.3
3		86.0	9.52	78.98	25.0	25.8	2.3	97.8	9.3
3		91.0	9.11	81.14	24.2	24.4	2.4	95.7	8.7
3		97.0	10.31	78.17	26.6	27.1	2.5	95.5	10.0
3		84.0	9.15	78.35	22.3	26.4	2.1	94.3	8.7
3		85.0	7.72	79.59	24.2	26.4	2.2	96.3	9.0
3		90.0	9.12	80.11	27.0	25.1	2.5	95.9	10.0
3		95.0	7.56	72.59	27.1	27.1	2.0	96.3	8.3
4		95.0	11.22	81.20	25.6	25.8	2.5	96.3	10.0
4		91.0	9.62	80.43	26.3	25.1	2.3	96.3	9.3
4		82.0	10.17	77.29	21.4	27.1	2.3	95.4	9.3
4		91.0	8.74	77.29	21.4	25.1	2.1	91.0	8.7
4		73.0	7.00	76.06	26.5	25.1	2.2	94.3	9.0
4		85.0	9.02	76.94	23.6	24.4	2.5	98.3	10.0
4		85.0	6.86	74.72	23.7	25.8	2.0	90.3	8.3

8. Bukti konfirmasi submit revisi keempat, respon kepada reviewer, dan file supplementary diresubmit

(1 Maret 2024)

Email kedelapan

Dari: **Arunachalam Anbalagan** <arunachalam.anbalagan@hindawi.com>
Tanggal: Jum, 1 Mar 2024 pukul 14.49
Subjek: Re: 5511045: Author Data Needed
Ke: <edy@umi.ac.id>

Dear Dr. Edy,

Thank you for your email,

Kindly address the overlap concern in your supplementary file, so that we can proceed further,

I have attache the screenshot of the overlap concern, for your reference.

S153 Umur 28 DA (Malang)

Genotype	Replicate				
	I	II	III	IV	Rataan
JPI-1	9.1	9.2	10.0	8.5	9.2
JPI-2	10.4	10.7	9.9	9.8	10.2
JPI-3	8.4	9.0	8.3	7.8	8.4
JPI-4	9.0	8.6	8.5	8.6	8.7
Pulut Uri	9.6	9.3	8.8	9.1	9.2
Srikandi Putih	8.4	8.8	7.9	8.4	8.4
Pulut lokal	11.0	9.2	10.0	10.1	10.1
Anoman	72.5	72.5	74.3	68.4	71.9

S154 Umur 35 DA (Malang)

Genotype	Replicate				
	I	II	III	IV	Rataan
JPI-1	9.9	8.9	9.7	10.0	9.6
JPI-2	11.1	10.3	10.7	9.6	10.4
JPI-3	9.8	9.8	10.1	9.3	9.8
JPI-4	19.0	18.1	17.3	17.6	18.0
Pulut Uri	10.6	10.3	11.3	10.2	10.6
Srikandi Putih	10.0	9.1	9.2	8.4	9.2
Pulut lokal	25.4	27.1	24.2	25.0	25.4
Anoman	80.3	80.6	77.9	79.5	79.6

S155 Umur 42 HS (Malang)

Genotip	Ulangan				
	I	II	III	IV	Rataan
JPI-1	9.9	8.9	9.7	10.0	9.6
JPI-2	11.1	10.3	10.7	9.6	10.4
JPI-3	9.8	9.8	10.1	9.3	9.8
JPI-4	19.0	18.1	17.3	17.6	18.0
Pulut Uri	10.6	10.3	11.3	10.2	10.6
Srikandi Putih	10.0	9.1	9.2	8.4	9.2
Pulut lokal	25.4	27.1	24.2	25.0	25.4
Anoman	82.2	86.2	80.5	86.1	83.7

SS 161 Leaf
Umur 60 D
Genotype
JPI-1
JPI-2
JPI-3
JPI-4
Pulut Uri
Srikandi Pu
Pulut lokal
Anoman

SS 162 Leaf
Umur 70 D
Genotype
JPI-1
JPI-2
JPI-3
JPI-4
Pulut Uri
Srikandi Pu
Pulut lokal
Anoman

SS 163 Ave
Genotype
JPI-1
JPI-2
JPI-3
JPI-4
Pulut Uri
Srikandi Pu
Pulut lokal
Anoman

Bukti revisi file supplementary keempat

Data Gowa

S1 Growth percentage (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	95	94	89	96	93.5
JPI-2	94	93	92	93	93.0
JPI-3	94	94	97	90	93.8
JPI-4	93	87	85	91	89.0
JPI-5	95	93	86	79	88.3
JPI-6	95	86	91	84	89.0
JPI-7	98	98	94	84	93.5

S2 Male flower age (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	58	56	55	56	56.3
JPI-2	57	57	56	56	56.5
JPI-3	55	56	57	57	56.3
JPI-4	57	56	56	55	56.0
JPI-5	54	57	56	56	55.8
JPI-6	59	58	57	57	57.8
JPI-7	52	53	51	51	51.8

S3 Pest attack (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.04	0.02	0.04	0.02	0.03
JPI-2	0.03	0.03	0.05	0.03	0.035
JPI-3	0.03	0.01	0.03	0.02	0.0225
JPI-4	0.02	0.03	0.04	0.02	0.0275
JPI-5	0.05	0.04	0.05	0.06	0.05
JPI-6	0.05	0.05	0.05	0.03	0.045
JPI-7	0.05	0.05	0.08	0.05	0.0575

S4 Cob diameter (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	4.7	4.7	4.8	4.7	4.8
JPI-2	4.4	4.9	4.7	4.7	4.7
JPI-3	4.6	5.0	4.4	4.7	4.7
JPI-4	4.4	4.4	4.5	4.4	4.4
JPI-5	4.2	4.5	4.1	4.1	4.2
JPI-6	4.8	4.9	5.0	5.0	4.9
JPI-7	3.7	3.7	3.7	3.5	3.6

S5 Harvest time (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	100.4	100.8	101.2	101.0	100.9
JPI-2	101.2	100.6	102.8	101.4	101.5
JPI-3	101.4	103.4	103.4	101.8	102.5
JPI-4	103.9	105.6	106.2	104.2	105.0
JPI-5	111.0	109.2	110.0	109.0	109.8
JPI-6	111.2	111.4	109.0	109.2	110.2
JPI-7	91.2	92.4	91.4	92.2	91.8

S6 Cob closure

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	2.0	2.2	2.2	2.4	2.2
JPI-2	2.2	2.2	2.2	2.2	2.2
JPI-3	2.2	2.2	2.4	2.2	2.25
JPI-4	2.2	2.2	2.2	2.4	2.25
JPI-5	2.6	2.4	2.4	2.4	2.45
JPI-6	2.2	2.4	2.6	2.6	2.45
JPI-7	1.2	1.4	1.6	1.6	1.45

S7 Number of plants 2 middle rows

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	47.0	48.0	49.0	48.0	48.0
JPI-2	47.0	48.0	49.0	48.0	48.0
JPI-3	48.0	48.0	49.0	49.0	48.5
JPI-4	48.0	49.0	47.0	48.0	48.0
JPI-5	46.0	48.0	48.0	48.0	47.5
JPI-6	46.0	48.0	49.0	49.0	48.0
JPI-7	47.0	46.0	47.0	47.0	46.8

S8 Cob appearance

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.6	1.8	1.4	1.6	1.6
JPI-2	1.6	1.6	1.6	1.6	1.6
JPI-3	1.4	1.6	1.6	1.8	1.6
JPI-4	1.6	1.4	1.8	1.6	1.6
JPI-5	1.8	1.8	2.0	1.8	1.9
JPI-6	1.6	1.8	1.8	1.6	1.7
JPI-7	1.6	1.6	1.6	1.6	1.6

S9 Plant height (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI -1	217.4	209	216.8	207.4	212.65
JPI -2	223.8	220.6	198.8	209.6	213.2
JPI -3	189	228.2	209.8	214.8	210.45
JPI -4	196	174.2	204.4	193.2	191.95
JPI -5	196.2	178.4	178.4	182.2	183.8
JPI -6	204.6	214.6	225.6	226.2	217.75
JPI -7	207	208.6	205.6	197.8	204.75

S10 Female flower age (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	60	57	57	57	57.8
JPI-2	58	59	58	58	58.3
JPI-3	57	58	58	58	57.8
JPI-4	59	58	58	57	58.0
JPI-5	56	59	58	58	57.8
JPI-6	63	60	59	59	60.3
JPI-7	54	55	52	53	53.5

S11 Downy mildew attact (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.03	0.02	0.03	0.03	0.0275
JPI-2	0.03	0.03	0.02	0.03	0.0275
JPI-3	0.01	0.03	0.02	0.02	0.02
JPI-4	0.02	0.02	0.03	0.02	0.0225
JPI-5	0.03	0.05	0.07	0.04	0.0475
JPI-6	0.02	0.04	0.04	0.03	0.0325
JPI-7	0.04	0.07	0.01	0.07	0.0475

S12 Number of rows per cob

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	14	13	15	14	14.0
JPI-2	12	14	13	13	13.0
JPI-3	14	14	16	14	14.5
JPI-4	14	14	13	14	13.8
JPI-5	12	14	12	14	13.0
JPI-6	13	14	14	16	14.3
JPI-7	9	9	9	11	9.5

S13 Number of cobs 2 middle rows

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	49	48	50	49	49
JPI-2	49	48	49	48	48.5
JPI-3	50	49	48	47	48.5
JPI-4	50	49	50	49	49.5
JPI-5	48	47	48	47	47.5
JPI-6	48	48	50	48	48.5
JPI-7	47	47	45	47	46.5

S14 Seed row appearance

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.4	1.6	1.4	1.4	1.5
JPI-2	1.6	1.4	1.6	1.4	1.5
JPI-3	1.4	1.4	1.6	1.6	1.5
JPI-4	1.4	1.6	1.6	1.6	1.6
JPI-5	1.8	1.8	2.0	1.6	1.8
JPI-6	1.6	1.8	1.6	1.6	1.7
JPI-7	1.8	2.0	2.0	2.0	2.0

S15 Appearance due to Pests

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	2.0	2.2	2.2	2.2	2.2
JPI-2	2.2	2.4	2.0	2.2	2.2
JPI-3	2.2	2.4	2.2	2.4	2.3
JPI-4	2.0	2.2	2.4	2.2	2.2
JPI-5	2.4	2.4	2.2	2.6	2.4
JPI-6	2.4	2.6	2.2	2.4	2.4
JPI-7	2.2	2.6	2.6	2.6	2.5

S16 Production(t/ha KA 15%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	10.56	8.98	8.88	8.61	9.26
JPI-2	9.94	9.96	9.34	9.38	9.66
JPI-3	9.49	11.68	8.26	8.27	9.42
JPI-4	8.24	9.24	8.39	8.63	8.62
JPI-5	7.53	7.85	6.82	6.83	7.26
JPI-6	9.48	9.45	9.72	9.63	9.57
JPI-7	5.19	5.09	5.25	5.55	5.27

S17 Number of leaves

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	11.8	11.2	11.6	10.2	11.2
JPI-2	12.6	13.0	10.4	12.4	12.1
JPI-3	11.6	12.8	11.0	12.2	11.9
JPI-4	11.2	9.8	11.2	10.8	10.8
JPI-5	10.8	11.0	10.4	10.2	10.6
JPI-6	12.4	11.6	11.2	11.2	11.6
JPI-7	9.8	10.2	10.0	10.6	10.2

S18 Root rot

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.02	0.03	0.02	0.01	0.02
JPI-2	0.01	0.02	0.01	0.01	0.0125
JPI-3	0.02	0.02	0.02	0.01	0.0175
JPI-4	0.02	0.02	0.02	0.02	0.02
JPI-5	0.04	0.04	0.03	0.04	0.0375
JPI-6	0.03	0.04	0.03	0.05	0.0375
JPI-7	0.06	0.06	0.05	0.06	0.0575

S19 Middle 2 row cob weights (kg)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	5.60	4.95	4.88	4.86	5.07
JPI-2	5.52	5.42	5.02	5.04	5.25
JPI-3	5.22	6.40	4.67	4.66	5.24
JPI-4	4.51	5.10	4.74	4.75	4.78
JPI-5	4.08	4.09	3.60	3.60	3.84
JPI-6	5.21	5.21	5.27	5.28	5.24
JPI-7	2.79	2.69	2.81	2.81	2.77

S20 Number of seeds per row

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	33.5	33.0	34.5	34.0	33.8
JPI-2	31.5	33.0	40.5	33.0	34.5
JPI-3	34.5	34.0	32.5	34.0	33.8
JPI-4	27.0	30.0	35.5	35.5	32.0
JPI-5	31.0	28.5	31.5	25.5	29.1
JPI-6	34.0	34.0	33.5	36.0	34.4
JPI-7	22.0	25.5	26.0	23.5	24.3

S21 Cob height (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	89.5	99.0	99.5	96.5	96.1
JPI-2	95.5	103.0	95.0	91.0	96.1
JPI-3	91.0	94.5	98.5	91.0	93.8
JPI-4	88.5	93.5	101.0	97.0	95.0
JPI-5	84.5	89.0	82.0	89.0	86.1
JPI-6	95.0	88.0	92.5	95.0	92.6
JPI-7	104.0	93.5	93.0	91.0	95.4

S22 Stem rot

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.03	0.02	0.01	0.01	0.0175
JPI-2	0.03	0.02	0.03	0.03	0.0275
JPI-3	0.02	0.03	0.04	0.01	0.025
JPI-4	0.03	0.03	0.03	0.03	0.03
JPI-5	0.04	0.04	0.04	0.04	0.04
JPI-6	0.04	0.05	0.04	0.06	0.0475
JPI-7	0.06	0.06	0.07	0.07	0.065

S23 Cob length (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	19.9	19.3	19.0	19.9	19.5
JPI-2	17.9	19.7	18.0	19.3	18.7
JPI-3	18.4	20.9	19.3	18.5	19.3
JPI-4	18.6	17.7	18.3	19.2	18.4
JPI-5	16.3	16.1	14.9	15.1	15.6
JPI-6	19.7	20.0	19.5	19.8	19.7
JPI-7	15.1	15.6	14.5	14.4	14.9

S24 Weight of 1000 seeds kA 15% y ogk

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	308.53	312.71	301.55	307.84	307.66
JPI-2	302.57	316.55	320.00	312.71	312.96
JPI-3	314.76	316.55	303.31	304.35	309.74
JPI-4	303.99	313.07	310.62	306.45	308.53
JPI-5	321.12	272.54	307.48	310.63	302.94
JPI-6	312.27	328.10	321.98	292.99	313.83
JPI-7	295.08	308.83	298.26	304.60	301.69

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S25 Growth percentage (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	92.0	94.0	90.0	95.0	92.8
JPI-2	91.0	93.0	92.0	93.0	92.3
JPI-3	94.0	94.0	94.0	90.0	93.0
JPI-4	93.0	89.0	85.0	91.0	89.5
JPI-5	95.0	93.0	88.0	79.0	88.8
JPI-6	95.0	86.0	91.0	90.0	90.5
JPI-7	98.0	98.0	94.0	86.0	94.0

S26 Male flower age (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	51.0	51.0	51.0	51.0	51.0
JPI-2	51.0	53.0	51.0	51.0	51.5
JPI-3	51.0	51.0	51.0	58.0	52.8
JPI-4	51.0	51.0	52.0	51.0	51.3
JPI-5	52.0	53.0	55.0	52.0	53.0
JPI-6	56.0	54.0	51.0	56.0	54.3
JPI-7	47.0	49.0	48.0	46.0	47.5

S27 Pest attack (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.05	0.04	0.04	0.04	0.04
JPI-2	0.04	0.05	0.06	0.04	0.05
JPI-3	0.04	0.05	0.06	0.05	0.05
JPI-4	0.05	0.04	0.05	0.05	0.05
JPI-5	0.06	0.06	0.07	0.07	0.07
JPI-6	0.06	0.05	0.06	0.06	0.06
JPI-7	0.07	0.08	0.08	0.08	0.08

S28 Cob diameter (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	4.2	4.3	4.4	4.3	4.3
JPI-2	4.0	4.0	4.1	4.1	4.1
JPI-3	4.4	4.1	4.2	4.2	4.3
JPI-4	3.8	4.0	3.8	4.3	4.0
JPI-5	3.6	3.7	3.9	3.9	3.8
JPI-6	4.0	4.4	4.5	4.3	4.3
JPI-7	3.8	3.6	3.6	3.5	3.6

S29 Harvest time (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	101.9	102.3	102.7	102.5	102.4
JPI-2	102.7	102.1	104.3	102.9	103.0
JPI-3	102.9	104.9	104.9	103.3	104.0
JPI-4	105.9	107.1	107.7	105.7	106.6
JPI-5	112.5	110.7	109.0	110.5	110.7
JPI-6	112.7	112.9	110.5	110.7	111.7
JPI-7	92.7	93.9	94.0	93.7	93.6

S30 Cob closure

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	2.0	2.0	2.2	2.2	2.1
JPI-2	2.4	2.2	2.2	2.2	2.3
JPI-3	2.2	2.0	2.2	2.0	2.1
JPI-4	2.2	2.0	2.0	2.4	2.2
JPI-5	2.4	2.4	2.2	2.4	2.4
JPI-6	2.2	2.4	2.4	2.4	2.4
JPI-7	1.4	1.6	1.4	1.2	1.4

S31 Plant height (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI -1	219.8	228.0	196.0	219.6	215.9
JPI -2	193.8	173.8	163.2	182.0	178.2
JPI -3	169.4	200.2	245.2	241.6	214.1
JPI -4	154.6	162.2	169.0	173.2	164.8
JPI -5	204.2	204.8	162.6	200.2	193.0
JPI -6	233.6	190.2	180.0	239.6	210.9
JPI -7	219.4	228.0	219.6	222.0	222.3

S32 Female flower age (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	53.0	53.0	53.0	53.0	53.0
JPI-2	53.0	55.0	53.0	53.0	53.5
JPI-3	53.0	53.0	53.0	60.0	54.8
JPI-4	53.0	53.0	54.0	53.0	53.3
JPI-5	54.0	55.0	57.0	54.0	55.0
JPI-6	58.0	56.0	53.0	58.0	56.3
JPI-7	46.0	46.0	50.0	48.0	47.5

S33 Downy mildew attact (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.02	0.02	0.03	0.02	0.02
JPI-2	0.03	0.03	0.03	0.03	0.03
JPI-3	0.02	0.02	0.03	0.02	0.02
JPI-4	0.03	0.03	0.03	0.03	0.03
JPI-5	0.02	0.05	0.06	0.04	0.04
JPI-6	0.03	0.05	0.05	0.04	0.04
JPI-7	0.05	0.07	0.07	0.06	0.06

S34 Number of rows per cob

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	15.0	14.0	15.0	15.0	14.8
JPI-2	13.0	15.0	14.0	14.0	14.0
JPI-3	15.0	15.0	15.0	14.0	14.8
JPI-4	15.0	16.0	15.0	15.0	15.3
JPI-5	12.0	15.0	13.0	14.0	13.5
JPI-6	15.0	15.0	14.0	15.0	14.8
JPI-7	11.0	11.0	9.0	11.0	10.5

S35 Number of plants 2 middle rows

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	46.0	48.0	49.0	48.0	47.8
JPI-2	47.0	46.0	48.0	48.0	47.3
JPI-3	48.0	47.0	49.0	47.0	47.8
JPI-4	46.0	48.0	48.0	47.0	47.3
JPI-5	45.0	48.0	46.0	46.0	46.3
JPI-6	46.0	48.0	49.0	46.0	47.3
JPI-7	45.0	47.0	46.0	45.0	45.8

S36 Cob appearance

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.4	1.6	1.2	1.4	1.4
JPI-2	1.4	1.4	1.4	1.4	1.4
JPI-3	1.2	1.4	1.4	1.6	1.4
JPI-4	1.4	1.2	1.6	1.4	1.4
JPI-5	1.6	1.6	1.8	1.6	1.7
JPI-6	1.4	1.6	1.6	1.4	1.5
JPI-7	1.4	1.4	1.4	1.4	1.4

S37 Number of leaves

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	14.4	11.0	10.6	10.4	11.6
JPI-2	11.2	10.8	9.6	10.4	10.5
JPI-3	10.2	11.0	11.2	12.0	11.1
JPI-4	9.2	9.6	10.0	9.6	9.6
JPI-5	11.4	9.8	8.2	10.2	9.9
JPI-6	12.0	10.0	9.0	12.8	11.0
JPI-7	10.0	10.0	10.4	9.4	10.0

S38 Root down

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.03	0.02	0.02	0.02	0.02
JPI-2	0.02	0.03	0.01	0.02	0.02
JPI-3	0.02	0.03	0.02	0.02	0.02
JPI-4	0.02	0.03	0.03	0.04	0.03
JPI-5	0.03	0.04	0.04	0.04	0.04
JPI-6	0.03	0.03	0.04	0.05	0.04
JPI-7	0.07	0.06	0.07	0.08	0.07

S39 Middle 2 row cob weights (kg)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	5.60	4.95	4.88	4.86	5.07
JPI-2	5.52	5.42	5.02	5.04	5.25
JPI-3	5.22	6.40	4.67	4.66	5.24
JPI-4	4.51	5.10	4.74	4.75	4.78
JPI-5	4.08	4.09	3.60	3.60	3.84
JPI-6	5.21	5.21	5.27	5.28	5.24
JPI-7	2.79	2.69	2.81	2.81	2.77

S40 Number of seeds per row

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	33.5	33.0	34.5	34.0	33.8
JPI-2	31.5	33.0	40.5	33.0	34.5
JPI-3	34.5	34.0	32.5	34.0	33.8
JPI-4	27.0	30.0	35.5	35.5	32.0
JPI-5	31.0	28.5	31.5	25.5	29.1
JPI-6	34.0	34.0	33.5	36.0	34.4
JPI-7	22.0	25.5	26.0	23.5	24.3

S41 Number of cobs 2 middle rows

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	48.00	49.00	49.00	48.00	48.50
JPI-2	49.00	49.00	49.00	49.00	49.00
JPI-3	49.00	50.00	50.00	48.00	49.25
JPI-4	49.00	49.00	50.00	48.00	49.00
JPI-5	47.00	49.00	49.00	49.00	48.50
JPI-6	48.00	48.00	49.00	47.00	48.00
JPI-7	47.00	47.00	46.00	49.00	47.25

S42 Seed row appearance

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.2	1.4	1.2	1.2	1.3
JPI-2	1.4	1.2	1.4	1.2	1.3
JPI-3	1.2	1.2	1.4	1.4	1.3
JPI-4	1.2	1.4	1.4	1.4	1.4
JPI-5	1.6	1.6	1.8	1.4	1.6
JPI-6	1.4	1.6	1.4	1.4	1.5
JPI-7	1.6	1.8	1.8	1.8	1.8

S43 Cob height (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	89.8	95.2	78.2	88.8	88.0
JPI-2	62.8	72.4	63.8	94.0	73.3
JPI-3	93.4	83.0	121.4	88.0	96.5
JPI-4	70.8	74.0	70.0	77.0	73.0
JPI-5	88.8	83.2	74.0	94.4	85.1
JPI-6	84.4	86.8	91.4	106.4	92.3
JPI-7	77.8	108.8	91.0	106.4	96.0

S44 Stem rot

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.02	0.02	0.01	0.01	0.015
JPI-2	0.02	0.03	0.02	0.02	0.0225
JPI-3	0.01	0.02	0.03	0.02	0.02
JPI-4	0.03	0.03	0.02	0.03	0.0275
JPI-5	0.03	0.05	0.05	0.05	0.045
JPI-6	0.04	0.04	0.05	0.05	0.045
JPI-7	0.08	0.07	0.06	0.07	0.07

S45 Cob length (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	18.2	18.2	19.0	18.4	19.5
JPI-2	17.4	18.4	17.8	18.0	18.7
JPI-3	17.6	17.2	18.2	18.0	19.3
JPI-4	19.2	19.2	19.0	18.8	18.4
JPI-5	14.4	16.2	16.2	15.2	15.6
JPI-6	16.0	17.6	17.8	19.2	19.7
JPI-7	13.8	13.6	14.0	15.0	14.9

S46 Weight of 1000 seeds kA 15% y ogk

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	283.62	296.82	304.94	308.12	298.38
JPI-2	285.93	278.26	298.53	286.59	287.33
JPI-3	295.80	297.88	279.67	297.16	292.63
JPI-4	309.53	289.55	307.41	295.80	300.57
JPI-5	291.53	287.16	290.54	309.53	294.69
JPI-6	305.29	280.33	258.00	288.34	282.99
JPI-7	290.21	277.54	281.56	259.02	277.08

S47 Appearance due to Pests

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.8	2.0	2.0	2.0	2.0
JPI-2	1.8	2.4	1.8	1.8	2.0
JPI-3	1.8	2.6	1.8	2.0	2.1
JPI-4	2.2	2.0	2.0	1.8	2.0
JPI-5	2.2	2.2	2.2	2.4	2.3
JPI-6	2.0	2.4	2.2	2.0	2.2
JPI-7	2.2	2.4	2.2	2.4	2.3

S48 Production (t/ha KA 15%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	10.34	9.64	8.86	9.17	9.50
JPI-2	10.79	10.46	9.28	9.69	10.05
JPI-3	11.86	14.15	8.76	8.93	10.92
JPI-4	8.44	9.12	9.04	8.64	8.81
JPI-5	9.52	8.20	7.21	7.10	8.01
JPI-6	9.89	10.01	8.36	9.57	9.46
JPI-7	5.59	5.28	5.57	5.82	5.57

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S49 Growth percentage (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-2	86.5	88.4	87.4	88.4	87.6
JPI-3	89.3	89.3	89.3	85.5	88.4
JPI-4	88.4	84.6	84.0	86.5	85.8
JPI-5	86.0	88.4	83.6	80.0	84.5
JPI-6	90.3	81.7	86.5	85.5	86.0
JPI-7	80.0	88.0	85.0	81.7	83.7

S50 Male flower age (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	58.0	58.0	58.0	59.0	58.3
JPI-2	59.0	58.0	59.0	58.0	58.5
JPI-3	58.0	58.0	58.0	59.0	58.3
JPI-4	59.0	59.0	58.0	58.0	58.5
JPI-5	59.0	70.2	60.0	59.0	62.0
JPI-6	60.0	61.0	59.0	71.6	62.9
JPI-7	54.0	56.0	55.0	54.0	54.8

S51 Pest attack (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.030	0.040	0.040	0.040	0.038
JPI-2	0.050	0.040	0.050	0.050	0.048
JPI-3	0.050	0.050	0.050	0.040	0.048
JPI-4	0.060	0.040	0.050	0.050	0.050
JPI-5	0.070	0.060	0.070	0.060	0.065
JPI-6	0.070	0.050	0.070	0.060	0.063
JPI-7	0.080	0.080	0.090	0.080	0.083

S52 Cob diameter (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	3.6	3.7	3.7	3.7	3.7
JPI-2	3.7	3.4	3.5	3.5	3.5
JPI-3	3.8	3.5	3.6	3.6	3.6
JPI-4	3.3	3.6	3.2	3.6	3.4
JPI-5	3.0	3.2	3.3	3.3	3.2
JPI-6	3.4	3.7	3.8	3.7	3.7
JPI-7	3.2	3.0	3.1	3.0	3.1

S53 Harvest time (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	45.0	45.0	47.0	44.0	45.3
JPI-2	44.0	43.0	46.0	45.0	44.5
JPI-3	45.0	44.0	46.0	44.0	44.8
JPI-4	43.0	45.0	45.0	44.0	44.3
JPI-5	42.0	45.0	43.0	43.0	43.3
JPI-6	44.0	45.0	46.0	45.0	45.0
JPI-7	42.0	44.0	43.0	42.0	42.8

S54 Cob closure

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.2	1.4	1.0	1.2	1.2
JPI-2	1.2	1.4	1.2	1.2	1.3
JPI-3	1.0	1.2	1.2	1.2	1.2
JPI-4	1.2	1.2	1.4	1.2	1.3
JPI-5	1.4	1.2	1.4	1.4	1.4
JPI-6	1.2	1.2	1.2	1.4	1.3
JPI-7	1.2	1.4	1.4	1.4	1.4

S55 Plant height (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI -2	155.0	139.0	130.6	145.6	142.6
JPI -3	135.5	160.2	196.2	193.3	171.3
JPI -4	167.0	129.8	135.2	138.6	142.6
JPI -5	163.4	163.8	130.1	160.2	154.4
JPI -6	186.9	152.2	144.0	191.7	168.7
JPI -7	164.0	160.0	175.7	170.0	167.4

S56 Female flower age (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	60.0	60.0	60.0	61.0	60.3
JPI-2	61.0	60.0	61.0	60.0	60.5
JPI-3	60.0	60.0	61.0	61.0	60.5
JPI-4	61.0	61.0	60.0	60.0	60.5
JPI-5	61.0	62.0	62.0	61.0	61.5
JPI-6	62.0	63.0	61.0	63.0	62.2
JPI-7	56.0	58.0	57.0	56.0	56.8

S57 Downy mildew attact (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.030	0.030	0.040	0.030	0.033
JPI-2	0.030	0.030	0.040	0.040	0.035
JPI-3	0.030	0.030	0.040	0.030	0.033
JPI-4	0.040	0.040	0.040	0.040	0.040
JPI-5	0.060	0.060	0.060	0.050	0.058
JPI-6	0.060	0.060	0.060	0.050	0.058
JPI-7	0.080	0.080	0.080	0.070	0.078

S58 Number of rows per cob

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	14.0	14.0	14.0	14.0	14.0
JPI-2	13.0	15.0	14.0	14.0	14.0
JPI-3	14.0	15.0	14.0	13.0	14.0
JPI-4	14.0	15.0	15.0	14.0	14.5
JPI-5	12.0	13.0	13.0	13.0	12.8
JPI-6	14.0	14.0	14.0	14.0	14.0
JPI-7	10.0	9.0	9.0	9.0	9.3

S59 Number of plants 2 middle rows

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	47.0	47.0	47.0	45.0	46.5
JPI-2	46.0	44.0	46.0	46.0	45.5
JPI-3	46.0	47.0	47.0	45.0	46.3
JPI-4	46.0	46.0	47.0	45.0	46.0
JPI-5	46.0	43.0	44.0	46.0	44.8
JPI-6	45.0	47.0	46.0	47.0	46.3
JPI-7	44.0	44.0	43.0	46.0	44.3

S60 Cob appearance

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.2	1.4	1.2	1.2	1.3
JPI-2	1.4	1.2	1.2	1.2	1.3
JPI-3	1.2	1.2	1.4	1.4	1.3
JPI-4	1.0	1.2	1.4	1.2	1.2
JPI-5	1.2	1.4	1.4	1.4	1.4
JPI-6	1.4	1.2	1.2	1.2	1.3
JPI-7	1.2	1.8	1.4	1.4	1.5

S61 Number of leaves

Treatment	replicate				Average
	I	II	III	IV	
JPI-2	10.1	9.7	8.6	9.4	9.5
JPI-3	9.2	9.9	10.1	10.8	10.0
JPI-4	9.6	8.6	9.0	8.6	9.0
JPI-5	10.3	8.8	7.4	9.2	8.9
JPI-6	10.8	9.0	8.1	11.5	9.9
JPI-7	9.0	8.5	9.4	8.5	8.8

S62 Root down

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.02	0.03	0.03	0.03	0.03
JPI-2	0.03	0.04	0.02	0.03	0.03
JPI-3	0.03	0.04	0.03	0.03	0.03
JPI-4	0.03	0.04	0.04	0.05	0.04
JPI-5	0.04	0.05	0.05	0.05	0.05
JPI-6	0.04	0.04	0.05	0.06	0.05
JPI-7	0.08	0.07	0.08	0.09	0.08

S63 Middle 2 row cob weights (kg)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	4.52	4.05	3.93	4.00	4.12
JPI-2	4.46	5.30	4.14	3.88	4.45
JPI-3	4.26	4.96	3.65	3.81	4.17
JPI-4	3.71	3.39	3.89	3.86	3.71
JPI-5	3.29	3.37	2.85	2.96	3.12
JPI-6	4.27	3.57	3.98	4.18	4.00
JPI-7	2.36	2.27	2.36	2.37	2.34

S64 Number of seeds per row

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	264.10	281.11	285.57	293.44	281.05
JPI-2	269.78	266.47	285.36	256.24	269.46
JPI-3	278.57	268.44	254.50	281.96	270.87
JPI-4	296.97	278.82	291.68	278.57	286.51
JPI-5	264.97	276.01	268.32	277.78	271.77
JPI-6	286.44	274.36	258.73	263.41	270.73
JPI-7	268.78	276.07	278.08	256.74	269.92

S65 Number of cobs 2 middle rows

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.6	1.2	2.0	2.0	1.7
JPI-2	1.8	1.6	2.0	1.8	1.8
JPI-3	1.8	1.4	2.0	2.2	1.9
JPI-4	1.6	1.2	2.2	2.2	1.8
JPI-5	2.2	1.6	2.2	2.2	2.1
JPI-6	1.8	1.0	2.2	2.4	1.9
JPI-7	2.0	1.6	2.4	2.4	2.1

S66 Seed row appearance

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	6.75	6.42	5.78	6.15	6.28
JPI-2	7.09	8.36	6.26	5.93	6.91
JPI-3	7.07	7.97	5.50	5.95	6.62
JPI-4	5.69	5.24	6.04	6.13	5.78
JPI-5	4.88	5.54	4.48	4.78	4.92
JPI-6	6.58	5.52	5.72	6.41	6.05
JPI-7	3.93	3.71	3.88	3.94	3.86

S67 Cob height (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-2	76.0	65.2	67.0	84.6	73.2
JPI-3	84.1	74.7	109.3	79.2	86.8
JPI-4	63.7	66.6	63.0	69.3	65.7
JPI-5	79.9	74.9	66.6	85.0	76.6
JPI-6	76.0	78.1	82.3	95.8	83.0
JPI-7	70.0	77.0	81.9	78.0	76.7

S68 Stem rot

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.03	0.03	0.02	0.02	0.03
JPI-2	0.03	0.04	0.03	0.02	0.03
JPI-3	0.02	0.03	0.04	0.02	0.03
JPI-4	0.04	0.04	0.03	0.03	0.04
JPI-5	0.04	0.06	0.06	0.05	0.05
JPI-6	0.05	0.05	0.06	0.05	0.05
JPI-7	0.07	0.07	0.07	0.07	0.07

S69 Cob length (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	15.5	15.5	16.2	15.6	15.7
JPI-2	14.8	15.6	15.1	15.3	15.2
JPI-3	15.0	14.6	15.5	15.3	15.0
JPI-4	16.3	16.3	16.2	16.0	16.3
JPI-5	12.2	13.8	13.8	12.9	13.3
JPI-6	13.6	15.0	15.1	16.3	14.6
JPI-7	11.7	11.6	11.9	12.7	11.7

S70 Weight of 1000 seeds kA 15% y ogk

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	108.5	106.8	107.3	107.1	107.4
JPI-2	108.3	106.6	109.0	107.5	107.9
JPI-3	108.8	109.6	109.6	107.9	109.0
JPI-4	111.7	111.9	112.6	110.5	111.7
JPI-5	114.5	112.8	113.6	112.5	113.4
JPI-6	114.9	115.1	112.5	112.8	113.8
JPI-7	98.4	97.9	96.9	97.7	97.7

S71 Appearance due to Pests

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	2.0	2.0	2.0	2.0	2.0
JPI-2	2.2	2.0	2.0	2.2	2.1
JPI-3	2.2	2.2	2.2	2.0	2.2
JPI-4	2.0	2.0	2.2	2.2	2.1
JPI-5	2.0	2.2	2.4	2.2	2.2
JPI-6	2.2	2.0	2.4	2.2	2.2
JPI-7	1.2	1.8	1.6	1.2	1.5

S72 Production (t/ha KA 15%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	26.0	25.5	27.0	26.5	26.3
JPI-2	24.0	25.5	33.0	25.5	27.0
JPI-3	27.0	26.5	25.0	26.5	26.3
JPI-4	19.5	22.5	28.0	28.0	24.5
JPI-5	23.5	21.0	24.0	18.0	21.6
JPI-6	26.5	26.5	26.0	28.5	26.9
JPI-7	15.5	18.0	18.5	18.5	17.6

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S73 Growth percentage (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	90.2	92.1	88.2	93.1	90.9
JPI-2	89.2	91.1	90.2	91.1	90.4
JPI-3	92.1	92.1	92.1	88.2	91.1
JPI-4	91.1	87.2	83.3	89.2	87.7
JPI-5	91.1	91.1	86.2	84.3	88.2
JPI-6	90.2	84.3	89.2	88.2	88.0
JPI-7	96.0	96.0	92.1	84.3	92.1

S74 Male flower age (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	53.00	53.00	53.00	53.00	53.00
JPI-2	53.00	55.00	52.00	53.00	53.25
JPI-3	53.00	53.00	53.00	54.00	53.25
JPI-4	53.00	53.00	54.00	53.00	53.25
JPI-5	54.00	55.00	53.00	54.00	54.00
JPI-6	55.00	55.00	53.00	55.00	54.50
JPI-7	48.00	50.00	48.00	46.00	48.00

S75 Pest attack (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.03	0.04	0.05	0.03	0.0375
JPI-2	0.03	0.03	0.04	0.04	0.035
JPI-3	0.03	0.04	0.04	0.04	0.0375
JPI-4	0.04	0.03	0.06	0.05	0.045
JPI-5	0.05	0.06	0.07	0.07	0.0625
JPI-6	0.04	0.06	0.07	0.05	0.055
JPI-7	0.06	0.07	0.09	0.08	0.075

S76 Cob diameter (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	4.2	4.3	4.4	4.3	4.3
JPI-2	4.3	4.0	4.1	4.1	4.1
JPI-3	4.4	4.1	4.2	4.2	4.3
JPI-4	3.9	4.2	4.5	4.3	4.2
JPI-5	3.6	3.7	3.9	3.9	3.8
JPI-6	4.0	4.4	4.5	4.3	4.3
JPI-7	3.8	3.6	3.6	3.5	3.6

S77 Harvest time (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	104.7	102.0	100.3	101.5	102.1
JPI-2	104.1	101.1	102.0	102.4	102.4
JPI-3	101.8	102.6	102.6	100.9	102.0
JPI-4	104.7	104.9	105.6	103.5	104.7
JPI-5	105.8	105.8	106.6	105.5	105.9
JPI-6	107.9	106.4	104.9	103.4	105.7
JPI-7	95.0	95.4	95.3	92.2	94.5

S78 Cob closure

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.8	2.0	2.2	2.0	2.0
JPI-2	2.0	2.0	2.2	2.2	2.1
JPI-3	2.0	2.2	2.4	2.0	2.2
JPI-4	1.8	2.0	2.4	2.2	2.1
JPI-5	1.8	2.2	2.6	2.2	2.2
JPI-6	2.0	2.0	2.6	2.2	2.2
JPI-7	1.2	1.8	1.8	1.2	1.5

S79 Plant height (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI -1	197.8	205.2	176.4	197.6	194.3
JPI -2	174.4	182.7	180.0	163.8	175.2
JPI -3	152.5	180.2	220.7	217.4	192.7
JPI -4	180.0	182.0	179.1	173.9	178.7
JPI -5	183.8	184.3	146.3	180.2	173.7
JPI -6	210.2	171.2	162.0	215.6	189.8
JPI -7	197.5	205.2	197.6	199.8	200.0

S80 Female flower age (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	55.00	55.00	54.00	54.00	54.50
JPI-2	55.00	56.00	54.00	55.00	55.00
JPI-3	55.00	55.00	56.00	55.00	55.25
JPI-4	55.00	55.00	55.00	54.00	54.75
JPI-5	56.00	56.00	55.00	56.00	55.75
JPI-6	57.00	57.00	55.00	57.00	56.50
JPI-7	50.00	51.00	50.00	48.00	49.75

S81 Downy mildew attact (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.02	0.02	0.01	0.03	0.02
JPI-2	0.02	0.02	0.01	0.02	0.0175
JPI-3	0.02	0.02	0.01	0.03	0.02
JPI-4	0.03	0.03	0.02	0.02	0.025
JPI-5	0.04	0.04	0.02	0.04	0.035
JPI-6	0.03	0.03	0.02	0.03	0.0275
JPI-7	0.05	0.05	0.04	0.05	0.0475

S82 Number of rows per cob

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	15.0	15.0	14.0	15.0	14.8
JPI-2	14.0	16.0	15.0	14.0	14.8
JPI-3	15.0	16.0	15.0	15.0	15.3
JPI-4	15.0	15.0	15.0	15.0	15.0
JPI-5	14.0	13.0	14.0	14.0	13.8
JPI-6	15.0	16.0	15.0	15.0	15.3
JPI-7	11.0	9.0	10.0	11.0	10.3

S83 Number of plants 2 middle rows

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	47.0	47.0	48.0	50.0	48.0
JPI-2	49.0	47.0	49.0	49.0	48.5
JPI-3	49.0	48.0	50.0	48.0	48.8
JPI-4	48.0	47.0	49.0	48.0	48.0
JPI-5	46.0	49.0	47.0	47.0	47.3
JPI-6	47.0	49.0	50.0	47.0	48.3
JPI-7	46.0	48.0	47.0	46.0	46.8

S84 Cob appearance

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.2	1.2	1.0	1.2	1.2
JPI-2	1.2	1.2	1.2	1.2	1.2
JPI-3	1.0	1.2	1.2	1.2	1.2
JPI-4	1.2	1.2	1.4	1.2	1.3
JPI-5	1.4	1.2	1.4	1.4	1.4
JPI-6	1.2	1.2	1.0	1.4	1.2
JPI-7	1.2	1.4	1.2	1.4	1.3

S85 Number of leaves

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	13.8	10.6	10.2	10.0	11.1
JPI-2	10.8	10.4	9.6	10.0	10.2
JPI-3	9.8	10.6	10.8	11.5	10.7
JPI-4	10.6	11.5	9.6	11.5	10.8
JPI-5	10.9	9.6	10.6	9.8	10.2
JPI-6	11.5	9.6	10.6	12.3	11.0
JPI-7	10.6	11.5	10.0	9.6	10.4

S86 Root down

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.01	0.01	0.02	0.03	0.0175
JPI-2	0.01	0.02	0.02	0.02	0.0175
JPI-3	0.01	0.02	0.02	0.02	0.0175
JPI-4	0.01	0.03	0.02	0.03	0.0225
JPI-5	0.01	0.03	0.02	0.03	0.0225
JPI-6	0.01	0.02	0.03	0.02	0.02
JPI-7	0.03	0.05	0.04	0.06	0.045

S87 Middle 2 row cob weights (kg)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	5.68	5.03	4.78	4.77	5.07
JPI-2	5.55	6.58	4.97	4.92	5.50
JPI-3	5.29	6.19	4.55	4.73	5.19
JPI-4	4.68	4.21	4.82	4.79	4.63
JPI-5	3.94	3.97	3.70	3.67	3.82
JPI-6	5.30	4.45	4.84	5.21	4.95
JPI-7	2.92	2.81	2.92	2.93	2.90

S88 Number of seeds per row

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	34.5	33.5	37.0	38.0	35.8
JPI-2	32.5	34.0	38.5	34.0	34.8
JPI-3	35.5	34.5	35.5	35.0	35.1
JPI-4	28.0	31.0	36.5	36.5	33.0
JPI-5	32.0	29.5	32.5	26.5	30.1
JPI-6	35.0	34.5	34.5	37.0	35.3
JPI-7	23.0	26.5	27.0	24.5	25.3

S89 Number of cobs 2 middle rows

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	47.0	49.0	50.0	51.0	49.3
JPI-2	50.0	47.0	49.0	50.0	49.0
JPI-3	49.0	48.0	49.0	49.0	48.8
JPI-4	50.0	50.0	51.0	49.0	50.0
JPI-5	48.0	50.0	50.0	48.0	49.0
JPI-6	49.0	49.0	51.0	48.0	49.3
JPI-7	47.0	48.0	47.0	50.0	48.0

S90 Seed row appearance

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.2	1.4	1.2	1.2	1.3
JPI-2	1.2	1.2	1.2	1.2	1.2
JPI-3	1.2	1.2	1.4	1.4	1.3
JPI-4	1.0	1.0	1.4	1.2	1.2
JPI-5	1.2	1.4	1.4	1.4	1.4
JPI-6	1.2	1.0	1.2	1.2	1.2
JPI-7	1.0	1.6	1.4	1.4	1.4

S91 Cob height (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	86.21	91.39	75.07	85.25	84.48
JPI-2	60.29	69.50	61.25	90.24	70.32
JPI-3	89.66	79.68	116.54	84.48	92.59
JPI-4	67.97	71.04	67.20	73.92	70.03
JPI-5	85.25	79.87	71.04	90.62	81.70
JPI-6	81.02	83.33	87.74	98.30	87.60
JPI-7	74.69	104.45	87.36	102.14	92.16

S92 Stem rot

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.01	0.03	0.02	0.02	0.02
JPI-2	0.01	0.02	0.02	0.02	0.0175
JPI-3	0.01	0.03	0.03	0.01	0.02
JPI-4	0.01	0.02	0.02	0.01	0.015
JPI-5	0.01	0.04	0.02	0.02	0.0225
JPI-6	0.01	0.02	0.03	0.02	0.02
JPI-7	0.04	0.04	0.07	0.01	0.04

S93 Cob length (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	18.9	18.9	19.8	19.1	19.2
JPI-2	18.1	19.1	18.5	18.7	18.6
JPI-3	18.3	17.9	18.9	18.7	18.5
JPI-4	20.0	20.0	19.8	19.6	19.8
JPI-5	16.0	16.8	16.8	15.8	16.4
JPI-6	18.7	19.9	18.0	20.0	19.1
JPI-7	14.3	14.1	14.6	15.6	14.7

S94 Weight of 1000 seeds kA 15% y ogk

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	268.74	285.65	290.45	292.97	284.45
JPI-2	275.18	271.51	279.92	275.65	275.56
JPI-3	283.20	273.91	259.47	286.47	275.76
JPI-4	298.90	282.94	296.34	283.20	290.35
JPI-5	259.34	265.94	285.35	281.97	273.15
JPI-6	291.29	283.35	257.82	277.77	277.56
JPI-7	272.05	279.44	281.62	259.94	273.26

S95 Appearance due to Pests

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	2.2	1.4	2.2	2.0	2.0
JPI-2	2.2	1.8	2.0	1.8	2.0
JPI-3	2.2	1.6	2.4	2.0	2.1
JPI-4	2.0	1.4	2.4	2.0	2.0
JPI-5	2.4	1.6	2.2	1.8	2.0
JPI-6	2.2	1.4	2.4	2.0	2.0
JPI-7	2.2	1.6	2.6	2.4	2.2

S96 Production (t/ha KA 15%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	10.03	9.40	8.31	8.51	9.06
JPI-2	10.40	12.22	8.55	9.09	10.07
JPI-3	10.36	11.77	8.12	8.71	9.74
JPI-4	8.37	7.65	8.84	9.00	8.47
JPI-5	6.63	7.30	7.18	6.99	7.03
JPI-6	9.65	8.13	8.05	9.44	8.82
JPI-7	5.71	5.39	5.64	5.73	5.62

Data NTB

97 Growth percentage (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	96.0	93.0	94.0	93.0	94.0
JPI-2	94.0	95.0	95.0	94.0	94.5
JPI-3	96.0	96.0	95.0	97.0	96.0
JPI-4	95.0	94.0	96.0	94.0	94.8
JPI-5	94.0	97.0	94.0	92.0	94.3
JPI-6	96.0	95.0	96.0	92.0	94.8
JPI-7	96.0	97.0	95.0	95.0	95.8

S98 Male flower age (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	59.0	56.0	55.0	55.0	56.3
JPI-2	56.0	56.0	57.0	57.0	56.5
JPI-3	56.0	57.0	55.0	57.0	56.3
JPI-4	57.0	57.0	56.0	56.0	56.5
JPI-5	52.0	52.0	53.0	52.0	52.3
JPI-6	61.0	56.0	56.0	59.0	58.0
JPI-7	51.0	51.0	52.0	52.0	51.5

S99 Pest attack (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.02	0.04	0.04	0.03	0.03
JPI-2	0.01	0.04	0.04	0.04	0.03
JPI-3	0.01	0.03	0.03	0.03	0.03
JPI-4	0.01	0.03	0.03	0.03	0.03
JPI-5	0.04	0.01	0.04	0.06	0.04
JPI-6	0.07	0.08	0.04	0.05	0.06
JPI-7	0.04	0.12	0.09	0.08	0.08

S100 Cob diameter (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	4.7	4.9	4.5	4.6	4.6
JPI-2	4.8	4.8	4.7	4.8	4.8
JPI-3	4.9	4.8	4.9	4.9	4.9
JPI-4	4.7	4.9	4.5	4.7	4.7
JPI-5	4.3	4.8	4.7	4.3	4.5
JPI-6	4.9	4.8	4.9	4.6	4.8
JPI-7	3.6	3.8	3.7	3.3	3.6

S101 Harvest time (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	50.0	49.0	49.0	49.0	49.3
JPI-2	49.0	48.0	48.0	48.0	48.3
JPI-3	50.0	49.0	49.0	48.0	49.0
JPI-4	49.0	48.0	48.0	47.0	48.0
JPI-5	47.0	47.0	48.0	47.0	47.3
JPI-6	48.0	49.0	48.0	48.0	48.3
JPI-7	49.0	49.0	49.0	49.0	49.0

S102 Cob closure

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.8	2.0	2.0	2.2	2.0
JPI-2	2.2	2.2	2.0	2.2	2.2
JPI-3	2.0	2.0	2.0	2.0	2.0
JPI-4	2.0	2.0	2.2	2.0	2.1
JPI-5	2.2	2.2	2.2	2.2	2.2
JPI-6	2.2	2.2	2.2	2.2	2.2
JPI-7	1.2	1.0	1.0	1.2	1.1

S103 Plant height (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	170.2	183.6	182.0	120.2	164.0
JPI-2	167.4	192.0	180.0	179.0	179.6
JPI-3	184.0	188.0	175.0	160.0	176.8
JPI-4	174.0	179.0	164.0	154.0	167.8
JPI-5	188.6	185.6	176.2	155.0	176.4
JPI-6	186.4	175.6	168.0	160.6	172.7
JPI-7	180.6	202.2	188.0	168.4	184.8

S104 Female flower age (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	61.0	57.0	57.0	57.0	58.0
JPI-2	58.0	57.0	58.0	58.0	57.8
JPI-3	57.0	58.0	56.0	58.0	57.3
JPI-4	59.0	59.0	58.0	57.0	58.3
JPI-5	54.0	53.0	54.0	53.0	53.5
JPI-6	63.0	57.0	57.0	60.0	59.3
JPI-7	52.0	52.0	54.0	53.0	52.8

S105 Downy mildew attact (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.01	0.02	0.03	0.02	0.02
JPI-2	0.03	0.02	0.03	0.03	0.03
JPI-3	0.01	0.03	0.02	0.03	0.02
JPI-4	0.02	0.02	0.04	0.04	0.03
JPI-5	0.01	0.04	0.08	0.05	0.05
JPI-6	0.03	0.03	0.03	0.07	0.04
JPI-7	0.01	0.02	0.05	0.07	0.04

S106 Number of rows per cob

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	14.0	14.0	15.0	15.0	14.5
JPI-2	14.0	14.0	14.0	14.0	14.0
JPI-3	13.0	14.0	16.0	13.0	14.0
JPI-4	14.0	14.0	14.0	15.0	14.3
JPI-5	12.5	14.0	14.0	13.0	13.4
JPI-6	14.0	14.0	15.0	14.0	14.3
JPI-7	13.0	12.0	12.5	13.0	12.6

S107 Number of plants 2 middle rows

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	241.24	244.28	243.91	237.47	241.72
JPI-2	239.86	245.20	233.92	235.03	238.50
JPI-3	240.91	249.23	244.18	239.18	243.37
JPI-4	254.21	256.69	244.23	235.28	247.60
JPI-5	231.10	232.04	247.92	222.87	233.48
JPI-6	242.05	242.29	249.92	231.39	241.41
JPI-7	212.29	224.27	246.38	235.82	229.69

S108 Cob appearance

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.2	1.2	1.2	1.2	1.2
JPI-2	1.4	1.2	1.4	1.2	1.3
JPI-3	1.2	1.4	1.4	1.2	1.3
JPI-4	1.4	1.4	1.4	1.4	1.4
JPI-5	1.6	1.2	1.4	1.4	1.4
JPI-6	1.2	1.4	1.2	1.2	1.3
JPI-7	1.2	1.4	1.4	1.6	1.4

S109 Number of leaves

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	12.4	12.4	12.6	12.4	12.5
JPI-2	12.2	12.8	12.8	12.0	12.5
JPI-3	13.0	12.6	12.6	12.0	12.6
JPI-4	12.4	12.8	12.0	12.4	12.4
JPI-5	13.2	12.0	12.2	11.2	12.2
JPI-6	12.6	12.4	12.4	12.2	12.4
JPI-7	12.8	11.6	11.2	11.8	11.9

S110 Root down

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.01	0.01	0.02	0.02	0.015
JPI-2	0.01	0.03	0.01	0.01	0.015
JPI-3	0.02	0.02	0.02	0.02	0.02
JPI-4	0.01	0.02	0.02	0.02	0.0175
JPI-5	0.03	0.03	0.03	0.02	0.0275
JPI-6	0.01	0.04	0.01	0.03	0.0225
JPI-7	0.02	0.05	0.04	0.02	0.0325

S111 Middle 2 row cob weights (kg)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	6.15	5.34	5.49	5.49	5.61
JPI-2	6.33	7.11	5.40	5.40	6.06
JPI-3	5.91	6.08	5.40	5.40	5.69
JPI-4	5.73	5.70	5.18	5.18	5.45
JPI-5	5.92	5.33	5.05	5.05	5.34
JPI-6	6.06	6.15	5.17	5.17	5.63
JPI-7	3.83	2.91	3.74	3.74	3.55

S112 Number of seeds per row

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	37.0	32.0	35.0	33.0	34.3
JPI-2	35.5	32.0	34.5	33.0	33.8
JPI-3	36.0	33.0	35.0	32.0	34.0
JPI-4	33.5	32.5	33.0	33.0	33.0
JPI-5	28.5	31.5	29.0	27.5	29.1
JPI-6	36.5	32.5	33.0	31.0	33.3
JPI-7	26.0	26.5	27.0	26.0	26.4

S113 Number of cobs 2 middle rows

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	99.6	99.8	100.4	100.2	100.0
JPI-2	100.4	100.0	101.6	100.8	100.7
JPI-3	100.8	101.0	101.8	102.2	101.5
JPI-4	105.0	105.0	105.4	104.8	105.1
JPI-5	109.8	110.0	111.2	110.8	110.5
JPI-6	110.4	111.0	110.2	111.4	110.8
JPI-7	92.2	93.6	91.8	92.6	92.6

S114 Seed row appearance

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.0	1.0	1.2	1.2	1.1
JPI-2	1.2	1.2	1.2	1.0	1.2
JPI-3	1.2	1.2	1.0	1.2	1.2
JPI-4	1.2	1.2	1.2	1.0	1.2
JPI-5	1.2	1.4	1.4	1.0	1.3
JPI-6	1.2	1.2	1.0	1.2	1.2
JPI-7	1.4	1.4	1.4	1.4	1.4

S115 Cob height (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	126.2	98.8	109.8	72.4	101.8
JPI-2	130.4	121.0	105.8	105.6	115.7
JPI-3	109.0	106.4	95.4	70.6	95.4
JPI-4	114.2	114.2	78.0	74.2	95.2
JPI-5	109.8	105.4	89.6	81.0	96.5
JPI-6	139.4	113.0	85.8	79.8	104.5
JPI-7	117.0	118.4	107.8	94.4	109.4

S116 Stem rot

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.01	0.03	0.02	0.00	0.02
JPI-2	0.03	0.03	0.01	0.01	0.02
JPI-3	0.03	0.01	0.02	0.02	0.02
JPI-4	0.01	0.01	0.01	0.02	0.01
JPI-5	0.01	0.05	0.02	0.01	0.02
JPI-6	0.01	0.05	0.04	0.03	0.03
JPI-7	0.02	0.02	0.06	0.07	0.04

S117 Cob length (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	19.0	18.4	17.1	16.5	17.7
JPI-2	17.9	17.7	17.4	16.4	17.3
JPI-3	18.4	18.4	16.9	16.9	17.6
JPI-4	17.1	18.5	17.0	16.9	17.4
JPI-5	15.4	14.8	14.4	14.2	14.7
JPI-6	17.8	18.0	17.3	16.7	17.4
JPI-7	14.8	13.7	14.0	13.2	13.9

S118 Weight of 1000 seeds kA 15% y ogk

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	49.0	48.0	49.0	49.0	48.8
JPI-2	48.0	48.0	48.0	48.0	48.0
JPI-3	48.0	49.0	49.0	48.0	48.5
JPI-4	47.0	48.0	48.0	47.0	47.5
JPI-5	47.0	47.0	48.0	47.0	47.3
JPI-6	48.0	49.0	48.0	48.0	48.3
JPI-7	49.0	49.0	49.0	49.0	49.0

S119 Appearance due to Pests

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.6	1.4	1.4	1.2	1.4
JPI-2	1.8	1.6	1.6	1.4	1.6
JPI-3	1.4	1.4	1.2	1.2	1.3
JPI-4	1.6	1.4	1.6	1.6	1.6
JPI-5	1.6	1.8	1.4	1.4	1.6
JPI-6	1.6	1.6	1.6	1.4	1.6
JPI-7	1.8	1.8	1.6	1.4	1.7

S120 Production (t/ha KA 15%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	10.22	8.89	9.21	9.91	9.56
JPI-2	10.98	11.65	8.95	9.41	10.25
JPI-3	9.35	10.40	9.16	8.59	9.38
JPI-4	9.81	9.83	8.94	9.26	9.46
JPI-5	10.28	8.40	8.91	9.26	9.21
JPI-6	10.34	10.19	9.00	8.72	9.57
JPI-7	6.04	4.62	6.24	5.92	5.71

Data Kediri

S121 Growth percentage (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	94.0	92.0	86.0	95.0	91.8
JPI-2	93.0	93.0	91.0	91.0	92.0
JPI-3	93.0	95.0	97.0	82.0	91.8
JPI-4	91.0	75.0	84.0	91.0	85.3
JPI-5	94.0	92.0	85.0	73.0	86.0
JPI-6	88.0	84.0	90.0	85.0	86.8
JPI-7	98.0	99.0	95.0	85.0	94.3

S122 Male flower age (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	58.0	56.0	55.0	56.0	56.3
JPI-2	57.0	57.0	56.0	56.0	56.5
JPI-3	55.0	56.0	57.0	57.0	56.3
JPI-4	57.0	56.0	56.0	55.0	56.0
JPI-5	54.0	57.0	56.0	56.0	55.8
JPI-6	59.0	58.0	57.0	57.0	57.8
JPI-7	52.0	53.0	51.0	51.0	51.8

S123 Pest attack (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.03	0.02	0.04	0.02	0.03
JPI-2	0.02	0.03	0.05	0.03	0.03
JPI-3	0.03	0.02	0.03	0.02	0.03
JPI-4	0.02	0.03	0.04	0.02	0.03
JPI-5	0.04	0.04	0.05	0.04	0.04
JPI-6	0.04	0.05	0.05	0.03	0.04
JPI-7	0.05	0.06	0.08	0.05	0.06

S124 Cob diameter (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	4.8	4.8	4.9	4.6	4.8
JPI-2	4.7	5.0	4.8	4.7	4.8
JPI-3	4.5	4.8	5.4	4.7	4.9
JPI-4	4.6	4.6	4.7	4.8	4.7
JPI-5	4.9	4.4	4.5	4.3	4.5
JPI-6	4.9	5.0	4.8	4.9	4.9
JPI-7	3.4	4.3	3.9	3.9	3.9

S125 Harvest time (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	307.11	327.18	337.72	266.31	309.58
JPI-2	316.49	342.94	290.97	276.75	306.79
JPI-3	299.99	337.02	324.20	280.19	310.35
JPI-4	318.74	353.80	286.18	260.43	304.79
JPI-5	316.87	323.31	309.81	248.83	299.71
JPI-6	317.44	326.99	324.91	263.81	308.29
JPI-7	302.77	321.62	324.54	243.23	298.04

S126 Cob closure

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.4	1.6	1.6	1.4	1.5
JPI-2	1.6	1.8	1.4	1.6	1.6
JPI-3	1.6	1.4	1.4	1.4	1.5
JPI-4	1.4	1.6	1.4	1.4	1.5
JPI-5	1.4	1.6	1.6	1.6	1.6
JPI-6	1.4	1.6	1.4	1.6	1.5
JPI-7	1.6	1.6	1.4	1.6	1.6

S127 Plant height (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	165.2	162.0	167.2	142.0	159.1
JPI-2	162.8	173.6	159.0	163.8	164.8
JPI-3	164.8	168.2	170.2	130.4	158.4
JPI-4	154.4	158.2	156.2	148.8	154.4
JPI-5	158.8	163.2	140.0	127.8	147.5
JPI-6	175.2	163.0	148.2	159.6	161.5
JPI-7	190.8	182.0	164.0	159.8	174.2

S128 Female flower age (hari)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	60.0	57.0	57.0	57.0	57.8
JPI-2	58.0	59.0	58.0	58.0	58.3
JPI-3	57.0	58.0	58.0	58.0	57.8
JPI-4	59.0	58.0	58.0	57.0	58.0
JPI-5	56.0	59.0	58.0	58.0	57.8
JPI-6	63.0	60.0	59.0	59.0	60.3
JPI-7	54.0	55.0	52.0	53.0	53.5

S129 Downy mildew attact (%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.02	0.02	0.03	0.02	0.02
JPI-2	0.02	0.03	0.03	0.02	0.03
JPI-3	0.02	0.03	0.03	0.03	0.03
JPI-4	0.03	0.02	0.04	0.03	0.03
JPI-5	0.04	0.03	0.08	0.04	0.05
JPI-6	0.03	0.03	0.04	0.04	0.04
JPI-7	0.06	0.06	0.08	0.08	0.07

S130 Number of rows per cob

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	16.0	14.0	15.0	14.0	14.8
JPI-2	14.0	15.0	13.0	13.0	13.8
JPI-3	14.0	14.0	16.0	14.0	14.5
JPI-4	13.0	13.0	13.0	14.0	13.3
JPI-5	13.0	13.0	12.0	14.0	13.0
JPI-6	15.0	14.0	14.0	16.0	14.8
JPI-7	10.0	11.0	9.0	11.0	10.3

S131 Number of plants 2 middle rows

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	48.0	49.0	48.0	48.0	48.3
JPI-2	48.0	48.0	49.0	48.0	48.3
JPI-3	49.0	48.0	49.0	49.0	48.8
JPI-4	48.0	49.0	49.0	48.0	48.5
JPI-5	47.0	48.0	48.0	48.0	47.8
JPI-6	48.0	48.0	49.0	49.0	48.5
JPI-7	48.0	47.0	47.0	47.0	47.3

S132 Cob appearance

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.2	1.4	1.4	1.2	1.3
JPI-2	1.4	1.2	1.2	1.4	1.3
JPI-3	1.4	1.2	1.2	1.4	1.3
JPI-4	1.6	1.2	1.4	1.2	1.4
JPI-5	1.8	1.4	1.6	1.6	1.6
JPI-6	1.4	1.6	1.4	3.4	2.0
JPI-7	1.2	1.6	1.6	1.6	1.5

S133 Number of leaves

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	11.8	11.2	10.6	10.6	11.1
JPI-2	11.0	11.0	10.4	10.6	10.8
JPI-3	11.8	11.8	11.4	10.8	11.5
JPI-4	11.2	10.6	10.6	10.4	10.7
JPI-5	11.6	10.6	10.6	10.0	10.7
JPI-6	12.8	11.6	11.2	11.4	11.8
JPI-7	10.0	10.4	8.4	8.2	9.3

S134 Root down

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.02	0.03	0.01	0.01	0.0175
JPI-2	0.01	0.02	0.01	0.01	0.0125
JPI-3	0.01	0.01	0.02	0.01	0.0125
JPI-4	0.02	0.02	0.01	0.02	0.0175
JPI-5	0.04	0.02	0.02	0.03	0.0275
JPI-6	0.02	0.03	0.02	0.04	0.0275
JPI-7	0.04	0.06	0.06	0.04	0.05

S135 Middle 2 row cob weights (kg)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	5.85	5.20	5.67	5.84	5.64
JPI-2	6.73	5.65	5.09	5.09	5.64
JPI-3	6.25	5.21	6.93	5.93	6.08
JPI-4	5.80	5.18	5.09	5.09	5.29
JPI-5	4.85	4.94	4.52	4.12	4.60
JPI-6	6.75	6.46	5.74	5.74	6.17
JPI-7	2.53	3.08	3.71	3.71	3.26

S136 Number of seeds per row

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	33.5	33.0	34.5	34.0	33.8
JPI-2	31.5	33.0	40.5	33.0	34.5
JPI-3	34.5	34.0	32.5	34.0	33.8
JPI-4	27.0	30.0	35.5	35.5	32.0
JPI-5	31.0	28.5	31.5	25.5	29.1
JPI-6	34.0	34.0	33.5	36.0	34.4
JPI-7	22.0	25.5	26.0	23.5	24.3

S137 Number of cobs 2 middle rows

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	49.0	50.0	49.0	49.0	49.3
JPI-2	49.0	49.0	48.0	49.0	48.8
JPI-3	50.0	50.0	50.0	48.0	49.5
JPI-4	49.0	48.0	49.0	48.0	48.5
JPI-5	48.0	48.0	49.0	48.0	48.3
JPI-6	49.0	50.0	47.0	49.0	48.8
JPI-7	48.0	47.0	47.0	49.0	47.8

S138 Seed row appearance

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	1.0	1.2	1.0	1.2	1.1
JPI-2	1.2	1.0	1.2	1.0	1.1
JPI-3	1.2	1.0	1.2	1.2	1.2
JPI-4	1.0	1.4	1.2	1.0	1.2
JPI-5	1.4	1.4	1.6	1.0	1.4
JPI-6	1.4	1.2	1.2	1.2	1.3
JPI-7	1.6	1.6	1.6	1.4	1.6

S139 Cob height (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	104.0	76.5	88.5	77.0	86.5
JPI-2	96.5	80.8	72.5	84.5	83.6
JPI-3	84.8	91.3	89.5	88.3	88.4
JPI-4	90.3	76.8	87.8	75.0	82.4
JPI-5	88.0	82.8	66.5	69.0	76.6
JPI-6	96.3	87.5	74.0	90.3	87.0
JPI-7	101.3	85.3	79.3	79.3	86.3

S140 Stem rot

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	0.02	0.02	0.01	0.01	0.02
JPI-2	0.03	0.01	0.01	0.01	0.02
JPI-3	0.02	0.02	0.01	0.01	0.02
JPI-4	0.02	0.02	0.01	0.03	0.02
JPI-5	0.03	0.04	0.01	0.04	0.03
JPI-6	0.03	0.05	0.02	0.03	0.03
JPI-7	0.05	0.02	0.07	0.06	0.05

S141 Cob length (cm)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	19.1	19.0	18.3	18.6	18.7
JPI-2	17.5	18.2	19.8	18.3	18.4
JPI-3	18.7	18.6	19.0	18.9	18.8
JPI-4	18.8	20.0	18.9	18.7	19.1
JPI-5	17.4	16.0	15.5	17.9	16.7
JPI-6	18.9	20.0	17.8	18.8	18.9
JPI-7	14.5	15.5	15.2	15.8	15.2

S142 Weight of 1000 seeds kA 15% y ogk

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	100.0	100.4	101.0	100.6	100.5
JPI-2	101.0	100.0	102.4	101.8	101.3
JPI-3	101.0	102.8	102.4	102.4	102.2
JPI-4	103.8	106.0	106.2	105.6	105.4
JPI-5	110.6	110.4	112.0	110.0	110.8
JPI-6	110.6	111.4	109.8	111.6	110.9
JPI-7	91.8	93.0	92.2	93.0	92.5

S143 Appearance due to Pests

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	2.0	2.0	2.2	2.2	2.1
JPI-2	2.2	2.0	1.8	2.0	2.0
JPI-3	2.2	2.2	2.0	2.2	2.2
JPI-4	1.8	2.2	2.0	2.2	2.1
JPI-5	2.4	2.0	2.0	2.2	2.2
JPI-6	2.2	2.4	2.0	2.4	2.3
JPI-7	1.2	1.0	1.2	1.0	1.1

S144 Production (t/ha KA 15%)

Treatment	replicate				Average
	I	II	III	IV	
JPI-1	9.18	9.63	9.52	11.22	9.89
JPI-2	9.79	9.81	9.11	9.62	9.58
JPI-3	10.03	9.00	10.31	10.17	9.88
JPI-4	9.21	8.12	9.15	8.74	8.80
JPI-5	8.44	9.95	7.72	7.00	8.28
JPI-6	9.27	10.15	9.12	9.02	9.39
JPI-7	3.48	5.66	7.56	6.86	5.89

Data downy mildew infection in Bajeng Gowa, 2023

S145 Age 14 DAP

genotype	replicate				
	I	II	III	IV	Average
JPI-1	0.0	0.0	0.0	0.0	0.0
JPI-2	0.0	0.0	0.0	0.0	0.0
JPI-3	0.0	0.4	1.0	0.8	0.6
JPI-4	4.2	5.2	3.8	3.0	4.1
Pulut Uri	0.0	0.0	0.0	0.0	0.0
Srikandi Putih	0.0	0.0	0.0	0.0	0.0
Pulut lokal	0.0	0.0	0.0	0.0	0.0
Anoman	7.2	6.8	8.2	7.8	7.5

S146 Age 21 D (Gowa)

Genotype	Replicate				
	I	II	III	IV	Rataan
JPI-1	3.8	3.2	3.4	3.7	3.5
JPI-2	4.7	5.0	4.2	4.4	4.6
JPI-3	5.8	6.4	5.9	6.7	6.2
JPI-4	11.9	12.8	12.6	12.7	12.5
Pulut Uri	3.6	4.1	4.5	4.2	4.1
Srikandi Putih	4.0	3.2	3.6	3.2	3.5
Pulut lokal	7.0	8.2	6.4	7.2	7.2
Anoman	69.2	60.4	60.8	66.2	64.2

S147 Age 28 D (Gowa)

Genotype	Replicate				
	I	II	III	IV	Rataan
JPI-1	5.1	5.6	5.2	5.4	5.3
JPI-2	7.8	7.2	7.1	6.4	7.1
JPI-3	11.0	12.0	10.4	11.2	11.2
JPI-4	28.2	27.4	26.8	28.4	27.7
Pulut Uri	8.8	8.3	7.8	8.9	8.5
Srikandi Putih	5.2	5.3	6.0	5.0	5.4
Pulut lokal	32.5	30.2	30.0	29.3	30.5
Anoman	82.4	80.1	78.6	82.5	80.9

S148 Age 35 D (Gowa)

Genotype	Replicate				
	I	II	III	IV	Rataan
JPI-1	5.8	5.6	5.2	6.4	5.8
JPI-2	9.0	7.2	8.1	8.4	8.2
JPI-3	11.0	12.0	12.4	11.2	11.7
JPI-4	28.2	27.4	26.8	28.4	27.7
Pulut Uri	8.8	8.7	9.8	8.9	9.1
Srikandi Putih	5.2	5.3	6.0	5.0	5.4
Pulut lokal	32.5	38.2	39.0	39.3	37.3
Anoman	97.4	98.1	98.6	99.5	98.4

S149 Age 42 H (Gowa)

Genotip	Ulangan				
	I	II	III	IV	Rataan
JPI-1	5.8	5.6	5.2	6.4	5.8
JPI-2	9.0	7.2	8.1	8.4	8.2
JPI-3	11.0	12.0	12.4	11.2	11.7
JPI-4	28.2	27.4	26.8	28.4	27.7
Pulut Uri	8.8	8.7	9.8	8.9	9.1
Srikandi Putih	5.2	5.3	6.0	5.0	5.4
Pulut lokal	38.5	40.2	39.4	40.3	39.6
Anoman	90.4	95.1	90.6	92.5	92.2

S150 Tabel 1. Rata-rata persentase infeksi patogrn bulai di Bajeng Gowa 2023

Genotip	Insidensi penyakit bulai (%) pada age (HST)					Reaksi
	14	21	28	35	42	
JPI-1	0.0	3.5	5.3	5.8	5.8	Susceptible T)
JPI-2	0.0	4.6	7.1	8.2	8.2	Susceptible (S)
JPI-3	0.6	6.2	11.2	11.7	11.7	Susceptible (S)
JPI-4	4.1	12.5	27.7	27.7	27.7	agak Susceptible AT)
Pulut Uri	0.0	4.1	8.5	9.1	9.1	Susceptible (S)
Srikandi Putih	0.0	3.5	5.4	5.4	5.4	Susceptible (S)
Pulut lokal	0.0	7.2	30.5	37.3	39.6	Vulnurable ®
Anoman	7.5	64.2	80.9	98.4	92.2	Very vulnurable (SR)

Data downy mildew infection in Malang, Jatim, 2023

S151 Age 14 DAP

genotype	replicate				
	I	II	III	IV	Average
JPI-1	0.0	0.0	0.0	0.0	0.0
JPI-2	0.0	0.0	0.0	0.0	0.0
JPI-3	2.4	3.8	2.4	3.4	3.0
JPI-4	4.0	4.2	4.3	3.6	4.0
Pulut Uri	0.5	0.2	0.2	0.4	0.3
Srikandi Putih	2.0	2.3	2.6	2.1	2.3
Pulut lokal	1.2	1.1	1.0	0.7	1.0
Anoman	23.1	20.2	19.6	19.6	20.6

S152 Age 21 D (Malang)

Genotype	Replicate				
	I	II	III	IV	Rataan
JPI-1	0.0	0.0	0.0	0.0	0.0
JPI-2	0.0	0.0	0.0	0.0	0.0
JPI-3	6.4	6.6	5.9	6.9	6.5
JPI-4	8.1	7.4	7.8	7.4	7.7
Pulut Uri	4.6	4.1	3.8	4.0	4.1
Srikandi Putih	5.9	7.0	6.4	5.8	6.3
Pulut lokal	8.7	7.8	7.4	8.1	8.0
Anoman	52.3	50.4	53.0	53.4	52.3

S153 Age 28 DA (Malang)

Genotype	Replicate				
	I	II	III	IV	Rataan
JPI-1	9.1	9.2	10.0	8.5	9.2
JPI-2	10.4	10.7	9.9	9.8	10.2
JPI-3	8.4	9.0	8.3	7.8	8.4
JPI-4	9.0	8.6	8.5	8.6	8.7
Pulut Uri	9.6	9.3	8.8	9.1	9.2
Srikandi Putih	8.4	8.8	7.9	8.4	8.4
Pulut lokal	11.0	9.2	10.0	10.1	10.1
Anoman	72.5	72.5	74.3	68.4	71.9

S154 Age 35 DA (Malang)

Genotype	Replicate				
	I	II	III	IV	Rataan
JPI-1	9.9	8.9	9.7	10.0	9.6
JPI-2	11.1	10.3	10.7	9.6	10.4
JPI-3	9.8	9.8	10.1	9.3	9.8
JPI-4	19.0	18.1	17.3	17.6	18.0
Pulut Uri	10.6	10.3	11.3	10.2	10.6
Srikandi Putih	10.0	9.1	9.2	8.4	9.2
Pulut lokal	25.4	27.1	24.2	25.0	25.4
Anoman	80.3	80.6	77.9	79.5	79.6

S155 Age 42 HS (Malang)

Genotip	Ulangan				
	I	II	III	IV	Rataan
JPI-1	9.9	8.9	9.7	10.0	9.6
JPI-2	11.1	10.3	10.7	9.6	10.4
JPI-3	9.8	9.8	10.1	9.3	9.8
JPI-4	19.0	18.1	17.3	17.6	18.0
Pulut Uri	10.6	10.3	11.3	10.2	10.6
Srikandi Putih	10.0	9.1	9.2	8.4	9.2
Pulut lokal	25.4	27.1	24.2	25.0	25.4
Anoman	82.2	86.2	80.5	86.1	83.7

S156 Tabel 2. Rata-rata persentase infeksi patogrn bulai di Malang Jatim- 2023

Genotip	Insidensi penyakit bulai (%) pada age (HST)					Reaksi
	14	21	28	35	42	
JPI-1	0.0	0.0	9.2	9.6	9.6	Susceptible T)
JPI-2	0.0	0.0	10.2	10.4	10.4	Susceptible (S)
JPI-3	3.0	6.5	8.4	9.8	9.8	Susceptible (S)
JPI-4	4.0	7.7	8.7	18.0	18.0	agak Susceptible (AT)
Pulut Uri	0.3	4.1	9.2	10.6	10.6	Susceptible (S)
Srikandi Putih	2.3	6.3	8.4	9.2	9.2	Susceptible (S)
Pulut lokal	1.0	8.0	10.1	25.4	25.4	agak susceptible (AT)
Anoman	20.6	52.3	71.9	79.6	83.7	Very vulnurable (SR)

SS 161
Lea
Age 60 D

Genotype
JPI-1
JPI-2
JPI-3
JPI-4
Pulut Uri
Srikandi Pu
Pulut lokal
Anoman

SS 162
Lea
Age 70 D

Genotype
JPI-1
JPI-2
JPI-3
JPI-4
Pulut Uri
Srikandi

SS 163
Ave

Genotype
JPI-1
JPI-2
JPI-3
JPI-4
Pulut Uri
Srikandi Pu
Pulut lokal

Data leaf blight infection in Bajeng, Gowa, 2023
S157 Age 45 DAP

genotype	replicate				
	I	II	III	IV	Average
JPI-1	1.60	2.00	1.20	1.30	1.53
JPI-2	6.10	5.80	5.40	5.30	5.65
JPI-3	13.10	12.60	12.70	12.40	12.70
JPI-4	12.40	12.60	12.20	12.00	12.30
Pulut Uri	0.00	0.00	0.00	0.00	0.00
Srikandi Putih	6.20	5.40	5.11	4.50	5.30
Pulut lokal	4.70	5.10	4.20	4.80	4.70
Anoman	1.30	1.60	1.11	1.20	1.30

S158 Age 60 DA (gowa)

Genotype	Replicate				
	I	II	III	IV	Rataan
JPI-1	16.50	16.80	14.20	14.90	15.60
JPI-2	18.40	18.80	17.30	18.20	18.18
JPI-3	18.10	16.60	17.20	17.10	17.25
JPI-4	18.80	19.20	18.20	17.40	18.40
Pulut Uri	16.30	17.00	15.10	15.60	16.00
Srikandi Putih	17.50	18.20	16.30	17.20	17.30
Pulut lokal	15.10	15.40	14.50	15.00	15.00
Anoman	38.40	40.10	38.80	39.90	39.30

S159 Age 75 DA (gowa)

Genotype	Replicate				
	I	II	III	IV	Rataan
JPI-1	18.50	18.40	19.10	19.20	18.80
JPI-2	22.20	20.60	20.10	19.50	20.60
JPI-3	19.20	18.20	17.60	17.00	18.00
JPI-4	22.40	20.80	20.40	19.60	20.80
Pulut Uri	21.30	20.40	18.10	20.20	20.00
Srikandi Putih	19.70	18.31	19.10	19.70	19.20
Pulut lokal	21.30	21.60	20.20	20.10	20.80
Anoman	70.20	70.40	68.10	65.30	68.50

S160 Tabel 3. Rata-rata persentase hawar daun di Bajeng-Gowa- 2023

Genotype	nsi penyakit bulai (%) pada age			Reaksi	
	45	60	70		
JPI-1	1.53	15.60	18.80	Susceptible T)	
JPI-2	5.65	18.18	20.60	Susceptible (S)	
JPI-3	12.70	17.25	18.00	Susceptible (S)	
JPI-4	12.30	18.40	20.80	Susceptible (S)	(SR)
Pulut Uri	0.00	16.00	20.00	Susceptibl	

f rust infection data in Bajeng, Gowa, 2023
AP

	Replicate			
I	II	III	IV	Average
16.30	14.40	15.80	15.50	15.50
16.40	17.20	16.80	17.20	16.90
18.10	18.00	20.00	17.10	18.30
14.80	15.00	13.20	14.20	14.30
17.50	16.70	16.80	16.20	16.80
14.70	15.00	14.00	13.50	14.30
14.80	14.30	15.10	13.80	14.50
23.10	23.50	21.80	21.60	22.50

f rust infection data in Bajeng, Gowa, 2023
(gowa)

	Replicate			
I	II	III	IV	Average
21.70	22.40	19.40	19.30	20.70
20.20	19.80	19.80	18.90	19.68
22.20	20.20	18.40	19.10	19.98
18.50	17.30	19.20	17.00	18.00
21.80	21.60	18.60	19.20	20.30
18.40	18.20	17.40	18.00	18.00
21.20	21.00	19.30	18.50	20.00
66.80	70.60	67.20	68.20	68.20

rage percentage of leaf rust in Bajeng-Gowa- 2023

Leaf rust percentage (%) at age (DAP)			Reaksi
45	60	70	
	15.50	20.70	Susceptible T)
	16.90	19.68	Susceptible (S)
	18.30	19.98	Susceptible (S)
	14.30	18.00	Susceptible (S)
	16.80	20.30	Susceptible (S)
tih	14.30	18.00	Susceptible (S)
	14.50	20.00	Susceptible (S)
	22.50	68.20	angat vulnurable (SR)

Data downy mildew infection in Bajeng Gowa, 2023

S145 Age 14 DAP

genotype	replicate				
	I	II	III	IV	Average
JPI-1	0.0	0.0	0.0	0.0	0.0
JPI-2	0.0	0.0	0.0	0.0	0.0
JPI-3	0.0	0.4	1.0	0.8	0.6
JPI-4	4.2	5.2	3.8	3.0	4.1
Pulut Uri	0.0	0.0	0.0	0.0	0.0
Srikandi Putih	0.0	0.0	0.0	0.0	0.0
Pulut lokal	0.0	0.0	0.0	0.0	0.0
Anoman	7.2	6.8	8.2	7.8	7.5

S146 Age 21 D (Gowa)

Genotype	Replicate				
	I	II	III	IV	Rataan
JPI-1	3.8	3.2	3.4	3.7	3.5
JPI-2	4.7	5.0	4.2	4.4	4.6
JPI-3	5.8	6.4	5.9	6.7	6.2
JPI-4	11.9	12.8	12.6	12.7	12.5
Pulut Uri	3.6	4.1	4.5	4.2	4.1
Srikandi Putih	4.0	3.2	3.6	3.2	3.5
Pulut lokal	7.0	8.2	6.4	7.2	7.2
Anoman	69.2	60.4	60.8	66.2	64.2

S147 Age 28 D (Gowa)

Genotype	Replicate				
	I	II	III	IV	Rataan
JPI-1	5.1	5.6	5.2	5.4	5.3
JPI-2	7.8	7.2	7.1	6.4	7.1
JPI-3	11.0	12.0	10.4	11.2	11.2
JPI-4	28.2	27.4	26.8	28.4	27.7
Pulut Uri	8.8	8.3	7.8	8.9	8.5
Srikandi Putih	5.2	5.3	6.0	5.0	5.4
Pulut lokal	32.5	30.2	30.0	29.3	30.5
Anoman	82.4	80.1	78.6	82.5	80.9

S148 Age 35 D (Gowa)

Genotype	Replicate				
	I	II	III	IV	Rataan
JPI-1	5.8	5.6	5.2	6.4	5.8
JPI-2	9.0	7.2	8.1	8.4	8.2
JPI-3	11.0	12.0	12.4	11.2	11.7
JPI-4	28.2	27.4	26.8	28.4	27.7
Pulut Uri	8.8	8.7	9.8	8.9	9.1
Srikandi Putih	5.2	5.3	6.0	5.0	5.4
Pulut lokal	32.5	38.2	39.0	39.3	37.3
Anoman	97.4	98.1	98.6	99.5	98.4

S149 Age 42 H (Gowa)

Genotip	Ulangan				
	I	II	III	IV	Rataan
JPI-1	5.8	5.6	5.2	6.4	5.8
JPI-2	9.0	7.2	8.1	8.4	8.2
JPI-3	11.0	12.0	12.4	11.2	11.7
JPI-4	28.2	27.4	26.8	28.4	27.7
Pulut Uri	8.8	8.7	9.8	8.9	9.1
Srikandi Putih	5.2	5.3	6.0	5.0	5.4
Pulut lokal	38.5	40.2	39.4	40.3	39.6
Anoman	90.4	95.1	90.6	92.5	92.2

S150 Tabel 1. Rata-rata persentase infeksi patogrn bulai di Bajeng Gowa 2023

Genotip	Insidensi penyakit bulai (%) pada age (HST)					Reaksi
	14	21	28	35	42	
JPI-1	0.0	3.5	5.3	5.8	5.8	Susceptible T)
JPI-2	0.0	4.6	7.1	8.2	8.2	Susceptible (S)
JPI-3	0.6	6.2	11.2	11.7	11.7	Susceptible (S)
JPI-4	4.1	12.5	27.7	27.7	27.7	agak Susceptible AT)
Pulut Uri	0.0	4.1	8.5	9.1	9.1	Susceptible (S)
Srikandi Putih	0.0	3.5	5.4	5.4	5.4	Susceptible (S)
Pulut lokal	0.0	7.2	30.5	37.3	39.6	Vulnurable ®
Anoman	7.5	64.2	80.9	98.4	92.2	Very vulnurable (SR)

Data downy mildew infection in Malang, Jatim, 2023

S151 Age 14 DAP

genotype	replicate				
	I	II	III	IV	Average
JPI-1	0.0	0.0	0.0	0.0	0.0
JPI-2	0.0	0.0	0.0	0.0	0.0
JPI-3	2.4	3.8	2.4	3.4	3.0
JPI-4	4.0	4.2	4.3	3.6	4.0
Pulut Uri	0.5	0.2	0.2	0.4	0.3
Srikandi Putih	2.0	2.3	2.6	2.1	2.3
Pulut lokal	1.2	1.1	1.0	0.7	1.0
Anoman	23.1	20.2	19.6	19.6	20.6

S152 Age 21 D (Malang)

Genotype	Replicate				
	I	II	III	IV	Rataan
JPI-1	0.0	0.0	0.0	0.0	0.0
JPI-2	0.0	0.0	0.0	0.0	0.0
JPI-3	6.4	6.6	5.9	6.9	6.5
JPI-4	8.1	7.4	7.8	7.4	7.7
Pulut Uri	4.6	4.1	3.8	4.0	4.1
Srikandi Putih	5.9	7.0	6.4	5.8	6.3
Pulut lokal	8.7	7.8	7.4	8.1	8.0
Anoman	52.3	50.4	53.0	53.4	52.3

S153 Age 28 DA (Malang)

Genotype	Replicate				
	I	II	III	IV	Rataan
JPI-1	9.1	9.2	10.0	8.5	9.2
JPI-2	10.4	10.7	9.9	9.8	10.2
JPI-3	8.4	9.0	8.3	7.8	8.4
JPI-4	9.0	8.6	8.5	8.6	8.7
Pulut Uri	9.6	9.3	8.8	9.1	9.2
Srikandi Putih	8.4	8.8	7.9	8.4	8.4
Pulut lokal	11.0	9.2	10.0	10.1	10.1
Anoman	72.5	72.5	74.3	68.4	71.9

S154 Age 35 DA (Malang)

Genotype	Replicate				
	I	II	III	IV	Rataan
JPI-1	9.9	8.9	9.7	10.0	9.6
JPI-2	11.1	10.3	10.7	9.6	10.4
JPI-3	9.8	9.8	10.1	9.3	9.8
JPI-4	19.0	18.1	17.3	17.6	18.0
Pulut Uri	10.6	10.3	11.3	10.2	10.6
Srikandi Putih	10.0	9.1	9.2	8.4	9.2
Pulut lokal	25.4	27.1	24.2	25.0	25.4
Anoman	80.3	80.6	77.9	79.5	79.6

S155 Age 42 HS (Malang)

Genotip	Ulangan				
	I	II	III	IV	Rataan
JPI-1	9.9	8.9	9.7	10.0	9.6
JPI-2	11.1	10.3	10.7	9.6	10.4
JPI-3	9.8	9.8	10.1	9.3	9.8
JPI-4	19.0	18.1	17.3	17.6	18.0
Pulut Uri	10.6	10.3	11.3	10.2	10.6
Srikandi Putih	10.0	9.1	9.2	8.4	9.2
Pulut lokal	25.4	27.1	24.2	25.0	25.4
Anoman	82.2	86.2	80.5	86.1	83.7

S156 Tabel 2. Rata-rata persentase infeksi patogrn bulai di Malang Jatim- 2023

Genotip	Insidensi penyakit bulai (%) pada age (HST)					Reaksi
	14	21	28	35	42	
JPI-1	0.0	0.0	9.2	9.6	9.6	Susceptible T)
JPI-2	0.0	0.0	10.2	10.4	10.4	Susceptible (S)
JPI-3	3.0	6.5	8.4	9.8	9.8	Susceptible (S)
JPI-4	4.0	7.7	8.7	18.0	18.0	Moderate Susceptible (MT)
Pulut Uri	0.3	4.1	9.2	10.6	10.6	Susceptible (S)
Srikandi Putih	2.3	6.3	8.4	9.2	9.2	Susceptible (S)
Pulut lokal	1.0	8.0	10.1	25.4	25.4	Moderate susceptible (MT)
Anoman	20.6	52.3	71.9	79.6	83.7	Very vulnurable (SR)

Data leaf blight infection in Bajeng, Gowa, 2023

S157 Age 45 DAP

genotype	replicate				
	I	II	III	IV	Average
JPI-1	1.60	2.00	1.20	1.30	1.53
JPI-2	6.10	5.80	5.40	5.30	5.65
JPI-3	13.10	12.60	12.70	12.40	12.70
JPI-4	12.40	12.60	12.20	12.00	12.30
Pulut Uri	0.00	0.00	0.00	0.00	0.00
Srikandi Putih	6.20	5.40	5.11	4.50	5.30
Pulut lokal	4.70	5.10	4.20	4.80	4.70
Anoman	1.30	1.60	1.11	1.20	1.30

S158 Age 60 DA (gowa)

Genotype	Replicate				
	I	II	III	IV	Rataan
JPI-1	16.50	16.80	14.20	14.90	15.60
JPI-2	18.40	18.80	17.30	18.20	18.18
JPI-3	18.10	16.60	17.20	17.10	17.25
JPI-4	18.80	19.20	18.20	17.40	18.40
Pulut Uri	16.30	17.00	15.10	15.60	16.00
Srikandi Putih	17.50	18.20	16.30	17.20	17.30
Pulut lokal	15.10	15.40	14.50	15.00	15.00
Anoman	38.40	40.10	38.80	39.90	39.30

S159 Age 75 DA (gowa)

Genotype	Replicate				
	I	II	III	IV	Rataan
JPI-1	18.50	18.40	19.10	19.20	18.80
JPI-2	22.20	20.60	20.10	19.50	20.60
JPI-3	19.20	18.20	17.60	17.00	18.00
JPI-4	22.40	20.80	20.40	19.60	20.80
Pulut Uri	21.30	20.40	18.10	20.20	20.00
Srikandi Putih	19.70	18.31	19.10	19.70	19.20
Pulut lokal	21.30	21.60	20.20	20.10	20.80
Anoman	70.20	70.40	68.10	65.30	68.50

S160 Tabel 3. Rata-rata persentase hawar daun di Bajeng-Gowa- 2023

Genotype	nsi penyakit bulai (%) pada age			Reaksi
	45	60	70	
JPI-1	1.53	15.60	18.80	Susceptible (S)
JPI-2	5.65	18.18	20.60	Susceptible (S)
JPI-3	12.70	17.25	18.00	Susceptible (S)
JPI-4	12.30	18.40	20.80	Susceptible (S)
Pulut Uri	0.00	16.00	20.00	Susceptible (S)
Srikandi Putih	5.30	17.30	19.20	Susceptible (S)
Pulut lokal	4.70	15.00	20.80	Susceptible (S) (SR)
Anoman	1.30	39.30	68.50	Very vulnerable (VV)

SS 161 Leaf rust infection data in Bajeng, Gowa, 2023

Age 60 DAP

Genotype	Replicate				
	I	II	III	IV	Average
JPI-1	16.30	14.40	15.80	15.50	15.50
JPI-2	16.40	17.20	16.80	17.20	16.90
JPI-3	18.10	18.00	20.00	17.10	18.30
JPI-4	14.80	15.00	13.20	14.20	14.30
Pulut Uri	17.50	16.70	16.80	16.20	16.80
Srikandi Putih	14.70	15.00	14.00	13.50	14.30
Pulut lokal	14.80	14.30	15.10	13.80	14.50
Anoman	23.10	23.50	21.80	21.60	22.50

SS 162 Leaf rust infection data in Bajeng, Gowa, 2023

Age 70 DAP (gowa)

Genotype	Replicate				
	I	II	III	IV	Average
JPI-1	21.70	22.40	19.40	19.30	20.70
JPI-2	20.20	19.80	19.80	18.90	19.68
JPI-3	22.20	20.20	18.40	19.10	19.98
JPI-4	18.50	17.30	19.20	17.00	18.00
Pulut Uri	21.80	21.60	18.60	19.20	20.30
Srikandi Putih	18.40	18.20	17.40	18.00	18.00
Pulut lokal	21.20	21.00	19.30	18.50	20.00
Anoman	66.80	70.60	67.20	68.20	68.20

SS 163 Average percentage of leaf rust in Bajeng-Gowa- 2023

Genotype	Percentage (%) at age (DAP)			Reaksi
	45	60	70	
JPI-1		15.50	20.70	Susceptible T)
JPI-2		16.90	19.68	Susceptible (S)
JPI-3		18.30	19.98	Susceptible (S)
JPI-4		14.30	18.00	Susceptible (S)
Pulut Uri		16.80	20.30	Susceptible (S)
Srikandi Putih		14.30	18.00	Susceptible (S)
Pulut lokal		14.50	20.00	Susceptible (S)
Anoman		22.50	68.20	Very vulnurable (VV)

9. Bukti konfirmasi editor terhadap email author

(10 April 2024)

Email kesembilan

Dari: **Arunachalam Anbalagan** <arunachalam.anbalagan@hindawi.com>
Tanggal: Rab, 10 Apr 2024 pukul 12.01
Subjek: Re: 5511045: Author Data Needed
Ke: <edy@umi.ac.id>

Dear Dr. Edy,

Thank you for your response,

Please be informed that your manuscript has passed the initial screening checks and is currently under going peer review process.

If you have any further concern, feel free to contact us.

Best Regards,

Arunachalam

———————————

Arunachalam Anbalagan
Editorial Screener

arunachalam.anbalagan@hindawi.com

Hindawi

> On Wed, 10 Apr at 5:00 AM , Edy <edy@umi.ac.id> wrote:
> Dear Editor, I sent the revised supplementary E. Should I revised the file, please inform me which table I must revise it?
>
> Best Regards
> Edy
>
> > On Sat, Mar 30, 2024 at 11:56 PM Arunachalam Anbalagan <arunachalam.anbalagan@hindawi.com> wrote:
> > Dear Dr. Edy,
> >
> > Thank you for your email,
> >
> > Please be informed that we will proceed with your supplementary material once we receive a valid supplementary material, i.e. without any overlap of tables or not any wrapping of table to the next page.
> >
> > Looking forward to hearing form you.
> >
> > Best Regards,
> >
> > Arunachalam

10. Bukti konfirmasi submit revisi kelima, respon kepada reviewer, dan file artikel diresubmit
(16 April 2024)

Email kesepuluh

Dari: **International Journal of Agronomy** <IJA@email.hindawi.com>
Tanggal: Sel, 16 Apr 2024 pukul 18.04
Subjek: Important Announcement about International Journal of Agronomy
Ke: <edy@umi.ac.id>

Can't see this email? View online

International Journal of Agronomy

Aims & Scope | Editorial Board | Indexing | Special Issues

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Attachment
Reviewer comment
Yield, Protein and Amylopectin Contents of BC3F2 Mayze By Selfing of Different Grain Colors
Reviewer comments
-Improve the language quality of the manuscript for better readability
- The abstract effectively outlines the objectives and key findings of the study, providing readers with a clear understanding of the research aims and outcomes. However, it would be beneficial to explicitly state the specific objectives of the study in the abstract to guide readers in understanding the scope and purpose of the research. Additionally, the conclusion should be strengthened by summarizing the implications of the findings and providing recommendations for future research or practical applications in maize breeding programs.
- The introduction could be enhanced by providing a more comprehensive overview of the importance of producing high nutritional and productive maize varieties, especially in the context of addressing global food security challenges. Additionally, the introduction should delineate the research gaps and justify the need for investigating the yield, amylopectin, and protein contents of BC3F3 maize resulting from selfing across different grain colors. Integration of recent literature reviews and discussions on relevant studies would enrich the introduction and provide a solid theoretical framework for the research. Clearly stating the hypothesis and specific objectives of the study would further strengthen the introduction section.
-The materials and methods section should be critically evaluated for clarity and reproducibility. Authors should provide detailed descriptions of the experimental procedures, including the criteria for selecting BC3F2 plants, methods for selfing, and parameters for evaluating yield, amylopectin, and protein content. Emphasizing the standardization of experimental protocols and quality control measures would enhance the credibility and reproducibility of the results. Additionally, inclusion of statistical analyses and measures taken to minimize experimental biases would strengthen the methodological rigor of the study.

-The results and discussion section should succinctly present the main findings of the study and provide meaningful interpretations and comparisons with existing literature. - --Authors should avoid redundant repetition of results and focus on highlighting significant trends, patterns, and correlations observed in the data. Integration of relevant statistical analyses and graphical representations would aid in elucidating key findings and facilitating data interpretation. Additionally, the discussion should delve into the underlying mechanisms driving the observed variations in yield, amylopectin, and protein content across different grain colors, providing insights into the genetic and physiological factors influencing maize grain quality.

Response perbaikan naskah

Multilocation Test of Prospective Composite Sticky Corn Varieties with High Production in Indonesia

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Abstract

National staple food needs are increasing along with the increase in population. Therefore, he needs a delicious alternative staple food, one of which is glutinous corn. To anticipate the increasing demand for glutinous corn, efforts are required to increase productivity by using new superior varieties that can adapt to specific and wider environments and are resistant to pests and diseases. This research aims to evaluate multi-location test of crossover varieties of four prospective composite corn varieties. The method used in this research was the adaptation testing of 4 prospective varieties of composite sticky (JPI-1, JPI-2, JPI-3, JPI-4) and 3 comparative varieties (Sticky Uri, White Srikandi, and local Sticky Takalar) carried out in 6 districts in Indonesia as research locations. Each location was designed using a randomized block design, with 4 replications to obtain 28 experimental units at each location. Observation data were analyzed using analysis of variance (ANOVA). If there is a difference in the mean value of the varieties in the F test, continue with the Least Significant Difference (LSD) test at the 5% level. Data analysis using the DSAASTAT program. Analysis of the stability of the results used the additive mean effect multiplicative interaction multivariate analysis model using the PBSTAT program. Testing for resistance to downy mildew, rust and leaf blight was carried out in a randomized block design with 4 replications. Proximate analysis testing was conducted at the Animal Husbandry Integrated Biotechnology Laboratory, Faculty of Animal Husbandry, Hasanuddin University. The results of the research show that the prospective composite corn varieties JPI-1, JPI-2, JPI-3, and JPI-4 have the potential for yields that are significantly superior to the three comparative varieties, respectively, with each of 8.88 t.ha-1 ; 8.54 t.ha-1; 8.57 t.ha-1; 8.67 tha-1. Based on the results of the stability analysis, JPI-1 and JPI-4 show stable results in all environments, and JPI-3 shows increasingly better results in the optimum environment. Prospective varieties JPI-1, JPI-2 JPI-3 and JPI-4 offer the criteria for resistance to Downy mildew disease *Peronosclerospora maydis*, *Peronosclerospora philippinensis* type, Bipolaris maydis type blight, and also resistance to the leaf rust disease type *Puccinia polysora*. Based on the approximate test JPI-1, JPI-3, and JPI-4 have superior protein content than the three comparative varieties, 11.64, 11.69% - 11.86%. The prospective variety JPI-1 has a high amylopectin content (85.10%) equivalent to the amylopectin content of local Sticky parents and higher than the two comparative varieties. JPI-2, JPI-3, and JPI-4 have higher amylopectin content than the two comparative varieties.

Keywords: adaptation, corn composite, productivity, disease resistance, proximate

1. Introduction

Corn (*Zea mays* L.) is one of the world's most essential carbohydrate-producing food crops, besides wheat and rice [1]. Corn is a second cereal commodity food in Indonesia. Corn is generally utilized as an alternative staple food, snacks, and various other foods, as well as in the animal feed industry. In some areas, the community consumed corn as a staple food. Moreover, corn is also a main ingredient in animal feed and other industries such as raw materials for producing bioethanol. Currently, a study initiates to develop corn as a functional food because it contains dietary fiber [1].

Sticky or waxy corn (*Zea mays ceratina* L.) is a particular type of corn that has the potential as a source of food diversification and industrial materials. In Japan, sticky corn is a source of amylopectin, a raw material for food products, textiles, glue, and paper. In addition, sticky corn is a source of germplasm for developing new cultivars through plant breeding [2]. Sticky corn, like sweet corn, can be consumed as a fresh or boiled vegetable because it has a soft and delicious taste. Glutinous corn contains starch from amylopectin, which almost reaches 100% [3]. The high level of amylopectin in sticky corn is suitable for the diet of diabetics and to increase the weight of livestock. The sticky corn is generally consumed as corn porridge and snacks. Sticky corn, however, has a low potential yield. It only produces small cobs with a 10–11 mm diameter, production less than 2 tons/ha. Due to its poor production and vulnerability to downy mildew, it has been rarely used as a staple food and, hence become scarce [4].

Sticky corn is a typical food ingredient in Sulawesi, Indonesia. Domestic demand for sticky corn continues to increase, but supply is insufficient. Furthermore, the national need for corn is growing along with the increase in population and the development of the food and feed industry. Data for the 2018-2022 period show that corn production has grown along with the increase in harvested area; unfortunately, there has been a particular decline in 2021. The effort to provide glutinous corn as an alternative staple food requires the release of appropriate variety. It must express a high-yielding amylopectin content and adapt to environmental changes especially downy mildew attact.

The proposed composite corn genotype is a line assembled and developed from a cross between a high protein and production variety and a local sticky variety containing amylopectin. The composite corn genotype assembly program goes through several breeding stages to obtain a combination of traits resulting from the cross. This requires continuous identification, characterization, and evaluation. One of the stages in testing the results of the genotype assembly is the multi-location test. This research aims to evaluate multi-location test of crossover varieties of four prospective composite corn varieties.

2. Materials and Methods

This study evaluated the performance of the multi-location test of four prospective composite corn varieties and three comparative varieties. The four prospective corn varieties consisted of JPI-1, JPI-2, JPI-3, and JPI-4, while the three comparative varieties are Sticky Uri (JPI-5), White *Srikandi* (JPI-6) and Local Sticky *Takalar* (JPI-7). JPI-1, JPI-2, JPI-3 and JPI-4 originate from a cross between the White *Srikandi* variety (as the female parent) and the local Sticky *Takalar* (as the male parent). The crossover process was conducted from 2017 to 2022 through the eighth generation.

2.1. Testing Time and Location

The adaptation test was carried out during the 2023 planting season from March to September 2023 in six districts. Four districts were located in South Sulawesi (Gowa Regency, Takalar Regency, Bantaeng Regency, Maros Regency) and two districts from other provinces (Lombok Regency, West Nusa Tenggara Province and Kediri Regency, East Java Province). Disease resistance tests were carried out in 2 districts, Gowa Regency (3 locations: location 1, leaf rust test, location 2 leaf blight test and location 3, downy mildew test specific for the species *Peronosclerospora philippinensis* which often attacks corn in Sulawesi) and Malang Regency, East Java Province (specifically the specific downy mildew test for the *Peronosclerospora maydis* species which often attacks corn in Java). Descriptions of adaptation test locations and disease resistance tests for prospective composite varieties are presented in Tables 1 and 2.

The plot area used for each experimental unit was 5 × 3 m^2 with a planting space of 75 × 20 cm^2. A total of 100 individual corn was planted 4 rows in each plot. The type and dose of fertilizer used was 300 kg/ha of urea and 400 kg/ha of Nitrogen, Phosphorus and Potassium. Fertilization was done twice when the plants were seven days old and 30 days after planting, each administered 50% of the dose. The water was merely applied when the rain stopped for a week. The samples were collected from the two middle rows, randomly taking as many as 10 plants per plot.

2.2. Adaptation Test Method

The research was carried out using a randomized block design consisting of seven varieties, repeated 4 times so that there were 28 experimental units at each adaptation test location (Table 1). Data collected from each location were analyzed for combined variance. Combined analysis of variance was used to determine the influence of environment, genotype, and interaction of genotype and environment. Observation data were analyzed using analysis of variance (ANOVA). Bi values were used to analyze the stability of results. If there was a difference in the mean value of the varieties in the F test, test was continued with the Least Significant Difference (LSD) test at the 5% level. The results were presented only paired comparatives between prospective and comparative varieties. Data analysis using the DSAASTAT program. Analysis of the stability of the results used the additive mean effect multiplicative interaction multivariate analysis model using the PBSTAT program.

TABLE 1: Description of adaptation test locations for prospective composite corn varieties in six districts.

No.	Location	Soil type	Altitude (a.s.l)	Climate type	Planting date	Harvest date
1.	Bajeng Gowa, South Sulawesi	Alluvial, land paddy field	89	D	06 May 2023	20 August 2023
2.	Sinoa, Bantaeng, South Sulawesi	Latosol, land dry	500	B	17 May 2023	10 September 2023
3.	Lembar Lombok Barat, NTB	Alluvial, Land dry	14	D3	21 May 2023	05 September 2023
4.	Kepung, Kediri, East Java	Alluvial, Land dry	67	C2	22 May 2023	07 September 2023
5	Galesong, Takalar, South Sulawesi	Alluvial, Land paddy field	20	C2	24 May 2023	09 September 2023
6.	Lau, Maros, South Sulawesi	Alluvial, Land Paddy field	25	C2	21 June 2023	06 October 2023

TABLE 2: Description of disease resistance test locations for prospective composite corn varieties in 2 districts.

No.	Location	Soil type	Altitude (mdpl)	Climate type	Planting date	Harvest date	Information

1	Bajeng, Gowa, South Sulawesi	Alluvial, Land dry	89	D	11 June 2023	26 August 2023	Leaf rust
					17 June 2023	02 Sept 2023	Hover down
					24 June 2023	10 August 2023	Bubbles *(P. philippinensis*)
2	Gondang legi, Malang, East Java	Inceptisol, Land paddy field	400.1	C2	12 June 2023	31 July 2023	Bubbles (*P. maydis*)

3. Results and Discussion

3.1. Overview Adaptation test

The results of the integrated variance analysis of yield and agronomic characteristics of four prospective composite corn varieties and three comparative varieties are presented in Table 3. The combined variance analysis shows that location strongly affects all observed variables except for leaf width, male flowering age, cob appearance, and harvest water content. The effect of location indicates the environmental characteristics of the study sites were quite diverse.

The effect of genotype was significant on all observed variables except leaf length. Each prospective variety has a different genetic potential in expressing traits or characters. Another study reported that the lines tested differ significantly in all characters, indicating that there are differences in genetic potential between the lines tested [5].

TABLE 3: Middle square of agronomic characters, yield components, and yield of prospective JPI composite corn varieties at several locations.

Variable	Location (L)	Genotype	L × G
Plant Growth (%)	222.52 **	76.72**	8.70
Plant Height (cm)	10549.10**	2218.36**	381.10*
Cob Height (cm)	2257.33 **	547.79 **	148.34 *
Stem Fall (%)	0.00 **	0.00 **	0.00
Root Reduction (%)	0.00 **	0.00 **	0.00 **
Number of leaves	0.15 7 **	0.08 **	0.01
Leaf angle (º)	23.98 **	5.80 **	0.67
Leaf length (cm)	15.12 **	1.41	1.67 *
Leaf width (cm)	10.01	24.05 *	7.29
Age of male flowering (DAP)	0.31	0.53 *	0.20
Female flowering age (DAT)	163.09 **	95.97 **	3.22
Harvest age (DAP)	173.52 **	104.23 **	3.31 **
Plant Appearance Aspects (score)	149.72 **	780.59 **	6.33 **
Closing husk (score)	2.87 **	0.22 **	0.02
Cob Performance (score)	0.19	2.50 **	0.02
Blight Score (score)	0.71**	0.17**	0.04
Rust Disease Score (score)	0.00 **	0.00 **	0.00
Number of harvested plants	0.00 *	0.00 **	0.00

Number of harvested cobs (cobs)	64.71**	7.57**	0.81
Harvest cob weight (kg)	42.28 **	7.61**	1.20
Seed yield (%)	8.09 **	40.93 **	0.48 **
Harvest Water Content (%)	2.94	44.66 **	1.60
Cob length (cm)	12.26 **	21.98 **	1.55
Cob diameter (cm)	49.94 **	65.23 **	0.67 *
Number of Seed rows (rows)	5.39 7 **	2.49 **	0.07 **
Number of seeds per row (Seeds)	6.76 **	54.88 **	1.44 **
Weight of 1000 seeds (g)	277.67 **	310.58 **	0.93
seed yield (f/ha)	7.52	43.51 **	0.40 *

** = significant effect at the F test level of 1%; * = significant effect at the F test level of 5%

3.2. Average and Potential Results

The results of the tests of the average and potential yields in prospective and comparative varieties demonstrated that the averages yield of two tested varieties (JPI-1 and JPI-2) were significantly superior to those of comparative varieties as well as two other tested varieties (JPI-3 and JPI-4).

The JPI-1 variety productions had the highest production in all location except in location 2 (Takalar). That in Takalar was highest found in JPI-2. The productions of JPI-2 were rank second in Bantaeng and Maros. Those of JPI-3 were rank second in Gowa and Kediri, while JPI-4 was rank second in Lombok. In all locations, prospective variety productions were superior to those of the Sticky Uri and Sticky Local varieties (Table 4). Changes in the rank of a genotype at each test location indicate a genotype and environment interaction [6].

Table 4: Average yield (t/ha) of JPI corn seeds and comparative varieties at each test site in MT 2023.

Genotype	Yield at 15% moisture content (t/ha)						
	Gowa	Takalar	Bantaeng	Maros	Lombok	Kediri	Average
JPI-1	8.11 ac	7.70 ac	7.36 ac	8.45 abc	8.88 ac	8.48 ac	8.16 abc
JPI-2	7.19 ac	7.87 ac	7.20 ac	8.11 ac	8.54 ac	7.63 c	7.88 ac
JPI-3	7.95 ac	7.54 ac	6.56 ac	7.69 ac	8.57 ac	8.14 ac	7.74 ac
JPI-4	7.71 ac	7.47 c	6.71 ac	7.61 ac	8.67 ac	7.56 c	7.62 ac
Sticky Uri (a)	5.61	6.85	5.53	6.02	7.73	7.12	6.48
White Srikandi (b)	7.82	7.74	6.97	7.88	8.36	7.76	7.75
Local Sticky Takalar (c)	4.38	3.92	3.97	4.41	4.77	4.55	4.33
Average	7.07	7.01	6.33	7.17	7.93	7.32	7.14
SE	0.17	0.21	0.26	0.16	0.27	0.30	0.13
LSD 5%	0.49	0.63	0.78	0.46	0.80	0.89	0.37

KK	4.7	6.1	8.3	4.3	6.7	8.2	6.6

a= significantly superior to Sticky *Uri*-1, b=significantly superior to White *Srikandi*, c=significantly superior to Sticky Local in the LSD 5% test.

3.3. Results of Stability Test

The combined analysis of variance on seed yields of four prospective varieties and three comparative varieties at 6 test locations showed a significant genotype and location interaction (Table 5). The clear interaction of genotype and location on crop yield indicated that the seed yield of prospective variety was significantly higher than the comparative varities. The significant interaction of genotype with the environment indicated the inconsistent appearance of a trait under different environmental conditions. This causes differences in yield in various planting environments [7]. The interaction of genotype and environment is a component that influences results and phenotypic expression [8], so stability and adaptability tests are needed to determine the level of stability of a genotype in each testing environment.

TABLE 5: Analysis of variance of the combination of environmental × outcome characters in 6 test locations (districts) in MT 2023.

Source of diversity	DF	SQ	MQ	F Hit	Prob F	Sig
Location (L)	5	37.58	7.52	27.06	0.00	**
L/R	18	5.00	0.28	1.27	0.22	
Genotype (G)	6	261.04	43.51	108.15	0.00	**
L × G	30	12.07	0.40	1.84	0.01	*
SD	108	23.61	0.22			
Total	167	339.31	2.03			

** = very real based on an F test of 1%. * = significantly different based on the 5% F test; DF= degrees of freedom; SQ= sum of squares; MQ= middle square

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The variation in crop yield characteristics (MQ) was caused by a location factor of 7.52 and a genotype factor of 43.51 and a genotype and location interaction factor of 0.40, which can be seen in the middle square value (Table 5). Based on this proportion, it can be seen that the genotype makes the most significant contribution to the diversity of the characteristics of the crop yield. Stability analysis is used to see the effect of the interaction of genotype and environment effectively so that the level of stability and adaptability of the proposed variety prospective can be determined.

Table 6 showed that the JPI-1 and JPI-4 genotypes with Bi (Slope) values were not significantly different from 1 (standard). The average yield is higher than the general average so that the performance of these prospective varieties was stable in all environments, both optimum and suboptimal. The bi value of JPI-3 was significantly higher than 1 so that the genotype was adaptive to the optimum environment. In contrast, Bi value of JPI-2 was significantly smaller than 1 so that this genotype may produce increased yields in sub-optimal condition.

TABLE 6: Average and stability of composite corn yields (KA 15%) based on the combined analysis of six test locations (districts) in MT 2023.

Genotype	Yield (t/ha) min	max	mean	Slope	SE	MQ MS-TXL	MQ MS-REG	MQ MS-DEV	R**2(%)
JPI-1	7.36	8.88	8.16	1.01	0.20	0.04	0.00	0.05	0
JPI-2	7.20	8.54	7.88	0.77*	0.20	0.06	0.07	0.05	25
JPI-3	6.56	8.57	7.74	1.26*	0.19	0.06	0.09	0.05	34
JPI-4	6.71	8.67	7.62	1.17	0.14	0.03	0.04	0.03	25
Sticky Uri (a)	5.53	7.73	6.48	1.40	0.50	0.31	0.21	0.34	14

White Srikandi (b)	6.97	8.36	7.75	0.83	0.11	0.02	0.04	0.02	35
Local Sticky Takalar (c)	3.92	4.77	4.33	0.55	0.17	0.08	0.27	0.04	64
Average			7.36						

Bi = regression slope of the average variety in the environmental index, * = Bi value is significantly different from 1; SE = standard error, MQ-HXL = Contribution of each genotype to the mean square of the interaction, MQ-Reg = Contribution of each genotype to the regression component in the interaction between genotype x location interaction; MQ-Dev = Middle square deviation (deviation of the interaction regression components), R ** 2 (%) = squared correlation between the residuals of the main effects of the model and the environmental index.

3.4. Plant growth, flowering time, harvest time, plant height, and cob height

Based on the statistical test, the percentage of prospective corn varieties growth was significantly higher from the comparative variety, except JPI-4 variety. It was not significantly different from the comparative variety, though the percentage of plants grew above 85%. The flowering times for males and females of prospective varieties JPI-1, JPI-2, JPI-3, and JPI-4 were significantly faster than that of the White *Srikandi* variety. The harvest time for the prospective varieties JPI-1, JPI-2, JPI-3, and JPI-4 was significantly faster than those of Sticky Uri and White Srikandi varieties (Table 7). Plant genetic factors are one of the causes of differences between one plant and another [9]. Corn plants have a short maturity ranging from 75 to 90 DAP, medium maturity between 90-120 DAP, and more than 120 DAP [10]. The JPI-2 genotype showed plant height yields were significantly superior to local Sticky, while JPI-4 showed plant height yields superior to White Srikandi and local Takalar Sticky. For cob height, JPI-2 genotype was superior to local Sticky. The position height of JPI-4 genotype was superior to White Srikandi and Local Takalar Sticky. The correct position of the cob can reduce the intensity of rat pest attacks. If the height of the cob is located more or less in the middle of the plant, it will reduce the intensity of root and stem lodging.

The characteristics of plant height and cob location are closely related to the suitability of the planting environment. Environments with high altitudes with the potential for strong winds are suitable for shorter plants, while tall plants with suitable cobs are needed in areas susceptible to pest attacks, such as mice. Most plant breeders concentrate selection on shorter plants to be able to withstand lodging caused by strong winds [11]. Selection is also done the characteristics of plant height and ear height. Several cases show a decrease in ear height and an increase in plant height [12].

TABLE 7: Average plant growth, age, plant height and position of test composite corn cobs and comparative varieties in 6 test locations (districts) in MT 2023.

Genotype	Growth	Flowering (DAP)		Harvesting (DAP)	Height (cm)	Ear Height (cm)
		Female	Male			
JPI-1	91.83^{ab}	56.87^{b}	55.16^{b}	102.21^{ab}	186.42	89.35
JPI-2	91.63^{ab}	57.20^{b}	55.45^{b}	102.79^{ab}	175.59^{c}	85.35^{c}
JPI-3	92.33^{ab}	57.20^{b}	55.50^{b}	103.50^{ab}	187.27	92.23
JPI-4	88.67	57.12^{b}	55.25^{b}	106.39^{ab}	166.70^{bc}	80.20^{bc}
Sticky Uri	88.32	56.87	54.69	110.15	171.42	83.75

(a)						
White Srikandi (b)	89.15	59.12	57.52	110.49	186.86	91.16
Local Sticky (c)	92.21	52.29	50.87	93.17	192.23	92.65
Means	90.59	56.67	54.92	104.18	180.93	87.81
SE	0.60	0.37	0.36	0.51	3.98	2.46
LSD 5%	1.73	1.07	1.05	1.48	11.50	7.18
CD (%)	4.10	2.20	2.90	0.90	8.60	10.20

a = significantly superior to Sticky Uri, b = significantly superior to White Srikandi, c = significantly superior to Sticky Local Takalar in the 5% LSD test, CD = Diversity coefficient.

Stem diameter, angle, length, and width of leaves, and percentage of leaf rust were presented in Table 8. Result showed that the prospective varieties JPI-1, JPI-2, JPI-3 and JPI-4 had stem diameters of 2.38 cm, 2.35 cm, and 2.36 cm and 2.32 cm respectively. Those were lower than White Srikandi stem diameter (2.39), but higher to the Local sticky stem diameter (2.22 cm) . A large stem diameter makes the plant stronger so that the intensity of lodging can be reduced. The character of leaf angle, length, and width of leaves can be used to develop a new variety.

TABLE 8: Mean stem diameter, angle, length, and width of leaves, as well as percentage of stem and root fall of maize composite test and comparative varieties in six locations.

Genotype	Stem diameter	Leave angle	Leave length	Leave wide	Stem rot	Root rot
JPI-1	2.38ac	26.89	96.42abc	9.44ac	0.017abc	0.02abc
JPI-2	2.35ac	26.59	95.00c	9.29c	0.020abc	0.01abc
JPI-3	2.36ac	26.55	94.72	9.40c	0.020abc	0.02abc
JPI-4	2.32c	26.82	94.14	9.20	0.020abc	0.02abc
Sticky Uri (a)	2.30	27.00	94.50	9.16	0.04	0.03
White Srikandi (b)	2.39	26.90	94.12	9.34	0.04	0.03
Local Sticky (c)	2.22	26.32	93.17	9.02	0.06	0.06
Average	2.30	26.72	94.13	9.18	0.04	0.04
SE	0.02	0.26	0.55	0.09	0.00	0.00
LSD 5%	0.05	0.76	1.59	0.27	0.01	0.01
CV	5.70	3.60	2.70	4.50	34.80	24.30

a= significantly superior to Sticky Uri, b= significantly superior to White Srikandi, c=significantly superior to Sticky Local in the 5% LSD test, CV= Coefficient of variation.

The leaf angles of the four prospective varieties JPI-1, JPI-2, JPI-3 and JPI-4 did not show significant differences with the comparative varieties Sticky Uri, White Srikandi and Local Sticky. The leaf angles of the prospective varieties and the comparative varieties were all less than 30°. Leaf angles ranging from 21.1° to 50° include moderate leaf angles [13]. The angle of the leaves between small and medium has a straight or bent leaf pattern, which is included in the erect leaf category [14]. Erect-type plants with small to medium leaf angles can increase the number of planted populations.

The average leaf length character of the prospective variety JPI-1 showed superior results and significantly differed from the comparative varieties Sticky Uri, White Srikandi and local Sticky. The leaf length of JPI-2 is superior and significantly different from that of Local Sticky. The average leaf diameter character of the prospective variety JPI-1 showed superior results and significantly differed from the comparative varieties Sticky Uri and local Sticky. The leaf diameter of JPI-2 is superior and significantly different from that of Local Sticky.

The size of the leaves greatly influences the results of photosynthesis. The wider the leaves, the more photosynthesis or biomass they need, and this biomass is really needed by plants. The percentage of stem and root lodging for all prospective varieties was lower and significantly different from all comparative varieties.

3.5. Plant and Ear Appearance, Husk Closure, Leaf Rust, and Leaf Blight

Based on statistical analysis, the prospective varieties JPI-1, JPI-2, JPI-3, and JPI-4 showed good plant performance with mean values respective scores of 1.77; 1.85; 1.83 and 1.82, significantly different from the three comparative varieties.However, the result indicated that the plant performances were lower than those of comparative vatieties. The appearance of plants with good scores indicates that the plants have good uniformity and sturdy stems when planted in 6 adaptation testing locations. More uniform plants, especially in terms of plant height and cob height, can facilitate the application of mechanization in plant management [15].

TABLE 9: Average plant and ear appearance, husk closure, leaf rust, and leaf blight at 6 test locations in MT 2022.

Genotype	Plant performance	Husk closure	Ear appearance	Leaf rust	Leaf blight
JPI-1	1.77abc	2.06ab	1.30ab	0.02aabc	0.03abc
JPI-2	1.85ac	2.13ab	1.34ab	0.02abc	0.03abc
JPI-3	1.83ac	2.13ab	1.31ab	0.02abc	0.03abc
JPI-4	1.82ac	2.11ab	1.37a	0.02abc	0.03abc
Sticky Uri (a)	1.97	2.26	1.53	0.05	0.05
White Srikandi (b)	1.91	2.28	1.48	0.04	0.05
Local sticky Takalar (c)	2.05	1.33	1.43	0.06	0.07
Average	1.98	1.96	1.48	0.05	0.06
SE	0.03	0.03	0.04	0.00	0.00
LSD 5%	0.09	0.09	0.12	0.01	0.01
CV	7.90	6.80	13.90	7.00	9.80

Note: score value 1 is the best and 5 is the worst, a= significantly superior to Sticky Uri, b= significantly superior to White Srikandi, c=significantly superior to local Sticky in the 5% LSD test, CV = Diversity coefficient.

The prospective varieties had perfect husk closure with a mean score of 2.06, 2.13, 2.13, and 2.11, respectively. The closure of the husks is significantly different from the comparative varieties Sticky Uri and White Srikandi, which close well and tightly. However, the local sticky still has a better husk closure score.

FIGURE 1: Appearance of Clot Closure: (a.) JPI-1, (b.) JPI-2, (c.) JPI-3, (d.) IPI-4, (e.) Pulut uri (Sticky Uri), Srikandi putih (White Srikandi), g, Pulut lokal (Local Sticky)

Properly and tightly husk closure can protect the cobs from weather effects, pest attacks, especially the powder beetle (*Sitophillus zeamais)*, and cob rot infections. This is in agreement with another study [16], tightly closing husks can reduce the intensity of water seeping into the cob so that it can prevent seed germination and growth of pathogenic fungi and protect the cob and seeds from attack by the *Sitophillus zeamais* pest. The appearance of the husk closure can be seen in Figure 1.

The appearance of cobs was related to the uniformity of size, seed color, seed filling, and seed damage due to pests and diseases. The cob performances of JPI-1, JPI-2, JPI-3 showed good performance with an average score of 1.30; 1.34; 1.31was significantly lower than those of comparative vatieties. The appearance of a cob that has good size uniformity, the seeds are filled to the tip of the cob, a straight grain arrangement and an attractive seed color will be preferred by consumers or farmers. The appearance of the cob can be seen in Figure 2.

FIGURE 2: Cob appearance between test genotypes (JPI-1, JPI-2, JPI-3, IPI-4) and comparative varieties (Sticky Uri, White Srikandi, and Sticky local).

The scoring of leaf rust disease attacks for prospective varieties JPI-1, JPI-2, JPI-3, and JPI-4 showed a small average of 0.02 each, which is a significantly different value from the comparative variety, while leaf blight attacks on JPI-1, JPI-2, JPI-3 and JPI-4 showed the smallest mean score, namely 0.03. This value was also significantly different from the three comparative varieties. The score for blight and leaf rust infections is less than 1 for prospective varieties, indicating good resistance to disease.

3.6. Number of Plants and Harvested Ears, Weight of Harvested Ears, Length and Diameter of Ears

Table 10 presents the average number of plants and ears harvested, the weight of harvested ears, and the length and diameter of the ears. The statistical test showed significant differences between the prospective and the comparative varieties on the characteristics of the number of harvested plants, number of harvested ears, weight of harvested ears, length of ears, and diameter of ears. The yield component was determined by the genetic potential of each prospective variety and differences in plant population, number of harvested ears, weight of harvested ears, length, and diameter of the ears. The number of harvest pieces produced by a plant is related to the production of that plant. Under optimum conditions, more than two cob shoots can develop for some genotypes [17].

All prospective varieties showed that the average harvest ear weight, ear length, and ear diameter were superior to the comparative varieties Sticky Uri and local Sticky. Long cobs produce a higher number of seeds and assimilate, which affects the weight of the crop and if the diameter of the cob is large, the yield obtained is small and vice versa [18].

TABLE 10: Average number of plants and harvested ears, weight of harvested ears, length and diameter of ears in six test locations (districts) in MT 2023.

Genotype	Number of harvested plants	Number of harvested ears	Weight of harvested ears (kg)	Length of harvested ears (cm)	Diameter of ears (cm)
JPI-1	47.66ac	48.62ac	8.57ac	18.21ac	4.41ac
JPI-2	47.41ac	48.16c	8.41ac	17.69ac	4.33ac
JPI-3	47.83ac	48.541ac	8.29ac	17.83ac	4.4ac
JPI-4	47.25ac	48.50ac	8.18ac	18.31ac	4.23ac
Sticky Uri (a)	46.54	47.54	7.07	15.33	4.00
White Srikandi (b)	47.54	48.17	8.41	17.97	4.47
Sticky local Takalar (c)	46.38	47.13	4.97	14.13	3.57
Average	46.82	47.61	6.82	15.81	4.01
SE	0.18	0.22	0.14	0.17	0.05
LSD 5%	0.53	0.65	0.41	0.48	0.15
CD	1.70	1.90	6.10	3.60	4.00

Note: a= significantly superior to Sticky Uri, b= significantly superior to White Srikandi, c=significantly superior to local Sticky in the 5% LSD test, CD= Coefficient of Diversity.

3.7. Seed Water Content, Number of Rows of Seeds, Number of Seeds per Row, Seed Yield and Weight of 1000 Seeds KA 15%

Hasil menunjukkan bahwa Seed water content in all prospective varities were higher than those in comparative varieties. Number of seed rows in JPI-1 and JPI-3 were higher than those in comparative varieties. Number of seed per row in JPI-2 was higher than those in comparative varieties. Seed yield in JPI-1 was higher than those in comparative varieties. Weight 1000 seeds KA in JPI-1 and JPI-4 were higher than those in comparative varieties (Table 11).

TABLE 11: Average water content, number of rows of seeds, number of seeds per row, seed yield, and weight of 1000 KA 15% seeds at 6 test locations in MT 2023.

Genotype	Seed water content (%)	Number of seed rows	Number of seed per row	Seed yield (%)	Weight 1000 seeds KA 15% (g)
JPI-1	23.33abc	14.86ac	32.91ac	79.13abc	287.14ac
JPI-2	23.52bc	14.27ac	33.16ac	78.04ac	281.76c
JPI-3	23.80bc	15.09ac	32.77ac	78.00ac	283.78c
JPI-4	22.95abc	14.70ac	31.08ac	77.14c	289.72abc
Sticky Uri (a)	24.15	13.47	28.04	71.02	279.29
White Srikandi (b)	24.95	14.81	33.08	78.28	282.47
Local Sticky Takalar (c)	25.67	10.80	23.67	74.86	274.95
Average	24.92	13.02	28.26	76.72	278.90
SE	0.25	0.25	0.20	0.26	1.80
LSD 5%	0.73	0.71	0.57	0.75	5.19
KK	6.30	5.50	7.40	2.00	4.20

Note: a= significantly superior to Sticky Uri, b= significantly superior to White Srikandi, c=significantly superior to local Sticky in the 5% LSD test, CV = coefficient of diversity.

3.8. Testing for Major Diseases

The results of observations on the intensity of downy mildew attacks (*P. philippinensis*) in Bajeng Gowa at 14, 21, 28, 35 and 42 days after planting (DAP) are presented in Table 12.

Table 12: Average percentage of downy mildew pathogen infections in Bajeng, Gowa 2023.

Genotype	Average percentage of downy mildew infections (%)					Reaction
	14 DAP	21 DAP	28 DAP	35 DAP	42 DAP	
JPI-1	0.0	3.5	5.3	5.8	5.8	R
JPI-2	0.0	4.6	7.1	8.2	8.2	R
JPI-3	0.6	6.2	11.2	11.7	11.7	R
JPI-4	4.1	12.5	27.7	27.7	27.7	AT
Sticky Uri	0.0	4.1	8.5	9.1	9.1	R
White Srikandi	0.0	3.5	5.4	5.4	5.4	R
Local Sticky	0.0	7.2	30.5	37.3	41.6	S
Anoman	7.5	64.2	80.9	98.4	92.2	VS

Information: R = resistant; M = Moderate; V = Vulnerable; VV = very vulnerable

Table 12 showed that none of the prospective varieties tested showed a susceptible reaction to downy mildew. However, the check plants (susceptible plants) of the Anoman variety was susceptible to downy mildew with a percentage of attacks at 42 days after reaching 92.2%, while the local Sticky was tolerant with an intensity of 39.6%. The comparative varieties Sticky Uri and White Srikandi showed a resistant reaction to downy mildew in Bajeng with an average percentage of infection of 9.1% and 5.4%, respectively at 42 DAP.

Table 12 also showed that the Anoman and local sticky varieties have become quite heavily infected with downy mildew pathogens since 21 DAP. This indicated that the level of resistance of prospective varieties to *P. philippinensis* in Bajeng is relatively good, although JPI-4 reacts somewhat resistant.

The results of the test of prospective varieties against downy mildew (*P. maydis*) carried out in Malang were presented in Table 13. Result showed that the four prospective composite varieties tested showed a resistant reaction to *P. maydis*, with an average percentage of attacks at 42 days after planting, ranging between 9.61% and 10.42%. All comparative varieties, apart from the check plants (susceptible plants) of the Anoman variety, showed a resistant reaction to *P. maydis* except for the local sticky that reacted somewhat resistantly. The average percentage of infection with downy mildew pathogen in check plants (susceptible plants) of Varetas Anoman is 83.75%, which means that the reaction is very susceptible. The Anoman variety has started to be infected with the heavy downy mildew pathogen since 21 DAP.

TABLE 13: Average percentage of downy mildew pathogen infections in Malang in 2023.

Genotype	Average percentage of infections (%)					Response
	14 DAP	21 DAP	28 DAP	35 DAP	42 DAP	
JPI-1	0.00	0.00	9.21	9.61	9.61	R
JPI-2	0.00	0.00	10.21	10.42	10.42	R
JPI-3	3.00	6.50	8.37	9.75	9.75	R
JPI-4	4.00	7.67	8.67	18.00	18.00	R
Sticky Uri	0.33	4.13	9.21	10.60	10.60	R
White Srikandi	2.25	6.27	8.37	9.18	9.18	R
Local Sticky	1.00	8.00	10.06	25.42	25.42	M
Anoman	20.62	52.28	71.91	79.57	83.75	VS

Note: R = Resistant; M = Moderate; S = Susceptible; VV = Very Susceptible

The results of observations of maydis leaf blight infection in all test genotypes showed that all prospective varieties tested reacted with resistance with an average percentage of attacks at 75 DAP ranging from 18.0% to 20.8% (Table 14). Similarly, all the resistant comparative varieties showed a resistant reaction to Maydis leaf blight. However, the check plants (susceptible plants) of the Anoman variety reacted very susceptiblely with an average attack percentage of 68.5%.

TABLE 14: Average percentage of Maydis leaf blight infection in test lines and comparative varieties at 45, 60 and 75 DAP Bajeng, Gowa, 2023.

Genotype	Average percentage of infections (%)			Response
	45 DAP	60 DAP	75 DAP	
JPI-1	1.50	15.60	18.80	R
JPI-2	5.70	18.20	19.60	R
JPI-3	12.70	17.30	18.00	R
JPI-4	12.3	18.40	18.80	R
Sticky Uri	0.00	16.00	20.00	R
White Srikandi	5.30	17.30	19.20	R
Local Sticky	4.70	15.00	20.30	R
Anoman	1.30	39.30	68.50	VS

Note: R = Resistant; M = Moderate; S = Susceptible; VS = Very Susceptible

Maydis leaf blight, like most other leaf diseases of corn, is a late-season disease where the most severe disease development occurs post anthesis [19]. Therefore, observations of the intensity of leaf blight attacks were carried out during that period. Furthermore, [19] stated that leaf blight can occur in corn plants with different intensities and one of the main factors that really influences it apart from climate and planting conditions is the level of resistance of a plant.

The results of observations on the intensity of rust infection carried out in Bajeng are shown in Table 15. Result showed that of the four prospective varieties tested, all comparative varieties except check plants (susceptible plants), the Anamon variety, which acted very susceptible with a value of 68.2%, showed a resistant reaction.

Table 15: Average percentage of attacks with maydis leaf rust in test lines and comparative varieties at 60 and 75 DAP in Bajeng, Gowa 2023.

Genotype	Average percentage of infections (%)		Response
	60 DAP	75 DAP	
JPI-1	15.5	20.1	R
JPI-2	16.9	19.7	R
JPI-3	18.3	20.0	R
JPI-4	14.3	18.0	R
Sticky Uri	16.8	20.3	R
White Srikandi	14.3	18.0	R
Local Sticky	14.5	20.4	R
Anoman	22.5	68.2	VS

Note: R = Resistant; M = Moderate; S = Susceptible; VS = Very Susceptible

3.9. Nutritional Content

Hasil analisis menunjukkan bahwa kadar protein pada JPI-1, JPI-3 dan JPI-4 genotypes were higher than those in comparative varieties. Kadar lemak pada JPI-2, JPI-3 dan JPI-4 genotypes were were higher than those of comparative varieties. Kadar karbohidrat pada all prospective varieties was higher than those in all comparative varieties. Kadar amilopectin pada all prospective varieties was higher than those in Sticky Uri and White Srikandi, but those was lower that that in Local Sticky variety. According to [20], the main nutritional content of corn is carbohydrates, which range from 72-73% and are mostly concentrated in the endosperm. The composition of carbohydrates as starch consisting of amylose and amylopectin in seeds is genetically controlled. These components influence the functional properties of corn. The physical, chemical, and available properties of carbohydrates can guide in selecting appropriate corn varieties for the desired product. From this description, prospective varieties with high carbohydrate content are suitable for use as food and raw materials for bioethanol production.

TABLE 16: Results of analysis of carbohydrate, fat, protein, and amylopectin content in corn seeds of prospective varieties and comparative varieties in MT 2023.

Genotype	Protein (%)	Fat (%)	Carbohydrate (%)	Amylopectin (%)
JPI-1	11.64	4.85	75.74	85.10
JPI-2	11.54	5.72	74.51	82.80
JPI-3	11.69	6.63	74.49	82.45
JPI-4	11.86	5.76	73.46	80.90
Sticky Uri (a)	10.97	5.55	72.65	55.95
White Srikandi (b)	11.63	4.76	73.04	38.80
Local Sticky (c)	10.24	5.08	72.56	85.40

Note: statistical analysis was not performed

In addition to being a source of carbohydrates, corn also contains other macronutrients such as fat and protein. According to [20], the fat content of corn kernels is genetically controlled, ranging from 3-18%. Based on laboratory test results, all prospective varieties and comparatives have relatively high-fat content. Generally, corn contains 3.5% fat in the kernel part [21]. Corn kernel protein ranges typically between 8-11% [20]. The test results showed that all prospective varieties had a higher protein content than all comparative varieties except the White Srikandi variety.

The amylopectin content in all prospective varieties is relatively high (>80%) compared to the two comparative varieties, namely Sticky Uri and White Srikandi. Still, the amylopectin content in the local sticky is generally equivalent to all prospective varieties, especially JPI-1. High amylopectin is a determinant of the level of fluffier taste. The higher the amylopectin content in the corn kernels, the more suitable it is for use as an alternative staple food. This shows that the high amylopectin character of local sticky Takalar parents has generally been inherited in the four genotypes of prospective varieties through the development of the Dreher method. This is consistent with studies that demonstrate the formation of maize with unique traits via systematic and recurrent plant breeding operations [22]. A homozygous recessive wx gene (wxwx) in sticky corn modifies the chemical makeup of starch, giving it a savoury, palatable flavour. To achieve unique qualities, donor genes from special corn with a high amylopectin concentration can be inserted into high protein corn using the backcross breeding technique.

Conclusion

Prospective composite corn varieties JPI-1 and JPI-2, JPI-3, and JPI-4 have the potential for higher productivity (respectively: 8.88; 8.54; 8.57, 8.67 t/ha) compared to the three comparative varieties (respectively: 7.73; 8.36; 4.77 t/ha). Prospective composite corn varieties JPI-1 and JPI-2, have higher average yields (8.16 and 7.88 t/ha) than the three comparative varieties (6.48; 7.75 and 4.33 t/ha) Ha). Prospective composite corn varieties JPI-1, JPI-2, JPI-3, and JPI-4 show the criteria for resistance to downy mildew, *P. maydis*, *P. philippinensis* (except JPI-4 which is somewhat resistant), type H blight. maydis, and *P. polysora* leaf rust disease. The prospective JPI-1 composite corn variety has a higher protein content than the three comparative varieties, 11.64%. The JPI-1 prospective hybrid corn variety, which is stable in various environmental conditions with a higher average yield than the overall average, is included in the genotype category. At the same time, JPI-2 has high productivity due to improved environmental conditions. Prospective composite corn varieties JPI-1 and JPI-2 have a relatively high amylopectin content of 85.10% and 82.80%, respectively. Prospective varieties JP-1 and JPI-2 have met the eligibility requirements to be released as new superior varieties based on productivity and amylopectin content.

Data Availability

The data used to support the findings of this study are included within the supplementary information file(s).

Conflicts of Interest

The authors declare that they have no conflicts of interest.

Funding Statement

This study was funded by the Directorate of Research and Community Service (DRCS), Ministry of Education, Culture, Research and Technology, Republic of Indonesia through the Research Scheme of Superior University [Contract number 1813.f/B.07/UMI/V/2023].

Acknowledgments

The authors gratefully acknowledge the financial support provided by the Directorate of Research and Community Service (DRCS), Ministry of Education, Culture, Research and Technology Republic of Indonesia through the Research Scheme of Superior University, Contract number 1813.f/B.07/UMI/V/2023. We want to thank the Rector and Head of the Research and Development Institute of LP2S and the Dean of the Faculty of Agriculture, University of Muslim Indonesia and the students for their assistance.

Supplementary Materials

See Table S1-S164 in the Supplementary Material for a comprehensive data analysis

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Multilocation Test of Prospective Composite Sticky Corn Varieties with High Production in Indonesia

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Abstract

National staple food needs are increasing along with the increase in population. Therefore, he needs a delicious alternative staple food, one of which is glutinous corn. To anticipate the increasing demand for glutinous corn, efforts are required to increase productivity by using new superior varieties that can adapt to specific and wider environments and are resistant to pests and diseases. This research aims to evaluate multi-location test of crossover varieties of four prospective composite corn varieties. The method used in this research was the adaptation testing of 4 prospective varieties of composite sticky (JPI-1, JPI-2, JPI-3, JPI-4) and 3 comparative varieties (Sticky Uri, White Srikandi, and local Sticky Takalar) carried out in 6 districts in Indonesia as research locations. Each location was designed using a randomized block design, with 4 replications to obtain 28 experimental units at each location. Observation data were analyzed using analysis of variance (ANOVA). If there is a difference in the mean value of the varieties in the F test, continue with the Least Significant Difference (LSD) test at the 5% level. Data analysis using the DSAASTAT program. Analysis of the stability of the results used the additive mean effect multiplicative interaction multivariate analysis model using the PBSTAT program. Testing for resistance to downy mildew, rust and leaf blight was carried out in a randomized block design with 4 replications. Proximate analysis testing was conducted at the Animal Husbandry Integrated Biotechnology Laboratory, Faculty of Animal Husbandry, Hasanuddin University. The results of the research show that the prospective composite corn varieties JPI-1, JPI-2, JPI-3, and JPI-4 have the potential for yields that are significantly superior to the three comparative varieties, respectively, with each of 8.88 t.ha-1 ; 8.54 t.ha-1; 8.57 t.ha-1; 8.67 tha-1. Based on the results of the stability analysis, JPI-1 and JPI-4 show stable results in all environments, and JPI-3 shows increasingly better results in the optimum environment. Prospective varieties JPI-1, JPI-2 JPI-3 and JPI-4 offer the criteria for resistance to Downy mildew disease *Peronosclerospora maydis*, *Peronosclerospora philippinensis* type, Bipolaris maydis type blight, and also resistance to the leaf rust disease type *Puccinia polysora*. Based on the approximate test JPI-1, JPI-3, and JPI-4 have superior protein content than the three comparative varieties, 11.64, 11.69% - 11.86%. The prospective variety JPI-1 has a high amylopectin content (85.10%) equivalent to the amylopectin content of local Sticky parents and higher than the two comparative varieties. JPI-2, JPI-3, and JPI-4 have higher amylopectin content than the two comparative varieties.

Keywords: adaptation, corn composite, productivity, disease resistance, proximate

1. Introduction

Corn (*Zea mays* L.) is one of the world's most essential carbohydrate-producing food crops, besides wheat and rice [1]. Corn is a second cereal commodity food in Indonesia. Corn is generally utilized as an alternative staple food, snacks, and various other foods, as well as in the animal feed industry. In some areas, the community consumed corn as a staple food. Moreover, corn is also a main ingredient in animal feed and other industries such as raw materials for producing bioethanol. Currently, a study initiates to develop corn as a functional food because it contains dietary fiber [1].

Sticky or waxy corn (*Zea mays ceratina* L.) is a particular type of corn that has the potential as a source of food diversification and industrial materials. In Japan, sticky corn is a source of amylopectin, a raw material for food products, textiles, glue, and paper. In addition, sticky corn is a source of germplasm for developing new cultivars through plant breeding [2]. Sticky corn, like sweet corn, can be consumed as a fresh or boiled vegetable because it has a soft and delicious taste. Glutinous corn contains starch from amylopectin, which almost reaches 100% [3]. The high level of amylopectin in sticky corn is suitable for the diet of diabetics and to increase the weight of livestock.

The sticky corn is generally consumed as corn porridge and snacks. Sticky corn, however, has a low potential yield. It only produces small cobs with a 10–11 mm diameter, production less than 2 tons/ha. Due to its poor production and vulnerability to downy mildew, it has been rarely used as a staple food and, hence become scarce [4].

Sticky corn is a typical food ingredient in Sulawesi, Indonesia. Domestic demand for sticky corn continues to increase, but supply is insufficient. Furthermore, the national need for corn is growing along with the increase in population and the development of the food and feed industry. Data for the 2018-2022 period show that corn production has grown along with the increase in harvested area; unfortunately, there has been a particular decline in 2021. The effort to provide glutinous corn as an alternative staple food requires the release of appropriate variety. It must express a high-yielding amylopectin content and adapt to environmental changes especially downy mildew attact.

The proposed composite corn genotype is a line assembled and developed from a cross between a high protein and production variety and a local sticky variety containing amylopectin. The composite corn genotype assembly program goes through several breeding stages to obtain a combination of traits resulting from the cross. This requires continuous identification, characterization, and evaluation. One of the stages in testing the results of the genotype assembly is the multi-location test. This research aims to evaluate multi-location test of crossover varieties of four prospective composite corn varieties.

2. Materials and Methods

This study evaluated the performance of the multi-location test of four prospective composite corn varieties and three comparative varieties. The four prospective corn varieties consisted of JPI-1, JPI-2, JPI-3, and JPI-4, while the three comparative varieties are Sticky Uri (JPI-5), White *Srikandi* (JPI-6) and Local Sticky *Takalar* (JPI-7). JPI-1, JPI-2, JPI-3 and JPI-4 originate from a cross between the White *Srikandi* variety (as the female parent) and the local Sticky *Takalar* (as the male parent). The crossover process was conducted from 2017 to 2022 through the eighth generation.

2.1. Testing Time and Location

The adaptation test was carried out during the 2023 planting season from March to September 2023 in six districts. Four districts were located in South Sulawesi (Gowa Regency, Takalar Regency, Bantaeng Regency, Maros Regency) and two districts from other provinces (Lombok Regency, West Nusa Tenggara Province and Kediri Regency, East Java Province). Disease resistance tests were carried out in 2 districts, Gowa Regency (3 locations: location 1, leaf rust test, location 2 leaf blight test and location 3, downy mildew test specific for the species *Peronosclerospora philippinensis* which often attacks corn in Sulawesi) and Malang Regency, East Java Province (specifically the specific downy mildew test for the *Peronosclerospora maydis* species which often attacks corn in Java). Descriptions of adaptation test locations and disease resistance tests for prospective composite varieties are presented in Tables 1 and 2.

The plot area used for each experimental unit was 5 × 3 m^2 with a planting space of 75 × 20 cm^2. A total of 100 individual corn was planted 4 rows in each plot. The type and dose of fertilizer used was 300 kg/ha of urea and 400 kg/ha of Nitrogen, Phosphorus and Potassium. Fertilization was done twice when the plants were seven days old and 30 days after planting, each administered 50% of the dose. The water was merely applied when the rain stopped for a week. The samples were collected from the two middle rows, randomly taking as many as 10 plants per plot.

2.2. Adaptation Test Method

The research was carried out using a randomized block design consisting of seven varieties, repeated

4 times so that there were 28 experimental units at each adaptation test location (Table 1). Data collected from each location were analyzed for combined variance. Combined analysis of variance was used to determine the influence of environment, genotype, and interaction of genotype and environment. Observation data were analyzed using analysis of variance (ANOVA). Bi values were used to analyze the stability of results. If there was a difference in the mean value of the varieties in the F test, test was continued with the Least Significant Difference (LSD) test at the 5% level. The results were presented only paired comparatives between prospective and comparative varieties. Data analysis using the DSAASTAT program. Analysis of the stability of the results used the additive mean effect multiplicative interaction multivariate analysis model using the PBSTAT program.

TABLE 1: Description of adaptation test locations for prospective composite corn varieties in six districts.

No.	Location	Soil type	Altitude (a.s.l)	Climate type	Planting date	Harvest date
1.	Bajeng Gowa, South Sulawesi	Alluvial, land paddy field	89	D	06 May 2023	20 August 2023
2.	Sinoa, Bantaeng, South Sulawesi	Latosol, land dry	500	B	17 May 2023	10 September 2023
3.	Lembar Lombok Barat, NTB	Alluvial, Land dry	14	D3	21 May 2023	05 September 2023
4.	Kepung, Kediri, East Java	Alluvial, Land dry	67	C2	22 May 2023	07 September 2023
5	Galesong, Takalar, South Sulawesi	Alluvial, Land paddy field	20	C2	24 May 2023	09 September 2023
6.	Lau, Maros, South Sulawesi	Alluvial, Land Paddy field	25	C2	21 June 2023	06 October 2023

TABLE 2: Description of disease resistance test locations for prospective composite corn varieties in 2 districts.

No.	Location	Soil type	Altitude (mdpl)	Climate type	Planting date	Harvest date	Information
1	Bajeng, Gowa, South Sulawesi	Alluvial, Land dry	89	D	11 June 2023	26 August 2023	Leaf rust
					17 June 2023	02 Sept 2023	Hover down
					24 June 2023	10 August 2023	Bubbles *(P. philippinensis*)

2	Gondang legi, Malang, East Java	Inceptisol, Land paddy field	400.1	C2	12 June 2023	31 July 2023	Bubbles (*P. maydis*)

3. Results and Discussion

3.1. Overview Adaptation test

The results of the integrated variance analysis of yield and agronomic characteristics of four prospective composite corn varieties and three comparative varieties are presented in Table 3. The combined variance analysis shows that location strongly affects all observed variables except for leaf width, male flowering age, cob appearance, and harvest water content. The effect of location indicates the environmental characteristics of the study sites were quite diverse.

The effect of genotype was significant on all observed variables except leaf length. Each prospective variety has a different genetic potential in expressing traits or characters. Another study reported that the lines tested differ significantly in all characters, indicating that there are differences in genetic potential between the lines tested [5].

TABLE 3: Middle square of agronomic characters, yield components, and yield of prospective JPI composite corn varieties at several locations.

Variable	Location (L)	Genotype	L × G
Plant Growth (%)	222.52 **	76.72**	8.70
Plant Height (cm)	10549.10**	2218.36**	381.10*
Cob Height (cm)	2257.33 **	547.79 **	148.34 *
Stem Fall (%)	0.00 **	0.00 **	0.00
Root Reduction (%)	0.00 **	0.00 **	0.00 **
Number of leaves	0.15 7 **	0.08 **	0.01
Leaf angle (⁰)	23.98 **	5.80 **	0.67
Leaf length (cm)	15.12 **	1.41	1.67 *
Leaf width (cm)	10.01	24.05 *	7.29
Age of male flowering (DAP)	0.31	0.53 *	0.20
Female flowering age (DAT)	163.09 **	95.97 **	3.22
Harvest age (DAP)	173.52 **	104.23 **	3.31 **
Plant Appearance Aspects (score)	149.72 **	780.59 **	6.33 **
Closing husk (score)	2.87 **	0.22 **	0.02
Cob Performance (score)	0.19	2.50 **	0.02
Blight Score (score)	0.71**	0.17**	0.04
Rust Disease Score (score)	0.00 **	0.00 **	0.00
Number of harvested plants	0.00 *	0.00 **	0.00
Number of harvested cobs (cobs)	64.71**	7.57**	0.81
Harvest cob weight (kg)	42.28 **	7.61**	1.20
Seed yield (%)	8.09 **	40.93 **	0.48 **
Harvest Water Content (%)	2.94	44.66 **	1.60
Cob length (cm)	12.26 **	21.98 **	1.55
Cob diameter (cm)	49.94 **	65.23 **	0.67 *
Number of Seed rows (rows)	5.39 7 **	2.49 **	0.07 **
Number of seeds per row	6.76 **	54.88 **	1.44 **

(Seeds)			
Weight of 1000 seeds (g)	277.67 **	310.58 **	0.93
seed yield (f/ha)	7.52	43.51 **	0.40 *

** = significant effect at the F test level of 1%; * = significant effect at the F test level of 5%

3.2. Average and Potential Results

The results of the tests of the average and potential yields in prospective and comparative varieties demonstrated that the averages yield of two tested varieties (JPI-1 and JPI-2) were significantly superior to those of comparative varieties as well as two other tested varieties (JPI-3 and JPI-4).

The JPI-1 variety productions had the highest production in all location except in location 2 (Takalar). That in Takalar was highest found in JPI-2. The productions of JPI-2 were rank second in Bantaeng and Maros. Those of JPI-3 were rank second in Gowa and Kediri, while JPI-4 was rank second in Lombok. In all locations, prospective variety productions were superior to those of the Sticky Uri and Sticky Local varieties (Table 4). Changes in the rank of a genotype at each test location indicate a genotype and environment interaction [6].

Table 4: Average yield (t/ha) of JPI corn seeds and comparative varieties at each test site in MT 2023.

Genotype	Yield at 15% moisture content (t/ha)						
	Gowa	Takalar	Bantaeng	Maros	Lombok	Kediri	Average
JPI-1	8.11 ac	7.70 ac	7.36 ac	8.45 abc	8.88 ac	8.48 ac	8.16 abc
JPI-2	7.19 ac	7.87 ac	7.20 ac	8.11 ac	8.54 ac	7.63 c	7.88 ac
JPI-3	7.95 ac	7.54 ac	6.56 ac	7.69 ac	8.57 ac	8.14 ac	7.74 ac
JPI-4	7.71 ac	7.47 c	6.71 ac	7.61 ac	8.67 ac	7.56 c	7.62 ac
Sticky Uri (a)	5.61	6.85	5.53	6.02	7.73	7.12	6.48
White Srikandi (b)	7.82	7.74	6.97	7.88	8.36	7.76	7.75
Local Sticky Takalar (c)	4.38	3.92	3.97	4.41	4.77	4.55	4.33
Average	7.07	7.01	6.33	7.17	7.93	7.32	7.14
SE	0.17	0.21	0.26	0.16	0.27	0.30	0.13
LSD 5%	0.49	0.63	0.78	0.46	0.80	0.89	0.37
KK	4.7	6.1	8.3	4.3	6.7	8.2	6.6

a= significantly superior to Sticky *Uri*-1, b=significantly superior to White *Srikandi*, c=significantly superior to Sticky Local in the LSD 5% test.

3.3. Results of Stability Test

The combined analysis of variance on seed yields of four prospective varieties and three comparative varieties at 6 test locations showed a significant genotype and location interaction (Table 5). The clear interaction of genotype and location on crop yield indicated that the seed yield of prospective variety was significantly higher than the comparative varities. The significant interaction of genotype with the environment indicated the inconsistent appearance of a trait under different environmental conditions. This causes differences in yield in various planting environments [7]. The interaction of genotype and environment is a component that influences results and phenotypic expression [8], so stability and adaptability tests are needed to determine the level of stability of a genotype in each testing environment.

TABLE 5: Analysis of variance of the combination of environmental × outcome characters in 6 test locations (districts) in MT 2023.

Source of diversity	DF	SQ	MQ	F Hit	Prob F	Sig
Location (L)	5	37.58	7.52	27.06	0.00	**
L/R	18	5.00	0.28	1.27	0.22	
Genotype (G)	6	261.04	43.51	108.15	0.00	**
L × G	30	12.07	0.40	1.84	0.01	*
SD	108	23.61	0.22			
Total	167	339.31	2.03			

** = very real based on an F test of 1%. * = significantly different based on the 5% F test; DF= degrees of freedom; SQ= sum of squares; MQ= middle square

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The variation in crop yield characteristics (MQ) was caused by a location factor of 7.52 and a genotype factor of 43.51 and a genotype and location interaction factor of 0.40, which can be seen in the middle square value (Table 5). Based on this proportion, it can be seen that the genotype makes the most significant contribution to the diversity of the characteristics of the crop yield. Stability analysis is used to see the effect of the interaction of genotype and environment effectively so that the level of stability and adaptability of the proposed variety prospective can be determined.

Table 6 showed that the JPI-1 and JPI-4 genotypes with Bi (Slope) values were not significantly different from 1 (standard). The average yield is higher than the general average so that the performance of these prospective varieties was stable in all environments, both optimum and suboptimal. The bi value of JPI-3 was significantly higher than 1 so that the genotype was adaptive to the optimum environment. In contrast, Bi value of JPI-2 was significantly smaller than 1 so that this genotype may produce increased yields in sub-optimal condition.

TABLE 6: Average and stability of composite corn yields (KA 15%) based on the combined analysis of six test locations (districts) in MT 2023.

Genotype	Yield (t/ha) min	max	mean	Slope	SE	MQ MS-TXL	MQ MS-REG	MQ MS-DEV	R**2(%)
JPI-1	7.36	8.88	8.16	1.01	0.20	0.04	0.00	0.05	0
JPI-2	7.20	8.54	7.88	0.77*	0.20	0.06	0.07	0.05	25
JPI-3	6.56	8.57	7.74	1.26*	0.19	0.06	0.09	0.05	34
JPI-4	6.71	8.67	7.62	1.17	0.14	0.03	0.04	0.03	25
Sticky Uri (a)	5.53	7.73	6.48	1.40	0.50	0.31	0.21	0.34	14
White Srikandi (b)	6.97	8.36	7.75	0.83	0.11	0.02	0.04	0.02	35
Local Sticky Takalar (c)	3.92	4.77	4.33	0.55	0.17	0.08	0.27	0.04	64
Average			7.36						

Bi = regression slope of the average variety in the environmental index, * = Bi value is significantly different from 1; SE = standard error, MQ-HXL = Contribution of each genotype to the mean square of the interaction, MQ-Reg = Contribution of each genotype to the regression component in the interaction between genotype x location interaction; MQ-Dev = Middle square deviation (deviation of the interaction regression components), R ** 2 (%) = squared correlation between the residuals of the main effects of the model and the environmental index.

3.4. Plant growth, flowering time, harvest time, plant height, and cob height

Based on the statistical test, the percentage of prospective corn varieties growth was significantly higher from the comparative variety, except JPI-4 variety. It was not significantly different from the comparative variety, though the percentage of plants grew above 85%. The flowering times for males and females of prospective varieties JPI-1, JPI-2, JPI-3, and JPI-4 were significantly faster than that of the White *Srikandi* variety. The harvest time for the prospective varieties JPI-1, JPI-2, JPI-3, and JPI-4 was significantly faster than those of Sticky Uri and White Srikandi varieties (Table 7). Plant genetic factors are one of the causes of differences between one plant and another [9]. Corn plants have a short maturity ranging from 75 to 90 DAP, medium maturity between 90-120 DAP, and more than 120 DAP [10]. The JPI-2 genotype showed plant height yields were significantly superior to local Sticky, while JPI-4 showed plant height yields superior to White Srikandi and local Takalar Sticky. For cob height, JPI-2 genotype was superior to local Sticky. The position height of JPI-4 genotype was superior to White Srikandi and Local Takalar Sticky. The correct position of the cob can reduce the intensity of rat pest attacks. If the height of the cob is located more or less in the middle of the plant, it will reduce the intensity of root and stem lodging.

The characteristics of plant height and cob location are closely related to the suitability of the planting environment. Environments with high altitudes with the potential for strong winds are suitable for shorter plants, while tall plants with suitable cobs are needed in areas susceptible to pest attacks, such as mice. Most plant breeders concentrate selection on shorter plants to be able to withstand lodging caused by strong winds [11]. Selection is also done the characteristics of plant height and ear height. Several cases show a decrease in ear height and an increase in plant height [12].

TABLE 7: Average plant growth, age, plant height and position of test composite corn cobs and comparative varieties in 6 test locations (districts) in MT 2023.

Genotype	Growth	Flowering (DAP)		Harvesting (DAP)	Height (cm)	Ear Height (cm)
		Female	Male			
JPI-1	91.83^{ab}	56.87^{b}	55.16^{b}	102.21^{ab}	186.42	89.35
JPI-2	91.63^{ab}	57.20^{b}	55.45^{b}	102.79^{ab}	175.59^{c}	85.35^{c}
JPI-3	92.33^{ab}	57.20^{b}	55.50^{b}	103.50^{ab}	187.27	92.23
JPI-4	88.67	57.12^{b}	55.25^{b}	106.39^{ab}	166.70^{bc}	80.20^{bc}
Sticky Uri (a)	88.32	56.87	54.69	110.15	171.42	83.75
White Srikandi (b)	89.15	59.12	57.52	110.49	186.86	91.16
Local Sticky (c)	92.21	52.29	50.87	93.17	192.23	92.65
Means	90.59	56.67	54.92	104.18	180.93	87.81
SE	0.60	0.37	0.36	0.51	3.98	2.46

LSD 5%	1.73	1.07	1.05	1.48	11.50	7.18
CD (%)	4.10	2.20	2.90	0.90	8.60	10.20

a = significantly superior to Sticky Uri, b = significantly superior to White Srikandi, c = significantly superior to Sticky Local Takalar in the 5% LSD test, CD = Diversity coefficient.

Stem diameter, angle, length, and width of leaves, and percentage of leaf rust were presented in Table 8. Result showed that the prospective varieties JPI-1, JPI-2, JPI-3 and JPI-4 had stem diameters of 2.38 cm, 2.35 cm, and 2.36 cm and 2.32 cm respectively. Those were lower than White Srikandi stem diameter (2.39), but higher to the Local sticky stem diameter (2.22 cm) . A large stem diameter makes the plant stronger so that the intensity of lodging can be reduced. The character of leaf angle, length, and width of leaves can be used to develop a new variety.

TABLE 8: Mean stem diameter, angle, length, and width of leaves, as well as percentage of stem and root fall of maize composite test and comparative varieties in six locations.

Genotype	Stem diameter	Leave angle	Leave length	Leave wide	Stem rot	Root rot
JPI-1	2.38ac	26.89	96.42abc	9.44ac	0.017abc	0.02abc
JPI-2	2.35ac	26.59	95.00c	9.29c	0.020abc	0.01abc
JPI-3	2.36ac	26.55	94.72	9.40c	0.020abc	0.02abc
JPI-4	2.32c	26.82	94.14	9.20	0.020abc	0.02abc
Sticky Uri (a)	2.30	27.00	94.50	9.16	0.04	0.03
White Srikandi (b)	2.39	26.90	94.12	9.34	0.04	0.03
Local Sticky (c)	2.22	26.32	93.17	9.02	0.06	0.06
Average	2.30	26.72	94.13	9.18	0.04	0.04
SE	0.02	0.26	0.55	0.09	0.00	0.00
LSD 5%	0.05	0.76	1.59	0.27	0.01	0.01
CV	5.70	3.60	2.70	4.50	34.80	24.30

a= significantly superior to Sticky Uri, b= significantly superior to White Srikandi, c=significantly superior to Sticky Local in the 5% LSD test, CV= Coefficient of variation.

The leaf angles of the four prospective varieties JPI-1, JPI-2, JPI-3 and JPI-4 did not show significant differences with the comparative varieties Sticky Uri, White Srikandi and Local Sticky. The leaf angles of the prospective varieties and the comparative varieties were all less than 30°. Leaf angles ranging from 21.1° to 50° include moderate leaf angles [13]. The angle of the leaves between small and medium has a straight or bent leaf pattern, which is included in the erect leaf category [14]. Erect-type plants with small to medium leaf angles can increase the number of planted populations.

The average leaf length character of the prospective variety JPI-1 showed superior results and significantly differed from the comparative varieties Sticky Uri, White Srikandi and local Sticky. The leaf length of JPI-2 is superior and significantly different from that of Local Sticky. The average leaf diameter character of the prospective variety JPI-1 showed superior results and significantly differed from the comparative varieties Sticky Uri and local Sticky. The leaf diameter of JPI-2 is superior and significantly different from that of Local Sticky.

The size of the leaves greatly influences the results of photosynthesis. The wider the leaves, the more photosynthesis or biomass they need, and this biomass is really needed by plants. The percentage of stem and root lodging for all prospective varieties was lower and significantly different from all comparative varieties.

3.5. Plant and Ear Appearance, Husk Closure, Leaf Rust, and Leaf Blight

Based on statistical analysis, the prospective varieties JPI-1, JPI-2, JPI-3, and JPI-4 showed good plant performance with mean values respective scores of 1.77; 1.85; 1.83 and 1.82, significantly different from the three comparative varieties.However, the result indicated that the plant performances were lower than those of comparative vatieties. The appearance of plants with good scores indicates that the plants have good uniformity and sturdy stems when planted in 6 adaptation testing locations. More uniform plants, especially in terms of plant height and cob height, can facilitate the application of mechanization in plant management [15].

TABLE 9: Average plant and ear appearance, husk closure, leaf rust, and leaf blight at 6 test locations in MT 2022.

Genotype	Plant performance	Husk closure	Ear appearance	Leaf rust	Leaf blight
JPI-1	1.77abc	2.06ab	1.30ab	0.02aabc	0.03abc
JPI-2	1.85ac	2.13ab	1.34ab	0.02abc	0.03abc
JPI-3	1.83ac	2.13ab	1.31ab	0.02abc	0.03abc
JPI-4	1.82ac	2.11ab	1.37a	0.02abc	0.03abc
Sticky Uri (a)	1.97	2.26	1.53	0.05	0.05
White Srikandi (b)	1.91	2.28	1.48	0.04	0.05
Local sticky Takalar (c)	2.05	1.33	1.43	0.06	0.07
Average	1.98	1.96	1.48	0.05	0.06
SE	0.03	0.03	0.04	0.00	0.00
LSD 5%	0.09	0.09	0.12	0.01	0.01
CV	7.90	6.80	13.90	7.00	9.80

Note: score value 1 is the best and 5 is the worst, a= significantly superior to Sticky Uri, b= significantly superior to White Srikandi, c=significantly superior to local Sticky in the 5% LSD test, CV = Diversity coefficient.

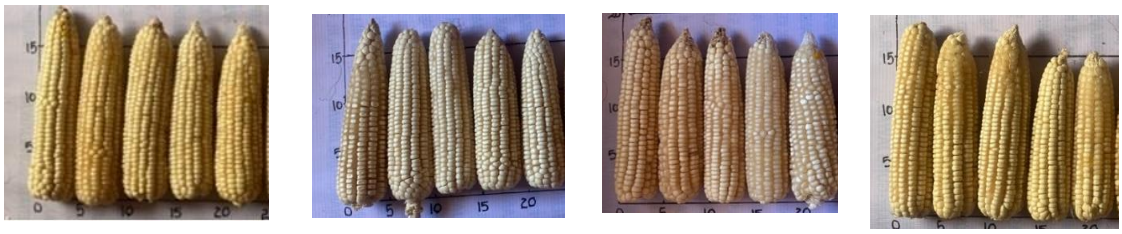
The prospective varieties had perfect husk closure with a mean score of 2.06, 2.13, 2.13, and 2.11, respectively. The closure of the husks is significantly different from the comparative varieties Sticky Uri and White Srikandi, which close well and tightly. However, the local sticky still has a better husk closure score.

FIGURE 1: Appearance of Clot Closure: (a.) JPI-1, (b.) JPI-2, (c.) JPI-3, (d.) IPI-4, (e.) Pulut uri (Sticky Uri),

Srikandi putih (White Srikandi), g, Pulut lokal (Local Sticky)

Properly and tightly husk closure can protect the cobs from weather effects, pest attacks, especially the powder beetle (*Sitophillus zeamais),* and cob rot infections. This is in agreement with another study [16], tightly closing husks can reduce the intensity of water seeping into the cob so that it can prevent seed germination and growth of pathogenic fungi and protect the cob and seeds from attack by the *Sitophillus zeamais* pest. The appearance of the husk closure can be seen in Figure 1.

The appearance of cobs was related to the uniformity of size, seed color, seed filling, and seed damage due to pests and diseases. The cob performances of JPI-1, JPI-2, JPI-3 showed good performance with an average score of 1.30; 1.34; 1.31was significantly lower than those of comparative vatieties. The appearance of a cob that has good size uniformity, the seeds are filled to the tip of the cob, a straight grain arrangement and an attractive seed color will be preferred by consumers or farmers. The appearance of the cob can be seen in Figure 2.



JPI-1 JPI-2 JPI-3 JPI-4

Sticky Uri White Srikandi Local Sticky

FIGURE 2: Cob appearance between test genotypes (JPI-1, JPI-2, JPI-3, IPI-4) and comparative varieties (Sticky Uri, White Srikandi, and Sticky local).

The scoring of leaf rust disease attacks for prospective varieties JPI-1, JPI-2, JPI-3, and JPI-4 showed a small average of 0.02 each, which is a significantly different value from the comparative variety, while leaf blight attacks on JPI-1, JPI-2, JPI-3 and JPI-4 showed the smallest mean score, namely 0.03. This value was also significantly different from the three comparative varieties. The score for blight and leaf rust infections is less than 1 for prospective varieties, indicating good resistance to disease.

3.6. Number of Plants and Harvested Ears, Weight of Harvested Ears, Length and Diameter of Ears

Table 10 presents the average number of plants and ears harvested, the weight of harvested ears, and the length and diameter of the ears. The statistical test showed significant differences between the prospective and the comparative varieties on the characteristics of the number of harvested plants, number of harvested ears, weight of harvested ears, length of ears, and diameter of ears. The yield component was determined by the genetic potential of each prospective variety and differences in plant population, number of harvested ears, weight of harvested ears, length, and diameter of the ears.

The number of harvest pieces produced by a plant is related to the production of that plant. Under optimum conditions, more than two cob shoots can develop for some genotypes [17].

All prospective varieties showed that the average harvest ear weight, ear length, and ear diameter were superior to the comparative varieties Sticky Uri and local Sticky. Long cobs produce a higher number of seeds and assimilate, which affects the weight of the crop and if the diameter of the cob is large, the yield obtained is small and vice versa [18].

TABLE 10: Average number of plants and harvested ears, weight of harvested ears, length and diameter of ears in six test locations (districts) in MT 2023.

Genotype	Number of harvested plants	Number of harvested ears	Weight of harvested ears (kg)	Length of harvested ears (cm)	Diameter of ears (cm)
JPI-1	47.66ac	48.62ac	8.57ac	18.21ac	4.41ac
JPI-2	47.41ac	48.16c	8.41ac	17.69ac	4.33ac
JPI-3	47.83ac	48.541ac	8.29ac	17.83ac	4.4ac
JPI-4	47.25ac	48.50ac	8.18ac	18.31ac	4.23ac
Sticky Uri (a)	46.54	47.54	7.07	15.33	4.00
White Srikandi (b)	47.54	48.17	8.41	17.97	4.47
Sticky local Takalar (c)	46.38	47.13	4.97	14.13	3.57
Average	46.82	47.61	6.82	15.81	4.01
SE	0.18	0.22	0.14	0.17	0.05
LSD 5%	0.53	0.65	0.41	0.48	0.15
CD	1.70	1.90	6.10	3.60	4.00

Note: a= significantly superior to Sticky Uri, b= significantly superior to White Srikandi, c=significantly superior to local Sticky in the 5% LSD test, CD= Coefficient of Diversity.

3.7. Seed Water Content, Number of Rows of Seeds, Number of Seeds per Row, Seed Yield and Weight of 1000 Seeds KA 15%

Hasil menunjukkan bahwa Seed water content in all prospective varities were higher than those in comparative varieties. Number of seed rows in JPI-1 and JPI-3 were higher than those in comparative varieties. Number of seed per row in JPI-2 was higher than those in comparative varieties. Seed yield in JPI-1 was higher than those in comparative varieties. Weight 1000 seeds KA in JPI-1 and JPI-4 were higher than those in comparative varieties (Table 11).

TABLE 11: Average water content, number of rows of seeds, number of seeds per row, seed yield, and weight of 1000 KA 15% seeds at 6 test locations in MT 2023.

Genotype	Seed water content (%)	Number of seed rows	Number of seed per row	Seed yield (%)	Weight 1000 seeds KA 15% (g)
JPI-1	23.33abc	14.86ac	32.91ac	79.13abc	287.14ac
JPI-2	23.52bc	14.27ac	33.16ac	78.04ac	281.76c
JPI-3	23.80bc	15.09ac	32.77ac	78.00ac	283.78c
JPI-4	22.95abc	14.70ac	31.08ac	77.14c	289.72abc
Sticky Uri (a)	24.15	13.47	28.04	71.02	279.29
White Srikandi (b)	24.95	14.81	33.08	78.28	282.47

Local Sticky Takalar (c)	25.67	10.80	23.67	74.86	274.95
Average	24.92	13.02	28.26	76.72	278.90
SE	0.25	0.25	0.20	0.26	1.80
LSD 5%	0.73	0.71	0.57	0.75	5.19
KK	6.30	5.50	7.40	2.00	4.20

Note: a= significantly superior to Sticky Uri, b= significantly superior to White Srikandi, c=significantly superior to local Sticky in the 5% LSD test, CV = coefficient of diversity.

3.8. Testing for Major Diseases

The results of observations on the intensity of downy mildew attacks (*P. philippinensis*) in Bajeng Gowa at 14, 21, 28, 35 and 42 days after planting (DAP) are presented in Table 12.

Table 12: Average percentage of downy mildew pathogen infections in Bajeng, Gowa 2023.

Genotype	Average percentage of downy mildew infections (%)					Reaction
	14 DAP	21 DAP	28 DAP	35 DAP	42 DAP	
JPI-1	0.0	3.5	5.3	5.8	5.8	R
JPI-2	0.0	4.6	7.1	8.2	8.2	R
JPI-3	0.6	6.2	11.2	11.7	11.7	R
JPI-4	4.1	12.5	27.7	27.7	27.7	AT
Sticky Uri	0.0	4.1	8.5	9.1	9.1	R
White Srikandi	0.0	3.5	5.4	5.4	5.4	R
Local Sticky	0.0	7.2	30.5	37.3	41.6	S
Anoman	7.5	64.2	80.9	98.4	92.2	VS

Information: R = resistant; M = Moderate; V = Vulnerable; VV = very vulnerable

Table 12 showed that none of the prospective varieties tested showed a susceptible reaction to downy mildew. However, the check plants (susceptible plants) of the Anoman variety was susceptible to downy mildew with a percentage of attacks at 42 days after reaching 92.2%, while the local Sticky was tolerant with an intensity of 39.6%. The comparative varieties Sticky Uri and White Srikandi showed a resistant reaction to downy mildew in Bajeng with an average percentage of infection of 9.1% and 5.4%, respectively at 42 DAP.

Table 12 also showed that the Anoman and local sticky varieties have become quite heavily infected with downy mildew pathogens since 21 DAP. This indicated that the level of resistance of prospective varieties to *P. philippinensis* in Bajeng is relatively good, although JPI-4 reacts somewhat resistant.

The results of the test of prospective varieties against downy mildew (*P. maydis*) carried out in Malang were presented in Table 13. Result showed that the four prospective composite varieties tested showed a resistant reaction to *P. maydis*, with an average percentage of attacks at 42 days after planting, ranging between 9.61% and 10.42%. All comparative varieties, apart from the check plants (susceptible plants) of the Anoman variety, showed a resistant reaction to *P. maydis* except for the local sticky that reacted somewhat resistantly. The average percentage of infection with downy mildew pathogen in check plants (susceptible plants) of Varetas Anoman is 83.75%, which means that the reaction is very susceptible. The Anoman variety has started to be infected with the heavy downy mildew pathogen since 21 DAP.

TABLE 13: Average percentage of downy mildew pathogen infections in Malang in 2023.

Genotype	Average percentage of infections (%)					Response
	14 DAP	21 DAP	28 DAP	35 DAP	42 DAP	
JPI-1	0.00	0.00	9.21	9.61	9.61	R
JPI-2	0.00	0.00	10.21	10.42	10.42	R
JPI-3	3.00	6.50	8.37	9.75	9.75	R
JPI-4	4.00	7.67	8.67	18.00	18.00	R
Sticky Uri	0.33	4.13	9.21	10.60	10.60	R
White Srikandi	2.25	6.27	8.37	9.18	9.18	R
Local Sticky	1.00	8.00	10.06	25.42	25.42	M
Anoman	20.62	52.28	71.91	79.57	83.75	VS

Note: R = Resistant; M = Moderate; S = Susceptible; VV = Very Susceptible

The results of observations of maydis leaf blight infection in all test genotypes showed that all prospective varieties tested reacted with resistance with an average percentage of attacks at 75 DAP ranging from 18.0% to 20.8% (Table 14). Similarly, all the resistant comparative varieties showed a resistant reaction to Maydis leaf blight. However, the check plants (susceptible plants) of the Anoman variety reacted very susceptibley with an average attack percentage of 68.5%.

TABLE 14: Average percentage of Maydis leaf blight infection in test lines and comparative varieties at 45, 60 and 75 DAP Bajeng, Gowa, 2023.

Genotype	Average percentage of infections (%)			Response
	45 DAP	60 DAP	75 DAP	
JPI-1	1.50	15.60	18.80	R
JPI-2	5.70	18.20	19.60	R
JPI-3	12.70	17.30	18.00	R
JPI-4	12.3	18.40	18.80	R
Sticky Uri	0.00	16.00	20.00	R
White Srikandi	5.30	17.30	19.20	R
Local Sticky	4.70	15.00	20.30	R
Anoman	1.30	39.30	68.50	VS

Note: R = Resistant; M = Moderate; S = Susceptible; VS = Very Susceptible

Maydis leaf blight, like most other leaf diseases of corn, is a late-season disease where the most severe disease development occurs post anthesis [19]. Therefore, observations of the intensity of leaf blight attacks were carried out during that period. Furthermore, [19] stated that leaf blight can occur in corn plants with different intensities and one of the main factors that really influences it apart from climate and planting conditions is the level of resistance of a plant.

The results of observations on the intensity of rust infection carried out in Bajeng are shown in Table 15. Result showed that of the four prospective varieties tested, all comparative varieties except check plants (susceptible plants), the Anamon variety, which acted very susceptible with a value of 68.2%, showed a resistant reaction.

Table 15: Average percentage of attacks with maydis leaf rust in test lines and comparative varieties at 60 and 75 DAP in Bajeng, Gowa 2023.

Genotype	Average percentage of infections (%)		Response
	60 DAP	75 DAP	
JPI-1	15.5	20.1	R
JPI-2	16.9	19.7	R
JPI-3	18.3	20.0	R
JPI-4	14.3	18.0	R

Sticky Uri	16.8	20.3	R
White Srikandi	14.3	18.0	R
Local Sticky	14.5	20.4	R
Anoman	22.5	68.2	VS

Note: R = Resistant; M = Moderate; S = Susceptible; VS = Very Susceptible

3.9. Nutritional Content

Hasil analisis menunjukkan bahwa kadar protein pada JPI-1, JPI-3 dan JPI-4 genotypes were higher than those in comparative varieties. Kadar lemak pada JPI-2, JPI-3 dan JPI-4 genotypes were were higher than those of comparative varieties. Kadar karbohidrat pada all prospective varieties was higher than those in all comparative varieties. Kadar amilopectin pada all prospective varieties was higher than those in Sticky Uri and White Srikandi, but those was lower that that in Local Sticky variety. According to [20], the main nutritional content of corn is carbohydrates, which range from 72-73% and are mostly concentrated in the endosperm. The composition of carbohydrates as starch consisting of amylose and amylopectin in seeds is genetically controlled. These components influence the functional properties of corn. The physical, chemical, and available properties of carbohydrates can guide in selecting appropriate corn varieties for the desired product. From this description, prospective varieties with high carbohydrate content are suitable for use as food and raw materials for bioethanol production.

TABLE 16: Results of analysis of carbohydrate, fat, protein, and amylopectin content in corn seeds of prospective varieties and comparative varieties in MT 2023.

Genotype	Protein (%)	Fat (%)	Carbohydrate (%)	Amylopectin (%)
JPI-1	11.64	4.85	75.74	85.10
JPI-2	11.54	5.72	74.51	82.80
JPI-3	11.69	6.63	74.49	82.45
JPI-4	11.86	5.76	73.46	80.90
Sticky Uri (a)	10.97	5.55	72.65	55.95
White Srikandi (b)	11.63	4.76	73.04	38.80
Local Sticky (c)	10.24	5.08	72.56	85.40

Note: statistical analysis was not performed

In addition to being a source of carbohydrates, corn also contains other macronutrients such as fat and protein. According to [20], the fat content of corn kernels is genetically controlled, ranging from 3-18%. Based on laboratory test results, all prospective varieties and comparatives have relatively high-fat content. Generally, corn contains 3.5% fat in the kernel part [21]. Corn kernel protein ranges typically between 8-11% [20]. The test results showed that all prospective varieties had a higher protein content than all comparative varieties except the White Srikandi variety.

The amylopectin content in all prospective varieties is relatively high (>80%) compared to the two comparative varieties, namely Sticky Uri and White Srikandi. Still, the amylopectin content in the local sticky is generally equivalent to all prospective varieties, especially JPI-1. High amylopectin is a determinant of the level of fluffier taste. The higher the amylopectin content in the corn kernels, the more suitable it is for use as an alternative staple food. This shows that the high amylopectin character of local sticky Takalar parents has generally been inherited in the four genotypes of prospective varieties through the development of the Dreher method. This is consistent with studies that demonstrate the formation of maize with unique traits via systematic and recurrent plant breeding operations [22]. A homozygous recessive wx gene (wxwx) in sticky corn modifies the chemical makeup of starch, giving it a savoury, palatable flavour. To achieve unique qualities, donor genes from special corn with a high amylopectin concentration can be inserted into high protein corn using the backcross breeding technique.

Conclusion

Prospective composite corn varieties JPI-1 and JPI-2, JPI-3, and JPI-4 have the potential for higher productivity (respectively: 8.88; 8.54; 8.57, 8.67 t/ha) compared to the three comparative varieties (respectively: 7.73; 8.36; 4.77 t/ha). Prospective composite corn varieties JPI-1 and JPI-2, have higher average yields (8.16 and 7.88 t/ha) than the three comparative varieties (6.48; 7.75 and 4.33 t/ha) Ha). Prospective composite corn varieties JPI-1, JPI-2, JPI-3, and JPI-4 show the criteria for resistance to downy mildew, *P. maydis*, *P. philippinensis* (except JPI-4 which is somewhat resistant), type H blight. maydis, and *P. polysora* leaf rust disease. The prospective JPI-1 composite corn variety has a higher protein content than the three comparative varieties, 11.64%. The JPI-1 prospective hybrid corn variety, which is stable in various environmental conditions with a higher average yield than the overall average, is included in the genotype category. At the same time, JPI-2 has high productivity due to improved environmental conditions. Prospective composite corn varieties JPI-1 and JPI-2 have a relatively high amylopectin content of 85.10% and 82.80%, respectively. Prospective varieties JP-1 and JPI-2 have met the eligibility requirements to be released as new superior varieties based on productivity and amylopectin content.

Data Availability

The data used to support the findings of this study are included within the supplementary information file(s).

Conflicts of Interest

The authors declare that they have no conflicts of interest.

Funding Statement

This study was funded by the Directorate of Research and Community Service (DRCS), Ministry of Education, Culture, Research and Technology, Republic of Indonesia through the Research Scheme of Superior University [Contract number 1813.f/B.07/UMI/V/2023].

Acknowledgments

The authors gratefully acknowledge the financial support provided by the Directorate of Research and Community Service (DRCS), Ministry of Education, Culture, Research and Technology Republic of Indonesia through the Research Scheme of Superior University, Contract number 1813.f/B.07/UMI/V/2023. We want to thank the Rector and Head of the Research and Development Institute of LP2S and the Dean of the Faculty of Agriculture, University of Muslim Indonesia and the students for their assistance.

Supplementary Materials

See Table S1-S164 in the Supplementary Material for a comprehensive data analysis

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Multilocation Test of Prospective Composite Sticky Corn Varieties with High Production in Indonesia

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Recently, the needs a delicious alternative staple food has increased. This study aims to evaluate multi-location test of crossover varieties of four prospective composite corn varieties. The method used in this research was the adaptation testing of 4 prospective varieties of composite sticky (JPI-1, JPI-2, JPI-3, JPI-4) and 3 comparative varieties (Sticky Uri, White Srikandi, and local Sticky Takalar) carried out in 6 districts in Indonesia as research locations. Each location was designed using a randomized block design, with 4 replications to obtain 28 experimental units at each location. Testing for resistance to downy mildew, rust and leaf blight was carried out in a randomized block design with 4 replications. Proximate analysis testing was conducted at the Animal Husbandry Integrated Biotechnology Laboratory, Faculty of Animal Husbandry, Hasanuddin University. Observation data were analyzed using analysis of variance (ANOVA). The results of the research show that the prospective composite corn varieties JPI-1, JPI-2, JPI-3, and JPI-4 have the potential for yields that are significantly superior to the three comparative varieties, respectively, with each of 8.88 t.ha-1 ; 8.54 t.ha-1; 8.57 t.ha-1; 8.67 tha-1. Based on the results of the stability analysis, JPI-1 and JPI-4 show stable results in all environments, and JPI-3 shows increasingly better results in the optimum environment. Prospective varieties JPI-1, JPI-2 JPI-3 and JPI-4 offer the criteria for resistance to Downy mildew disease *Peronosclerospora maydis*, *Peronosclerospora philippinensis* type, Bipolaris maydis type blight, and also resistance to the leaf rust disease type *Puccinia polysora*. The prospective variety JPI-1 has a high amylopectin content (85.10%) equivalent to the amylopectin content of local Sticky parents and higher than the two comparative varieties. JPI-2, JPI-3, and JPI-4 have higher amylopectin content than the two comparative varieties.

Keywords: adaptation, corn composite, productivity, disease resistance, proximate

1. Introduction

Corn (*Zea mays* L.) is one of the world's most essential carbohydrate-producing food crops, besides wheat and rice [1]. Corn is a second cereal commodity food in Indonesia. Corn is generally utilized as an alternative staple food, snacks, and various other foods, as well as in the animal feed industry. In some areas, the community consumed corn as a staple food. Moreover, corn is also a main ingredient in animal feed and other industries such as raw materials for producing bioethanol. Currently, a study initiates to develop corn as a functional food because it contains dietary fiber [1].

Sticky or waxy corn (*Zea mays ceratina* L.) is a particular type of corn that has the potential as a source of food diversification and industrial materials. In Japan, sticky corn is a source of amylopectin, a raw material for food products, textiles, glue, and paper. In addition, sticky corn is a source of germplasm for developing new cultivars through plant breeding [2]. Sticky corn, like sweet corn, can be consumed as a fresh or boiled vegetable because it has a soft and delicious taste. Glutinous corn contains starch from amylopectin, which almost reaches 100% [3]. The high level of amylopectin in sticky corn is suitable for the diet of diabetics and to increase the weight of livestock. The sticky corn is generally consumed as corn porridge and snacks. Sticky corn, however, has a low potential yield. It only produces small cobs with a 10–11 mm diameter, production less than 2 tons/ha. Due to its poor production and vulnerability to downy mildew, it has been rarely used as a staple food and, hence become scarce [4].

Sticky corn is a typical food ingredient in Sulawesi, Indonesia. Domestic demand for sticky corn continues to increase, but supply is insufficient. Furthermore, the national need for corn is growing along with the increase in population and the development of the food and feed industry. Data for the 2018-2022 period show that corn production has grown along with the increase in harvested area; unfortunately, there has been a particular decline in 2021 [5]. The effort to provide glutinous corn as an alternative staple food requires the release of appropriate variety. It must express a high-yielding amylopectin content and adapt to environmental changes especially downy mildew attack.

The proposed composite corn genotype is a line assembled and developed from a cross between a high protein and production variety and a local sticky variety containing amylopectin. The composite corn genotype assembly program goes through several breeding stages to obtain a combination of traits resulting from the cross. This requires continuous identification, characterization, and evaluation. One of the stages in testing the results of the genotype assembly is the multi-location test. This research aims to evaluate multi-location test of crossover varieties of four prospective composite corn varieties.

2. Materials and Methods

This study evaluated the performance of the multi-location test of four prospective composite corn varieties and three comparative varieties. The four prospective corn varieties consisted of JPI-1, JPI-2, JPI-3, and JPI-4, while the three comparative varieties are Sticky Uri (JPI-5), White *Srikandi* (JPI-6) and Local Sticky *Takalar* (JPI-7). JPI-1, JPI-2, JPI-3 and JPI-4 originate from a cross between the White *Srikandi* variety (as the female parent) and the local Sticky *Takalar* (as the male parent). The crossover process was conducted from 2017 to 2022 through the eighth generation.

2.1. Testing Time and Location. The adaptation test was carried out during the 2023 planting season from March to September 2023 in six districts. Four districts were located in South Sulawesi (Gowa Regency, Takalar Regency, Bantaeng Regency, Maros Regency) and two districts from other provinces (Lombok Regency, West Nusa Tenggara Province and Kediri Regency, East Java Province). Disease resistance tests were carried out in 2 districts, Gowa Regency (3 locations: location 1, leaf rust test, location 2 leaf blight test and location 3, downy mildew test specific for the species *Peronosclerospora philippinensis* which often attacks corn in Sulawesi) and Malang Regency, East Java Province (specifically the specific downy mildew test for the *Peronosclerospora maydis* species which often attacks corn in Java). Descriptions of adaptation test locations and disease resistance tests for prospective composite varieties are presented in Tables 1 and 2.

The plot area used for each experimental unit was 5 × 3 m^2 with a planting space of 75 × 20 cm^2. A total of 100 individual corn was planted 4 rows in each plot. The type and dose of fertilizer used was 300 kg/ha of urea and 400 kg/ha of Nitrogen, Phosphorus and Potassium. Fertilization was done twice when the plants were seven days old and 30 days after planting, each administered 50% of the dose. The water was merely applied when the rain stopped for a week. The samples were collected from the two middle rows, randomly taking as many as 10 plants per plot.

2.2. Adaptation Test Method. The research was carried out using a randomized block design consisting of seven varieties, repeated 4 times so that there were 28 experimental units at each adaptation test location (Table 1). Data collected from each location were analyzed for combined variance. Combined analysis of variance was used to determine the influence of environment, genotype, and interaction of genotype and environment. Observation data were analyzed using analysis of variance (ANOVA). Bi values were used to analyze the stability of results. If there was a difference in the mean value of the varieties in the F test, test was continued with the Least Significant Difference (LSD) test at the 5% level. The results were presented only paired comparatives between prospective and comparative varieties. Data analysis using the

DSAASTAT program. Analysis of the stability of the results used the additive mean effect multiplicative interaction multivariate analysis model using the PBSTAT program.

1 TABLE 1: Description of adaptation test locations for prospective composite corn varieties in six districts.

No.	Location	Soil type	Altitude (a.s.l)	Climate type	Planting date	Harvest date
1.	Bajeng Gowa, South Sulawesi	Alluvial, land paddy field	89	D	06 May 2023	20 August 2023
2.	Sinoa, Bantaeng, South Sulawesi	Latosol, land dry	500	B	17 May 2023	10 September 2023
3.	Lembar Lombok Barat, NTB	Alluvial, Land dry	14	D3	21 May 2023	05 September 2023
4.	Kepung, Kediri, East Java	Alluvial, Land dry	67	C2	22 May 2023	07 September 2023
5	Galesong, Takalar, South Sulawesi	Alluvial, Land paddy field	20	C2	24 May 2023	09 September 2023
6.	Lau, Maros, South Sulawesi	Alluvial, Land Paddy field	25	C2	21 June 2023	06 October 2023

2 TABLE 2: Description of disease resistance test locations for prospective composite corn varieties in 2 districts.

No.	Location	Soil type	Altitude (mdpl)	Climate type	Planting date	Harvest date	Information
1	Bajeng, Gowa, South Sulawesi	Alluvial, Land dry	89	D	11 June 2023	26 August 2023	Leaf rust
					17 June 2023	02 Sept 2023	Hover down
					24 June 2023	10 August 2023	Bubbles *(P. philippinensis*)
2	Gondang legi, Malang, East Java	Inceptisol, Land paddy field	400.1	C2	12 June 2023	31 July 2023	Bubbles (*P. maydis*)

3 ## 3. Results and Discussion

3.1. Overview Adaptation test. The results of the integrated variance analysis of yield and agronomic characteristics of four prospective composite corn varieties and three comparative varieties are presented in Table 3. The combined variance analysis shows that location strongly affects all observed variables except for leaf width, male flowering age, cob appearance, and harvest water content. The effect of location indicates the environmental characteristics of the study sites were quite diverse.

The effect of genotype was significant on all observed variables except leaf length. Each prospective variety has a different genetic potential in expressing traits or characters. Another study reported that the lines tested differ significantly in all characters, indicating that there are differences in genetic potential between the lines tested [6].

TABLE 3: Middle square of agronomic characters, yield components, and yield of prospective JPI composite corn varieties at several locations.

Variable	Location (L)	Genotype	L × G
Plant Growth (%)	222.52 **	76.72**	8.70
Plant Height (cm)	10549.10**	2218.36**	381.10*
Cob Height (cm)	2257.33 **	547.79 **	148.34 *
Stem Fall (%)	0.00 **	0.00 **	0.00
Root Reduction (%)	0.00 **	0.00 **	0.00 **
Number of leaves	0.15 7 **	0.08 **	0.01
Leaf angle (º)	23.98 **	5.80 **	0.67
Leaf length (cm)	15.12 **	1.41	1.67 *
Leaf width (cm)	10.01	24.05 *	7.29
Age of male flowering (DAP)	0.31	0.53 *	0.20
Female flowering age (DAT)	163.09 **	95.97 **	3.22
Harvest age (DAP)	173.52 **	104.23 **	3.31 **
Plant Appearance Aspects (score)	149.72 **	780.59 **	6.33 **
Closing husk (score)	2.87 **	0.22 **	0.02
Cob Performance (score)	0.19	2.50 **	0.02
Blight Score (score)	0.71**	0.17**	0.04
Rust Disease Score (score)	0.00 **	0.00 **	0.00
Number of harvested plants	0.00 *	0.00 **	0.00
Number of harvested cobs (cobs)	64.71**	7.57**	0.81
Harvest cob weight (kg)	42.28 **	7.61**	1.20
Seed yield (%)	8.09 **	40.93 **	0.48 **
Harvest Water Content (%)	2.94	44.66 **	1.60
Cob length (cm)	12.26 **	21.98 **	1.55
Cob diameter (cm)	49.94 **	65.23 **	0.67 *
Number of Seed rows (rows)	5.39 7 **	2.49 **	0.07 **
Number of seeds per row (Seeds)	6.76 **	54.88 **	1.44 **
Weight of 1000 seeds (g)	277.67 **	310.58 **	0.93
seed yield (f/ha)	7.52	43.51 **	0.40 *

** = significant effect at the F test level of 1%; * = significant effect at the F test level of 5%

3.2. Average and Potential Results. The results of the tests of the average and potential yields in prospective and comparative varieties demonstrated that the averages yield of two tested varieties (JPI-1 and JPI-2) were significantly superior to those of comparative varieties as well as two other tested varieties (JPI-3 and JPI-4).

The JPI-1 variety productions had the highest production in all location except in location 2 (Takalar). That in Takalar was highest found in JPI-2. The productions of JPI-2 were rank second in Bantaeng and Maros. Those of JPI-3 were rank second in Gowa and Kediri, while JPI-4 was rank second in Lombok. In all locations, prospective variety productions were superior to those of the Sticky Uri and Sticky Local varieties (Table 4). Changes in the rank of a genotype at each test location indicate a genotype and environment interaction [7].

TABLE 4: Average yield (t/ha) of JPI corn seeds and comparative varieties at each test site in MT 2023.

Genotype	Yield at 15% moisture content (t/ha)						
	Gowa	Takalar	Bantaeng	Maros	Lombok	Kediri	Average
JPI-1	8.11 ac	7.70 ac	7.36 ac	8.45 abc	8.88 ac	8.48 ac	8.16 abc
JPI-2	7.19 ac	7.87 ac	7.20 ac	8.11 ac	8.54 ac	7.63 c	7.88 ac
JPI-3	7.95 ac	7.54 ac	6.56 ac	7.69 ac	8.57 ac	8.14 ac	7.74 ac
JPI-4	7.71 ac	7.47 c	6.71 ac	7.61 ac	8.67 ac	7.56 c	7.62 ac
Sticky Uri (a)	5.61	6.85	5.53	6.02	7.73	7.12	6.48
White Srikandi (b)	7.82	7.74	6.97	7.88	8.36	7.76	7.75
Local Sticky Takalar (c)	4.38	3.92	3.97	4.41	4.77	4.55	4.33
Average	7.07	7.01	6.33	7.17	7.93	7.32	7.14
SE	0.17	0.21	0.26	0.16	0.27	0.30	0.13
LSD 5%	0.49	0.63	0.78	0.46	0.80	0.89	0.37
KK	4.7	6.1	8.3	4.3	6.7	8.2	6.6

a= significantly superior to Sticky *Uri*-1, b=significantly superior to White *Srikandi*, c=significantly superior to Sticky Local in the LSD 5% test.

3.3. Results of Stability Test. The combined analysis of variance on seed yields of four prospective varieties and three comparative varieties at 6 test locations showed a significant genotype and location interaction (Table 5). The clear interaction of genotype and location on crop yield indicated that the seed yield of prospective variety was significantly higher than the comparative varities. The significant interaction of genotype with the environment indicated the inconsistent appearance of a trait under different environmental conditions. This causes differences in yield in various planting environments [7]. The interaction of genotype and environment is a component that influences results and phenotypic expression [8], so stability and adaptability tests are needed to determine the level of stability of a genotype in each testing environment.

TABLE 5: Analysis of variance of the combination of environmental × outcome characters in 6 test locations (districts) in MT 2023.

Source of diversity	DF	SQ	MQ	F Hit	Prob F	Sig
Location (L)	5	37.58	7.52	27.06	0.00	**
L/R	18	5.00	0.28	1.27	0.22	
Genotype (G)	6	261.04	43.51	108.15	0.00	**
L × G	30	12.07	0.40	1.84	0.01	*
SD	108	23.61	0.22			
Total	167	339.31	2.03			

** = very real based on an F test of 1%. * = significantly different based on the 5% F test; DF= degrees of freedom; SQ= sum of squares; MQ= middle square.

The variation in crop yield characteristics (MQ) was caused by a location factor of 7.52 and a genotype factor of 43.51 and a genotype and location interaction factor of 0.40, which can be seen in the middle square value (Table 5). Based on this proportion, it can be seen that the genotype makes the most significant contribution to the diversity of the characteristics of the crop yield. Stability analysis is used to see the effect of the interaction of genotype and environment effectively so that the level of stability and adaptability of the proposed variety prospective can be determined.

Table 6 showed that the JPI-1 and JPI-4 genotypes with Bi (Slope) values were not significantly different from 1 (standard). The average yield is higher than the general average so that the performance of these prospective varieties was stable in all environments, both optimum and suboptimal. The bi value of JPI-3 was significantly higher than 1 so that the genotype was adaptive to the optimum environment. In contrast, Bi value of JPI-2 was significantly smaller than 1 so that this genotype may produce increased yields in sub-optimal condition.

TABLE 6: Average and stability of composite corn yields (KA 15%) based on the combined analysis of six test locations (districts) in MT 2023.

Genotype	Yield (t/ha) min	max	mean	Slope	SE	MQ MS-TXL	MQ MS-REG	MQ MS-DEV	R**2(%)
JPI-1	7.36	8.88	8.16	1.01	0.20	0.04	0.00	0.05	0
JPI-2	7.20	8.54	7.88	0.77*	0.20	0.06	0.07	0.05	25
JPI-3	6.56	8.57	7.74	1.26*	0.19	0.06	0.09	0.05	34
JPI-4	6.71	8.67	7.62	1.17	0.14	0.03	0.04	0.03	25
Sticky Uri (a)	5.53	7.73	6.48	1.40	0.50	0.31	0.21	0.34	14
White Srikandi (b)	6.97	8.36	7.75	0.83	0.11	0.02	0.04	0.02	35
Local Sticky Takalar (c)	3.92	4.77	4.33	0.55	0.17	0.08	0.27	0.04	64
Average					7.36				

Bi = regression slope of the average variety in the environmental index, * = Bi value is significantly different from 1; SE = standard error, MQ-HXL = Contribution of each genotype to the mean square of the interaction, MQ-Reg = Contribution of each genotype to the regression component in the interaction between genotype x location interaction; MQ-Dev = Middle square deviation (deviation of the interaction regression components), R ** 2 (%) = squared correlation between the residuals of the main effects of the model and the environmental index.

3.4. Plant growth, flowering time, harvest time, plant height, and cob height. Based on the statistical test, the percentage of prospective corn varieties growth was significantly higher from the comparative variety, except JPI-4 variety. It was not significantly different from the comparative variety, though the percentage of plants grew above 85%. The flowering times for males and females of prospective varieties JPI-1, JPI-2, JPI-3, and JPI-4 were significantly faster than that of the White *Srikandi* variety. The harvest time for the prospective varieties JPI-1, JPI-2, JPI-3, and JPI-4 was significantly faster than those of Sticky Uri and White Srikandi varieties (Table 7). Plant genetic factors are one of the causes of differences between one plant and another [9]. Corn plants have a short maturity ranging from 75 to 90 DAP, medium maturity between 90-120 DAP, and more than 120 DAP [10]. The JPI-2 genotype showed plant height yields were significantly superior to local Sticky, while JPI-4 showed plant height yields superior to White Srikandi and local Takalar Sticky. For cob height, JPI-2 genotype was superior to local Sticky. The position height of JPI-4 genotype was superior to White Srikandi and Local Takalar Sticky. The correct position of the cob can reduce the intensity of rat pest attacks. If the height of the cob is located more or less in the middle of the plant, it will reduce the intensity of root and stem lodging.

The characteristics of plant height and cob location are closely related to the suitability of the planting environment. Environments with high altitudes with the potential for strong winds are suitable for shorter plants, while tall plants with suitable cobs are needed in areas susceptible to pest attacks, such as mice. Most plant breeders concentrate selection on shorter plants to be able to withstand lodging caused by strong winds [11]. Selection is also done the characteristics of plant height and ear height. Several cases show a decrease in ear height and an increase in plant height [12].

TABLE 7: Average plant growth, age, plant height and position of test composite corn cobs and comparative varieties in 6 test locations (districts) in MT 2023.

Genotype	Growth	Flowering (DAP)		Harvesting (DAP)	Height (cm)	Ear Height (cm)
		Female	Male			
JPI-1	91.83^{ab}	56.87^{b}	55.16^{b}	102.21^{ab}	186.42	89.35
JPI-2	91.63^{ab}	57.20^{b}	55.45^{b}	102.79^{ab}	175.59^{c}	85.35^{c}
JPI-3	92.33^{ab}	57.20^{b}	55.50^{b}	103.50^{ab}	187.27	92.23
JPI-4	88.67	57.12^{b}	55.25^{b}	106.39^{ab}	166.70^{bc}	80.20^{bc}
Sticky Uri (a)	88.32	56.87	54.69	110.15	171.42	83.75
White Srikandi (b)	89.15	59.12	57.52	110.49	186.86	91.16
Local Sticky (c)	92.21	52.29	50.87	93.17	192.23	92.65
Means	90.59	56.67	54.92	104.18	180.93	87.81
SE	0.60	0.37	0.36	0.51	3.98	2.46

LSD 5%	1.73	1.07	1.05	1.48	11.50	7.18
CD (%)	4.10	2.20	2.90	0.90	8.60	10.20

a = significantly superior to Sticky Uri, b = significantly superior to White Srikandi, c = significantly superior to Sticky Local Takalar in the 5% LSD test, CD = Diversity coefficient.

Stem diameter, angle, length, and width of leaves, and percentage of leaf rust were presented in Table 8. Result showed that the prospective varieties JPI-1, JPI-2, JPI-3 and JPI-4 had stem diameters of 2.38 cm, 2.35 cm, and 2.36 cm and 2.32 cm respectively. Those were lower than White Srikandi stem diameter (2.39), but higher to the Local sticky stem diameter (2.22 cm) . A large stem diameter makes the plant stronger so that the intensity of lodging can be reduced. The character of leaf angle, length, and width of leaves can be used to develop a new variety.

TABLE 8: Mean stem diameter, angle, length, and width of leaves, as well as percentage of stem and root fall of maize composite test and comparative varieties in six locations.

Genotype	Stem diameter	Leave angle	Leave length	Leave wide	Stem rot	Root rot
JPI-1	2.38ac	26.89	96.42abc	9.44ac	0.017abc	0.02abc
JPI-2	2.35ac	26.59	95.00c	9.29c	0.020abc	0.01abc
JPI-3	2.36ac	26.55	94.72	9.40c	0.020abc	0.02abc
JPI-4	2.32c	26.82	94.14	9.20	0.020abc	0.02abc
Sticky Uri (a)	2.30	27.00	94.50	9.16	0.04	0.03
White Srikandi (b)	2.39	26.90	94.12	9.34	0.04	0.03
Local Sticky (c)	2.22	26.32	93.17	9.02	0.06	0.06
Average	2.30	26.72	94.13	9.18	0.04	0.04
SE	0.02	0.26	0.55	0.09	0.00	0.00
LSD 5%	0.05	0.76	1.59	0.27	0.01	0.01
CV	5.70	3.60	2.70	4.50	34.80	24.30

a= significantly superior to Sticky Uri, b= significantly superior to White Srikandi, c=significantly superior to Sticky Local in the 5% LSD test, CV= Coefficient of variation.

The leaf angles of the four prospective varieties JPI-1, JPI-2, JPI-3 and JPI-4 did not show significant differences with the comparative varieties Sticky Uri, White Srikandi and Local Sticky. The leaf angles of the prospective varieties and the comparative varieties were all less than 30°. Leaf angles ranging from 21.1° to 50° include moderate leaf angles [13]. The angle of the leaves between small and medium has a straight or bent leaf pattern, which is included in the erect leaf category [14]. Erect-type plants with small to medium leaf angles can increase the number of planted populations.

The average leaf length character of the prospective variety JPI-1 showed superior results and significantly differed from the comparative varieties Sticky Uri, White Srikandi and local Sticky. The leaf length of JPI-2 is superior and significantly different from that of Local Sticky. The average leaf diameter character of the prospective variety JPI-1 showed superior results and significantly differed from the comparative varieties Sticky Uri and local Sticky. The leaf diameter of JPI-2 is superior and significantly different from that of Local Sticky.

The size of the leaves greatly influences the results of photosynthesis. The wider the leaves, the more photosynthesis or biomass they need, and this biomass is really needed by plants. The percentage of stem and root lodging for all prospective varieties was lower and significantly different from all comparative varieties.

3.5. Plant and Ear Appearance, Husk Closure, Leaf Rust, and Leaf Blight. Based on statistical analysis, the prospective varieties JPI-1, JPI-2, JPI-3, and JPI-4 showed good plant performance with mean values respective scores of 1.77; 1.85; 1.83 and 1.82, significantly different from the three comparative varieties.However, the result indicated that the plant performances were lower than those of comparative vatieties. The appearance of plants with good scores indicates that the plants have good uniformity and sturdy stems when planted in 6 adaptation testing locations. More uniform plants, especially in terms of plant height and cob height, can facilitate the application of mechanization in plant management [15].

TABLE 9: Average plant and ear appearance, husk closure, leaf rust, and leaf blight at 6 test locations in MT 2022.

Genotype	Plant performance	Husk closure	Ear appearance	Leaf rust	Leaf blight
JPI-1	1.77abc	2.06ab	1.30ab	0.02aabc	0.03abc
JPI-2	1.85ac	2.13ab	1.34ab	0.02abc	0.03abc
JPI-3	1.83ac	2.13ab	1.31ab	0.02abc	0.03abc
JPI-4	1.82ac	2.11ab	1.37a	0.02abc	0.03abc
Sticky Uri (a)	1.97	2.26	1.53	0.05	0.05
White Srikandi (b)	1.91	2.28	1.48	0.04	0.05
Local sticky Takalar (c)	2.05	1.33	1.43	0.06	0.07
Average	1.98	1.96	1.48	0.05	0.06
SE	0.03	0.03	0.04	0.00	0.00
LSD 5%	0.09	0.09	0.12	0.01	0.01
CV	7.90	6.80	13.90	7.00	9.80

Note: score value 1 is the best and 5 is the worst, a= significantly superior to Sticky Uri, b= significantly superior to White Srikandi, c=significantly superior to local Sticky in the 5% LSD test, CV = Diversity coefficient.

The prospective varieties had perfect husk closure with a mean score of 2.06, 2.13, 2.13, and 2.11, respectively. The closure of the husks is significantly different from the comparative varieties Sticky Uri and White Srikandi, which close well and tightly. However, the local sticky still has a better husk closure score.

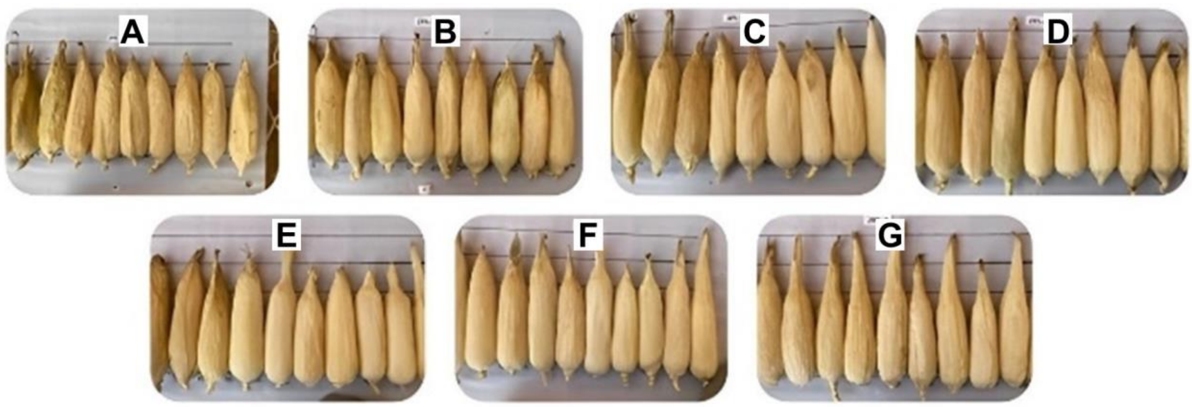

FIGURE 1: Appearance of Clot Closure: (A) JPI-1, (B) JPI-2, (C) JPI-3, (D) IPI-4, (E) Pulut uri (Sticky Uri), (F) White Srikandi, (G) Local Sticky

Properly and tightly husk closure can protect the cobs from weather effects, pest attacks, especially the powder beetle (*Sitophillus zeamais),* and cob rot infections. This is in agreement with another study [16], tightly closing husks can reduce the intensity of water seeping into the cob so that it can prevent seed germination and growth of pathogenic fungi and protect the cob and seeds from attack by the *Sitophillus zeamais* pest. The appearance of the husk closure can be seen in Figure 1.

The appearance of cobs was related to the uniformity of size, seed color, seed filling, and seed damage due to pests and diseases. The cob performances of JPI-1, JPI-2, JPI-3 showed good performance with an average score of 1.30; 1.34; 1.31was significantly lower than those of comparative vatieties. The appearance of a cob that has good size uniformity, the seeds are filled to the tip of the cob, a straight grain arrangement and an attractive seed color will be preferred by consumers or farmers. The appearance of the cob can be seen in Figure 2.

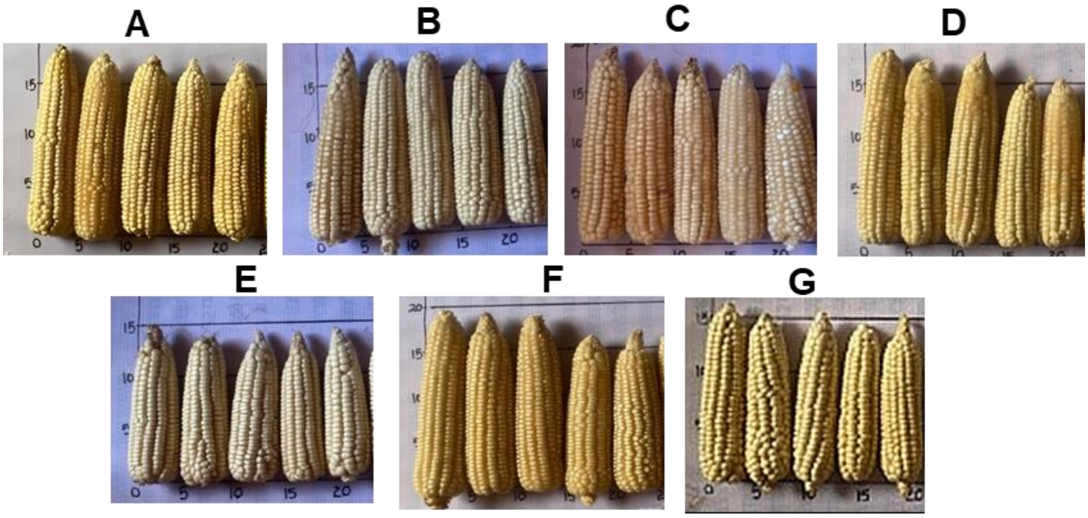

FIGURE 2: Cob appearance between test genotypes (A) JPI-1, (B) JPI-2, (C) JPI-3, (D) IPI-4, (E) Pulut uri (Sticky Uri), (F) White Srikandi, (G) Local Sticky

The scoring of leaf rust disease attacks for prospective varieties JPI-1, JPI-2, JPI-3, and JPI-4 showed a small average of 0.02 each, which is a significantly different value from the comparative variety, while leaf blight attacks on JPI-1, JPI-2, JPI-3 and JPI-4 showed the smallest mean score, namely 0.03. This value was also significantly different from the three comparative varieties. The score for blight and leaf rust infections is less than 1 for prospective varieties, indicating good resistance to disease.

3.6. Number of Plants and Harvested Ears, Weight of Harvested Ears, Length and Diameter of Ears. Table 10 presents the average number of plants and ears harvested, the weight of harvested ears, and the length and diameter of the ears. The statistical test showed significant differences between the prospective and the comparative varieties on the characteristics of the number of harvested plants, number of harvested ears, weight of harvested ears, length of ears, and diameter of ears. The yield component was determined by the genetic potential of each prospective variety and differences in plant population, number of harvested ears, weight of harvested ears, length, and diameter of the ears. The number of harvest pieces produced by a plant is related to the production of that plant. Under optimum conditions, more than two cob shoots can develop for some genotypes [17].

All prospective varieties showed that the average harvest ear weight, ear length, and ear diameter were superior to the comparative varieties Sticky Uri and local Sticky. Long cobs produce a higher number of seeds and assimilate, which affects the weight of the crop and if the diameter of the cob is large, the yield obtained is small and vice versa [18].

TABLE 10: Average number of plants and harvested ears, weight of harvested ears, length and diameter of ears in six test locations (districts) in MT 2023.

Genotype	Number of harvested plants	Number of harvested ears	Weight of harvested ears (kg)	Length of harvested ears (cm)	Diameter of ears (cm)
JPI-1	47.66ac	48.62ac	8.57ac	18.21ac	4.41ac
JPI-2	47.41ac	48.16c	8.41ac	17.69ac	4.33ac
JPI-3	47.83ac	48.541ac	8.29ac	17.83ac	4.4ac
JPI-4	47.25ac	48.50ac	8.18ac	18.31ac	4.23ac
Sticky Uri (a)	46.54	47.54	7.07	15.33	4.00
White Srikandi (b)	47.54	48.17	8.41	17.97	4.47
Sticky local Takalar (c)	46.38	47.13	4.97	14.13	3.57
Average	46.82	47.61	6.82	15.81	4.01
SE	0.18	0.22	0.14	0.17	0.05
LSD 5%	0.53	0.65	0.41	0.48	0.15
CD	1.70	1.90	6.10	3.60	4.00

Note: a= significantly superior to Sticky Uri, b= significantly superior to White Srikandi, c=significantly superior to local Sticky in the 5% LSD test, CD= Coefficient of Diversity.

3.7. Seed Water Content, Number of Rows of Seeds, Number of Seeds per Row, Seed Yield and Weight of 1000 Seeds KA 15%. Result showed that seed water content in all prospective varities were higher than those in comparative varieties. Number of seed rows in JPI-1 and JPI-3 were higher than those in comparative varieties. Number of seed per row in JPI-2 was higher than those in comparative varieties. Seed yield in JPI-1 was higher than those in comparative varieties. Weight 1000 seeds KA in JPI-1 and JPI-4 were higher than those in comparative varieties (Table 11).

TABLE 11: Average water content, number of rows of seeds, number of seeds per row, seed yield, and weight of 1000 KA 15% seeds at 6 test locations in MT 2023.

Genotype	Seed water content (%)	Number of seed rows	Number of seed per row	Seed yield (%)	Weight 1000 seeds KA 15% (g)
JPI-1	23.33abc	14.86ac	32.91ac	79.13abc	287.14ac
JPI-2	23.52bc	14.27ac	33.16ac	78.04ac	281.76c
JPI-3	23.80bc	15.09ac	32.77ac	78.00ac	283.78c
JPI-4	22.95abc	14.70ac	31.08ac	77.14c	289.72abc
Sticky Uri (a)	24.15	13.47	28.04	71.02	279.29
White Srikandi (b)	24.95	14.81	33.08	78.28	282.47
Local Sticky Takalar (c)	25.67	10.80	23.67	74.86	274.95
Average	24.92	13.02	28.26	76.72	278.90
SE	0.25	0.25	0.20	0.26	1.80
LSD 5%	0.73	0.71	0.57	0.75	5.19
KK	6.30	5.50	7.40	2.00	4.20

Note: a= significantly superior to Sticky Uri, b= significantly superior to White Srikandi, c=significantly superior to local Sticky in the 5% LSD test, CV = coefficient of diversity.

3.8. Testing for Major Diseases. The results of observations on the intensity of downy mildew attacks (P. philippinensis) in Bajeng Gowa at 14, 21, 28, 35 and 42 days after planting (DAP) are presented in Table 12.

Table 12: Average percentage of downy mildew pathogen infections in Bajeng, Gowa 2023.

Genotype	Average percentage of downy mildew infections (%)					Reaction
	14 DAP	21 DAP	28 DAP	35 DAP	42 DAP	
JPI-1	0.0	3.5	5.3	5.8	5.8	R
JPI-2	0.0	4.6	7.1	8.2	8.2	R
JPI-3	0.6	6.2	11.2	11.7	11.7	R
JPI-4	4.1	12.5	27.7	27.7	27.7	AT
Sticky Uri	0.0	4.1	8.5	9.1	9.1	R
White Srikandi	0.0	3.5	5.4	5.4	5.4	R
Local Sticky	0.0	7.2	30.5	37.3	41.6	S
Anoman	7.5	64.2	80.9	98.4	92.2	VS

Information: R = resistant; M = Moderate; V = Vulnerable; VV = very vulnerable

Table 12 showed that none of the prospective varieties tested showed a susceptible reaction to downy mildew. However, the check plants (susceptible plants) of the Anoman variety was susceptible to downy mildew with a percentage of attacks at 42 days after reaching 92.2%, while the local Sticky was tolerant with an intensity of 39.6%. The comparative varieties Sticky Uri and White Srikandi showed a resistant reaction to downy mildew in Bajeng with an average percentage of infection of 9.1% and 5.4%, respectively at 42 DAP.

Table 12 also showed that the Anoman and local sticky varieties have become quite heavily infected with downy mildew pathogens since 21 DAP. This indicated that the level of resistance of prospective varieties to *P. philippinensis* in Bajeng is relatively good, although JPI-4 reacts somewhat resistant.

The results of the test of prospective varieties against downy mildew (*P. maydis*) carried out in Malang were presented in Table 13. Result showed that the four prospective composite varieties tested showed a resistant reaction to *P. maydis*, with an average percentage of attacks at 42 days after planting, ranging between 9.61% and 10.42%. All comparative varieties, apart from the check plants (susceptible plants) of the Anoman variety, showed a resistant reaction to *P. maydis* except for the local sticky that reacted somewhat resistantly. The average percentage of infection with downy mildew pathogen in check plants (susceptible plants) of Varetas Anoman is 83.75%, which means that the reaction is very susceptible. The Anoman variety has started to be infected with the heavy downy mildew pathogen since 21 DAP.

TABLE 13: Average percentage of downy mildew pathogen infections in Malang in 2023.

Genotype	Average percentage of infections (%)					Response
	14 DAP	21 DAP	28 DAP	35 DAP	42 DAP	
JPI-1	0.00	0.00	9.21	9.61	9.61	R
JPI-2	0.00	0.00	10.21	10.42	10.42	R
JPI-3	3.00	6.50	8.37	9.75	9.75	R

JPI-4	4.00	7.67	8.67	18.00	18.00	R
Sticky Uri	0.33	4.13	9.21	10.60	10.60	R
White Srikandi	2.25	6.27	8.37	9.18	9.18	R
Local Sticky	1.00	8.00	10.06	25.42	25.42	M
Anoman	20.62	52.28	71.91	79.57	83.75	VS

Note: R = Resistant; M = Moderate; S = Susceptible; VS = Very Susceptible

The results of observations of maydis leaf blight infection in all test genotypes showed that all prospective varieties tested reacted with resistance with an average percentage of attacks at 75 DAP ranging from 18.0% to 20.8% (Table 14). Similarly, all the resistant comparative varieties showed a resistant reaction to Maydis leaf blight. However, the check plants (susceptible plants) of the Anoman variety reacted very susceptibley with an average attack percentage of 68.5%.

TABLE 14: Average percentage of Maydis leaf blight infection in test lines and comparative varieties at 45, 60 and 75 DAP Bajeng, Gowa, 2023.

Genotype	Average percentage of infections (%)			Response
	45 DAP	60 DAP	75 DAP	
JPI-1	1.50	15.60	18.80	R
JPI-2	5.70	18.20	19.60	R
JPI-3	12.70	17.30	18.00	R
JPI-4	12.3	18.40	18.80	R
Sticky Uri	0.00	16.00	20.00	R
White Srikandi	5.30	17.30	19.20	R
Local Sticky	4.70	15.00	20.30	R
Anoman	1.30	39.30	68.50	VS

Note: R = Resistant; M = Moderate; S = Susceptible; VS = Very Susceptible

Maydis leaf blight, like most other leaf diseases of corn, is a late-season disease where the most severe disease development occurs post anthesis [19]. Therefore, observations of the intensity of leaf blight attacks were carried out during that period. Furthermore, [19] stated that leaf blight can occur in corn plants with different intensities and one of the main factors that really influences it apart from climate and planting conditions is the level of resistance of a plant.

The results of observations on the intensity of rust infection carried out in Bajeng are shown in Table 15. Result showed that of the four prospective varieties tested, all comparative varieties except check plants (susceptible plants), the Anamon variety, which acted very susceptible with a value of 68.2%, showed a resistant reaction.

Table 15: Average percentage of attacks with maydis leaf rust in test lines and comparative varieties at 60 and 75 DAP in Bajeng, Gowa 2023.

Genotype	Average percentage of infections (%)		Response
	60 DAP	75 DAP	
JPI-1	15.5	20.1	R
JPI-2	16.9	19.7	R
JPI-3	18.3	20.0	R
JPI-4	14.3	18.0	R
Sticky Uri	16.8	20.3	R
White Srikandi	14.3	18.0	R
Local Sticky	14.5	20.4	R
Anoman	22.5	68.2	VS

Note: R = Resistant; M = Moderate; S = Susceptible; VS = Very Susceptible

3.9. Nutritional Content. The analysis results showed that the protein levels in JPI-1, JPI-3 and JPI-4 genotypes were higher than those in comparative varieties. Fat content in JPI-2, JPI-3 and JPI-4 genotypes were higher than those of comparative varieties. Carbohydrate levels in all prospective varieties were higher than those in all comparative varieties. Amylopectin levels in all prospective varieties were higher than those in Sticky Uri and White Srikandi, but those were lower than those in Local Sticky variety.

According to [20], the main nutritional content of corn is carbohydrates, which range from 72-73% and are mostly concentrated in the endosperm.

These components influence the functional properties of corn. The physical, chemical, and available properties of carbohydrates can guide in selecting appropriate corn varieties for the desired product. From this description, prospective varieties with high carbohydrate content are suitable for use as food and raw materials for bioethanol production.

TABLE 16: Results of analysis of carbohydrate, fat, protein, and amylopectin content in corn seeds of prospective varieties and comparative varieties in MT 2023.

Genotype	Protein (%)	Fat (%)	Carbohydrate (%)	Amylopectin (%)
JPI-1	11.64	4.85	75.74	85.10
JPI-2	11.54	5.72	74.51	82.80
JPI-3	11.69	6.63	74.49	82.45
JPI-4	11.86	5.76	73.46	80.90
Sticky Uri (a)	10.97	5.55	72.65	55.95
White Srikandi (b)	11.63	4.76	73.04	38.80
Local Sticky (c)	10.24	5.08	72.56	85.40

Note: statistical analysis was not performed

In addition to being a source of carbohydrates, corn also contains other macronutrients such as fat and protein. According to [20], the fat content of corn kernels is genetically controlled, ranging from 3-18%. Based on laboratory test results, all prospective varieties and comparatives have relatively high-fat content. Generally, corn contains 3.5% fat in the kernel part [21]. Corn kernel protein ranges typically between 8-11% [20]. The test results showed that all prospective varieties had a higher protein content than all comparative varieties except the White Srikandi variety.

The amylopectin content in all prospective varieties is relatively high (>80%) compared to the two comparative varieties, namely Sticky Uri and White Srikandi. Still, the amylopectin content in the local sticky is generally equivalent to all prospective varieties, especially JPI-1. High amylopectin is a determinant of the level of fluffier taste. The higher the amylopectin content in the corn kernels, the more suitable it is for use as an alternative staple food. This shows that the high amylopectin character of local sticky Takalar parents has generally been inherited in the four genotypes of prospective varieties through the development of the Dreher method. This is consistent with studies that demonstrate the formation of maize with unique traits via systematic and recurrent plant breeding operations [22]. A homozygous recessive wx gene (wxwx) in sticky corn modifies the chemical makeup of starch, giving it a savoury, palatable flavour. To achieve unique qualities, donor genes from special corn with a high amylopectin concentration can be inserted into high protein corn using the backcross breeding technique.

4. Conclusion

Prospective composite corn varieties JPI-1 and JPI-2, JPI-3, and JPI-4 have the potential for higher productivity (respectively: 8.88; 8.54; 8.57, 8.67 t/ha) compared to the three comparative varieties (respectively: 7.73; 8.36; 4.77 t/ha). Prospective composite corn varieties JPI-1 and JPI-2, have higher average yields (8.16 and 7.88 t/ha) than the three comparative varieties (6.48; 7.75 and 4.33 t/ha) Ha). Prospective composite corn varieties JPI-1, JPI-2, JPI-3, and JPI-4 show the criteria for resistance to downy mildew, *P. maydis*, *P. philippinensis* (except JPI-4 which is somewhat resistant), type H blight. maydis, and *P. polysora* leaf rust disease. The prospective JPI-1 composite corn variety has a higher protein content than the three comparative varieties, 11.64%. The JPI-1 prospective hybrid corn variety, which is stable in various environmental conditions with a higher average yield than the overall average, is included in the genotype category. At the same time, JPI-2 has high productivity due to improved environmental conditions. Prospective composite corn varieties JPI-1 and JPI-2 have a relatively high amylopectin content of 85.10% and 82.80%, respectively. Prospective varieties JP-1 and JPI-2 have met the eligibility requirements to be released as new superior varieties based on productivity and amylopectin content.

Data Availability

The data used to support the findings of this study are included within the supplementary information file(s).

Conflicts of Interest

The authors declare that they have no conflicts of interest.

Funding Statement

This study was funded by the Directorate of Research and Community Service (DRCS), Ministry of Education, Culture, Research and Technology, Republic of Indonesia through the Research Scheme of Superior University [Contract number 1813.f/B.07/UMI/V/2023].

Acknowledgments

The authors gratefully acknowledge the financial support provided by the Directorate of Research and Community Service (DRCS), Ministry of Education, Culture, Research and Technology Republic of Indonesia through the Research Scheme of Superior University, Contract number 1813.f/B.07/UMI/V/2023. We want to thank the Rector and Head of the Research and Development Institute of LP2S and the Dean of the Faculty of Agriculture, University of Muslim Indonesia and the students for their assistance.

Supplementary Materials

See Table S1-S164 in the Supplementary Material for a comprehensive data analysis

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Multilocation Test of Prospective Composite Sticky Corn Varieties With High Production in Indonesia

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Received 13 February 2024; Revised 18 October 2024; Accepted 29 November 2024

Academic Editor: Tauseef Anwar

Abstract

Sticky corn is required to meet the demand for a national staple food, driven by population growth. In this context, different efforts are carried out to increase productivity by using new superior varieties with easy adaptation to specific and wider environments as well as high resistance to pests and diseases. Therefore, this research aimed to evaluate composite sticky corn variety performance in several locations in Indonesia. The method used was the adaptation testing of 4 prospective and 3 comparative varieties of composite sticky (JPI-1, JPI-2, JPI-3, and JPI-4) and (Sticky Uri, White Srikandi, and local Sticky Takalar) in 6 districts serving as research locations, respectively. Each location was designed using a randomized block design, with 4 replications to obtain 28 experimental units. Meanwhile, observation data were analyzed using analysis of variance (ANOVA). Least significant difference (LSD) test was carried out at the 5% level when there was a difference in the average value and the data analysis was conducted using the DSAASTAT program. The stability of the results was analyzed using the additive main effects and multiplicative interaction (AMMI) model through the PBSTAT program. Additionally, testing for resistance to downy mildew, rust, and leaf blight was carried out in a randomized block design with 4 replications. Proximate analysis testing was performed at the Animal Husbandry Integrated Biotechnology Laboratory, Faculty of Animal Husbandry, Hasanuddin University. The results showed that the prospective composite corn varieties JPI-1, JPI-2, JPI-3, and JPI-4 had the potential for yields significantly superior to the three comparative varieties, with 8.88, 8.54, 8.57, and 8.67 $t \cdot ha^{-1}$, respectively. In the context of the analysis, JPI-1 and JPI-4 reported stable results in all environments. Meanwhile, JPI-3 showed increasingly better results in the optimum environment. Prospective varieties JPI-1, JPI-2 JPI-3, and JPI-4 offered the criteria for resistance to Downy mildew disease *Peronosclerospora maydis*, *Peronosclerospora philippinensis* type, *Bipolaris maydis* type blight, and leaf rust disease type *Puccinia polysora*. Based on the approximate test, JPI-1, JPI-3, and JPI-4 had superior protein content of 11.64, 11.69%–11.86% than the 3 comparative varieties, respectively. The prospective variety JPI-1 had a high amylopectin content of 85.10% equivalent to local sticky parents and higher than the two comparative varieties. Additionally, JPI-2, JPI-3, and JPI-4 had higher amylopectin content than the 2 comparative varieties.

Keywords: adaptation; corn composite; disease resistance; productivity; proximate

1. Introduction

Corn (*Zea mays* L.) is among the most essential carbohydrate-producing food crops besides wheat and rice [1]. This food crop is the second cereal commodity grown in Indonesia after rice. Corn is central as an alternative staple food, snacks, and various other commodities [2]. Moreover, corn is a main component in animal feed and other industries such as raw materials for producing bioethanol. This cereal crop has been developed as a functional food because of the dietary fiber [1].

Sticky corn has the potential as a source of food diversification and industrial materials. In Japan, corn is a source of amylopectin, a raw material for food products, textiles, glue, and paper. Sticky corn is a source of germplasm for developing new cultivars through plant breeding [3]. In addition, sweet corn can be consumed as a fresh or boiled vegetable due to the soft and delicious taste. Sticky corn contains starch from amylopectin, which reaches 100% [4]. The high level of amylopectin is suitable for the diet of diabetics and to increase the weight of livestock. Sticky corn is consumed as porridge and rarely used as a staple food due to poor production and vulnerability to downy mildew. However, the cereal has a low potential yield, producing small cobs with a 10–11 mm diameter, and production of less than 2 tons/ha [5].

In Sulawesi, Indonesia, sticky corn is a typical food ingredient and domestic demand continues to increase with insufficient supply. The national need for corn is growing with the increase in population and the development of the food and feed industry. Data for the 2018–2022 period show that the production has grown with the increase in harvested area, but there has been a particular decline in 2021. The effort to provide sticky corn as an alternative staple food requires the release of appropriate variety. This must express a high-yielding amylopectin content and adapt to environmental changes.

The proposed composite corn genotype is a line assembled and developed from a cross between high protein content and local sticky varieties containing amylopectin. The genotype assembly program is subjected to several breeding stages to obtain a combination of traits from the cross.

Several research types have analyzed and evaluated the sweet corn hybrid performance in targeted environments [6–9]. The corn traits are controlled by multiple genes and are inherited through quantitative genetic variation from combined action. The ability of parents can determine offspring with superior characteristics, such as the balanced proportion of kernel carbohydrates to meet consumer appeal [9].

To obtain the best corn quality, comprehensive testing is needed, including disease resistance.

Therefore, this research aims to test the stability of hybrid varieties with many parameters including production, nutrient levels, and disease resistance. Continuous identification, characterization, and evaluation are also required. An important stage in testing the genotype assembly is the multilocation test. Previous research in Indonesia has been conducted concerning the environmental conditions in Java [2, 10]. Tests in different environments are needed to represent the capabilities of different islands in Indonesia. In this context, composite sticky corn variety performance is evaluated in several locations.

2. Materials and Methods

This research evaluated the performance of the adaptation test of 4 prospective and 3 comparative varieties. The 4 prospective corn varieties consisted of JPI-1, JPI-2, JPI-3, and JPI-4, while the 3 comparative varieties are Sticky Uri (JPI-5), White Srikandi (JPI-6), and local Sticky Takalar (JPI-7). JPI-1, JPI-2, JPI-3, and JPI-4 originate from a cross between the White Srikandi and local Sticky Takalar as female and male parents, respectively. The crossover process was conducted from 2017 to 2022 through the 8th generation.

2.1. Testing Time and Location

The adaptation test was carried out during the 2023 planting season (PS) from March to September 2023 in 6 districts. A total of 4 districts were located in South Sulawesi (Gowa, Takalar, Bantaeng, and Maros) and 2 from other provinces (Lombok and Kediri in West Nusa Tenggara and East Java Province) (Table 1). Disease resistance tests were carried out in 2 districts, namely, Gowa (3 locations: location 1, leaf rust test; location 2, leaf blight test; and location 3, downy mildew test specific for the species *Peronosclerospora philippinensis*) and Malang (the specific downy mildew test for the *Peronosclerospora maydis* species) (Table 2).

Table 1: Description of adaptation test locations for prospective composite corn varieties in 6 districts.
Table 2: Description of disease resistance test locations for prospective composite corn varieties in 2 districts.

The plot area used for each experimental unit was 5 × 3 m with a planting space of 75 × 20 cm. The samples were collected from the two middle row, randomly taking as 10 plants per plot. The type and dose of fertilizer used was 300 and 400 kg/ha of urea and nitrogen, phosphorus, and potassium. Fertilization was carried out twice when the plants were 7 days old and 30 days after planting (DAP), administering 50% of the dose.

2.2. Adaptation Test Method

The research was carried out using a randomized block design consisting of 7 varieties, repeated 4 times to obtain 28 experimental units at each adaptation test location. Observation data were assessed using analysis of variance (ANOVA), and bi values were used to investigate the stability of results. Least significant difference (LSD) test was carried out at a 5% level when there was a difference in the average value of the varieties in the F test. The results were presented as paired comparatives between prospective and comparative varieties. Meanwhile, the data analysis was carried out using the DSAASTAT program. Analysis of the stability of the results used the additive average effect multiplicative interaction through PBSTAT program.

3. Results and Discussion

3.1. Adaptation Test

3.1.1. Overview Adaptation Test

Data collected from each location were analyzed for combined variance. ANOVA was used to determine the influence of environment, genotype, and interaction of genotype and environment. The results of the integrated variance analysis of yield and agronomic characteristics of 4 prospective composite corn and 3 comparative varieties are presented in Table 3. The combined variance analysis shows that location strongly affects the observed variables except for leaf width, male flowering age, cob appearance, and harvest water content. The effect of location showed that the environmental characteristics of the research sites were quite diverse.

Table 3: Middle square of agronomic characters, yield components, and yield of prospective JPI composite corn varieties at several locations.

The effect of genotype was significant on all observed variables except leaf length. Each prospective variety has a different genetic potential in expressing traits or characters (Supporting table (available here)). Another research reported that the lines tested differ significantly in all characters. Therefore, there are differences in genetic potential between the lines tested [11].

3.2. Average and Potential Results

The results of the average and potential yields in comparative and prospective varieties of JPI-1, JPI-2, JPI-3, and JPI-4 showed that the average yields of 8.16, 7.88, 7.74, and 7.62 t/ha were significantly superior to Sticky Uri-1, White Srikandi, and local Sticky at 6 test locations, respectively. Meanwhile, the respective comparative varieties amount to 6.48, 7.75, and 4.33 t/ha, as reported in Table 4.

Table 4: Average yield (t/ha) of JPI corn seed and comparative varieties at each test site in MT 2023.

The prospective variety JPI-1, especially Sticky Uri and Local, was significantly superior in all locations. In the Maros location, JPI-1 is superior to all comparative varieties. The prospective varieties JPI-2, JPI-3, and JPI-4 were significantly superior for all locations compared to Sticky Uri and Local varieties. Changes in the rank of a genotype at each test location indicate a genotype and environment interaction [12].

4. Results Stability Analysis

The combined ANOVA on seed yielding 4 prospective and 3 comparative varieties at 6 test locations showed a very significant genotype × location interaction (Table 5). This causes the seed yield of each prospective variety to be different in each testing environment. The results state that the interaction of genotype with the environment leads to inconsistent appearance of a trait under different environmental conditions. This causes differences in yield for various planting environments [13]. In addition, the interaction of genotype and environment is a component that influences phenotypic expression [14]. Stability and adaptability tests are needed to determine the level of genotype in each environment.

Table 5: Analysis of variance of the combination of environmental × outcome characters in 6 test locations (districts) in MT 2023.

The variation in crop yield characteristics (t/ha) was caused by location and genotype factors of 7.52 and 43.50, respectively. Based on this proportion, the genotype makes the most significant contribution to the diversity of the characteristics. Stability analysis is used to determine the effect of the interaction of genotype and environment effectively. Therefore, the level of stability and adaptability of the proposed variety can be determined. Previous research reported corn stability tests in West Java, Indonesia. The results showed that 2 varieties, namely, G5 (SR 24 × SR 17) and G11 (SR 31 × SR 17), had good levels of stability and adaptability in terms of earliness and yield [15].

The JPI-1 and JPI-4 genotypes with bi values are not significantly different from 1, and the average yield is higher than the general average. Therefore, the performance of prospective varieties is stable in optimum and suboptimal environments. For the prospective variety, JPI-3 shows that the bi value is significantly different from 1 (Table 6). This is because the genotype is adaptive to the optimum environment. Meanwhile, JPI-2 reports that the bi value is smaller and significantly different from 1 since the genotype produces increased yields.

Table 6: Average and stability of composite corn yields (KA 15%) based on the combined analysis of 6 test locations (districts) in MT 2023.

4.1. Agronomic Components and Yield Components

4.1.1. Plant Growth, Flowering Time, Harvest Time, Plant Height, and Cob Height

Table 7 shows plant growth capacity, male and female flowering age, harvest age, plant height, and cob location. Based on the statistical test, the percentage of prospective corn varieties growth was significantly higher from the comparative variety, except for the JPI-4 variety. The percentage was not significantly different from the comparative variety but increased above 85%. The flowering times for males and females of prospective varieties JPI-1, JPI-2, JPI-3, and JPI-4 were significantly faster than White Srikandi. Additionally, the harvest time was significantly faster than the comparative varieties Sticky Uri and White Srikandi. Genetic factors cause differences between one plant and another [16]. Corn plants have short, medium, and high maturity ranging from 75 to 90 DAP, 90–120 DAP, and more than 120 DAP, respectively [17]. The JPI-2 genotype showed plant height yields that were significantly superior to local Sticky. Meanwhile, JPI-4 reported plant height yields superior to White Srikandi and Local Takalar Sticky. For cob height, JPI-2 was 85.35 cm, while JPI-4 showed a position height superior to White Srikandi and Local Takalar Sticky. The correct position of the cob reduces the intensity of rat pest attacks. The intensity of root and stem lodging was reduced when the height of the cob was located more or less in the middle of the plant.

Table 7: Average plant growth, age, plant height, and position of test composite corn cobs and comparative varieties in 6 test locations (districts) in MT 2023.

The characteristics of plant height and cob location were closely related to the suitability of the planting environment. In this context, the environment with high altitudes and strong winds is suitable for shorter plants. Meanwhile, tall plants with suitable cobs are needed in areas susceptible to pest attacks, such as mice. Most plant breeders concentrate selection on shorter plants to withstand lodging caused by strong winds [18]. Selection is also carried out on the characteristics of plant and ear height. Several cases show a decrease and an increase in ear and plant height, respectively [19].

Table 8 shows stem diameter, angle, length, width of leaves, and percentage of leaf rust. The prospective varieties JPI-1, JPI-2, JPI-3, and JPI-4 have stem diameters of 2.38, 2.35, 2.36, and 2.32 cm, respectively. These varieties are superior to the Local Takalar Sticky with a diameter of only 2.22 cm. A large stem makes the plant stronger and reduces the intensity of lodging. The character of leaf angle, length, and width of leaves is used to develop a new variety.

Table 8: Average stem diameter, angle, length, and width of leaves, as well as percentage of stem and root fall of maize composite test and comparative varieties in six locations.

The leaf angles of the four prospective varieties JPI-1, JPI-2, JPI-3, and JPI-4 did not show significant differences with Sticky Uri, White Srikandi, and local Sticky. The leaf angles of the prospective and comparative varieties were all less than 30°, and the moderate type was between 21.1° and 50° [20]. The angle between small and medium had a straight or bent leaf pattern, which was included in the erect leaf category [21]. Erect-type plants with small to medium leaf angles could increase the number of planted populations.

The average leaf length character of the prospective variety JPI-1 showed superior results and significantly differed from the comparative varieties Sticky Uri, White Srikandi, and local Sticky. The leaf length of JPI-2 is superior and significantly different from local Sticky. The average leaf diameter character of the prospective variety JPI-1 showed superior results and significantly differed from Sticky Uri and local Sticky. In addition, the leaf diameter of JPI-2 is superior and significantly different from local Sticky.

The size of the leaves greatly influences the results of photosynthesis. The percentage of stem and root lodging for all prospective was lower and significantly different from comparative varieties.

4.2. Plant and Ear Appearance, Husk Closure, Leaf Rust, and Leaf Blight

The characteristics of the plant appearance, the closure of the husk, the appearance of the cob, and the attacks of the disease were qualitatively observed by scoring. The average assessment of plant appearance, husk closure, cob appearance, blight, and leaf rust attacks are presented in Table 9. Based on statistical analysis, the prospective varieties JPI-1, JPI-2, JPI-3, and JPI-4 showed good plant performance with average values respective scores of 1.77, 1.85, 1.83, and 1.82, significantly different from the 3 comparative varieties. The appearance of good scores shows that the plants have uniformity and sturdy stems when planted in 6 adaptation testing locations. More uniform plants can facilitate the application of mechanization in the management [22].

Table 9: Average plant and ear appearance, husk closure, leaf rust, and leaf blight at 6 test locations in MT 2022.

The prospective varieties had perfect husk closure with an average score of 2.06, 2.13, 2.13, and 2.11. The closure of the husks was significantly different from the comparative varieties Sticky Uri and White Srikandi. However, the local Sticky had a better husk closure score.

Properly and tightly husk closure can protect the cobs from weather effects, pest attacks, especially the powder beetle (*Sitophilus zeamais*), and cob rots infections. According to [23], tightly closing husks can reduce the intensity of water seeping into the cob to prevent seed germination and growth of pathogenic fungi as well as provide protection from *Sitophilus zeamais* pest.

The appearance of cobs is related to the uniformity of size, seed color, seed filling, and seed damage due to pests and diseases. The cob performances of JPI-1, JPI-2, and JPI-3 showed an average score of 1.30, 1.34, and 1.31, respectively. This is significantly different from the comparative varieties Sticky Uri and White Srikandi. However, the appearance of the cob of JPI-4 is only substantially different from the comparative variety Sticky Uri. The seed is filled to the tip of the cob, with a straight grain arrangement, and an attractive seed color preferred by consumers or farmers.

The scoring of leaf rust disease attacks for prospective varieties JPI-1, JPI-2, JPI-3, and JPI-4 showed a small average of 0.02. This is a significantly different value from the comparative variety, while leaf blight attacks report the smallest average score of 0.03. The value was also significantly different from the 3 comparative varieties. The score for blight and leaf rust infections is less than 1 for prospective varieties, indicating good disease resistance.

4.3. Number of Plants and Harvested Ears, Weight of Harvested Ears, and Length and Diameter of Ears

Table 10 presents the average number, the weight, the length, and the diameter of the ears. The statistical test showed significant differences between the prospective and the comparative varieties on the characteristics, number, weight, length, and diameter of harvested ears. The yield component is caused by the genetic potential of each prospective variety, differences in plant population, as well as number, weight, length, and diameter of the ears. The number of harvest pieces produced by a plant is related to the level of production. Under optimum conditions, more than 2 cob shoots can develop for some genotypes [24].

Table 10: Average number of plants and harvested ears, weight of harvested ears, and length and diameter of ears in six test locations (districts) in MT 2023.

All prospective varieties showed that the average weight, length, and diameter of the ears were superior to the comparative varieties Sticky Uri and local Sticky. Long cobs produce a higher number of seeds and assimilate, which affects the weight of the crop [25].

4.4. Seed Water Content, Number of Rows of Seed, Number of Seeds per Row, Seed Yield, and Weight of 1000 Seed KA 15%

The statistical tests on water content, number of seed rows, number of seeds per row, seed yield, and weight of 1000 KA 15% seed are presented in Table 11. The average water content in JPI-1 is significantly different from the comparative of all varieties. JPI-2, JPI-3, and JPI-4 reported lower water content and were significantly different from the comparative varieties Sticky Uri and local Sticky. The characteristics of the number of rows and seeds in the 4 prospective varieties were superior and significantly different from Sticky Uri and local Sticky. Moreover, the average weight of 1000 seed with a water content of 15% JPI-1 showed superior results. JPI-2 and JPI-3 also reported superiority and were substantially different from local Sticky, while JPI-4 was significantly different from all comparative varieties.

Table 11: Average water content, number of rows of seed, number of seeds per row, seed yield, and weight of 1000 KA 15% seed at 6 test locations in MT 2023.

4.5. Testing for Major Diseases

The observations on the intensity of downy mildew attacks (*P. philippinensis*) in Bajeng Gowa at 14, 21, 28, 35, and 42 DAP are presented in Table 12.

Table 12: Average percentage of downy mildew pathogen infections in Bajeng, Gowa 2023.

The prospective varieties tested did not show a susceptible reaction to downy mildew. However, the check plants of the Anoman variety were susceptible to downy mildew with a percentage of attacks at 42 days after reaching 92.2%, while the local Sticky was tolerant with an intensity of 39.6%. The comparative varieties Sticky Uri and White Srikandi reported a resistant reaction in Bajeng with an average percentage of 9.1% and 5.4% at 42 DAP.

The Anoman and Local Sticky varieties have become quite heavily infected with downy mildew pathogens since 21 DAP. Therefore, the level of resistance of prospective varieties to *P. philippinensis* in Bajeng is relatively good.

The test of prospective varieties against downy mildew (*P. maydis*) carried out in Malang is presented in Table 13. The 4 prospective composite varieties showed a resistant reaction to *P. maydis*, with an average percentage of attacks at 42 DAP, ranging between 9.61% and 10.42%. All comparative varieties, apart from the check plants (susceptible plants) of the Anoman variety, showed a resistant reaction to *P. maydis*. The reaction was susceptible since the average percentage of infection with downy mildew pathogen in check plants was 83.75%. The Anoman variety was infected with the heavy downy mildew pathogen since 21 DAP.

Table 13: Average percentage of downy mildew pathogen infections in Malang in 2023.

The observations of leaf blight infection in all test genotypes showed that the prospective varieties reacted with an average percentage of attacks at 75 DAP ranging from 18.0% to 20.8%. The resistant comparative varieties showed a reaction to leaf blight. However, the check plants of the Anoman variety reacted with an average attack percentage of 68.5% (Table 14).

Table 14: Average percentage of maydis leaf blight infection in test lines and comparative varieties at 45, 60, and 75 DAP Bajeng, Gowa, 2023.

Maydis leaf blight is a late-season disease where the most severe development occurs postanthesis [26]. Therefore, the intensity of attacks was carried out during the period. According to [27], leaf blight can occur in corn plants with different intensities and the main factors influencing the disease are climate, planting conditions, and level of resistance.

The observations on the intensity of rust infection in Bajeng are shown in Table 15. The comparative varieties showed a resistant reaction except Anoman variety, which acted very susceptible with a value of 68.2%.

Table 15: Average percentage of attacks with maydis leaf rust in test lines and comparative varieties at 60 and 75 DAP in Bajeng, Gowa 2023.

4.6. Nutritional Content

Based on the laboratory analysis results, all prospective varieties show a high carbohydrate content range from 72.56 to 75.74 (Table 16). The result is consistent with the previous study. As a main nutritional content of corn, carbohydrate contents ranged from 72% to 73% and are concentrated in the endosperm [28]. The composition of starch in seed is genetically controlled, and the component influences the functional properties of corn. The physical, chemical, and available properties can guide in selecting appropriate varieties for the desired product. In this context, prospective varieties with high carbohydrate content are suitable for use as food and raw materials for bioethanol production.

Table 16: Results of analysis of carbohydrate, fat, protein, and amylopectin content in corn seed of prospective varieties and comparative varieties in MT 2023.

Corn contains other macronutrients such as fat and protein, which are genetically controlled [29]. The prospective varieties and comparatives have relatively high fat content. Generally, corn contains 3.5% and 8%–11% fat and protein in the kernel, respectively [27, 30]. The test results showed that prospective varieties had a higher protein content than comparative varieties except for White Srikandi.

The amylopectin content in all prospective varieties is relatively high (> 80%) compared to Sticky Uri and White Srikandi. However, the content in the local Sticky is equivalent to all prospective varieties, especially JPI-1. High amylopectin is a determinant of the level of fluffier taste. The increased content in the corn kernels favors the use as an alternative staple food. Therefore, the high amylopectin character of local Sticky Takalar parents has been inherited in the 4 genotypes of prospective varieties through the development of the Dreher method. In this context, corn with special characteristics can be formed through repeated and programmed plant breeding programs [31, 32]. For sticky corn, there is a recessive wx gene in a homozygous state (wxwx) affecting the chemical composition of starch to cause a delicious and savory taste. The backcross breeding method can be applied to introduce donor genes from special corn with high amylopectin content to obtain special characteristics.

5. Conclusion

In conclusion, prospective composite corn varieties JPI-1 as well as JPI-2, JPI-3, and JPI-4 had the potential for higher productivity at 8.88, 8.54, 8.57, and 8.67 t/ha, respectively. JPI-1 and JPI-2 had higher average yields of 8.16 and 7.88 t/ha. Meanwhile, JPI-1, JPI-2, JPI-3, and JPI-4 showed the criteria for resistance to downy mildew, *P. maydis*, *P. philippinensis*, Type H blight *maydis*, and *P. polysora* leaf rust disease. JPI-1 composite corn variety reported a higher protein content of 11.64% and was stable in different environmental conditions with increased average yield in the genotype category. Similarly, JPI-2 had high productivity due to improved environmental conditions. JPI-1 and JPI-2 possessed a relatively high amylopectin content of 85.10% and 82.80% after meeting the eligibility requirements to be released as new superior varieties based on productivity and amylopectin content.

Data Availability Statement

The data used to support the findings of this study are included within the supporting information file(s).

Conflicts of Interest

The authors declare no conflicts of interest.

Funding

This study was funded by the Directorate of Research and Community Service (DRCS), Ministry of Education, Culture, Research and Technology, Republic of Indonesia, through the Research Scheme of Superior University (Contract number 1813.f/B.07/UMI/V/2023).

Acknowledgments

The authors gratefully acknowledge the financial support provided by the Directorate of Research and Community Service (DRCS), Ministry of Education, Culture, Research and Technology, Republic of Indonesia, through the Research Scheme of Superior University, Contract number 1813.f/B.07/UMI/V/2023. The authors want to thank the Rector and Head of the Research and Development Institute of LP2S and the Dean of the Faculty of Agriculture, University of Muslim Indonesia, and the students for their assistance.

Supporting Information

Additional supporting information can be found online in the Supporting Information section. (*Supporting Information*)

See Table S1–S164 in the Supporting Information for a comprehensive data analysis.

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TABLE 1: Description of adaptation test locations for prospective composite corn varieties in six districts.

No.	Location	Soil type	Altitude (a.s.l)	Climate type	Planting date	Harvest date
1.	Bajeng Gowa, South Sulawesi	Alluvial, land paddy field	89	D	06 May 2023	20 August 2023
2.	Sinoa, Bantaeng, South Sulawesi	Latosol, land dry	500	B	17 May 2023	10 September 2023
3.	Lembar Lombok Barat, NTB	Alluvial, Land dry	14	D3	21 May 2023	05 September 2023
4.	Kepung, Kediri, East Java	Alluvial, Land dry	67	C2	22 May 2023	07 September 2023
5	Galesong, Takalar, South Sulawesi	Alluvial, Land paddy field	20	C2	24 May 2023	09 September 2023
6.	Lau, Maros, South Sulawesi	Alluvial, Land Paddy field	25	C2	21 June 2023	06 October 2023

33. TABLE 2: Description of disease resistance test locations for prospective composite corn varieties in 2 districts.

No.	Location	Soil type	Altitude (mdpl)	Climate type	Planting date	Harvest date	Information
1	Bajeng, Gowa, South Sulawesi	Alluvial, Land dry	89	D	11 June 2023	26 August 2023	Leaf rust
					17 June 2023	02 Sept 2023	Hover down
					24 June 2023	10 August 2023	Bubbles *(P. philippinensis*)
2	Gondang legi, Malang, East Java	Inceptisol, Land paddy field	400.1	C2	12 June 2023	31 July 2023	Bubbles (*P. maydis*)

TABLE 3: Middle square of agronomic characters, yield components, and yield of prospective JPI composite

corn varieties at several locations.

Variable	Location (L)	Genotype	L × G
Plant Growth (%)	222.52 **	76.72**	8.70
Plant Height (cm)	10549.10**	2218.36**	381.10*
Cob Height (cm)	2257.33 **	547.79 **	148.34 *
Stem Fall (%)	0.00 **	0.00 **	0.00
Root Reduction (%)	0.00 **	0.00 **	0.00 **
Number of leaves	0.15 7 **	0.08 **	0.01
Leaf angle (º)	23.98 **	5.80 **	0.67
Leaf length (cm)	15.12 **	1.41	1.67 *
Leaf width (cm)	10.01	24.05 *	7.29
Age of male flowering (DAP)	0.31	0.53 *	0.20
Female flowering age (DAT)	163.09 **	95.97 **	3.22
Harvest age (DAP)	173.52 **	104.23 **	3.31 **
Plant Appearance Aspects (score)	149.72 **	780.59 **	6.33 **
Closing husk (score)	2.87 **	0.22 **	0.02
Cob Performance (score)	0.19	2.50 **	0.02
Blight Score (score)	0.71**	0.17**	0.04
Rust Disease Score (score)	0.00 **	0.00 **	0.00
Number of harvested plants	0.00 *	0.00 **	0.00
Number of harvested cobs (cobs)	64.71**	7.57**	0.81
Harvest cob weight (kg)	42.28 **	7.61**	1.20
Seed yield (%)	8.09 **	40.93 **	0.48 **
Harvest Water Content (%)	2.94	44.66 **	1.60
Cob length (cm)	12.26 **	21.98 **	1.55
Cob diameter (cm)	49.94 **	65.23 **	0.67 *
Number of Seed rows (rows)	5.39 7 **	2.49 **	0.07 **
Number of seeds per row (Seeds)	6.76 **	54.88 **	1.44 **
Weight of 1000 seeds (g)	277.67 **	310.58 **	0.93
seed yield (f/ha)	7.52	43.51 **	0.40 *

** = significant effect at the F test level of 1%; * = significant effect at the F test level of 5%

TABLE 4: Average yield (t/ha) of JPI corn seeds and comparative varieties at each test site in MT 2023.

Genotype	Yield at 15% moisture content (t/ha)						
	Gowa	Takalar	Bantaeng	Maros	Lombok	Kediri	Average
JPI-1	8.11 ac	7.70 ac	7.36 ac	8.45 abc	8.88 ac	8.48 ac	8.16 abc
JPI-2	7.19 ac	7.87 ac	7.20 ac	8.11 ac	8.54 ac	7.63 c	7.88 ac
JPI-3	7.95 ac	7.54 ac	6.56 ac	7.69 ac	8.57 ac	8.14 ac	7.74 ac
JPI-4	7.71 ac	7.47 c	6.71 ac	7.61 ac	8.67 ac	7.56 c	7.62 ac
Sticky Uri (a)	5.61	6.85	5.53	6.02	7.73	7.12	6.48

White Srikandi (b)	7.82	7.74	6.97	7.88	8.36	7.76	7.75
Local Sticky Takalar (c)	4.38	3.92	3.97	4.41	4.77	4.55	4.33
Average	7.07	7.01	6.33	7.17	7.93	7.32	7.14
SE	0.17	0.21	0.26	0.16	0.27	0.30	0.13
LSD 5%	0.49	0.63	0.78	0.46	0.80	0.89	0.37
KK	4.7	6.1	8.3	4.3	6.7	8.2	6.6

a= significantly superior to Sticky *Uri*-1, b=significantly superior to White *Srikandi*, c=significantly superior to Sticky Local in the LSD 5% test.

TABLE 5: Analysis of variance of the combination of environmental × outcome characters in 6 test locations (districts) in MT 2023.

Source of diversity	DF	SQ	MQ	F Hit	Prob F	Sig
Location (L)	5	37.58	7.52	27.06	0.00	**
L/R	18	5.00	0.28	1.27	0.22	
Genotype (G)	6	261.04	43.51	108.15	0.00	**
L × G	30	12.07	0.40	1.84	0.01	*
SD	108	23.61	0.22			
Total	167	339.31	2.03			

** = very real based on an F test of 1%. * = significantly different based on the 5% F test; DF= degrees of freedom; SQ= sum of squares; MQ= middle square.

TABLE 6: Average and stability of composite corn yields (KA 15%) based on the combined analysis of six test locations (districts) in MT 2023.

Genotype	Yield (t/ha) min	max	mean	Slope	SE	MQ MS-TXL	MQ MS-REG	MQ MS-DEV	R**2(%)
JPI-1	7.36	8.88	8.16	1.01	0.20	0.04	0.00	0.05	0
JPI-2	7.20	8.54	7.88	0.77*	0.20	0.06	0.07	0.05	25
JPI-3	6.56	8.57	7.74	1.26*	0.19	0.06	0.09	0.05	34
JPI-4	6.71	8.67	7.62	1.17	0.14	0.03	0.04	0.03	25
Sticky Uri (a)	5.53	7.73	6.48	1.40	0.50	0.31	0.21	0.34	14
White Srikandi (b)	6.97	8.36	7.75	0.83	0.11	0.02	0.04	0.02	35
Local Sticky Takalar (c)	3.92	4.77	4.33	0.55	0.17	0.08	0.27	0.04	64
Average					7.36				

Bi = regression slope of the average variety in the environmental index, * = Bi value is significantly different from 1; SE = standard error, MQ-HXL = Contribution of each genotype to the mean square of the interaction, MQ-Reg = Contribution of each genotype to the regression component in the interaction between genotype x location interaction; MQ-Dev = Middle square deviation (deviation of the interaction regression components), R

** 2 (%) = squared correlation between the residuals of the main effects of the model and the environmental index.

TABLE 7: Average plant growth, age, plant height and position of test composite corn cobs and comparative varieties in 6 test locations (districts) in MT 2023.

Genotype	Growth	Flowering (DAP)		Harvesting (DAP)	Height (cm)	Ear Height (cm)
		Female	Male			
JPI-1	91.83^{ab}	56.87^{b}	55.16^{b}	102.21^{ab}	186.42	89.35
JPI-2	91.63^{ab}	57.20^{b}	55.45^{b}	102.79^{ab}	175.59^{c}	85.35^{c}
JPI-3	92.33^{ab}	57.20^{b}	55.50^{b}	103.50^{ab}	187.27	92.23
JPI-4	88.67	57.12^{b}	55.25^{b}	106.39^{ab}	166.70^{bc}	80.20^{bc}
Sticky Uri (a)	88.32	56.87	54.69	110.15	171.42	83.75
White Srikandi (b)	89.15	59.12	57.52	110.49	186.86	91.16
Local Sticky (c)	92.21	52.29	50.87	93.17	192.23	92.65
Means	90.59	56.67	54.92	104.18	180.93	87.81
SE	0.60	0.37	0.36	0.51	3.98	2.46
LSD 5%	1.73	1.07	1.05	1.48	11.50	7.18
CD (%)	4.10	2.20	2.90	0.90	8.60	10.20

a = significantly superior to Sticky Uri, b = significantly superior to White Srikandi, c = significantly superior to Sticky Local Takalar in the 5% LSD test, CD = Diversity coefficient.

TABLE 8: Mean stem diameter, angle, length, and width of leaves, as well as percentage of stem and root fall of maize composite test and comparative varieties in six locations.

Genotype	Stem diameter	Leave angle	Leave length	Leave wide	Stem rot	Root rot
JPI-1	2.38ac	26.89	96.42abc	9.44ac	0.017abc	0.02abc
JPI-2	2.35ac	26.59	95.00c	9.29c	0.020abc	0.01abc
JPI-3	2.36ac	26.55	94.72	9.40c	0.020abc	0.02abc
JPI-4	2.32c	26.82	94.14	9.20	0.020abc	0.02abc
Sticky Uri (a)	2.30	27.00	94.50	9.16	0.04	0.03
White Srikandi (b)	2.39	26.90	94.12	9.34	0.04	0.03
Local Sticky (c)	2.22	26.32	93.17	9.02	0.06	0.06
Average	2.30	26.72	94.13	9.18	0.04	0.04

SE	0.02	0.26	0.55	0.09	0.00	0.00
LSD 5%	0.05	0.76	1.59	0.27	0.01	0.01
CV	5.70	3.60	2.70	4.50	34.80	24.30

a= significantly superior to Sticky Uri, b= significantly superior to White Srikandi, c=significantly superior to Sticky Local in the 5% LSD test, CV= Coefficient of variation.

TABLE 9: Average plant and ear appearance, husk closure, leaf rust, and leaf blight at 6 test locations in MT 2022.

Genotype	Plant performance	Husk closure	Ear appearance	Leaf rust	Leaf blight
JPI-1	1.77abc	2.06ab	1.30ab	0.02aabc	0.03abc
JPI-2	1.85ac	2.13ab	1.34ab	0.02abc	0.03abc
JPI-3	1.83ac	2.13ab	1.31ab	0.02abc	0.03abc
JPI-4	1.82ac	2.11ab	1.37a	0.02abc	0.03abc
Sticky Uri (a)	1.97	2.26	1.53	0.05	0.05
White Srikandi (b)	1.91	2.28	1.48	0.04	0.05
Local sticky Takalar (c)	2.05	1.33	1.43	0.06	0.07
Average	1.98	1.96	1.48	0.05	0.06
SE	0.03	0.03	0.04	0.00	0.00
LSD 5%	0.09	0.09	0.12	0.01	0.01
CV	7.90	6.80	13.90	7.00	9.80

Note: score value 1 is the best and 5 is the worst, a= significantly superior to Sticky Uri, b= significantly superior to White Srikandi, c=significantly superior to local Sticky in the 5% LSD test, CV = Diversity coefficient.

TABLE 10: Average number of plants and harvested ears, weight of harvested ears, length and diameter of ears in six test locations (districts) in MT 2023.

Genotype	Number of harvested plants	Number of harvested ears	Weight of harvested ears (kg)	Length of harvested ears (cm)	Diameter of ears (cm)
JPI-1	47.66ac	48.62ac	8.57ac	18.21ac	4.41ac
JPI-2	47.41ac	48.16c	8.41ac	17.69ac	4.33ac
JPI-3	47.83ac	48.541ac	8.29ac	17.83ac	4.4ac
JPI-4	47.25ac	48.50ac	8.18ac	18.31ac	4.23ac
Sticky Uri (a)	46.54	47.54	7.07	15.33	4.00
White Srikandi (b)	47.54	48.17	8.41	17.97	4.47
Sticky local Takalar (c)	46.38	47.13	4.97	14.13	3.57
Average	46.82	47.61	6.82	15.81	4.01
SE	0.18	0.22	0.14	0.17	0.05
LSD 5%	0.53	0.65	0.41	0.48	0.15
CD	1.70	1.90	6.10	3.60	4.00

Note: a= significantly superior to Sticky Uri, b= significantly superior to White Srikandi, c=significantly superior to local Sticky in the 5% LSD test, CD= Coefficient of Diversity.

TABLE 11: Average water content, number of rows of seeds, number of seeds per row, seed yield, and weight of 1000 KA 15% seeds at 6 test locations in MT 2023.

Genotype	Seed water content (%)	Number of seed rows	Number of seed per row	Seed yield (%)	Weight 1000 seeds KA 15% (g)
JPI-1	23.33abc	14.86ac	32.91ac	79.13abc	287.14ac
JPI-2	23.52bc	14.27ac	33.16ac	78.04ac	281.76c
JPI-3	23.80bc	15.09ac	32.77ac	78.00ac	283.78c
JPI-4	22.95abc	14.70ac	31.08ac	77.14c	289.72abc
Sticky Uri (a)	24.15	13.47	28.04	71.02	279.29
White Srikandi (b)	24.95	14.81	33.08	78.28	282.47
Local Sticky Takalar (c)	25.67	10.80	23.67	74.86	274.95
Average	24.92	13.02	28.26	76.72	278.90
SE	0.25	0.25	0.20	0.26	1.80
LSD 5%	0.73	0.71	0.57	0.75	5.19
KK	6.30	5.50	7.40	2.00	4.20

Note: a= significantly superior to Sticky Uri, b= significantly superior to White Srikandi, c=significantly superior to local Sticky in the 5% LSD test, CV = coefficient of diversity.

Table 12: Average percentage of downy mildew pathogen infections in Bajeng, Gowa 2023.

Genotype	Average percentage of downy mildew infections (%)					Reaction
	14 DAP	21 DAP	28 DAP	35 DAP	42 DAP	
JPI-1	0.0	3.5	5.3	5.8	5.8	R
JPI-2	0.0	4.6	7.1	8.2	8.2	R
JPI-3	0.6	6.2	11.2	11.7	11.7	R
JPI-4	4.1	12.5	27.7	27.7	27.7	AT
Sticky Uri	0.0	4.1	8.5	9.1	9.1	R
White Srikandi	0.0	3.5	5.4	5.4	5.4	R
Local Sticky	0.0	7.2	30.5	37.3	41.6	S
Anoman	7.5	64.2	80.9	98.4	92.2	VS

Information: R = resistant; M = Moderate; V = Vulnerable; VV = very vulnerable

TABLE 13: Average percentage of downy mildew pathogen infections in Malang in 2023.

Genotype	Average percentage of infections (%)					Response
	14 DAP	21 DAP	28 DAP	35 DAP	42 DAP	
JPI-1	0.00	0.00	9.21	9.61	9.61	R
JPI-2	0.00	0.00	10.21	10.42	10.42	R
JPI-3	3.00	6.50	8.37	9.75	9.75	R
JPI-4	4.00	7.67	8.67	18.00	18.00	R
Sticky Uri	0.33	4.13	9.21	10.60	10.60	R
White Srikandi	2.25	6.27	8.37	9.18	9.18	R
Local Sticky	1.00	8.00	10.06	25.42	25.42	M
Anoman	20.62	52.28	71.91	79.57	83.75	VS

Note: R = Resistant; M = Moderate; S = Susceptible; VS = Very Susceptible

TABLE 14: Average percentage of Maydis leaf blight infection in test lines and comparative varieties at 45, 60 and 75 DAP Bajeng, Gowa, 2023.

Genotype	Average percentage of infections (%)			Response
	45 DAP	60 DAP	75 DAP	
JPI-1	1.50	15.60	18.80	R
JPI-2	5.70	18.20	19.60	R
JPI-3	12.70	17.30	18.00	R
JPI-4	12.3	18.40	18.80	R
Sticky Uri	0.00	16.00	20.00	R
White Srikandi	5.30	17.30	19.20	R
Local Sticky	4.70	15.00	20.30	R
Anoman	1.30	39.30	68.50	VS

Note: R = Resistant; M = Moderate; S = Susceptible; VS = Very Susceptible

Table 15: Average percentage of attacks with maydis leaf rust in test lines and comparative varieties at 60 and 75 DAP in Bajeng, Gowa 2023.

Genotype	Average percentage of infections (%)		Response
	60 DAP	75 DAP	
JPI-1	15.5	20.1	R
JPI-2	16.9	19.7	R
JPI-3	18.3	20.0	R
JPI-4	14.3	18.0	R
Sticky Uri	16.8	20.3	R
White Srikandi	14.3	18.0	R
Local Sticky	14.5	20.4	R
Anoman	22.5	68.2	VS

Note: R = Resistant; M = Moderate; S = Susceptible; VS = Very Susceptible

TABLE 16: Results of analysis of carbohydrate, fat, protein, and amylopectin content in corn seeds of prospective varieties and comparative varieties in MT 2023.

Genotype	Protein (%)	Fat (%)	Carbohydrate (%)	Amylopectin (%)
JPI-1	11.64	4.85	75.74	85.10
JPI-2	11.54	5.72	74.51	82.80
JPI-3	11.69	6.63	74.49	82.45
JPI-4	11.86	5.76	73.46	80.90
Sticky Uri (a)	10.97	5.55	72.65	55.95
White Srikandi (b)	11.63	4.76	73.04	38.80
Local Sticky (c)	10.24	5.08	72.56	85.40

Note: statistical analysis was not

16. Bukti konfirmasi bahwa artikel sudah lengkap dan siap untuk di publish online (11 Desember 2024)

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17. Bukti artikel published pertama online
(27 Desember 2024)

International Journal of **Agronomy**

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Multilocation Test of Prospective Composite Sticky Corn Varieties With High Production in Indonesia

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First published: 27 December 2024 | https://doi.org/10.1155/ioa/5511045

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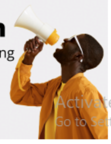

Abstract

Sticky corn is required to meet the demand for a national staple food, driven by population growth. In this context, different efforts are carried out to increase productivity by using new superior varieties with easy adaptation to specific and wider