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Test the Effect of Age and the Number of Seeds on the Growth and Production of Rice (*Oriza sativa* L.)

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Abstract
This study aims to determine the age of transfer and the number of seeds and their interactions on the growth and yield of rice plants.
This research was carried out in Pepara Village Grogot, Tanah Grogot, Paser Regency, from September 27 to January 24, 2019.
This study used a Randomized Block Design (RAK) using two factors, namely various transfer ages consisting of three levels, namely transfer age 7 days (w1) , the age of 14 days (w2) and 21 days (w3) as the first factor, and the number of seedlings consisted of three levels, namely 1 seed (j1), 2 seedlings (j2) and 3 seedlings (j3) as the second factor.
The results of the treatment of transplanting age (W) did not significantly affect all parameters, while the number of seeds (J) treatment had a very significant effect on the observation of the number of rice tillers at the age of 2, 4 weeks after planting and the weight of 1000 grains of grain.
The interaction of the treatment of transfer age and number of seeds did not significantly affect all parameters observed from plant height to the end of the observation of the weight of 1000 grains of grain.
Keywords*: Number, Age, Rice*

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I. Introduction

Rice is one of the food ingredients that contain nutrients and boosters that are sufficient for the human body, because it contains ingredients that are easily converted into energy. The nutritional value required by every adult is 1821 calories (Ina Hasanah, 2007).

One of the most important factors that determine the high low production of rice is the quality of good seeds and the appropriate age of seedlings. The use of young seedlings is very risky because it is still weak and rooting is not yet strong but has the potential for saplings and high plant growth, while the age of much older seedlings will decrease production (Anonymous in Muhammad Amin, 2015).

The number of seedlings per planting hole is less able to increase the absorption of nutrients, sunlight and air more optimally, thus increasing the growth of the formation of the number of saplings, roots and other growth more optimally and increasing the number of saplings in one planting hole that can obtain nutrients, growing space and sunlight (Sauki A; Nugroho A. and Soelistiyono R. 2014)

A. Research Objectives

Know the influence of the age of seed transfer on the growth and yield of rice plants. Know the influence of the number of seedlings on the growth and yield of rice crops. Know the influence of the interaction between the age of transfer and the number of seedlings on the growth and yield of rice plants.

B. Hypothesis

1. The age of moving planting seeds affects the growth and yield of rice plants.
2. The number of seeds per planting hole affects the growth and yield of rice crops.
3. There is an interaction between the age of seedlings moving planting and the number of seeds per planting hole to the growth and yield of rice crops.

II. Research Methods

This research was carried out for 4 months from seeding to harvesting, starting from 27 September 2018 to 24 January 2019, the research location was located in Pepara Village, district Tanah Grogot, Paser Regency.
The materials needed in this study were soil, Mikongga variety seeds, urea fertilizer, KCl, SP-36, goat manure, BASSA insecticide, bird nets.

The tools needed in this research are wooden stakes, treatment plan, sprayer, hoe, machete, meter, bucket, stationery, meter, scale, colculator, documentation using cellphone camera and mount tester.

A. Experimental Design

The design used in this experiment was a randomized block design (RAK) which was composed of two factorials consisting of:

The first factor was the use of seedling age (W), which consisted of three levels, namely:

w1 = 7 days after seeding

w2 = 14 days after seeding

w3 = 21 days after seeding

The second factor is the use of the number of seeds (J), which consists of three levels including

j1 = 1 seeds

j2 = 2 seeds

j3 = 3 seeds

B. Research Procedure

1. Land Preparation

Before placing the media the land must be cleaned, then the soil is hoeed at the top to get topsoil soil and loosened by mixing goat manure with a ratio of 50% soil and 50% manure (3 kg of topsoil soil and 3 kg of goat manure), capacity of 10 kg per bucket (26.5 cm in diameter with a height of 23.5 cm), mixed with 2 liters of water into a bucket and then stirred until the soil and fertilizer are well mixed into muddy

2. Planting

Planting begins with removing the seeds in the nursery with the age of seeds 7 days, 14 days and 21 days and the number of seeds including 1 seed, 2 seedlings, and 3 seeds per planting hole but the age of transfer and the number of seeds are adjusted according to the treatment.

3. Maintenance

Maintenance is carried out at the time of planting until the harvest period, namely: replanting, weeding, fertilizing, irrigation, pest control.

C. Data Collection

The data observed were: plant height (cm), total tillers (clumps), panicle length (cm), number of panicle filled grain (seeds), number of empty panicles (seeds), number of panicle grain (seeds), weight of wet unhulled grain (grams), weight of milled dry grain (grams), weight per 1000 grain of grain (grams)

D. Data Analysis

To find out the effect of the age of transfer and the number of seeds on the growth of rice plants, the data obtained were analyzed using variance if the calculated F is greater than the F table (0.05 and 0.01) then a further test must be carried out using BNT level 0, 05.

III. Results And Discussion

Results

Plant Height

Average Paddy Plant Height Growth at 2 MST

Based on the results of the calculation of the results of the variance of the influence of the age of transfer (W) and the number of seeds (J) of rice as well as the interaction between the age of transfer and the number of seeds (WxJ) had no significant effect on the calculation of the average plant height at 2 weeks after planting, but the trend showed that the w2j2 treatment was higher (32.17), while the treatment w2j1 showed lower (28.22)

1. **Average Paddy Plant Height Growth at 4 WAP**

Based on the results of the calculation of the results of the variance of the influence of the age of transfer (W) and the number of seeds (J) of rice as well as the interaction between the age of transfer and the number of seeds (WxJ) had no significant effect on the calculation of the average plant height at 4 weeks after planting, but the trend showed that the w2j2 treatment was higher (44.25), while the treatment w1j1 showed lower (41.88).

3. **Average Paddy Plant Height Growth at the Age of 6 WAP**

Based on the results of the calculation of the results of the variance of the influence of the age of transfer (W) and the number of seeds (J) of rice as well as the interaction between the age of transfer and the number of seeds (WxJ) had no significant effect on the calculation of the average plant height at 4 weeks after planting, but the trend showed that the w2j3 treatment was higher (55.98), while the treatment w1j2 showed lower (50.98).

A. **Number of tillers**

1. Average Number of Tillers of Total Rice Plants at 2 WAP

Based on the variance, it showed that the number of seeds (J) had a very significant effect, while the age of transfer (W) and the interaction of the two factors (WxJ) showed no significant effect on the average number of tillers of the total rice plant, but the treatment of the number of seeds (J) had a very significant effect on the average number of total tillers.

Table 2. The Effect of Transfer Age and Number of Seeds on the Average Number of Total Tillers (clumps) of Rice Plants 2 WAP

Age of Transfer (W)	Number of Seeds (J)			Average
	j1 (1 Seeds)	j2 (2 Seeds)	j3 (3 Seeds)	
w1(7 days)	1,58	3,58	2,33	2,50
w2(14 days)	1,67	3,25	2,67	2,53
w3(21 days)	1,42	3,08	0,75	1,75
Average	1,56[b]	3,31[a]	1,92[ab]	

The average number followed by the same letter shows no significant difference in the BNT Test of 0.05 (1.67)

Based on the 0.05 BNT test on the number of seedlings (J) treatment, it showed that the treatment of the number of seedlings (j2) was significantly different from the number of seedlings (j1) but not significantly different from the number of seedlings (j3). Treatment of the number of seedlings (j2) resulted in the highest average number of tillers with a value of 3.31 and the lowest number of seedlings (j1) with a total of 1.56.

2. Average Number of Tillers of Total Rice Plants at Age 4 WAP

Based on the variance, it showed that the number of seeds (J) had a very significant effect, while the age of transfer (W) and the interaction of the two factors (WxJ) showed no significant effect on the average number of total tillers of rice plants, but the treatment of the number of seeds (J) had a very significant effect on the average total number of tillers.

Table 3. Effect of Transfer Age and Number of Seeds on the Average Number of Total Tillers (clumps) of Rice Plants 2 WAP

Age of Transfer (W)	Number of Seeds (J)			Average
	j1 (1 Seeds)	j2 (2 Seeds)	j3 (3 Seeds)	
w1 (7 days)	11,25	12,17	13,17	12,19
w2 (14 days)	7,58	18,08	13,83	13,17
w3 (21 days)	10,25	12,75	11,50	11,50
Average	9,69[b]	14,33[a]	12,83[ab]	

The average number followed by the same letter shows no significant difference in the BNT Test 0.05 (4.49)

Based on the 0.05 BNT test on the number of seedlings (J) treatment, it showed that the treatment of the number of seedlings (j2) was significantly different from the number of seedlings (j1) but not significantly different from the number of seedlings (j3). Treatment of the number of seedlings (j2) resulted in the highest average number of tillers with a value of 14.33 and the lowest number of seedlings (j1) with a total of 9.69.

3. Average Number of Tillers of Total Rice Plants at the Age of 6 WAP

Based on the results of the calculation of the results of the variance of the influence of the transfer age (W) and the number of seeds (J) of rice as well as the interaction between the age of transfer and the number of seedlings (WxJ) the effect was not significant on the calculation of the average number of tillers of the total age of 6 weeks after planting, but the tendency showed that the w2j2 treatment was higher (30.08), while the w3j1 treatment was lower (23.83).

B. **Average Number of Branches perumpun (panicle)**

Based on the results of the calculation of the results of the variance of the influence of the transfer age (W) and the number of seeds (J) of rice as well as the interaction between the age of transfer and the number of seedlings (WxJ) the effect was not significant on the calculation of the average number of tillers of the total age

of 6 weeks after planting, but the tendency showed that the w2j2 treatment was higher (39.83), while the w2j1 treatment was lower (35.33).

C. Average Panicle Length (cm)

Based on the results of the calculation of the results of the variance of the influence of the age of transfer (W) and the number of seeds (J) of rice as well as the interaction between age

Transfer and number of seedlings (WxJ) had no significant effect on the calculation of the average number of total tillers aged 6 weeks after planting, but the trend showed that the w2j2 treatment was higher (27.41), while the w2j3 treatment was lower (25.80).

D. Average Number of Grain Filled Permalai (seeds)

Based on the results of the calculation of the results of the variance of the influence of the transfer age (W) and the number of seeds (J) of rice as well as the interaction between the age of transfer and the number of seedlings (WxJ) the effect was not significant on the calculation of the average number of tillers of the total age of 6 weeks after planting, but the tendency showed that treatment w1j2 was higher (106.00), while treatment w3j2 showed lower (92.01).

E. Average Number of Void Grain Permalai

Based on the results of the calculation of the results of the variance of the influence of the transfer age (W) and the number of seeds (J) of rice as well as the interaction between the age of transfer and the number of seedlings (WxJ) the effect was not significant on the calculation of the average number of tillers of the total age of 6 weeks after planting, but the tendency shows that treatment w1j3 is higher (19.00), while treatment w1j2 is lower (12.77).

F. Average Weight of Cluster Wet Grain (grams)

Based on the results of the calculation of the results of the variance of the influence of the transfer age (W) and the number of seeds (J) of rice as well as the interaction between the age of transfer and the number of seeds (WxJ) the effect was not significant on the calculation of the average number of tillers of the total age of 6 weeks after planting, but the tendency showed that treatment w1j2 was higher (112.58), while treatment w3j2 was lower (94.42).

G. Average Weight of Perumpun Dry Milled Grain (grams)

Based on the results of the calculation of the results of the variance of the influence of the transfer age (W) and the number of seeds (J) of rice as well as the interaction between the age of transfer and the number of seedlings (WxJ) the effect was not significant on the calculation of the average number of tillers of the total age of 6 weeks after planting, but the tendency showed that treatment w1j2 was higher (107.67), while treatment w3j3 showed lower (86.75).

H. Average Weight Per 1000 Grain Seeds (grams)

Based on the variance, it showed that the number of seeds (J) had a very significant effect, while the age of transfer (W) and the interaction of the two factors (WxJ) showed no significant effect on the average number of total tillers of rice plants, but the treatment of the number of seeds (J) had a very significant effect on the average total number of tillers.

Table 3. Effect of Transfer Age and Number of Seeds on Average Weight Per 1000 Grain Seeds (grams) of Rice Plants.

Age of Transfer (W)	Number of Seeds (J)			Average
	j1 (1 Seeds)	j2 (2 Seeds)	j3 (3 Seeds)	
w1(7 days)	27,92	28,75	27,67	28,11
w2(14 days)	27,75	29,33	28,58	28,56
w3(21 days)	27,67	29,08	28,25	28,33
Average	27,78[b]	29,06[a]	28,17[ab]	

The mean number followed by the same letter shows no significant difference in the BNT Test 0.05 (0.81)

Based on the BNT 0.05 test on the number of seeds (J) treatment, the number of seeds (j1) was significantly different from the number of seeds (j2) and the number of seeds (j3), while the number of seeds (j2) was not significantly different from the number of seeds (j3). however the number of seeds (j2) yielded higher than the others (29.06) and the lowest value was the number of seeds (j1) with a value of (27.78).

IV. Discussion

A. Testing the Effect of Transfer Age on Growth and Yield of Rice Plants

Based on the variance of treatment, transfer age (W) had no significant effect on the measurement of rice plant height at the age of 2, 4 and 6 weeks after planting, the total number of tillers aged 2, 4 and 6 weeks after planting. - average panicle length, average number of panicle filled grain, average number of empty panicles, average number of panicles, average wet grain weight of clusters and average weight of milled dry grain and average weight per 1000 grain seeds. Caused by genetic factors from plants and factors from pest attacks (environment) more influence on growth and production so that plants are not able to show their effects and differences with other treatments.

B. Test the Effect of Number of Seeds on Growth and Yield of Rice Plants

Based on the variance of treatment, transfer age had no significant effect on the measurement of rice plant height at the age of 2, 4 and 6 weeks after planting, the total number of tillers 6 weeks after planting, the average number of branches of the cluster panicle, the average panicle length, the average the number of panicle filled grain, the average number of empty panicles, the average number of panicles, the average weight of wet grain in the cluster and the average weight of dry milled grain. presumably due to genetic and environmental factors (pests).

C. Interaction Between Transfer Age and Number of Seeds on Growth and Yield of Rice Plants

Interaction of Effect of Age of Transfer and Number of Seeds on Growth and Yield of Rice Paddy Crops The interaction treatment showed that all observations showed no significant effect, while the cause was influenced by environmental factors (grasshoppers, walang sangit and sparrows.

V. Conclusions And Suggestions

Conclusion

Based on the results of research on the effect of transfer age and number of seeds on growth and yield of rice plants (Oriza sativa L.) some conclusions can be drawn as follows:

1. The treatment of the effect of transfer age (W) showed no significant effect on the calculation of all observations.
2. The treatment of the number of seeds (J) had a very significant effect on the calculation of the number of tillers at the age of 2 weeks after planting, 4 weeks after planting and the weight of 1000 grain seeds. While the number of seeds that used 3 levels but the dominant influence was the number of tillers and the weight of 1000 grains of grain in the treatment of 2 seeds (j2).
3. While the treatment interaction effect of the age of transfer and the number of seedlings did not have a significant effect on all observation parameters from the beginning to the end of the observation.

Suggestion

Based on the conclusions from the above observations I suggest that:

1. Treatment of transfer time 7 weeks after planting (w1) can be recommended because it can have the opportunity to produce high production if there is no inhibiting factor for rice growth.
2. In the affected or unaffected condition, it is better to use the number of 2 seeds (j2) because a small number of seeds can increase the number of clusters of panicles and the weight of 1000 grain seeds.
3. It is hoped that further researchers will be able to carry out further research.

References

[1]. Ina Hasanah. 2007. Farming Rice Crops. Azka Mulia Media. Jakarta.
[2]. Muhammad Amin. 2015. Effect of Age of Transplanting and Number of Seedlings Per Planting Holes on the Growth of Rice Plants (Oriza sativa L.) Faculty of Agriculture, Teuku Umar University, Meulaboh. West Aceh.
[3]. Napisah.K and Ningsih.D.R. 2014. The Effect of Seedling Age on Rice Productivity of the Inpari Variety 17. Agricultural Technology Assessment Center (BPTP), Banjar Baru. South Kalimantan.
[4]. Rahmat Hidayah, Jurnawaty Sofjan and Wardati. 2016. Effect of Age of Seedling and Fertilizer N, P, K on Rice Varieties Ir 42 in Tidal Land Using Sri Method in Kuala Mulya Village, Kuala Cenaku District. Rotechnology Department. Agriculture Faculty. University of Riau Jl. HR. Subrantas Km 12.5 Simpang Baru. New Week.
[5]. Sauki A; Nugroho A. and Soelistiyono R. 2014. The Effect of Planting Distance and Inundation Time in the SRI (System Of Rice Intensification) Method on Plant Growth and Yield (Oryza sativa L.) Journal of Crop Production.

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