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Study of New Specific Location Superior Rice Varieties on Landsown Rain in Merauke Regency Papua

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Abstract **– Increased production of rice nowadays can be achieved by the use of superior rice varieties (VUB). It is considered as an important way in improving rice production quantitatively and qualitatively. The aims of this assessment are to figure out the level of productivity and production of superior rice varieties and to obtain 2 to 3 VUB which are locally specific on irrigated rice field. Different studies were conducted in the village of Yasa Mulya, District Tanah Miring, starting from April to July 2016. Using randomized group design (RGD), varieties that used were Inpago 4, Inpari 7, Inpari 9, Inpari 23, Inpari 24, Inpari 26, Inpari 27 and Inpari 28. The results showed that each varieties had a significant effect on the 0.05% test level on plant height, maximum number of tillers, number of productive tillers, as well as productions of dry milled grain. However SRV has no significant effect on the length of panicle, the number of grains per panicle, the empty grain per panicle, the weight per 1000 grains.**

Keywords **– VUB, Rice, Rainfed Land, Specific Location.**

I. INTRODUCTION

Rice plays important role in Indonesia. This commodity is always a social, political, economic, and cultural issue of the nation. The success of Indonesia's self-sufficiency in rice in 2016 shows the government's seriousness in maintaining national food stability. The success is inseparable from the efforts made by IAARD and other research institutions, including national and private universities private in research activities and assessment of rice crops that have been done so far.

The challenges to food security (rice) from time to time are getting heavier due to the national demand, mainly because of the increase of Indonesia population through years (1.49% per year). In addition, global climate change also affects agricultural productivity in terms of quality, pest, and drought. According to the Agricultural Research Agency (2014), VUB is one of the technologies that play an important role in increasing the quantity and quality of agricultural products.

The real contribution of improved varieties to the increase of national rice production is reflected in the achievement of rice self-sufficiency in 1984. Varieties as one of the components of production have contributed 56% in the production increase, which in the 1970-2000 decade nearly tripled (Merauke statistics center, 2014). Therefore, one of the main stack points of increasing rice production is assembly and improvement of new improved varieties (Large Rice Plants, 2004). Hapsah (2005) states that increased rice productivity can be pursued through the use of new improved varieties. The potential of paddy rice yield according to Agricultural Research Agency based on some research results of adaptation of superior varieties can reach 10 t / ha with the application of innovative technology (Large Rice Plants, 2010; Agricultural Research Agency, 2007). Nationally rice production is largely (98%) of its contribution from wetland, while dry land and tidal land donations are less than 10% (Hasanudin, 2004).

Imran et al., (2003) states that efforts in finding and improving varieties (quality and quantity, including aromatics) which have better adaptability to specific growing environments are one of the most appropriate policies for the development of productive, effective rice farming and efficient in the future. Makarim and Las (2005) suggests that to achieve maximum results from the use of new varieties, an appropriate growing environment is necessary to achieve the potential outcomes and advantages. The weakness of the current superior varieties in farmers, especially IR-64 and Ciliwung is less resistant to the brown plant hopper biotype 3, tungro, the gap in the rainy and dry season is relatively high, intolerant of iron poisoning and low temperature (Simanulang et al., 2005). New improved varieties is one of the efforts in gaining maximum yield and anticipating the failure of rice production yet at some point after intensive use by farmers in the field the results will decrease and their resistance to pests and diseases certain will decrease. Lubis et al. (1999) and Baehaki (2001),

Merauke Regency is located in the southern part of Papua Province-Indonesia. This region is reaching 45,071 km2 or 4,507,100 ha and has the potential to develop agricultural land area of 2,491,821 ha (55.3%) of the total area, consisting of wetlands 1,937,291 ha (77. 7%) and dry land 554,530 ha (22.3%). Land that has been opened and utilized by farmers is 37.014 ha (1.5%) of the potential area of agricultural land with the condition of flat land, fertile, without stone and without a mountain. Among other crops, rice is the main crop which has been planted widely in this area. In 2014 the area of rice plant reaches 37,505 Ha, harvest area 35,507 ha and production reach 177,581 ton GKP with productivity 5.00 ton / ha. (Merauke statistics center, 2014).

Increasing productivity and paddy production in Merauke Regency is influenced by several factors such as the use of improved varieties, maintenance, climate, soil, and harvesting and post harvest handling. Substantial quantity of superior have been released by research institutes but farmers only use certain varieties through time like in 1940 there were about 190 varieties that have been released in Indonesia and about 171 varieties grown by farmers but only about 10-20 varieties that are predominantly planted farmers. The information regarding these varieties among farmers or from government to

farmers seems still very limited so it is necessary to socialize those improved plant. Nationally, particular varieties such as Ciherang and Mekonga still in the first ranks from the existing planting area.

Therefore, the Agency for Agricultural Research and ddevelopment has always assembled various varieties resembling Ciherang characters but has more advantagesthan Ciherang such as: Cigeulis, Inpari 1, Inpari 6 Jete, Inpari 7 Lanrang, Inpari 8, Inpari 9 Elo, Inpari 10 Laeya, Inpari 23 Banten, Inpari 24 Gabusan, Inpari 27, Inpari 28 Kerinci, Inpari 32, Inpari 33 and many other new superior varieties (Agricultural research, 2013). The purpose of the assessment is to determine the level of productivity and production in some new varieties of rice and to find out the locally specific varieties which is adaptable in Merauke.

II. METOHODOLOGY

The study was carried out in Merauke, District Tanah Miring, Yasamulya village from April to July 2016. The assessment was carried out through a plot demonstration approach and field experiments using Randomized Block Design, three replications and eight treatments, Inpago- 4, Inpari-7, Inpari-9, Inpari-23, Inpari-24, Inpari-26, Inpari-27 and Inpari-28. Sizes of plot treatment (varieties) 10 m x 25 m. and processing of the soil are done completely with the plow twice and rake once until the puddling occurs. Maintenance of seedlings in nurseries is done intensively, appropriate Urea fertilizer, SP36 (each 15 g m-2).

The planting system that has been used is legowo 4: 1 with spacing (20 cm x 10 cm) x 40 cm. Number of seedlings planted about 1-3 seedlings per hole with early seedlings (<18 days). Fertilization is based on soil analysis or soil nutrient status using PUTS. Additionaly, nitrogen fertilizer is given based on leaf color chart (BWD), while P and K are based on soil fertility status. Basic fertilization is done by giving urea as much as 150 kg / ha NPK pongksa 250 kg / ha and SP-36 50 kg / ha) at age 14 days after planting (dap). The subsequent urea fertilizer is given based on the leaf color scale on active tiller phase (21-28 dap) and primordia (38-42 dap). If the reading value of BWD <4, then the urea dose given about 5 kg in the phase of active tillers and 100 kg ha-1 in the phase of primordia. Herbicide, DMA 2.4 (5 cc l-1 water) at age 21 dap and insecticide Furadan 3 G (25 kg ha-1) at the same time base fertilization (5 dap) were applied on the field. Further action on pest control was carried out by monitoring only when there is an attack on the vegetative phase.

The observed variables include: plant height, number of tillers at age 45 and 75 days after plant and harvest, length of panicle, total grain per panicle, number of filled grain per panicle, percentage of empty grain per panicle, weight of 1000 grain, and dry weight of harvested grain per hectare. The variables of the growth component and the yield component were observed per 10 plants randomly, while the dry grain yield and pest / disease observations were observed in the sample plots 2.5 m x 2.5 m = 6.25 m2.

The data were analyzed by statistical method, comprising the analysis of variance (F-Test) on determine the effect of treatment and Duncan Test (DMRT) to look for the effect between treatments following Gomez & Gomez (1995) procedure.

III. RESULTS AND DISCUSSION

A. *Growth Components*

Results of various plant growth growth components showed that Inpari-23 and Inpari-28 varieties had plant height (age 45 dap, age 75 and harvest) were significantly higher than other varieties, while the shortest was inpari-7 (age 45 dap, 75 dap and harvest time). The observed data on plant height growth components are presented in Table1.

Tabel 1. Plant height at age 45 and 75 days after planting during harvest performance of some specific location rice paddy field VUBs in Merauke Regency

Vareties	Plant height (cm)		
	45 (dap)	75 (dap)	harvest
Inpago 4	62.7ab	96.7ab	108.3ab
Inpari 7	56.5b	78.9bc	94.8b
Inpari 9	62.1ab	83.4b	109.7ab
Inpari 23	70.9a	100.1a	121.0a
Inpari 24	57.8b	78.5bc	111.3a
Inpari 26	68.3ab	95.3ab	116.7a
Inpari 27	60.6ab	90.5ab	107.7ab
Inpari 28	72.7a	101.4a	116.3a
Anova	12.61**	8.63*	8.66*
DMRT 0,05	5.84	11.72	10.04
CV (%)	3.18	4.52	13.04

Average number of sows followed by the same letter is not significantly different at the 5% level, DMRT Test.

The results of various growth components for the largest number of tillers are presented in Table 2. It shows that Inpari-9 and inpari-28 have significant number of tillers (age 45 dap, age 75 and harvest) compared to other varieties, whereas the most slightly ones were inpari-23 and inpari-24 (age 45 dap, 75 dap and harvest time). Differences in plant height among varieties are strongly influenced by differences in genetic factors of each variety. This result according to what was stated by Sunarti et al., in 2006 that difference in the total growth period in the vegetative phase, is more influenced by the genetic trait or depends on the sensitivity of the varieties cultivated to the environment where Genetic diversity between populations produces diverse genetic expression.

Tabel 2. Number of tillers at age 45 dap, 75 dap and during harvest performance of several specific rice field VUBs in Merauke District.

Varieties	tillers		
	45 dap	75 dap	Harvest
Inpago 4	7.7c	7.7bc	12.0b
Inpari 7	11.6b	9.3b	13.6b
Inpari 9	16.1a	15.8a	17.2a
Inpari 23	7.4c	6.7c	10.5c
Inpari 24	7.5c	7.3bc	11.8
Inpari 26	11.2b	13.5ab	14.5b
Inpari 27	10.4bc	10.6b	12.2b
Inpari 28	14.6ab	16.1a	16.3a
Anova	12.61**	8.66**	11.01**
DMRT 5%	5.24	3.83	5.35
CV (%)	0.11	13.04	0.38

Average number of lanes followed by the same letter is not significantly different at the 5% level, the DMRT Test.

B. *Result Component*

The observed component consisted of panicle length, number of grain per panicle (grain containing and unhulled grain), 1000 grain weight and ton/ ha production, presented in Table 3. One of the factors affecting the increase of grain yield is the crop yield component. This is as stated by Atman (2005) on Batang Piaman varieties whereas one factor influencing the increase of grain yield is the increase of growth component value and crop yield components, among others: number of productive tillers, panicle length, number of grain per panicle, and percentage of grain pithy.

Tabel 3. Length of panicle, filled grain, empty grain and weight of 1000 grain of VUB rice performances on specific field location in Merauke.

Varieties	Length of panicle (cm)	Number of grain per panicle	filled grain (panicle)	empty grain (panicle)	weight of 1000 g	Productiont /ha
Inpago 4	24.1	112.6	45.4c	67.2	23.3	3.1bc
Inpari 7	23.2	95.2	52.1b	43.1	25.2	4.2a
Inpari 9	24.5	121.8	70.0a	51.8	24.1	4.7a
Inpari 23	26.1	161.8	87.4a	74.7	27.5	4.0a
Inpari 24	23.8	113.6	64.6b	49.0	26.8	3.8b
Inpari 26	25.1	121.0	56.9b	64.1	24.9	3.9b
Inpari 27	26.1	113.5	64.9b	48.6b	23.6	3.7b
Inpari 28	24.1	107.8	55.1b	52.7	26.1	3.8b
Anova	3.53^{tn}	0.93^{tn}	7.88*	2.05^{tn}	2.60^{tn}	18.91**
DMRT 0.05	1.82	64.01	16.61	27.63	8.12	0.37
CV (%)	0.03	70.51	1.02	3.10	1.70	3.37

The average number of lanes followed by the same letter is not significantly different at the 5% level, the DMRT Test Analysis of the variance on various components of the results in Table 3 show that the longest panicle length (26.1 cm) is inpari-23, inpari-27 but there was no significance different compared to other new superior varieties. Inpari-9 (376.1) and inpari-26 (371.3) are the highest on term of number of grains compared to the lowest, Inpari 7 (95.2). Furthermore, Then the grain with the most content is inpari 23, where per panicle has 87,4 grains make it significantly different with other VUB. The highest grain hull is inpago 4 (67.2 grains) and the lowest is inpari-7 (43.1 grains) so it is not real different from other VUBs. The weight of 1000 inpari-23 grains is the highest of 27.5 grams and the lowest is inpago-4 which is 23.3 gram, indicating no real effect on other VUB. The results of weight analysis of 1000 grains and number of tillers showed a negative correlation to the results. This is due to the competition factor in rice plants, where in rice that has many tillers will compete in terms of getting nutrients and carbohydrates that cause the size of the seeds to be small so that the weight of the granules is low. It is suggested by Swasti et al (2008) that the weight of 1000 grains depends on grain size, grain shape and harvesting time.

Inpari-9 has the highest productivity of 4.7 t / ha and the lowest is inpago-4 which is 3.1 t/ ha, significantly different to other VUB. According to Imran et al. (2003), efforts to continue to find and develop improved varieties and have better adaptability to specific growing environments are one of the appropriate policies for the development of productive, effective and efficient paddy farming in future. Makarim, Las, Djulin, and Sutoro (2009) also suggested that to achieve maximum results from the use of new varieties required an appropriate growth environment so that the potential results and excellence can be realized.

IV. Conclusion

Several new varieties of rice in specific locations in Merauke Papua especially in rainfed lowland areas. Varieties that showed optimal and consistent growth are inpari 9, inpari 26 and inpari 7 in the vegetative phase. Whilst the varieties indicate the highest productivity are inpari 9 then inpari 7 followed by inpari 23. Further research is needed in order to determine the time of planting and recommendation of specific fertilizer doses.

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Fransikus Palobo, SP, M.Si is a Researcher at Assistance Institute for Agricultural Technology (AIAT) Papua, born in Toraja born Toraja on October 10, 1973. The author completes his Bachelor (S-1) Degree of State Administration at STIA by Dharma Merauke in 2001, S1 Agrotechnology agriculture High School of Agricultural Science of St. Thomas Aquineas Jayapura 2007 and S2 was obtained at the University of Cenderawasih. Jayapura Papua in 2017. The author's career started as an honorary staff at Agricultural Technology Research Center of Papua, since 1993. The writer was appointed CPNS in April 2005 at Agricultural Technology Assessment Institute (BPTP) Papua. In 1996 it was transferred to BPTP Papua to date. The author actively participated in various seminars of National Center of Rice Sukamandi West Java, Indonesian Agronomy Society in Bogor, Ambon Technology Assessment Center. So many scientific papers of published research results, both in Proceedings and Journals. Scientific publication as the main writer in the last 5 years such as Rice Adaptation Testing of Inpari Varieties in Semangga District of Merauke Regency, Interpretive Structural Modeling (Ism) Implementation in Determining Elements of Integrated Crop Management (Ptt) Wetland Rice Towards Sustainable Agriculture in Merauke Regency, between Coconut Cultivation in Papua Border Area, Merauke, Prospect of Mungbean Farming as Intercropping Plant of Coconut Plantation in Merauke-Papua, Application of Technology Innovation Rice Paddy in Border Area of Jayapura City Papua, Analysis of Paddy Farming Variety Diahsuci using Revenue Cost Ratio (R / C Ratio), Assistance of Coconut Based Field Laboratory in Papua Border Area of Merauke Regency. Currently the author is active as a Researcher at the Assistance Institute for Agricultural Technology (AIAT) Papua.