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Pengaruh Pemberian Sitokinin dan Pupuk Kosarmas Terhadap Pengisian Biji Padi Impari Sembilan

The Effect Cytokinin Aplication and Kosarmas Fertilizer on Rice Seed Filling Impari Sembilan in Pintupadang

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ABSTRACT

Impari sembilan is one of the superior varieties used in Pintupadang. This seedling is one of the superior varietas produced from agricultural hall in Indonesia. Rice productivity efforts can be incresed by using siperior varieties application of growth regulators. Cytokines application has a role in the formation of grains and root during the initial process of grain development, affect the percentage of seed and will affecct the yield. Kosarmas fertilizer is an organic fertilizer from cow dung, charccoal, candlenut shell and golden snails as organic fertilizer which improves soil physic. The purpose of the study was evaluated the effect cytokynins and KOSARMAS fertilizer on wet weight, dry weight, seed filling of Impari rice plants. This study used a Completely randomized design with two factors, namely cytokinin concentration of 0, 10, 25, 50 ppm and Kosarmas liquid fertilizer concentration of 0, 20, 30, 50 ml. Based on analysis of error variance of 5%. Cyokinin at aconcentration of 50 ppm increased, the height of Impari rice stalks while cytokinin applied at aconcentration of 25 ppm increased ,the ammount of fresh weiht of 100 rice seed, dry weight of sed. A doses of 30 ml kosarmas fertilizer increases the total amount of panicle grain.

Keywords: Cytokine endogenious, Kosarmas fertilzer, seed filling

ABSTRAK

Impari Sembilan merupakan salah satu varietas ungggul yang digunakan di Pintupadang bibit ini merupakan salah satu varietas unggul yang keluaran dari balai pertanian di Indonesia. Upaya produktivitas padi dapat ditingkatkan dengan menggunakan varietas unggul dan pemberian zat pengatur tumbuh.Sitokinin berperan dalam pembentukan bulir dan akar selama awal proses perkembangan bulir, memperngaruhi persentase biji dan akan mempengruhi hasil produksi.Pupuk kosarmas merupakan pupuk organik dari kotoran sapi, arang,cangkang kemiri dan keong mas sebagai pupuk organik yang menggantikan pupuk kimia. Pupuk kosarmas mengandung unsur hara makro dan mikro yang memperbaikifisiktanah. Tujuan dari penelitian ini untuk mengevaluasi pengaruh sitokinin dan pupuk kosarmas terhadap berat basah, berat kering, pengisian biji tanaman padi impari. Penelitian ini menggunakan Rancangan Acak Lengkap dengan dua faktor yaitu konsentrasi sitokinin konsentrasi 0, 10, 25, 50 ppm dan kadar pupuk cair kosarmas 0 ,20,30, 50 ml per tanaman. Berdasarkan analisis variansi kesalahan 5%. Sitokinin pada konsentrasi 50 ppm meningkatkan tinggi batang padi Impari sedangkan sitokinin aplikasikan pada konsentrasi 25 ppm meningkatkan ,jumlah berat basah 100 biji padi, berat kering 100 biji. Dosis pupuk kosarmas 30 ml meningkatakan jumlah total gabah permalai. Pada setiap perlakuan terdapat interaksi pada setiap perlakuan.

Kata kunci : Sitokinin, pupuk kosarmas, pengisian biji

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INTRODUCTION

Rice is the staple food of most Indonesians. The amount of domestic rice consumption is not comparable with rice productivity, which indicates that a good agricultural system needs to be improved by selecting superior seeds and applying other systems. Impari Sembilan is one of the superior varieties used in Pintupadang. This seedling is one of the superior varieties produced by the Indonesian agriculture center. Rice productivity efforts can be increased by using improved varieties and application of growth regulators.

One of the growth regulators that can regulate the growth and shape of plants at each growth phase is cytokinins. Cytokines play a role in the formation of grains and roots during the process of grain development, affecting the percentage of seeds that aim to increase production yields. Saxena et. al., (2002), the application of cytokinins can increase the activity of nitrate reductase and glutamate synthase. Sing et. al., (2001), cytokines can increase the rate of photosynthesis and rubpco activity which consequently will increase crop productivity.

One of the ingredients used is Kosarmas organic fertilizer consisting of cow dung and charcoal of candlenut and golden snail shell. Fermented liquid fertilizer contains microorganisms that can assist the process of nutrients in the soil. Fertilizers which are not normally used can be used as fertilizer. Gold snail is known as a paddy pest, processed into liquid organic fertilizer by farmers in replacing the use of chemical fertilizers. Cow dung also contains macro and micro-nutrients needed by plants. Organic fertilization can improve soil physical attribute and assist soil fertility. Based on the description above, research on the application of cytokinins and Kosarmas fertilizer to Impari Sembilan paddy variety growth was carried out.

MATERIALS AND METHODS

This research was conducted in Pintupadang, Tapanuli Selatan. Tools and materials used are furnace, rolling stone, 60 mesh sieve (flour sieve), 1500 and 600 mL plastic bottles, ¼ inch clear plastic hose, cutter knife, stirring spoon, a plastic funnel, thermometer, analytical balance, sticky tape, sample bottles, plastic pots, trays, shovels, measuring cups, beaker cups, rulers, scissors, mortars, measuring flasks, razor blades, tweezers,cover cups, Gold snail meat, cow dung, candlenut shells, coconut water, palm sugar, kerosene, water, Impari Sembilan seeds, and cytokines. The research will be conducted with a factorial group design. The first factor is the application of cytokines with concentrations of 0% (S0), 10% (S1), 25% (S2), 50% (S3). The second factor is the application of Kosarmas fertilizer with 0, 20, 30, 50 ml. Each treatment combination had 3 replications hence 48 plants would be obtained. Observed parameters include; plant height, wet weight and containing wet and dry weight, the total number of grains per panicle.

RESULTS AND DISCUSSION

Plant height

Based on Table 1, it was found that the application of cytokinins can increase the stem height of paddy plants in the 13th week after transplanting. There is an interaction between Kosarmas fertilizer and cytokines. Cytokinin concentrations at 50 ppm increase the height of paddy stalks of impari plants because cytokinins play a role in stimulating cell elongation. Application of cytokinins reported by Shah (2006), spraying kinetin on plants increases cell division. Leaf spraying is more easily absorbed by plants.

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Table 1. Impari Sembilan heights on cytokinin and Kosarmas fertilizer treatments (cm)

Fertilizer		Cytokinin			
		0	**20**	**30**	**50**
		Stalk Height (cm)			
5th Week	**0**	68	72	69	71
	10	71	70	73	66
	25	66	67	62	67
	50	63	63	53	63
9th Week	**0**	76	81	90	83
	10	75	83	76	81
	25	76	78	74	79
	50	71	78	85	79
13th Week	**0**	101	111	123	121
	10	98	108	110	127
	25	101	112	98	117
	50	110	121	104	122

Note: Different letters in the same column and row showed a significant difference between treatments at the 5% error level (n = 3)

Wet weight of 100 rice seeds

The distribution of assimilation and allocation of paddy's bottom are important processes that will determine crop productivity (Daie, 1985). In this research, there was an interaction between Kosarmas fertilizer and cytokines. The most influential fertilizer is the concentration of 50 ml, probably caused by external and internal factors. During the fertilizing is a rainy season and organic fertilizer is slow to decompose and absorb by plants as a result, the way it works is rather long. Cytokinins are known to have an important role in the transport of photosynthate, a process that occurs at the bottom (Table 2). The transportation of deep sucrose involves transportation via Simplas and Apoplasts (Oparka and Gates, 1981). Based on Table 3, the highest yield of 50 ppm cytokinin treatment can increase the wet weight of 100 rice seeds in a total of 2.6 grams compared to the control because of the possibility of more photosynthetic seed distribution. As reported by Okura et al. (1994), cytokinins increase the ability of sucrose absorption by stimulating the experiment of the OsCINI gene that plays a role in the activation of invertase enzymes that function to replenish seeds and OsSUT genes that activate sucrose transporters.

Table 2. Wet weight of 100 seeds rice (g), results of cytokinin treatment and Kosarmas fertilizer

Treatment	C_0	C_1	C_2	C_3	Averages
P_0	2.12	2,7	2.4	2.6	2.45^{x}
P_1	2.30	2.4	2.6	2.5	2.45^{x}
P_2	2.38	2.5	2.6	2.4	2.47^{x}
P_3	2.30	2.6	2.7	2.4	2.5^{xy}
Averages	2.3^{x}	2.5^{xy}	2.6^{y}	2.5^{xy}	

Note: Different letters in the same column and row showed a significant difference between treatments at the 5% error level (n = 3)

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Table 3. Dry weight of 100 rice seeds (g) with cytokinins and Kosarmas fertilizer application treatment

Treatment	C_0	C_1	C_2	C_3	Averages
P_0	1.9	2.3	2.2	2.5	2.2
P_1	2.1	2.1	2.5	2.4	2.22
P_2	2.2	2.2	2.5	2.2	2.27
P_3	2.1	2.4	2.4	2.2	2.27
Averages	2.1^{x}	2.3^{xy}	2.4^{y}	2.3^{xy}	

Note: Different letters in the same column and row showed a significant difference between treatments at the 5% error level (n = 3)

Table. 4 Total amount of grains per panicle (grain)

Treatment	C_0	C_1	C_2	C_3	Averages
P_0	115.93	101.00	121.47	113.13	112.88
P_1	113.13	119.87	103.67	124.53	115.30
P_2	118.13	128.93	127.33	127.00	125.35
P_3	112.65	108.60	118.07	116.56	111.66
Averages	112.65^{x}	114.600^{xy}	117.63^{xy}	120.31^{y}	

Note: Different letters in the same column and row showed a significant difference between treatments at the 5% error level (n = 3)

100 Seed dry weight

Based on Table 3, the interaction effect of cytokinins and Kosarmas fertilizer on P2C2 and P2C3 increased 100 dried rice seeds compared to controls. This is consistent with research reported by Parman (2007), which stated that cytokinins interact to encourage nitrogen to increase the photosynthetic activity of plants thereby increasing the carbohydrates produced as food reserves from source to sink hence the grain weight increases.

Total amount of grain per panicle

Based on table 4, the highest amount of grain content was found in the P2C1 interaction fertilizer treatment as much as 125.35 and at the least was found on 50 ml fertilization. Hormones and fertilizers greatly affect plants. According to Makarim (2005), nutrients greatly affect plant growth and production if applied according to plant needs. Deficiency or excess in applying fertilizer amounts affect plants. Balanced fertilization is an effort to fulfill balanced blindness to achieve optimal results.

CONCLUSION

The research results above stated that there are interactions on cytokines and Kosarmas fertilizers. Cytokinin at a concentration of 50 ppm increased the height of Impari paddy stalks while cytokinin applied at a concentration of 25 ppm increased the amount of wet weight of 100 rice seeds and dry weight of 100 seeds. A dose of 30 ml Kosarmas fertilizer increases the total amount of grain per panicle.

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