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Research Paper

EFFECTIVENESS OF BIOLOGICAL ORGANIC FERTILIZER PLUS INORGANIC FERTILIZER ON THE GROWTH AND PRODUCTION PLANT VARIETY SOME HYBRID CORN (ZEA MAYS L.) AND WEEDS IN LOWLAND SWAMP AREA

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Increased food production is currently directed at suboptimal as lowland swamp that is widespread in several regions in Indonesia (Purwanto, 2005; and Subagyo, 2006). The main problem in the utilization of lowland swamp that waterlogging, soil acidity, the presence of Al and Fe cations binding phosphorus and nutrient-poor (Alihamsyah and Ar-Riza, 2006). Efforts to improve the productivity of maize in lowland swamp area through organic fertilizer enriched with microorganisms called bio-organic fertilizer (bio-fertilizer) and the use of inorganic fertilizers with low dose. The research aims to identify and determine the dose of organic fertilizer plus best inorganic fertilizer on the growth and production of several varieties of hybrid corn plants (*Zea mays* L.) and weeds in lowland swamp area. Field trial was conducted from April 2016 to August 2016, in the village of Pulau Semambu Ogan Ilir, South Sumatra Province. Statistical experiments using a randomized block design factorial with 15 combinations of treatments and 3 replications. Factor I: Biological Organic Fertilizer dose (BOF) + Inorganic Fertilizers (T) consisting of T0 = BOF + 0% N, P, K; T1 = BOF + 25% N, P, K; T2 = BOF + 50% N, P, K; T3 = BOF+ 75% N, P, K; T4 = BOF + 100% N, P, K. Factor II: hybrid corn varieties (V), namely Pioneer V1 = 27, V2 = Bisi 18, V3 = DK 85. Variables observed that High Plant (cm) Number of leaves (leaf), length of cob (cm), diameter of cob (cm), weight of 100 seeds (g), shelled weight per plot (kg), plant remains dry weight (g). The number and type Weeds (SDR), Weeds wet weight (g), Weeds Dry Weight (g). Result: The biological treatment of organic fertilizer + 75% N, P, K is the best treatment shelled weight per plot of 714.67 kg. There were changes in weed populations dominated by Imperata cylindrica before treatment and after the study Cyperus compresus weeds dominated.

Keywords: Biological organic fertilizer dose, Inorganic fertilizer, Hybrid corn, Weeds, Lowland swamp area

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INTRODUCTION

Maize (*Zea mays* L.) is the second staple crop after rice and used as food sources of carbohydrates. The development of farming systems and agribusiness corn in swamp land shown good prospects for still vast swamp land in Indonesia that has not been earned.

The main problem in the utilization of swampy wetlands that waterlogging, soil acidity, the presence of Al and Fe cations binding phosphorus and nutrient-poor (Alihamsyah and Ar-Riza, 2006). Therefore, support cultivation technology and management of land, water, and nutrients in corn development in wetlands indispensable includes land preparation and tillage, seeding, use of improved varieties, amelioration and fertilization, mulching and organic ingredients.

Organic fertilizers are essential components in organic farming that play a role in maintaining soil fertility and quality of crops through improved biological activities that ultimately can interact with the physical properties and chemical soil (Mahdil and Hassan, 2010).

Applications include livestock manure organic fertilizer, biochar, husk, rice straw or a combination thereof can be used to enhance the ability of the corn crop in the face of poor soil conditions Iqbal (2008), stating that the application of biological fertilizer on maize is able to increase an average of 50-97% uptake of macro and micro nutrients from 58.9 to 63.2%.

Organic fertilizers such as manure chicken manure can decompose quickly if aided by microbes include Lactobacillus lactic acid bacteria, photosynthetic bacteria and *Streptomyces* sp. and yeasts. These microbes provide a good influence on the quality of organic fertilizer, while the availability of nutrients in the fertilizer was influenced by the length of incubation time needed by bacteria to degrade organic fertilizer. The results showed that the fertilizer that has be composted and incubated for 20 days provide a real influence on the growth of maize (Siburan, 2007). Besides the use of organic fertilizers, the addition of inorganic fertilizer needs to be done to improve the growth of corn plants but pursued with lower doses than the recommended, it is because in organoc fertilizer, have nutrient elements more fully and quickly available to plants, while organic fertilizers are Slow realease.

Additionally weeds become one of the obstacles in swampy areas. Weeds are plants that harm other plants that are nearby or staple crops and grow in unwanted places. Due to the nature of the harm, then wherever weeds grow always be revoked, daytime, and even burned. (Suryaningsih, 2011).

The purpose of this study is to find out and get a dose of organic fertilizer plus N, P, K and best varieties on the growth and yield of hybrid maize (*Zea mays* L.) as well as the growth of the weed population in lowland swamp area.

MATERIALS AND METHODS

Research conducted at the Experimental Garden, Faculty of Agriculture in Campus C Muhammadiyah University Palembang Pulau Semambu Village, District of Indralaya Utara, Ogan Ilir Regency, in South Sumatra, from April to August 2016. Materials used in the research are agricultural lime, hybrid corn seeds (Pioneer 27, Bisi 18 and DK 85), chicken manure organic fertilizer, biological fertilizer, rice husk, bran, sugar, Urea, SP 36, KCl, Furadan and Decis.

This study uses a randomized block design with 15 combinations of treatments and 3

replications. A spacing of 70 x 25 cm corn planted in plots with 45 plots. Planting corn seeds 2 points per planting hole with ditugal, cultivation techniques and maintenance refers to the integrated crop management unless weeds were allowed to grow. Initial soil analysis is done based on the results of laboratory analysis P.T Binasawit Makmur, *Soil and Plant Tissue Analysis Laboratory Laboratoryegrated,* Palembang, South Sumatra.

To determine the effect among the treatments performed by analysis of variance followed by SAS program HSD test level of 5%. Variables measured include: plant height, number of leaves, cob length, cob diameter, weight of 100 seeds, shelled weight and dry weight per plot of crop residu. Observations weeds are the type and amount of weeds (SDR), fresh weight and dry weight of weeds.

RESULTS

The soil used in this study have the chemical and physical properties as listed in Table 1.

Based on the assessment criteria for the chemical and physical soil properties according Hardjowigeno (1995), the soil used in this study included the category of low-fertility soils with pH H_2O as very acid. Subagyo (2006), that the swampy soil pH ranging from 4.0 to 5.5 and the content of macro nutrients are low. The results of analysis of soil on top, despite the availability of nutrients P high, but many sequestered metal ions in the soil such as aluminum, to form Al-P and may cause P can not be absorbed by plants. Attempts to improve soil fertility in the study were given agricultural lime 5 tons/ha, aims to increase the pH and the addition of organic fertilizer and inorganic fertilizer for plants that grow on it can grow and produce the maximum. Organic fertilizers are used in this study has been added to the biological fertilizer and incubated for 20 days (on a preliminary study with a C/N ratio is 19.19). According Hardjowigeno (1995), that the best organic fertilizers have a value of C/N-ratio range from 10-20.

Table 1: Characteristics of the Soil Before Planting in Soil Research in Pulau Semambu Village, 2016

No.	Observations	Results	Criteria
1	pH H_20	4,17	Very Acid
2	pH KCl	3,99	
3	N-total (%)	0,48	Average
4	C-organic (%)	14,32	Very High
5	KTK (me/100 g)	24,76	Average
6	K-dd (me/100 g)	0,23	Low
7	Ca-dd (me/100 g)	0,07	Very Low
8	Mg-dd (me/100 g)	0,05	Very Low
9	Na-dd (me/100 g)	0,05	Very Low
10	P_2O_5 (me/100 g)	127,59	Very High
11	K_2O (me/100 g)	7,19	Very Low
12	P Bray I (ppm)	8,37	Average
13	Aldd (%)	6,58	
14	Soil Texture		Clay Sandy
	Sand (%)	70,00	
	Dust (%)	14,00	
	Clay (%)	16,00	

Note: Description: Criteria Land Research Center (1983) and the Soil Research Institute (2005).

Results of analysis of variance Table 2 shows that treatment of organic biological fertilizer plus N, P, K and interaction effect was not significant to all of the observed variables Treatment varieties significant to very significant to all of the observed variables, but no real effect on the cob length and weight of 100 seeds.

Table 2: Results of Analysis of Variance Influence Biological Treatment of Organic Fertilizer Plus N, P, K and Varieties of the Observed Variables

Treatment Parameters	Observed			Diversity Coefficient (%)
	T	V	I	
Plant Height (cm)	ns	*	ns	32,01
Number of leaves (sheet)	ns	*	ns	17,05
Cob Length (cm)	ns	ns	ns	20,48
Cob Diameter tongkol (cm)	ns	*	ns	15,47
Weight of 100 seeds (g)	ns	ns	ns	10,87
Seed Weight per plot (g)	ns	**	ns	25,36
Dry Weight of crop Residue (g)	ns	**	ns	27,21

Note: Description: ns = non significant; * = significant; ** = very significant; T = organic biological fertilizer plus organic fertilizer; V = varieties; I = interaction.

Data influence biological treatment of organic fertilizer plus N, P, K of the variables of growth and production of hybrid corn and its interactions shown in Table 3 and Table 5. The effect of treatment of different varieties manifest until very real, then continued test of HSD in Table 4.

Table 3 shows that the biological treatment of organic fertilizer plus N, P, K can promote the growth and production of corn increased with increasing doses of fertilizers applied and the best at the lowest T0 and T3 treatment.

Table 4 shows that treatment of different varieties manifest until very significant to the growth of corn and variables positively correlated with yield components, it is best to V_1 (varieties Pioneer 27), V_2 (Bisi 18) and V_3 (DK 85).

To see the relationship between plant height with a weight of seed per plot shown in Figure 1, and the relationship between plant height with a dry weight of crop residue shown in Figure 2.

Figure 1 shows that the higher the dose of fertilizer given a high increase in corn and positively correlated with the weight of shelled corn kernels per plot to the extent of fertilizer combination BOF + 75% N, P, K. Similarly, what happened in Figure 2 shows that the increase in plant height due to the increase in dry weight of crop residue of corn and peak in the combination treatment of manure BOF + 75% N, P, K.

Nutrient Uptake of N, P dan K in Plant Tissue (%)

Nutrient Uptake of N, P and K Plant Tissue (%) Uptake of N, P and K corn plant tissue performed at maximum vegetative phase (8

Table 3: Effect of Biological Organic Fertilizer (BOF) Plus N, P, K of the Variables of Growth and Production of Hybrid Corn

Treatment of BOF + PA Doses	Plant Height (cm)	Number of Leaves (Sheet)	Cob Length (cm)	Cob Diameter (cm)	Weight 100 biji	Weight of Seed per Plot	Dry Weight of Crop Residue
T_0	126,78	10,51	12,15	3,66	27,11	449,56	47,17
T_1	133,56	10,71	12,89	3,77	27,78	479,33	52,25
T_2	1358,80	10,82	13,79	3,96	27,44	482,89	62,01
T_3	156,47	11,67	14,16	4,04	28,56	526,78	67,99
T_4	138,02	11,29	12,94	3,89	28,11	508,78	64,11

Note: Description: T_0 = BOF + 0% N, P, K; T_1 = BOF + 25% N, P, K; T_2 = BOF + 50% N, P, K; T_3 = BOF + 75% N, P, K; T_4 = BOF + 100% N, P, K.

Table 4: Effect of Varieties of the Variables of Growth and Production of Hybrid Corn

Treatment of Corn Varities	Plant Height (cm)	Number of Leaves (Sheet)	Cob Length (cm)	Cob Diameter (cm)	Weight of 100 Seeds	Weight of Seed per Plot	Dry Weight of Crop Residue (g)
V_1	164,63 b	11,93b	14,39	4,20 b	28,67	591,00 b	73,74 b
V_2	122,91 a	10,25a	12,05	3,55 a	27,27	416,40 a	44,94 a
V_3	126,84 ab	10,81a	13,12	3,85 ab	27.47	461,00 a	57,45 a
HSD 0,05	39,95	1,69	ns	0,54	ns	112,15	21,45

Note: Description: The numbers followed by the same letters mean different non significant. V_1 = Pioneer 27; V_2 = Bisi 18; V_3 = DK 85.

Table 5: The Effect of the Interaction of Biological Organic Fertilizer Plus N, P, K and Varieties of the Variables of Growth and Production of Hybrid Corn

Treatment of BOF + Non Organic and Corn Varities	Plant Height (cm)	Number of Leaves (Sheet)	Cob Length (cm)	Cob Diameter (cm)	Weight of 100 Seeds	Weigth of Seed per Plot	Dry Weight of Crop Residue (g)
T_0V_1	138,27	11,27	12,79	3,96	27,67	487,33	68,95
T_0V_2	118,40	9,80	10,95	3,21	26,67	403,33	30,09
T_0V_3	123,67	10,47	12,71	3,79	27,00	458,00	52,47
T_1V_1	158,87	11,67	13,55	3,99	28,33	504,00	61,02
T_1V_2	116,20	9,93	12,42	3,49	28,00	453,00	42,39
T_1V_3	125,60	10,53	12,73	3,84	27,00	481,00	53,33
T_2V_1	177,53	12,27	15,61	4,45	29,33	576,67	80,49
T_2V_2	108,73	10,40	12,36	3,60	27,33	422,00	51,89
T_2V_3	127,80	11,20	13,42	3,85	27,67	450,00	59,95
T_3V_1	185,80	12,67	16,30	4,49	29,67	714,67	88,97
T_3V_2	152,07	11,07	12,73	3,73	27,67	391,00	52,47
T_3V_3	131,53	11,27	13,45	3,88	28,33	474,67	62,53
T_4V_1	162,67	11,80	13,72	4,12	28,33	672,33	79,24
T_4V_2	119,13	10,07	11,81	3,70	26,67	412,67	47,85
T_4V_2	125,60	10,60	13,31	3,87	27,33	441,33	58,95

Note: Description: T_0V_1 = BOF + 0% N, P, K dan Pionner; T_0V_2 = BOF + 0% N, P, K dan BISI 18; T_0V_3 = BOF + 0% N, P, K dan DK 85; T_1V_1 = BOF + 25% N, P, K dan Pionner; T_1V_2 = BOF + 25% N, P, K dan BISI 18; T_1V_3 = BOF + 25% N, P, K dan DK 85; T_2V_1 = BOF + 50% N, P, K dan Pionner; T_2V_2 = BOF + 50% N, P, K dan BISI 18; T_2V_3 = BOF + 50% N, P, K dan DK 85; T_3V_1 = BOF + 75% N, P, K dan Pionner; T_3V_2 = BOF + 75% N, P, K dan BISI 18; T_3V_3 = BOF + 75% N, P, K dan DK 85; T_4V_1 = BOF + 100% N, P, K dan Pionner; T_4V_2 = BOF + 100% N, P, K dan BISI 18; T_4V_3 = BOF + 100% N, P, K dan DK 85.

MST) can be seen in Table 6. The average uptake of N, P and K from the three varieties of corn grown in the highest fertilizer treatment BOF + 75% N, P, K. The highest response to the uptake of N, P and K are varieties of Pioneer 27 amounted to 3.31% of N, 0.214% P and 2.90% K; Bisi 18 varieties of 3.00% N, 0.204% P and 2.51% K; DK 85 varieties amounted to 2.64% of N, 0.185% P and 2.32% K.

Observations of weeds is done before planting and harvest. The results of the analysis of vegetation weeds before planting with the calculation of Summed Dominance Ratio (SDR), fresh weight and dry weight of weeds are listed in Table 7.

Figure 1: The Relationship Between BOF + N, P, K Dose with Plant Height (cm) Weiht of Seed per Plot (g)

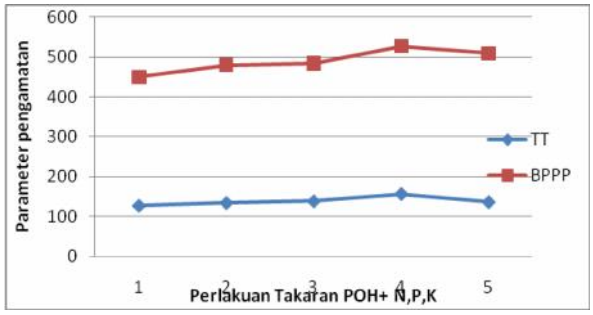
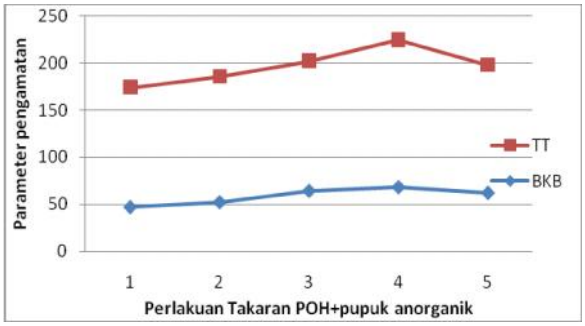


Figure 2: The Relationship Between Plant Height with a Dry Weight of Crop RO Shown (g)



Weed Vegetation Analysis at 2 Days Before Harvest

The results of the analysis of weed vegetation 2 days before harvest showed that a decline in weed species. SDR results in all treatment plots show, that is the dominant weed Cyperus compesus. The results of the analysis of weed vegetation (SDR) are listed in Table 7.

DISCUSSION

Treatment without inorganic fertilizer (N, P, K) in this study showed the lowest value of both the variables of growth and yield components of maize, as also happens in the treatment of the interaction of BOF + N, P, K deliver growth and better results than without fertilizer inorganic.

Tabel 6: The Effect of Interaction Treatment on Nutrient Uptake NPK (%)

Tretment of BOF+ Non Organic Fertilizer		Varieties	
	V1	V2	V3
	.....	Nutrient Uptake N%	.....
T0	2,52	2,30	2,21
T1	2,54	2,31	2,55
T2	2,74	2,45	2,51
T3	3,31	3,00	2,64
T4	2,79	2,89	2,61
Tretment of BOF+ Non Organic Fertilizer		**Varieties**	
	V1	**V2**	**V3**
	.....	Nutrient Uptake P%	.....
T0	0,153	0,102	0,159
T1	0,147	0,135	0,171
T2	0,171	0,192	0,162
T3	0,214	0,204	0,185
T4	0,172	0,194	0,181
Tretment of BOF+ Non Organic Fertilizer		**Varieties**	
	V1	**V2**	**V3**
	.....	Serapan Hara K%	.....
T0	2,17	2,20	1,92
T1	2,41	2,13	2,02
T2	2,19	2,23	2,26
T3	2,90	2,51	2,32
T4	2,75	2,26	2,28

Tabel 7: Result of Weed Vegetation Analysis Before Land Tillage

No.	Type of Weed	SDR (%)	Wet Weight (g)	Dry Weight (g)
1	*Imperata cylindrica*	69,54	1492	566
2	*Cyperus rotundus*	8,72	22,0	6,0
3	*Borreria alata*	6,39	36,0	14,0
4	*Ageratum conyzoides*	5,46	206	7,9
5	*Micania micrantha*	3,39	68,0	26,5
6	*Melaleuca spp*	3,39	4,0	1,0
7	*Acrostichum aureum*	3,11	2,0	0,5

Table 8: Average of Weed Vegetation Analysis (SDR) 2 Days Before Harvest %)

No	Treatment	*Cyperus Compresus*	Name of Weed *Hyptis Capitata*	*Borreria repens* Dc.	Amount (%)
1	T0V1	80,88	11,12	8	100
2	T0V2	71,17	0	28,83	100
3	T0V3	66,55	34,45	0	100
4	T1V1	48,15	30,24	31,61	100
5	T1V2	79,36	10	10,64	100
6	T1V3	58,41	11,59	33	100
7	T2V1	44,3	42,47	13,23	100
8	T2V2	48,35	29,24	22,41	100
9	T2V3	26,05	33,33	40,62	100
10	T3V1	100	0	0	100
11	T3V2	65,5	34,5	0	100
12	T3V3	43,3	43,3	13,4	100
13	T4V1	26,3	73,7	0	100
14	T4V2	74,32	21,24	4,44	100
15	T4V3	93,07	6,93	0	100

Note: Description: T_0V_1 = BOF + 0% N, P, K with Pionner; T_0V_2 = BOF + 0% N, P, K with BISI 18; T_0V_3 = BOF + 0% N, P, K with DK 85; T_1V_1 = BOF + 25% N, P, K with Pionner; T_1V_2 = BOF + 25% N, P, K with BISI 18; T_1V_3 = BOF + 25% N, P, K with DK 85; T_2V_1 = BOF + 50% N, P, K with Pionner; T_2V_2 = BOF + 50% N, P, K with BISI 18; T_2V_3 = BOF + 50% N, P, K with DK 85; T_3V_1 = BOF + 75% N, P, K with Pionner; T_3V_2 = BOF + 75% N, P, K with BISI 18; T_3V_3 = BOF + 75% N, P, K with DK 85; T_4V_1 = BOF + 100% N, P, K with Pionner; T_4V_2 = BOF + 100% N, P, K with BISI 18; T_4V_3 = BOF + 100% N, P, K with DK 85.

Further enhanced the provision of inorganic fertilizer also increases the growth and yield components of maize at 75% dose recommended doses of inorganic fertilizer were tested. This shows that the administration of BOF alone in sub-optimal land is not enough to support growth and crop production, then added inorganic fertilizer to accelerate the availability of nutrients that plants need, because of the nature of organic fertilizers slow release in the supply of nutrients while inorganic fertilizer quickly available in a number of sufficient. In line proposed (Agustina, 1990; and Jumin, 2005) that the availability of nutrients in sufficient quantity and balance are the main factors that determine the success rate of growth and maximum production.

HSD test results, 27 Pioneers hybrid corn varieties produce the best growth and production compared Bisi 18 and DK 85, visible from all variables corn growth and yield components showed the highest values (Table 4). Suspected of hybrid corn variety Pioneer 27 has the adaptability of the environment in swampy areas are better than the varieties and varieties Bisi 18 DK 85. In line with the opinion of Toha (2008) in Barus *et al.* (2014), that the potential yield of a particular variety is not can be separated with the level of adaptation and stability in a growing environment. The level of production of a crop depending on the variety, cultivation methods and environmental conditions where the plants grow. Suistability a cultivated plants against the growth environment is very effect to growth and productivity of these plants. Furthermore, according Simatupang (1997) in Biological *et al.* (2011), that the increase in productivity due to a variety of these varieties able to adapt to the growth environment. While the hybrid maize varieties Bisi 18 have a genetic trait with poorly adapted to the environment swampy areas, so it is not able to demonstrate the primacy of nature, as a result of growth and production produced less than optimal. In line with the opinion of Lovelles (1989) in Biological *et al.* (2011), that each plant has a certain tolerance range of the environmental conditions. Therefore, most plants can be successfully grown in diverse conditions.

The interaction of biological treatment of organic fertilizer + N, P, K with some hybrid corn varieties in swampy areas no real effect on all observed variables. It is suspected between the

factors of fertilizer varieties not cooperate in influencing the growth and production of several varieties of hybrid corn plants or both factors influence treatment separately. According to Hanafi (2010), that is not the interaction of two factors of treatment due to two factors are not able to work together so that the mechanism of action is different or one of the factors did not play a role in an optimal or even antagonistic, which press against each other and their respective influence. Although statistically the interaction of both treatment factors are not real, but a tabulation seen the difference. Combination treatment of BOF + 75% N, P, K with 27 Pioneer hybrid corn varieties produce the best growth and production compared to the combination of other treatments (Table 5). Allegedly at BOF + 75% N, P, K is able to provide sufficient nutrients and balanced to support the growth, development and production of hybrid corn variety Pioneer 27. In line with the opinion of Biological *et al.* (2006) in Pasta *et al.* (2015) that growth, production and quality of sweet corn is influenced by genetic factors that variety and environmental factors such as soil fertility. There is a positive correlation between a combination of BOF + N, P, K, which is further enhanced with plant height, weight of crop residue and dry weight of seed per plot (Figure 1 and Figure 2). In the graph shows that the higher the dose of fertilizer given a high increase in corn and positively correlated with the weight of shelled corn kernels per plot to the extent of fertilizer combination BOF + 75% N, P, K. Similarly, what happened in Figure 2 shows that the increase in plant height due to the increase in dry weight of crop residue of corn and fertilizer peak in the combination treatment of BOF + 75% N, P, K. This is in line propounded by Sujana *et al.* (1991) that generally corn hybrids provide a higher yield than the open pollinated maize. The study showed a positive correlation between the corn is tall with a yield of corn.

Besides the presence of weeds fertilizer factor in corn planting very effect on the growth and production of maize. Generally weeds that predominate in the area of the corn crop that is kind of puzzle-tekian as found in this study there are a lot of weeds *Cyperus compresus*. This includes family Cyperaceae weeds that have a high ability to adapt to the environment, multiply by seed and rhizome, can grow in extreme environmental conditions. As a result of this weed can be controlled space and strong growth in competing with cultivated plants. In accordance opinions Holm *et al.* (1988) in Suryaningsih (2011), that the family Cyperaceae weeds, including weeds that have high adaptability to the environment and a strong root rhizomes and can reproduce by seed and rhizome. Furthermore, according to Tjitrosoedirjo (2010), that the family Cyperaceae weeds have long root systems, many have seeds that cause rapid spread.

The results of the analysis of vegetation weeds before planting No. 7 of weed species (Table 6) and that the dominant weed *Imperata Cylindrica* (69.54%). After treatment, there are 3 types of weeds (Table 7) but the dominant weed namely Cyperus compressus (100%), on average the highest dominant weed in the combination treatment dose interaction BOF + 75% N, P, K. This suggests that the response of weeds and corn plants against fertilizer is the same in terms of fighting nutrients and other growth factors. Besides, the use of Biological Organic Fertilizer (BOF) are weed seeds that are still dormant so it will grow on the environmental conditions favorable. Along expressed Fitriana *et al.* (2011) that the use of manure can lead to the developme nt of weeds in cultivated land.

Physical condition swampy areas that are less supportive and nutrient-poor as well as the presence of weeds although the application of organic and inorganic fertilizers have not been sufficient to support plant growth due to maintenance should still be maintained. In line with the opinion of Suryaningsih (2011) that the presence of weeds can harm other plants that are nearby or a staple crop. Corn is very sensitive to weed competition with the decrease in the yield of 16-56% (Violic, 2000). Critical period of maize crops to compete with weeds occurred on days 20 and 45, then the critical period of maize plants also occurred on days 80 to 150 (Sembodo, 2010). Physically weeds compete with plants in the utilization of space, light and chemically in the utilization of water, nutrients, gases are important in the process allelopati. Competition can take place when components or substances needed by weeds or crops that are in limited quantities, and closely spaced together required (Moenandir, 2010).

CONCLUSION

1. Treatment of organic biological fertilizer + 75% N, P, K is the best treatment for the growth and production of hybrid corn in swampy areas.
2. The hybrid corn varieties are varieties that are best Pioneer 27 the growth and production in swampy areas with yield per plot of 714.67 kg (3, 57 ton ha).
3. Weeds dominant before the research is *Imperata cylindrica* and the in harvesting is *Cyperus rotundus*.

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