Agronomic Characteristics of Three Varieties of Bell Pepper as Affected by the Same Level of Different Organic Fertilizers[1]

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ABSTRACT

The study was conducted at the Romblon State College experimental lot from June to November 2007 to determine the effects of different organic fertilizers on the growth and yield of three varieties of bell pepper: majesty, trinity and kalahari. These three varieties of bell pepper were grown and fertilized with guano, chicken and carabao manure at the same level following the complete randomized block design with three treatments and three replications. The agronomic characteristics like height, number of fruits, and weight of fruits were gathered and analyzed using analysis of variance and Duncan Multiple range test at 5% level of significance.

The findings show that there are no significant differences in height between varieties of bell pepper. There are significant differences on the mean number of fruits of bell pepper as affected by the same level of organic fertilizers. The number of fruits produced by plants fertilized with organic fertilizers are significantly higher compared to control. Plants fertilized with bat and chicken manure produced more fruits compared to those fertilized with carabao manure. The mean number of fruits of majesty and trinity variety is significantly higher compared to Kalahari. The effects of the organic fertilizers on the mean weight of fruits of three varieties are not significant; however, the mean weight of fruits of Majesty variety is significantly higher compared to Trinity and Kalahari varieties.

Key words: *Organic fertilizer, Bell pepper varieties, Agronomic characteristics, Animal manure*

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INTRODUCTION

Animal manure contributes not more than just nitrogen, phosphorus and potassium to the soil, its continued application builds the presence of organic matter in the soil, improves its structure, water holding capacity, aeration, and friability. The presence of manure assists in the slow release of nutrients making these elements available to the plants for a longer time.

The importance of soil fertility helps in making the plants grow vigorously and become productive. This could be achieved by applying organic fertilizers which can be derived from chicken dung, guano, cattle, horse, carabao and swine, commonly found in poultry farms, pasture lands area, caves and horse barns.

The addition of these materials could enrich the soil with nitrogen, phosphorus, potassium and other micronutrients; however its addition to the soil should be based on the stages of plant growth, types of soil and kinds of crop planted. These materials are known to contribute about 30% to 50% increase in the yield of crops.

The continued practice of organic farming has been observed in some parts of the country. According to De la Cruz (2004) organic way of raising vegetables is very common in Region 10, where farmers are found to grow their vegetables in an organic way, a practice that must contribute to the intensive production of vegetables which resulted in the sufficiency of the commodity in provinces and in various markets in Luzon and Visayas during off-season months.

Wide varieties and sources of organic fertilizers have resulted in the production of processed products like liquefied and pellet forms which are sold commercially. In fact, the presence of these forms has given farmers enough supply of organic fertilizers for their plants throughout the vegetable production season.

The use of organic fertilizers provides more advantages than disadvantages to food producers, these are the improvement of soil fertility and structure, increase water holding capacity, and add beneficial biota in the soil (Kuepper, 2003). The continued use of this fertilizer also resulted in high crop yields that are at par with that of chemical or synthetic fertilizers. Colting and Bernard (PCARRD 2001 Highlight 2000) revealed that the use of organic fertilizer resulted in a reduction of soil acidity and lead to the replacement of synthetic inorganic fertilizer with organically produced soil enhancers.

One of the natural sources of organic fertilizer is chicken manure or chicken dung. The use of chicken manure/dung as fertilizer has been a highly recommended material for agricultural production. This manure is composted and converted into "a black gold". It is usually added to the soil by spreading on the surface or by gently working the manure into existing soil. If used in its fresh form, care should be considered because fresh chicken manure contains disease organisms that may contaminate the vegetable gardens and kill the plants.

Farmers have also resorted to guano sourced out from droppings of seabirds or bat. This guano had become an integral partner of farmers in their agricultural activities as natural source of nitrogen, phosphorus, potassium and minor trace elements for plants overall health (Malcolm). Everything in guano, even the microbes are considered useful and necessary for the soil, roots development and foliage of plant life. Guano is considered a 100 percent natural organic soil amendment. However, since this pellet manure does not decompose easily it becomes dangerous to apply to plants, thus it is recommended that this should be incorporated properly to the soil before planting and should be decomposed first to make it more effective in supplying the nutrients for the plants. Care is therefore necessary in the above practice.

One of the vegetables that is highly in demand is bell pepper, a vegetable commonly grown in highland areas, noted for its cool and humid weather. However, its productivity is affected by the type and fertility of the soil which are the basic requirements in the cultural aspects of plant production. Because of this, it could be found that the supply of bell pepper in the market is limited, not enough to cater to the needs of the consumers besides being expensive for the ordinary consumer. It is therefore necessity of making bell pepper more accessible to most people.

The present study was conducted to determine the effects of different organic fertilizers applied at the same level on the growth and yield of sweet bell pepper under Romblon State College conditions.

STATEMENT OF THE PROBLEM

The study was conducted to determine the effect of different organic fertilizers applied at the same level on the growth and yield of different varieties of bell pepper under Romblon Sate College condition. Specifically, it sought answers to the following questions:

1. Are there significant differences in the growth and yield of three varieties of bell pepper treated with the same level of bat, chicken, and carabao manure?
2. Which organic fertilizer is found to produce a significantly higher growth and yield of bell pepper?
3. Which variety of bell pepper is highly responsive to organic fertilizer?

MATERIALS AND METHODS

The experimental method of research particularly the randomized complete block design (RCBD) factorial was used in this study. The experiment had four treatments and three replications. The treatments used were the same level of organic fertilizers (40 grams bat manure, 40 grams chicken manure, 40 grams carabao manure, and control- no fertilizer). Three varieties of bell pepper and the three varieties (Majesty, Trinity, and Kalahari) were used in this study.

The three varieties of hybrid sweet bell pepper were obtained from the East West Seed company and the three kinds of organic fertilizers were gathered from pasture lands, poultry farm and caves in the province of Romblon.

The organic fertilizers were dried, pulverized and weighed, and this were basally applied to the soil with a rate of 40 grams per plant by treatment and replications. The three varieties of hybrid sweet bell pepper were planted at the distance of 50 cm by 50 cm to 1 m by 1 m plot at the experimental area from June to November 2007.

Seeds of three varieties of bell pepper were sowed separately in the respective seed boxes and maintained daily until such time that the plants were ready for transplanting.

The agronomic characteristics of bell pepper gathered were the height (cm) number of fruits and weight (grams) of fruits. The data gathered were analyzed using analysis of variance (ANOVA) for the randomized complete block design and Duncan's Multiple Range Test (DMRT) at the 5% level of significance, was used.

RESULTS AND DISCUSSION

As shown in Table 1, the same levels of different organic fertilizers namely bat, chicken, and carabao manure did not significantly affect the height of the three varieties of bell pepper. The differences in height between varieties of the bell pepper is not significant.

Table 1. Average Height (cm) of Three Varieties of Bell Pepper as Affected by the Same Level of Organic Fertilizers

Treatment	Varieties of Bell Pepper			Total	Mean
	Majesty	Trinity	Kalahari		
Bat manure	31.33	31.33	32.33	94.99	31.66a
Chicken manure	40.67	29.50	33.00	103.17	34.39a
Carabao manure	30.67	31.33	29.67	91.67	30.56ab
Control	28.67	27.00	24.33	80	26.67b
Total	131.34	119.16	119.33		
Mean	32.84 a	29.79a	29.83a		30.82

CV = 18.45%

Means followed by a common letter in rows or column are not significantly different at 5% level using DMRT

The number of fruits produced by majesty and trinity varieties was significantly higher compared to Kalahari variety (Table2). The number of fruits obtained by plants fertilized with organic fertilizers was significantly higher compared to control. Plants fertilized with bat and chicken manure produced significantly higher number of fruits of bell pepper compared to fertilized with carabao manure.

Table 2. Average Number of Fruits of Three Varieties of Bell Pepper as Affected by Same Level of Organic Fertilizers

Treatment	Varieties of Bell Pepper			Total	Mean
	Majesty	Trinity	Kalahari		
Bat manure	6.67	8.33	4.33	19.33	6.44a
Chicken Manure	6.0	5.67	5	16.67	5.56ab
Carabao Manure	4.33	5.67	4	14.0	4.67b
Control	3.67	3.33	2.67	9.67	3.22c
Total	20.67	23.00	16		
Mean	5.18a	5.75a	4b		4.97

CV = 18.66%

Means followed by a common letters in row and column are not significantly different at 5% level using DMRT.

Table 3. Average Weight (grams) of Fruits of Three Varieties of Bell Pepper as Affected by the Same Level of Organic Fertilizers

Treatment	Varieties of Bell Pepper			Total	Mean
	Majesty	Trinity	Kalahari		
Bat manure	86.67	61.67	74.33	222.67	74.22a
Chicken manure	80.00	59.67	68.67	208.34	69.45a
Carabao manure	91.00	62.00	71.33	224.33	74.78a
Control	84.00	56.00	67.20	207.20	69.07a
Total	341.67	239.34	281.53		
Mean	85.42a	59.83b	70.38b		71.88

CV=18.71%

Means followed by the same letter in row or column are not significantly different at 5% level using DMRT.

Table 3, reveals interesting observations among the three varieties in terms of yield (weight of fruits) using the three organic fertilizers. Majesty has higher mean weight in terms of yield of fruit followed by Trinity and Kalahari.

CONCLUSIONS

1. There are no significant differences in terms of the height of the three varieties of bell pepper treated with the same level of different organic fertilizers.
2. There is a significant difference observed in the number of fruits of the three varieties of bell pepper treated with the same level of organic fertilizers.
3. No significant differences are observed in the mean weight of fruits of the three varieties of bell pepper treated with the same level of organic fertilizers.
4. Majesty variety is found to be more responsive to organic fertilizer compared to Trinity and Kalahari.
5. Processed/dried organic fertilizers as bat, guano, chicken, etc. may be good alternative to commercially prepared fertilizers for growing the three varieties of pepper namely majesty, trinity and Kalahari.

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