

## **BIBLIOGRAPHY**

OWAY, REY C. APRIL 2013. Growth and Yield Response of Cucumber (*Cucumis sativus*) to Different Organic Fertilizers. Benguet State University, La Trinidad Benguet.

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## **ABSTRACT**

This study was conducted at the Balili Organic Farm, Benguet State University, La Trinidad Benguet from October to January 2013 to determine the growth and yield response of cucumber to different organic fertilizers and identify the best organic fertilizer suited to cucumber production.

Study revealed that the different organic fertilizers applied had no significant effect on the number of nodes to first flowering, fruit diameter, number of days to flowering, male to female ratio and the number of days from transplanting to harvesting. In terms of fruit length, weight of marketable fruits and length of vines, plants applied with Yama bym, processed chicken manure (PCM) and Bioganic enhanced the production of longest fruits, heavier fruits and longer vines, as compared to the control and to plants applied with alnus compost.



## RESULTS AND DISCUSSION

### Soil Analysis

The soil analysis in the experiment area before land preparation had a pH of 5.63 and contained 2.5% organic matter, 63 ppm phosphorus and 400 ppm potassium. After the experiment the soil had a pH of 5.85 and contained 2.0% organic matter, 88 ppm phosphorus, and 240 ppm potassium.

Table 1. Soil analysis

	P (ppm)	K (ppm)	OM (%)	pH
Initial	63	400	2.5	5.63
Final	88	240	2.0	5.85

Ppm (parts per million)

### Average Number of Nodes per Plant

The average number of nodes per plant was not significantly affected by the organic fertilizers applied as shown in Table 2. It was evident that no significant statistically difference existed among the plant applied with different organic fertilizer. However, numerical data shows that plants applied with Bioganic and Yama bym organic fertilizers appear to have produced slightly higher number of nodes per plot.



Table 2. Average number of nodes per plant

TREATMENT	MEAN
No application (control)	3.00 <sup>a</sup>
Alnus compost	3.00 <sup>a</sup>
Bioganic	3.75 <sup>a</sup>
Processed Chicken Manure	3.00 <sup>a</sup>
Yama bym	3.25 <sup>a</sup>
CV (%)	24.71

Means with a common letter are not significantly different at 5% level by DMRT

#### Male to Female Flower Ratio

The ratio between the male and female flowers was not affected by the application of the different organic fertilizers showing no significant differences as shown in Table 3. However, numerical figures show that higher male to female flower ratio was observed in the plants applied with the Alnus compost. The least ratio was noted on the plants applied with the processed chicken manure.

#### Number of Days to First Flowering

The fertilizer treatment did not significantly affect the number of days to first flowering as shown in Table 4. All the cucumber plants applied with the various organic fertilizers produced flower within 41 days.



Table 3. Male to female flower ratio

TREATMENT	MEAN
No application (control)	0.67 <sup>a</sup>
Alnus compost	0.73 <sup>a</sup>
Bioganic	0.41 <sup>a</sup>
Processed Chicken Manure	0.35 <sup>a</sup>
Yama bym	0.50 <sup>a</sup>
CV (%)	0.00

Means with a common letter are not significantly different at 5% level by DMRT

Table 4. Number of days to first flowering

TREATMENT	MEAN
No application	41.00 <sup>a</sup>
Alnus compost	41.00 <sup>a</sup>
Bioganic	41.00 <sup>a</sup>
Processed Chicken Manure	41.00 <sup>a</sup>
Yama bym	41.00 <sup>a</sup>
CV (%)	0.00

Means with a common letter are not significantly different at 5% level by DMRT



### Number of Days from Transplanting to Harvesting

The fertilizer treatments did not significantly affected the number of days from transplanting to harvesting was shown in Table 5. All the cucumber plants applied with the various organic fertilizers were harvested within 73 days which may mean that cucumbers fruit could be harvested at the same time regardless of the application of organic fertilizers.

Table 5. Number of days from transplanting to harvesting

TREATMENT	MEAN
No application	73.00 <sup>a</sup>
Alnus compost	73.00 <sup>a</sup>
Bioganic	73.00 <sup>a</sup>
Processed Chicken Manure	73.00 <sup>a</sup>
Yama bym	73.00 <sup>a</sup>
CV (%)	0.00

Means with a common letter are not significantly different at 5% level by DMRT

### Fruit Length and Diameter (cm)

Table 6 shows the fruits harvested from plants applied with Yama bym, PCM and Bioganic have no significant differences as to fruit length but it was significantly different from fruits harvested from plants grown in the control and using Alnus compost. Fruit diameter was significantly affected by the different organic fertilizers applied. Results show that cucumber applied with Yama bym attained wider fruit diameter but are statistically comparable to cucumber applied with the Bioganic and PCM fertilizer. The least fruit diameter was noted on the plants with no fertilizer application.



Table 6. Fruit length and diameter (cm)

TREATMENT	FRUIT DIAMETER MEAN	FRUIT LENGTH MEAN
No application	3.38 <sup>a</sup>	9.75 <sup>b</sup>
Alnus compost	3.83 <sup>a</sup>	10.50 <sup>b</sup>
Bioganic	4.05 <sup>a</sup>	13.12 <sup>a</sup>
Processed Chicken Manure	3.75 <sup>a</sup>	13.25 <sup>a</sup>
Yama bym	4.13 <sup>a</sup>	13.00 <sup>a</sup>
CV (%)	10.97	6.20

Means with a common letter are not significantly different at 5% level by DMRT

#### Average Number of Fruit per Plant

The results in Table 7 shows that plants applied with Yama bym had significantly produced higher average number of fruits per plant. Similarly, plants applied with Bioganic and PCM produced statistically comparable average number of fruits per plant. Plants applied with Alnus compost and plants with no fertilizer application produced the least average number of fruits per plant.



Table 7. Average number of fruits per plant

TREATMENT	MEAN
No application	2.50 <sup>b</sup>
Alnus compost	2.50 <sup>b</sup>
Bioganic	3.50 <sup>ab</sup>
Processed Chicken Manure	3.75 <sup>a</sup>
Yama bym	4.00 <sup>a</sup>
CV (%)	19.46

Means with a common letter are not significantly different at 5% level by DMRT

Final Vine Length of the Plant at Fruiting (cm)

There were significant statistically differences noted on the table 8 regarding final vine lengths as affected by the application of various organic fertilizers. Plants applied with PCM produced longer vines but not significantly different from the plants grown using Bioganic and Yama bym. Plants grown within no fertilizer application having the lowest vine length but are comparable to the plants applied with Alnus compost.



Table 8. Final vine length of the plant at fruiting stage (cm)

TREATMENT	MEAN
No application	74.00 <sup>c</sup>
Alnus compost	84.75 <sup>b</sup>
Bioganic	97.25 <sup>a</sup>
Processed Chicken Manure	101.00 <sup>a</sup>
Yama bym	94.00 <sup>a</sup>
CV (%)	5.91

Means with a common letter are not significantly different at 5% level by DMRT

#### Marketable Yield (g)

Table 9 shows that plants applied with Yama bym fertilizer produced the highest weight of marketable yield but not significantly different to the plants applied with PCM and Bioganic fertilizers having a mean of 592.5 grams and 550 grams respectively. The lowest marketable yield produced was observed on plants applied with no fertilizer application but are again statistically comparable with the plants applied with Alnus compost.





Table 9. Marketable yield (g)

TREATMENT	MEAN
No application	162.50 <sup>b</sup>
Alnus compost	175.00 <sup>b</sup>
Bioganic	550.00 <sup>a</sup>
Processed Chicken Manure	592.00 <sup>a</sup>
Yama bym	635.00 <sup>a</sup>
CV (%)	13.93

Means with a common letter are not significantly different at 5% level by DMRT

#### Non-Marketable Yield (g)

The results in Table 10 reveal that the highest weight non- marketable fruits were observed on the plants applied with Yama bym but did not differ from plants applied with PCM. It was followed by plants applied with Bioganic which did not also differ from the control.



Table 10. Non-marketable yield (g)

TREATMENT	MEAN
No application	137.50 <sup>c</sup>
Alnus compost	175.00 <sup>bc</sup>
Bioganic	200.00 <sup>bc</sup>
Processed Chicken Manure	250.00 <sup>ab</sup>
Yama bym	287.50 <sup>a</sup>
CV (%)	24.30

Means with a common letter are not significantly different at 5% level by DMRT

### Total Yield

Table 11 shows the total yield as affected by the different organic fertilizers used. The plants applied with Yama bym had the highest total yield but are comparable to the yield of plants applied with PCM followed by the plants applied with Bioganic fertilizers. The lowest yields were noted on the plants applied with Alnus compost and plants not applied with fertilizers.



Table 11. Total Yield (g)

TREATMENT	MEAN
No application	300.00 <sup>c</sup>
Alnus compost	350.00 <sup>c</sup>
Bioganic	737.50 <sup>b</sup>
Processed Chicken Manure	825.00 <sup>ab</sup>
Yama bym	885.00 <sup>a</sup>
CV (%)	14.51

Means with a common letter are not significantly different at 5% level by DMRT

Insect (fruit fly) and Disease (powdery mildew) Reaction

The occurrence of insect and disease shown in Table 12 and 13 is not affected by organic fertilizers showing no significant difference but statistically the Alnus compost and no fertilizer application has the highest disease and insect infestation.



Table 12. Disease (powdery mildew) reaction

TREATMENT	MEAN
No application	2.00 <sup>a</sup>
Alnus compost	2.00 <sup>a</sup>
Bioganic	3.00 <sup>a</sup>
Processed Chicken Manure	3.00 <sup>a</sup>
Yama bym	3.00 <sup>a</sup>
CV (%)	0.00

Means with a common letter are not significantly different at 5% level by DMRT

Scales:

<u>Disease Rating</u>	<u>Description</u>	<u>Reaction</u>
5	None of the population is infected.	Highly resistant
4	1-25% of the population is infected.	Resistant
3	26-50% of the population is infected.	Moderately Resistant
2	51-75% of the population is infected.	Susceptible
1	76-100% of the total population is infected	Very Susceptible



Table 13. Insect (fruit fly) reaction

TREATMENT	MEAN
No application	2.00 <sup>a</sup>
Alnus compost	2.00 <sup>a</sup>
Bioganic	3.00 <sup>a</sup>
Processed Chicken Manure	3.00 <sup>a</sup>
Yama bym	3.00 <sup>a</sup>
CV (%)	0.00

Means with a common letter are not significantly different at 5% level by DMRT

### Insect Infestation

<u>Rating Scale</u>	<u>Description</u>
1	(40% or more) Severe infestation
2	(20-39%) Moderate Infestation
3	(1-19%) Slight Infestation
4	No Infestation





Figure 1. Overview of the experiment at seedling stage



Figure 2. Overview of the experimental area at flowering and fruiting stage

## SUMMARY, CONCLUSION, RECOMMENDATIONS

### Summary

The study was conducted at Balili Organic Farm of Benguet State University, La Trinidad, Benguet from October to January 2013 to evaluate the growth and yield of cucumber as affected by organic fertilizers and identify the best organic fertilizer suited to cucumber production

Results revealed that the amount of organic matter after planting decreased while the soil pH increased. The average number of nodes per plant was not significantly affected by the organic fertilizer but statistically Bioganic fertilizer induced the production of more number of nodes followed by plant applied with PCM. In male to female flower ratio, results showed that there are no significant differences but numerical figures shows that Alnus compost had the highest ratio and PCM had the least male to female flowers developed. The number of days to first flowering and the number of days from transplanting to harvesting had exactly the same results. In fruit diameter and fruit length, plants applied with PCM fertilizer attained the widest fruit and no application had the least fruit diameter. The average fruits per plant show that plant applied with Yama bym produced higher average fruit per plant, while the plants applied with both Alnus compost and no application fertilizer had the least average. The fruit vine length there were not significance affected with the application of the various organic fertilizers. In the marketable and non marketable yield, plants applied with Yama bym attained the highest results. In the occurrence of insect and disease both Alnus compost and no application of fertilizer was the most susceptible among the treatments.



## Conclusion

Based on the results presented and discussed, the different organic fertilizers had varying effects on the growth and yield of cucumber.

## Recommendations

Based on the results of the study, application of Yama bym can increase the growth and yield of cucumber. It is further recommended that another study along this line be conducted to further validate the results.





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