BIBLIOGRAPHY

MAYOMES, GABELON D. APRIL 2013, Yield and Profitability of Pak Choi 'Cherokee' Applied with Varying Rates of Dalfos Guano Phosphate. Benguet State University, La Trinidad, Benguet.

Adviser: Silvestre L. Kudan, PhD.

ABSTRACT

Results of the study revealed that there were no significant differences among the various rates of Dalfos guano phosphate applied to pak choi when the soil had a pH of 6.03, contain 6.0 % organic matter, 172 ppm of phosphorus and 1,180 ppm potassium before planting. The leaf length, number of leaves per plant, weight of individual plant, weight of marketable plants per plot and the computed yield per hectare did not differ statistically in terms of profitability, the plants applied with 125g per 5 sq m had the highest net income followed by the plants without application of Dalfos guano phosphate and those applied with 50g per 5 sq m, 75g, 25g, and the 100g, obtained the lowest net income. Based on the results of this study, the production cost per kilo was Php 15.91 which was the expenses incurred to produce one kilo of pak choi.

RESULTS AND DISCUSSION

Leaf Length

As presented in Table 1, no significant differences of leaf length were observed among the rates of applying guano phosphate to pak choi 'Cherokee'. The plants not applied with guano phosphate has shorter leaves but the 3.75 cm difference from the longest leaves produced by the plants applied with 125 g per 5 sq. m plot was statistically insignificant.

Table 1.Leaf length (cm)

TREATMENT	MEAN
No guano phosphate application (control)	18.13[a]
25 g guano phosphate per 5 sq. m plot	19.03[a]
50 g guano phosphate per 5 sq. m plot	19.85[a]
75 g guano phosphate per 5 sq. m plot	19.73[a]
100 g guano phosphate per 5 sq. m plot	19.94[a]
125 g guano phosphate per 5 sq. m plot	21.88[a]

Means with the same letter are not significantly different at 5% level by DMRT

Table 2. Soils analysis result from the Department of Agriculture Soil Laboratory in Baguio city

SOILS ANALYSIS	PH	OM (%)	P (ppm)	K (ppm)
Before Planting	6.03	6	172	1,180
After Planting	5.93	4.50	180	512

The slight differences in the length of pak choi leaves may be due to the presence of nutrient elements in the soils enough to support the plants as shown in the soil samples analysis (Table 2). The area utilized in this study had been continuously applied with compost since 2003 and then converted to organic farming practices in 2008 which might explain the slight differences in leaf length among the treatment plants. Fig. 2 shows the crop stand from the different treatments plot with similar heights.

Figure 2. Photographs of the plants from the different treatment plots of block 2, the similar crop stand and the insect damage on the leaves

Number of Leaves Produced per plant at Harvest

The application of 125 g of guano phosphate produced slightly higher number of leaves compared to the rest of the treatments (Table 3). The slight differences in number of leaves among the plants applied with varying rates of guano phosphate including the plants not applied with guano phosphate may be due to the availability of nutrient element as discussed earlier.

Table 3. Number of leaves produced at harvest

TREATMENT	MEAN
No guano phosphate application (control)	8.00[a]
25 g guano phosphate per 5 sq. m plot	8.13[a]
50 g guano phosphate per 5 sq. m plot	9.10[a]
75 g guano phosphate per 5 sq. m plot	8.60[a]
100 g guano phosphate per 5 sq. m plot	7.70[a]
125 g guano phosphate per 5 sq. m plot	9.23[a]

Means with the same letter are not significantly different at 5% level by DMRT

Weight of Individual Plant

Table 4 shows the weight of individual plant from the different rates of guano phosphates application. Similar to the other data, there were no statistical differences observed. This may suggest that the soil consisting 6% organic matter and the presence of 172 ppm of phosphorous and 1,180 ppm of potassium before planting is enough for pak choi and the application of guano phosphate at any rate is unnecessary.

Table 4. Weight of individual plant (g)

TREATMENT	MEAN
No guano phosphate application (control)	33.19[a]
25 g guano phosphate per 5 sq. m plot	31.99[a]
50 g guano phosphate per 5 sq. m plot	30.69[a]
75 g guano phosphate per 5 sq. m plot	29.94[a]
100 g guano phosphate per 5 sq. m plot	33.86[a]
125 g guano phosphate per 5 sq. m plot	26.27[a]

Means with the same letter are not significantly different at 5% level by DMRT

Weight of Marketable Plants per Plot

Table 5 shows that the plants applied with 125 g guano phosphate per 5 sq m produced the highest weight of marketable plant per plot among the various rates studied. However, the statistical analysis did not show any significant differences among the treatments studied. As explained earlier, the experiment are may have enough nutrients elements as shown in Table 2 so the application of guano phosphate did not affect the weight of marketable plants per plot.

Table 5. Weight of marketable plants per plot (kg)

TREATMENT	MEAN
No guano phosphate application (control)	8.38[a]
25 g guano phosphate per 5 sq. m plot	8.15[a]
50 g guano phosphate per 5 sq. m plot	8.46[a]
75 g guano phosphate per 5 sq. m plot	8.42[a]
100 g guano phosphate per 5 sq. m plot	6.94[a]
125 g guano phosphate per 5 sq. m plot	9.22[a]

Means with the same letter are not significantly different at 5% level by DMRT

Computed Yield per Hectare

The computed yield per hectare from the yield per plot of 5 sq m showed similar results with that weight of marketable plants per plot where there were no significant differences among the treatments (Table 6). This observation may agree to the statement of Pears (2002) that the soil must be rich in humus where the experiment area has 6% organic matter before planting (Table 2). Aside from the organic matter, the phosphorous and potassium content is high already in the soil.

Table 6. Computed yield per hectare (ton/ha)

TREATMENT	MEAN
No guano phosphate application (control)	16.23[a]
25 g guano phosphate per 5 sq. m plot	16.10[a]
50 g guano phosphate per 5 sq. m plot	15.59[a]
75 g guano phosphate per 5 sq. m plot	16.90[a]
100 g guano phosphate per 5 sq. m plot	13.74[a]
125 g guano phosphate per 5 sq. m plot	18.33[a]

Means with the same letter are not significantly different at 5% level by DMRT

Cost and Return Analysis

The different rates of guano phosphate application on pak choi 'Cherokee' had slight differences in yield and the level inputs, which resulted to slight differences in net profit (Table 7). In terms of return on cash expenses, the application of 125 g per5 sq m had the highest of 247.95 % or p 2.48 for every peso spent in the production which was followed classify by the plants not applied with guano phosphate, plants applied with 50g, 75g, 25g and the 100g had the lowest with their respective ROCE of 224.48%, 224.29%, 221.12%, 214.06% and 163.91%.

Table 7. Cost and return analysis

ITEM	RATES OF GUANO PHOSPHATE					
	25g	50g	75g	100g	125g	Control
YIELD (kg)	24.45	25.38	25.25	20.81	27.65	25.15
SALES (P)	1222.50	1269.00	1262.50	1040.50	1382.50	1258.00
EXPENSES:						
Alnus Compost	23.33	23.33	23.33	23.33	23.33	23.33
Seeds	14.85	14.85	14.85	14.85	14.85	14.85
Guano Phosphate	1.88	3.75	5.63	7.5	9.36	-
Packaging materials	4.27	4.44	4.4	3.64	4.84	4.41
Labor						
Land preparation	53.33	53.33	53.33	53.33	53.33	53.33
Planting	50.00	50.00	50.00	50.00	50.00	50.00
Guano phosphate application	32.50	32.50	32.50	32.50	32.50	32.50
Irrigation	33.33	33.33	33.33	33.33	33.33	33.33
Harvesting	120.67	120.67	120.67	120.67	120.67	120.67
Depreciation Cost						
G.I pipes	23.45	23.45	23.45	23.45	23.45	23.45
Plastic roofing	31.67	31.67	31.67	31.67	31.67	31.67
EXPENSES (Php)	389.26	391.32	393.16	394.27	397.33	387.50
NET INCOME (Php)	833.24	877.68	869.34	646.23	985.17	870.00
ROCE %	214.06	224.29	221.12	163.91	247.10	224.50
RANK	5	3	4	6	1	2

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The study was conducted at Balili Organic Farm of Benguet State University, La Trinidad, Benguet from December 2012 to January 2013 to evaluate the growth and profitability of Pak choi treated with different rates of Dalfos Guano Phosphote.

Results of the study revealed that there were no significant differences among the various rates of Dalfos guano phosphate applied to pak choi when the soil had a pH of 6.03, contain 6.0 % organic matter, 172 ppm of phosphorus and 1,180 ppm potassium before planting. The leaf length, number of leaves per plant, weight of individual plant, weight of marketable plants per plot and the computed yield per hectare did not differ statistically in terms of profitability, the plants applied with 125g per 5 sq m had the highest net income followed by the plants without application of Dalfos guano phosphate and those applied with 50g per 5 sq m, 75g, 25g, and the 100g, obtained the lowest net income. Based on the results this study, the production cost per kilo was Php 15.91 which was the expenses incurred to produce one kilo of pak choi.

Conclusions

Based on the results presented and discussed, the application of guano phosphate to pak choi ‘cherokee’ did not affect the yield and profit significantly when the soil pH is 6.0 with 6% organic matter and contains 172 ppm phosphorus and 1,180 ppm potassium. However, the application of 125g guano phosphate per 5 sq m may have slight advantage of higher net income.

Recommendations

It is therefore recommended that there is no need to apply guano phosphate when the soil pH is 6.0 with organic matter of 6% and phosphorus and potassium of 172 ppm, and 1,180 ppm, respectively. It is also recommended that the result of this study be verified as there was no trend observed from the increasing rate of guano phosphate application.

LITERATURE CITED

DOUBRAVA, C.M.2000 Pak choi. Fall Volume: Issue: 7(3)

PEARS, D. 2002.Encyclopedia of Organic Gardening. D.K Publishing Inc. Hudson Street, New York. P. 357.

PILPILING, J.E. 2010, Growth and Yield of Pak choi 'Cherokee' grown on soil with and without pine needle litters. BS thesis (Unpub). Benguet State University, La Trinidad, Benguet. P. 4.

PINGALO, A.V. 2008, Yield and profitability of Pak choi 'Cherokee' applied with foliar fertilizer. BS thesis (Unpub). Benguet State University, La Trinidad, Benguet. P. 22.

SAHADEVAN, N. 1987.Green Fingers. Sahadevan Publication, Seremban, Sembilan, Malaysia. Pp. 76-79.

SALISBURY, F.B AND C. ROSS. 1969. Plant Physiology. Woodworth Publishing Collection Co, Belmont, California. Pp. 203-204.

SIEMONSMA, J.S. AND PILUEK, K. (Eds.) 1994 Plant Resources of South-East Asia No. 8. Vegetables. Prosea Foundation, Bogor, Indonesia. Pp. 130-131.

SUBIDO, P.S.1961.The rate of fertilizer in crop production. Plant Industry Digest 24(4): 11.

TINDALL, H.D 1983. Vegetables in the Tropics. McMillan Education L.T.D Houndmills, Basingtoke, London. Pp.110-113.

TURK, L.M, 1972. Fundamentals of Soil Science. New York: John Wiley and Son Inc. Pp. 350-351.

WAYAN, E.L. 1997. Efficacy evaluation of 14-10-12 foliar fertilizer on the growth and yield of lettuce. BS Thesis (Unpub). Benguet State University, La Trinidad Benguet Pp. 32.