BIBLIOGRAPHY

CUEBES, KYLE T. APRIL 2013. Effect of Different Fertilizer Rates on the Growth and Yield of Carrot (*Daucus carota*). Benguet State University, La Trinidad, Benguet.

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ABSTRACT

The study was conducted in Abiang, Atok, Benguet from November 2012 to February 2013 to determine the effect of different fertilizer rates on the growth and yield of carrot; to determine the best kind of fertilizer suited for carrot production and; to determine the economics of using different rates of fertilizer application on carrot production.

Results showed that Cv. Teracota carrots applied with 16-16-16 (Vikingship fertilizer) significantly produced bigger and heavier, higher marketable roots, had the higher yield produced and computed yield per area. Likewise, application of 16-16-16 at the rate of 781g/5m^2 plot had the highest return on investment of 87.38% compared to other fertilizers applied.

RESULTS AND DISCUSSION

Days From Sowing to Harvest

Result revealed that highly significant differences were observed on the number of days from sowing to harvesting as affected by different rates of fertilizer application as shown in Table 1. Application of 27-0-0 + 0-18-0 +0-0-60 on the plants with rates of 462, 694, 208g/5m^2 plot had delayed harvesting of carrots that reached a mean of 100 days from sowing the seeds but are statistically comparable to the plants applied with 21-0-0 + 0-18-0 + 0-0-60, 46-0-0 + 0-18-0 + 0-0-60 and 12-12-12 at the rate of 595,694,208g/5m^2 plot, 271, 694, 208g/5m^2 plot with means of 98.33 to 99.33 days while the plants applied with chicken dung + 14-14-14 (farmer's practice) at the rate of 250g/5m^2 plot, triple 14 at the rate of 892g/5m^2 plot and 16-16-16 (Vikingship fertilizer) at the rate of 781g/5m^2 plot were harvested earlier with means ranging from 96 to 97 days from sowing the seeds.

Number of Big Roots

Results showed significant differences with regards to the number of big roots of Teracota carrots as affected by different kinds and rates of fertilizers applied. Tables 2 shows that application of Chicken dung + T-14(Famer's practice) on the plants at the rate of 250g/5m^2 plot and 16-16-16 (Vikingship fertilizer) at the rate of 781g/5m^2 plot produced the highest number of big roots harvested with means of 133.33 and 134.33. This was followed by the application of 14-14-14, 21-0-0 + 0-18-0 + 0-0-60, 12-12-12, 46-0-0 + 0-18-0 + 0-0-60 and 27-0-0 + 0-18 + 0-0-60 at different rates which had means ranging from 106.67 to 111.67, respectively.

Table1.Days from sowing to harvesting

TREATMENT	MEAN (Days)
Chicken dung + 14-14-14 (farmer's practice)	96.00[c]
14-14-14 (Danat Hi-Yield Philippine Planters)	97.00[c]
21-0-0 + 0-18-0 + 0-0-60 (Ammonium sulfate, + Solophos, Muriate of Potash)	99.33[ab]
12-12-12 (Fujiyama)	98.33[b]
46-0-0 + 0-18-0 + 0-0-60 (Urea+ Solophos, Muriate of Potash)	99.33[ab]
16-16-16 (Vikingship fertilizer)	96.00[c]
27-0-0 + 0-18-0 + 0-0-60 (Calcium nitrate+ Solophos, Muriate of Potash)	100.00[a]

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

Table 2. Number of big roots

TREATMENT	MEAN
Chicken dung + 14-14-14 (farmer's practice)	133.33[a]
14-14-14 (Danat Hi-Yield Philippine Planters)	111.67[b]
21-0-0 + 0-18-0 + 0-0-60 (Ammonium sulfate, + Solophos, Muriate of Potash)	106.67[b]
12-12-12 (Fujiyama)	111.00[b]
46-0-0 + 0-18-0 + 0-0-60 (Urea+ Solophos, Muriate of Potash)	109.00[b]
16-16-16 (Vikingship fertilizer)	134.33[a]
27-0-0 + 0-18-0 + 0-0-60 (Calcium nitrate+ Solophos, Muriate of Potash)	107.67[b]

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

Number of Medium Roots

Highly significant differences was noted on the number of medium roots as affected by different kinds and rates of fertilizer application. It was shown in Table 3 that application of Chicken dung + 14-14-14(Farmer's practice) on the plants at the rate of 250g/5m^2 plot and 16-16-16 (Vikingship fertilizer) at the rate of 781g/5m^2 plot still produced the highest number of medium roots with a mean of 106.67. This was followed by the application of 14-14-14 and 46-0-0 + 0-18-0 + 0-0-60 with a mean of 93.33 and 95.00 medium roots but are comparable also to the plants applied with 27-0-0 + 0-18-0 + 0-0-60.Lowest number of a medium roots were produced from plants applied with 12-12-12 at the rate of 100g/5m^2 plot with a mean of 66.67.

Table 3.Number of medium roots

TREATMENT	MEAN
Chicken dung + 14-14-14(farmer's practice)	106.67[a]
14-14-14 (Danat Hi-Yield Philippine Planters)	93.33[b]
21-0-0 + 0-18-0 + 0-0-60 (Ammonium sulfate, 14-14-14 +Solophos, Muriate of Potash)	181.67[c]
12-12-12 (Fujiyama)	66.67[d]
46-0-0 + 0-18-0 + 0-0-60 (Urea, 14-14-14 + Solophos, Muriate of Potash)	95.00[b]
16-16-16 (Vikingship fertilizer)	106.67[a]
27-0-0 + 0-18-0 + 0-0-60 (Calcium nitrate, 14-14-14 + Solophos, Muriate of Potash)	87.67[bc]

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

Number of Small Roots

Table 4 shows that highly significant differences were obtained on the number of small roots of carrots as affected by different kinds and rates of fertilizer application. Application of 12-12-12 at the rate of 1000g/5m^2 plot produced the highest number of small roots followed by the application of 21-0-0 + 0-18-0 + 0-0-60 at the rate of 595, 694 and 208g/ 5m^2plot with a mean of 61.67. Application of Chicken dung + 14-14-14 and 16-16-16 (Vikingship) fertilizers on the plants produced the least number of small roots with a mean of 9 and 16.67.

Table 4. Number of small roots

TREATMENT	MEAN
Chicken dung + 14-14-14(farmer's practice)	16.67[d]
14-14-14 (Danat Hi-Yield Philippine Planters)	48.33[c]
21-0-0 + 0-18-0 + 0-0-60 (Ammonium sulfate + Solophos, Muriate of Potash)	61.67[b]
12-12-12 (Fujiyama)	72.33[a]
46-0-0 + 0-18-0 + 0-0-60 (Urea+ Solophos, Muriate of Potash)	46.67[c]
16-16-16 (Vikingship fertilizer)	9.00[d]
27-0-0 + 0-18-0 + 0-0-60 (Calcium nitrate + Solophos, Muriate of Potash)	54.67[bc]

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

Total Number of Roots

Results revealed that there were no significant statistical differences noted on the total number of roots as affected by the different fertilizers and rates of application (Table 5). However, numerical results showed that the highest total number of roots were produced by the plants applied with the Chicken dung + 14-14-14 at the rate of 250g/ 15m^2 plot followed by 14-14-14 application at the rate of 892g/ 5m^2 plot having a mean 253.33 plant roots.

Table 5. Total number of roots

TREATMENT	MEAN
Chicken dung + 14-14-14 (farmer's practice)	256.67[a]
14-14-14 (Danat Hi-Yield Philippine Planters)	253.33[a]
21-0-0 + 0-18-0 + 0-0-60 (Ammonium sulfate + Solophos, Muriate of Potash)	250.00[a]
12-12-12 (Fujiyama)	250.67[a]
46-0-0 + 0-18-0 + 0-0-60 (Urea14 + Solophos, Muriate of Potash)	250.00[a]
16-16-16 (Vikingship fertilizer)	250.00[a]
27-0-0 + 0-18-0 + 0-0-60 (Calcium nitrate+ Solophos, Muriate of Potash)	250.00[a]

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

Weight of Big Roots

Results revealed that there were highly significant differences observed on the plants with regards to the number of big roots as shown in Table 6. Heaviest weight of big roots were obtained from plants applied with 16-16-16 at the rate of 781g/5m^2 plot with a mean of 29 kg followed by plants applied with Chicken dung + 14-14-14 at 250g/5m^2 plot with a mean of 25.33. Application of 14-14-14, 21-0-0 + 0-18-0 + 0-0-60, 12-12-12, 46-0-0 + 0-18-0 + 0-0-60 and 27-0-0 + 0-0-60 had produced the least weight of big roots with a comparable means ranging from 20.67 to 22.0 kg.

Weight of Medium Roots

Table 7 shows that there were significant differences noted on the weight of medium roots as affected by different kinds and rates of fertilizer application. Likewise, the application of 16-16-16 on the plants at the rate of 781g/5m^{2}plot produced the heaviest weight of medium roots with a mean of 19 kg followed by plants applied with Chicken dung + 14-14-14 with a mean of 15 kg but are comparable to the plants applied with 14-14-14, 12-12-12, 21-0-0 + 0-18-0 + 46-0-0 + 0-18-0 +0-0-60 and 27-0-0 + 0-18-0 + 0-0-60 which had a means ranging from 13.67 to 14.67kg.

Weight of Small Roots

Table 8 shows that there were no significant differences observed on the weight of small roots as affected by different kinds and rates of fertilizers applied. However, application of 14-14-14 to the plants at the rate of 892g/5m^2 plot produced the heaviest weight of small roots with a mean of 5kg.

Table 6. Weight of big roots (kg)

TREATMENT	MEAN (kg)
Chicken dung + 14-14-14 (farmer's practice)	25.33[b]
14-14-14 (Danat Hi-Yield Philippine Planters)	22.00[c]
21-0-0 + 0-18-0 + 0-0-60 (Ammonium sulfate +Solophos, Muriate of Potash)	20.33[c]
12-12-12 (Fujiyama)	20.67[c]
46-0-0 + 0-18-0 + 0-0-60 (Urea+ Solophos, Muriate of Potash)	22.00[c]
16-16-16 (Vikingship fertilizer)	29.00[a]
27-0-0 + 0-18-0 + 0-0-60 (Calcium nitrate+ Solophos, Muriate of Potash)	22.00[c]

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

Table 7. Weight of medium roots

TREATMENT (kg)	MEAN
Chicken dung + 14-14-14 (farmer's practice)	15.00[b]
14-14-14 (Danat Hi-Yield Philippine Planters)	13.67[b]
21-0-0 + 0-18-0 + 0-0-60 (Ammonium sulfate + Solophos, Muriate of Potash)	13.67[b]
12-12-12 (Fujiyama)	14.00[b]
46-0-0 + 0-18-0 + 0-0-60 (Urea+ Solophos, Muriate of Potash)	14.67[b]
16-16-16 (Vikingship fertilizer)	19.00[a]
27-0-0 + 0-18-0 + 0-0-60 (Calcium nitrate+ Solophos, Muriate of Potash)	13.67[b]

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

Table 8. Weight of small roots

TREATMENT (kg)	MEAN
Chicken dung + 14-14-14 (farmer's practice)	3.37[a]
14-14-14 (Danat Hi-Yield Philippine Planters)	5.00[a]
21-0-0 + 0-18-0 + 0-0-60 (Ammonium sulfate + Solophos, Muriate of Potash)	3.00[a]
12-12-12 (Fujiyama)	3.00[a]
46-0-0 + 0-18-0 + 0-0-60 (Urea+ Solophos, Muriate of Potash)	2.33[a]
16-16-16 (Vikingship fertilizer)	3.00[a]
27-0-0 + 0-18-0 + 0-0-60 (Calcium nitrate+ Solophos, Muriate of Potash)	2.67[a]

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

Number of Forked Roots

As shown in Table 9, highly significant differences were obtained on the number of forked roots as affected by different kinds and rates of fertilizer application. Plants applied with 12-12-12 at the rate of 1000g/5m^2 plot produced the highest number of forked roots with a mean of 33 roots. This was followed by plants applied with 21-0-0 + 0-18-0 + 0-0-60, 14-14-14, 27-0-0 + 0-18-0 + 0-0-60 and 46-0-0 + 0-18-0 + 0-0-60 with means ranging from 16.67 to 24.33. Lowest number a forked roots were produced from plants applied with 16-16-16 and Chicken dung+ 14-14-14 (farmer's practice).

Table 9. Number of forked roots

TREATMENT	MEAN
Chicken dung + 14-14-14 (farmer's practice)	4.33[c]
14-14-14 (Danat Hi-Yield Philippine Planters)	18.33[b]
21-0-0 + 0-18-0 + 0-0-60 (Ammonium sulfate + Solophos, Muriate of Potash)	24.33[b]
12-12-12 (Fujiyama)	33.00[a]
46-0-0 + 0-18-0 + 0-0-60 (Urea+ Solophos, Muriate of Potash)	16.67[b]
16-16-16 (Vikingship fertilizer)	2.33[c]
27-0-0 + 0-18-0 + 0-0-60 (Calcium nitrate+ Solophos, Muriate of Potash)	17.67[b]

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

Number of Cracked Roots

Highly significant differences were noted on the number of cracked roots as affected by different kinds and rates of fertilizer application. Table 10 shows that plants applied with 27-0-0 + 0-18-0 + 0-0-60 at the rate of 462,494 and 208g/5m^2 plot produced the highest number of cracked roots with a mean of 32.33 but are comparable to the plants applied with 12-12-12 at the rate of 1000g/5m^2 plot with a mean of 28.33 followed by plants applied with 46-0-0 + 0-18-0 + 0-0-60 and 21-0-0 + 0-18-0 + 0-0-16.Least number of cracked roots were produced from plants applied with 16-16-16 at the rate of 78.1g/5m^2 plot with a mean of 2.67.

Table 10. Number of cracked roots

TREATMENT	MEAN
Chicken dung + 14-14-14 (farmer's practice)	4.33[de]
14-14-14 (Danat Hi-Yield Philippine Planters)	13.33[cd]
21-0-0 + 0-18-0 + 0-0-60 (Ammonium sulfate + Solophos, Muriate of Potash)	19.33[bc]
12-12-12 (Fujiyama)	28.33[ab]
46-0-0 + 0-18-0 + 0-0-60 (Urea+ Solophos, Muriate of Potash)	22.00[bc]
16-16-16 (Vikingship fertilizer)	2.67[e]
27-0-0 + 0-18-0 + 0-0-60 (Calcium nitrate+ Solophos, Muriate of Potash)	32.33[a]

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

Weight of Forked Roots

Table 11 shows highly significant differences on the weight of forked roots as affected by the different kinds and rates of fertilizers application. Application of 12-12-12 at the rate of 1000/5m^2 plot produced the highest number of forked roots with a mean of 9.33 kg but are statistically the same to the plants applied with27-0-0 + 0-18-0 + 0-0-60 and 14-14-14 at the rate of 595, 694, 208g/5m^2 plot. The plants applied with 16-16-16 fertilizers produced the least weight of forked roots with a mean of 1.33 kg.

Weight of Cracked Roots

Highly significant differences were noted on the weight of cracked roots as affected by different kinds and rates of fertilizer application. Table 12 revealed that application of 27-0-0 + 0-18-0 + 0-0-60 at the rate of 462, 694, 208 g/5m^2 plot produced the highest weight

of cracked roots with a mean of 7.76 kg but are statistically comparable to the plants applied 12-12-12 with a mean of 7.33. It was followed by the plants applied with 46-0-0 + 0-18-0 + 0-0-60. It was followed by plants applied with 16-16-16 produced the least weight of cracked roots with a mean of 1.67 kg.

Table 11. Weight of forked roots (kg)

TREATMENT (kg)	MEAN
Chicken dung + 14-14-14 (farmer's practice)	3.00[cd]
14-14-14 (Danat Hi-Yield Philippine Planters)	6.33[ab]
21-0-0 + 0-18-0 + 0-0-60 (Ammonium sulfate + Solophos, Muriate of Potash)	8.00[ab]
12-12-12 (Fujiyama)	9.33[a]
46-0-0 + 0-18-0 + 0-0-60 (Urea+ Solophos, Muriate of Potash)	5.67[bc]
16-16-16 (Vikingship fertilizer)	1.33[d]
27-0-0 + 0-18-0 + 0-0-60 (Calcium nitrate+ Solophos, Muriate of Potash)	7.00[ab]

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

Table 12. Weight of cracked roots (kg)

TREATMENT (kg)	MEAN
Chicken dung + 14-14-14 (farmer's practice)	3.00[ef]
14-14-14 (Danat Hi-Yield Philippine Planters)	4.00[de]
21-0-0 + 0-18-0 + 0-0-60 (Ammonium sulfate + Solophos, Muriate of Potash)	4.67[cd]
12-12-12 (Fujiyama)	7.33[ab]
46-0-0 + 0-18-0 + 0-0-60 (Urea+ Solophos, Muriate of Potash)	6.00[bc]
16-16-16 (Vikingship fertilizer)	1.67[f]
27-0-0 + 0-18-0 + 0-0-60 (Calcium nitrate+ Solophos, Muriate of Potash)	7.67[a]

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

Weight of Marketable Roots

Table 13 shows that there were highly significant differences noted on the weight of marketable roots as affected by the application of different kinds and rates of fertilizers. Plants applied with 16-16-16 (Vikingship fertilizers) produced the highest weight of marketable roots that reached a mean of 48 kg followed by plants applied with Chicken dung + 14-14-14(farmer's practice) at the rate of 250g/5m^2 plot with a mean of 40.33 kg. Application of 21-0-0 + 0-18-0 + 0-0-60 produced the lowest weight of marketable roots with a mean of 33.33kg.

Table 13. Weight of marketable roots (kg)

TREATMENT (kg)	MEAN
Chicken dung + 14-14-14 (farmer's practice)	40.33[b]
14-14-14 (Danat Hi-Yield Philippine Planters)	35.67[c]
21-0-0 + 0-18-0 + 0-0-60 (Ammonium sulfate + Solophos, Muriate of Potash)	33.33[d]
12-12-12 (Fujiyama)	34.67[cd]
46-0-0 + 0-18-0 + 0-0-60 (Urea+ Solophos, Muriate of Potash)	36.67[c]
16-16-16 (Vikingship fertilizer)	48.00[a]
27-0-0 + 0-18-0 + 0-0-60 (Calcium nitrate+ Solophos, Muriate of Potash)	35.67[c]

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

Weight of Non-Marketable Roots (kg)

With regards to the weight of non-marketable roots, it was found out that there were highly significant differences as affected by the application of different kinds and rates of fertilizer as shown in Table 14. Highest weight of non-marketable roots were produced from plants applied with 12-12-12 at the rate of 1000g/5m^2 plot with a mean of 19.67 kg followed by the plants applied with 21-0-0 + 0-18-0 + 0-0-60, 14-14-14, 27-0-0 + 0-18-0 + 0-0-60 and 46-0-0 + 0-18-0 + 0-0-60. The plants applied with 16-16-16produced the least weight of non- marketable roots with a mean of 6 kg.

Table 14. Weight of non-marketable roots (kg)

TREATMENT (kg)	MEAN
Chicken dung + 14-14-14 (farmer's practice)	8.67[c]
14-14-14 (Danat Hi-Yield Philippine Planters)	15.33[b]
21-0-0 + 0-18-0 + 0-0-60 (Ammonium sulfate + Solophos, Muriate of Potash)	15.67[b]
12-12-12 (Fujiyama)	19.67[a]
46-0-0 + 0-18-0 + 0-0-60 (Urea+ Solophos, Muriate of Potash)	14.00[b]
16-16-16 (Vikingship fertilizer)	6.00[c]
27-0-0 + 0-18-0 + 0-0-60 (Calcium nitrate+ Solophos, Muriate of Potash)	16.17[b]

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

Total Yield (kg)

Significant differences were obtained on the total yield as affected by different kinds and rates of fertilizers application as shown in Table 15. Results showed that plants applied with 12-12-12 at the rate of 1000g/5m^2 plot produced the harvested yield with a mean of 54.33 kg but are statistically the same to plants applied with 16-16-16 (Vikingship fertilizer) with a mean of 54.00kg. This was followed by plants applied with 14-14-14, 46-0-0 + 0-18-0 + 0-0-60 and 27-0-0 + 0-18-0 + 0-0-60 with means ranging from 50.67-52.17 kg. Lowest yield were produced from plants applied with Chicken dung + 14-14-14 (farmer's practice) and 21-0-0 + 0-18-0 + 0-0-60.

Table 15. Total yield (kg)

TREATMENT (kg)	MEAN
Chicken dung + 14-14-14 (farmer's practice)	49.00[b]
14-14-14 (Danat Hi-Yield Philippine Planters)	51.00[ab]
21-0-0 + 0-18-0 + 0-0-60 (Ammonium sulfate + Solophos, Muriate of Potash)	49.00[b]
12-12-12 (Fujiyama)	54.33[a]
46-0-0 + 0-18-0 + 0-0-60 (Urea+ Solophos, Muriate of Potash)	50.61[ab]
16-16-16 (Vikingship fertilizer)	54.00[a]
27-0-0 + 0-18-0 + 0-0-60 (Calcium nitrate + Solophos, Muriate of Potash)	52.17[ab]

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

Computed Yield

Results revealed that there were highly significant differences obtained on the computed yield in tons/ha as shown in table 16. Plants applied with 16-16-16 at the rate of 781g/5m^2 plot produced the highest computed yield/ha with a mean of 96.0 kg followed by plants applied with Chicken dung + 14-14-14 with a mean of 80.67 kg. It was followed by plants applied with 46-0-0 + 0-18-0 + 0-0-60, 14-14-14 and 27-0-0 + 0-18-0 + 0-0-60. Lowest computed yield were obtained from plants applied with 21-0-0 + 0-18-0 + 0-0-60 with only a mean of 66.67 t/ha.

Table 16. Computed yield (t/ha)

TREATMENT (tons/ha)	MEAN
Chicken dung + 14-14-14 (farmer's practice)	80.67[b]
14-14-14 (Danat Hi-Yield Philippine Planters)	71.33[c]
21-0-0 + 0-18-0 + 0-0-60 (Ammonium sulfate +Solophos, Muriate of Potash)	66.67[d]
12-12-12 (Fujiyama)	69.33[cd]
46-0-0 + 0-18-0 + 0-0-60 (Urea+ Solophos, Muriate of Potash)	73.33[c]
16-16-16 (Vikingship fertilizer)	96.00[a]
27-0-0 + 0-18-0 + 0-0-60 (Calcium nitrate+ Solophos, Muriate of Potash)	71.31[c]

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

Reaction to Pests and Diseases

There were no significant differences obtained with regards to the reaction of pests and disease as affected by different kinds and rates of fertilizer application as shown in Table 10. However, application of 12-12-12 at the rate of 1000/5m^2 plot had produced a quite high disease reaction of 1.33.Other fertilizers applied did not really react to pest and diseases. This means that Cv. Teracota carrot is resistant to pest and diseases.

Table 17. Reaction to pests and diseases (cutworms, leaf miner, and aphids)

TREATMENT	MEAN
Chicken dung + 14-14-14 (farmer's practice)	1.00[a]
14-14-14 (Danat Hi-Yield Philippine Planters)	1.00[a]
21-0-0 + 0-18-0 + 0-0-60 (Ammonium sulfate + Solophos, Muriate of Potash)	1.00[a]
12-12-12 (Fujiyama)	1.33[a]
46-0-0 + 0-18-0 + 0-0-60 (Urea+ Solophos, Muriate of Potash)	1.00[a]
16-16-16 (Vikingship fertilizer)	1.00[a]
27-0-0 + 0-18-0 + 0-0-60 (Calcium nitrate+ Solophos, Muriate of Potash)	1.00[a]

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

Rating Scale.

a. Insect Pests

Scale	**Description**	**Reaction**
1	No infestation	Highly resistant
2	Slight infestation (1-5plants/row)	Resistant
3	Moderate infestation (6-10plants/row)	Moderate resistant
4	Extensive infestation (10 and above plants per row)	Susceptible

b. Diseases

Scale	**Description**	**Reaction**
1	0-10% infection	Resistant
2	11-20% infection	Moderately resistant

3	21-40% infection	Moderately susceptible
4	41-60% infection	Susceptible
5	61% and above infection	Very susceptible

Return on Investment (ROI)

There were highly significant differences obtained with regards to the return on investment as affected by different kinds and rates of fertilizer application. Table 18 shows that plants applied with 16-16-16 % had the highest return on investment (ROI) with a mean of 87.38%followed by plants applied with Chicken dung + T-14 (farmer's practice) with a mean of 67.42%. Plants with least return on investment were produced from plants applied with 27-0-0 + 0-18-0 + 0-0-60 with only 29.37%.

Table 18.Cost and return analysis

Figure 1.Overview of the experiment area

ITEMS	T1	T2	T3	T4	T5	T6	T7
Marketable yield:							
Big	76	66	61	62	66	87	66
Medium	45	41	41	42	44	57	41
A. Sales							
Big X 10	760	660	610	620	660	870	660
Medium X 6	270	246	246	252	264	342	246
Total sales	1030	906	856	872	924	1212	906
B. Expenses							
Teracota seeds	231.43	231.43	231.43	231.43	231.43	231.43	231.43
Insecticides	42.86	42.86	42.86	42.86	42.86	42.86	42.86
Fungicides	56.25	56.25	56.25	56.25	56.25	56.25	56.25
FERTILIZERS:							
Chicken manure	50						
Atlas	20.42						
Danat high-yield Planters		31.86					
Ammuniun sulfate			17				
Atlas solophos			33.31		33.31		31
Muriate of potash			19.5		19.5		19.5
Fujiyama 12-12-12				90			
Urea					96		
Viking ship						102	
Calcium nitrate							105
Transportation	142.85	142.85	142.85	142.85	142.85	142.85	142.85
Meal	71.42	71.42	71.42	71.42	71.42	71.42	71.42
TOTAL EXPENSES	615.23	576.67	614.62	634.81	693.62	646.81	700.31
NET INCOME	414.77	329.33	241.38	237.19	230.38	565.19	205.69
ROI(%)	67.4171	57.1089	39.2730	37.3639	33.2142	87.3811	29.3712
RANK	2	3	4	5	6	1	7

Figure 2. Overview of the experiment 2 weeks from planting

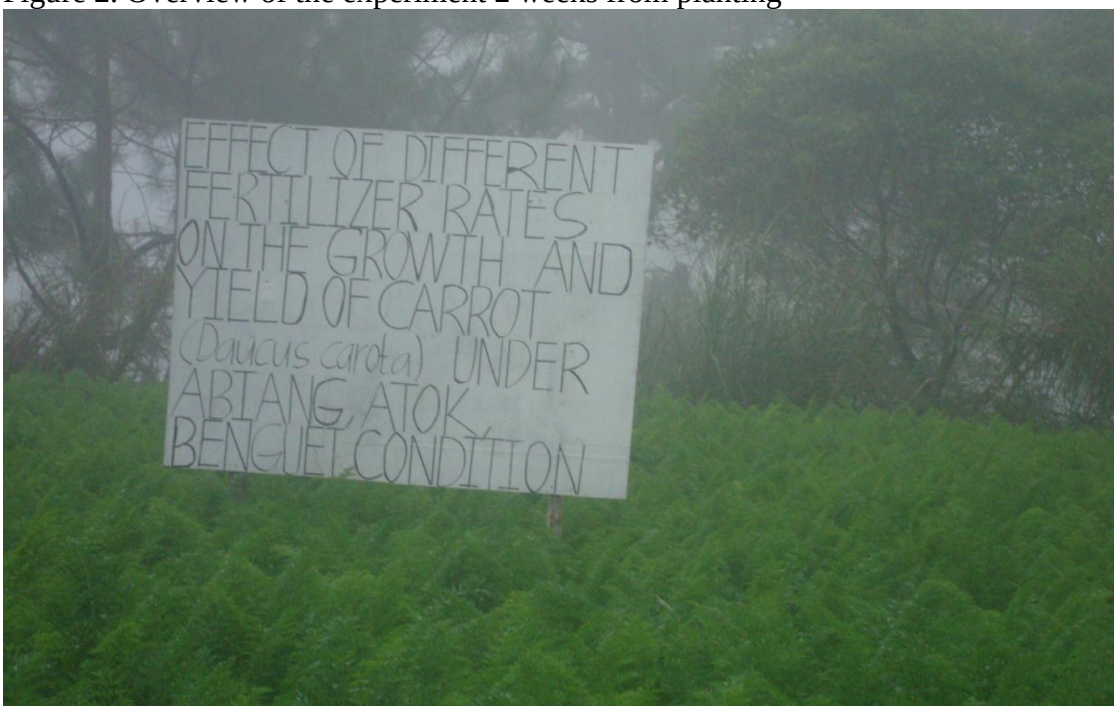

Figure 3. Harvesting stage

Figure 4. During harvesting of the crop

SUMMARY, CONCLUSION AND RECOMMENDATION

Summary

The study was conducted to determine the effect of different fertilizer rates on the growth and yield of carrot under Abiang, Atok, Benguet condition as well as to determine the best fertilizer that will increase farm profit. The results of this study could help farmers avoid losses, hence upgrading their socio-economic status. Furthermore, the results will also help extension workers that are best suited to carrot growth thus, increasing farmer's production.

Results showed that Cv. Teracota carrots applied with 27-0-0 + 0-18-0 +0-0-60 on the plants with rates of 462, 694, 208g/5m^2 plot had delayed harvesting that reached a mean of 100 days from sowing the seeds but are statistically comparable to the plants applied with 21-0-0 + 0-18-0 + 0-0-60, 46-0-0 + 0-18-0 + 0-0-60 and 12-12-12 at the rate of 595, 694, 208g/5m^2 plot, 271, 694, 208g/5m^2 plot with means of 98.33 to 99.33 days while the plants applied with chicken dung + 14-14-14 (farmer's practice) at the rate of 250g/5m^2 plot, 14-14-14 at the rate of 892g/5m^2 plot and 16-16-16 (Vikingship fertilizer) at the rate of 781g/5m^2 plot were harvested earlier with means ranging from 96 to 97 days from sowing the seeds.

It also revealed that application of Chicken dung + 14-14-14 (Famer's practice) on the plants at the rate of 250g/5m^2 plot and 16-16-16 (Vikingship fertilizer) at the rate of 781g/5m^2 plot produced the highest number of big and medium roots harvested with means of 133.33 and 134.33 (big roots); and 106.67 (medium roots) plants. They also produced the heaviest weight of marketable roots with a mean of 40.33kg. Application of 16-16-16 on the plants had the highest total yield of 54kg and computed yield of 96t/ha followed by

the plants applied with Chicken dung + 14-14-14 with a total yield of 49kg and computed yield of 80.67t/ha.

Application of 12-12-12 at the rate of 1000g/5m^2 plot produced the heaviestweight of non-marketable roots with a mean of 19.67kg and highest number of small roots with a mean of 72.33kg. Application of Chicken dung + 14-14-14 and 16-16-16 (Vikingship) fertilizers on the plants produced the least number of small roots with a mean of 9 and 16.67.

Heaviest weight of big and medium roots were obtained from plants applied with 16-16-16 at the rate of 781g/5m^2 plot with a mean of 29 kg and 19kg followed by plants applied with Chicken dung + 14-14-14 at 250g/5m^2 plot with a mean of 25.33 and 15kg.

There were no significant differences observed on the weight of small roots as affected by different kinds and rates of fertilizers applied. However, application of 14-14-14 to the plants at the rate of 892g/5m^2 plot produced the highest weight of small roots with a mean of 5kg.

Application of 16-16-16 (Vikingship fertilizer) on Teracota carrot plants at the rate of 781g/5m^2 plot had the highest return on investment (ROI) with a mean of 29.13%followed by plants applied with Chicken dung + 14-14-14 at the rate of 250g/5m^2 plot with a mean of 20.47% compared to plants applied with other fertilizers.

Conclusion

It is therefore concluded that application of 16-16-16 (Vikingship fertilizer) to carrots (Teracota) at the rate of 781g/5m^2 was the best fertilizer since the results showed that it had produced bigger root sizes, heavier weight, higher total and computed yield and higher return on investment (ROI) of 87.38%.

Recommendation

Based on the finding of the study, application of 16-16-16 (Vikingship fertilizer) to carrots (Teracota) at the rate of 781g/5m^2 is recommended fertilizer since the results showed that it had produced bigger root sizes, heavier weight, higher yield and higher return on investment (ROI) of 87.38%.

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