BIBLIOGRAPHY

SAB-IT, LENIE B. APRIL 2013. Yield of Amaranth (*Amaranthus viridis*) Shoot Topped at Various Stages After Seedling Emergence. Benguet State University, La Trinidad, Benguet.

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ABSTRACT

Results of the study revealed that Amaranth (*Amaranthus viridis*) shoot topped five weeks after seedling emergence produced the highest profit, the highest number of shoots harvested, had the biggest stem diameter, the highest yield and profit. No shoot topping (control) treatment had the lowest yield and lowest profit which was significantly lower from the other treatments.

In terms of profit, amaranth shoot topped five weeks after seedling emergence obtained the highest net profit of P1,672.41 followed by shoot topping six weeks after emergence which had net profit of P1,417.72; shoot topped seven weeks after emergence with P979.98; and amaranth plants shoot topped four weeks after emergence had a net profit of P232.34.

RESULTS AND DISCUSSION

Total Number of Lateral Shoots Harvested per Plot

Table 1 shows the number of shoots harvested per plot. Amaranth shoot- topped five weeks after emergence produced the most shoots per plot followed by those plants topped six weeks after emergence, seven weeks after emergence and four weeks after emergence. The plants allowed to grow without shoot topping had the least lateral shoots. However, there were no significant differences among the different treatments studied.

Table 1. Total number of lateral shoots harvested per plot

TREATMENT	MEAN
No shoot topping (Control)	962.00[a]
Topped four weeks after emergence	1,829.66[a]
Topped five weeks after emergence	2,351.00[a]
Topped six weeks after emergence	2,039.66[a]
Topped seven weeks after emergence	1,901.66[a]

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

Total Yield per Plot

As presented in Table 2, the highest yield was produced from the plants topped five weeks after emergence followed by plants topped six weeks after emergence, seven weeks after emergence and plants topped four weeks after emergence, all of which have similar total yield that significantly differed over the yield of plants without shoot topping.

The significantly lower yield from plants without shoot topping is due to the few production of lateral shoots as shown in Table 1. According to George (1985), it is customary to pinch out the growing point of the cultivars which have a relatively small apical inflorescence for four weeks after planting to encourage development of secondary shoots.

Table 2. Total yield per plot (kg)

TREATMENT	MEAN
No topping (Control)	3.09[b]
Topped four weeks after emergence	5.68[a]
Topped five weeks after emergence	8.07[a]
Topped six weeks after emergence	7.19[a]
Topped seven weeks after emergence	6.82[a]

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

Total Yield per Plant

Similar to the total yield per plot, the yield per plant from those that were topped four to seven weeks after emergence did not differ significantly but significantly surpassed the total yield per plant from those that were not topped at all (Table 3). It was apparent in this yield data that topping the plants five weeks after emergence enhanced the production of more lateral shoots compared to the other stages after emergence. It might be that the plants are too young below five weeks, the plants have passed the vegetative stage already thus, the production of lateral shoots in declining.

Table 3. Total yield per plant (g)

TREATMENT	MEAN
No topping (Control)	64.42[b]
Topped four weeks after emergence	118.51[a]
Topped five weeks after emergence	168.12[a]
Topped six weeks after emergence	149.89[a]
Topped seven weeks after emergence	142.25[a]

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

Diameter of the Main Stem

The stem diameter from the from the plants topped four weeks after emergence had the smallest measurement while plants topped five weeks after emergence had the biggest diameter as shown in Table 4. However, the differences among the treatments in the stem diameter were not significant. This means that the shoot topping at the different stages did not affect the growth of the main stem.

Table 4. Diameter of the main stem (cm)

TREATMENT	MEAN
No topping (Control)	4.32[a]
Topped four weeks after emergence	1.32[a]
Topped five weeks after emergence	4.36[a]
Topped six weeks after emergence	4.3[a]
Topped seven weeks after emergence	4.11[a]

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

Frequency of Harvesting Shoots/Leaves for Five Months Duration

The frequency of harvesting amaranth ranges from 10 to 14 times (Table 5). The plants without shoot topping had the lowest while the plants topped four weeks after emergence had the most but the observed differences were not significant.

Figure 8, 9 and 10 show the harvested shoots of amaranth and the packing done before it was delivered to the market for sale.

Table 5. Frequency of harvestingshoots/leaves for five months duration

TREATMENT	MEAN
No topping (Control)	10[a]
Topped four weeks after emergence	14[a]
Topped five weeks after emergence	13[a]
Topped six weeks after emergence	12[a]
Topped seven weeks after emergence	11[a]

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

Figure 8. Newly harvested Amaranth shoots ready for packing.

Figure 9. Amaranth shoots packed and weighed 250 grams per pack.

Figure 10. Properly packed amaranth shoots to be delivered at Benguet State University Organic market.

Cost and Return Analysis

As presented in Table 6, Amaranth topped five weeks after emergence obtained the highest profit (P1, 672.41) followed by topping the plants six ,seven and four weeks after emergence. The plants without shoot topping had the lowest profit of P232.34.

In terms of return on cash expenses, shoot topping of plants five weeks after emergence obtained 223.41% or P2.23 for every peso spent in the production of amaranth in five months. In descending order, this was followed by topping six, seven, four weeks after emergence and without shoot topping with P1.91, P1.78, P1.35, and P0.33, respectively.

Based on the total expenses in the experiment and the total yield sold in the market, the production cost per kilo is P39.40. This means that the selling price of P100.00 per kilo can be lowered so that all people can afford to buy organically produced amaranth.

Table 6. Economic analysis per treatment from 15sq m area

ITEMS	TREATMENTS				
	T_1	T_2	T_3	T_4	T_5
A.YIELD (kg)	9.277	17.067	24.21	21.585	20.485
B. SALES (Php)	927.70	1706.70	2421.00	2158.50	2048.50
C. EXPENSES					
Seeds	7.20	7.20	7.20	7.20	7.20
Alnus					
Compost	75.00	75.00	75.00	75.00	75.00
Cellophane	12.95	23.80	33.60	30.10	28.35
Sticker	15.99	29.30	41.37	37.06	34.91
Labor cost					
Cleaning	18.74	18.74	18.74	18.74	18.74
Digging Plots	31.25	31.25	31.25	31.25	31.25
Planting	18.74	18.74	18.74	18.74	18.74
Irrigation	18.74	18.74	18.74	18.74	18.74
Harvesting	190.10	190.10	190.10	190.10	190.10
Depreciation cost					
G.I. pipes	150.65	150.65	150.65	150.65	150.65
Plastic roofing	131.94	131.94	131.94	131.94	131.94
Expenses (Php)	695.36	726.72	748.59	740.78	736.88
Net Profit	232.34	979.98	1,672.41	1,417.72	1,311.62
ROE(%)	33.41	134.85	223.41	191.38	178.00
RANK	5	4	1	2	3

Note: The selling price per kilo of Amaranth at the BSU Organic market is P100.00/kg only.

SUMMARY, CONCLUSION AND RECOMMENDATION

Summary

The study was conducted from November 2012 to March 2013 at Balili Organic Farms of Benguet State University, La Trinidad, Benguet purposely to determine the best stage of growth from seedling emergence to pinch out the shoot of amaranth, determine the yield of amaranth, how many times of shoot harvesting can be done in five months and compute for the profitability of the shoo topping study.

The results obtained, can be summarized as follows:

1. the best stage to shoot top amaranth is five weeks after emergence in order to obtain the highest yield and profit;

2. shoot topping amaranth four weeks after emergence might be too early as the growth of the main stem is affected and shoot topping after six weeks from emergence might be late as the lateral shoots production was declining;

3. the frequency of harvesting the lateral shoots of *Amaranthus viridis* when shoot topped ranges from 11 to 14 in five months; and

4. the profit from shoot topping ranges from P979.98 to P1,672.41 in 15sq m of land under greenhouse condition.

Conclusion

Based on the results presented and discussed, it is best to shoot topped *Amaranthus viridis* five weeks after seedling emergence.

Recommendation

It is therefore recommended that *Amaranthus viridis* be shoot topped five weeks after emergence to obtain higher yield and profit.

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