

Effect of Tillage on the Yield of Bitter Leaf (*Vernonia amydalina*) in Southern Nigeria

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Abstract

This research was carried out in School of Agriculture teaching farm in Delta State Polytechnic, Ozoro between June - October 2012. Most farmers do not carry out tillage before planting, the need therefore to evaluate the effect of tillage on the growth performance of bitter leaf. Bitter leaf stems collected from Oleh Market, a nearby village were planted in a Complete Randomized Block Design (CRBD) with three (3) replications. Some stems were planted on ridges while others were planted on flat land. Parameters measured are number of leaves, number of branches and plant height. Data collected were subjected to student T-test. The result revealed that bitter leaf planted on ridges had more number of leaves of 24.67, 63.17, 77.67, and 120.0 as against those planted on flat land of 19.33, 55.67 and 95.67cm. Bitter leaf planted on ridges had better number of branches of 8.3, 8.3, 13.67 and 13.67cm than those planted on flat land of 5.6, 10.33 and 10.33cm. The plant height followed the same trend of those planted on flat land having 13.0, 19.33, 25.83 and 44.73cm as against 19.33, 30.0, 43.83 and 63.27cm. There was significant difference between the performance of bitter leaf planted on ridges with those planted on flat land in terms of; number of leaves, number of branches and plant height at ($P>0.05$). Hence, planting on ridges is recommended to farmers to boost the growth performance of bitter leaf.

Keywords: Bitter leaf (*Vernonia amydalia*), Tillage, and Flat land yield

Introduction

Bitter leaf scientifically known as (*Vernonia amydalia*) belong to the family *Asterceiace*, it originated from Tropical Africa (Tindall, 1988). It is mainly used

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in the Southern part of Nigeria as a vegetable and for medicinal purpose. Bitter leaf stimulates the digestive system as well as reduces fever (Ebiaba, 1992). The extract from the leaves cures the nerves, strengthens the muscles thereby reduces stroke and as well as the sugar level drastically. It helps to repair the pancreas (Johnbull, 2009).

Bitter leaf are versatile in their uses; reason because as a vegetable, its more beneficial and medical to both man and animals. They are used as vegetable and stimulate the digestive system as well as reduces fever. *Vernonia amygdalina* is also used to make beer in Nigeria. It contains very high amount of zinc, important to many enzymes function and also helps to keep the skin fresh. The bitter taste is also of great value because it helps detoxify the body system thereby making the body health aid free from toxic substances which are harmful to the body (W.H.O., 1999). *Vernonia amygdalina* solution calms the nerves, strengthens the muscles and thereby control stroke (Ologunde, Ayirinde and Afolabi, 2000). It is used for curing disease such as diarrhea, fever among others. Bitter leaf is mainly employed as an agent in treating schistosomiasis disease caused by parasitic worms. Bitter leaf dilutes the sugar level drastically; and helps to repair the pancreas.

Bitter leaf can be very helpful in maintaining the liver optimum health to release bile acid every time people eat fatty foods. It also helps to take care of the kidney. Bitter leaf is used by diabetic patient as medication to prevent high blood sugar level as it does not only lower the sugar level but also repair the impaired pancreas. As we all know that pancreas is the organ responsible for the production of insulin; impaired pancreas does not release the right sugar level in the blood. Bitter leaf is a real wonder of nature. You can take the benefit of the amazing plant by squeezing its leaves in ten liters of water (Perry, 2013 and Shoback, 2011). In spite of the numerous importance of this crop to the health of man, attention has not been fully given to its cultivation.

Tillage refers to the practice of keeping the soil mellow (soft) and free from weeds. In many parts of the rainforest zone of Nigeria, tillage operation is not part of their cultural management practices. In general, any good tillage system should provide good soil structure, improve soil water filtration and retention, reduce weed competition, minimize soil erosion, control infestation of pest, encourage biological activities of soil, and recycle soil organic matter through residue management. The use of tractor and the associated implement in the tillage operations is still limited, as the majority of farmers cannot afford it. In fact this situation is the leading factor responsible for the inadequate supply of

food and raw materials for agro-allied industries. Tillage encourages aggregation of particles for better contact between the seed and the root, it provides good soil environment for germination of emergence of seeds, helps in loosening of compacted soil and also ease the penetration of plant root into the soil (Lobb, 1997). Most farmers in Southern Nigeria do not carry out tillage operation before planting. The objective of the study is to determine the effect of tillage on the growth / yield of bitter leaf in Southern Part of Nigeria.

Materials and Methods

The Research was carried out at back of cattle ranch behind the school farm in Delta State Polytechnic, Ozoro, in Isoko North Local Government Area of Delta State, Nigeria. The temperature range is between 24°C - 37°C, while the annual rainfall ranges between 241.9mm - 432.2mm (Ofune, 1993). The research started in the month of June. The planting materials that is; the stems of bitter leaf were collected from Oleh Market in a nearby village. A total number of 150 stems were gotten from the village. The number of stems planted on the flat land was seventy five (75) stems and seventy five (75) stem were also planted on the ridges which was replicated three times in Complete Randomized Block Design (CRBD) at the planting distance of 1m x 1m and planting depth of 5cm. The growth parameters are the number of leaves, plant height and number of branches that were measured. Data were collected at interval of two weeks and were subjected to analysis of variance.

Results

Table (1) revealed the number of leaves of bitter leaf planted on ridges and flat land from 6 - 12 weeks after planting. It shows that bitter leaf planted on ridges had 24.67, 63.17, 77.67 and 120.0 as against the ones planted on flat land which had 19.33, 48.83, 55.67 and 95.67.

Table (2) shows the number of branches of bitter leaf planted on ridges and on flat land from 6 - 12 weeks after planting. The result shows that those planted on ridges had 8.3, 8.3, 13.67 and 13.67 as against 5.6, 5.6, 10.33 and 10.33 for those planted on flat land.

Table (3) shows the plant height of bitter leaf planted on ridges and flat land from 6-12 weeks after planting. The result shows that bitter leaf planted on ridges had 19.33cm, 30.0cm, 43.83m and 63.27cm while those planted on flat land had 13.0cm, 19.33cm, 25.83cm and 44.73cm.

Table 1: Number of Leaves of Bitter leaf at 6th-12th Weeks After Planting (WAP)

Treatment	6 th	8 th	10 th	12 th
Ridge	24.67	63.17	77.67	120.0
Flat	19.33	48.83	55.67	95.67
F-cal	9.00	10.95	11.77	12.87

Table 2: Number of Branches of Bitter Leaf at 6th-12th Weeks After Planting (WAP)

Treatment	6 th	8 th	10 th	12 th
Ridge	8.3	8.3	13.67	13.67
Flat	5.6	5.6	10.33	10.33
F-Cal	26.87	26.87	45.71	45.71

Table 3: Plant Height of Bitter Leaf at 6th-12th Weeks After Planting (WAP)

Treatment	6 th	8 th	10 th	12 th
Ridge	19.33	30.0	43.83	63.27
Flat	13.0	19.33	25.83	44.73
F-Cal	9.78	11.76	24.08	43.75

Discussions

Table (1) revealed that the number of leaves of the bitter leaf planted on ridges were more than those planted on flat land. This finding agreed with (Lobb, 1997) who reported that tillage helps in loosening of soil which ease the penetration of plant root, which increase the rate of nutrient absorption of the plant.

Table (2) shows that the number of branches of bitter leaf planted on ridges was more than those planted on flat land. This could be attributed to the fact that tillage encourages aggregation of soil particle for bitter contact between soil and root.

Table (3) also followed the same trend of bitter leaf planted on ridges having better height than those planted on flat land. This finding also agreed with (Lobb, 1997) who stated that tillage encourages proper growth of the plant.

Summary

This research was carried in school of Agriculture Teaching farm in Delta State Polytechnic, Ozoro between June-October 2012. Most farmers do not carry out tillage; hence, the need to evaluate the effect of tillage on the growth performance of bitter leaf becomes necessary. Bitter leaf stems collected from Oleh market, a nearby village were planted in a Complete Randomized Block Design and replicated three times. Some were planted on flat land while others were planted on ridges. Growth parameters taken are number of leaves, number of branches and plant height. Data collected at two weeks interval were subjected to student T-test.

The research shows that bitter leaf planted on ridges performed better in terms of number of leaves, branches and plant height than those planted on flat land. However, there was significant difference between bitter leaf planted on ridges and those planted on flat land at ($p > 0.05$).

Conclusion

The result reveals that bitter leaf planted on ridges performed better than those planted on flat land in terms of numbers of leaves, number of branches and plant height.

Recommendations

Since there was significant difference between bitter leaf planted on ridges and those planted on flat land, it is therefore recommended that bitter leaf should be planted on ridges so as to have a better growth performance.

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