

Effect of Slash and Bush Burning Cultivation Strategies on Fluted Pumpkin Production in Uyo Local Government

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Abstract

*The study was carried out to determine the effect of slash and bush burning cultivation strategies on fluted pumpkin (*Telfairia occidentalis* Hook F.) production in Uyo Local Government Area. Six specific purposes, six research questions and six hypotheses guided this study. The study adopted experimental research design with true experimental layout of Complete Block Design (CBD). The study was carried out in Uyo Local Government Area of Akwa Ibom State. The population of this study consisted of 128 fluted pumpkin seeds of *Telfairia occidentalis* Hook F. A sample size of 104 fluted pumpkin plant stands were selected for the study using purposive sampling technique. To facilitate the assessment of vine length measuring tape was used for measurement, and the number of leaves was carried out by counting while leaves weight was measured using Electronic Compact Scale. The experimental plot was selected, cleared, marked using measuring tape, garden line, peg and ranging pole, in preparation of planting materials (Fluted pumpkin seeds). Application of Treatment (Decomposed Slash and bush burnt materials as applicable), weeding and pest and disease control using neem leaves extract. Data collected were analyzed using mean and standard deviation for research questions, and independent t-test statistics for null hypotheses. Findings of the study showed that slash cultivation strategy has significant effect on prominent growth parameters of fluted pumpkin particularly; the vine length, number of leaves and leaves weight when compared with bush burning cultivation strategy. Also, there was a significant effect in terms of the vine length, number of leaves and leaves weight when compared with bush burning cultivation strategy. On the basis of the findings, it was recommended among others that vegetable farmers should adopt slash cultivation strategy to obtain improved growth of fluted pumpkin in terms of number of leaves.*

Keywords: Burning, Cultivation, Fluted-Pumpkin, Slash, Strategies.

Introduction

The quest for better productivity of vegetable crops by farmers has driven them to different practices in farming to meet the demand of rising population in food supply. Land preparation and soil nutrient management has become a priority to farmers for better and more productions of food. Ubuoh (2017) asserted that soil quality is an ideal indicator for sustainable agriculture. Therefore, soil management through the process of the decomposed materials which may enhance soil

biological activities by increasing the amount of nutrients and nutrients recycling is necessary in crop production.

Slash of grasses and plant leaf litters, allowing for decomposition before cultivation, is one of the strategies to sustain land for crop production, especially fluted pumpkin. Decomposed slash allow natural processes of soil regeneration through nutrient circulation. According to Denom and Beyer (2023), slash cultivation strategy is an agricultural technique that involves cutting down existing trees, brush and other foliage to create land for cultivation. Green grasses that are slash may be liken to as green manure that acts as a natural fertilizer, releasing nutrients into the soil as it decomposes and increases the nutrient content in the soil and shows positive effect on plant growth and development. Joshna *et al.* (2024) reported that addition of green manure contributes to greater fixation of atmospheric nitrogen, and when decomposed, makes the nitrogen availability in the soil, reducing the need for synthetic nitrogen fertilizers in crops. Furthermore, it has a significant impact on several plant growth and yield parameters, resulting in increased agricultural productivity and ecosystem health. According to Stirling *et al.* (2019), in farming system, farmers could use bush fallow, plant residues (slash), household refuse, animal manures and other organic nutrient sources as cultivation strategies to maintain soil fertility. Farmers clear or slash their land in preparation for planting season by allowing soil micro-organism to act on the slashed materials for decomposition, as they are crucial to the stability; regulation and functioning of all farm land nutrient recycling.

It is observed by the researcher that some areas in the farm land when burn with dried grasses, wood and other reduces will always do better in crop cultivation due to the ash from burned biomass as it is incorporated into the soil resulting in an increase in soil fertility. Bush burning in the context of this research refers to land preparation strategy where grasses, dry leaf litters or wood are packed together and spot burning applied to get ashes as fertilizer component for pumpkin production. Wood ash from the kitchen is a major fertilizer, being used in the home gardens where fruits and vegetables are grown. Ash derived from burnt plant residues is a source of plant nutrients which can be used alone or in combination with N-rich chemical fertilizer or organic manure such as that of goat and poultry as soil amendment for enhancement of crop growth (Ojeniyi, *et al.*, 2017)

Soil preparation is the basic pool of plant nutrients. However, soil may not at all times contain adequate mineral reserves to supply sufficient amount of nutrient elements to meet the increasing requirements for higher fluted pumpkin production. Therefore, the fertility of the soil must be adequate to support the production of fluted pumpkin. Novotny and Frouz (2019) maintained that soil quality is an ideal indicator of sustainable land management through the application of ashes and the decomposed slash materials which enhances soil biological activities by increasing the amount and efficiency of nutrient acquisition and recycling, the regulation of the retention and flow of water and nutrients, and the maintenance of good soil physical structure. Therefore, the use of slash and bush burning has becomes a procedure aimed at rapid fertilization of soil through which may ensures good germination and growth of fluted pumpkin.

Fluted pumpkin (*Telfairia occidentalis* Hook F.) is a leafy vegetable with edible seeds that are also used for propagation. Fluted pumpkin had been found useful in the area of human and animal nutrition, ethno-medicine and source of livelihood for farmers especially in Uyo LGA, with great potential for industrial usage. According to Umunnakwe *et al.* (2022) fluted pumpkin (*Telfairia occidentalis* Hook F.) is a vegetable of great economic importance. In Nigeria, the leaves, flowers and seeds are consumed locally as vegetables by human and foliage for livestock. The leave have about 700ppm of iron, 11% ash, 3% oil, 25% carbohydrate, 11% crude protein and 86% moisture content. The crop has been reported to possess medicinal and therapeutic properties such as anti-diabetic, anti-cholesterol, anti-bacterial and anti-inflammatory properties (Kuku *et al.*, 2014). These nutritional benefits make the demand of the crop to be high, which propelled farmers in Uyo LGA to use every possible cultivation strategies for crop cultivation including fluted pumpkin.

Fluted pumpkin (*Telfairia occidentalis* Hook F.) is a dioecious creeping vegetable crop belongs to the family Cucurbitaceae which originated from tropical West Africa and become more popular in South-East and South-South region of Nigeria as a result of its important as leafy vegetable (Chukwurah & Ugurn, 2015). Fluted pumpkin is herbaceous perennial crop although it is cultivated as an annual crop especially under the traditional farming system in Akwa Ibom State. The crop grows and spreads low across the ground, climbs by means of creeping vines coiled tendrils up to 10m or more in length under favorable condition. The leaves are single but lobed and arise on alternate sides of the vines, on long petioles with 3-4cm palmate arranged leaflets which vary in size according to the cultivar (Udoh & Ndon, 2016).

Adejumobi *et al.* (2021) stressed that, to obtained good production of fluted pumpkin, the ecological conditions and soil fertility must be favorable. Williams and Paul (2023) asserted that for better performance, fluted pumpkin can be cultivated on flat land with incorporation of organic manure. Slash of grasses that are allow to decompose encourage favorable condition for activities of micro-organisms in a large scale for development of nutrient availability that may support fluted pumpkin production. Also, burnt grasses release ash and other elements that will make the soil fertile. This is in line with Ayi (2022) who asserted that agricultural wastes decomposed and releases nutrient like nitrogen, phosphorus, and potassium into the soil. These nutrients are gradually released, providing a consistent and balanced source of nourishment for crops over time. Similarly, Hu *et al.* (2022) conducted a field-tests on green manure to evaluate its effects on soil physio-chemical characteristics and uptake of nitrogen by rice crops. It was found out that it boosted plant productivity for N fertilizer and increases plant availability of total organic carbon and nitrogen. It generates an extensive root system, which helps in nutrient uptake, resulting in improved plant growth, a higher leaf area index, and more tillers than the conventional method (application of approved fertilizer dosages alone). Ibrahim-Dawi (2015) assessed a soil vulnerable to wind erosion to monitor decomposition and nutrient release from residues of Mesquite (*Prosopis spp*), Mahogany (*Khaya senegalensis*) and Neem (*Azadirachta indica*) in western Omdurman and found that all litters were found to be good sources of K, especially in sandy soils which low in K,

as 80% of the initial content of this mineral was released in the first 2 weeks to support plant growth.

Moyin-Jesu (2015) who carried out a study to determine the effect of poultry manure, wood ash and rice bran on the soil fertility improvement, growth and head yield of cabbage (*Brassica oleracea* L) in 2011 and 2012 cropping seasons in Akure in the rain forest zone of Nigeria and found that the increased growth and head yield of cabbage was because of its balanced nutrient composition and the least C/N ratio. Ajala, *et al.* (2017) reported that the growth parameters such as plant height, number of leaves, leaf area, leaf area index, leaf length, stem diameter, number of flowers, number of pods, weight of plant and total biomass of amended maize-lima beans intercrop were significantly increased by wood ash application. According to Abana (2022), effect of palm bunch and wood ash on the growth and yield performance of fluted pumpkin (*Telfairia occidentalis*) was carried out and found that plant height, leaf number and vine length and shoot/root ratio, fresh weight and the results showed that sole application of 10 t/ha PBA and 10 t/ha WA and halved their rates in combination, increased soil pH, N, O C, P, K, Ca and Mg in relation to the control treatment but the combination of palm bunch ash (PBA) and wood ash (WA) significantly enhanced yield in fluted pumpkin (*Telfairia occidentalis*).

Adejumobi *et al.* (2021) investigated on the effects of bush burning on chemical properties at different soil depth of 0-30 cm respectively base on the rooting depth of crop planted and observed a variations between burnt and un-burnt soil for Mg, exchangeable acidity, pH, Nitrogen, Potassium was significant at $p < 0.05$ probability level. This indicates that bush burning has an impact on soil physical and chemical properties which may affect the suitability of the soil for crop production. Similarly, Obidiebube *et al.* (2022) reported that the effects of different rates (0.0, 0.1, 0.2, 0.3 t/ha) of wood ash on the growth and yields of carrot varieties in Awka South Eastern Nigeria and observed that treatment of 0.3 t/ha performed significantly better in most of the assessed parameters both on growth and yields such as plant height, marketable yield, root diameter, whole plant biomass, root length, total yield and harvest index, but in pot experiment, 0.2 t/ha of wood ash gave highest result both on growth and yield parameters.

Statement of the Problem

The increasing population, high cost of food supply, reduction and the attendant rapid loss of soil fertility and productivity, high cost and scarcity of chemical fertilizers, acidity imbalance and other problems associated with over use of chemical fertilizers that cause soil physical degradation have caused a serious threat to crop production, including fluted pumpkin Uyo LGA (Williams and Etim, 2021)

It is observed that farmers still slash or weed their farmland and packed the grasses away without incorporating or spreading them on the soil. This practice may reduce soil nutrients because those removed grasses have absorbed some important elements from the soil that would have supply nutrients back to the soil for high productivity of fluted pumpkin has been removed. This necessitated a search for locally acceptable, cheap, economically viable, environmentally sound and culturally adoptable means of soil fertility maintenance. Hence there is need to conduct

research into alternative methods of sustaining soil fertility, productivity and supplying plant nutrients. Based on these, the researcher sought to determine the effect of slash and bush burning cultivation strategies on fluted pumpkin (*Telfairia occidentalis* Hook F.) production in Uyo Local Government Area, Akwa Ibom State.

Purpose of the Study

The main purpose of this study was to determine the effect of slash and bush burning cultivation strategies on fluted pumpkin (*Telfairia occidentalis* Hook F.) production in Uyo Local Government Area. Specifically, the study sought to:

1. determine the comparative effect of slash and bush burning cultivation strategies on vine length of fluted pumpkin (*Telfairia occidentalis* Hook F.) in Uyo L.G.A.
2. determine the comparative effect of slash and bush burning cultivation strategies on number of leaves of fluted pumpkin (*Telfairia occidentalis* Hook F.) in Uyo L.G.A
3. determine the comparative effect of slash and bush burning cultivation strategies on leaves weight of fluted pumpkin (*Telfairia occidentalis* Hook F.) in Uyo LGA.

Research Questions

The following questions were posed to guide the study.

1. What is the comparative effect of slash and bush burning cultivation strategies on vine length fluted pumpkin (*Telfairia occidentalis* Hook F.) in Uyo?
2. What is the comparatives effect of slash and bush burning cultivation strategies on number of leaves of fluted pumpkin (*Telfairia occidentalis* Hook F.) in Uyo?
3. What is the comparative effect of slash and bush burning cultivation strategies on leaves weight of fluted pumpkin (*Telfairia occidentalis* Hook F.) in Uyo?

Research Hypotheses

The following null hypotheses were formulated to guide the study.

- Ho₁: There is no significant effect of slash and bush burning cultivation strategies on vine length of fluted pumpkin (*Telfairia occidentalis* Hook F.) in Uyo.
- Ho₂: There is no significant effect of slash and bush burning cultivation strategies on number of leaves of fluted pumpkin (*Telfairia ccidental* Hook F.) in Uyo.
- Ho₃: There is no significant effect of slash and bush burning cultivation strategies on leaves weight of fluted pumpkin (*Telfairia occidentalis* Hook F.) in Uyo.

Methodology

This study adopted experimental layout of a Randomized Complete Block Design (RCBD). The experiment was conducted at Agricultural Education Skills Acquisition Farm in the University of Uyo. The area of the land was 102m² where each block measured 8.5m x 6m and each plot for the beds measured 8.5m x 1m. Each bed was separated by 1m within row and 0.5m between. 128 fluted pumpkin seeds of *Telfairia occidentalis* Hook F were planted 2 per hole at the depth of 3-4cm at the spacing of 1m x 1m. The treatments involved were T₁ slash decomposed materials and

T₂ bush burnt materials into ashes. Vegetation in the selected area were cleared and allowed for six weeks for decomposition to take place, after which they were incorporated into the soil during the preparation of the bed for planting which serve as fertilizer to fluted pumpkin planted while burnt materials like dried grasses, dried leaves and wood into ashes in incinerator and were collected, measured and poured to mix with the soil at the spot were pumpkin seeds were planted to serve as fertilizer. Standardized instruments such as measuring tape, garden line, and pegs, ranging pole, shovel, hand-fork, and electronic compact scale were used. Measurement was taken from 104 fluted pumpkin plants as sample size. The results are presented in tables using weighted mean to answered research questions and analysis of independent t-test to test null hypotheses.

Results

Research Question 1: What is the comparative effect of slash and bush burning cultivation strategies on vine length fluted pumpkin (*Telfairia occidentalis* Hook F.) in Uyo?

Table 1: Mean Analysis Showing the Effect of Slash and Bush Burning Cultivation Strategies on Vine Length of Fluted Pumpkin (*Telfairia occidentalis* Hook F.) in Uyo

Categories	Number of Plants	Mean (cm)	SD	Remarks
Slash Cultivation	52	45.79	1.14	Growth indices on vine length is in favour of slash cultivation
Bush burning Cultivation	52	43.62	1.86	

Source: Field Experiment (2024)

Results in Table 1 shows the mean score for effect of slash and bush burning cultivation strategies on length of vine of fluted pumpkin (*Telfairia occidentalis* Hook F.) in Uyo Local Government Area. It indicates that the mean length of vine of fluted pumpkin grown using slash cultivation strategy is 45.79cm with standard deviation of 1.14 while those grown using burning cultivation strategy is 43.62cm with standard deviation of 1.87. This implies that fluted pumpkin grown using slash cultivation strategy has higher length of vine than those grown using plant burning cultivation strategy. This revealed that slash cultivation strategy has supports more length of vine than those grown using burning cultivation strategy.

Research Question 2: What is the comparatives effect of slash and bush burning cultivation strategies on number of leaves of fluted pumpkin (*Telfairia occidentalis* Hook F.) in Uyo?

Table 2: Mean Analysis Showing the Effect of Slash and Bush Burning Cultivation Strategies on Number of Leaves of Fluted Pumpkin (*Telfairia occidentalis* Hook F.) in Uyo

Categories	Number of Plants	Mean	SD	Remarks
Slash Cultivation	52	25.69	10.09	Growth indices on number of laves is in favour of slash cultivation
Bush burning Cultivation	52	18.89	1.53	

Source: Field Experiment (2024)

Results in Table 2 shows the mean score for effect of slash and bush burning cultivation strategies on number of leaves of fluted pumpkin (*Telfairia occidentalis* Hook F.) in Uyo Local Government Area. It indicates that the mean number of leaves of fluted pumpkin grown using slash cultivation strategy is 25.69 with standard deviation of 10.09 while those grown using bush burning cultivation strategy is 18.89 with standard deviation of 1.53. This implies that fluted pumpkin grown using slash cultivation strategy has higher number of leaves than those grown using plant burning cultivation strategy. Therefore, slash cultivation strategy supports the rapid multiplication of number of leaves of fluted pumpkin than those grown using bush burning cultivation strategy.

Research Question 3: What is the comparative effect of slash and bush burning cultivation strategies on leaves weight of fluted pumpkin (*Telfairia occidentalis* Hook F.) in Uyo?

Table 3: Mean Analysis Showing the Effect of Slash and Bush Burning Cultivation Strategies on Leaves Weight of Fluted Pumpkin (*Telfairia occidentalis* Hook F.) in Uyo

Categories	Number of Plants	Mean(g)	SD	Remarks
Slash Cultivation	52	86.85	42.42	Growth indices on leaves weight very highly in favour of slash cultivation
Bush burning Cultivation	52	45.55	36.01	

Source: Field Experiment (2024)

Results in Table 3 shows the mean score for effect of slash and bush burning cultivation strategies on leaves weight of fluted pumpkin (*Telfairia occidentalis* Hook F.) in Uyo Local Government Area. It indicates that the mean leaves weight of fluted pumpkin grown using slash cultivation strategy is 86.85g with standard deviation of 42.42 while those grown using burning cultivation strategy is 45.55g with standard deviation of 36.01. This implies that, fluted pumpkin grown using slash cultivation strategy has higher leaves weight than those grown using plant

burning cultivation strategy thus, slash cultivation strategy has support higher leaves weight than those grown using bush burning cultivation strategy.

Research Hypothesis 1: There is no significant effect of slash and bush burning cultivation strategies on vine length of fluted pumpkin (*Telfairia occidentalis* Hook F.) in Uyo.

Table 4: Independent t-test Analysis of Effect of Slash and Bush Burning Cultivation Strategies on Vine Length of Fluted Pumpkin (*Telfairia occidentalis* Hook F.) in Uyo

Categories	n	Mean	SD	Df	t-cal value	Sig Value	Decision
Slash Cultivation	52	45.79	1.14	102	7.15	.000	S
Bush burning Cultivation	52	43.62	1.86				

P >.05; S-Significant

Table 4 indicates that the calculated t-value is 7.15 and the probability value is .000 at 102 degree of freedom. Comparison of the probability value and .05 level of significance shows that the probability value (Sig value) is less than the .05 level of significance; thus, the null hypothesis is rejected. This implies that there is a significant effect of slash and plant bush burning cultivation strategies on vine length of fluted pumpkin (*Telfairia occidentalis* Hook F.) in Uyo.

Research Hypothesis 2: There is no significant effect of slash and bush burning cultivation strategies on number of leaves of fluted pumpkin (*Telfairia ccidentalis* Hook F.) in Uyo.

Table 5: Independent t-test Analysis of Effect of Slash and Bush Burning Cultivation Strategies on Number of Leaves of Fluted Pumpkin (*Telfairia occidentalis* Hook F.) in Uyo

Categories	N	Mean	SD	Df	t-cal value	Sig Value	Decision
Slash Cultivation	52	25.69	10.09	102	4.80	.000	S
Bush burning Cultivation	52	18.89	1.53				

P >.05; S-Significant

Table 5 indicates that the calculated t-value is 4.80 and the probability value is .000 at 102 degree of freedom. Comparison of the probability value and .05 level of significance shows that the probability value (Sig value) is less than the .05 level of significance; thus, the null hypothesis is rejected. This implies that there is a significant effect of slash and bush burning cultivation strategies on number of leaves of fluted pumpkin (*Telfairia occidentalis* Hook F.) in Uyo.

Research Hypothesis 3: There is no significant effect of slash and bush burning cultivation strategies on leaves weight of fluted pumpkin (*Telfairia occidentalis* Hook F.) in Uyo.

Table 6.: Independent t-test Analysis of Effect of Slash and Bush Burning Cultivation Strategies on Leaves Weight of Fluted Pumpkin (*Telfairia occidentalis* Hook F.) in Uyo

Categories	N	Mean	Std.	Df	t-cal value	Sig Value	Decision
Slash Cultivation	52	86.85	42.42	102	5.35	.000	S
Bush burning Cultivation	52	45.55	36.01				

P >.05; S-Significant

Table 6 indicates that the calculated t-value is 5.35 and the probability value is .000 at 102 degree of freedom. Comparison of the probability value and .05 level of significance shows that the probability value (Sig value) is less than the .05 level of significance; thus, the null hypothesis is rejected. This implies that there is a significant effect of slash and plant bush burning cultivation strategies on leaves weight of fluted pumpkin (*Telfairia occidentalis* Hook F.) in Uyo.

Discussion of Findings

Effect of Slash and Bush Burning Cultivation Strategy on Length of Vine

Finding showed that slash cultivation strategy supports higher length of vine than those grown using bush burning cultivation strategy. Furthermore, it was revealed that there was a significant effect of slash and bush burning cultivation strategies on vine length of fluted pumpkin (*Telfairia occidentalis* Hook F.) in Uyo. The finding points to the fact that slash cultivation strategy improve soil fertility as the slashed plant materials decompose, enhance accessibility of fluted pumpkin plant to nutrient by reducing erosion and leaching thereby promoting the growth of vine. Meanwhile, nutrients available in bush burning plot are easily eroded and leached thereby hindering good vine length performance.

The finding is supported by the finding of Ayi (2022) who asserted that agricultural wastes decomposed and releases nutrient like nitrogen, phosphorus, and potassium into the soil. These nutrients are gradually released, providing a consistent and balanced source of nourishment for crops over time. Similarly, the findings is inconsonance with the findings of Hu *et al.* (2022) conducted a field tests on green manure to evaluate its effects on soil physio-chemical characteristics and uptake of nitrogen by rice crops. It was found out that it boosted plant productivity for N fertilizer and increases plant availability of total organic carbon and nitrogen. It generates an extensive root system, which helps in nutrient uptake, resulting in improved plant growth, a higher leaf area index, and more tillers than the conventional method (application of approved fertilizer dosages alone). Because of the increased biomass and maximum nutrient absorption in rice crops, it also shows a positive influence on plant growth attributes such as plant

height, number of tillers, and dry matter accumulation which was applicable to fluted pumpkin production.

Effect of Slash and Bush Burning Cultivation Strategy on Number of Leaves

Finding of the study revealed that slash cultivation strategy supports higher number of leaves than those grown using bush burning cultivation strategy. It was also observed that there was a significant effect of slash and bush burning cultivation strategies on number of leaves of fluted pumpkin (*Telfairia occidentalis* Hook F.) in Uyo. The findings may have been triggered by the fact that slash cultivation strategy allows for gradual release of plant nutrients especially nitrogen from decomposed plant materials. Adejumobi *et al.* (2021) high quality of slash or litter leads to the formation of high quality organic carbon and nitrogen in mineral soil. Initial litter quality influences fresh litter or slash decomposition rate and nitrogen release from the decomposition litter. This process helps in binding with organic matter to form soil aggregates that protect soil carbon and nitrogen from heterotrophic soil. These can provide the necessary nutrients for the cultivation of spinach.

The finding also align with the finding of Moyin-Jesu (2015) who carried out a study to determine the effect of poultry manure, wood ash and rice bran on the soil fertility improvement, growth and head yield of cabbage (*Brassica oleracea* L) in 2011 and 2012 cropping seasons in Akure in the rain forest zone of Nigeria and found that the increased growth and head yield of cabbage was because of its balanced nutrient composition and the least C/N ratio. This implies that increased in number of leaves is due to the presence of nitrogen and other soil nutrients facilitated by slash cultivation strategy

Effect of Slash and Bush Burning Cultivation Strategy on Leaves Weight

Finding revealed that slash cultivation strategy has supports higher leaves weight than those grown using burning cultivation strategy. Result also revealed that there was a significant effect of slash and bush burning cultivation strategies on leaves weight of fluted pumpkin (*Telfairia occidentalis* Hook F.) in Uyo. The finding confirmed that slash cultivation strategy improve soil fertility as the slashed plant materials decompose, enhance accessibility of fluted pumpkin plant to nutrient by reducing erosion and leaching thereby promoting the growth of vine. Meanwhile, nutrients available in bush burning plot are left with element that will support fluted pumpkin growth and they are easily eroded and leached thereby limiting leaves weight performance.

The finding is in agreement with the findings of Ibrahim-Dawi (2015) who assess a soil vulnerable to wind erosion to monitor decomposition and nutrient release from residues of Mesquite (*Prosopis spp*), Mahogany (*Khaya senegalensis*) and Neem (*Azadirachta indica*) in western Omdurman and found that all litters were found to be good sources of K, especially in sandy soils which low in K, as 80% of the initial content of this mineral was released in the first 2

weeks. The findings is line with the findings of Abana (2022) who investigated the effect of palm bunch and wood ash on the growth and yield performance of fluted pumpkin (*Telfairia occidentalis*) in Federal Polytechnic Nekede. The growth parameters examined were: Plant height, leaf number and vine length and shoot/root ratio, fresh weight and the results showed that sole application of 10 t/ha PBA and 10 t/ha WA and halved their rates in combination, increased soil pH, N, OC, P, K, Ca and Mg in relation to the control treatment but the combination of palm bunch ash (PBA) and wood ash (WA) significantly enhanced yield in fluted pumpkin (*Telfairia occidentalis*). This implies that soil acidity could be neutralized and soil fertility improved to enhanced crop yield especially fluted pumpkin.

Conclusion

Slash cultivation strategy has significant effect on prominent growth parameters of fluted pumpkin on the vine length, number of leaves and leaves weight when compared with bush burning cultivation strategy. This study provides a unique perspective by focusing on the effect of slash and bush burning cultivation strategies on the crop's growth, yield, and quality. This contributes to a more comprehensive understanding of the factors influencing the production of this vegetable crop in the region.

Recommendations

Based on the findings of this study, it is recommended that:

- i. Vegetable farmers should adopt slash cultivation strategy to obtain improved growth of fluted pumpkin in terms of number of leaves.
- ii. Agronomists who are interested in the length of vine of fluted pumpkin should adopt slash cultivation strategy in the raising of fluted pumpkin.
- iii. Commercial vegetable farmers should adopt slash cultivation strategy in order to obtain better leaf weight for increased market value.

References

- Abana P.C. (2022). The Effect of Palm Bunch Ash and Wood Ash on the Growth and Yield of Fluted Pumpkin (*Telfaria Occidentalis*), *Global Journal of Agricultural Research*,10,(4),16-22.
- Adejumobi, M.A., Adeyemi, A. O., Eebo, A.J. & Ogunremi, M. (2021). Impact of bush burning on chemical properties of some soil in Igboora-Iba,Oyo State. *LAUTECH Journal of Civil and Environmental Studies*, 7(20):1-10
- Ajala, R. Awodun, M.& Oladele, S. (2017)."Effects of wood ash biomass application on growth indices and chlorophyll content of maize and lima bean intercrop," *Turkish Journal of Agriculture-Food Science and Technology*, 5, 614-621,

- Ayi, J. O (2022). Utilizing agro-waste as organic manure for sustainable agriculture: Implications for reducing synthetic fertilizer use and mitigating environmental pollution. *Environmental Management Journal*, 35(2):87-102.
- Chukwurah, N. F & Uguru, M. I. (2015). Juvenile morphological markers for maleness in fluted pumpkin (*Telfairia occidentalis* Hook F) *Journal of Tropical Agriculture, Food, Environment and Extension*, 9(2): 90-96.
- Denom, D. & Bayer, C. (2023). Slash and Burn Agriculture Technique. En.m.wikipedia.org./study.com. Retrieved on 6th September, 2024
- Hu, A., Huang, R., Liu, G., Huang, D., & Huan, H. (2022). Effects of green manure combined with phosphate fertilizer on movement of soil organic carbon fractions in tropical sown pasture. *Agronomy*, 12(5):1101.
- Ibrahim-Dawi, B. E. S (2015). Decomposition and Nutrient Release of different organic residues in soils of Western Omdurman. A dissertation submitted to the University of Khartoum, Faculty of Agriculture Omdurman Islamic University
- Joshna, A., Bokado, K., & Barkha, C. (2024). Green manure for sustainable crop production: A review. *International Journal of Environment and Climate Change*, 14(5):147–156.
- Kukla, J., Whitefeld, T., Cajtharni, T., Baldrian, P., & Vesela-Sinackova, H (2024). Slash and Burn Agriculture. Wikipedia
- Kuku, A, Etti, U.J & Ibronke, I.S (2014). Processing of fluted pumpkin seeds, *Telfairia occidentalis* (Hook F) as it affects grown performance and nutrient metabolism in rats. *African Journal of Food Agriculture, Nutrition and Development*, 14(5):9192-9214
- Moyin-Jesu, E. I. (2015). Use of different organic fertilizers on soil fertility improvement, growth and head yield parameters of cabbage (*Brassica oleraceae* L) in Akure, Ondo. *International Journal of Recycling Organic Waste Agriculture*, 4:291–298
- Obidiebube, E. A, Okolie, H. Obasi, C.C. & Ochuenwike, K.L. (2022). Effects of different rates of wood ash on the growth and yield of carrot (*Daucus Carota*) in Awka, South Eastern Nigeria. *Current Research in Agricultural Sciences*, 9(1): 13-21
- Ojeniyi, S. Oyatoye, A. & Abdulraheem, M. (2017) "Use of ash for soil fertility improvement effect on cowpea," *Nigeria Journal of Soil Science*, 27, 216-221.
- Stirling, E, Macdonald, L.M, Smernik, R.J & Cavagnaro, T.R. (2019). Post fire litter is richer in water soluble carbon and lead to increased microbial activity. *Applied Soil Ecology*, 6(3):345-352.

- Ubuoh, E. (2017). *The Effect of Burnt and Un-burnt Land on Soil Physicochemical Characteristics* in Ekeya-Okobe, Akwa Ibom. Retrieved from <https://www.researchgate.net/publication/268150234> on 7th August, 2024.
- Udoh, D.J. & Ndon, B.A. (2016). *Crop Production Techniques for the Tropic*, 2nd Edition, Lagos. Concept Publications Ltd.
- Umunnakwe, O. C, Akpan, J. T & Abeiagyi, F. V. (2022). Foliage yield of fluted pumpkin (*Telfairia occidentalis* Hook F) as influenced by organic manure and cutting frequencies on soil of Calabar. *Global Journal of Agricultural Science*, 21(2): 79-84.
- Williams, P. S & Etim G. J. (2021). Agricultural practices and sustainable. In: P.S Williams (Editor). *Issues and Trends in Vocational Education*, pp1-8.
- Williams, P. S & Paul, J. J. (2023). Effect of harvesting methods on the fresh leaves of fluted pumpkin (*Telfairia occidentalis*), Pp139-146. In: G.A.Akpan, E.B.Usoro, N. A. Akpan, A.A.Offiong, N.P. Essien, P.S.Williams, A.D. Usoro, E. P. Udofia, C. I. Usoroh and A. E. Udofia (Editors). *Lifelong Skills for Sustainable National Development*. A Freestschrift. Faculty of VELIS, University of Uyo, Nigeria, 245p.