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FIELD PERFORMANCE OF PALM BUNCH ASH ON GINGER GROWTH IN A HUMID ENVIRONMENT

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ABSTRACT
The paper focused on field performance of palm bunch ash on ginger growth in a humid environment in the south-south geographical zone of Nigeria. Findings of the study revealed that the highest plant height, highest average leave number and highest yield was obtained in the plot treated with 600g of (PBA). The use of palm bunch ash as alternative source of fertilizer should be explored with seriousness

Key words: field performance, palm bunch ash, ginger growth

INTRODUCTION
In recent times the importance of ginger plant has been established. Apart from its use as food, its medicinal functions has been exploited more than ever before. Ginger (*Zingiber oficinale*) is a tropical herb which belongs to the ginger family (*Zingiberaceae*). It is an erect plant propagated through its rhizomes which are underground. The rhizomes consists of eyes' or buds that are cut in pieces containing 1-2 eye's that are used for planting. It contains stalkless leaves and attains a height of 2-3 feet (60-90cm. it is popularly known in countries like Jamaica and Europe, but it is assumed to have originated from tropical Asia. It benefits from manuring and does well when irrigated (Adegbola, Are and Ashaye and Komlafe, 1972). Ginger has a variety of uses; a spice in cooking and in the preparation of confectioneries, pickles and beverages such as ginger ale. It is used in Sierra Leone and Liberia to make ginger beer, and as a preparation for stomach disorders. It grows best in lowland forest areas, under shade (Encyclopedia Americana, 1995). It is grown extensively for its aromatic rhizomes. The rhizomes (Underground stems) are used for flavoring foods and beverages and to a lesser extent as an ingredient in medicinal preparation. Ginger was one of the first spices introduced into Europe and for a long time ranked second in importance only next to black pepper.

The problem of high cost and unavailability of inorganic fertilizer has affected the growth of many crops and as such the need for alternative and available product is necessary. Besides, the intensity of rainfall during the cropping season makes their use problematic because of leaching. Seeking alternatives in order to overcome this hindrance to crop productivity is an important imperative to farmers**.** Park and Maurice (1961) stated that a successive increase in plant food supplies may each lead to an increase in crop yield, a point will be reached when further applications of plant food in the form of fertilizers results in higher additional cost than the extra value of the yield obtained. Fertilizers are very significant to the life of crop plants especially tuber crops and rhizome bearing crops like ginger. They aid the soil to supplement some of the essential elements that are not found in order to provide medium for their growth. According to Joy and Wibberley (1979), they are not substitute for soil fertility but a supplement only prevent nutrient shortages. Fertilizers are essential particles tending to increase the yield rate of crop plant. Ginger which is usually grown on sandy loam soil responds to fertilizer application like other crops. They are usually applied to crops especially (tuber) crops to increase yield, but since obtaining inorganic fertilizers is a problem the use of organic fertilizers becomes inevitable.

Organic fertilizers are usually waste materials from processing of parts of plants or animals. They have low nutrient concentrate. These organic fertilizer are normally got from

farm residues as green manure or compost manure and also things like pig dung and poultry droppings.(Childer, 1950) green manure contains almost the same ad even greater amount of nitrogen as manure does, although its phosphorus, when inorganic fertilizers were not discovered, peasant farmers used these sources of organic fertilizers on their crops to increase the rate of yield and as a source of maintaining the soil. Ginger is not an exception of such crops, thus organic fertilizers are applied to increase its nutrient uptake and the total content and availability of plant nutrient to maintain the level of organic matter in the soil (Jones, 1972).

The availability of palm bunch ash (PBA) in southern Nigeria is not in doubt as oil palm is a major crop grown in the area. It is therefore common to see heaps of palm bunch ash doting the cross section of many rural communities. Palm bunch ash is obtained from burnt palm bunch which contains primarily calcium, phosphorus and potassium. According to Aya and Lucas (1977) palm bunch ash constitute varying amount of calcium, phosphorus, potassium and magnesium and it affects the yield of crops. Potassium as a constituent of PBA plays a significant role by helping the plants to retain water and withstand through during drier seasons. Through the help of potassium, starch, as the main constituent of ginger is obtained by the plant (ginger). The presence of potassium prevents the ginger plant from pest and disease attack and crops in general. The effect of palm bunch ash to crops cannot be over emphasized mostly ginger production. This is as a result of the fact that palm bunch ash (PBA) contains some vital mineral elements needed by plants for their growth and yield mostly tuber crops and rhizome bearing crops like ginger. Calcium a constituent of (PBA) is the most prominent element in plant especially ginger plant. It play a vital role by reducing it acidic content of the soil as well as tuber yield in crops especially ginger.

Ginger is not widely cultivated in Omoku. Therefore this experimental work is carried out to know the performance of ginger plant and the effect of palm bunch as on its productivity as a source of fertilizer. This study investigated the use of palm bunch Ash as a fertilizer source on the productivity of ginger. The study also determined the emergence percentage, determine plant height, determine number of leaves, number of days to flowering and yield

METHODOLOGY

This experiment was carried out in a demonstration farm at Omoku, situated at the South-South of Nigeria in Rivers State. It is in the derived rain forest region of the country which is characterized by heavy rainfall during the rainy season and high sun shine during the dry season. The experimental plot was cleared manually by using cutlass, hoe and rake respectively. The type of soil were the experimental crops were planted was sandy loam. The plot was measured by the used of tape, rule ranging pole and pegs. The plot size was 6mx3m. The experiment was designed in a Randomized Complete Block Design (RCBD) with a single row arrangement by using six replicates, and each replicate containing two units each. The treatments were: Control, 200g, 400g, 600g, 800g and 1000g.

The ginger rhizomes were planted in the month of April by cutting the rhizomes, each piece containing 2 eyes planted per hole at the depth of 8cm. the planting distance used was 50x50cm apart. Planting was done with the aid of matched. The experimental plot measured 6mx3m. The total rows planted were thirteen (13) and the total stands planted were 136 which gave 78 stands.

Height: For collection of height data, four plants were randomly tagged in each experimental unit and their height were measured from the ground level to the tip of the shoot using a ruler at 20, 40, 60, and 80 days after planting. The data that was collected were computed and the average height of the plant for each treatment was determined.

Number of Leaves

The same tagged plants were also used for determining the number of leaves at 20, 40, 60, and 80 days after planting. The leaves were counted and the data obtained were computed to obtained the average number of leaves per plant.

Number of days to flowering

The same tagged plants were also used for determining the number days before the appearance of flowers on plants.

Yield

Harvest was done in the month of November, seven months after planting, and the yield got from the rows were weighed separately to get an accurate result.

DATA ANALYSIS

All the data collected were analyzed by the used of mean.

RESULTS AND DISCUSSION

Height of ginger

The height of plant gives an indication of the availability of nutrient responsible for growth of plant tissues. Height measurements were taken to determine the trend of growth. From the analysis, the lowest ginger height was observed in the control treatment. Plant height measured at 20, 40, 60 and 80 days after planting gave the values of 4.7, 10.3, 15.8 and 18.6cm respectively except treatment 200g which gave the value of 18.2cm at 80 days after planting. In the other treatment differences were observed as the days increased after planting. The highest ginger height was observed in 600g at 20, 40, 60, and 80 days after planting gave the values of 9.1, 18.5, 26 and 31cm respectively.

Number of leaves

The number of leaves on a plant is as a sign of rapid growth which determines a high content of nitrogen in the soil. The lowest average number of leaves of ginger plant was observed in treatment 1000g. Data collected at 20, 40, 60 and 80 days after planting gave no significant deference per plant respectively in control treatment. It was observed that other treatments when compared did not have much effect on the leaves as the leaves data at various DAPs were on the same range except treatment 600g which gave the highest number of leaves.

Yield

Yield is obtained by harvesting the plant population in the plot. It is determined by the viability of seed and the availability of nutrient in the soil. From the finding above, it was observed that the lowest yield was obtained in the control treatment 600g. The other treatment when compared had no significant difference per unit respectively.

DISCUSSION

Analysis of the result of the parameters observed above shows that among the treatment (PBA) applied, the lowest plant height, lowest average leaf number and lowest yield was obtained in the control treatment at 20, 40, 60, and 80 days after planting. While the highest plant height, highest average leave number and highest yield was obtained in the plot treated with 600g of PBA. There was a significant difference of the heights among the various treatments.

At the 20 DAP the lowest average leave number was obtained in the control treatment which gave the value 1. there was no significant differences among the treatments that were given. At the 40 DAP the lowest average number was also obtained in the control treatment while treatment 600g had an average leave number of 6, other when compared had significant difference. The lowest yield was obtained in the control treatment which gave yield of 139g while the highest yield was in treatment with 600g which gave 580g. Oguzor and Ezekiel (2006) reported improved grain yield of maize on application of palm bunch ash. Oguzor (2007) also reported similar findings with groundnut.

CONCLUSION

The study concludes that the highest plant height, highest average leaf number and highest yield were obtained in the plot treated with 600g of PBA. The implication of this is that improved growth of ginger is guaranteed when palm bunch ash is applied at that level.

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