**POTENTIALS OF PALM BUNCH ASH ON YIELD OF *Zea mays***

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**ABSTRACT**
*Field study were conducted on the effectiveness of using different rates of palm bunch ash to increase fruit field of maize during the 2009 cropping season at the teaching and search form of the Rivers State University of Education Ndele campus, Port- Harcourt Rivers State, Nigeria. The experiments were laid out in a randomized complete Block design (RCBD) with four treatments replicated three times. The treatment comprised of 0kglha, 80kglha, 160kglha and 240kglha palm bunch ash respectively. Date analyzed showed that application of palm bunch ash to the rate of 80kglha significantly increased whole grain weight,*

Key words: palm bunch ash, yield, maize

**INTRODUCTION**
Maize popularly called corn is an important grain of the world ranking second after wheat. (Offor and Ansa 1998). It originated from Mexico or central America. it is a coarse annual grass belonging to the family graminae. The root system consisting of seminal secondary on coronal, or crown or aerial roots. The seminal roots usually 3-5 in number grows downwards at the time of seed germination. The number of grains in a single ear usually lies between 300 and 1,000 and is usually cross pullulated. It is essentially a warm weather crop grown throughout the year. Maize grain contains mainly carbohydrate but significant quantities exist in protein, oil and small amount of mineral. The oil is found in the germ (emhryo). Approximate composition of maize seed is 76-88%carbohydrate, 6-15% protein, 4-5% fat and 1-3% mineral. It is prepared and consumed in many ways viz: ground or pounded and boiled, ground or pounded and baked or fried, ground, boiled whole, roasted. In Nigeria, it is consumed in two forms- in "ogi "and "agidi". As livestock feeds, stock, leaves and in mature ears are used as fodder. *Z mays* has industrial importance for the production of starch, oil and alcohol. The starch can be used as sugar or converted into dextrose, syrups etc

Inspite of the importance, the productivity of maize is still very low in Nigeria. This could be attributed to low soil fertility statue's occasioned by continues cropping. To enhance its productively and obtain optimum yield, the use of inorganic fertilizer becomes necessary since subsides on commercial fertilized in no longer feasible in the Country:  Farmers therefore need to source for other cheaper, more available  and sustainable source of plant nutrient. One of such source is palm bunch ash which is a by product of oil palm, growing wild and under cultivation in almost every locality in Nigeria. This study therefore examines the effectiveness of using palm bunch ash in increasing grain yield of *Zea mays*.

**MATERIALS AND METHOD**
The experiments were conducted at the teaching and research farm of the Rivers State University of Education –Ndele- campus, Port-Harcourt. The experimental areas were properly cleared of refuse and stumping was carried out manually. A randomized complete block (RCBD) with four treatments replicated three times was used. The treatments are 0kglha, 80kglha, 160kglha and 240kglha. Plot size was 2mx2m and the maize used was improved type Farz 27, purchased from Agricultural development project headquarter

Rumuodomaya, Port Harcourt. Four seeds were sown per hole at a spacing of 75 x75cm. Plant stands were late thinned to 3 at two weeks after planting. Weeding was done manually using simple hoe at 2 and 6 weeks after planting. The following agronomic parameters were measured at harvest- fresh whole grain weight, grain number per whole and whole grain length (cob length). These were done at harvest whole grain Weight was obtained by using weighing balance. Grain number was gotten by manually counting the harvested grains in each cob, while whole cob length was measured with a ruler after removing the husk.

Prior to the study, previous studies on the surface soils nutrient contain in the area has been done (Offor and Amakor 2008) as follows - Total N was determined by Brays p I method (Bray and kurtz 1945) while exchangeable k, ca and mg were determined by atomic absorption spectro- photometry following their extraction from the soil using neutral normal $NH_4$ OAC (Schollember and Drebelbs 1930).

Chemical analysis of palm bunch ash has also been determined in our previous works. (Offor and Ezekiel 2006). (See table 2) Nitrogen was determined by semi-micro- kjeldah method (Bremner, 1965), P was determined by Vando- Molybdate method (Jackson 1958) while K, Ca and Mg were determined by atomic absorption spectrophotometer. Data collected was subjected to analysis of variance and means separated by Duncan multiple Range Test.

## RESULTS AND DISCUSSION

Results on whole grain weight, grain number in a cob and whole length of maize cob are shown in table 3.

Table 1: Some physic 0-chemical properties of the experimental soil before cropping

| Soil Properties | Mean value |
|---|---|
| Available P(PPM) | 16 |
| Total nitrogen (%) | 0.055 |
| Exchangeable K (Meq/100g soil) | 0.16 |
| Exchangeable Mg (Meq/100g soil) | 0.18 |
| Exchangeable Ca (Meq/ 100g soil) | 0.26 |

Table 2: Chemical composition of Palm Bunch Ash

| Nutrients | Mean Values |
|---|---|
| N(%) | 1.18 |
| P (%) | 1.90 |
| K (%) | 2.17 |
| Ca (%) | 0.85 |
| Ma (%) | 1.80 |

Table 3: Effect of Palm Bunch Ash on pod yield of Okra

| Palm Bunch Ash (Kglha) | wholegrain Weight (Kglha) | grain number | cob length (cm) |
|---|---|---|---|
| 0 | 126.68b | 19.25ab | 11.92a | 16.96ab |
| 80 | 201.68a | 30.75a | 12.28a | 16.46a |
| 160 | 110.83b | 25.00bc | 11.84a | 15.10b |
| 240 | 110.83b | 17.50c | 2.27a | 16.15ab |

*Figures with the same letters in the same column are not significantly different at 5% level using Duncan's Multiple Range Test (DMRT).*

The result shows that plot treated with 80kglha of palm bunch ash recorded highest weight, grain number and whole length respectively. Conclusively application of palm bunch ash increased grain weight, grain number and length of cob at 80kglha and decreased at 160kglha and 240kglha respectively over the control. The relative increase in  grain weight and number obtained at 80kglha of palm bunch ash was probably due to the availability of phosphorus, potassium and calcium released from the ash as reported by Peter (1989), that good yield of crop is obtained when the necessary  nutrient are made available at the required rate. The decease in weight, grain number and cob-length obtained with application of 160 and 240kglha of palm bunch ash could be attributed to excess release of nutrient leading to nutrient imbalance as required by crop (Lombin 1986).

**CONCLUSION**
Result of the study shows that application of palm bunch ash increased grain weight, number and whole length of maize cob. It is therefore recommended that use of palm bunch ash can be added to the soil on which maize is cultivated to enhance productivity.

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