

## BIOSTATISTICAL ANALYSIS OF ORGANIC MANURE ON THE GROWTH OF A MONOCOTYLEDONOUS PLANT (A CASE STUDY OF MAIZE PLANTATION)

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### Abstract

Maize as one of the third highest monocotyledonous plant has been ranked as the third best in the production of cereals. It is the most important cereal crop in Nigeria and its importance cannot be over emphasized due to its industrial and economic uses which include popcorn, livestock feed and even the husk are used as mulching materials on yam plantation as well as a major source of income to some fast grown farmland in the middle belt of Nigeria. Maize as it is being called became so consequential to determine how it can be improved upon. In view of this, this research work intends to know the effect of organic manure such as goat dung, cattle dung, pig dung and poultry dung on maize growth as part of steps taken to boost its more yield. Complete randomised design (one-way analysis of variance), was then used as not to conceal the nucleus and aberration of the information collected over a whole season of the plant. It was eventually discovered that the effect of organic manure is not significant and exhibit no difference based on their yields.

**Keywords:** Maize, Organic Manual, Complete Randomised Design, Husk.

### INTRODUCTION

Maize belongs to the family of Poaceae and the genus Zea. Maize is one of the oldest cereals and the most completely domesticated of all field crops. It is an important crop in the temperate, humid, sub-tropical zone. It is originated in South America and Central America. It was later introduced to West Africa by the Portuguese traders and Spanish explorers. Its perpetuation for cultivation of maize has today spread to nearly all parts of the world. It is the most important cereal crop in Nigeria today and its economic use cannot be underestimated.

World greatest producer is U.S.A. that cultivates about 45% of world maize, other important countries include U.S.S.R., Mexico, China, France, Romania and India. Maize is common in the rain forest and savannah regions of West Africa; this is because rainfall and temperature are factors that are important in determining the development of maize under optimal condition of moisture and nutrient supply. Nigeria, Ghana, Guinea, Cameroon are the major producers in West Africa. In Nigeria, we have the middle belt, Kogi, Benue, Niger, Ogun, Ekiti, Ondo and Oyo states as the major producers of maize.

### MATERIALS AND METHODOLOGY

The data used for this research was basically primary. Half an acre of land was divided into five different plots whereby four plots were treated with four different organic manure and the fifth one was not treated at all. Thus serving as the control plot. Each plot was replicated five times.

**Table 1: Analysis of Variance Table**

<b>Plot I</b> Goat dung	<b>Plot II</b> Cattle dung	<b>Plot III</b> Pig dung
<b>Plot IV</b> Poultry dung	<b>Plot V</b> Control plot	

The plots were individually subjected to each of the above diagrammatically shown treatments and at the end of the season, the outcomes were summarised based on the yield harvested from each plot.

**ANOVA**

Analysis of variance technique was used because the experiment involves only one treatment per plot. Hence organic manure is the only factor being considered as the major substance and aid to the production of maize yield. It was assumed that all the experimental plots receiving the treatments or levels of the factor (organic manure) are homogenous.

**THE MODEL**

$$Y_i = \mu + \alpha_i + e_i; \quad i = 1, 2 \dots p$$

**ASSUMPTIONS**

- **Normality:** The distribution in dependent variable in the population from which samples are drawn must be normal.
- **Independence:** Here we mean that the experiment effects in the model are naturally independent regardless of whether they are random or fixed.
- **Homoscedasticity:** This means that the variances in the population from which the samples are drawn are equal.

**Table 2: The table of the quantity of each of the harvested yield of the product (maize).**

Goat Dung (kg)	Pig Dung (kg)	Cattle Dung(kg)	Poultry Dung(kg)	
150.62	165.03	143.69	100.30	559.64
184.98	194.52	309.08	166.10	854.68
184.37	172.65	167.23	136.90	661.15
179.12	187.67	209.80	170.50	747.09
230.27	182.62	281.50	184.40	878.79
929.36	902.49	1111.30	768.20	3711.35

**Hypotheses statement**

**Null Hypothesis, H<sub>0</sub>:** The mean yield of maize from all the organic manure groups are not significantly different.

**Alternative Hypothesis, H<sub>1</sub>:** The mean yield of maize from all the organic manure groups are significantly different.

The Analysis of data was done using SPSS version 15 and Minitab version 11. The Results of the analysis are contained in the tables below:

**Table 3: Analysis of Variance for Organic Manure on the Yield of Maize Using SPSS**

	Sum of Squares	DF	Mean Square	F	Sig.
Between Groups	12611.199	3	4203.733	2.342	0.112
Within Groups	28719.781	16	1794.986		
Total	41330.980	19			

**Table 4: Analysis of Variance for Organic Manure on the Yield of Maize Using Minitab**

Source	DF	SS	MS	F	P
Factor	3	12611	4204	2.34	0.112
Error	16	28720	1795		
Total	19	41331			

### DISCUSSION OF RESULTS

Since p-value (0.112) is greater than  $\alpha$ -value (0.05), we do not have sufficient reasons to reject the null hypothesis. We therefore conclude that the mean yields of maize from all the organic manure groups are not significantly different.

### CONCLUSION

The effects of organic manures used in this research work on the maize yield are not significantly different.

### RECOMMENDATION

It is therefore recommended that any of the four organic manures used in this research work can be used by maize farmers.

Government should also organize a programme which will sensitize and encourage maize farmers on how to apply any of the organic manures for effective yield of maize.

### FUTURE RESEARCH

The comparative analysis of organic manure and inorganic manure on a monocotyledonous plant; maize.

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