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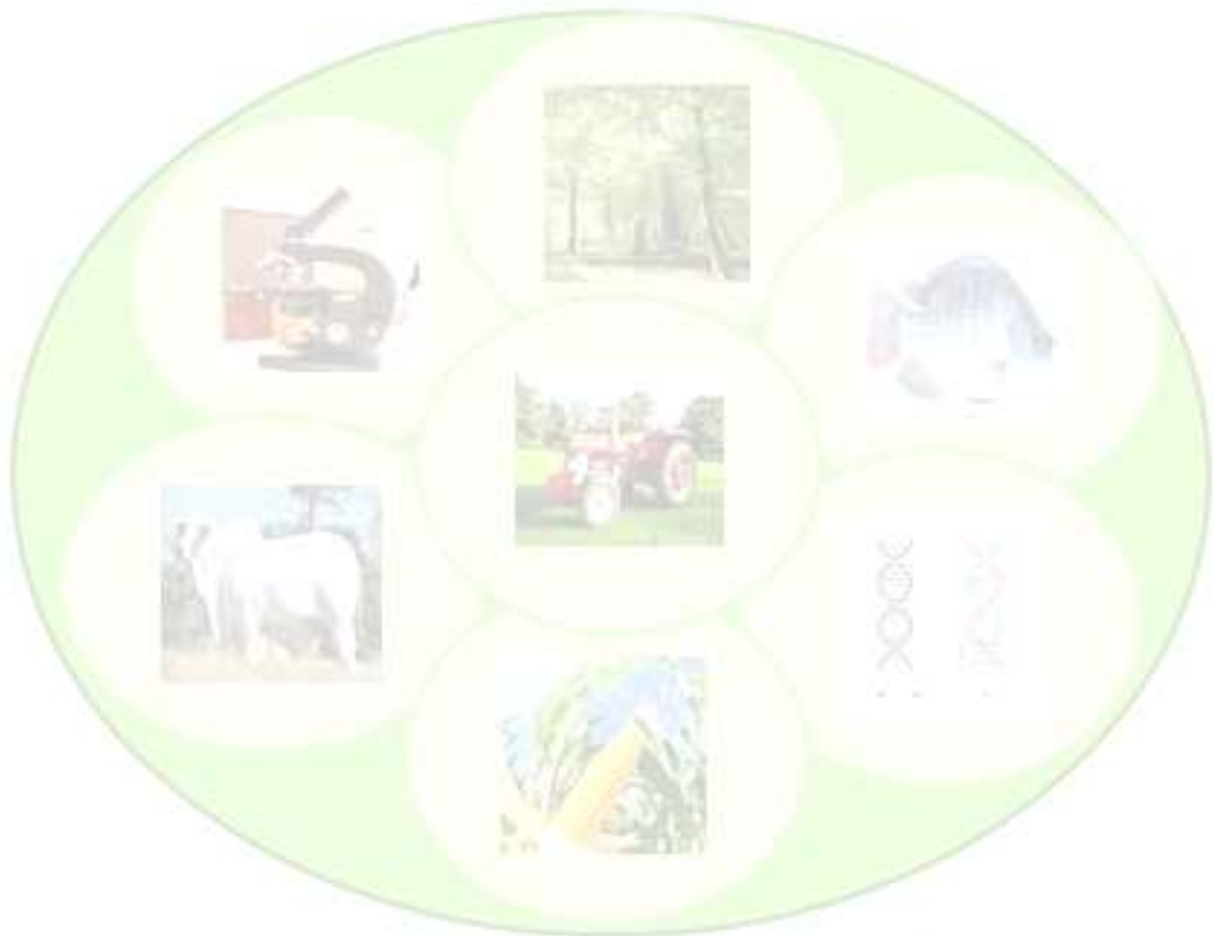
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## EFFECTS OF SOWING METHODS AND RATES OF POULTRY MANURE ON GROWTH AND YIELD OF ITCH (*ROTTBOELLIA COCHINCHINENSIS*) IN ALIERO, KEBBI STATE

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### ABSTRACT

A field trial was conducted during the 2023 rainy season at the orchard of Kebbi State University of Science and Technology, Aliero. This work was aimed to investigate the effect of sowing methods and rates of poultry manure (0.0, 3.5, and 5.5 kg/plot) on growth and yield of itch grass (*Rottboellia cochinchinensis*). Treatments consisted of three sowing methods (dibbling, drilling and broadcasting) laid out in a Randomized Complete Block Design (RCBD) replicated nine times. The observations were; standard establishment count, plant height, leaf length, leaf width and number of leaves/plants. The herbage yield of the plant was measured at 12WAS. The plant height of itch grass was influenced with a mean value of 96.03cm under dibbling method of sowing, leaf length of itch grass was statistically the same, leaf width recorded with mean value of 1.99cm as highest under drilling method of sowing, number of leaves per plant has a mean value of 28.10cm under broadcasting method of sowing which was the highest. The herbage yield of itch grass was found to be statistically significant. The mean standard establishment count was observed to be significant ( $P \leq 0.05$ ) for sowing methods, there was also significant influence of sowing methods on the plant height, leaf width, and leaf number/plant and herbage yield in all levels of sampling. The leaf length was also recorded not to be significantly affected ( $P \leq 0.05$ ) by the sowing methods at all levels of the treatments it could therefore be concluded that drilling sowing method is the best for the yield of itch grass. It is also recommend that higher level of poultry manure rates (5.5kg) should be tried on itch grass (*Rottboellia cochinchinensis*) to discover the optimum performance of the grass under the poultry manure treatment. It is also recommended that this study should serve as the baseline for subsequent and further researches in the future on itch grass (*Rottboellia cochinchinensis*).

**Keywords:** Sowing methods, Poultry manure, Growth, yield, Itch grass

### Introduction

Feeds have fundamental influence on productivity, health and welfare of animals. Feeds quality influences animal product quality, safety and the environment. To achieve balance among these parameters, animal nutritional requirements must be properly met. In the tropics, inadequate nutrition caused by scarcity of forages and its low quality constitute a major constraint to

good performance of ruminant animals (Lukuyu *et al.*, 2011). Herbage availability during the wet season often exceeds animal requirement (Chakomaet *al.* 1999). As the dry season sets in, the protein level of the accumulated forages drops and the fiber level increases, with an increase in lignin content while voluntary intake decrease. Due to lack of quality forage especially in the dry season,

animals feeding on them tend to lose weight and their productivity is negatively affected. *Rottboellia cochinchinensis* (*Rottboellia exaltata*) commonly referred to as corn weed (corngrass) itch grass, Guinea fowl grass, jointed grass, prickle grass, rice grass, sugarcane weed, Kokomagras, Raoulgrass, Shamvagrass, lisofya, orshamva grass (NAPPO, 2003) has become a major weed in tropical, and sub-tropical regions (Valverde, 2004) *R. cochinchinensis* is generally considered to have much economic value, it has been tested as a fodder grass and this is said to be how it was first introduced into USA in the early 1900s (Bugwood, 2008), however, it has rarely been exploited as a forage in its native range.

Presently, the most frequently cultivated forage species in Nigeria are Northern gamba grass (*Andropogon gayanus*), Woolly finger grass (*Digitaria smutsii*), Sorghum alatum (*columbusgrass*), Kyasuwa (*Penisetum pedicellatum*), *Setaria (Setaria anceps)*. Therefore, it is necessary to investigate the grasses species that are found in a particular area in order to have an adequate knowledge of the species that can be cultivated in a particular area and Itch grass is found as one of the promising species. The main focus of this present study is to determine the best sowing method, rate of poultry manure that could optimize nutrient composition of Itch grass to enhance its productivity in Aleiro LGA.

## Materials and Methods

### Study area

The research was conducted during 2023 rainy season in the Orchard of Kebbi state university Aliero between the months of June-August. Aliero Local Government Area is under Gwandu Emirate of Kebbi state. It covers a geographical land area of 412 square kilometres with an estimated population of about 125,783 inhabitants (NPC, 2006). It is bordered to the north-east by Gwandu Local Government Area, to the south-west by Jega Local Government Area, to the east by

Tambawal Local Government Area of Sokoto state, and to the north-west by Birnin-Kebbi Local Government Area. The study area is located on latitude 11.6781° north and longitude 4.0695° east of the equator.

### Treatments and experimental layout

Treatments consisted of three sowing methods (dibbling, drilling and broadcasting) and three levels of poultry manure (0.0, 3.5, and 5.5 kg/plot) laid out in a Randomized Complete Block Design (RCBD) to give nine treatment combinations. The treatments were replicated three times to give 27 experimental plots as shown in Table 1. A total of 27 plots were marked. Each plot size was 2 by 2 meters (2m<sup>2</sup>) with inter plots passage (foot path) of 0.5m on each side. The treatments were randomized in the gross plot of 184m<sup>2</sup> while the net plot is 108m<sup>2</sup>.

### Sources of the experimental materials

*Rottboellia cochinchinensis* Seeds of about 3kg was sourced from Zuru town from natural pastures. Poultry manure was sourced from Labana farms, Aliero. Total poultry manure

### Cultural practices

Land preparation was done two weeks before sowing by performing deep ploughing followed by breaking of clods to attain good tilth. Beds were raised 30 cm high ensuring that inter-plot spacing of 0.5m and 0.5m path separating blocks was maintained. Itch grass seeds were sown directly along on the beds at the seed rate of approximately 20kg per hectare (8g of seeds per plot). Supplementary watering was commenced immediately after sowing while weeding was throughout the experimental period. Deep ditches between plots were constructed to avoid movement of nutrients. All the plots were hand weeded once a month after sowing and thereafter as required based on occurrence of weeds. Harvesting was done manually, using a sharp sickle at 12 weeks after sowing (WAS).

Plants were harvested at the height of 5 cm above the ground level.

**Table 1. Treatment combinations for sowing methods and poultry manure rates on growth and yield of *Rottboelliacochinchinensis***

Sowing methods	Poultry manure rate	Treatments	Replication
Broadcasting	0.0	Br.+0.0 p m	3
	3.5	Br+3.5 p m	3
	5.5	Br+5.5 p m	3
Dibbling	0.0	Db+ 0.0 pm	3
	3.5	Db+3.5pm	3
	5.5	Db+ 5.5 pm	3
Drilling	0.0	Dr + 0.0 pm	3
	3.5	Dr + 3.5 pm	3
	5.5	Dr + 5.5 pm	3
Total		9	27

#### **Growth measurements**

Plant establishment was obtained by counting all the plants from the net plots at two WAS. Plant Height was recorded at two WAS, the height was measured from ground level to the tip of the tallest leaf of the 5 tagged plants using metre rule and repeated after every two weeks for the rest of the period of the experiment. Leaf Length was measured from five randomly selected plants within the net plots at 2 weeks interval from 2-12 WAS. The leaf length was obtained by measuring the leaf from the base of the leaf stalk to the tip using meter rule. The leaf width was measured from the five randomly

selected plants within the net plots from 2 weeks to 12 weeks after sowing. This was done by measuring the widest portion of the leaf using metre rule. The numbers of leaf per plant from the five tagged plants were counted from the second WAS and then every two weeks for the period of the experiment.

Five inners out of the plants per plot were used for data collection at the interval of two, two weeks after planting. The growth parameters that were measured include plant height, number of leaves and Means of the measurements from each experimental plot were recorded as the score for that treatment. subjected to weighing and the bulk fresh weight was determined. Thereafter, the bulk samples had been sorted into various treatments accordingly. The sample was collected and fresh weight has been determined.

#### **Herbage yields (HYs)**

The herbage yield was taken by cutting the plants from 5 cm above the ground and was deduced from the net plot area, fresh yield was measured using weighing balance scaled in kg per m<sup>2</sup> which was later converted to kg/ha and air dried for two weeks to estimate the total dry matter (DM) yield in kg/ha.

#### **Sample collection and sorting**

A sample was collected from the study area. The entire dried plants part of each sample has been crushed and it was taken to the laboratory for chemical analysis.

#### **Sample sorting and weighing**

The *Rottboellia cochinchinensis* plants that were raised has been put together and thereby

### Analytical Procedure

Sample from the treatments with three replications each was taken for laboratory analysis. The analysis has covered both the organic (moisture, ash, protein, lipid, fiber

and Nitrogen Free Extract) and inorganic (magnesium, sodium, potassium, calcium and phosphorous) nutrients according to the methods described by Association of Official Analytical Chemist (AOAC).

### Chemical and Physical Properties of Soil Used for the Study

Table 2: Physical and Chemical properties of soil sample collected in the study area

Parameters	
Sand (%)	89.92
Silt (%)	3.6
Clay (%)	6.48
Texture (%)	Sandy
Organic Matter (g/kg <sup>-1</sup> )	1.79
Total Nitrogen (g/kg <sup>-1</sup> )	0.19
Phosphorus (g/kg <sup>-1</sup> )	0.24
Exchangeable bases and pH (cmol/kg)	
pH	6.41
Magnesium	0.35
Potassium	0.04
Calcium	0.05
Sodium	0.09

Source: Kabir M., (2022) (Unpublished)

### Data Analysis

Data were collected on stand establishment count, plant height, leaf number, leaf length, leaf width and herbage yield. Five plants were randomly sampled and tagged for measurement of all the growth parameters during the experimental period, all the data collected on growth and herbage yield was subjected to Analysis of variance (ANOVA) in SPSS (2007) Significant means was separated using Duncan's New multiple range test (DNMRT) at 5% level.

### Results and Discussion

#### Establishment counts and tillering

Establishment counts and tillering of itch grass as influenced by the sowing methods and rates of poultry manure are presented in Table 4.1. The results revealed a significant difference ( $P < 0.05$ ) in the number of plants of itch grass at 12 weeks after sowing (12WAS). Drilling was found to have the

highest number of stands of (94.7) with poultry manure rate of 5.5kg, followed by broadcasting method with (82.7) at poultry manure rate of 3.5kg while the dibbling method has the least recorded value of (53.7) at the manure rate of 3.5kg. Similar results were reported by Gupta and Hobbs (2000) that higher germination in direct drilling is due to higher water content and more water holding capacity.

The result also revealed that the number of tillers of itch grass was significantly different ( $P < 0.05$ ) at 12WAS as influenced by the sowing methods and poultry manure rates. Drilling method has the highest mean value with (106.0) tillers, followed by dibbling method with (89.7). While broadcasting method has the lowest mean with (47.7). This can be attributed to a better/proper seed placement in the drilling method which enhances germination rates. This result is relatively the same from the findings of

Yesihak (2008) who recorded the number of tillers per plant for Rhodes grass grown sole in the savannah region of Ethiopia as 81 tillers. The mean number of tillers recorded in this research is also equivalent with the findings of NaAllah (2015) who recorded 79

tillers from *Chloris gayana* sown at Sokoto semi-arid region of Nigeria. Variations in the number of tillers may be as a result of type of cultivar, age of plant and other environmental factors (Duke, 1997 and FAO, 2009).

Table 3: Standard establishment counts and tillering as affected by the sowing methods and rates of poultry manure in Aliero, Kebbi State, Nigeria

Treatments	12 WAS	
	Number of plants (Means)	Number of tillers (Means)
Broadcasting +0.0PM	52.33 <sup>cd</sup>	47.00 <sup>cd</sup>
Broadcasting +3.5PM	82.67 <sup>ab</sup>	81.67 <sup>abc</sup>
Broadcasting +5.5PM	81.33 <sup>abc</sup>	65.33 <sup>bcd</sup>
Dibbling +0.0PM	57.00 <sup>bcd</sup>	43.67 <sup>d</sup>
Dibbling +3.5PM	53.67 <sup>bcd</sup>	48.67 <sup>ab</sup>
Dibbling +5.5PM	73.00 <sup>abcd</sup>	89.67 <sup>ab</sup>
Drilling +0.0PM	46.33 <sup>d</sup>	85.67 <sup>cd</sup>
Drilling +3.5PM	69.33 <sup>abcd</sup>	106.00 <sup>a</sup>
Drilling +5.5PM	94.67 <sup>a</sup>	90.00 <sup>ab</sup>
SEM	5.49	7.53

a,b,c= Means with the same superscripts along the same column are not significant ( $p > 0.05$ ) using Duncan Multiple Range Test (DMRT). WAS = Weeks after Sowing, PM = Poultry Manure

### Plant Height

The Mean plant height (cm) of itch grass (*Rottboellia cochinchinensis*) as influenced by sowing methods and variable poultry manure rates is presented in Table 4.2. The result revealed that the response of itch grass plant height to sowing methods and poultry manure were significantly different ( $P < 0.05$ ) at 12WAS across the treatments. Dibbling method was recorded to have the highest plant height with mean value of (96.03 cm) at 5.5pm rate, followed by drilling method with (90.78cm) at 5.5pm rate and Results indicated a gradual increase in the mean plant height of itch grass from 2-12 WAS. This increase might be as a result of This is similar to the findings of Fagimi and Odebode (2007) who reported an increased plant height and number of leaves of gamba

### Leaf Length

The Mean leaf length (cm) of itch grass (*Rottboellia cochinchinensis*) as influenced

broadcasting method was found to be the least with (83.02cm) at 0.0pm. This result is in tandem with the findings of Kutawaet al (2017) who recorded a significant difference in plant height of switch grass with dibbling having the highest mean plant height, followed by drilling and broadcasting and also stated that the significant difference recorded could be due to variation of the planting depth and minimal competition between plants in dibbling method, which enhanced proper nutrient utilization.

increase in poultry manure rates across the treatments.

grass resulting from application of higher rate of poultry manure.

by sowing methods and poultry manure rates is presented in Table 4.3. Dibbling method was found to be the highest with the mean

value of (22.7 cm) at 5.5pm rate and followed by broadcasting methods with the mean of (22.3 cm) at 5.5pm rate while the least was recorded in drilling method at 0.0pm rate with the mean value of (20.7 cm). Increased application of poultry manure provides abundant supply of nutrients to the soil, nitrogen in particular which stimulates the growth and development of itch grass

resulting in longer leaves, this is because dibbling method has less competition according to Kutawa (2017) and it allow for more improved water and nutrient availability compared to drilling and broadcasting methods thereby promoting healthy and rigorous growth including longer leaf length.

Table 4: Standard plant height of itch grass as affected by sowing methods and poultry manure rates in Aliero, Kebbi State, Nigeria.

Treatments	2WAS	4WAS	6WAS	8WAS	10WAS	12WAS	MEAN
Broadcasting +0.0PM	3.8 <sup>a</sup>	9.0 <sup>a</sup>	37.3 <sup>a</sup>	105.0 <sup>a</sup>	159.7 <sup>a</sup>	183.3 <sup>b</sup>	83.02
Broadcasting +3.5PM	4.2 <sup>a</sup>	9.7 <sup>a</sup>	39.8 <sup>a</sup>	109.3 <sup>a</sup>	169.3 <sup>a</sup>	194.3 <sup>b</sup>	87.77
Broadcasting +5.5PM	4.4 <sup>a</sup>	10.2 <sup>a</sup>	40.7 <sup>a</sup>	111.3 <sup>a</sup>	162.3 <sup>a</sup>	211.3 <sup>a</sup>	90.03
Dibbling +0.0PM	4.3 <sup>a</sup>	10.5 <sup>a</sup>	41.7 <sup>a</sup>	104.3 <sup>a</sup>	167.0 <sup>a</sup>	189.3 <sup>b</sup>	86.18
Dibbling +3.5PM	4.1 <sup>a</sup>	9.0 <sup>a</sup>	38.5 <sup>a</sup>	101.7 <sup>a</sup>	162.3 <sup>a</sup>	211.3 <sup>a</sup>	87.82
Dibbling +5.5PM	4.4 <sup>a</sup>	11.5 <sup>a</sup>	26.3 <sup>a</sup>	110.0 <sup>a</sup>	213.0 <sup>a</sup>	213.0 <sup>a</sup>	96.03
Drilling +0.0PM	3.9 <sup>a</sup>	9.5 <sup>a</sup>	38.0 <sup>a</sup>	100.3 <sup>a</sup>	160.7 <sup>a</sup>	177.7 <sup>ab</sup>	81.68
Drilling +3.5PM	4.2 <sup>a</sup>	10.0 <sup>a</sup>	40.1 <sup>a</sup>	103.0 <sup>a</sup>	183.7 <sup>a</sup>	203.3 <sup>b</sup>	90.72
Drilling +5.5PM	4.3 <sup>a</sup>	10.7 <sup>a</sup>	41.0 <sup>a</sup>	104.3 <sup>a</sup>	183.7 <sup>a</sup>	200.7 <sup>b</sup>	90.78
SEM	0.07	0.27	1.56	1.29	5.81	4.21	1.45

a,b,c= Means with the same superscripts under the same column are not significant using Duncan Multiple Range Test (DMRT). WAS = Weeks after Sowing.

There was no significant effect ( $P < 0.05$ ) of sowing methods and poultry manure rates on leaf length of itch grass. This might occur due to the plant species reaching it limit of the amount of nutrient it absorbs and utilizes

effectively, that is, increase in poultry manure rate surpasses the plants nutrient requirement resulting in not too different leaf length regardless of the poultry manure rates and sowing method.

Table 5: Leaf length of Itch grass as affected by sowing methods and poultry manure rates in Aliero, Kebbi State, Nigeria

Treatments	2WAS	4WAS	6WAS	8WAS	10WAS	12WAS	MEAN
Broadcasting +0.0PM	5.7 <sup>a</sup>	8.7 <sup>ab</sup>	18.5 <sup>a</sup>	25.7 <sup>b</sup>	31.3 <sup>a</sup>	33.3 <sup>a</sup>	20.5
Broadcasting +3.5PM	6.1 <sup>a</sup>	10.5 <sup>a</sup>	19.2 <sup>a</sup>	28.7 <sup>a</sup>	29.3 <sup>a</sup>	32.3 <sup>a</sup>	21.0
Broadcasting +5.5PM	6.2 <sup>a</sup>	10.3 <sup>a</sup>	19.5 <sup>a</sup>	31.7 <sup>ab</sup>	33 <sup>a</sup>	36 <sup>a</sup>	22.8
Dibbling +0.0PM	5.2 <sup>a</sup>	10.2 <sup>a</sup>	18.3 <sup>a</sup>	29.3 <sup>a</sup>	32 <sup>a</sup>	34.7 <sup>a</sup>	21.6
Dibbling +3.5PM	5.5 <sup>a</sup>	10.3 <sup>a</sup>	20 <sup>a</sup>	30.7 <sup>a</sup>	33.3 <sup>a</sup>	36.3 <sup>a</sup>	22.7
Dibbling +5.5PM	6.2 <sup>a</sup>	10.7 <sup>a</sup>	19.5 <sup>a</sup>	30 <sup>a</sup>	33.7 <sup>a</sup>	36 <sup>a</sup>	22.7
Drilling +0.0PM	5.8 <sup>a</sup>	9.7 <sup>a</sup>	19.7 <sup>a</sup>	28.8 <sup>a</sup>	29.3 <sup>a</sup>	33 <sup>a</sup>	20.7
Drilling +3.5PM	5.3 <sup>a</sup>	10.3 <sup>a</sup>	18.2 <sup>a</sup>	28.7 <sup>a</sup>	33 <sup>a</sup>	34.7 <sup>a</sup>	21.6
Drilling +5.5PM	5.7 <sup>a</sup>	10.9 <sup>a</sup>	19.3 <sup>a</sup>	25.7 <sup>b</sup>	31.7 <sup>a</sup>	35.3 <sup>a</sup>	21.8
SEM	0.12	0.21	0.22	0.68	0.55	0.48	0.29

a,b,c= Means with the same superscripts under the same column are not significant using Duncan Multiple Range Test (DMRT). WAS = Weeks after Sowing.

### Leaf Width

The Mean leaf width (cm) of itch grass (*Rottboelliacochinchinensis*) as influenced by sowing methods and poultry manure rates is presented in Table 4.4. The results revealed that the response of leaves width of itch grass to sowing methods and poultry manure rates were significantly affected ( $P < 0.05$ ) at 12<sup>th</sup> WAS. Drilling method was found to have the highest leaf width with the mean value of (1.99 cm) at 5.5pm rate, while broadcasting method was having (1.98 cm) at 3.5pm rate and dibbling method has the lowest mean yield of (1.88 cm) at 0.0pm rate.

The effective response obtained could be as a result of reduced competition for resources in drilling method of sowing which provides the plant with better access to sunlight, water and nutrients than broadcasting and dibbling methods. This contradicts the findings of Kutawaet *al* (2017) who reported that dibbling method of sowing influenced the leaf width of switch grass though the result obtained here is in line with the report by Yossif and Ibrahim, (2013) that leaf area and leaf to stem ratio of Rhodes grass increases by increase in fertilizer.

Table 6: Leaf width of itch grass as affected by both sowing methods and poultry manure rates in Aliero, Kebbi State, Nigeria (cm)

Treatments	2WAS	4WAS	6WAS	8WAS	10WAS	12WAS	MEAN
Broadcasting +0.0PM	0.92 <sup>a</sup>	1.37 <sup>a</sup>	2.00 <sup>a</sup>	2.23 <sup>a</sup>	2.37 <sup>a</sup>	2.60 <sup>a</sup>	1.92
Broadcasting +3.5PM	0.94 <sup>a</sup>	1.30 <sup>a</sup>	2.00 <sup>a</sup>	2.23 <sup>a</sup>	2.37 <sup>a</sup>	2.53 <sup>a</sup>	1.98
Broadcasting +5.5PM	0.93 <sup>a</sup>	1.33 <sup>a</sup>	1.97 <sup>a</sup>	2.20 <sup>a</sup>	2.40 <sup>a</sup>	2.67 <sup>a</sup>	1.96
Dibbling +0.0PM	0.94 <sup>a</sup>	1.37 <sup>a</sup>	2.00 <sup>a</sup>	2.27 <sup>a</sup>	2.40 <sup>a</sup>	2.60 <sup>a</sup>	1.88
Dibbling +3.5PM	0.97 <sup>a</sup>	1.50 <sup>a</sup>	2.00 <sup>a</sup>	2.50 <sup>a</sup>	2.30 <sup>a</sup>	2.50 <sup>a</sup>	1.91
Dibbling +5.5PM	0.93 <sup>a</sup>	1.33 <sup>a</sup>	2.00 <sup>a</sup>	2.27 <sup>a</sup>	2.40 <sup>a</sup>	2.67 <sup>a</sup>	1.91
Drilling +0.0PM	0.94 <sup>a</sup>	1.40 <sup>a</sup>	2.03 <sup>a</sup>	2.30 <sup>a</sup>	2.43 <sup>a</sup>	2.70 <sup>a</sup>	1.59
Drilling +3.5PM	0.96 <sup>a</sup>	1.33 <sup>a</sup>	2.00 <sup>a</sup>	2.27 <sup>a</sup>	2.37 <sup>a</sup>	2.57 <sup>a</sup>	1.93
Drilling +5.5PM	0.97 <sup>a</sup>	1.40 <sup>a</sup>	2.07 <sup>a</sup>	2.30 <sup>a</sup>	2.43 <sup>a</sup>	2.70 <sup>a</sup>	1.99
SEM	0.01	0.03	0.02	0.04	0.02	0.02	0.04

a,b,c= Means with the same superscripts under the same column are not significant using Duncan Multiple Range Test (DMRT). WAS = Weeks after Sowing.

### Number of Leaves per Plant

The Mean leaf number per plant of itch grass (*Rottboelliacochinchinensis*) as influenced by sowing methods and poultry manure rates is presented in Table 4.5. The result shows that the number of leaves per plants of itch grass in response to sowing methods and poultry manure rates were significantly affected ( $P < 0.05$ ) at 12 WAS. Broadcasting method was found to have the highest leaves per plant with mean value of (28.10 cm) at 5.5pm rate, while dibbling method was having (22.88 cm) at 5.5pm rate. Drilling method was found to be the least with (19.60 cm) at 3.5pm rate. This can be as a result of better distribution of seeds during the broadcasting method of sowing compared to

drilling and dibbling method. This is similar with the report of Prasher *et al.* (2004) who reported that sowing by broadcasting showed significant increased in all vegetative characteristics including leaf number.

### Herbage Yield

The Mean herbage yield of itch grass (*Rottboellia cochinchinensis*) as influenced by sowing methods and poultry manure rates is presented in Table 4.6. The response of itch grass yield to sowing methods and poultry manure rates was significant at ( $P < 0.05$ ). Drilling method was found to be the highest with mean value of 4.1 t/ha at 5.5 kg pm rate, while broadcasting method was having 4.0 t/ha at 5.5kg pm rate. Dibbling

method was found to be least with 2.8 t/ha at 0.0kg pm rate as presented in the above table. This might be attributed to the fact that drilling method ensures better seed-to-soil contact thereby allowing optimal seed germination and establishment leading to higher density and ultimately increased herbage yield.

This contradicts the work of Evans (2002) who reported that herbage yield in lablab was higher by the influence of broadcasting method of sowing than the dibbling and drilling and that of Kutawa *et al* (2017) who reported that herbage yield in switch grass

was higher by the influence of dibbling method of sowing but this result was in agreement with that of Elnesairy (1997), who found that chicken manure significantly increased alfalfa forage dry weight. Since chicken manure had enhanced forage dry weight it was expected that forage quality would also be improved. This finding concurs with those of Lim *et al.* (1994), Shin *et al.* (1996), Elnesairy (1997) and Elsheikh *et al.* (2006), who reported an enhancement in alfalfa forage crude protein content due to chicken manure application with regard to sowing methods.

**Table 7: Number of leaves per plant of itch grass as affected by both sowing methods and poultry manure rates**

Treatments	2WAS Cm	4WAS Cm	6WAS Cm	8WAS Cm	10WAS Cm	12WAS Cm	MEAN
Broadcasting +0.0PM	3.67 <sup>a</sup>	11.00 <sup>a</sup>	17.00 <sup>a</sup>	23.33 <sup>b</sup>	28.67 <sup>cd</sup>	34.67 <sup>c</sup>	18.25
Broadcasting +3.5PM	4.67 <sup>a</sup>	10.67 <sup>b</sup>	17.33 <sup>a</sup>	22.00 <sup>b</sup>	29.33 <sup>cd</sup>	33.67 <sup>c</sup>	24.93
Broadcasting +5.5PM	4.67 <sup>a</sup>	10.33 <sup>b</sup>	18.00 <sup>a</sup>	25.00 <sup>a</sup>	32.33 <sup>bcd</sup>	37.0 <sup>bc</sup>	28.10
Dibbling +0.0PM	4.00 <sup>a</sup>	9.67 <sup>b</sup>	16.00 <sup>a</sup>	20.33 <sup>ab</sup>	25.67 <sup>d</sup>	29.33 <sup>c</sup>	17.50
Dibbling +3.5PM	4.33 <sup>a</sup>	10.00 <sup>b</sup>	17.33 <sup>a</sup>	24.00 <sup>b</sup>	30.67 <sup>bcd</sup>	38.00 <sup>bc</sup>	15.65
Dibbling +5.5PM	4.67 <sup>a</sup>	10.33 <sup>b</sup>	17.33 <sup>a</sup>	25.33 <sup>a</sup>	36.67 <sup>abc</sup>	43.00 <sup>bc</sup>	22.88
Drilling +0.0PM	3.67 <sup>a</sup>	8.33 <sup>ab</sup>	16.67 <sup>a</sup>	23.67 <sup>b</sup>	28.67 <sup>cd</sup>	32.00 <sup>c</sup>	19.73
Drilling +3.5PM	4.00 <sup>a</sup>	10.67 <sup>b</sup>	17.33 <sup>a</sup>	25.33 <sup>a</sup>	40.33 <sup>ab</sup>	52.00 <sup>ab</sup>	19.60
Drilling +5.5PM	4.67 <sup>a</sup>	11.33 <sup>a</sup>	18.33	26.33 <sup>a</sup>	44.67 <sup>a</sup>	63.33 <sup>a</sup>	21.22
SEM	0.15	0.29	0.22	0.62	2.09	3.64	1.29

a,b,= Means with the same superscripts under the same column are not significant using Duncan Multiple Range Test (DMRT). WAS = Weeks after Sowing.

### Conclusion

Based on the results obtained from this study, it showed that application of poultry manure improved the growth performance and nutrients composition of itch grass (*Rottboellia cochinchinensis*) in the study area. The herbage yield of the plant was

significant ( $p < 0.05$ ) as influenced by sowing methods and poultry manure rates at all levels of treatments. The highest yield was obtained by drilling followed by broadcasting and dibbling method respectively. Based on the results obtained, it could therefore be concluded that drilling

sowing method is the best for the yield of itch grass.

Table 8: Mean herbage yield of itch grass as affected by sowing methods and rates of poultry manure in Aliero, Kebbi State, Nigeria

Treatments	Mean t/ha
Broadcasting +0.0PM	2.8 <sup>ab</sup>
Broadcasting +3.5PM	3.6 <sup>b</sup>
Broadcasting +5.5PM	3.7 <sup>b</sup>
Dibbling +0.0PM	2.9 <sup>ab</sup>
Dibbling +3.5PM	3.6 <sup>b</sup>
Dibbling +5.5PM	3.8 <sup>b</sup>
Drilling +0.0PM	2.3 <sup>ab</sup>
Drilling +3.5PM	3.4 <sup>b</sup>
Drilling +5.5PM	4.1 <sup>a</sup>
SEM	0.22
LSD (0.05)	0.49

a,b,= Means followed by the same superscripts within the same treatments are statistically the same ( $P < 0.05$ ).

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