

Effect of Varied Numbers of Sucker Foliage on the Vegetative Growth of Plantain

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ABSTRACT

This experiment was carried out at Oyo State College of Agriculture and Technology, Igboora Teaching and Research Farm, to evaluate the effect of different numbers of sucker foliage on the vegetative growth of plantain. The experimental design was a completely randomized design (CRD) with replicates consisting of three treatments namely: T_0 (no leaf) serve as control, T_1 (Sucker with one leaf) and T_2 (sucker with two leaves). Growth parameters such as plant height, number of leaves, stem girth, day before leaf sprouting, length of internode at 4, 8, 12, and 16 weeks after planting (WAP) were observed. The results obtained showed that application of control (no leaf) significantly improved. To ensure good planting improvement of plantain, application of sucker with one leaf (control) would be recommended to small scale resource farmer for improve growth of plantain.

Keyword: Plantain Suckers

INTRODUCTION

Plantain (*Musa paradisiaca*) is an herbaceous perennial crop that belongs to the family Musaceae (Robinson, 1996).

Plantain is a staple food in the tropical regions of the world and most important staple food that feeds the world. In Nigeria, Plantain is a carbohydrate source. The Vitamin C content of plantain is very similar to the one of sweet potato and cassava though the concentration may vary with crop, maturity at harvest, soil and farming condition (Oke *et al.* 1998). Plantain production in Africa is estimated at more than 50% of worldwide production (FAO, 1990). The demand for plantain within the country is high with supply struggling to meet demand. This has hampered the status of this crop as a foreign exchange earner. It remains an important staple food, as well as raw material for many products. It is a good source of revenue for many people. The crop ranked third among starchy staples after cassava and yam.

In Nigeria, all stages of fruit (from immature to overripe) are used as a source of food in one form or the other. The mature fruits are peeled, sliced, dried and made into powder. The mature fruits (ripe or overripe) are consumed boiled, steamed, baked, pounded, roasted or sliced and fried into chips. Overripe plantains are fried with palm oil and served as snacks (Dodo Ikire). Plantain leaves are also used for wrapping,

packaging, marketing and serving of food. Sucker management in plantain is a crucial cultural practice in which unwanted suckers developing from the base of the mother rhizome (plant crop) is removed, keeping a suitable sword sucker to produce the Raton crop. The strategy is to remove the surplus suckers that compete with mother plant.

As part of land preparation weeds are cleaned from the area. If the land is very steep and out suitable for farming, it is recommended to control weeds mechanically or with herbicides and that is a system of digging be utilized to plant. The growth of plantain is hampered by limiting factors that include land, cultural practices, labor availability, pest and diseases. In Nigeria, the type of land tenure system practiced in most plantain producing regions does not give space for expansion. With some cases where land is hired, its fertility is too low for plantain production. Where farmers maximize its use by practicing intercropping with crops like cocoyam and cassava (Akinyemi and Tijani Eniola, 2000). There has been little or no change in the cultural practices of the crop in the last 20 years. The inadequate knowledge of improved cultural practices of the crop by the farmer, inefficient extension services systems by the government, and skewers of specialization in areas of research are part of the reasons why yield potential of plantain is still low in Nigeria. Plantains are planted at the onset of the rains. This coincides with the time of planting of other crops. In most cases, shortage of labor makes cultivation of large farms difficult, resulting in delayed weeding and reduce yield (Akinyemi and

Makinde 1999; Akobundu, 1987). Constant high cost of labor is usually experienced in many oil producing states due to preference for higher paying jobs at oil companies. Black leaf streak and banana weevils (*Cosmopolites sordidus*) are the major disease and pest affecting plantain production in Nigeria. Most plantains are susceptible to disease, which causes 30-50% yield reduction (IITA, 1989). One of the advantages of plantain cultivation is that it does not require the use of heavy and costly farm machinery.

Plantains represent the world's second largest fruit crop with an annual production of 129,906,098 metric tons (FAOSTAT, 2010). They rank as the fourth most important global food commodity after rice, wheat and maize in terms of gross value of production (INIBAP, 1992). About 70 million people are estimated to depend on *Musa* fruits for a large proportion of their daily carbohydrate intake (Swennen and Wilson, 1983). Observations have shown that most plantain growers often allow suckers to emerge and grow in multiple forms along the main plantain plant leading to competition with the main plant for nutrients and thus reduction in the overall yield per stand.

Nutritional Value of Plantain

Plantain is a carbohydrate source. The vitamin c content of plantain is very similar to those of sweet potatoes, cassava, though the concentration may vary with the crop, maturity at harvest, soil and farming condition, (oke et al., 1998).

Table 1:

Plantain nutritional value per 100g (3.5 oz)

Nutrition	Amount	Nutrition	Amount
Energy	510k (120km)	Thiamine (B1)	0.052mg (5%)
Carbohydrates	31.89g	Riboflavin (B2)	0.054mg (5%)
Sugar	15g	Niacin (B3)	0.686mg (5%)
Dietary fiber	2.3g	Pantothenic-acid (B5)	0.26mg (5%)
Fat	0.37g	Vitamin B6	0.299mg (23%)
Protein	1.3g	Folate (B9)	22mg (6%)
Vitamin A	56mg (7%)	Choline	13.5mg (1%)
Beta carotene	457mg (4%)	Vitamin c	18.4mg (22%)

Nutrients	Amount
Vitamin E	0.14mg (10%)
Vitamin K	0.7mg (1%)
Calcium	3mg (0%)
Iron	0.6mg (5%)
Magnesium	37mg (10%)
Phosphorus	34mg (5%)
Potassium	499mg (11%)
Sodium	4mg (0%)
Zinc	0.14mg (1%)

Source VSDA (2012)

MATERIALS AND METHODS

This experiment was carried out at the teaching and research farm of the Oyo State College of Agriculture and Technology, Igboora. The town is derived savannah with an average rainfall of about 1455mm with a temperature range of 27⁰c to 32⁰c.

PLANTING MATERIALS

Different numbers of plantain sucker foliage was obtained from a plantain farmer in Idere, a town that is 5km away from Oyo state College of Agriculture and Technology, Igboora.

PLANTING MANAGEMENT PRACTICE:

Suckers foliage of different numbers of plantain was planted and wetting was done regularly until the onset of raining season. Each sizes of the plantain were replicated thrice.

LAND PREPARATION

The experimental site was cleared manually by use of hoe and cutlass for making ridges. The field was marked out into nine plots and a Randomized Complete Block Design (RCBD) was used. The experimental site has three treatments with three replicates, each plot measured 3mx3m, respectively with 1m gap between replicate and 0.5m between plots in replicate. One plantain suckers were planted per hole.

TREATMENT APPLICATION

There were three treatments replicated three times. The treatments are:

T₀; sucker with no leaf as control

T₁; sucker with one leaf

T₂; sucker with two leaves

PLANTING

The plantain suckers were planted on 26th of February, 2014. The plantain suckers were planted at a space 3m by 3m

in each plot at one sucker per hole. The vegetative part began to develop the 11th and 16th days after planting

EXPERIMENTAL LAYOUT

T ₀	T ₁	T ₂
T ₁	T ₂	T ₀
T ₂	T ₀	T ₁

T= represent treatment

CULTURAL OPERATION

WETTING

Wetting was done regularly until the onset of raining season.

WEEDING

This was carried out manually twice a month by using of hoe to reduce competition and infestation of rodents and diseases.

GROWTH PARAMETER

Number of Leaves

The number of leaves on plantain sucker plant was counted from third weeks after planting.

Plant Height

The plant height of plantain sucker plant was measured with tape rule (cm)

Table 2

Effect of varied numbers of sucker foliage on number of leaves of plantain.

TREATMENT	4WAP	8WAP	12WAP	16WAP
NO LEAF	0.92b	6.42a	10.83a	17.08a
ONE LEAF	1.83a	5.33a	8.65ab	11.00c
TWO LEAVES	0.92b	3.92c	7.84Cb	15.09b

Means followed by the same letter in the same columns and rows are not significant different at 5% level of probability by DMRT.

and meter rule (m) from third week after planting. The measurement was taken from the base to the tip of the last leaf plant

Number of Internode

The numbers of internode on the plantain sucker plant was measured in cm with tape rule from the third week to the 20th week after planting.

Stem Girth

The girth of the plantain sucker plant was measured using the vennai caliper starting from the 3rd week to the 20th week after planting.

Day before leaf sprouting

The numbers of day before the leaf sprout out were counted.

Table 2 shows the effect of different numbers of sucker foliage on number of leaves of plantain, the result shows that one leaf has highest treatment others, result also shows that one leaf and

two leaf have low treatment while control in high in wap, and 12 wap shows that there were significant different in control

among others, while control is highest in 16wap.

Table 3

Effect of varied numbers of sucker foliage on day before leaf sprouting of plantain.

TREATMENT	4WAP	8WAP	12WAP	16WAP
CONTROL	13.46b	16.16b	24.68c	53.84b
ONE LEAF	18.30a	20.46a	32.61b	46.91b
TWO LEAVES	12.54bc	19.86a	46.78a	88.08a.

Means followed by the same letter in the same columns and rows are not significant different at 5% level of probability by DMRT.

from 4 to 16 WAP on treatments observed on day before leaf sprouting. The result also shows that the use of two leaves gave the highest at 16 WAP (88.08) cm followed by To (53.84) cm while T1 gave the least (46.91) cm. the result of the day before leaf sprouting generally gave the order of response (T2>T0>T1)

The result from table 3 shows the effect of different numbers of sucker foliage on days before leaf sprouting of plantain. There were significant different

Table 4

Effect of varied numbers of sucker foliage on length of internode (cm) of plantain.

TREATMENT	4WAP	8WAP	12WAP	16WAP
CONTROL	9.50a	6.92a	6.86a	9.86a
ONE LEAF	8.25c	5.51ab	5.75b	7.52Bc
TWO LEAVES	9.92ab	4.52c	4.66bc	8.41b

Means followed by the same letter in the same columns and rows are not significant different at 5% level of probability by DMRT.

16wap on length of internode, the result shows that the use of control gave the highest result at 16wap (9.86cm) followed by two leaf (8.41cm) while one leaf gave the least (7.52cm). The result gave order of response of (control > two leaves> one leaf.)

The result from table 4 shows the effect of different numbers of sucker foliage on length of internode of plantain. There were general increase from 4 to

Table 5

Effect of varied numbers of sucker foliage on plant height (cm) of plantain

TREATMENT	4WAP	8WAP	12WAP	16WAP
ONE LEAF	0.59a	1.86a	1.96a	2.46a
TWO LEAVES	0.56ab	0.84c	1.36c	1.96ab

Means followed by the same letter in the same columns and rows are not significant different at 5% level of probability by DMRT.

Table 5 Shows of effect of different numbers of sucker foliage on plant height of plantain. The result shows

Table 6

Effect of varied numbers of sucker foliage on stem girth (cm) of plantain.

TREATMENT	4WAP	8WAP	12WAP	16WAP
CONTROL	20.42a	21.58a	28.96a	43.4a
ONE LEAF	15.52a	15.08b	19.41c	37.86a
TWO LEAVES	16.42b	17.33ab	22.83b	33.58c

Means followed by the same letter in the same columns and rows are not significant different at 5% level of probability by DMRT.

The result from table 6 shows the effect of different numbers of sucker foliage on length of internode of plantain. There was significant different and increase from 4 to 16wap on stem girth. The result shows that the use of control (no leaf) gave the highest result as 16wap (43.4cm) followed by one with (37.86cm) while Two leaf gave the least (33.58cm). The result of the stem girth generally gave the order of response of control > one leaf > two leaves.

CONCLUSION

At the end of the experimental work, it reveals that T₀ (Sucker with no leaf) has improved plant height, number of leaves, length of internode, stem girth and day before leaves sprouting, than other treatment T₁ (sucker with one leaf) and T₂ (sucker with two leaves).

RECOMMENDATION

In other to ensure good growth of the vegetative plantain, application of

that control is higher among others in 4wap, also the result shows that in 8wap and 12wap the one and two leaf are low, while the result shows that there were significant different in control among others in 16wap.

irrigation, bush burning, nearness to water, application of fertilizer either organic or inorganic would be recommended to both small scale and large scale farmer in the study area.

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