

**SCREENING OF FIVE PRE-EMERGENCE HERBICIDE FOR WEED CONTROL IN THE GROWTH OF COCOYAM (*Colocasia esculentus* (L.) schott) IN ABIA STATE.**

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**ABSTRACT**

This study was conducted at the National Root Crops Research Institute, Umudike, Abia State in 2015 and 2016 to investigate the weed control efficacy of five pre-emergence herbicides in cocoyam (Nce 012). The trial was laid out in a Randomized complete Block Design (RCBD) with three replications. The treatments consisted of Diuron at 3 and 4L/ha, Goat Tender 4F at 0.5 and 0.75/ha. Liberator forte at 1.0 and 1.5L/ha. Codal Gold at 3 and 4.5L/ha; Primextra Gold at 3 and 4.5L/ha, three hoe weeding at 4, 8 and 12 weeks after planting (WAP) and a weedy check plot. All data collected were subjected to analysis of variance (ANOVA), using Genstat Discovery Edition 12 and mean separation were carried out with fisher's least significant difference. ( $LD_{0.05}$ ) Statistical tool in both years, the plots treated with Goat Tender 4F at 0.75kg/ha gave the lowest weed biomass of 6.9 and 7.9g/m<sup>2</sup> at 6WAP 32.5 and 28.3g/m<sup>2</sup> at 9WAP, while the weeded check plot had the highest weed biomass of 20.0 and 24.4g/m<sup>2</sup> at 6WAP, 65.7 and 75.0g/m<sup>2</sup> at 9WAP in 2015 and 2016 respectively, when compare with the other treatments. Application of the five pre-emergency herbicides gave good results on plant height, number of leaves and leaf area. The results also shows significance difference among each other at  $P < 0.05$ . Highest corm mean weight of 2.38t/ha was obtained in plots treated with preextra Gold at 4.5L/ha, while the unweeded plot had the lowest mean corm weight of 0.63t/ha.

**Keywords:** Weed control, Herbicides, Cocoyam and Weedbiomass

**INTRODUCTION**

There are two main edible types of cocoyam in Nigeria: *Colocasia esculenta* (L.) schott otherwise known as taro and *Xanthosoma sagittifolium* also known as *tannia*. They serve as important source of food for the rural household in Nigeria.

Cocoyam is an excellent multipurpose food crop in Nigeria. It has the ability to tolerate salinity makes it suitable for localities where few other crops grow, as such, merits more attention in research focusing on yield (Grubben and Denton, 2004). However, cocoyam is difficult crop to grow because of its high requirement for soil nutrients, moisture and labour. It is also affected by numerous pests, weeds and diseases, which can have a drastic impact on yield.

Ivanic and Lebot (2000) reported that yield is the most important goal in all cocoyam which depends on genotype and environmental factors. Weeds are plants growing where man does not want it to be (Onwueme and Singh, 1999). According to Jackson

*et al.* (2003), weeds have been observed to drastically reduced farmers yield and constitute a major constraint to cocoyam production in the humid tropics. This study was conducted to evaluate the vegetative growth of cocoyam with different pre-emergency herbicide and also to evaluate cocoyam tuber yield under the different weed control strategies.

**MATERIALS AND METHODS:**

Geographical features of the study area. The study was conducted at the experimental station of the National Root Crops Research Institute (NRCRI), Umudike in 2015 and 2016 cropping seasons,. Umudike lies in the rainforest zone of Nigeria and is characterized by high annual rainfall lasting from April to October with about 2177mm per annum, temperature of 33°C and mean minimum temperature of 21°C. However, latitude 05°, 29°N, longitude 07°, 33°E and 122m above seas level (NEST, 1991).

The natural vegetation of this area is the lowland tropical rainforest type found in Umudike which its vegetation represents the climax vegetation of Nigeria and West African Coast Forest. The soil in the study area is sandy loam. The soils derived from the basement complex rocks are mostly well chained with medium to fine textures which are of high agricultural value for the production of both tree and arable crops (Agboola, 1979). There is periodic rainfall in the study area, such as heavy rainfall from April to June later interrupted with break in August and short rain season from September to October and early November. Dry season stretches from early to November March.

The experiment was laid out in a randomized complete block design replicated 3 times. The cormels used were sown on ridge, at a planting distance of 1m x 0.5m. the treatment consisted of 12 treatments, namely;

1. Diuron at 3L/ha
2. Diuron at 4L/ha
3. Goat Tender 4F at 0.5L/ha
4. Goat Tender 4F at 0.75L/ha
5. Liberator forte at 1L/ha
6. Liberator forte at 3L/ha
7. Codal Gold at 3L/ha
8. Codal Gold at 4.5L/ha
9. Pri-mextral Gold at 3L/ha
10. Pri-mextral Gold at 4.5L/ha
11. Hoe weeding at 4,8,12WAP
12. No weeding.

All pre-emergence herbicides treatment were applied after planting of the cormels. Herbicides were applied using manually mounted 15 litre knapsack

sprayer fitted with hand held operated blue nozzle in a spray volume of 240 litre per hectare. The herbicide were applied in the morning during warm temperature and high humidity.

#### **Data Collection:**

Plant height were taken from soil level to the tip of the top most fully expanded leaf. Number of tag leaves were counted and leave area was taken through the length and breadth (LxW). Dry weight of weeds was taken after oven drying to constant. The weight of the corms/cormels was determined by the use of 50kg scale (salter).

## **RESULT**

### **Plant height**

The application of herbicides treatments showed no significant ( $P>0.05$ ) effects at 2WAP (Table 1). However, plots treated with codal gold at 3l/ha and codal gold at 4.5L/ha, had the highest plant height (8.0cm) respectively at 2WAP in 2015, while plots treated with goal tender 4F at 0.75L/ha and liberator forte at 1.5L/ha had the highest plant height (10.3cm) respectively in 2016, when compared with other herbicides treated plots.

At 4 weeks after planting (WAP) plots treated with Codal Gold shows significant ( $P<0.05$ ) effects on plant height (12.3cm), followed with plots treated with primextra Gold at 3L/ha in 2015. The herbicides treatment did not show any significant ( $P>0.05$ ) effects on plant height in 2016. However, Codal Gold at 4.5L/ha and Diuron at 3L/ha gave the highest plant height (14.7cm) respectively in 2016.

At 6 weeks after planting, plots treated with Primextra Gold at 3L/ha shows significant ( $P<0.05$ ) effects on plant height (20.0cm) 2015 when compared with No weeded plots that had the least plant height (11.3). In 2016, codal gold at 4.5L/ha, Diuron at 4L/ha and Primextra Gold at 3L/ha, gave the highest plant height (20.0cm) respectively in 2016 at WAP, when compared with Manual hand hoe weeding and No weeding treatments. Plots treated with Primextra Gold at 3/ha, gave the highest plant height (31.3cm) at 8WAP in 2015, while herbicides treatment shows no significant ( $P>0.05$ ) effects on plant height (38.0cm) when compared with the other herbicides treated plots. At 10 WAP. Diuron at 3L/ha and liberator forte at 1.0L/ha shows significant ( $P<0.05$ ) on plant height, both herbicides had the height plant height of (64.0cm) respectively in 2015 when compared with manual hand hoe weeding and no weeding treatments. While in 2016 season, applications of Codal Gold at 4.5L/ha and Primextra Gold at 3L/ha gave the highest plant (66.0 and respectively when compared with the other herbicides treated plots.

### **Number of leaves**

Number of cocoyam leave differed significantly in the two planting season and across weed control treatments (Table 2). Number of leave where the same in all the treatments in early season and

regimes such as 2 and 4 WAP in 2015 and 2016 cropping seasons.

Plots treated with Goal tender 4F at 0.5L/ha followed Primextras Gold at 3L/ha has a higher number of leaves but not significantly different manual hand hoe weeding at 6WAP in 2015 while Goal Tender 4F at 0.5L/ha Primextra Gold at 3L/ha and manual hand hoe weeding has a higher number of leaves more than other herbicides treated plots.

Plots treated with herbicides shows significant ( $P<0.05$ ) effects on number of leaves at 8WAP (Table 2) in both seasons. Goal tender 4F at 0.5L/ha has a higher number of leaves when completed with the other herbicides treated plots in 2015, while codel hold at 4.5L/ha has a higher number of leaves than other herbicides treated plots in 2016 at 8 WAP. At 10WAP, plots treated with Goal Tender 4F at 0.5L/ha has a higher number of leaves (3.17) more than the other herbicides treated plots and No weeding treatments in 2015 at 10WAP, while plots treated with Codal Gold at 3L/ha and liberator forte at 1.5l/ha had higher number of leave (3.63) respectively in 2016 more than other herbicides treated plots.

### **Leaf area (cm<sup>3</sup>)**

The application of herbicides treatment show significant ( $p<0.05$ ) effects on leaf area in 2015 at 2WAP table (3.0) has the higher leaf area when compared with No weeding treatment that had the least leaf area (147.7cm<sup>2</sup>). at 2016 season, herbicides treatment shows no significant ( $p>0.05$ ) effect on leaf area. However, liberator forte at 1.5L/ha gave the highest leaf area (326.1cm<sup>2</sup>) plots treated with Diuron at 3L/ha has a higher leaf area (707.6cm<sup>2</sup>), but no significantly different from manual hand hoe weeding treatment at 4WAP in 2015, while Codal Gold at 4.3L/ha had the highest leaf area (707.6cm<sup>2</sup>) when compared with the other herbicides treated plots in 2016 at 4WAP. Plots treated with Goal tender 4F at 0.75L/ha has a higher leaf area (234.4cm<sup>2</sup>) at 6WAP in 2015 when compared with other herbicides treated plots. In 2016, plots treated with Diuron at 4L/ha has a higher leaf are (221.8cm<sup>2</sup>) more than other herbicides treated plots at 6WAP.

Plots treated with Goal tender 4f at 0.5L/ha had the highest leaf area (408.6cm<sup>2</sup>), when compared with other herbicides treated plots at 8WAP in 2015. Plots treated with primextral Gold at 3L/ha has a higher leaf area (380.0cm<sup>2</sup>) when compared with the other herbicides treated plots and manual hand hoe weeding treatments in 2016 at 8WAP.

At 10WAP, plots treated with Codal Gold at 3L/ha and Goal tender 4F at 0.5L/ha had the highest leaf area (635.0cm<sup>2</sup>) respectively when compared with the other herbicides treated plots in 2015, while liberator forte at 1.0L/ha had the highest leaf area (624.0cm<sup>2</sup>) when compared with other herbicides treated plots in 2016 at 10WAP.

### **Weed Biomass**

Weed biomass (g) significantly ( $p < 0.05$ ) affected by weed control treatments (Table 4) in both season Goal tender 4F at 0.75L/ha had lower weed biomass (6.99) when compared with other herbicides treated plots, at 6WAP while no weed treatments had the highest weed biomass ( $20.0\text{g/m}^2$ ) in 2015 at 6WAP. In 2016, Goal tender 4F at 0.754L/ha sustained the trend of having lower weed biomass (7.93) when compared with the other herbicides treated plots and No weeding treated plots had the highest weed biomass (24.4g) at 6WAP in 2016.

At 9WAP, plot treated with Goal Tender 4F at 0.75L/ha had the lowest weed biomass (24.2 and 32.5g) in both 2015 and 2016 cropping season, when compared with the other herbicides treated plots in both season, while No weeding treatments maintained the highest weed biomass in both seasons at 9WAP.

#### **Corm weight (t/ha)**

Corm weight were not significantly affected by weed control treatments (Table 5.0). However, plots treated with primextra Gold at 4.5L/ha gave the highest corm weight (3.07t/ha) in 2015, when compared with other herbicides treated plots and No weeding treatments. In 2016, plots treated with liberator forte at 1.0L/ha had the highest corm weight (1.93t/ha) when compared with other treatments with No weeding treatment having the least corm weight (0.15t/ha).

#### **Cormel weight (t/ha)**

Cormel weight obtained differed significantly in both seasons and across weed control treatments (Table 6.0). plots treated with Goal Tender 4F at 0.75L/ha, gave the highest cormel weight (4.57t/ha) but was not significantly different from weeding treatments having the least cormel weight (0.42t/ha) in 2015 season; the same trend was observed in 2016, were

plots treated with Goal Tender 4F at 0.75L/ha also gave the highest cormel weight (3.33t/ha) when compared with other herbicides treated plots. No weeding treatments had the least cormel weight (0.35t/ha).

#### **DISCUSSION**

The production of cocoyam is grossly affected by weed, weed infestation in the southern part of Nigeria (Sangakkara, 1992). This study seeks to investigate the effect of five pre-emergence herbicides for weed control on some growth parameter and yield components of cocoyam. In this study, the use of Codal Gold at 3L/ha and 4.5L/ha had significant positive effect on plant height, number of leaves and leaf area compared to the unweeded check plot and other weed control methods. This agrees with the work done by Oluwafemi (2013) in Ekiti state who reported the challenging factor in cocoyam production in weed infestation. The differences in growth, weed control and yield of the cocoyam are indication that the five pre-emergence herbicides had an effect on them (Oluwafemi, 2013). There was reduction in the production of cocoyam in all the unweeded checked plots for two years compared with the all the treated plots and checked plot in terms of weight of corms (kg), weight of cormels (kg) and weight of corms (t/ha). This observation also agrees with the findings of Remison, (1978) and the result of yield obtained from unweeded plots of cowpea. Weed affects the number of corms and cormels, this could be as a result of weed infestation on weedy plot. Oerke *et al.*, (1994) noted that losses caused by weed infestation in cocoyam production could be extensive. In another similar study, Chikoye (2000)

**Table 1.0: Effect of herbicides and weeding on the plant height (cm) of cocoyam at 2, 4, 6, 8 and 10 weeks after planting in 2015 and 2016.**

Treatments	Year and weeks after planting (wks) and plant height (cm)														
	2WAP			4WAP			6WAP			8WAP			10WAP		
	2015	2016	Mean	2015	2016	Mean	2015	2016	Mean	2015	2016	Mean	2015	2016	Mean
Codal Gold at 3 L/ha	8.0	9.3	8.7	12.3	14.0	13.2	18.7	18.7	18.7	30.0	36.7	33.3	59.3	62.0	60.7
Codal Gold at 4.5 L/ha	8.0	9.3	8.3	11.3	14.7	13.0	17.3	20.0	18.7	28.7	38.0	33.3	61.7	66.0	63.8
Diuron at 3 L/ha	6.7	10.0	8.0	11.3	14.7	13.0	18.0	18.0	18.0	28.7	30.0	29.3	64.0	61.3	62.7
Diuron at 4 L/ha	6.7	9.3	8.0	11.3	12.7	12.7	17.3	20.0	18.7	28.7	36.7	32.7	63.3	64.0	63.7
Goal Tender 4F at 0.5 L/ha	6.7	9.3	8.3	11.3	14.0	12.7	19.3	18.0	18.7	30.0	30.7	30.3	61.3	62.0	61.7
Goal Tender 4F at 0.75 L/ha	6.3	10.3	7.8	11.3	14.0	12.7	18.7	19.3	19.0	30.7	34.7	32.7	62.0	61.3	61.7
Hoe weeding	6.3	9.3	8.0	10.3	13.3	11.8	18.0	19.3	18.7	29.3	36.7	33.0	60.7	61.3	61.0
Liberator Forte at 1.0 L/ha	7.3	8.7	9.0	11.3	12.0	11.7	18.7	19.3	19.0	30.7	32.7	31.7	64.0	61.3	62.7
Liberator Forte at 1.5 L/ha	7.7	10.3	8.2	11.3	13.3	12.3	18.0	19.3	18.3	30.7	32.7	31.7	58.0	62.0	60.0
No weeding	7.0	9.3	7.2	9.3	11.3	10.3	11.3	14.0	12.7	18.0	21.3	19.7	36.0	28.0	32.0
Primextra Gold at 3 L/ha	5.7	8.7	8.7	12.0	14.0	13.0	19.3	20.0	19.7	31.3	36.0	33.7	60.0	66.0	63.0
Primextra Gold at 4.5 L/h	7.3	10.0	8.0	11.3	13.3	12.0	20.0	18.7	19.3	30.7	30.7	30.7	60.0	59.3	59.7
LSD <sub>(0.05)</sub>	Ns	ns		2.68	ns		2.59	ns		4.31	ns		6.34	5.35	
Coefficient of variation (CV %)	9.8	6.4		4.5	5.2		4.3	1.5		1	5.3		3.1	1.1	

**Table 2.0: Effect of herbicides and weeding methods on number of leaves of cocoyam after 2, 4, 6, 8 and 10 WAP at Umudike in 2015 and 2016 cropping seasons**

Treatments	Number of leaves of cocoyam after 2, 4, 6, 8 and 10 WAP at Umudike in 2015 and 2016 cropping seasons														
	2 WAP			4 WAP			6 WAP			8 WAP			10WAP		
	2015	2016	Mean	2015	2016	Mean	2015	2016	Mean	2015	2016	Mean	2015	2016	Mean
Codal Gold at 3 L/ha	0.46	0.53	0.49	0.9	0.98	0.94	1.79	1.93	1.86	2.12	2.38	2.25	2.9	3.63	3.27
Codal Gold at 4.5 L/ha	0.45	0.51	0.48	0.83	1.00	0.91	1.82	1.86	1.84	2.1	2.52	2.31	3.02	3.43	2.23
Diuron at 3 L/ha	0.48	0.56	0.52	0.96	0.98	0.97	1.93	1.96	1.94	2.19	2.31	2.25	2.88	3.53	3.21
Diuron at 4 L/ha	0.49	0.55	0.52	0.85	0.95	0.9	1.79	1.93	1.86	2.03	2.35	2.19	2.8	3.37	3.08
Goal Tender 4F at 0.5 L/ha	0.49	0.59	0.54	0.96	1.1	1.03	2.14	2.03	2.08	2.28	2.38	2.33	3.17	3.47	3.32
Goal Tender 4F at 0.75 L/ha	0.51	0.6	0.56	0.86	1.03	0.94	1.79	1.86	1.82	2.07	2.45	2.26	3.00	3.53	3.27
Hoe weeding	0.48	0.54	0.51	0.85	0.95	0.9	1.58	2.03	1.8	2.03	2.42	2.22	2.83	3.5	3.17
Liberator Forte at 1.0 L/ha	0.46	0.53	0.49	0.98	1.03	1	1.86	1.82	1.84	2.01	2.35	2.18	2.90	3.5	3.2
Liberator Forte at 1.5 L/ha	0.53	0.53	0.51	0.83	0.98	0.9	1.68	1.98	1.83	2.1	2.38	2.24	2.63	3.63	3.13
No weeding	0.43	0.28	0.52	0.61	0.43	0.52	1.17	1.12	1.15	1.12	1.26	1.19	1.3	1.83	1.57
Primextra Gold at 3 L/ha	0.45	0.58	0.49	0.83	1.03	0.93	2	2.03	2.01	2.21	2.45	2.33	2.78	3.57	3.18
Primextra Gold at 4.5 L/h	0.49	0.55	0.48	0.89	0.98		1.7	2.01	1.86	2.17	2.17	2.17	2.8	3.5	3.15
LSD <sub>(0.05)</sub>	0.236	0.223		ns	0.262		ns	0.492		0.60	0.479		0.798	0.612	
Coefficient of variation (CV %)	2.7	6.9		4.9	6.1		4.1	4		2.6	2.5		1.5	1.7	

**Table 3.0: Effect of herbicide and weeding methods on cocoyam leaf area (cm<sup>2</sup>) after 2, 4, 6, 8 and 10 WAP in 2015 and 2016**

Treatments	Leaf area (cm <sup>2</sup> ) and weeks after planting (week)														
	2 WAP		4 WAP			6 WAP			8 WAP			10WAP			
	2015	2016	Mean	2015	2016	Mean	2015	2016	Mean	2015	2016	Mean	2015	2016	Mean
Codal Gold at 3 L/ha	344.6	283.1	313.8	732.2	756.8	744.5	182.1	187.1	184.6	318.7	331.7	325.2	635.0	602.1	618.6
Codal Gold at 4.5 L/ha	289.1	233.8	261.5	739.1	707.6	723.4	205.8	199.1	202.4	352.6	368.6	360.6	559.3	609.8	584.6
Diuron at 3 L/ha	264.6	270.7	267.6	707.6	744.6	726.1	209.8	190.8	200.3	356.3	201.5	278.9	606.4	581.8	594.1
Diuron at 4 L/ha	264.6	215.3	239.9	732.3	756.6	744.6	171.4	221.8	196.6	311.6	363.7	337.6	627.6	622.1	624.9
Goal Tender 4F at 0.5 L/ha	32.0	289.1	304.6	769.2	732.2	750.7	212.0	183.4	197.7	408.6	363.0	385.8	635.0	590.1	612.6
Goal Tender 4F at 0.75 L/ha	306.1	276.9	291.5	763	744.5	753.8	234.4	216.3	225.4	393.8	326.1	360.0	632.0	550.7	591.4
Hoe weeding	313.8	301.5	307.7	781.4	744.6	763	182.2	194.2	188.2	295.5	283.8	289.6	580.6	610.1	595.3
Liberator Forte at 1.0 L/ha	252.3	313.8	283.1	738.8	738.4	738.4	193.6	212.3	203.0	354.7	307.1	330.9	591.3	624.0	607.6
Liberator Forte at 1.5 L/ha	356.9	326.1	341.5	732.3	723.0	723.0	188.6	195.7	192.1	324.3	332.3	328.3	594.4	576.6	585.5
No weeding	147.7	147.9	147.8	547.6	547.6	547.6	635.0	917.0	776.0	140.0	336.1	238.0	294.7	218.8	256.8
Primextra Gold at 3 L/ha	276.8	313.8	295.3	750.7	750.7	744.6	196.6	154.1	175.4	287.4	380.0	333.7	612.9	608.3	610.6
Primextra Gold at 4.5 L/h	258.4	283.1	270.7	744.6	776	760.3	190.1	182.4	186.3	309.8	343.7	326.7	596.9	925.9	586.1
LSD <sub>(0.05)</sub>	70.09	ns		36.55	39.33		550.5	45.56		ns	ns		592.3	4.3	
Coefficient of variation (CV %)	8.5	6.8		1.8	1.5		4.2	4		7.2	1.8		1.8		

**Table 4.0:** Effect of herbicides and weeding methods on weed biomass in cocoyam after 6 and 9 WAP in 2015 and 2016

Treatments	Weed Biomass (g) and WAP (weeks)					
	6 WAP			9WAP		
	2015	2016	Mean	2015	2016	Mean
Codal Gold at 3 L/ha	8.7	9.3	9.0	36.4	39.4	37.9
Codal Gold at 4.5 L/ha	8.4	8.8	8.6	34.5	36.5	35.5
Diuron at 3 L/ha	8.3	9.2	8.8	39.0	39.0	39.0
Diuron at 4 L/ha	8.4	8.7	8.5	36.0	40.3	38.2
Goal Tender 4F at 0.5 L/ha	7.2	8.3	7.8	29.1	37.9	33.5
Goal Tender 4F at 0.75 L/ha	6.9	7.9	7.4	24.2	32.5	28.3
Hoe weeding	1.1	1.2	1.2	10.6	26.1	18.3
Liberator Forte at 1.0 L/ha	9.0	8.8	8.9	38.3	40.5	39.4
Liberator Forte at 1.5 L/ha	10.2	9.1	9.6	37.6	46.0	41.8
No weeding	20.0	24.4	22.2	65.7	75.0	70.4
Primextra Gold at 3 L/ha	8.4	8.8	8.6	31.1	45.2	38.1
Primextra Gold at 4.5 L/h	8.2	8.1	8.1	33.1	37.9	35.5
LSD <sub>(0.05)</sub>	0.399	2.060		2.724	6.626	
Coefficient of variation (CV %)	0.9	3.6		1.1	4.2	

**Table 5.0:** Effect of weed control treatments on corm weight in 2015 and 2016

Treatments	Corm weight per hectare (t/ha)		
	2015	2016	Mean
Codal Gold at 3 L/ha	2.77	1.68	2.23
Codal Gold at 4.5 L/ha	2.97	1.67	2.32
Diuron at 3 L/ha	2.53	1.45	1.99
Diuron at 4 L/ha	2.33	1.72	2.03
Goal Tender 4F at 0.5 L/ha	2.57	1.90	2.23
Goal Tender 4F at 0.75 L/ha	2.57	1.72	2.14
Hoe weeding	2.02	1.87	1.94
Liberator Forte at 1.0 L/ha	2.73	1.93	2.33
Liberator Forte at 1.5 L/ha	2.73	1.60	2.17
No weeding	1.10	0.15	0.63
Primextra Gold at 3 L/ha	2.90	1.60	2.25
Primextra Gold at 4.5 L/h	3.07	1.68	2.38
LSD <sub>(0.05)</sub>	Ns		1.157
Coefficient of variation (CV %)	6.6		7.9

ns = not significant

**Table 6.0: Effect weed control treatments on cormel weight in 2015 and 2016**

Treatments	Cormel weight per hectare (t/ha)		
	2015	2016	Mean
Codal Gold at 3 L/ha	3.97	3.00	3.48
Codal Gold at 4.5 L/ha	3.97	2.90	3.43
Diuron at 3 L/ha	4.13	2.87	3.50
Diuron at 4 L/ha	3.90	3.00	3.45
Goal Tender 4F at 0.5 L/ha	4.27	3.20	3.73
Goal Tender 4F at 0.75 L/ha	4.57	3.33	3.95
Hoe weeding	3.97	2.73	3.35
Liberator Forte at 1.0 L/ha	3.77	2.90	3.33
Liberator Forte at 1.5 L/ha	4.00	2.27	3.13
No weeding	0.42	0.35	0.38
Primextra Gold at 3 L/ha	3.67	2.77	3.22
Primextra Gold at 4.5 L/h	3.50	3.02	3.26
LSD <sub>(0.05)</sub>	0.4188	0.3025	
Coefficient of variation (CV %)	0.5	10.3	

confirmed that the total information on economic impact of weeds on cocoyam production is still vague, probably because methods of estimating yield losses often differ and make it difficult for easy comparison in different regions of the country.

#### CONCLUSION AND RECOMMENDATION

Weeds reduced crops yield and quality. They also decrease the value and productivity of land, reduce harvesting and processing efficiency, increase cost and labour for control measures. From this work, it can be say that all the herbicides increased the vegetative growth of the cocoyam (plant height, number of leaves and leaf area), significantly increased yield loss in cocoyam when compared to the no weed control treatment. The herbicides significantly increased both the number and weight of corms/cormels per hectare.

Goal tender 4F also gave the highest weed control efficacy and lower the weed biomass when compare with the other treatment. The effectiveness of this Goal Tender 4F may be due to difference in chemical constituent of the active ingredients.

Among the pre-emergence herbicides evaluated for weed control in this study, shows good weed control and increase plant height, number of leaves and leaf area and increase corms/cormel weight (t/ha) by Goal tender 4F at 0.75L/ha.

Goal Tender 4F at 0.75L/ha is recommended for cocoyam farmers in the region to control weed in their cocoyam farm.

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