

# Effect of Different Weeding Frequency on the Growth and Yield of Jute Mallow (*Corchorus olitorus*)

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## ABSTRACT

The study examined the effect of different weeding frequency on the growth and yield of *Corchorus olitorus* within the experimental plot of the Federal College of Forestry, the experiment was laid out in a Randomized Complete Block Design (RCBD) with four (4) treatments replicated three (3) times as follows: Weed free plot, 2 days weeding interval, 5 days weeding interval and Non weeded plot. The treatments were compared on the basis of plant height, number of leaves, stem girth, leaf area for a period of six (6) weeks and fresh weight was measured and recorded prior to harvesting. The data collected were subjected to Analysis of Variance (ANOVA). The result revealed that application of all the treatments significantly influenced the growth of *Corchorus olitorus* and there was no significant difference on the Leaf length and yield of all the treatments evaluated though T3 had the highest yield among the four treatments with the mean value of 700g. Since yield is one of the most important parameters when leafy vegetable is concerned, it is therefore concluded that T3 should be used as weeding time for the growth and yield of *Corchorus olitorus* because it is the most effective of all the treatments applied.

**Keywords:** Jute mallow (*Corchorus olitorus*), weeding interval, Non-weeded, growth and yield

## INTRODUCTION

*Corchorus olitorus* is a vegetable that is widely grown in both dry or semi arid regions and in humid areas of Africa and it varies in size, branching, and shape of its fruits and leaves. The genus *Corchorus* consists of some 50-60 species of which about 30 are found in Africa. *Corchorus* is mainly known for its fibre product jute and for its leafy vegetables. Most of the species are used as a vegetable of which *Corchorus* is most frequently cultivated. Jew's Mallow are used in the treatment of fever, gonorrhea, chronic cystitis. The light and softwood are used in making sulfur matches (Edmonds, 1990).

Jute mallow is commonly called "Ewedu" amongst the Yoruba's, "Mahohiya" in Turkey and "Mulukhiyah" in Egypt (Khalid, 2011). It is an Afro-arabian variety of the family name Malvaceae. It grows to a height of 3-5m and has leaf branching very close to the top (Karol, 2003). It has thin stem with softer and stronger fibre. Its leaves are used for vegetable soup preparation. It has leaf axils that produce flowers which are yellow in colour. It has a long-like small lady's finger fruits which are greenish in colour when fresh and dark brown to black when dried. The seed disperses itself by explosive mechanism (Ejanakeube, 2009).

The economic importance of *Corchorus olitorus* vary from food to other uses such as the medicinal uses, cosmetics making e.t.c (FAO, 1995). *Corchorus olitorus* is grown under a suitable climatic condition of temperature 20°C-40°C and an average humidity of 75% in the pure alluvium soil. Germination occurs in 5-8 days depending on the soil temperature and requires 6-8cm of weekly rainfall (Whitlock, 2003).

In West Africa, it is commonly cultivated and very popular among rural people of all classes especially in Nigeria. *Corchorus olitorus* is known to contain high level of foliate and iron which are useful for the prevention of anaemia (Oyedele *et al.*, 2006). The plant is also eaten in some parts of Asia (Furumoro *et al.*, 2002). Ecologically, the crop grows more easily in rural subsistence farming system when compared to exotic species like cabbage and spinach (Schipper 2000, Modi *et al.*, 2006).

More broadly weed occasionally is applied pejoratively to species outside the plant kingdom, species outside the plant kingdom, species that can survive in diverse environments and reproduce quickly. Weed growth on *Corchorus* results in severe crop-weed competition, yield losses may be up to 75 to 80% implying the need for judicious weed management. The main problem limiting the production of *Corchorus olitorus* is inadequate weed management.

Therefore, this research was carried out to compare the effect of different weeding frequencies on the growth and yield of *Corchorus olitorus*.

## MATERIALS AND METHODS

### Location of the study

The experiment was carried out within Federal College of Forestry, Jericho, Ibadan North-West Local Government Area of Oyo State. The area lies between latitude 7°23'N and longitude 3°51'E of Greenwich Meridian Time (G.M.T). The climate of the area is dominated by rainfall pattern ranging from 1400mm – 1500mm. the average temperature is about 32° C and relative humidity is about 80-85%. The area has two distinct seasons namely: Dry season usually from November-March and Rainy season from April-October (FRIN, 2003).

### Experimental Layout

The project field was cleared and 12 beds of sizes 1.5m x 1m were made in all. The furrow path between the three replicates was 0.5m, and this made the whole plot size to be 7m x 5m.

The experiment was laid in a Randomized Complete Block Design (RCBD) having a total number of four (4) treatments (including the control) replicated three (3) times. **Treatments include** T1 – Weed free plot, T2 – Two days interval weeded plot, T3 – Five days interval weeded plot, T4 – Non-weeded plot (control).

#### Parameters Assessed

Data were collected once in a week on the following plant parameters **Plant Height, Number of leaves, Stem girth (mm) and weight of harvested fresh leaves.**

#### Data Analysis

Data collected were subjected to Analysis of Variance (ANOVA) and means separated using Duncan Multiple Range Test (DMRT) at 5% level of probability where significant differences were observed.

### RESULTS AND DISCUSSION

#### Table 1: Pre-planting physical and chemical properties of the soil used.

The soil at the experimental site was classified as an Alfisol with its distinctive features. The table reveals that the soil is low in zinc, total Nitrogen, moderate in Potassium and low in Available Phosphorus. Total Organic Carbon of the soil is or 7.6g/kg which is low. The pH of the soil is acidic and the textural class of the site is sandy loam.

#### Table 2: Effect of weeding frequency on the plant height of *Corchorus olitorus*

Table 2 shows the effect of weeding frequency on plant height, with T<sub>3</sub> having the highest performance with mean value of 44.33cm, T<sub>4</sub> performed least with mean value of 16.07. The result also shows that T<sub>3</sub> is significantly different from other treatments thereby performing best. Weeding facilitates plants to have more resources for growth, these results agreed with Joshi (2004), Mubarak (2004), Bedry (2007) and El Naim and Ahmed (2010); they found that, increasing times increased plant height, due to efficient weed control.

#### Table 3: Effect of weeding frequency on stem girth of *Corchorus olitorus*

Table 3 shows that T<sub>3</sub> performed best in stem diameter having 0.4000mm while least performance was observed in T<sub>4</sub> (0.2100mm). Hence, T<sub>3</sub> was significantly different from T<sub>1</sub>, T<sub>2</sub> and T<sub>4</sub>.

#### Table 4: Effect of weeding frequency on the number of leaves *Corchorus olitorus*

Table 5 shows the mean values of the number of leaves, with T<sub>3</sub> having the highest performance while T<sub>4</sub> performed least with mean value of 10.67. The highest number of leaves per plant was obtained at five days weeding interval. This result may be attributed to vigorous plant with less competition for light, nutrients, and free space in weed free environment. Yadara and Kurma (1981) and Weiss (1983) reported that weed control leads to increased number of leaves per plant compared to non-weeded plants.

#### Table 5: Effect of weeding frequency on the yield of *Corchorus olitorus*

T<sub>3</sub> had the highest performance in yield with mean value of 700.00; the second best was T<sub>4</sub> with mean value of 516.57. T<sub>1</sub> performed least with mean value of 316.67. This result is in line with Ishag, 1971, Bedry, 2007: El Naim and Ahmed, 2010).

### CONCLUSION AND RECOMMENDATION

The study revealed that T<sub>3</sub> (five days interval weeding plot) performed best in all the parameters assessed i.e. plant height, number of leaves, stem girth and yield of *Corchorus olitorus*. Weed growth on *Corchorus* results in severe crop-weed competition and yield losses may be up to 75 to 80% implying the need for judicious weed management. The main problem limiting the production of *Corchorus olitorus* is inadequate weed management. From the study, it is therefore recommended that T<sub>3</sub> (five days weeding interval) should be used as weeding time by farmers for better growth and yield of *Corchorus olitorus*.

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**Table 1: Pre Planting Physical and Chemical Properties of the Soil Used**

SOIL PROPERTIES	VALUES
pH (H <sub>2</sub> O)	4.69
Organic Carbon (%)	0.76
Total Nitrogen (%)	0.06
Available Phosphorus (mg kg <sup>-1</sup> )	4.29
Exchangeable Cation (cmol kg <sup>-1</sup> )	
Ca (cmol/kg)	15.83
Mg (cmol/kg)	1.06
Na(cmol/kg)	0.18
K (cmol/kg)	0.55
Extractable Micro-nutrients (mg kg <sup>-1</sup> )	
Mn (mg/kg)	52.10
Fe (mg/kg)	11.15
Cu (mg/kg)	1.55
Zn (mg/kg)	3.85
Exchangeable acidity (cmol kg <sup>-1</sup> )	0.12
Base Saturation (%)	99.32
ECEC (cmol kg <sup>-1</sup> )	17.74
Particle size Distribution	
Sand (g kg <sup>-1</sup> )	84.60
Silt (g kg <sup>-1</sup> )	5.40
Clay (g kg <sup>-1</sup> )	100
Textural Class	Sandy loam

**Table 2: Effect of weeding frequency on plant height (cm) of *Corchorus olitorus***

TREATMENTS	WK 1	WK 2	WK 3	WK 4
T <sub>1</sub> (Weed free plot)	6.67 <sup>a</sup>	11.57 <sup>a</sup>	15.33 <sup>a</sup>	27.50 <sup>b</sup>
T <sub>2</sub> (Two days interval)	7.87 <sup>a</sup>	11.33 <sup>a</sup>	20.40 <sup>a</sup>	25.90 <sup>b</sup>
T <sub>3</sub> (Five days interval)	8.37 <sup>a</sup>	9.00 <sup>a</sup>	26.07 <sup>a</sup>	44.33 <sup>a</sup>
T <sub>4</sub> (Non weeded plot)	8.37 <sup>a</sup>	8.43 <sup>a</sup>	13.47 <sup>a</sup>	16.07 <sup>c</sup>

**Note:** Means with the same letter are not significantly different from each other at 5% level of Significance.

**Table 3: Effect of weeding frequency on Stem Girth (mm) of *Corchorus olitorus***

TREATMENTS	WK 1	WK 2	WK 3	WK 4
T <sub>1</sub> (Weed free plot)	0.1233 <sup>a</sup>	0.2000 <sup>a</sup>	0.2167 <sup>a</sup>	0.3000 <sup>ab</sup>
T <sub>2</sub> (Two days interval)	0.1000 <sup>a</sup>	0.2000 <sup>a</sup>	0.2600 <sup>a</sup>	0.3000 <sup>ab</sup>
T <sub>3</sub> (Five days interval)	0.1100 <sup>a</sup>	0.1833 <sup>a</sup>	0.2667 <sup>a</sup>	0.4000 <sup>a</sup>
T <sub>4</sub> (Non weeded plot)	0.0967 <sup>a</sup>	0.1800 <sup>a</sup>	0.1933 <sup>a</sup>	0.2100 <sup>b</sup>

**Note:** Means with the same letter are not significantly different from each other at 5% level of significance.

**Table 4: Effect of weeding frequency on the Number of Leaves of *Corchorus olitorus***

TREATMENTS	WK 1	WK 2	WK 3	WK 4
T <sub>1</sub> (Weed free plot)	9.00 <sup>a</sup>	10.33 <sup>a</sup>	12.00 <sup>a</sup>	18.00 <sup>b</sup>
T <sub>2</sub> (Two days interval)	8.33 <sup>a</sup>	12.33 <sup>a</sup>	18.33 <sup>a</sup>	15.00 <sup>a</sup>
T <sub>3</sub> (Five days interval)	8.00 <sup>a</sup>	8.67 <sup>a</sup>	16.00 <sup>a</sup>	18.67 <sup>c</sup>
T <sub>4</sub> (Non weeded plot)	7.67 <sup>a</sup>	8.00 <sup>a</sup>	8.67 <sup>a</sup>	10.67 <sup>c</sup>

**Note:** Means with the same letter are not significantly different from each other at 5% level of significance.

**Table 5: Effect of weeding frequency on the yield g/m<sup>2</sup> of *Corchorus olitorus* YIELD**

TREATMENTS	
T <sub>1</sub> (Weed free plot)	316.67
T <sub>2</sub> (Two days interval)	500.00
T <sub>3</sub> (Five days interval)	700.00
T <sub>4</sub> (Non weeded plot)	516.67

**Note:** Means with the same letter are not significantly different from each other at 5% level of Significance.

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