American Journal of Multidisciplinary Research & Development (AJMRD)
Volume 2, Issue 7 (July- 2020), PP 34-38
ISSN: 2360-821X
www.ajmrd.com

Research Paper **Open Access**

Effect of Weeding Regime on the Performance of Cucumber (*Cucumussativus*) In the South-South Rainforest of Nigeria

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ABSTRACT:- Cucumber (*Cucumussativus*) is a crop of great interest and importance. The cultivation of the crop is rapidly gaining ground in the South-South Rainforest of Nigeria due to its numerous health benefits and its non-hazadous nature to the soil. The study examined the effect of weeding regime on the performance of cucumber (*Cucumissativus*) in the South-South Rainforest of Nigeria. Despite the usefulness of cucumber in the South-South Rainforest of Nigeria, the volume of production has been on the decrease because of weed interference due to lack of appropriate weeding regime, hence the need for the study to address the effect of weeding regime in the performance of cucumber. The experiment was laid out in a Completely Randomized Block Design (CRBD) replicated three times. The treatments were four weed interference durations, i.e. weeding regime (weedy free, 3 weeks after sowing, 3-WAS, 4-WAS, 5-WAS) and no weeding i.e. weedy check (control). Growth parameters measured were vine length, numbers of leaves and leaf area (growth parameters) and number of flowers, fruit length, fruit number and fruit weight (yield parameters). The results revealed that appropriate period of weed control in the production of cucumber has the potentiality of increasing and improving the performance of the crop. Thus, it is recommended that for effective and efficient cucumber production in the South-South Rainforest of Nigeria, weeds should not be allowed to grow with cucumber beyond 3 weeks after sowing, 3-WAS.

Keywords:- Weeding regime, cucumber, South-South Rainforest, performance, yields.

I. INTRODUCTION

Cucumber (*Cucumussativus*) is a crop of great interest and importance. The production of cucumber is tremendously and rapidly gaining ground in the South-South Rainforest of Nigeria despite the fact that it originated in India where many varieties are cultivated (Johnson and Mullinix, 2009). These varieties include market more, market more 96, lemon, stansisluccy, palace king hybrid, miss pickler (exotic varieties) while local varieties include pot luck, prize ridge, yellow ring, kingsy ring, bush champion, etc. (Binning *et al.,* 2003). It is one of the oldest vegetable crops cultivated by man and the most vital member of cucurbitaceae family (Eifediyi and Remsion, 2010). It is a monoecious annual crop having been cultivated by man for over 3,000 years (Adetula and Denton, 2003). Cucumber is a creeping vine which bears cylindrical fruits that are used as culinary vegetables loved by man and eaten in salads or sliced into stew in tropical regions. It possesses about 92% water, keeping the body hydrated and so helps in the removal of waste metabolic substances from the body. It has essential minerals and vitamins (vitamin A, B1, B2, B6, B12 and vitamin C) which are important for proper bio-physiological and chemical processes in man (Binning *et al.,* 2003).

Cucumber is used as a source of silicon for treating skin irritation and sunburn, useful in reduction of darkcircles, reduces eye wrinkles, reduces hair fall, keeps the renal system healthy, helps in the digestion of food, cures open wound and helps to destroy internal worms (Duke, 2007). This gives express reason why cucumber is essential for both the old and the young.

Despite the increasing importance of cucumber in Africa at large and South-South Rainforest of Nigeria in particular, the cultivation of the crop has been on the decline due to weed interference owing to the lack of appropriate weeding regime, poor soil fertility, environmental conditions, plant spacing, etc. Weed interference in cucumber production is a major problem due to ignorance of proper weeding regime (Anon, 2006).

There are over 150 plants species that are troublesome worldwide and regarded as weeds (Akobundu, 2007). Although, some of these troublesome plants (weeds) could be cultivated for the production of vital produce. Ansa et al., (2019) stated that elephant grass has for long been used as vital forage crop in the tropics because of its high yields and nutrient value. Another important beneficial use of elephant grass is its

sustainability as feedstock for ethanol production. Weeds are plants that grow where they are not required for any purpose. They are plants whose unwanted desire outweighs their essentiality (Anon, 2006). Result has shown that the critical period of weed competition occurs between 3 and 7 weeks after sowing (Seaman, 2009). The critical period of weed control is the key component of an integrated weed management programme. It is a period in the crop life span during when weeds must be controled to prevent yield losses. It has been reported that keeping the crop weed free until three (3) weeks after sowing (WAS) remove depression of growth and yield on the crop due to the absence of the adverse influence of weeds. Weed infestation beyond the first 3-WAS has more devastating effect on the crop (cucumber) growth and yield. Keeping the crop free from weeds enhances the performance (Friesen, 2008).

Weeds have been known to be a major menace to the vegetative growth and yield of crops from time immemorial (Stall, 2009). Farmers are greatly faced with the problem of weed management in the course of carrying out agricultural operations and the interference of these weeds in the growth, development and productivity of crops. Farmers are concerned on the effects of weeds on the overall performance of the vegetative growth of crops (Noble, 2009). Effects of weeds has greatly reduced the productivity of crop yields and hence the income generated from the farming operation. Wiro & Ansa (2019), stated that the income derived by farmers from their farm business is enough reason to retain them in the business. This has led to several researches been conducted on the possible ways to lower the effect of weeds on crop by providing more effective and efficient ways of weed management with a view to improving and increasing crop productivity.
Ibrahim and Hamma (2012) reported that no weed control and less fertilizer treatment gave rise to low parameters values in the growth and yield of crops because of weed competition for soil nutrients, giving to weeds competitive benefits over the crops. The degree of losses of crop yield caused by weeds are determined on the weed type, density, agro-climatic conditions, moisture content, soil type, crop growth type and climatic factors such as rainfall, sunlight, temperature, etc. (Singh *et al.*, 2006).

Lagoke (2000) stated that research on elements influencing the co-existence and interference association between crop and weed is ejective to established cultural activities to direct resources to crop growth at the expense of weeds. The weeds interfere with the crops reduce the efficiency of the production potential of the crops, add to the cost of farming practices, bring down the land value, hence, the losses caused by the presence of weeds are encountered universally and crop yield are adversely affected (Anderson, 2004). The productive quality and quantity of cucumber is hindered or affected as a result of weeds interference (Buhler, 2002).

II. MATERIALS AND METHODS

The experiment was carried out at the Teaching and Research Farm of the Department of Crop and Soil Science, Ignatius Ajuru University of Education (IAUE) Ndele Campus, Rivers State, Nigeria on the latitude $4^{O}58N$ and Longitude $6^{O}48N$. The site was covered with different weeds such as *Pennisefumpurpureum* (Elephant grass), *Panicummaximcen* (Guinea grass), *Cynodomplactostachus* (Giant star grass), etc.

The experiment was laid out in a Completely Randomized Block Design (CRBD), with three replications. The plant data obtained from the treatment combination were subjected to statistical analysis using the Analysis of Variance (ANOVA). Significant means were separated using the Duncan's New Multiple Range Test (DMRT) at 5% level of significance.

Soil Analysis

The soil analysis result (table 1) showed that the soil was predominantly sandy loam, an indication of a good water and nutrient holding capacity. The soil was acidic with pH of 6.2. The available phosphorous (mg/kg) was 8.9%. The experimental site showed nitrogen content of 0.9 and the organic carbon and organic matter contents were 0.5% and 1.4% respectively.

Table 1: Physico-chemical properties of the experimental site

Physical characteristics	**2018**
Sand (%)	83.20
Silt (%)	11.40
Clay (%)	5.40
Textural class	Loamy sand
Chemical properties	
pH (H_2O)	6.2
Organic carbon (%)	0.5
Total nitrogen (%)	0.9

Available potassium (mg Kg^{-1})	8.9
Exchangeable K (cmol kg^{-1})	0.2
Exchangeable Ca (cmol kg^{-1})	1.4
Exchangeable Mg (cmol kg^{-1})	0.7
Effective cation exchange capacity (cmol kg^{-1})	2.5
Base saturation (g/kg)	92.30

Source: Department of Agronomy University of Ibadan, May, 2019.

Table 2: Effect of weed interference duration (weeding regime) on Cucumber growth and yield parameters.

Treatments/ Level (ton ha^{-1})	Vine length (cm)	No. of Leaves	Leaf Area (cm^2)	Number of Flowers	Fruit Length (cm)	Fruit Weight (g) per plant	Fruit No.	Fruit Diameter
Weed Interference duration								
Weedy Check	80.20^{d}	50.10^{c}	90.07^{d}	10.02^{d}	12.40d	25.15^{d}	5.36^{d}	12.40^{c}
3WAS	109.60^{b}	62.20^{a}	108.10^{b}	18.12^{b}	17.14^{b}	40.80^{b}	9.42^{a}	19.20^{b}
4WAS	95.20^{c}	55.40^{b}	98.14^{c}	15.10^{b}	16.20^{c}	32.65^{c}	8.80^{b}	16.42^{c}
5WAS	85.40^{c}	50.80^{c}	95.09^{c}	15.40^{d}	14.40^{d}	29.80^{d}	6.20^{c}	14.80^{d}
Weed Free	160.80^{a}	65.40^{a}	120.20^{a}	25.40^{a}	22.80^{a}	60.20a	10.99^{a}	24.10^{a}
MEAN	**106.24**	**56.78**	**96.32**	**16.81**	**16.59**	**37.72**	**8.15**	**17.38**
SE±	**47.51**	**25.39**	**43.07**	**7.51**	**7.41**	**16.86**	**3.64**	**7.77**

Values followed by the same letter in the column (s) are not significantly different at 5% level using DMRT.

Table 3: Effect of weed interference duration (weeding regime) on weed fresh and dry weight (g/m^2)

Treatment PM Rate (ton ha-1)	Weed Fresh Weight (g)	Weed Dry Weight(g)
Weed Interference duration		
Weedy Check	500.00^{a}	23.00^{a}
Weed 3WAS	284.00^{c}	9.00^{c}
Weed 4WAS	308.00^{b}	11.00^{c}
Weed 5WAS	480.00^{b}	16.00^{b}
Weed Free	0.00^{d}	0.00^{d}
Mean	314.40	12.00
SE±	140.60	5.66

Values followed by the same letter(s) in the column are not significantly different at 5% level using DMRT.

Table 4: Weed flora cumulative found in the experimental site during growth period of cucumber

Weed Types	Family	Life Cycle	Growth Habit	Degree of Occurrence
Cyperusretundus	*Cyperacca*	P	S	++
Cynododactylon	*Poaccea*	P	G	++
PaspalumConjugatium	*Poaceac*	P	G	++
Eleusineindica (L)	*Poaceac*	A	G	+++
Panicum maximum	*Poaceac*	P	G	+++
Laporteaaestuans	*Urticaceac*	A	BL	++
Mimosa pudica Linn	*Leguminosac*	P	BL	++++
Adconopuscompressus	*Poacene*	P	G	+++
Ageratum conyzoides	*Asteraccea*	A	BL	++++
Chromoleanaodorata	*Asteracene*	P	BL	+++
Celesialoxo	*Amaranth acene*	A	BL	++
Aspiliaafricana	*Asteraceae*	P	BL	+++
Tridaxprocumbens	*Asteraceae*	P	BL	++
Phyllantusamarus	*Euphirbiaceae*	A	BL	+
Sidaacuta	*Malvaceae*	P	Bl	++

Boerhaviadiffusa	*Nyctaginaceae*	P	BL	++
Eragrostisatrovirens	*Poaceae*	P	G	++
Starchytophetaeayenesis	*Verbenanceae*	P	BL	++
Cyperestuberosus	*Cyeraceae*	P	S	++
Commlinadiffusa	*Commelinaceae*	P	SB	+

A = Annual, P=Perennial, S=sedges, G=Grass, BL = Broad Leaf, SB = Sidge broad
+ = Low weed occurrence, ++ = medium weed occurrence, +++ High weed occurrence

III. DISCUSSIONS

Table 2: Effect of weed interference duration (weeding regime) on Cucumber growth and yield parameters.

Weed interference on growth and yield of cucumber, on table 2 indicated that weedy check produced the least vine length (80.20cm), while the weed free resulted in the plants that produced the longest vine length (160.80cm). This implies that the weeds greatly interfered with the growth of cucumber vine length causing it to produce only but (80.20cm), but where the weeds were always removed, the vine length was longest (160.80cm) showing that the absence of weeds gave rise to at least a 100% increased growth of vine length.
In the same vein, weedy check plots produce the least number of leaves (50.10) and leaf area (90.07cm^2) while weed free plots resulted in 65.40 and 120.20cm^2 number of leaves and leave area respectively. This is closely followed by 3WAS with number of leaves and leaf area which were not significantly different in number of leaves but in leaf area as indicated in table 2. For three weeks after sowing (3-WAS), the table showed values for growth parameters as vine length was 109.60cm, number of leaves was 63.20 while leaf area was 108.10cm.
In yield parameters, number of flower was 10.12, fruit length was 17.14, fruit weight per plant was 40.80g, fruit number was 9.42 and fruit diameter was 19.20.

This simply means that the interference of weeds in both leaf number and leaf area was heaviest in weedy check, followed by 5WAS, but the best growth with less weed interference duration was observed.
Similarly, in weedy check, the flower number was 10.02, 3WAS was 18.12, 4 WAS 15.10, 5 WAS 15.40 while weed free was 25.40. This again indicates that weed interfered with the production of flowers in cucumber plant.
Furthermore, in fruit length, the Table 2 showed that the weedy check produced the lowest fruit length 12.40cm, 3WAS gave rise to 17.14cm which was significantly different while weed free has produced vine length of 22.80cm. This simply means that fruit length was longest in weed free plot. The shortest fruit length was recorded in weedy check plot.

Similar observations were recorded in fruit weight and fruit number as well as in fruit diameter where much weed interference affected the fruit weight, fruit number and fruit diameter of cucumber with 25.15g per plant for weight, 3.36 for fruit number per plant and 12.40cm for fruit diameter treatment produced, 3WAS has 40.80g fruit weight, 9.48 fruit number and 19.20cm fruit diameter.

The weed free plots were significantly different in the growth and yield parameters of cucumber. This was followed by 3 WAS and 4 WAS while weedy check with high weed interference resulted in the lowest leaf cucumber growth and yield parameters. This was followed by 5 WAS.

Table 3: Effect of weed interference duration (weeding regime) on weed fresh and dry weight (g/m^2)

Weed interference duration also affected the weed fresh weight and weed dry weight. In the weedy check where the plots were not weeded at all, the weed fresh weight was 500.00g while the weed dry weight was 23.00g. In 5 weeks after sowing (5WAS), the weed fresh weight was 480.00g and the weed dry weight was 16.00g. When weeding was done after four weeks (4 WAS), the weed fresh weight was 308.00g and weed dry weight was 11.00g. Weeding the cucumber three weeks after sowing (3 WAS), the weed fresh weight and weed dry weight gave 284.00g and 9.00g respectively. But when the plots were left weed free, the weed fresh weight and weed dry weight were 0.00. Thus the mean of the weed fresh weight was 314.40g while the mean of the dry weight was 12.00g. In the same vain, the standard error (SE±) of the weed fresh weight and that of weed dry weight stood at 140.60 and 5.66 respectively.
The above showed that the weed duration greatly affected the weed fresh weight as well as that of weed dry weight. The more the weeds, the higher the weed fresh and weed dry weight (Liebman and Davis, 2000).

Table 4: Weed flora cumulative found in the experimental site during growth period of cucumber

Leguminocceae and asteracceae were the weed families with the highest degree of occurrence while euphorbiaceae and commelinaceae were the least degree of occurrence.
Many weeds were observed in the experimental area. These weeds which are also plants competed with the cucumber crop for space, nutrient, water, light etc thus lowering the productivity level of the crop. The degree of occurrence of these weeds is of paramount importance in the cultivation of this vital crop (cucumber).

IV. CONCLUSION

The results of the study on the effect of weeding regime on the performance of cucumber showed that appropriate period of weed in the cultivation of cucumber has the capacity of improving and enhancing the performance of the crop. The study revealed the effect of weeds interference on the performance of cucumber indicating that cucumber production is greatly affected or influenced by weeds infestation.

REFERENCES

[1]. Adetula, O. and Denton, L. (2003) Performance of vegetative and yield accessions of cucumber (*Cucumissitivus*). Horticultural Society a Nigeria (HORTSON) *Proceeding for A 21st Annual Conference* 10-13, 2003.

[2]. Akodundu, I.O. (2007) Weed science in the tropics principles and practice. John Willey & Sons Inter Science Publication, New York. pp 103

[3]. Anderson, W.P. (2004). Weed crop completion in: weed science, principles, (2nd ed.) West publishing company, St. Pail, Minn, USA. PP15-33

[4]. Anon, C (2006) Studies on farm livestock West Agricultural Research Council, London. Pp 89

[5]. Ansa, J.E.O., Wiro, K.O. and Garjila, Y.A. (2019). Potential of Laterite soil for the production of elephant grass (*Pennisetum purpureum*) in Nigeria. *International Journal of Life Science Research.* Volume 7(4) pp1-4

[6]. Binning, L.K., Wyman, J.A. and Stevenson, R.W. (2003). Pest control in commercial viven production. University of Wiseconsin cooperation ex tension service publication.

[7]. Buhler, D.D. (2002). Challenges and Opportunities for Integrated Weed Management. *Weed Science* 50, 123-132.

[8]. Duke, J (2007). *The green pharmacy*. New York. St Martins press.

[9]. Eifediyi, E. K. and Remision, S. (2010). Growth and yield of cucumber as influenced by farm yard manure and inorganic fertilizer researcher 2 (4), 699.

[10]. Friesen, G.H. (2008). Weed interference in pickling cucumber (*Cucumissativus*). *Weed Science* 26.626-628 (Available online at http://www.jstore.org/stable/AD42942) (Verified 11 August, 2011).

[11]. Ibrahim, U. and Hamma, I.L. (2012). Influence of farmyard manure and weeding regimes on growth and yield of okra (*Abelmoschusesculentus*) Moench in Zaria. *World journal of Agricultural Science. 8*(5):453-458

[12]. Johnson, W.C. and Mullinix, B.G. (2009): Cyperusesulentus interference in *cucums, sativus*. *Weed science* 47,327-331

[13]. Lagoke, S.T., Parkinson, O.V. and Agunbiaden, R.M. (2000). Parasitic weed control: In Africa. In: Kim, (ed) *Proceeding of an International Workshop Organizd by IITA, ICTISAAT IPRC at IITTA, Ibadan. Nigeria* 22nd – 24th August, 2000. Pp. 3-14

[14]. Seaman, A. (2009) production guide for organic cucumbers and squash. NTS IPM publication No. 135-Cornel University and the New York State.

[15]. Singh, S.B., Singh, K. and Singh, S.P. (2006). Effect of time and weeding on growth and seed yield of okra. *Indian Journal of Weed Science,* 13:11-17

[16]. Stall, W.M. (2009). Weed control update for *Cucurbits* crops (Muskmelon, cucumber, squash, and watermelon) (online). Available at htt://edis.ifas.ufl.edu/wgo29 (Verified 18 July, 2011).

[17]. Wiro, K. O. and Ansa, J.E.O. (2019). Socio-Economic Potential of Taungya Farming System for Sustainable Food Production in Nigeria. *International Journal of Interdiscipinary Research and Innovations.* 7(4) 13-21.