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COMPARATIVE EFFECT OF DIFFERENT RATES OF POULTRY MANURE AND WEEDING REGIMES ON CANOPY DEVELOPMENT, CHLOROPHYLL CONCENTRATION AND PERFORMANCE OF HOT PEPPER (*Capsicum frutescens. L*)

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ABSTRACT

*Field study was conducted to examine the comparative effect of different rates of poultry manure and weeding regimes on canopy development, chlorophyll concentration and performance of hot pepper. The experiment consisted of a 3x5 factorial scheme arranged in a Randomized Complete Block Design with three replications. The treatments were three levels of poultry manure rates (0, 4, and 6t/ ha), with five weeding regimes namely; weeding once at 3WAT (weeks after transplanting), weeding twice at 3 and 5 weeks (WAT), weeding thrice at 3, 5 and 7 weeks (WAT), and weeding four times at 3, 5, 7 and 9 weeks (WAT). There was a No weeding treatment as control (NW). Agronomic characters of growth and yield parameters such as canopy development at different stages of plant growth, Chlorophyll concentration, fruit length, weed density, number of Red fruits/plant, fruit weight (t/ha) and percentage yield loss (%) were obtained and recorded. The result of the study revealed that different weeding regimes significantly affected canopy development and chlorophyll concentration of hot pepper. The highest canopy diameter with the highest mean value of (67.2) was recorded for weeding regime at 3 and 5 WAT (67.9cm and 69.2 cm) respectively at 4t/ha of poultry manure while the lowest canopy diameter was recorded for the weedy check with a mean value of (51.7) at 0t/ha. Similarly, the highest chlorophyll concentration with the highest mean value of (50.3) was recorded at 4 weeding regimes of 3. 5. 7 and 9 at 6t/ha of poultry manure. Highly significant difference was recorded for plant height (0.45**), weed density (0.71**) and number of red fruit (26.75 **) at 6t/ha. The percentage yield loss gave a higher yield loss for the weedy check (73.19%) while the 4 weeding regimes of 3, 5 7 and 9 WAT suppressed weed significantly and also recorded a higher yield of hot pepper with a lower yield loss of (3.57%) at 6t/ha).*

KEYWORDS: Canopy development; Chlorophyll concentration; Percentage yield loss; Poultry manure; Weeding regime

INTRODUCTION

Pepper (Cayenne pepper or red pepper also locally known as atawere) constitutes the major bulk of human diet. Hot pepper is a perennial plant with small, tapering fruits often 2-3 at a node that are very pungent. Capsaicin, the active component of different types of hot peppers that makes the peppers spicy hot, are used as food, pesticides, weight loss, topical anesthetic and fighting indigestion (O'Dell, 2012). It is a good source of vitamins, pepper powder provides trace amounts of anti-oxidants and other chemicals to aid digestive tissues such as, healing an upset stomach, reducing intestinal gas, curing diarrhea and acting as a natural remedy for cramps (Fitday, 2016).

Nigeria is the largest producer of pepper in Africa, accounting for about 50 percent of total production (FAOSTAT, 2013). More recent estimates indicate that Nigeria produced about 700,000 metric tons of pepper from a total land area of about 77,000 hectares (Omotayo et al., 2012). In spite of this nutritional value, the average yield of pepper is still low in Africa.

One of the major limiting factors in the production of pepper is weed infestation (Adigun, 2001; Boatwright & McKssick, 2003). Nigeria has good soils and weather that readily support the growth and production of pepper (Idowu, 2010; Aliyu, 2000). Low pepper production in Nigeria occurs as a result of high incidence of weed infestation. Weed has been reported to cause threat to growth of crops especially in the tropics resulting in losses between 30-49% and up to 84%. (Adigun, 2001; Khattak et al., 2005). The impact of weeding on crop yields varies with characteristics of the crops, the weed species, weed density, environment, control methods of weeds, and duration of crop exposure to the weed (Dowson et al., 2007; Khasmakh—Sab et al., 2009). Weeds are known to harbor pest and diseases where they compete with crops. Weeds emerge fast and grow rapidly competing with the crop for growth resources viz., nutrients, moisture, sunlight and space during the entire vegetative and early reproductive stages of pepper. The wide space provided in between pepper plants allows fast growth of different weed species, causing considerable reduction in yield. Weeds are a serious negative factor for crop production that may result in great losses in crop yield (Mansoor & Mohammad, 2005). Such losses may arise mainly from the direct competition between crops and weeds for light, water, space, and nutrients (Jilani et al., 2003) or indirectly from harboring insect and disease causing organisms (Hakoomat, 2005). The presence of weeds reduces the photosynthetic efficiency, dry matter production and its distribution to economical parts, thereby reducing the sink capacity of the crop and resulting in poor fruit yield. The extent of reduction in fruit yield of pepper has been reported in the range of 60 to 70 per cent depending on the intensity and persistence of weed density in standing crop (Patel et al., 2004). It is well established that 30 to 60 days after transplanting (DAT) is the most critical period for crop-weed competition in pepper (Frank et al., 1988). Yield losses caused by weed as a result of the improper method of control by farmers has been tremendous as many farmers need to be enlightened on the danger of improper control of weed to minimize losses due to these problems caused by weed on pepper field. Farmers need to be sensitized and therefore, optimum weed control methods for optimum yield of pepper are necessary and are of interest to use effective management practices. One of the methods to increase the nutrient content of the soil is application of appropriate levels of poultry manure, with or without inorganic fertilizers (Dauda et al., 2008). Poultry manure is relatively resistant to microbial declination (Dauda et al., 2005). Poultry manure has high concentrations of nutrients like nitrogen, phosphorus, calcium and magnesium than other forms of organic manure (Aliyu, 2002). Therefore; this work was carried out to determine the appropriate weeding regime and different rates of poultry manure that will enhance canopy development, chlorophyll concentration and overall performance of pepper in the study area.

MATERIALS AND METHODS

The experimental site was initially used to crop green vegetables after which it was left fallow for a year. The site was dominated by *Euphorbia heterophylla, Helianthus annuus, Tridax procumbens (Linn), Talinum trangulare (Jacq.), Cynodon dactylon, Cyperus rotundus Linn and Chromolaena odorata*. The experiment consists of a 3 x 5 factorial scheme arranged in a Randomized Complete Block Design with three

replications. The treatments consisted of three levels of poultry manure rates (0, 4, and 6 t/ha), with five weeding regimes namely; weeding once at 3WAT (weeks after transplanting), weeding twice at 3 and 5 weeks WAT, weeding thrice at 3, 5 and 7 weeks WAT, and weeding four times at 3, 5, 7 and 9 weeks WAT. There was a No weedy check as control (NW). Manual weeding was applied throughout the duration of the experiment. Alleyways of 0.50 m were allowed between the replications and the plots. Thinning was done after the emergence of seedling when 2-3 leaves were produced while seedlings were transplanted to the main field. Agronomic characters of growth and yield parameters such as Plant height (cm), Stem diameter (cm), canopy diameter (cm), weed density, weed dry weight, (g), number of fruits/plant, fruit length, (cm), fruit weight (g) and percentage yield loss (%)were obtained and recorded. The pepper seeds SAMARU MILD were obtained from IITA Ibadan. Nursery preparations was carried out in July and transplanting done the following month of 2018 on a raised bed at a spacing of 50x50cm. The poultry manure was applied and worked into the beds two weeks before transplanting (to allow further decomposition) while transplanting was done three weeks after planting. The menace of pepper leaf eaters was controlled by spraying the pepper stands with cypermethrine insecticide weekly at 30ml in 10L of water beginning from 2 weeks after transplanting. Weeding regimes were observed and chlorophyll concentration was assessed on tagged pepper plants.

Measurement of parameters evaluated

Stem diameter (cm)

Plant stem diameter was measured using vernier calipers at the height of 5cm from the soil surface. The stem diameter was expressed in centimeters (Sabli, 2012).

Plant height (cm)

Data on plant height was collected from three tagged sample plants after treatment application. Plant height was measured from the contact point (crown) of the stem with soil to the apical point of the main shoot. This data is as well needful to monitor the systematic process of growth and development of based on weeding regimes and poultry manure imposed (Mohammad-Amin, 2008).

Canopy diameter (cm)

Fruit diameter was determined using measuring tape, by putting the tape round the fruits of the plant (Beyer, 2012).

Weed density/population

This was estimated by counting the number plants in the total plot size using a movable quadrant at $1m^2$ radius to count all weeds within the quadrant. This was achieved by making a total of three random throws of the quadrant per plot. All weed specie within the quadrant were collected, counted and identified according to species type. Total count per specie type for all three throws were added together to give relative abundance of each specie per treatment (Anikwe et al., 2000)

Fruit length (cm)

Fruit length was determined using measuring tape. The tape was used to measure the fruits length (cm) of the plant from stalk end to the fruit apex (Akinfasoye et al., 2006)

Fruit weight (g)

The weight of matured fruit was determined on an electronic scale. Fruits from the sample plants were used to determine the weight of red fresh fruit. The average of the harvested red pepper fruits were taken as the weight of single fresh fruit (Beyer, 2012).

Number of red fruits per plant

Number of fruits per plant was counted from three sample plants at maturity. This is the data collected to help to know the number of fruits harvested on each plot (Kabir, 2014).

$$Number\ of\ fruits\ per\ plant = \frac{Number\ of\ fruits\ per\ plot}{Number\ of\ plants\ per\ plot}$$

Total Chlorophyll Content Estimation

Total chlorophyll content was estimated according to the spectrometry methods. The 100 mg fresh leaf was crushed in 20 ml of 80% acetone and the extract centrifuged for 10 min at 1000 rpm. Absorbance of the supernatant was recorded at 663nm and 645nm. They were read using a spectrophotometer. Chlorophyll content (expressed as mg/g-1 of each sample) was estimated according to the formula as follows:

Chlorophyll a (mg/g-1) = 12.7 (A663) – 2.69 (A645) x VW

Chlorophyll b (mg/g-1) = 22.9 (A645) – 4.86 (A663) x VW

Total Chlorophyll t (mg/g-1) = [20.2 (A645) – 8.02 (A663) xVW]/1000

Where A = absorbance at the given wavelength, W = weight of fresh leaf sample, V = final volume of chlorophyll solution (Li et al., 2018).

Data Analysis

Data collected were subjected to analysis of variance and significant means were separated using Fisher's Protected Least Significant Difference (LSD) at 5% level of probability where count data were transformed using Square Root Transformation while the mean was estimated to minimize error difference.

RESULTS AND DISCUSSION

Table 1 showed the result of soil physico-chemical properties before the experiment. The pH of the soil was 6.95. Organic matter contents analyzed was (2.15%). Nitrogen content was (0.38%). The available P content in the soil was (16.1 mg/kg), K (24.9 cmol/kg), Na (0.34 cmol/kg), Ca (5.4cmol/kg) and Mg (2.50 cmol/kg). The result showed that the soil was sandy loam in texture with high proportion of sand (62.8%). This implies that basic cations such as Ca, K, Na and Mg would be leached more easily as texture determines the degree of retention or ease of leaching of basic cations (Wapa & Oyetayo 2014). The soil was slightly acidic in pH (6.95) with low organic carbon; total nitrogen and available P were also low in the soil. Low organic carbon and organic matter in the soil of the experimental site was probably as a result of high proportion of sand content of the soil**.** Table 2 shows that poultry manure had N, P and K ranges of 6.73, 13.50 and 8.80 respectively and a pH of 7.9 (that is, slightly alkaline). The exchangeable cations in the soil particularly Ca^{2+} and K^{+} were high while Mg^{2+} and Na^{2+} are of moderate levels. The nutrient contents of the manure were moderate to high.

Effect of weeding regimes and poultry manure rates on canopy diameter and chlorophyll concentration

The widest canopy diameter with the highest mean of (67.2) was recorded for 2 weeding regimes of 3 and 5 weeks WAT (67.9cm and 69.2cm) respectively at 4t/ha. In contrast, however, the lowest canopy diameter was recorded for the weedy check with a mean value of (51.7) at 0t/ha. Highest chlorophyll concentration with the highest mean value of (50.5) was recorded at 4 weeding regimes of 3, 5 7 and 9 WAT at 6t/ha. The result shows a decline in the chlorophyll concentration among treatments imposed with the highest concentration recorded at 3 WAT which shows that early weed removal enhanced chlorophyll concentration in plants. Regular weed removal

with application of poultry manure must have contributed to the enhanced growth which was reflected in the higher canopy development, early chlorophyll concentration and performance of hot pepper in the study area.

Effect of weeding regimes and poultry manure rates on growth, weed density and yield characters of pepper

The result in Table 4 shows there were significant difference recorded for weeding regimes and poultry manure rates on growth, weed density and yield characters of hot pepper. Significant differerence were recorded for plant height 0.45**, weed density 0.71**, and number of red fruit 26.75** at 6t/ha while there was no significant difference in the stem diameter and fruit length of pepper based on the treatments imposed. Pepper plot that received 4 weeding at 3, 5 7 and 9 WAT had higher plant height, (82.4cm), fruit weight (2.10g), number of red fruit (70.9), fruit length (8.43cm) with a lower weed density and significantly lower percentage yield loss (3.2%). This might indicate that weeding regimes of 3, 5 7 and 9 WAT at 6t/ha of poultry manure could result in a lower weed density and higher yield. The percentage yield loss showed that higher yield loss was recorded for the weedy check (73.19%). The result obtained might be due to combination of higher rate of poultry manure at 4 weeding regimes which could have enhanced more nutrient release compared to other treatments imposed. Generally, uncontrolled weed infestation caused a drastic percentage yield loss of (73.12%) while the lowest percentage yield lost was obtained for plots weeded at 3, 5 7 and 9 WAT (3.15%).

The study showed that there was a significant effect of weeding regimes and poultry manure rates on performance of pepper. This study observed that all growth parameters increased due to a corresponding increase in poultry manure rates. This agrees with the work of Fabiyi et al., (2015) who stated that increased PM rate led to increase in plant height of sweet pepper. This might be due to optimum nutrients supply provided to plant, enhancing the growth and development by increasing the rate of plant metabolic processes like photosynthesis, respiration and their better acclimatization that encouraged greater leaf area helping in higher carbohydrate synthesis leads to increase formation of plant metabolites that helped to build the plant tissue. Similar results were reported by Malik et al., (2011) and Abu et al., (2017) in *Capsicum* who both opined that reducing planting distance and increasing PM rate resulted in increasing number of leaves. The result further showed that keeping weeds beyond 3 weeks after planting could negatively affect fruit formation. This observation is in agreement with the report by Khattak et al., (2005), who noted that critical period of weed interference is between 3 weeks after planting and weed free until harvest, beyond which pepper growth and yield parameters will be adversely affected. Also poultry manure on the other hand has a positive effect on crops. It has been documented that the number of weeding to be done on long season vegetable such as pepper will essentially depend on crop growth, weed growth and the critical period of weed competition (Reddy & Reddy, 2000). In this study, uncontrolled weed infestation caused a drastic percentage yield loss of (73.2%) while the lowest percentage yield lost was obtained for plots weeded at 3, 5 7 and 9 WAT (3.15%). This result is in line with the work of Ayub et al., (2003) who reported a yield loss of up to (78.2%) and (96%) in pepper fruit yield. Reduction in crop yield has a direct correlation with weed competition. Supporting

this result, according to Ayub et al., (2003) and Khattak et al., (2005), weeding done at three times interval resulted in a higher number of fruits and reduced weed density on each plant. This is because of improved soil conditions, reduced weed-crop competition, adequate moisture supply and good soil aeration. Similarly, the result of the study agrees with the findings of Singh et al., (2010) who reported that constant weeding suppressed weed effectively in pepper and also increased the number of fruits of pepper. In this study, the lowest seed number and weight were obtained in plots that received lower rates of poultry manure with less weeding frequency. The use of 6 t/ha of poultry manure at 4 levels of weeding regimes might have enhanced early fruit development thereby producing acceptable higher number of pods. Joshi et al., (2007) and Rao (2000) observed that the extent of weed competition depends upon the type of weed species, the severity of weed infestation, the duration of infestation and climatic conditions which affect weed and crop growth.

CONCLUSIONS AND RECOMMENDATIONS

The crop responded to different rates of poultry manure under different weeding regimes. In this experiment, application of 6t/ha of poultry manure with 4 weeding regimes significantly enhanced canopy development, chlorophyll concentrations and overall performance of hot pepper. The highest percentage yield loss was obtained from weedy check plot while the least percentage yield loss was obtained from plot combination of 6 t/ha at 4 weeding regimes.

REFERENCES

Abu, N. E., & Odo, C. V. (2017). The effect of plant density on growth and yield of 'Nsukka Yellow' aromatic pepper (*Capsicum annuum* L.). *African Journal of Agricultural Research*, *12*(15), 1269 - 1277.

Adigun, J. A., (2001). Influence of intra – row spacing and chemical weed control on growth and yield of Chilli pepper (*Capsicum frutescens L*.) in the Northern Guinea Savannah. *Nigerian Journal of Horticultural Science, 5*, 67 – 73.

Akinfasoye, L., Nmyan, D. J., Tairu , R. M. (2006). Effect of harvesting on the duration, yield, and quality of pepper. *International Proceeding of 24th Conference of Horticultural Society of Nigeria, 17-22.*

Aliyu, L. (2000). The effect of organic and mineral fertilizers on growth, yield and composition of pepper (*Capsicum annuum* L.). *Biological Agriculture and Horticulture, 18*(1), 29 - 36.

Aliyu, L. (2002). Growth and yield of pepper (*Capsicum annuum* L.) as affected by Nitrogen and Phosphorus application and plant density. *Crop Research, 23*(3), 467-475.

Anikwe, L. S., Atthor, F. M., Sakav, T. (2000). Effect of different planting pattern on weed control and manure rates on growth, yield and yield. components of maize. *Indian Agronomy Journal*. 42, 265-268.

Ayub, M., Tanveer, A., Nadeem, M. A., & Tayyub, M. (2003). Fodder yield and quality of sorghum (*Sorghum bicolor* L.) as influenced by different tillage methods and seed rates. *Journal of Agronomy*,*2*, 179-184.

Beyer, A. L. (2012). Evaluating nutrient management systems for organically-produced greenhouse colored bell pepper (*Capsicum annuum* L.). Unpublished M.Sc. thesis, College of Agriculture, University of Florida. USA.

Boatwright, S. R., & Mckissick, C. (2003). *Georgia Farm Gate Value Report AR 04-01*. University of Agricultural and Environmental Science, Centre for Agric business and Economic Development.

Dauda, N. S., Aliyu, L., & Chiezey, U. F. (2005). Effect of seedling age at transplant and poultry manure on fruit yield and nutrient composition of garden egg (*Solanum gilo* L.) varieties. *Journal of Tropical Biosciences, 5*(2), 38-41.

Dauda, N. S., Ajayi, F. A., & Ndor, E. (2008). Growth and yield of watermelon (*Citrullus lanatus*) as affected by poultry manure application. *Journal of Agriculture and Social Sciences, 4*(3), 121-124.

Fabiyi, E. F., Ademiluyi. B. O., & Abiodun, J. (2015). Comparative evaluation of organic and inorganic manure on sweet pepper performance in two

ecological zones of Nigeria. *American Journal of experimental Agriculture*, *6*(5), 305 - 309.

FAOSTAT (2013): Database for publication of peppers. FAOSTAT, http://faostat 3.fao.0rg/home/index.htm/download.

Fitday, (2016). Food composition Database. Retrieved on 1st Feb., (2016) from: *http://fitday.com*

Frank, J. R., Schwartz, P. H., & Bourke, J. B. (1988). Insect and weed interactions in bell pepper (*Capsicum annuum*). *Weed Techno,* 2**,** 423-428.

Hakoomat, A., Dilbaugh, M., Shoukat, A. A. (2005). Weeds control practices in cotton (*Gossypium hirsutum* L.) planted on bed and furrow. *Pakistan Journal of Weed Science Research, 11*(1-2), 43-48.

Idowu, O. E. (2010). Popularity of pepper in world second most important crop. *Agriculture and Biology Journal of North America*, *1*(5), 1062-1068.

Jilani, M. S., Abdul, G., & Saif, U. R. (2003). Conventional and chemical control of weeds in five cultivars of transplanted onion (*Allium cepa* L.). *Pakistan Journal of Weed Science Research, 9* (3&4), 215- 224.

Joshi, M., Kumaraswamy, A. S., Rudraradhya, M., & Krishnamurthy, N. (2007). Effect of herbicides on weed control and seedling in chili nursery. *Current Research, 24*, 220-221.

Kabir, K. (2014). *Performance of sweet pepper (Capsicum annuum L.) Varieties as Influenced by nitrogen and poultry manure fertilization in the Sudan savanna.* Unpublished M.Sc. Thesis, Science Agronomy, Ahmadu Bello University.

Khattak, M. K., Khan, M. J., Asrar, M., Wahab, S., & Ramzan, M. (2005). Enhancement of wheat and yield components by controlling weeds with Deep tillage practices under irrigated clay loam soil conditions. *Pakistan Journal of Weed Science Research, 11*, 41-46.

Li, Y., Liu, C., Zhang, J., Yao, H., Xu, L., Wang, Q., & Lawren, S. (2018). Variation in leaf chlorophyll concentration from tropical to cold-temperate forests: association with gross primary productivity. *Ecolological Indicators,* 85, 383–389. Doi: 10.1016/j.ecolind.2017.10.025

Malik, A. A., Chattoo, M. A., Sheemar, G., & Rashid, R. (2011). Growth, yield and fruit quality of sweet pepper hybrid SH-SP-5 (*Capsicum annuum* L.) as affected by integration of inorganic fertilizers and organic manures (FYM). *Journal of Agricultural Technology, 7*(4),1037-1048.

Mansoor, K. K., & Muhammad, J. K. (2005). Effects of different tillage practices on Weeds and yield of chickpea under sandy loam soil conditions. *Pakistan Journal of Weed Science Research, 11*(3-4), 67-74.

Mohammad-Amin, N. Q. (2008). Effect of some plant growth regulators and micronutrient on growth and development and apical dominance of pea (*Pisum sativum* L.) plants. Unpublished M.Sc. thesis, College of Science of Education, University of Salahaddin, Iraq Kurdistan region.

O'Dell, W. (2012). Top 10 Uses for Hot Peppers, Food, Health, Nature (1-3) Download on Jan. 20, 2014 at (http://www.toptenz.net/top-10-uses-for-hot- pepper-php).

Omotayo, O. A., Ribeiro, M. C., Oluleye. A. K., & Fajimi, A. (2012). Participatory evaluation of improved pepper (Capsicum Spp) among small scale farmers – Research Pre-proposal submitted to the Africa Brazil Agricultural innovation Marketplace Project, EMBRAPA Brazil 5Pp.

Patel, R.B., Barevadia, T.N., Patel, B.D., & Meisuriya, M. (2004). Effect of cultural and chemical methods on weed and fruit yield of green chilli. *Indian Journal of Weed Science, 36*, 300 - 301.

Rao, V. S. (2000). *Principles of Weed Science.* Enfield (NH), USA: Science publishers Inc.

Reddy, C.N., Reddy, M. D., & Devi, M. P. (2000): Efficiency of various herbicides on weed control and yield of brinjal. *Indian. Journal of Weed Science*, 32(3-4), 150 - 152.

Singh, G. P., Thakral, K. K., & Pandita, M. L. (2010). Efficacy of various herbicides and hand weeding for weed control and fruit yield in chilies (capsicum annum L.) *Abstracts of Pepper, Annual Conference. Indian society of Weed Science.*

Sabli, M. Z. (2012). Fertigation of Bell Pepper (*Capsicum annuum* L.) in a soil-less greenhouse system: effects of fertilizer formulation and irrigation frequency. Unpublished PhD thesis, Collage of Agriculture University of Newcastle, United Kingdom

Wapa, J. M., & Oyetola, S. O. (2014) Combining effects of nitrogen and different organic manures on major chemical properties of typic ustipsament in North East Nigeria. *American International Journal of Biology, 2*(2),27-45.

Table 1: Physico-chemical properties of the soil at experimental site

Properties	value
pH	6.95
Total N (%)	0.38
Available P (mg/kg)	16.1
Ca^{2+} (Cmol/kg)	5.4
Mg^{2+} (Cmol/kg)	2.5
K^{+} (mg/kg)	24.9
Na^{2+} (Cmol/kg)	0.34
Organic carbon (%)	2.14
Organic matter (%)	2.15
Particle size distribution	
Sand	62.80
Silt	12.0
Clay	25.20
Texture	Sandy loam
Bulk density)g/cm^3)	1.32

Table 2: Characteristics of poultry manure used for the experiment

Properties	**Values**
pH	7.90
Total N (%)	6.73
Available P (mg/kg)	13.50
Exchangeable cations (Cmol.kg^{-1})	
Ca^{2+}	19.20
Mg^{2+}	5.45
K^{+}	8.80
Na^{2+}	1.77
Organic Carbon (%)	14.70
Organic matter (%)	25.40

Table 3: Effect of weeding regimes and different rates of poultry manure on canopy diameter and chlorophyll concentration of *Capsicum frutescens*

Treatment	Canopy Diameter (cm)				Mean	Chlorophyll Concentration (Mg/100g)				Mean
	3 WAT	5 WAT	7 WAT	9 WAT		3 WAT	5 WAT	7 WAT	9 WAT	
Weeding Regime (WR)										
Weedy check	51.5	54.6	52.5	48.0	51.7	42.0	33.7	33.9	33.4	35.9
Weeding at 3WAT	56.8	56.8	53.7	51.0	54.6	49.0	44.5	39.0	39.5	43.0
Weeding at 3 and 5 WAT	67.9	69.2	65.3	66.3	67.2	51.7	50.4	43.8	39.1	46.3
Weeding at 3, 5 ad 7 WAT	55.8	55.7	53.3	55.2	55.0	47.6	48.0	45.8	43.9	46.3
Weeding at 3, 5 7 ad 9 WAT	63.4	67.5	66.7	61.5	64.8	53.6	51.6	50.1	46.5	50.5
LSD (0.05)	11.34*	ns	12.55**	11.29*	-	6.08*	5.16**	6.96**	ns	-
Poultry Manure Rates (PMR)										
0t/ha	58.7	61.2	61.1	59.8	60.2	47.8	41.8	37.5	37.8	41.2
4t/ha	60.2	64.3	62.7	63.7	62.7	49.1	45.7	42.5	42.5	45.0
6t/ha	57.0	56.3	58.9	67.1	59.8	50.3	49.4	46.9	48.1	48.7
LSD (0.05)	ns	ns	ns	ns	-	ns	3.78**	5.17*	6.45*	-
WR x PMR LSD (0.05)	ns	ns	ns	ns	-	12.55*	Ns	ns	ns	-

* Significant at 5% level of probability. NS: Not significant. ** Highly significant 1% level of probability.WAT: Weeks after transplanting.

Table 4: Effect of weeding regimes and poultry manure rates on growth, weed density and yield characters of *Capsicum frutescens*

Treatments	Plant height (cm)	Stem diameter (cm)	Weed density ($m^{2)}$	Weed dry weight (g)	Fruit weight (g)	Number of red fruit/plant	Fruit length (cm)	% Yield loss
Weeding Regime (WR)								
Weedy Check	71.0	1.20	10.1	170.5	0.44	30.4	6.47	73.19
Weeding at 3 WAT	77.0	1.70	6.54	123.8	1.40	64.9	6.77	28.17
Weeding at 3 and 5 WAT	80.5	1.80	5.68	62.6	1.93	65.6	7.37	21.81
Weeding at 3, 5 and 7 WAT	72.5	1.55	5.00	47.5	1.48	69.5	7.60	14.95
Weeding at 3, 5, 7 and 9 WAT	82.4	1.71	5.32	20.5	2.10	70.9	8.43	3.15
LSD (0.05)	0.45**	Ns	0.71**	10.55*	1.01*	26.75**	ns	-
Poultry Manure Rates (PMR)								
0 t/ha	76.0	1.58	6.46	84.00	1.20	59.5	6.92	
4 t/ha	72.9	1.61	6.47	90.00	1.50	76.3	7.22	
6 t/ha	82.5	1.61	6.10	93.10	1.3	80.9	8.98	
LSD (0.05)	ns	Ns	ns	ns	0.39*	8.75*	ns	-
Interaction								
WRxPMR LSD (0.05)	ns	Ns	ns	ns	ns	ns	ns	-

* Significant at 5% level of probability. NS: Not significant. ** Highly significant at 1% level of probability.WAT: Weeks after transplanting.

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