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Effect of Mulching Materials and Spacing on Growth and Yield of Two Varieties of Chilli Pepper (*Capsicum annum* L.) Planted in Experimental Plot in Jericho area of Ibadan Northwest Local Government, Oyo State, Nigeria

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ABSTRACT: Mulching is covering the soil surface around the plants with organic or synthetic material to create favorable conditions for plant growth and proficient crop production. Hence, the objective of this paper is to investigate the Effect of Mulching Materials and Spacing on Growth and Yield of Two Varieties of Chilli Pepper (*Capsicum annum* L.) Planted in Experimental Plot in Jericho area of Ibadan Northwest Local Government, Oyo State, Nigeria using appropriate standard techniques. The results obtained from the experiment showed no significant difference in the growth parameters of both varieties except in the fruit yield data of the local variety assessed. Treatments which recorded highest values for hybrid and local variety on plant height, stem diameter, number of leaves, number of flowers and number of fruits were T2(27.7cm), T2(1.2mm), T2(64.0), T2(5.00) and T2(17.0) while treatments which recorded least were T4(20.3cm), T4(0.7mm),T5(20), T4 (1.00) T3 (0.00) respectively. In conclusion, T1 (30x75cm+plantain leaves), hybrid variety recorded the best performance while for local variety, T2 (60cmx75cm+plantain leaves) recorded highest than other treatments assessed. It was therefore recommended that spacing of 30cmx75cm and plantain leaves should be adopted for the growth and yield of Capsicum annum hybrid varieties while 60x75cm and plantain leaves can be used for local varieties in the study area.

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Chilli (*Capsicum annum* L.) is been regarded as one of the important spice crops belonging to the genus Capsicum under Solanaceae family. It is widely cultivated throughout the warm temperate, tropical and subtropical countries with its centre of origin located in Mexico. According to (Maida *et al*., 2019), It was referred to as the most widely used spice named as wonder spice. Capsicum fruits, fresh, dried or processed are consumed as spice, vegetable or condiments (Geleta, 1998). Its nutritional value merits special attention because it is rich in vitamin A, C and E. Both hot and sweet pepper contains more vitamins C than any other vegetable crops (Poulos, 1993) oleoresin of paprika and capsicum is the two important extracts of pepper. The antioxidant vitamins A, C and E are present in high concentration in hot pepper

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(Bosland and Votava, 2000). Both hot pepper and sweet pepper contain more vitamin C than any other vegetable crops (Poulos, 1993), pro vitamin A, E, P, B_1 (thiamine), B_2 (riboflavin) and B_3. Chilli pepper has significant role in the human diet. Mulching is a process of covering the soil providing better medium for plant growth and development. It is an important cultural method that helps to produce healthy plants with good productivity (Sathiyamurthy *et al*., 2017). Mulching have been found to reduce losses of water through evaporation from soil. In addition, it reduces weed problem, maintaining a thermal regime in the root zone. Plastic mulches of different colours are been used in place of organic mulch. Organic mulches improve the condition of soil by providing organic matter through decomposition which causes loosening of soil and improves root growth. The moisture retained by mulching materials will be used for plants for many weeks or even months. Mulching however, has been considered as one of the various factors affecting the production and good quality of chilli. There is also information about different mulches enhancing not only the yield but also improving the quality of vegetable crops that are typically grown indoors. Mulching materials have effects on the seedling emergence and growth performance of hot pepper by affecting soil temperature, moisture soil structure and weed emergence. These factors have effect on germination percentage, growth performance like number of leaves per plant, height and plant size and leaf diameter of stem (Bosland and Votava, 2000). With the introduction of technology, man has devised means to increase the efficiency of food production. The use of organic and plastic mulches in commercial vegetable production is one of those conventional techniques that have been used since 1950. Mulching with plant residues and synthetic materials is a well-established technique for increasing profitability of many horticultural crops (Iqbal, 2009). A favorable soil, water and plant relationship is created by placing mulch over the soil surface. The micro climate surrounding the plant and soil is significantly affected by mulch i.e., thermodynamic environment, moisture, root zone, erosion, physical, chemical and biological properties of soil the incidence of pests and diseases, crop growth and yield (Iqbal, 2009).The additions of organic materials such as crop residues play a key role in the recycling of nutrients. Crop residues can maintain or enhances soil quality and productivity through favorable effects on soil properties and life support process. Organic mulches serve as food for many microorganisms in the soil. These organisms are necessary for maintaining and promoting soil granulation. Mulch also helps to keep the soil temperature constant so that the activity of the microorganisms can continue at an even rate (Williams, 1997). Recent studies showed that mulched plots significantly increased the bacteria, fungal and actinomycetes colonies compared to non-mulched plots (Shashidhar *et al*., 2009). Spacing is very important because of its effects on crop growth, development and yield. Spacing of crops varies with the plant, environment and cultural factors. Plants are spaced to achieve optimum desired population per unit area. Plant density has direct influence on yield, quantity, varietal purity and quality of fruits and seeds (Norman, 1992). Crops having wider spacing permits easier entry of pathogens that can cause severe damage in fruits and seeds resulting in low yield and poor quality seeds (Williams *et al.,* 1991). Closer spacing creates a more humid environment that can triger the development of pathogens whose effects can be detrimental to the production of quality seed. High plant density leads to dense leaf canopy resulting to poor light penetration and aeration at the lower parts of the plant (Pedigo, 1996), it also causes poor pollination by insects, seed deterioration, fruit shedding and incomplete seed development. Wider spacing leads to increased competition between plants and weeds for the essential growth factors whereby it has direct effect on plants. Wider spacing promotes the production of numerous lateral branches which delays flowering and seeds do not mature uniformly (Van Gastel *et al.,* 1996). An increase in plant density does not affect the performance of individual plants while the plant density stays below the level at which competition occurs between plants (Acheampong, 2007). Due to the pungency, taste, medicinal properties of chilli, it serves a great importance among people. In addition, its demand is increasing day by day across the globe, thus there is urgent need to increase the production and productivity of chilli. Hence, the objective of this paper is to investigate the Effect of Mulching Materials and Spacing on Growth and Yield of Two Varieties of Chilli Pepper (*Capsicum annuum* L.) Plated in Experimental Plot in Jericho area of Ibadan Northwest Local Government, Oyo State, Nigeria.

MATERIALS AND METHODS

The experiment was carried out at the experimental plot of Crop Production Technology Department, Federal College of Forestry Ibadan, Oyo state (latitude 7'23' N and longitude 3'15'E). The college is situated at Jericho area in Ibadan Northwest Local Government Oyo state. The climate condition of the area is topically dominated by rainfall pattern from 1300mm-1600mm. The average temperature is about 32^{o}C, average relative humidity of 50-80% and the ecological climate condition of the area experience rainfall with two distinct seasons: dry season from November to March and raining season from April to

October (FRIN, 2020).

Materials used for the Experiment: The materials used were Cutlass, hoe, two varieties of Chilli pepper seeds (open pollinated and hybrid) weighing balance, mulching materials (banana leaves and transparent plastic mulch), bucket, watering can, Measuring ruler, pencil, pen, notebook, water, hand gloves Rain boot.

Procurement of materials: Pepper seeds (local and hybrid) were purchased at the seed store Solokad multiventures limited, Ibadan. The plastic mulch was bought from the Bodija market and the plantain mulch was collected from Greenfield Agropalm Ventures. Other materials were collected from Crop Production Technology Department store, Federal College of Forestry Ibadan, Nigeria.

Routine Analysis: Prior to sowing, soil samples was collected from the experimental site and taken to the soil laboratory to determine the soil physical and chemical properties.

Land preparation and Sowing of Capsicum annum: The experimental field was cleared and levelled manually with cutlass and hoe. The field was marked into block and sub plots. The plots were partitioned into 20 plots before transplanting of pepper seedlings. Chilli pepper seeds were raised on seed beds in the nursery for a period of (3) weeks before transplanting to the experimental plot. Watering and other management practices were carried out as required.

Experimental design: The experiment was laid in a 2x2x2 factorial in Randomized Complete Block Design (RCBD) having five (5) treatments replicated four (4) times which include:
T1= 30cmx75cm + Dry plantain leaves
T2= 60cmx75cm + Dry plantain leaves
T3= 30cmx75cm + Plastic mulch
T4 = 60cmx75cm +Plastic mulch
T5= control (30cmx46cm) + no mulch
The study assessed the effect of mulching materials and spacing on growth and yield of two varieties of *Capsicum annum* L. The experiment was conducted at the experimental plot of Crop Production Technology Department, Federal College of Forestry, Ibadan Oyo State, Nigeria. The experiment was laid out in a 2x2x2 factorial in a Randomized Complete Block Design (RCBD) having five (5) treatments which include T1 (30cmx75cm + dry plantain leaves), T2 (60cmx75cm + dry plantain leaves), T3 (30cmx75cm + plastic mulch), T4 (60cmx75cm +plastic mulch), T5 (30cmx46cm + no mulch) replicated four (4) times. *Capsicum annum* seeds were raised on seed beds in the nursery for a period of three (3) weeks before transplanting of seedlings to the experimental plot. Data collection commenced two (2) weeks after transplanting on the following parameters; plant height, number of leaves, stem diameter, number of flowers and number of fruits.

Data collection: Collection of data commenced two (2) weeks after transplanting on the following parameters:
Plant height (cm): The height of plants from each plot selected randomly was measured with the use of measuring tape from soil surface to the tip of the plant on a weekly basis for a period of twelve (12) weeks.
Number of leaves: The number of leaves per plant was counted.
Stem diameter (mm): Stem girth was taken at 5cm above the base of each sampled plant.
Number of flowers: this was done by visual counting of flowers before fruiting.
Number of fruits: Fruit yield of pepper was carried out with the use of weighing balance.

Data Analysis: Data obtained was subjected to Analysis of variance (ANOVA) using Statistical Package for Social Sciences (SPSS) and significant means separated using Duncan Multiple Range Test (DMRT) at 5% probability level.

RESULTS AND DISCUSSION

Selected physicochemical properties of the experimental site before planting as evaluated and presented in Table 1.

Table 1: Physical and chemical properties of the experimental site before planting

Parameters	Unit 1	Unit 2
Sand	36%	84%
Silt	21%	3%
Clay	43%	13%
pH (H_20)	6.2	7.2
pH ($CaCl_2$)	6	6.6
Organic carbon	0.51%	0.82%
Organic matter	0.87%	3.82%
Available phosphorus	12.34	6.97
Total nitrogen (%)	0.0446	0.0705
Exchangeable bases		
K^+	0.21	0.29
Na^+	0.17	0.14
Ca^{2+}	1.4	1.3
Mg^{2+}	1.15	1.28
Exchangeable acidity cmol/kg		
Al^{3+}	0.3	0.7
H^+	0.3	0.3
Extractable micronutrients (mg/kg)		
Mn	1.20	1.00
Fe	170.00	152.00
Cn	1.30	1.60
Zn	0.40	0.42

Source: FRIN Laboratory Department, Jericho Hill, Ibadan. 2023

The effect of spacing and mulching on plant height of hybrid variety of C. annum is shown in table 2. Plant height increased with time reaching the maximum at 8WAP. Although, the result showed no significant

difference (p>0.05). However, the highest value was recorded on 60cmx75cm+ dry plantain leaves plot having 25.7cm while 60cmx75cm +plastic mulch plot had the least recording of 21.8cm. Table 3 revealed there were no significant difference among the treatments assessed however, the result showed T3 (30cmx75cm+ plastic mulch) plot had consistent increase in stem diameter compared to other treatments from week 3 to week 8.The control plot also showed an increasing trend in stem girth from week to week, but its stem girth were generally lower compared to other treatments. T2 (30cmx75cm + Dry plantain leaves) and T3 (60cmx75cm + Dry plantain leaves) had similar patterns in their growth with T3 generally having slightly higher values, especially from week 5 onwards. T4 (60cmx75cm +Plastic mulch) therefore, recorded the least values. Overall, the data suggests that T3 had a positive impact on the stem girth of the hybrid variety of C. annum.

Table 2: Effect of spacing and mulching on plant height of hybrid variety of *C. annum*

Treatments	WK 1*	WK 2*	WK 3*	WK 4*	WK 5*	WK 6*	WK 7*	WK 8*
T1	6.0	12.3	13.8	15.2	18.7	20.5	22.7	24.8
T2	5.0	9.8	11.3	15.8	19.1	21.3	24.0	25.7
T3	5.3	13.5	14.6	15.3	15.7	22.2	23.5	24.8
T4	3.0	11.7	14.2	15.0	16.8	18.3	19.7	21.8
T5	6.0	11.0	13.0	14.5	16.5	19.0	20.5	22.5

** No significant difference among the treatments in each column; T1= 30cmx75cm + Dry plantain leaves; T2= 60cmx75cm + Dry plantain leaves; T3= 30cmx75cm + Plastic mulch; T4 = 60cmx75cm +Plastic mulch; T5= control (30cmx46cm) + no mulch*

Table 3: Effect of spacing and mulching on stem diameter of hybrid variety of *C. annum*

Treatment	WK 1*	WK 2*	WK 3	WK 4*	WK 5*	WK 6*	WK 7	WK 8
T1	0.4	0.4	0.4^{a}	0.5	0.8	0.8	0.9^{ab}	1.0^{ab}
T2	0.4	0.4	0.5^{a}	0.6	0.6	0.8	0.9^{ab}	1.1^{ab}
T3	0.6	0.6	0.7^{b}	0.7	0.7	1.0	1.1^{b}	1.2^{b}
T4	0.3	0.4	0.4^{a}	0.4	0.4	0.5	0.6^{a}	0.7^{a}
T5	0.4	0.4	0.5^{a}	0.5	0.5	0.6	0.7^{a}	0.8^{a}

** No significant difference among the treatments in each column (p>0.05); Means with different alphabets are significantly different (P<0.05)*

Table 4: Effect of spacing and mulching on number of leaves of hybrid variety of *C. annum*

Treatment	WK 1	WK 2*	WK 3	WK 4	WK 5*	WK 6*	WK 7*	WK 8*
T1	9	13^{a}	20^{b}	21^{a}	42	47	50	56
T2	9	11^{a}	12^{ab}	18^{ab}	30	40	43	53
T3	13	23^{b}	28^{b}	30^{b}	42	45	50	55
T4	5^{a}	5	5^{a}	9^{a}	16	18	19	22
T5	4^{a}	4	5^{a}	7^{a}	15	17	19	20

** No significant difference among the treatments in each column (p>0.05); Means with different alphabets are significantly different (P<0.05)*

According to the above findings in the data regarding the effect of spacing and mulching on the number of leaves of the hybrid variety of C. annum, the result revealed that T1(30cmx75cm + Dry plantain leaves) recorded a consistently higher number of leaves compared to the other treatments throughout the 8-week period of data collection. This suggests that the plantain leaves had positive impact than other treatments assessed. T4 (60cmx75cm +Plastic mulch) and T5 (30cmx46cm+ no mulch) had relatively lower number of leaves compared to the other treatments. Overall, the data suggests T1 (30cmx75cm + Dry plantain leaves) had the most significant impact on the number of leaves of the hybrid variety of C. annum.

Table 5: Effect of spacing and mulching on the number of flowers of hybrid variety of *C. annum*

Treatment	WK 3*	WK 4	WK 5*	WK 6*	WK 7*	WK 8*
T1	1^{ab}	1	1	1	2	4
T2	0a	0	1	1	2	3
T3	0	0	1	1	3^{b}	4
T4	0	0^{a}	0	0	0	1
T5	0	0^{a}	0	0	0	2

** No significant difference among the treatments in each column (p>0.05); Means with different alphabets are significantly different (P<0.05)*

Based on the result in Tale 5, T1 (30cmx75cm + Dry plantain leaves) and T3 (30cmx75cm + Plastic mulch) treated plots recorded similar values having the highest number of flowers of the hybrid variety of C. annum throughout the 8-week assessment while T4 (60cmx75cm +Plastic mulch) recorded the least number of flowers. Interestingly, T3 (60cmx75cm + plastic mulch) performed best more than the others, indicating that the use of plastic mulch had a significant effect in promoting flower production for this particular variety.

Table 6: Effect of spacing and mulching on the number of fruits of hybrid variety of *C. annum*

Treatment	WK 5*	WK 6*	WK 7*	WK 8*
T1	3	4	4	4
T2	2	2	3	3
T3	1	1	2	3
T4	1	2	2	2
T5	0	0	1	2

** No significant difference among the treatments in each column (p>0.05).*

Based on the data provided on the effect of spacing and mulching on the number of fruits of hybrid variety of C. annum, it appears that there were no significant differences among the treatments in from weeks 5 to 8 ($p > 0.05$). This suggests that the spacing and mulching treatments did not have a significant impact on the number of fruits during these weeks however, T1 (30 cmx 75 cm + Dry plantain leaves) recorded the best number of fruits while T4 (60 cm x 75 cm +Plastic mulch) and (30 cm x 46 cm) + no mulch recorded least. Overall, the gathered result provides valuable insights into the potential effects of spacing and mulching on the number of fruits of the hybrid variety of C. annum, although the results suggest that further investigation may be needed to fully understand the impact of these treatments on fruit production.

Table 7: Effect of spacing and mulching on plant height of local variety of *C. annum*

Treatment	WK 1*	WK 2*	WK 3*	WK 4*.	WK 5*	WK 6*	WK 7*	WK 8*
T1	7.7	13.3	14.7	15.0	18.6	23.2	25.5	27.2
T2	6.3	13.0	15.8	17.3	22.0	24.0	26.2	27.7
T3	5.7	11.8	13.3	18.8	22.6	24.3	26.0	27.5
T4	6.0	9.5	12.2	17.0	17.5	17.7	19.0	20.3
T5	8.5	10.5	13.0	14.0	19.5	20.5	22.5	23.8

** No significant differences among the treatments in each column (p>0.05); T1= 30cmx75cm + dry plantain leaves; T2= 60cmx75cm + dry plantain leaves; T3= 30cmx75cm + plastic mulch; T4 = 60cmx75cm +plastic mulch; T5= control (30cmx46cm) + no mulch*

Based on the findings, the result showed no significant differences among the treatments (p>0.05) although, 60cmx75cm + dry plantain leaves recorded similar values when compared to 30cmx75cm + plastic mulch and 30cmx75cm + dry plantain leaves. On the other hand, the control plot showed better performance than the 60cmx75cm +plastic mulch treatment application. For T1 (30cm x 75cm+dry plantain leaves), the plant height increased steadily over the weeks, reaching 27.2 cm by week 8. T2 (60cm x 75cm+ dry plantain leaves) also showed a consistent increase in plant height, reaching 27.7 cm by week 8, although the growth pattern was slightly different from T1. T3 and T4 both showed fluctuating plant heights over the weeks, with T3 reaching 27.5 cm by week 8 and T4 reaching 20.3 cm. The control (T5) showed a similar growth pattern to the mulch treatments, reaching 23.8 cm by week 8.

Table 8: Effect of spacing and mulching on stem diameter of local variety of *C. annum*

Treatment	WK 1	WK 2*	WK 3*	WK 4*	WK 5*	WK 6	WK 7	WK 8
T1	0.5	0.5	0.6	0.7^{bc}	0.7	0.8^{a}	0.9^{ab}	0.9^{a}
T2	0.6	0.7^{bc}	0.7	0.7	0.9	0.9^{b}	1.0^{c}	1.2^{b}
T3	0.5	0.5	0.5	0.7	0.8^{ab}	0.9^{c}	0.9^{b}	1.0^{a}
T4	0.5	0.5	0.5	0.5	0.6^{ab}	0.7^{a}	0.8^{ab}	0.8^{a}
T5	0.5^{a}	0.6	0.6	0.6	0.7	0.8^{a}	0.8^{a}	0.9^{a}

** No significant difference among the treatments in each column (p>0.05); Means with different alphabets are significantly different (P<0.05).*

Table 9: Effect of spacing and mulching on number of leaves of local variety of *C. annum*

Treatment	WK 1*	WK 2*	WK 3*	WK 4*	WK 5*	WK 6*	WK 7*	WK 8*
T1	11	12	13	14	27	30	32	40
T2	11	20	21	26	43	46	59	64
T3	9	18	20	25	29	33	36	48
T4	10	13	15	16	21	24	28	31
T5	7	9	13	23	25	32	35	39

** No significant difference among the treatments in each column (p>0.05).*

The result from table 8 showed no significant difference among the treatments assessed. Although not significant, 60cmx75cm + dry plantain leaves exhibited an increase in stem girth reaching 1.2mm by the 8th week. Meanwhile, T3 treated plots was followed closely having similar value as T2. However, T1 and T5 also had their increase over the weeks reaching 0.9mm by the end of week eight. The table 9 showed the effect of spacing and mulching on number of leaves of local variety of *Capsicum annum* over

eight weeks. Although, T2 (60cmx75cm + dry plantain leaves) consistently exhibited an increase in the number of leaves reaching its peak at week eight. However, all other treatment assessed showed an increasing trend as well ranging from 31 in T4 treated plots to 48 in T3. However, there were no significant differences among the treatments in each column ($p>0.05$), indicating that the spacing and mulching treatment had no significant difference on the number of leaves based on the data collected.

Table 10: Effect of spacing and mulching on number of flowers of local variety of *C. annum*

Treatment	WK 3	WK 4*	WK 5*	WK 6*	WK 7*	WK 8*
T1	0[a]	0	0	1	2	3
T2	0	1	1	4[b]	5	5
T3	0	0	0	1	1	2
T4	0	0	0	0	1	1
T5	0	0	1	2	2	3

**No significant difference among the treatments in each column (p>0.05); Means with different alphabets are significantly different (P<0.05).*

Table 10 illustrates the effect of spacing and mulching on number of flowers of local variety of C. annum. The above result showed no significant difference in the flowers initiated among the treatments assessed although T2 started flower initiation from week 4 and produced the best performance by week 8. T4 application plots however had no production of flowers until week 7 which later recorded the least number having only one flower. T1 and T5 showed similar patterns in their production of flowers recording same values while T3 produced two flowers by the end of week 8.

Table 11: Effect of spacing and mulching on the number of fruits of local variety of *C. annum*

Treatment	WK 5	WK 6	WK 7	WK 8
T1	0[a]	0[a]	1[a]	1[a]
T2	2[b]	17[b]	17[b]	17[b]
T3	0[a]	0[a]	0[a]	0[a]
T4	0[a]	1[a]	1[a]	1[a]
T5	0[a]	1[a]	1[a]	1[a]

Means with different alphabets are significantly different (P<0.05)

Based on the above result, the spacing and mulching treatments had significant effect on the number of fruits of the local variety of C. annum. The results showed that only T2 started production of fruits from week 5 which later resulted in the highest number of fruits at week 8, this number remained consistent from week 6 to 8. This indicates that the wider spacing used in T2 resulted in a higher yield of fruits compared to the other treatments. T1, T4 and T5 displayed no increase in the number of fruits producing one over the weeks however T3 had no fruit production at the time of data collection. Based on the significantly different means ($P<0.05$), it can be concluded that the spacing and mulching treatments had a clear impact on the number of fruits of the local variety of C. annum.

The experiment assessed the influence of spacing and mulching on the varieties of chilli pepper. Based on the above findings, no significant difference was observed among the treatments applied on the hybrid variety of *Capsicum annum* even though 30cmx75cm+dry plantain leaves performed best on number of leaves, flowers and fruits. On the other hand, best performance was recorded on plots applied with 60cmx75cm+dry plantain leaves for local variety of Capsicum annum on all the parameters assessed. Similarly, Mochiah *et al*. (2012) observed non-significant differences among the mulched plots but he recorded dry plantain leaves mulched plots performed best than the plastic mulched plots. Our findings is in contrary to (Iqbal, 2009) who stated that pepper mulched with transparent plastic mulch had better vegetative growth on plant height and fruit yield (Iqbal, 2009). Our findings on the other hand supports the work of (Dzomeku *et al*., 2009) where they indicated that straw mulch enhanced plant height and increased fruit number and fruit yield in both pepper and tomato.

Similar findings from Warner and Zandstra (2004) showed none of the plastic mulch increased early yield compared to control plots. However, plastic mulch had lower mean values for plant height, stem diameter, number of flowers and number of fruits of the hybrid variety of chilli pepper although transparent plastic is believed to achieve higher soil temperatures due to its photogenic effect, heavy rain damage to the leaves can have adverse effect on the plant. Similarly, (Mochiah *et al*., 2012) showed that mulch may provide a better refuge for disease causing agents that can later cause considerable damage to plants. Howbeit, some of the advantages of mulches are soil protection, earlier yield, increased water retention, inhibition of weeds, reduced fertilizer leaching and decreased soil compaction (Hatutale, 2010). Organic mulches as investigated by (Mugalla *et al*., 1996) offers a barrier against weed invasion, loss of water, nutrient loss, run off, pests and disease infestation while encouraging early establishment of crops of good growth and higher productivity. (Scheerens and Brenneman, 1994) also reiterated the effect of combining soil temperature, soil moisture and weed suppression not only work to improve crop growth but also facilitate

early picking leading to high yield and increased fruit size. Higher number of primary branches under straw mulch relative to the control plot on bottle gourd was recorded by Tan *et al.,* (2009). Aiyelaagbe and Fawusi (1986) studies showed growth and yield response of chilli pepper to mulching and reported plant height, canopy diameter, leaf area per plant, number of fruits per plant and total fruit dry weight under organic mulches with saw dust, dry grass and maize crop were higher than plots with no mulch. Mulching significantly resulted in tallest plant and give higher yield per plant in garlic (Islam *et al*., 2007). Umar *et al*., (2000) observed significant effect of mulching on number of leaves per plant in onions. Islam *et al*., (2007) reported higher number of leaves on mulched plot over the bare plot in onion. The suitable condition enhanced the plant growth and development and this produced increased fruit bearing nodes compared to the control. Similar finding was reported by Ashrafuzzaman *et al.,* (2011) in chilli. Abuzar et al., (2011) indicated that as row plant spacing decreased, plant height increased. Islam *et al.,* (2011) noteworthingly stated that the effect of plant spacing was found to be significant on plant height at different growth stages. It was also found that the smallest spacing produced taller plants at all growth stages compared to other wider spacing. The obtained results showed similar trend as the closest spacing gave the tallest plants throughout the assessment. This is because with closer spacing, there are a greater number of plants per unit area competing for available sunlight, nutrients and water. This is in contrary with our findings which revealed that wider spacing and dry plantain leaves performed better for local variety while closer spacing and dry plantain leaves was observed to give best results for the hybrid variety of chilli pepper.

Conclusion: From our experiment, it was concluded that the difference in mulching types and spacing did not show significant effect on the growth and yield of chilli pepper. However, significant difference was observed in wider spacing combined with dry plantain leaves showing considerably higher number of fruits in the local variety plots while closer spacing and dry plantain leaves hybrid plots recorded best in number of fruits than other treatments assessed.

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