



INFLUENCE OF DIFFERENT MULCHES ON GROWTH AND YIELD OF SPONGE GOURD (*LUFFA CLYNDRICA* L.)

Sageer Khan, Mahender Pal¹ and Vijay Kumar^{1*}

Institute of Agriculture Science, Bundelkhand University, Jhansi - 284 124 (Uttar Pradesh), India.

²Horticulture Fruit, College of Horticulture, Noorsarai - 803 113, Nalanda, Bihar

Bihar Agricultural University, Sabour, Bhagalpur (Bihar), India.

Abstract

The field experiment was conducted to assess the effect of different mulching material on growth and yield of Sponge gourd (*Luffa clyndrica* L.) cv. Pusa Chikni at the Institute of Agriculture Science, Bundelkhand University, Jhansi (U.P.), India, in the central Indian semi arid tracts during-2011. The experiment comprises of seven treatment allocated in Randomized Block Design with three replications viz., T₁- mulching with goat manure, T₂- control (no mulch), T₃- white polythene mulch, T₄- grass mulch, T₅- farm yard manure mulch, T₆- black polythene mulch, T₇- rice straw mulch. The maximum values for vine length (125.00 cm.) and yield characters, days to flowering, vine spread (cm), fruit length (cm), fruit weight (g), fruit diameter (cm), no. of fruits per plant and fruit yield (213.47q/ha) were significantly superior with black polyethylene mulch while, plants without mulch (control) resulted poor growth and yield.

Key words : Mulches, sponge gourd, yield.

Introduction

Sponge gourd (*Luffa clyindirca* L.) is tropical and sub-tropical member of the Cucurbitaceae family, grown in India with prime importance. Sponge gourds are in cultivation since centuries in the Middle East and India, China, Japan and Malaysia. Cucurbits share about 5.6 per cent of the total vegetables production of India. Mulching in general is a beneficial agronomic practice for crop production. It conserves soil moisture, retained heat as well as suppresses weed growth. Some mulching material as a reflective mulches are efficient in repelling insects (AVRDC, 1990). According to Struzina and Kromer (1989), the use of Black Plastic or straw mulch on cucumber plots produced higher yield and compensate additional cost of input. Black mulches will reduce light penetration to the soil. Weeds cannot generally survive under such mulches. Fertilizer beneath the mulch is not lost by leaching, so that fertilizers are optimally used and not wasted. The soil under plastic mulch remains loose, friable and well-aerated. Roots have access to adequate oxygen and microbial activity is enhanced. Therefore, considering the importance of different mulching in various vegetable crops, data and the facts, present investigation

entitled “Studies on effect of mulches on growth and yield of Sponge gourd (*Luffa clyndrica* L.)” was planned to be carried out in growing region of Jhansi (U.P.), India.

Materials and Methods

The experiment was conducted on single variety Pusa Chikni with seven treatment of different mulching materials T₁- mulching with goat manure, T₂- control (no mulch), T₃- white polythene mulch, T₄- grass mulch, T₅- farm yard manure mulch, T₆- black polythene mulch, T₇ - rice straw mulch, at Agriculture Research Farm, Gunmawara, Institute of Agricultural Sciences, Kanpur Road, Bundelkhand University, Jhansi (U.P.), India; during the March-July, 2011. The experimental location is geographically situated at 25° 27” N latitude and 78° 35” E longitudes at an altitude of 271 meters above from mean sea level in semi-arid tract of Central India. The field was well levelled having good irrigation and drainage facilities. Experiment planted at spacing of 1 × 1 meter row to row and plant to plant, in Randomized Block design with three replication including 21 plots. All the recommended package of practice was adopted to raise a good crop. The observations were recorded on five randomly selected plants in each replication of characters namely vine length (cm.), number of leaves/plant, number

*Author for correspondence: E-mail : vijaykumar0517@gmail.com

Table 1 : Effect of different mulches on growth attributes of sponge gourd (*Luffa cylindrica* L.).

Treatments	Vine length (cm.)	Number of leaves/plant	Number of nodes/plant	Vine girth (cm)	Vine spread (cm)
T ₁ - Mulching with goat manure	97.67	46.67	43.67	1.09	35.67
T ₂ - Control (no mulch)	95.33	42.33	41.33	0.87	31.00
T ₃ - White polythene mulch	104.00	49.00	48.00	0.98	41.67
T ₄ - Grass mulch	102.00	49.33	48.33	1.03	38.33
T ₅ - Farm yard manure mulch	115.33	49.67	49.33	0.9	42.33
T ₆ - Black polythene mulch	125.00	50.67	49.67	1.28	41.67
T ₇ - Rice straw mulch	84.67	43.33	42.33	1.45	42.33
CD at 5% level of probability	23.19	NS	NS	NS	4.55
SEm±	7.5	3.25	3.36	0.14	1.47

Table 2 : Effect of different mulches on yield attributes of Sponge Gourd (*Luffa cylindrica* L.)

Treatments	Days to flowering	Fruit length (cm)	Fruit weight (g)	Fruit diameter (cm)	No. of fruits per plant	Fruit yield (q/ha)
T ₁ - Mulching with goat manure	43.00	16.33	87.00	10.33	12.33	95.60
T ₂ - Control (no mulch)	45.00	13.50	76.34	7.53	9.33	79.14
T ₃ - White polythene mulch	41.00	17.13	111.67	9.86	14.67	85.52
T ₄ - Grass mulch	41.00	16.57	102.33	8.30	13.00	100.11
T ₅ - Farm yard manure mulch	39.00	17.93	112.00	8.79	14.00	152.33
T ₆ - Black polythene mulch	38.67	18.27	125.00	11.20	16.00	213.47
T ₇ - Rice straw mulch	42.33	16.73	100.00	10.40	15.33	91.03
CD at 5 % level of probability	5.17	3.73	21.83	2.12	4.95	9.36
SEm±	1.68	1.21	9.93	0.69	1.58	3.03

of nodes, vine girth (cm), vine spread (cm), days to flowering, vine spread (cm), fruit length (cm), fruit weight (g), fruit diameter (cm), no. of fruits per plant and fruit yield (q/ha). The experimental data obtained during the course of study was subjected to statistical analysis by using standard statistical procedure for Randomized Block Design (RBD) as per Cochran and Cox (1964), standard error of means (S.E.m.±) was computed in each case. Critical difference (C.D.) was calculated at 5% level of probability. The significance of variance was tested by applying 'F' test.

Results and Discussion

The results revealed that different types of mulching materials evoked significant influence on the growth parameters of Sponge gourd *viz.*, length of the vine and spread of plant over control (table 1). Among different mulching treatments, treatment T₆– black polythene mulch gave higher length of the vines (125.00cm) while spread of plant was noticed higher in T₅ and T₇, *i.e.* 42.33

cm, respectively in each, the increase in growth parameters was attributed to sufficient soil moisture near root zone, reduced competition of weeds and minimized the evaporation loss due to mulching. The extended retention of moisture and availability of moisture also leading to higher uptake of nutrient for proper growth and development of plants, resulted higher growth of plant as compared to control. The results of the present investigation are in close agreement to Struzina and Kromer (1989) and Ibeawuchi *et al.* (2007) in cucumber.

The data presented in table 2, indicated significant effect of different mulching materials on yield and yield attributing characters. Minimum days to first flowering was recorded 36.67 days from planting, maximum fruit length (18.27cm), fruit weight (125.00g), fruit diameter (11.20cm), no. of fruits per plant (16) and fruit yield (213.47q/ha) were recorded with T₆– black polythene mulch than control. The highest fruit length, fruit diameter and fruit weight on black polythene mulch was due to congenial soil moisture results higher uptake of nutrition

for better growth of fruit, the reduction in evaporation losses of soil moisture caused by mulches covered the soil surface in row of sponge gourd. The above results were in consonance with those of Johnson *et al.* (2000), Ansary and Roy (2005) in watermelon, Suresh and Ashok Kumar (2006) in pointed gourd. Black polyethylene mulch was found to have significantly better effect on the extent of more number of fruit per plant than other mulching materials tried and control. This mulch consistently increased. This might have been influenced by favorable soil temperature, moisture conditions and pest-disease control as influenced by black mulch. The present finding was in accordance with Johnson *et al.* (2000), Ansary and Roy (2005) in watermelon and Hanna (2000) in cucumber. Plants under black polyethylene mulch produced larger fruit and have higher fruit yield per hectare because of better plant growth due to favorable hydro-thermal regime of soil and complete weed free environment. The above results were in consonance with those of Jiménez *et al.* (2004), Ansary and Roy (2005), Cenobio *et al.* (2007) and Arancibia and Motsenbocker (2008) in watermelon, Ibarra-Jimenez *et al.* (2008), Hallidri (2001) in cucumber, Ibarra *et al.* (2001) in muskmelon.

Conclusion

On the basis of the findings of the present field experiment, it can be concluded to use black polythene as mulching material for higher yield of sponge gourd.

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