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Short Communication

Response of summer capsicum yield to different mulching in western ghat zone of Maharashtra

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Vegetable crops are very sensitive to moisture stress, a little moisture stress in the soil can affect the plant growth and yield adversely. Capsicum is a highly remunerative crop of Western Ghat Zone of Igatpuri tahsil (Maharashtra) but production in the region is affected adversely by moisture deficit. The productivity can be increased by adopting improved package of practices, particularly *in situ* moisture conservation by mulching.

Plastic mulch provides cover on soil surface and hence reduces loss of moisture through evaporation. Numerous studies have been conducted to determine the influence of mulches on soil water storage content, and evaporation. Lindon (1963), Manesu and Ciofu (1970) and Pusztal (1963), reported increased soil water retention up to 32 per cent. Addel-Hafeez *et al*., (1977) observed plastic sheet (transparent and black) conserving more soil moisture than the control plots and differences were 47 and 50 per cent for transparent and black polythene respectively. Abdul Baki *et al.*, (1992) also reported that black polythene mulch doubled the yield of tomatoes. Christopher Lourduraj, *et.al.*, (1996) revealed that mulching of tomato with black LLDPE mulch film (25 μ) resulted in highest yield 12.73 t ha^{-1} and increases of 28.4 pr cent compared to unmulched control.

MATERIALS AND METHODS

The field experiment was conducted during the summer season of 2005 (January-May) at the Agricultural Research Station Farm of Zonal Agricultural Research Station, Igatpuri located at 20^0 N and 74^0E and 586 m above mean sea level. The soil was silt clay loam, and the field capacity, permanent wilting point and bulk density were 17.1 per cent, 6.7 per cent and 1.58g cm^{-3}, respectively in 0-30 cm soil depth.

Capsicum cv. California Wonder was planted on 2nd February 2005. The plot size was 4.5 x 3.0 m. Within each plot, raised beds were formed with 45 cm spacing. Irrigation channels were made along with raised beds for irrigating capsicum crop. The different mulching material were fixed tightly during the non-windy period without any crease to cover only the raised beds. On the raised beds, both the ends of plastic sheet were buried into the soil upto a depth of 10 cm. Capsicum seedlings were planted in holes made at 45 cm spacing. The treatments under experiment were viz:(I) M_1- Black poly mulch of 25 μ , (II) M_2- Black poly mulch of 50 μ , (III) M_3- Silver and black poly mulch of 50 μ , (IV) M_4-Paddy straw mulch and (V) M_0-No mulch (control). The experiment was laid out in randomized block design with four replications. The crop was fertilized with 100 kg N+ 25 Kg P_2O_5 ha^{-1}. Half dose of nitrogen and full dose of phosphorus were applied to capsicum crop after one week of transplanting and remaining 50 per cent dose of nitrogen was applied as top dressing, 30 days after transplanting. An uniform crop stand was maintained by keeping two plants per hill at spacing 45 x 45 cm. Thirty five day-old seedlings were used for capsicum transplanting.

Maximum plant height was recorded with black poly mulch of 50μ, followed by silver and black poly mulch of 50μ and black poly mulch of 25μ (Table 1). Maximum crop canopy and number of branches was recorded with black poly mulch of 50μ and silver and black poly mulch of 50μ. The highest values of growth and yield attributes could be due to increased availability of soil moisture due to mulching.

On an average survival percentage of capsicum crop was 89.50 per cent. The average survival percentage of capsicum crop with poly mulch was about 93.75 per cent. Percent soil moisture retention under various treatments from transplantation (6 MW) to fruit development (16 MW) of stage at weekly interval were collected (Fig. 1). The maximum soil moisture content was recorded under black poly mulch 50μ (M_2), followed by silver and black poly mulch of 50 μ (M_3) and black poly mulch of 25 μ (M_1), compared to paddy straw mulch (M_4) and control (M_0).

Maximum capsicum yield was obtained with black poly mulch of 50 μ (13.45 t ha^{-1}) compared to paddy straw mulch (M_4) and control (M_0) which recorded yield of 6.10 and 5.25 t ha^{-1} respectively. It was 11.83 and 9.69 t ha^{-1} in the M_3 and M_1 treatments respectively. This was due to more number and size of capsicum fruits per plant with black poly mulch of 50μ (M_2) compared with other treatments. Lack of soil moisture in root zone under unmulched (control) plots restricted the plant growth and development at critical stages which ultimately reduced the yield.

Table 1: Growth and yield of capsicum as influenced by different mulching treatments

Treatments	Survival (%)	Plant ht. at harvest (cm)	Mean of Number branches per plant	Mean fruit weight (g)	Yield (t ha^{-1})	Mean crop canopy (cm^2)
Black poly mulch (25 μ)	91	26.5	5	25.8	9.69	359
Black poly mulch (50μ)	95	27.8	6	29.0	13.45	410
Silver and black poly mulch (50 μ)	95	27.6	6	26.1	11.83	403
Paddy straw mulch	90	25.9	5	24.4	6.10	220
Control	76	21.6	3	23.8	5.25	156
Mean	90	25.9	5	25.8	9.26	310

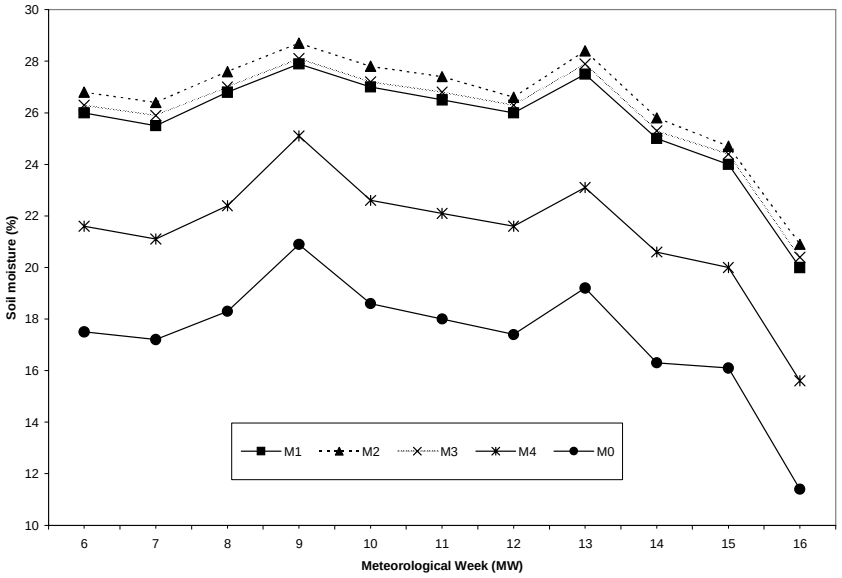

Fig.1: Effect of mulching material on soil moisture

It is inferred from the present study that for high yield of vegetable capsicum under summer condition in Western Ghat Zone of Igatpuri tahsil (Maharashtra), the crop should mulched with black poly mulch sheet.

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