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Studies on Effect of Mulching on Growth, Yield and quality of Watermelon *cv.* Sugar Baby

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ABSTRACT

A field experiment was conducted to know the effect of mulches *viz.*, transparent plastic mulch, paddy straw mulch and soil mulch on growth, yield and quality of water melon C V. Sugar baby under South Gujarat conditions during summer season 1997 at Agricultural Experimental Station, Gujarat Agricultural University, Paria. Observations were recorded for days for germination, per cent germination, soil temperature, length of main axis, number of primary branches per plant, node number on which first female flower appeared, number of fruits per vine, fruit weight, total soluble solids and fruit yield per hectare. The results revealed that all the mulching treatments differed significantly for all the characters under study. The transparent plastic mulch showed significantly higher per cent of seed germination (97%) in minimum number of days (5.9), higher length of main axis (229 cm) and more number of primary branches per plant (7.83) and it also maintained high soil temperature. Besides, transparent plastic mulch also increased number of fruits per vine (3.01), fruit weight (2.8kg) and fruit yield per hectare (231 q). The TSS was not influenced by mulching treatment. The results indicated that use of transparent plastic much was the best for getting early, uniform and higher per cent of germination in watermelon.

Key words : Growth, Mulching, Paddy Straw Mulch, Soil mulch, Sugar baby and Transparent Plastic Mulch.

Watermelon is an important summer fruit crop grown successfully on well drained clay soils of South Gujarat. It is usually sown in the month of January during which very low temperatures prevailed and the mean weekly minimum temperature fluctuates between 10.3° C and 13.5° C.Low temperatures have been widely reported to affect and delay germination in watermelon (Murthy, 1963). Application of mulches resulted in an increase in soil temperature and favourable effect on germination. Further mulching has also been reported to be effective in increasing vine length and improving yields (Singh *et al* 1976). Hence the present investigation was undertaken with three mulches viz., transparent plastic mulch, paddy straw mulch and soil mulch to study their effect o soil temperature, germination, growth, yiled and quality of water melon *cv.*Sugar baby under South Gujarat conditions.

MATERIAL AND METHODS

The Studies were undertaken at Paria in Valsad district of Gujarat state in randomized block design with three replications during summer 1997. The soil temperature was measured by soil thermometer at the depth of 5 cm under different mulches at the time of seed germination. The seeds were given mild hot water treatment for about 12 hours so as to overcome the possible dormancy. The sowings were taken up in the first fortnight of January by dibbling three seeds per hill in rows at spacing of 2.5m x 1.5m. Mulches were applied immediately after sowing over the sown area (30 cm / 30 cm) by keeping the seed in center and transparent plastic mulch was removed ten days after seed germination, where as paddy straw was left undisturbed. Observations on days taken for germination, whereas paddy straw was left undisturbed. Observations on days taken for germination, per cent germination, soil temperature, length of main axis, number of primary branches per plant, node number on which first feamle flower appeared, number of fruits per vine, fruit weight, total soluble solids and fruit yield per hectare were recorded following standard procedures and anlyzed as per the statistical procedures as detailed by Steel and Torrie (1980).

RESULTS AND DISCUSSION

Results of this study (Table 1 and Table 2) revealed significant differences in their effect on soil temperature, germination, growth, yield and quality of watermelon. The application of transparent plastic mulch recorded significantly higher soil temperature

Table 1. Effect of Mulching on Soil Temperature and Seed Germination of Watermelon

S.No.	Treatment	Soil Temperature (°C)	Number of days taken for germination	Seed germination (%)
1	Transparent plastic mulch	23.93	5.90	97.00
2	Paddy straw Mulch	22.23	7.70	87.00
3	SE m±	19.67	8.90	85.00
	CD @ 5%	0.18	0.15	2.08
	CV (%)	0.71	0.60	8.17
		4.58	11.18	12.63

Table 2. Effect of Mulching on Growth, Yield and Quality of Watermelon.

S.No.	Treatment	Length of main axis (cm)	Number of priamary branches per plant	Number of fruits per vine	Fruit weight (kg)	Total soluble solids (%)	Fruit yield (q/ha)
1	Transparent plastic mulch	229.30	7.63	3.01	2.80	8.09	231.76
2	Paddy straw Mulch	217.90	6.67	2.77	2.60	8.08	194.53
3	SE m±	208.06	5.97	2.50	2.30	8.07	160.53
	CD @ 5%	0.27	0.05	0.02	0.08	0.09	4.95
	CV (%)	1.06	0.21	0.07	0.31	NS	14.53
		0.68	4.38	4.00	16.73	6.22	13.86

(23.93°C), lower number of days for seed germination (5.90 days) and higher seed germination percentage (97%) compared to control (19.67°C, 8.90 days and 85% respectively) and paddy straw mulch (22.2°C, 7.7 days and 87% respectively) coupled with better conservation of soil moisture. The findings may be attributed to increased penetration of sun light resulting in increased soil temperatures leading to favourable effects on germination evidenced by lower number of days for germination. Drapeau and Darisse (1981) also observed similar favourable effects of palstic mulch on cucumbers during cooler and shorter seasons, compared to bare soil controls.

Application of transparent plastic mulch (Table 2) also resulted in significantly higher vine length (229.3 cm), number of primaries (7.63), number of fruits per plant (3.01), single fruit weight (2.8 kg) and yield (231.76 q/ha) compared to control (208.06 cm, 5.97, 2.50, 2.30 kg and 160.53 q/ha respectively). Similar results were reported by Singh et al., (1976) in their studies on the effect of various mulch material on growth and yield of bitter gourd, ridge gourd, sponge gourd under rainfed conditions of Dry Farming Research Centre, Haryana Agricultural University, Banval. They reported higher yields in mulched plot compared to control for all three crops during both the years. Further, among different mulch treatments, straw and straw dust mulches were observed to result in increased vine length and crop yield. Drapeau and Darisse (1981) in their studies on cucumber during summer with plastic mulch also reported increased yield under mulch treatment compared to control. Application of mulches did not result in any significant variations in total soluble sugars (%).

The study thus revealed the favourable effects of mulching on germination, growth and yield of watermelon *C V.* Sugar baby and hence application of mulches, transparent plastic mulch in particular is recommended for realizing higher yields of summer watermelon under South Gujarat conditions.

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