

Effect of mulching on plant growth, yield and quality of strawberry under agro-climatic conditions of Central Uttar Pradesh

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ABSTRACT

The effect of mulching on plant growth, yield and quality of strawberry under agro-climatic conditions of Kanpur was studied and it was found that plant growth indices mainly crown height and its spread, leaf number, area, and quality traits (TSS, sugar and vitamin 'C') of fruit were influenced by different mulch materials. Black polythene has established its superiority with regard to maximum crown height crown spread, leaf number, leaf area and quality parameters followed by white polythene and paddy straw. The minimum values on all the above parameters of growth, yield and quality were recorded under no mulch (control).

Key words : Mulching, Growth, Yield, Quality, Strawberry.

INTRODUCTION

Strawberry (*Fragaria × ananassa* Dusch.) is one of the most delicious and refreshing temperate fruits of the world. It gives early and very high returns per unit area compared to other fruits because its crop is ready for harvesting within six months after planting (Sharma, 2002) In India, earlier efforts made to popularize it could not be made successful because of poor adaptability of introduced cultivars and lack of technical know-how on its production technology was standardized and a sizable increase in its area and production has been observed in the preceding years (Sharma and Singh, 1999). It is known fact that mulching is the most important cultural practice in strawberry as it influences plant growth, yield and quality of fruits (Childers *et al.*, 1995; Sharma and Singh, 1999; Tarara, 2000; Sharma, 2002). Therefore, it seems essential to study the impact of mulching on plant growth, yield and quality of strawberry under agro-climatic conditions of central Uttar Pradesh.

MATERIALS AND METHODS

The present study was conducted in the Horticulture Garden, Department of Horticulture, C.S. Azad University of Agriculture and Technology, Kanpur during 2004-05. Healthy and disease free runners of cultivar Chandler were collected from University of Horticulture and Forestry, Naini, Solan (H.P.) and were planted on the raised beds at 20 × 30 cm distance in the last week of October. Mulching was done after 15 days of planting with black polythene (B.P.), white polythene (W.P.) and paddy straw (P.S.), whereas no mulch (NM) was used in the plant under control. The treatments were replicated five times in Randomized Block Design.

Observations were recorded on plant growth

parameters like crown height (cm), crown spread (cm), leaves (number) and leaf area (cm²) and quality attributes of fruits during February in randomly selected five plants in each bed. Thus, in all growth attributes of 25 plants per treatment were recorded. Standard procedures were adopted for recording plant growth parameters. Leaf area was recorded with the help of K factor using graph paper. The data on fruit number (yield) were recorded in each picking during February-March, from 5 randomly selected plants per bed. T.S.S., sugar and vitamin 'C' contents of fruits were estimated as per A.O.A.C. (1990).

RESULTS AND DISCUSSION

All the plant growth parameters *viz.* crown height, crown spread, leaf number and leaf area were significantly influenced by mulching (Table 1). Plants with black polythene had the maximum crown height (11.93 cm), crown spread (25.70 cm), number of leaves (36.46), leaf area (44.73cm²). All these parameters had significantly lower values, when either white polythene, paddy straw or no mulch (control) were used. However, the plants under control (without mulch) had the minimum crown height (8.13 cm), crown spread (18.26 cm), leaf number (28.30) and leaf area (38.20 cm²). Similar trend of results has been observed in case of yield. Maximum yield (515.66g/plant) could be recorded with black polythene followed by white polythene and paddy straw. The minimum yield (253.33g/plant) was recorded in case of no mulch *i.e.* control. The quality of strawberry fruits judged in terms of their T.S.S., sugar and vitamin 'C' content was enhanced significantly under the influence of black polythene giving 6.96° Brix, 5.49% and 51.93 mg/100g values, respectively.

The next effective mulch improving the quality traits was found to be white polythene revealing the

Table 1 : Effect of mulching on plant growth, yield and quality of strawberry

Parameters	B.P.	W.P.	P.S.	N.M.	C.D. (P=0.05)
Crown height (cm)	11.93	11.30	9.13	8.13	1.098
Crown spread (cm)	25.70	23.13	20.60	18.26	2.437
Leaf area (cm ²)	44.73	42.53	41.13	38.20	5.966
No. of leaves	36.46	34.86	32.60	28.30	7.429
Fruit weight (g/plant)	515.66	409.33	330.00	253.33	70.875
T.S.S. (Brix)	6.96	6.49	6.14	6.01	0.676
Sugar (%)	5.49	5.34	5.23	5.04	0.495
Vit. 'C' (mg / 100g)	51.93	49.33	48.35	46.20	1.252

corresponding values of 6.49°Brix, 5.34% and 49.33 mg/100 g. These observations are in conformity with the reports of Renquist *et al.* (1977) and Sharma and Singh (1999) who attributed the superiority in quality traits to the vigorous plants availing weed free environment.

The significant and positive influence of mulching on plant growth and quality parameters of fruits in the present study may probably be due to better conservation of moisture, better regulation in temperature, and suppression of weeds by different mulching materials over control (Badiyala and Aggrawal, 1981; Himelrick *et al.*, 1983; Sharma, 2002). Plants mulched with black polythene had the best plant growth improving thereby yield and quality of fruits over white polythene, paddy straw or when no mulch was used (control) perhaps because of better moisture and temperature regulation and suppression of weeds over other mulch material or when no mulch (control) was used (Renquist *et al.*, 1977; Tarara, 2000). The variability in growth behaviour under subtropical climate in different mulch material and control might have been also influenced by temperature prevailing during the period of study.

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