



Influence Of Different Mulches On Growth And Yield Of Chilli (*Capsicum Annum*) Cv. Kashi Anmol

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Abstract: A field experiment entitled “ Influence of different mulches on Growth and Yield of Chilli (*Capsicum annuum* L.) cv. Kashi Anmol” was concluded at the experimental field of Department of Horticulture, Udai Pratap (Autonomous) College, Varanasi (U.P.) during Rabi season of 2024 – 2025. Experiment was laid out in a Randomized Block Design (RBD) with seven treatments replicated three times organic and inorganic mulch with control i.e, Red plastic mulch (50 μ), Paddy straw mulch (5 cm), Compost (5 cm), Black plastic mulch (50 μ), Wheat straw mulch (5 cm), Silver plastic mulch (50 μ), No mulch (Control). Significantly, differences were found for plant growth parameter viz. Plant height (cm), number of branches per plant, number of leaves per plant, was recorded highest in (Black plastic mulch). The treatment (Black plastic mulch) was also found best in yield attributed viz. Number of fruit per plant, weight of one fruit (g), fruit length (cm), fruit diameter (cm), and green chilli yield (q/ha.). It is revealed that the use of Black plastic mulch, considerably increased the vegetative growth parameters and significantly increased growth, and yield of chilli.

(Index terms : Chilli, Mulches, Black plastic, Growth and yield)

Introduction

Chilli (*Capsicum annuum* L.) commonly known as hot pepper, belonging to the Solanaceae family and is cultivated as an annual crop world wide. It is a species of the genus *Capsicum* and is indigenous to Southern North America. It is an important spice as well as vegetable crop, where both ripe and unripe fruits are used for culinary, salad and processing purposes. Its extract is used in pharmaceutical industry for colorings the drugs. Imperative worldwide is one of the foremost assorted spice crops. It is commercially important for its red color due to the chemical constituent capsaicin. Hence, chili serves diverse purposes as a spice, condiment, culinary supplement, medicine and vegetable (*Kumar et al., 2019*) Known by various names like bell pepper, hot pepper and red pepper, it plays a pivotal role as a primary ingredient in many different cuisines globally, owing to its pungency, color, flavor and taste. It is an excellent source of Vitamin-A and C. Being richest source of Vitamin-C, it is sometimes referred as capsule of Vitamin-C (*Durustet al. 1997*). It is believed to possess immune-boosting properties and offer relief from conditions such as arthritis, headache and dermatological conditions (*Bharati et al., 2023*).

Mulching is referred as spreading various covering materials on the surface of soil to minimize moisture losses and weed population and to enhance crop yield (*Kader et al, 2019*). Mulches can effectively minimize soil erosion and nutrient loss (*Van Derwerken and Wilcox-Lee 1988*). It also reduces pest and disease incidence in crops. There are two types of mulch materials that are used organic mulch and inorganic mulch. In case of organic mulch we are using straw of different crops, dry leaves, grass clipping etc. as mulch material. In case of inorganic mulch we are using different types of poly ethylene film as mulch material. In perennial crops generally mulches like polyethylene film, plastic mulch, synthetic mulch etc. is used (*Rani et al., 2020*). Mulches also create a micro-environment by retaining soil moisture and changing root-zone temperatures and the quantity and quality of light reflected back to the plants which alter plant growth and development (*Crizinszkyet al. 1995*).

RESEARCH METHODOLOGY

The experiment was conducted during November 2024 to February 2025 at Udai Pratap Autonomous College, Varanasi Uttar Pradesh. The soil of the experimental plot was sandy loam in texture having ph 6.87, rich in P (Phosphorus), medium in K (Potassium) and poor in Organic matter, N (nitrogen), and Zn (Zinc) content. The treatment of the experiment comprised six mulch material viz. Paddy straw (5 cm thick), Wheat straw (5 cm thick), Compost (5 cm thick), Black plastic (50 μ thick), Red plastic (50 μ thick), Silver plastic (50 μ thick) with control (no mulch). The research trial was conducted in a Randomized block Design with three replication and the treatment were 7. The unit plot size $2.66 \times 1.4 \text{ m} = 3.72 \text{ m}^2$ prepared. The seedlings were transplanted on the November 8th, 2024 maintaining a spacing 60cm \times 45cm. Crop was fertilized with FYM 20 t/ha, Urea 260.86 kg/ha, SSP (Single super phosphate) 375 kg/ha, and MOP (muriate of potash) 100 kg/ha. Total amount of FYM, SSP, MOP and $\frac{1}{2}$ Urea were applied during final land preparation. The rest of Urea was applied in two equal installments at 30 and 60 days after transplanting. Irrigation was done after application of fertilizer. Other intercultural operations and plant protection measures were taken as needed. Data was collected on growth and yield characters. Recorded data were analyzed statistically.

Results and discussion

The results on the influence of different mulch material on growth and yield components are presented in Table 1. The influence of mulching have been presented in Table 1. Mulching significantly influence on growth and yield in chilli, Like plant height mulch (cm), no. branches per plant, no. of leaves per plant, number of fruit per plant, fruit length (cm), fruit diameter (cm), one fruit weight (g) and yield (q/ha).

The maximum plant height (68.93 cm) was recorded under black plastic mulch and minimum plant height (59.16 cm) under control (no mulch). The maximum no. of branches (13.26) was recorded under black plastic mulch and minimum no. of branches (9.24) under control (no mulch). The maximum no. of leaves (176.26) was recorded under black plastic mulch and minimum no. of leaves (118.83) under control (no mulch). The maximum no. of fruit per plant (289) was recorded under black plastic mulch and minimum no. of fruit per plant (260) under control (no mulch). The maximum fruit length (7.4 cm) was recorded under black plastic mulch and minimum fruit length (5.4 cm) under control (no mulch). The maximum fruit diameter (0.97 cm) was recorded under black plastic mulch and minimum fruit diameter (0.69 cm) under control (no mulch). The maximum one fruit weight (2.67 g) and minimum (2.61 g) under control. The maximum yield (285.55 q/ha) was recorded under black plastic mulch and minimum yield (251.11 q/ha) under control (no mulch). The difference in chilli on growth and yield in the present study appear the black plastic mulch enhancing the photosynthesis activities, improve the soil moisture, soil temperature, increased microorganism growth, reduce the weed infestation, and other reasons which may help in increasing the yield. These results are in conformity with the finding of *Ahmad et al. (1996)*, *El-Shikha et al. (1999)*, *Abdul-Baki and Teasdale (2002)*, *Ibarra-Jiménez et al. (2011)*, *Moreno et al. (2001)*, *Ibarra-Jiménez et al. (2004)*, *Ghosal et al. (2000)*, *Kasirajan and Ngouajio (2012)*, *Ahmad et al. (2010)*, *Kashi et al. (2011)*, *Ibarra-Jiménez et al. (2013)*,

Table 1. Influence of different mulches on growth and yield of chilli cv. Kashi Anmol Table 1. Influence of different mulches on growth and yield of chilli cv. Kashi Anmol

Mulch	Plant height(cm)	No. of branches per plant	No. of leaves per plant	Number of fruit per plant	Fruit length (cm)	Fruit diameter (cm)	One fruit weight (g)	Yield (q/ha)
Red plastic	64.46	11.89	146.28	278	6.6	0.84	2.64	271.48
Paddy straw	63.40	11.21	138.47	273	6.2	0.79	2.63	265.55
Compost	65.98	12.44	156.11	281	6.9	0.88	2.65	275.55
Black plastic	68.93	13.26	176.26	289	7.4	0.97	2.67	285.55
Wheat straw	62.20	10.46	129.32	269	5.8	0.74	2.62	260.74
Silver plastic	66.73	12.98	169.72	286	7.1	0.92	2.66	281.48
Control	59.16	9.24	118.83	260	5.4	0.69	2.61	251.11
SEm+_	0.90	0.22	1.28	3.82	0.05	0.01	0.03	4.78
CD	2.78	0.69	3.96	11.77	0.17	0.04	0.10	14.73

Fig.1. Influence of different mulches on plant height, No. of leaves per plant, No. of fruit per plant, and yield

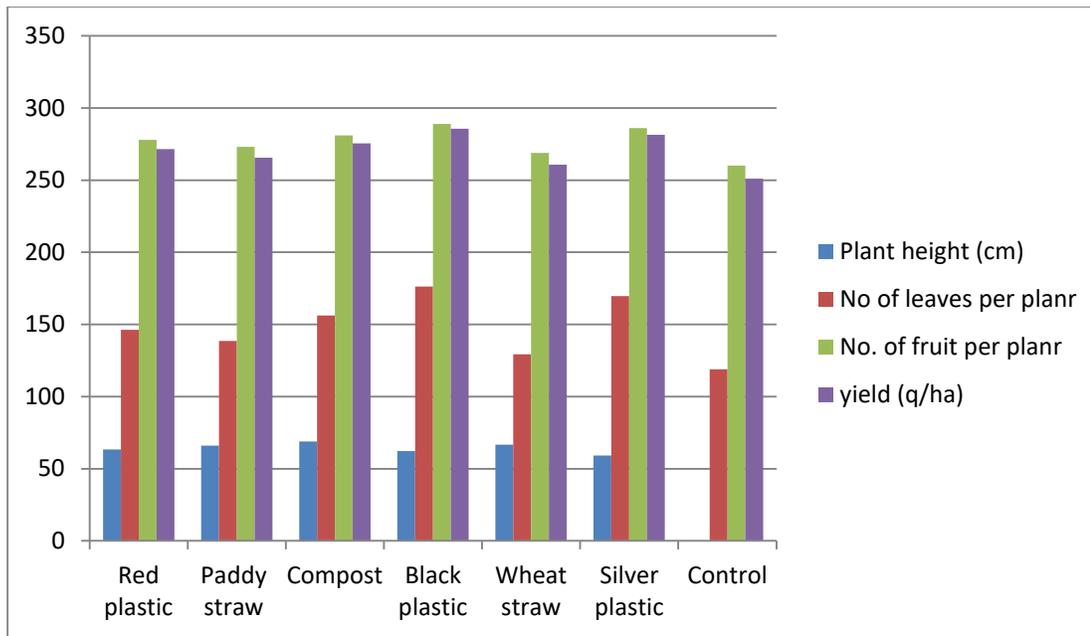
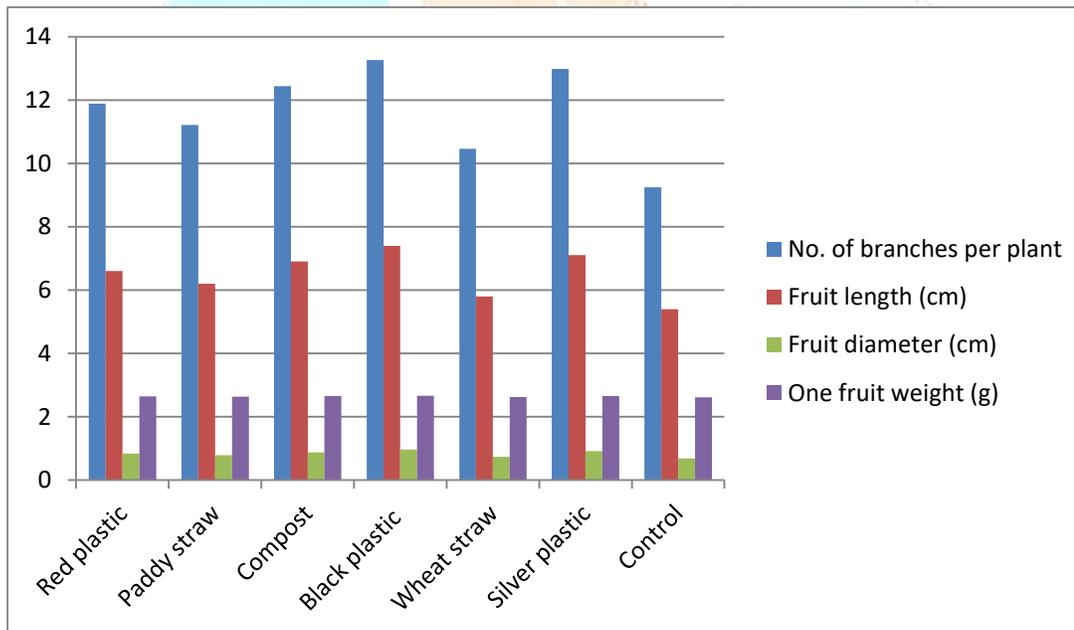


Fig 2. Influence of different mulches on No. of branches per plant, Fruit length(cm), Fruit diameter (cm), One fruit weight (g)



Conclusion

On the basis of above finding it can be concluded that recommended inorganic mulches, has proved to potential in case of whole plant height, no. of branches per plant, no. of leaves per plant, no. of fruit per plant, fruit length, fruit diameter, weight of fruit and yield of chilli displayed highest value (Black plastic mulch) among the whole mulch of various treatment. While the silver plastic mulch give higher result just after black plastic mulch.

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