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Effect of different type of mulches on growth, flowering and yield of cucumber var. Pusa Sanyog

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Abstract

An experiment was conducted at Polytechnic in Horticulture, ACH, NAU, Paria (Gujarat) during late kharif, 2021-24. The experiment was laid out in a Randomized Block Design (RBD) in nine treatments and three replications. The treatment consisted of T₁: Black polyethylene mulch (25 micron), T₂: Black polyethylene mulch (50 micron), T₃: Silver polyethylene mulch (25 micron), T₄: Silver polyethylene mulch (50 micron), T₅: Red polyethylene mulch (25 micron), T₆: Red polyethylene mulch (50 micron), T₇: White polyethylene mulch (25 micron), T₈: White polyethylene mulch (50 micron) and T₉: Control (No mulch). Crop earliness was recorded in treatment Silver polyethylene mulch (25 micron) in respect to days to first male & female flower appearance, and days to first fruit harvest as compared to other treatments. Treatment Silver polyethylene mulch (50 micron) was recorded maximum no. of female flowers per vine, maximum fruit diameter, fruit weight, no. of fruits per vine, yield and highest net realization as compared to other treatments. The farmers of South Gujarat, growing cucumber during late kharif are recommended to mulch with 50µm thickness silver polyethylene (covered with 70% area) before seed sowing along with recommended dose of fertilizers (100:60:60 kg NPK/ha) for getting higher yield and net realization.

Keywords: Silver plastic mulch, cucumber, karif, earliness, yield, realization

Introduction

Cucumber (*Cucumis sativus* L.) is grown mainly for its fruits both in India and abroad. The fruit of cucumber is said to have cooling effect, prevent constipation, checks jaundice and indigestion. Besides, the seed of cucumber is used in Ayurvedic preparations and raw fruits are also being used in cosmetic preparations. It is reported that oil extracted from seed is good for brain and body (Shanmugavelu, 1989)^[1]. Nutritively 100 g edible portion of cucumber contains 96.3 g moisture, 2.5 g carbohydrates, 0.4 g protein, 0.1 g fat, 0.3 g minerals, 10 mg calcium, 0.4 g fiber and traces of vitamin C and iron. It is eaten raw with salt and bell pepper or as a component of salad and pickles.

Mulching is a practice of covering the surface of soil with plastics, organic and non-organic materials to reduce evaporation and moderate wide fluctuation in diurnal soil temperature, especially in the root zone environment. There are different types of mulch used in the field depending on the purpose. Mulches are used to regulate the soil temperature, protect the root of a plant from heat, check evaporation, conserve soil moisture, suppress weed growth, increase water use efficiency and modify the soil micro climate. Mulches reduce weed growth by making conditions unfavorable for germination of weed seeds and by providing a physical barrier for emerging weeds. A good mulch layer can save many hours of laborious weeding.

The use of plastic mulch has brought a considerable change in vegetable production in many countries. In temperate countries, the year-round production of vegetables has been possible with the use of plastic mulches. Plant growth performance and yields of various vegetable crops such as tomato (Agrawal *et al.*, 2010)^[2], watermelon (Rao *et al.*, 2017)^[3], chilli (Ashrafuzzaman *et al.*, 2011)^[4], summer squash (Kumar and Sharma, 2018)^[5], watermelon (Dadheech *et al.*, 2018)^[6] can be significantly improved by mulching.

Materials and Methods

An experiment was conducted at Polytechnic in Horticulture, ACH, NAU, Paria (Gujarat) during late kharif, 2021-24. The experiment was laid out in a Randomized Block Design (RBD) in nine treatments and three replications. The treatment consisted of T₁: Black polyethylene mulch (25 micron), T₂: Black polyethylene mulch (50 micron), T₃: Silver polyethylene mulch (25 micron),

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T₄: Silver polyethylene mulch (50 micron), T₅: Red polyethylene mulch (25 micron), T₆: Red polyethylene mulch (50 micron), T₇: White polyethylene mulch (25 micron), T₈:

White polyethylene mulch (50 micron) and T₉: Control (No mulch).

Table 1: Effect of different type of mulches on vine length (cm) of cucumber var. Pusa Sanyog.

Treatment	Vine Length (cm) at 45 DAS				Vine Length (cm) at 60 DAS				Vine Length (cm) at final harvest			
	2022-23	2023-24	2024-25	Pooled	2022-23	2023-24	2024-25	Pooled	2022-23	2023-24	2024-25	Pooled
T ₁	67.58	66.45	63.20	65.74	100.95	97.44	93.62	97.33	156.11	152.24	148.89	152.41
T ₂	69.97	71.42	70.57	70.65	102.81	99.96	98.67	100.48	182.44	179.59	174.24	178.76
T ₃	67.13	65.21	64.32	65.55	100.44	100.35	98.70	99.83	168.22	166.89	163.17	166.10
T ₄	69.07	68.39	67.08	68.18	105.41	103.85	101.59	103.62	182.56	182.04	178.57	181.05
T ₅	70.25	70.96	70.23	70.48	103.27	101.90	98.46	101.21	172.44	172.46	169.10	171.34
T ₆	69.14	69.69	68.04	68.96	98.85	97.12	94.66	96.88	178.22	177.53	170.73	175.49
T ₇	70.78	68.73	67.12	68.88	103.50	102.28	99.95	101.91	174.56	173.98	167.58	172.04
T ₈	67.24	66.51	65.76	66.50	104.98	104.16	98.68	102.61	155.56	153.55	149.88	153.00
T ₉	62.89	61.52	61.30	61.91	97.21	96.39	93.05	95.55	140.67	138.84	134.61	138.04
Mean	68.23	67.65	66.40		101.94	100.38	97.49		167.86	166.35	161.86	
S.E.m ±	1.02	0.92	0.87	0.54	0.80	0.69	1.02	0.49	1.12	1.52	2.38	1.01
C.D. @ 5%	3.05	2.75	2.62	1.54	2.39	2.07	3.06	1.39	3.36	4.55	7.14	2.88
C.V.%	2.58	2.35	2.28	2.41	1.35	1.19	1.81	1.47	1.16	1.58	2.55	1.84
Y	S.E.m ±			0.31				0.28				0.58
	C.D.@ 5%			0.89				0.80				1.66
Y x T	S.E.m ±			0.94				0.85				1.75
	C.D.@ 5%			NS				NS				NS
T ₁ : Black polyethylene mulch (25 micron) T ₂ : Black polyethylene mulch (50 micron) T ₃ : Silver polyethylene mulch (25 micron) T ₄ : Silver polyethylene mulch (50 micron) T ₅ : Red polyethvlene mulch (25 micron)				T ₆ : Red polyethylene mulch (50 micron) T ₇ : White polyethylene mulch (25 micron) T ₈ : White polyethylene mulch (50 micron) T ₉ : Control								

Results and Discussions

a) Effect of different type of mulches on growth parameters of cucumber var. Pusa Sanyog

Vine Length at 45 DAS, 60 DAS and final harvest (cm): The data presented in Table clearly indicated that there were differences on vine length due to different type of mulches during 2022, 2023, 2024 and in pooled analysis. Significantly the maximum vine length at 45 DAS (69.97, 71.42, 70.57 & 70.65 cm) were recorded in treatment T₂ (Black polyethylene mulch @ 50 µm) and which was at par with T₅. While maximum vine length (105.41, 103.85, 101.59 & 103.62 cm) and (182.56, 182.04, 178.57 & 181.05 cm) at 60 DAS and at final harvest were recorded in treatment T₄ (Silver polyethylene mulch @ 50 µm) in all years and in pooled analysis respectively, which was at par with treatment T₈. While, the minimum vine length at 45 DAS (62.89, 61.52, 61.30 & 61.91 cm), 60 DAS (97.21, 96.39, 93.05 & 95.55 cm) and final harvest (140.67, 138.84, 134.61 & 138.04 cm) was recorded in treatment T₉ (Control) during 2022, 2023, 2024 and in pooled analysis, respectively.

Number of nodes per vine: Significant differences in the number of nodes per vine were observed among different mulching treatments in 2022, 2023, 2024 and in pooled analysis (Table 2). The maximum number of nodes per vine (27.11) was recorded in T₂ treatment (Black polyethylene mulch @ 50 µm) during 2022 and in treatments T₈ (White polyethylene mulch @ 50 µm) during years 2023, 2024 and pooled analysis (26.06, 25.04 & 26.03) respectively, which was at par with treatments

T₁, T₂, T₃, T₄ and T₆. The minimum number of nodes per vine (23.33, 22.16, 21.52 & 22.34) was observed in treatment T₉ (control) during individual years and in pooled analysis, respectively.

Number of branches per vine: A perusal of data presented in Table 2 revealed a significant variation in number of branches per vine due to different mulching treatments in cucumber during all years and in pooled analysis. Significantly the maximum number of branches per vine (6.89, 6.70, 6.36 & 6.65) was observed in treatment T₄ (Silver polyethylene mulch @ 50 µm), during 2022, 2023, 2024 and in pooled analysis respectively, which was at par with treatments T₅, T₆, T₇ & T₈. The minimum number of branches per vine (5.11, 4.94, 4.54 & 4.86) was recorded in treatment T₉ (Control) during individual years and in pooled analysis, respectively.

Internodal length (cm): A perusal of data presented in Table for internodal distance revealed significantly affect due to mulching treatments during year 2022 and 2024 while non-significantly influence during year 2023 and in pooled analysis. The minimum internodal length (12.00 cm) and (11.98 cm) was recorded in treatment T₄ (silver polyethylene mulch @ 50 µm) and T₈ (White polyethylene mulch @ 50 µm) respectively, While maximum (14.44 cm) and (15.02 cm) found in treatment T₉ (control) and T₆ respectively, during in year 2022 and 2024.

Table 2: Effect of different type of mulches on nodes per vine, no. of branches per vine and internodal length (cm) of cucumber var. Pusa Sanyog.

Treatment	Nodes per vine				No. of branches per vine				Internodal length (cm)			
	2022-23	2023-24	2024-25	Pooled	2022-23	2023-24	2024-25	Pooled	2022-23	2023-24	2024-25	Pooled
T ₁	26.56	24.63	24.04	25.07	5.89	5.00	4.81	5.23	13.11	11.54	12.97	12.54
T ₂	27.11	25.66	24.59	25.79	6.00	5.60	5.35	5.65	12.89	11.73	15.02	13.21
T ₃	25.89	24.95	24.03	24.96	6.11	5.79	5.49	5.80	13.22	12.61	12.95	12.93

T ₄	26.11	25.46	24.57	25.38	6.89	6.70	6.36	6.65	12.00	11.97	13.37	13.02
T ₅	24.67	24.02	23.11	23.93	6.44	6.48	6.29	6.40	12.56	12.05	14.04	12.88
T ₆	26.11	25.70	24.90	25.57	6.22	6.05	5.96	6.08	13.00	12.77	15.08	13.05
T ₇	25.11	24.07	23.20	24.13	6.44	6.41	6.35	6.41	12.78	12.15	13.80	12.91
T ₈	27.00	26.06	25.04	26.03	6.56	6.40	5.95	6.30	12.78	12.52	11.98	12.43
T ₉	23.33	22.16	21.52	22.34	5.11	4.94	4.54	4.86	14.44	10.45	12.89	12.59
Mean	25.77	24.75	23.89		6.18	5.93	5.68		12.98	11.98	13.57	
S.E.m ±	0.70	0.61	0.68	0.38	0.44	0.39	0.32	0.22	0.38	0.46	0.59	0.54
C.D.@ 5%	2.11	1.81	2.05	1.09	NS	1.16	0.95	0.63	1.14	NS	1.75	NS
C.V.%	4.74	4.24	4.96	4.65	12.40	11.34	9.69	11.28	5.06	6.59	7.47	6.49
Y	S.E.m ±			0.22				0.13				0.31
	C.D.@ 5%			0.63				0.37				0.94
Y x T	S.E.m ±			0.67				0.39				0.48
	C.D.@ 5%			NS				NS				1.37
T ₁ : Black polyethylene mulch (25 micron) T ₂ : Black polyethylene mulch (50 micron) T ₃ : Silver polyethylene mulch (25 micron) T ₄ : Silver polyethylene mulch (50 micron) T ₅ : Red polythene mulch (25 micron)					T ₆ : Red polythene mulch (50 micron) T ₇ : White polythene mulch (25 micron) T ₈ : White polythene mulch (50 micron) T ₉ : Control							

The greater value for vine length at 45, 60 DAS and at the time of final harvesting during both the seasons and in pooled analysis was examined in T₂ (Black polyethylene mulch @ 50 µm) it might be due to the black color of the mulch enhances heat absorption which creating a warmer microclimate that promotes vine growth and the reflective nature of the mulch ensures better light distribution which stimulating photosynthesis and supporting elongation of the vine (Nwokwu and Aniekwe, 2014) [7]. The above finding was agreement with the results of Awasthi *et al.* (2021) [8] in cucumber, Parmar *et al.* (2013) [9], Tyagi and Sharma (2013) in watermelon, Shinde *et al.* (2014) [10] in muskmelon, Chaudhary (2017) [11] in brinjal, and Radhika *et al.* (2021) [12] in summer squash.

The treatment T₄ (Silver polyethylene mulch @ 50 µm) was reported superior as compared to other mulches and control for number of nodes per vine at the time of final harvesting during all seasons as well as in pooled analysis. It could be attributed to microbial activities in soil improved by silver-black mulch and enhanced nutrient availability to the plant which were the key factors for greater plant growth and ultimately affected the node production (Kulkarni *et al.*, 2015) [13]. This discovery closely aligned with Ajibola *et al.* (2019) [14] in cucumber, Sylvestre *et al.* (2014) [15] in watermelon, Khan *et al.* (2015) [16] in sponge gourd, Rai *et al.* (2018) [17] in bottle gourd and Shinde *et al.* (2014) [10] in muskmelon.

The number of branches per vine at final harvesting was remain higher in T₄ (Silver polyethylene mulch @ 50 µm) during corresponding years and in pooled analysis it might be due to the silver-black mulch can retain moisture, suppress weeds, regulate root temperature and potentially enhance nutrient availability which promoting robust branching (Tyagi and Sharma, 2013). This finding was in close conformity with the observation reported by Mona *et al.* (2019) [18] in cucumber, Rao *et al.* (2017) [3] and Moe *et al.* (2018) [19] in watermelon, Kumar *et al.* (2019) [20] in brinjal, Choube *et al.* (2020) [21] in cauliflower and Bhatt *et al.* (2011) [22] in summer squash.

The periodical data on internodal distance during respected seasons and in pooled analysis were recorded maximum in T₉ treatment (Control). Similar results obtained by Singha *et al.* (2023) [23] in watermelon, Mohammed *et al.* (2017) in bottle gourd, Reddy *et al.* (2021) in cucumber, Nayak *et al.* (2018) [24] in pointed gourd and Khan *et al.* (2015) [16] in sponge gourd.

All the growth parameters were favourably influenced due to maximum energy utilization received by plant with T₄ (Silver polyethylene mulch @ 50 µm) treatment for higher biomass production and accumulation which increased vine length,

number of branches per vine, number of nodes per vine except internodal distance during 2022, 2023, 2024 and in pooled analysis. The increased in plant growth parameters might be due to plastic mulches that provide proper soil temperature and moisture content during the entire growth stage of watermelon and create favorable condition for plant process which ultimately leads to an increased in photosynthetic capacity and metabolic activities of the plant. silver- black polyethylene mulch modified the crop growing environment by low evaporation and high moisture availability in the root zone, better uptake of nutrients, increased CO₂ level and absence of weed growth which leads to an increased in vegetative growth of plants (Rao *et al.*, 2017) [3].

b) Effect of different type of mulches on flowering parameters of cucumber var. Pusa Sanyog

Days to first male flower appearance: A perusal of data presented in Table 3 clearly revealed that the different mulching treatments had significant effect on days to first male flower during 2022, 2023, 2024 and in pooled analysis. Significantly minimum days to first male flower in 2023, 2024 and in the pooled analysis (34.36, 35.63 & 34.29 days, respectively) were recorded in treatment T₃ (Silver polyethylene mulch @ 25 µm), which was statistically at par with treatment T₄, T₅, T₆, T₇ & T₈. While, significantly maximum days to first male flower in the all years and in pooled analysis (36.33, 38.71, 39.72 and 38.26 days, respectively) was noted in treatment T₉ (control).

Days to first female flower appearance: A perusal of data presented in Table revealed that there were significant differences in days to first female flower due to the different mulching treatments. Significantly the minimum days to first female flower during 2022, 2023, 2024 and in pooled analysis (35.0, 36.57, 39.79 & 37.12 days, respectively) was recorded in treatment T₃ (Silver polyethylene mulch @ 25 µm), which was statistically at par with treatment T₄. Significantly the maximum days to first female flower (39.22, 40.78, 42.95 & 40.98 days) was observed in treatment T₉ (control) during individual years and in the pooled analysis, respectively.

Node no. first male flower appearance: The data presented in Table revealed a significant variation in nodal position of first male flower due to the different mulching treatments during the year 2022 & in pooled analysis. While node no. first male flower appearance found non-significant in year 2023 & 2024. The lowest nodal position of first male flower (2.22) during

2022 was recorded in treatment T₄ (Silver polyethylene mulch @ 50 µm), while in year 2023, 2024 and pooled analysis recorded in T₆ (Red polyethylene mulch @ 50 µm), which was statistically similar to treatment T₃. While, the highest nodal position of first male flower in each year and in pooled analysis (3.11, 3.10, 3.02 and 3.08, respectively) was recorded in treatment T₉ (control).

Node no. first female flower appearance: The data presented in Table revealed a non-significant variation in the nodal position of first female flower due to the different mulching treatments in cucumber in all years while significant in pooled analysis. The minimum nodal position of first female flower (3.33, 3.55, 3.57 & 3.48) in both individual years and in pooled analysis was observed in T₄ treatment (Silver polyethylene mulch @ 50 µm). The maximum nodal position of first female flower (4.78, 4.55, 3.99 & 4.44) was recorded in treatment T₉ (control) during 2022, 2023, 2024 and the pooled analysis, respectively.

Number of male flowers per vine: Data regarding no. of male flowers per vine are presented in Table indicated that there were significant differences due to different mulching treatments. Maximum no. of male flowers per vine (111.44, 106.25, 110.62 & 109.44) was recorded in T₉ treatment (Control) in all years and pooled analysis respectively. While minimum no. of male

flowers per vine (89.67 & 88.48) in treatment T₁ (Black polyethylene mulch @ 25 µm), (91.34) in treatment T₄ (Silver polyethylene mulch @ 50 µm) & (90.75) in treatment T₄ (Black polyethylene mulch @ 50 µm) in years 2022, 2023, 2024 & in pooled analysis respectively.

Number of female flowers per vine: The data presented in Table 5 revealed a significant variation in female flowers per vine due to the different mulching treatments. The maximum number of female flowers (26.00, 25.27, 24.50 & 25.26) was recorded in all years and pooled analysis in treatment T₄ (Silver polyethylene mulch @ 50 µm) which was statistically similar to treatment T₅, T₆ & T₈. While, minimum numbers of female flowers (19.44, 19.03, 19.98 & 19.48) was recorded in T₉ (control).

Sex ratio (M:F): A perusal of data presented in Table 5 revealed that there were significant differences in sex ratio (M:F) due to the different mulching treatments. Significantly the minimum sex ratio (M:F) during all years and pooled analysis (3.62, 3.60, 3.75 & 3.66, respectively) was recorded in treatment T₄ (Silver polyethylene mulch @ 50 µm), which was statistically at par with treatment T₅. Minimum sex ratio (M:F) during all years and pooled analysis (5.79, 5.63, 5.58 & 5.67, respectively) was recorded in treatment T₉ (Control).

Table 3: Effect of different type of mulches on days to first male flower appearance and days to first female flower appearance of cucumber var. Pusa Sanyog.

Treatment	days to first male flower appearance				days to first female flower appearance			
	2022-23	2023-24	2024-25	Pooled	2022-23	2023-24	2024-25	Pooled
T ₁	33.78	36.00	36.87	35.55	36.56	38.46	41.22	38.74
T ₂	35.00	36.17	37.01	36.06	37.67	38.69	42.76	39.70
T ₃	32.89	34.36	35.63	34.29	35.00	36.57	39.79	37.12
T ₄	32.33	35.25	36.02	34.53	35.11	36.99	40.62	37.58
T ₅	33.78	34.99	36.01	34.93	36.89	37.63	40.53	38.35
T ₆	33.22	35.21	36.28	34.91	36.89	37.45	40.94	38.43
T ₇	33.33	35.21	36.62	35.06	37.00	38.00	42.03	39.01
T ₈	33.33	35.33	36.50	35.05	36.11	38.22	40.94	38.43
T ₉	36.33	38.71	39.72	38.26	39.22	40.78	42.95	40.98
Mean	33.78	35.69	36.74		36.72	38.09	41.31	
S.E.m ±	0.52	0.64	0.46	0.32	0.47	0.59	0.57	0.31
C.D.@ 5%	1.55	1.93	1.39	0.90	1.41	1.76	1.70	0.89
C.V.%	2.66	3.13	2.19	2.68	2.22	2.67	2.38	2.43
Y	S.E.m ±			0.18				0.17
	C.D.@ 5%			0.52				0.51
Y x T	S.E.m ±			0.55				0.54
	C.D.@ 5%			NS				NS
T ₁ : Black polyethylene mulch (25 micron) T ₂ : Black polyethylene mulch (50 micron) T ₃ : Silver polyethylene mulch (25 micron) T ₄ : Silver polyethylene mulch (50 micron) T ₅ : Red polythene mulch (25 micron)				T ₆ : Red polythene mulch (50 micron) T ₇ : White polythene mulch (25 micron) T ₈ : White polythene mulch (50 micron) T ₉ : Control				

Table 4: Effect of different type of mulches on days to first male flower appearance and days to first female flower appearance of cucumber var. Pusa Sanyog.

Treatment	Node no. first male flower appearance				Node no. first female flower appearance			
	2022-23	2023-24	2024-25	Pooled	2022-23	2023-24	2024-25	Pooled
T ₁	2.78	2.57	2.53	2.62	4.00	4.02	4.20	4.07
T ₂	2.44	2.45	2.57	2.49	4.00	3.73	3.88	3.87
T ₃	2.67	2.66	2.67	2.66	4.00	3.92	3.89	3.94
T ₄	2.22	2.48	2.59	2.43	3.33	3.55	3.57	3.48
T ₅	2.44	2.51	2.57	2.51	4.00	4.14	3.69	3.94
T ₆	2.33	2.40	2.37	2.37	3.78	3.83	4.11	3.91
T ₇	2.89	2.68	2.75	2.77	4.11	3.85	4.05	4.00

T ₈	2.56	2.57	2.66	2.60	4.00	3.89	4.02	3.97
T ₉	3.11	3.10	3.02	3.08	4.78	4.55	3.99	4.44
Mean	2.60	2.60	2.64		4.00	3.94	3.93	
S.E.m ±	0.14	0.15	0.12	0.08	0.24	0.27	0.18	0.13
C.D.at 5%	0.43	NS	NS	0.22	NS	NS	NS	0.38
C.V.%	9.62	9.66	7.56	8.99	10.58	11.89	7.73	10.22
Y	S.E.m ±			0.05				0.08
	C.D.@ 5%			NS				NS
Y x T	S.E.m ±			0.14				0.23
	C.D.@ 5%			NS				NS
T ₁ : Black polyethylene mulch (25 micron) T ₂ : Black polyethylene mulch (50 micron) T ₃ : Silver polyethylene mulch (25 micron) T ₄ : Silver polyethylene mulch (50 micron) T ₅ : Red polythene mulch (25 micron)				T ₆ : Red polythene mulch (50 micron) T ₇ : White polythene mulch (25 micron) T ₈ : White polythene mulch (50 micron) T ₉ : Control				

Table 5: Effect of different type of mulches on no. of male, female flowers per vine and sex ratio (M:F) of cucumber var. Pusa Sanyog.

Treatment	No. of male flowers per vine				No. of female flowers per vine				Sex ratio (M:F)			
	2022-23	2023-24	2024-25	Pooled	2022-23	2023-24	2024-25	Pooled	2022-23	2023-24	2024-25	Pooled
T ₁	89.67	88.48	94.18	90.78	24.56	22.35	20.89	22.60	3.79	4.04	4.57	4.13
T ₂	90.78	89.96	91.51	90.75	23.22	22.77	21.76	22.58	3.92	3.97	4.23	4.04
T ₃	97.56	95.63	98.30	97.16	22.56	21.33	21.57	21.82	4.64	4.51	4.63	4.59
T ₄	93.44	90.29	91.34	91.69	26.00	25.27	24.50	25.26	3.62	3.60	3.75	3.66
T ₅	91.89	90.86	92.54	91.76	26.00	24.76	24.09	24.95	3.58	3.68	3.85	3.70
T ₆	99.67	99.15	99.46	99.43	25.89	24.91	24.05	24.95	3.89	3.98	4.14	4.00
T ₇	105.22	104.51	104.37	104.70	24.78	23.48	22.44	23.57	4.28	4.48	4.67	4.48
T ₈	103.78	103.93	102.60	103.44	24.78	24.68	24.04	24.50	4.20	4.21	4.27	4.23
T ₉	111.44	106.25	110.62	109.44	19.44	19.03	19.98	19.48	5.79	5.63	5.58	5.67
Mean	98.16	96.56	98.32		24.14	23.18	22.59		4.19	4.23	4.41	
S.E.m ±	2.42	2.08	2.10	1.27	0.92	0.80	0.74	0.48	0.22	0.16	0.16	0.10
C.D.@ 5%	7.27	6.23	6.29	3.62	2.77	2.40	2.22	1.36	0.65	0.48	0.47	0.30
C.V.%	4.28	3.73	3.69	3.91	6.64	5.98	5.67	6.13	9.01	6.58	6.10	7.30
Y	S.E.m ±			0.74				0.27				0.06
	C.D.@ 5%			NS				0.78				0.17
Y x T	S.E.m ±			2.21				0.82				0.18
	C.D.@ 5%			NS				NS				NS
T ₁ : Black polyethylene mulch (25 micron) T ₂ : Black polyethylene mulch (50 micron) T ₃ : Silver polyethylene mulch (25 micron) T ₄ : Silver polyethylene mulch (50 micron) T ₅ : Red polythene mulch (25 micron)					T ₆ : Red polythene mulch (50 micron) T ₇ : White polythene mulch (25 micron) T ₈ : White polythene mulch (50 micron) T ₉ : Control							

Minimum days to first male and female flower were examined in T₃ (Silver polyethylene mulch @ 25 µm) during relevant years and in pooled analysis it might be due to heat-absorbing nature of the mulch may have provided a conducive environment for flower development which leading to observed early initiation of male and female flowers in watermelon (Sawant, 2021) [25]. These findings were in close accordance with the observation noted by Singha *et al.* (2023) [23] in watermelon, Nihar *et al.* (2023) [26] in cauliflower and Kumawat *et al.* (2021) [27] in chilli.

The T₄ (Silver polyethylene mulch @ 50 µm) observed minimum value for nodal position of first male and female flower during 2022, 2023, 2024 and in pooled analysis it might be due to the reflective nature of the silver mulch helps in maintaining lower soil temperature and creating a favorable environment for plant development. This cooler microclimate may have influenced the early differentiation and emergence of male flowers at lower nodal positions (Singha *et al.*, 2023) [23]. Similar results obtained by Sawant (2021) [25] in watermelon, Chaudhary (2017) [11] in brinjal and Anjali *et al.* (2019) [28] in okra.

c) Effect of different type of mulches on yield parameters of cucumber var. Pusa Sanyog: Days to first fruit harvest: It was

evident from the data presented in Table 6 that the different mulching treatments showed significant effect on days to first harvest. Earliness (46.89, 47.72, 46.79 & 47.13 days) was recorded in treatment T₃ (Silver polyethylene mulch @ 25 µm) in all years and in pooled analysis which was statically at par with treatments T₁, T₄ & T₆. While maximum days (54.33, 55.12, 54.64 & 54.70) for first fruit harvest was recorded in T₉ (Control) during 2022, 2023, 2024 & pooled analysis, respectively.

Fruit diameter (cm) at 3rd picking: The data presented in Table 6 revealed nonsignificantly differences in diameter of fruit due to different mulching treatments in all experimental years and pooled analysis.

Fruit length (cm) at 3rd picking

A perusal of data presented in Table 6 revealed a non-significant variation in length of fruit due to different mulching treatments in cucumber during all years while in pooled analysis was recorded significantly maximum fruit length in treatment T (14.76cm). While minimum fruit length (13.79 cm) was recorded in treatment T₉ (control) in pooled analysis.

Fruit weight (g): The data pertaining to average fruit weight are presented in Table 7 indicated that there were significant differences due to different mulching treatments. The maximum average fruit weight (135.22, 130.95, 128.51&131.56g, respectively) during all experimental years as well as in pooled analysis was observed in treatment T₄ (Silver polyethylene mulch @ 50 µm) and it was statistically at par with T₂, T₃ & T₈. The minimum average fruit weight (125.22, 121.78, 123.34 &123.45g) was observed in treatment T₉ (control) during individual years and in pooled analysis, respectively.

No. of fruits per vine: The data in Table 7 indicated that the different mulching treatments significantly influenced the number of fruits per vine in all years and pooled analysis. Significantly the maximum number of fruits (14.11, 14.19, 13.82 &14.04 was recorded in treatment T₄ (Silver polyethylene mulch @ 50 µm) during both the years and in pooled analysis respectively, which was at par with treatment T₈. While minimum number of fruits per vine (11.22, 11.07, 11.94&11.41 in 2022, 2023, 2024 and in pooled analysis, respectively) was recorded in treatment T₉ (control).

Fruit yield per vine (g): The data presented in Table 8, clearly revealed that there were significant differences in fruit yield per vine due to different mulching treatments during the experimental years and in pooled analysis. The treatment T₄ (Silver polyethylene mulch @ 50 µm) resulted in the maximum fruit yield per vine (1903.33, 1787.48, 1776.06&1822.29) in

2022, 2023, 2024& pooled analysis respectively. This performance was statistically at par with the treatment T₂& T₈. The treatment T₉ (control) had the minimum fruit yield per vine (1363.67, 1482.24, 1472.47&1439.46 g) in all years and pooled analysis respectively.

Fruit yield per plot (Kg/plot): Data pertaining to fruit yield per plot found significant due to different mulching treatments during all years as well as in pooled analysis (Table 8). Among the different mulching treatments, the treatment T₄ (Silver polyethylene mulch @ 50 µm) gave significantly maximum fruit yield per plot during 2022, 2023, 2024 and in pooled analysis (22.84, 22.85, 21.31 & 22.33 Kg/plot, respectively). While, significantly minimum fruit yield per plot (16.36, 16.17, 17.59& 16.71 Kg/plot) was observed in treatment T₉ (Control) during all years as well as in pooled analysis.

Fruit yield per hectare (t/ha)

The data presented in Table 8 clearly revealed that there were significant differences in the total yield due to different mulching treatments. The treatment T₄ (Silver polyethylene mulch @ 50 µm) resulted in the highest total yield (35.25, 35.26, 32.88 & 34.46 t/ha) in 2022, 2023, 2024 and pooled analysis respectively followed by treatment T₈. The treatment T₉ (Control) exhibited the lowest total yield (25.25, 24.95, 27.15 & 25.79 t/ha) in 2022, 2023, 2024 and the pooled analysis respectively.

Table 6: Effect of different type of mulches on days to first fruit harvest, fruit diameter and fruit length (cm) of cucumber var. Pusa Sanyog.

Treatment	Days to first fruit harvest				Fruit diameter (cm) at 3rd picking				Fruit length (cm) at 3rd picking			
	2022-23	2023-24	2024-25	Pooled	2022-23	2023-24	2024-25	Pooled	2022-23	2023-24	2024-25	Pooled
T ₁	49.33	49.10	47.45	48.63	3.14	2.96	3.21	3.11	14.89	14.20	13.60	14.23
T ₂	49.11	49.54	49.42	49.36	3.14	2.72	2.85	2.91	15.33	14.57	14.14	14.68
T ₃	46.89	47.72	46.79	47.13	3.27	3.10	3.02	3.13	14.67	14.13	13.79	14.20
T ₄	48.22	48.86	49.10	48.73	3.48	3.14	3.16	3.26	14.89	14.77	14.61	14.76
T ₅	50.22	50.25	50.39	50.29	3.10	3.13	3.14	3.12	14.44	14.17	14.26	14.29
T ₆	48.78	49.12	48.11	48.67	3.19	2.86	2.91	2.99	14.33	14.14	13.85	14.11
T ₇	49.44	48.65	49.69	49.26	3.10	3.01	3.08	3.06	14.22	14.00	13.87	14.03
T ₈	51.00	50.78	50.44	50.74	3.30	3.24	3.10	3.21	14.00	14.03	13.79	13.94
T ₉	54.33	55.12	54.64	54.70	3.01	2.97	2.85	2.94	14.44	13.51	13.40	13.79
Mean	49.70	49.90	49.56		3.19	3.01	3.04		14.58	14.17	13.92	
S.E.m ±	1.19	1.17	0.90	0.63	0.14	0.19	0.11	0.09	0.38	0.34	0.32	0.20
C.D.at 5%	3.57	3.50	2.70	1.80	NS	NS	NS	NS	NS	NS	NS	0.57
C.V.%	4.15	4.06	3.15	3.81	7.54	10.70	6.18	8.32	4.46	4.20	3.96	4.22
Y	S.E.m ±			0.36				0.05				0.12
	C.D.@ 5%			NS				0.14				0.33
Y x T	S.E.m ±			1.09				0.15				0.35
	C.D.@ 5%			NS				NS				NS
T ₁ : Black polyethylene mulch (25 micron) T ₂ : Black polyethylene mulch (50 micron) T ₃ : Silver polyethylene mulch (25 micron) T ₄ : Silver polyethylene mulch (50 micron) T ₅ : Red polythene mulch (25 micron)					T ₆ : Red polythene mulch (50 micron) T ₇ : White polythene mulch (25 micron) T ₈ : White polythene mulch (50 micron) T ₉ : Control							

Table 7: Effect of different type of mulches on fruit weight (g) and no. of fruits per vine of cucumber var. Pusa Sanyog.

Treatment	Fruit weight (g)				No. of fruits per vine			
	2022-23	2023-24	2024-25	Pooled	2022-23	2023-24	2024-25	Pooled
T ₁	127.00	125.75	127.85	126.87	12.33	12.33	12.60	12.42
T ₂	131.00	130.34	128.97	130.10	13.56	13.62	13.43	13.54
T ₃	131.33	130.87	127.73	129.98	13.56	13.17	13.37	13.36
T ₄	135.22	130.95	128.51	131.56	14.11	14.19	13.82	14.04
T ₅	127.44	125.88	127.58	126.97	12.33	12.14	12.26	12.24
T ₆	129.00	127.56	127.07	127.88	12.22	12.74	12.92	12.63
T ₇	128.89	128.05	128.27	128.40	13.44	13.49	13.45	13.46
T ₈	130.67	129.82	129.81	130.10	13.67	13.55	13.55	13.59

T ₉	125.22	121.78	123.34	123.45	11.22	11.07	11.94	11.41
Mean	129.53	127.89	127.68		12.94	12.92	13.04	
S.E.m ±	1.35	1.07	1.79	0.83	0.30	0.29	0.26	0.16
C.D.at 5%	4.03	3.20	NS	2.35	0.90	0.86	0.77	0.46
C.V.%	1.80	1.45	2.42	1.93	4.04	3.85	3.43	3.78
Y	S.E.m ±			0.48				0.09
	C.D.@ 5%			1.36				NS
Y x T	S.E.m ±			1.43				0.28
	C.D.@ 5%			NS				NS
T ₁ : Black polyethylene mulch (25 micron) T ₂ : Black polyethylene mulch (50 micron) T ₃ : Silver polyethylene mulch (25 micron) T ₄ : Silver polyethylene mulch (50 micron) T ₅ : Red polythene mulch (25 micron)				T ₆ : Red polythene mulch (50 micron) T ₇ : White polythene mulch (25 micron) T ₈ : White polythene mulch (50 micron) T ₉ : Control				

Table 8: Effect of different type of mulches on fruit yield per vine (gm), fruit yield per plot (Kg) and fruit yield per hectare (t/ha) of Cucumber var. Pusa Sanyog.

Treatment	Fruit yield per vine(gm)				Fruit yield per plot (Kg)				Fruit yield per hectare (t/ha)			
	2022-23	2023-24	2024-25	Pooled	2022-23	2023-24	2024-25	Pooled	2022-23	2023-24	2024-25	Pooled
T ₁	1543.33	1620.58	1611.60	1591.84	18.52	18.60	19.70	18.94	28.58	28.71	30.39	29.23
T ₂	1774.44	1750.85	1733.08	1752.79	21.29	21.30	20.38	20.99	32.86	32.87	31.45	32.39
T ₃	1777.00	1723.32	1707.01	1735.78	21.32	20.68	20.72	20.91	32.91	31.91	31.97	32.26
T ₄	1903.33	1787.48	1776.06	1822.29	22.84	22.85	21.31	22.33	35.25	35.26	32.88	34.46
T ₅	1552.33	1618.57	1564.91	1578.60	18.63	18.34	18.63	18.53	28.75	28.30	28.75	28.60
T ₆	1582.22	1609.52	1641.69	1611.15	18.99	19.51	19.41	19.30	29.30	30.11	29.95	29.79
T ₇	1720.33	1721.25	1725.35	1722.31	20.64	20.72	20.66	20.67	31.86	31.98	31.88	31.91
T ₈	1779.33	1736.44	1759.64	1758.47	21.35	21.11	20.84	21.10	32.95	32.57	32.17	32.56
T ₉	1363.67	1482.24	1472.47	1439.46	16.36	16.17	17.59	16.71	25.25	24.95	27.15	25.79
Mean	1666.22	1672.25	1665.75		19.99	19.92	19.92		30.86	30.74	30.73	
S.E.m ±	40.26	54.99	44.49	27.13	0.48	0.51	0.38	0.27	0.75	0.79	0.59	0.41
C.D.at 5%	120.71	164.85	133.38	77.22	1.45	1.53	1.15	0.76	2.24	2.37	1.78	1.17
C.V.%	4.19	5.70	4.63	4.88	4.19	4.45	3.34	4.02	4.19	4.45	3.34	4.02
Y	S.E.m ±			15.66				0.15				0.24
	C.D.@ 5%			NS				NS				NS
Y x T	S.E.m ±			46.99				0.46				0.71
	C.D.@ 5%			NS				NS				NS
T ₁ : Black polyethylene mulch (25 micron) T ₂ : Black polyethylene mulch (50 micron) T ₃ : Silver polyethylene mulch (25 micron) T ₄ : Silver polyethylene mulch (50 micron) T ₅ : Red polythene mulch (25 micron)					T ₆ : Red polythene mulch (50 micron) T ₇ : White polythene mulch (25 micron) T ₈ : White polythene mulch (50 micron) T ₉ : Control							

The results for yield parameters showed that the, mulching significantly affected the days to first harvest, days to last harvest, yield vine⁻¹, yield net plot⁻¹ and total yield.

The treatment T₃ (Silver polyethylene mulch @ 25 µm) recorded minimum days to first harvest and days to last harvest during 2022, 2023, 2024 and in pooled analysis it might be due to higher soil moisture content and soil temperature under plastic mulch improved the plant microclimate which leading to early growth, flowering as well as fruiting and lead to early harvesting of crops (Kulkarni *et al.*, 2015) [13]. These findings are in line with Sawant (2021) [25] in watermelon, Nihar *et al.* (2023) [26] in cauliflower, Anjali *et al.* (2019) [28] in okra and Chaudhary (2017) [11] in brinjal.

The T₄ treatment (Silver polyethylene mulch @ 50 µm) gave utmost length of fruit, diameter of fruit and average weight of fruit it might be due to least competition from weeds as silver-black polyethylene mulch affects weed growth adversely and uniform moisture conservation throughout the growing season which leading to higher length, diameter and average weight of fruit (Romic *et al.*, 2003) [29]. These findings are similar with Parmar *et al.* (2013) [9] in watermelon, Mohammed *et al.* (2017)

[30] in bottle gourd, Shinde *et al.* (2014) [10] in musk melon and Hossain *et al.* (2021) [31] in pointed gourd.

During both the experiment seasons and in pooled analysis, the T₄ treatment (Silver polyethylene mulch @ 50 µm) recorded higher value for yield vine⁻¹, yield net plot⁻¹ and total yield its might be due to silver-black mulch recorded the highest plant height, number of leaves and leaf length resulting in higher photosynthetic rate which leads to more synthesis and translocation of photosynthates toward the fruit formation (Sibale *et al.*, 2015) [32]. The findings presented above are in agreement with the results obtained by Luis *et al.* (2008) [33] in cucumber, Parmar *et al.* (2013) [9] in watermelon, More *et al.* (2014) [34] in tomato and Ekwu *et al.* (2010) [35] in okra.

The yield vine⁻¹, yield net plot⁻¹ and total yield remain maximal in T₄ treatment (Silver polyethylene mulch @ 50 µm) during corresponding seasons and in pooled analysis its might be due to with three fruits per vine, there is an optimal balance between resource allocation and fruit load. This allows the plant to efficiently distribute nutrients and water among the fruits which promoting their growth and development. These finding are similar with Bassiony *et al.* (2012) [36] as well as Campos *et al.* (2014) in watermelon and Khatun *et al.* (2020) [37] in tomato.

D) Effect of different type of mulches on soil parameters of cucumber var. Pusa Sanyog

Soil temperature (0-15 cm depth): The mean data recorded soil temperature (0-15 cm depth) at standard week (15 days interval) presented in Table 9. The impact of various types of mulches on soil temperature was assessed at 45 DAS, 60 DAS and final harvest.

The soil temperature was influenced by different types of mulch. The higher soil temperature (33.76, 32.15 & 32.50 °C) was recorded in T₄ (polyethylene mulch @ 50 µm) while the lower soil temperature (28.90, 27.45 & 28.15 °C) was recorded in treatment T₉ (Control) in all years at 45 DAS.

The higher soil temperature (31.62, 31.68 °C) was recorded in T₄ (Silver polyethylene mulch @ 50 µm) in year 2022 and 2024 respectively and 31.03 °C in T₃ (Silver polyethylene mulch @ 25 µm) during year 2023. While the lower soil temperature (27.89, 27.89 & 27.65 °C) was recorded in treatment T₉ (Control) in all years at 60 DAS.

The higher soil temperature (29.80, 30.45 °C) was recorded in T₄ (Silver polyethylene mulch @ 50 µm) in year 2022 and 2023 respectively and 29.60 °C in T₃ (Silver polyethylene mulch @ 25 µm) during year 2024. While the lower soil temperature (27.10, 27.10 & 27.08 °C) was recorded in treatment T₉ (Control) in all years at 60 DAS. A similar result was observed by Tarara (2000) [38]. The soil temperature under silver mulch was observed to be highest followed by that under silver mulch, while temperature of soil without any mulch cover was seen to be the lowest (Kayande *et al.*, 2016) [39]

Soil Moisture (%): The mean data on soil moisture content (%) at 45 DAS, 60 DAS and final harvest was affected by various types of mulch are presented in Table 10. The perusal of data presented in table indicated that soil moisture content (%) was affected by the treatment.

The maximum soil moisture content 23.74% was recorded in treatment T₂ (Black polyethylene mulch @ 50 µm) in year 2022 while in year 2023 & 2024 it was 23.71 & 23.72% respectively, minimum soil moisture (19.46, 22.03, 22.74 & 21.41%) was recorded in treatment T₉ (Control) during all years at 45 DAS.

The maximum soil moisture content 22.20% was recorded in treatment T₂ (Black polyethylene mulch @ 50 µm) in year 2022, 22.24% was recorded in treatment T₃ (Silver polyethylene mulch @ 25 µm) in year 2023 while in year 2024, maximum (22.25%) was recorded in treatment T₄ (Silver polyethylene mulch @ 50 µm). Minimum soil moisture (18.47, 19.27, 20.05 & 19.26%) was recorded in treatment T₉ (Control) during all years at 60 DAS.

The maximum soil moisture content 21.53, 21.53 and 21.36% was recorded in treatment T₂ (Black polyethylene mulch @ 50 µm) in all years, respectively. While minimum soil moisture (18.30, 18.30 & 18.89%) was recorded in treatment T₉ (Control) during all years at final harvest. The use of plastic mulch helps conserving water by reducing evaporation from soil surface, controlling weed growth and reducing soil compaction. Higher soil moisture content was observed at 30, 60 and 90 days after planting in plots covered with black plastic mulch as compared to non-mulched plots. The plastic mulch is used to retain soil moisture. (Anjali Patel *et al.* 2018) in okra.

Table 9: Effect of different type of mulches on soil temperature (°C) of cucumber var. Pusa Sanyog.

Treatment	Soil Temperature (0-15 cm depth) (°C) @ 45 DAS				Soil Temperature (0-15 cm depth) (°C) @ 60 DAS				Soil Temperature (0-15 cm depth) (°C) @ Final Harvest			
	2022-23	2023-24	2024-25	Mean	2022-23	2023-24	2024-25	Mean	2022-23	2023-24	2024-25	Mean
T ₁	31.66	30.32	31.30	31.09	30.20	29.23	30.51	29.98	29.50	30.50	27.50	29.17
T ₂	32.30	31.68	31.55	31.84	31.75	30.83	30.11	30.90	30.42	29.89	28.66	29.66
T ₃	32.60	31.95	31.40	31.98	31.00	31.03	30.52	30.85	29.20	30.45	29.60	29.75
T ₄	33.76	32.15	32.50	32.80	31.62	30.68	31.68	31.33	29.80	30.45	29.05	29.77
T ₅	31.71	30.71	30.11	30.84	30.65	30.02	29.25	29.97	28.25	29.85	28.52	28.87
T ₆	31.90	31.05	30.77	31.24	31.00	30.07	29.75	30.27	29.50	29.68	28.71	29.30
T ₇	32.05	31.08	31.04	31.39	31.25	30.91	30.95	31.04	29.15	30.10	29.22	29.49
T ₈	31.65	30.29	30.45	30.80	31.08	30.01	29.90	30.33	29.24	29.16	28.45	28.95
T ₉	28.90	27.45	28.15	28.17	27.89	27.89	27.65	27.81	27.10	27.10	27.08	27.09
Mean	31.84	30.74	30.81		30.72	30.07	30.04		29.13	29.69	28.53	
T ₁ : Black polyethylene mulch (25 micron) T ₂ : Black polyethylene mulch (50 micron) T ₃ : Silver polyethylene mulch (25 micron) T ₄ : Silver polyethylene mulch (50 micron) T ₅ : Red polythene mulch (25 micron)					T ₆ : Red polythene mulch (50 micron) T ₇ : White polythene mulch (25 micron) T ₈ : White polythene mulch (50 micron) T ₉ : Control							

Table 10: Effect of different type of mulches on soil moisture (%) of cucumber var. Pusa Sanyog.

Treatment	Soil Moisture (0-15 cm depth) (%) at 45 DAS				Soil Moisture (0-15 cm depth) (%) at 60 DAS				Soil Moisture (0-15 cm depth) (%) at Final Harvest			
	2022-23	2023-24	2024-25	Mean	2022-23	2023-24	2024-25	Mean	2022-23	2023-24	2024-25	Mean
T ₁	23.31	23.53	23.29	23.38	21.32	20.40	20.48	20.74	20.13	20.26	20.71	20.41
T ₂	23.74	23.57	23.53	23.61	22.20	21.82	21.87	21.96	21.10	21.53	21.36	21.47
T ₃	23.36	23.11	23.21	23.22	22.01	22.24	22.00	22.08	20.67	21.01	21.02	21.02
T ₄	23.33	23.37	23.46	23.39	21.77	22.22	22.25	22.08	20.90	21.02	20.96	21.00
T ₅	22.33	23.59	24.00	23.31	21.20	21.38	21.48	21.35	20.47	20.58	20.65	20.60
T ₆	22.47	23.71	23.72	23.30	21.29	20.84	20.91	21.01	21.00	20.84	21.12	20.94
T ₇	22.56	23.08	23.22	22.95	21.22	21.41	21.11	21.25	20.67	20.52	20.75	20.60
T ₈	21.87	22.66	23.08	22.54	20.90	21.20	21.39	21.16	20.13	20.57	20.84	20.66
T ₉	19.46	22.03	22.74	21.41	18.47	19.27	20.05	19.26	18.30	18.30	18.89	18.50
Mean	22.49	23.18	23.36		21.15	21.20	21.28		20.37	20.51	20.70	
T ₁ : Black polyethylene mulch (25 micron) T ₂ : Black polyethylene mulch (50 micron) T ₃ : Silver polyethylene mulch (25 micron) T ₄ : Silver polyethylene mulch (50 micron) T ₅ : Red polythene mulch (25 micron)					T ₆ : Red polythene mulch (50 micron) T ₇ : White polythene mulch (25 micron) T ₈ : White polythene mulch (50 micron) T ₉ : Control							

e) Economics: The major consideration with the vegetable growers for the adoption of research based production technology is economics. The economics in terms of gross and net returns for various mulch treatments were worked out and presented in Table 11& Table 12.

The different types of treatments were registered more or less a good value of benefitcost ratio. This indicated that the sowing

of cucumber with proper type of mulching is economical under South Gujarat conditions. The conjoint application silver polythene mulch@ 50 µm (T) achieved the maximum fruit yield (34.46 t/ha) and highest net realization (Rs.2, 40,753/ha), which was followed by the treatment T₃ (Silver polythene mulch@ 25 µm).

Table 11: Economics of different treatments of cucumber (Rs. ha⁻¹)

Treatments	Yield (kg ha ⁻¹)	Total cost of cultivation (Rs.)	Gross Returns (Rs.)	Net Returns (Rs.)
T ₁	29230	170824.5	350760	179935.5
T ₂	32390	173194.5	388680	215485.5
T ₃	32260	171117.0	387120	216003.0
T ₄	34460	172767.0	413520	240753.0
T ₅	28600	171342.0	343200	171858.0
T ₆	29790	172234.5	357480	185245.5
T ₇	31910	174814.5	382920	208105.5
T ₈	32560	175302.0	390720	215418.0
T ₉	25790	163114.5	309480	146365.5
T ₁ : Black polyethylene mulch (25 micron) T ₂ : Black polyethylene mulch (50 micron) T ₃ : Silver polyethylene mulch (25 micron) T ₄ : Silver polyethylene mulch (50 micron) T ₅ : Red polythene mulch (25 micron)			T ₆ : Red polythene mulch (50 micron) T ₇ : White polythene mulch (25 micron) T ₈ : White polythene mulch (50 micron) T ₉ : Control	

Summary and Conclusions

Crop earliness was recorded in treatment Silver polyethylene mulch (25 micron) in respect to days to first male & female flower appearance, and days to first fruit harvest as compared to other treatments. Treatment Silver polyethylene mulch (50 micron) was recorded maximum no. of female flowers per vine, maximum fruit diameter, fruit weight, no. of fruits per vine, yield and highest net realization as compared to other treatments.

The farmers of South Gujarat, growing cucumber during late kharif are recommended to mulch with 50µm thickness silver polyethylene (covered with 70% area) before seed sowing along with recommended dose of fertilizers (100:60:60 kg NPK/ha) for getting higher yield and net realization.

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