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Nishant Ghode
Department of Horticulture (Vegetable Science), Sardar Patel University, Balaghat, Madhya Pradesh, India

AS Choudhary
Department of Horticulture (Vegetable Science), Sardar Patel University, Balaghat, Madhya Pradesh, India

Shani Raj
Department of Horticulture (Vegetable Science), Sardar Patel University, Balaghat, Madhya Pradesh, India

Shivam Sahu
Department of Horticulture (Vegetable Science), Sardar Patel University, Balaghat, Madhya Pradesh, India

Ashish Kumar
Department of Horticulture (Vegetable Science), Sardar Patel University, Balaghat, Madhya Pradesh, India

Corresponding Author:
Nishant Ghode
Department of Horticulture (Vegetable Science), Sardar Patel University, Balaghat, Madhya Pradesh, India

Effect of weed management on yield parameters of cauliflower

Nishant Ghode, AS Choudhary, Shani Raj, Shivam Sahu and Ashish Kumar

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Abstract
A field experiment was during *rabi* season of 2020-21 at village Mehrumkala, Rajnandgaon (C.G) jointly at Sardar Patel University, Balaghat (M.P.), to evaluate the influence of "Integrated weed management practices in Cauliflower (*Brassica oleracea* var. *botrytis* L.)" Totally 08 different treatments consisting of different chemical weedicide treatment, wheat straw and black plastic mulch, alone and in both combination have been tried. Among the different integrated weed management practices, The application of integrated weed management significantly enhanced yield parameters *viz.* Curd length (cm), Curd width (cm), Average curd weight (kg), Marketable curd yield (q ha-1) and Total curd yield (q ha-1) were also significantly superior in the treatment T_7 (Weed free) followed by treatment T_2 (Black plastic mulch) and T_1 (Wheat straw mulch). On the basis of above findings, treatment T8 (Weedy check (control)) stand first in position and T_1 (Wheat straw mulch) stand in second order of preference of effective integrated weed management practices in cauliflower.

Keywords: Weed management, yield parameters, cauliflower

Introduction
Cauliflower (*Brassica oleracea* var. *botrytis* L.) is one of the most popular vegetable crop among the cole crops and has originated from the Mediterranean region. It was introduced in our country in 1822. Cauliflower belongs to family brassicaceae and is grown for its white tender curd which is used for vegetable, curry, soup and pickle preparations.

Besides being good source of protein and carbohydrates, cauliflower is a rich source of vitamins and minerals (Bana *et al.*, 2012) [2]. Cauliflower fresh curd are highly nutritive and contain moisture 90.8 g, protein 2.6 g, fat 0.4 g, minerals 1.0 g, fiber 1.2 g, carbohydrates 4.0 g, calcium 33 mg, phosphorous 57 mg, iron 1.5 mg, carotene 30 mg, thiamine 0.04 mg, riboflavin 0.10 mg, niacin 1.0 mg vitamin-C 56 mg per 100 g of edible portion (Jood & Neelam, 2011) [3].

India ranks second in area and production of cauliflower in the world after China. In India, the area under cauliflower was 459 thousand hectares with a production of 8800 thousand tonnes and productivity of 19.17 tonnes/ha. India produces around 32.5% of the world's total production of cauliflower. Individually cauliflower accounts for 5.06% of vegetable production of the country. More than 20 million tonnes of cauliflower is produced annually worldwide and China and India are among the leading countries. Madhya Pradesh cauliflower is cultivated in about 25,747 ha area with production of 72,503 tonnes and productivity about 28.16 qt/ha. (Anonymous 2018) [1]. It is a very sensitive crop and needs more care to grow successfully than most of other vegetables. In India annually undergoes considerable loss due to various stresses of the agriculture and among these, weeds top the list by contributing 33% towards total loss. Weeds remove the available nutrients from soil in large quantity ranging from 30 to 40 per cent. Weeds interfere with crop plants severely reduce crop growth and lower yield and quality (Mal *et al*., 2005) [4]. Although considerable research work has been carried out in India on various aspects of cauliflower cultivation, but the problem of weeds in this crop need special attention, as weeds when present in the field reduce the yield and impair the quality of the produce for vegetable purposes, the crop remain in the field for about four months and during its growth period, the crop faces competition due to presence of monocot and dicot weed.

Weed competition early in the season may lead to irrecoverable growth and yield losses of cauliflower and add appreciably to the cost of farm operations, for profitable cultivation of cauliflower, control of weeds is necessary because longer period of weed cauliflower competition greatly reduce crop growth and curd yield. Average reduction in shoot dry weight and curd yield were 81 percent and 89 per cent, respectively (Qasem, 2009) [5].

It is an established fact that weeds can be controlled effectively by manual hand weeding. But presently labour has become very costly and their non-availability at proper time makes the daunting task of weed control further challenging. Whereas, use of herbicides alone may not be the answer to the problem because an environmentalist claims them dangerous for sustainable agriculture. Thus appropriate choice for weed control in cauliflower would be an integration of cultural and herbicidal control for boosting the cauliflower production. Besides hand weeding and herbicidal control, mulching (particularly plastic mulch and rice straw mulch) has also been advocated by many researchers as an effective mean for reducing weed population (Bana *et al.*, 2012) [2]. Thus, it is of utmost importance, advisable and beneficial to go in for integrated approach or combinations of more than one method to achieve the desired results.

Materials and Methods

A field experiment was conducted at the village Mehrumkala, Rajnandgaon (C.G) jointly at Sardar Patel University, Balaghat (M.P.). Rajnandgaon is located in central plane of Chhattisgarh at latitude 21.10° N, and longitude 81.03° E and an altitude of 330.70 meters above the mean sea level. Climatologically, Rajnandgaon witnesses normal tropical wet and dry climate. An average annual rainfall of 1200 mm is generally appeared and mostly concentrated during the period from June to September. The major portion of the rainfall is received by South-Western monsoon. The May and December is the hottest and coolest month of the year respectively. In general, weekly maximum temperature goes upto 47 °C during the summer season and minimum temperature falls upto 5 °C during the winter season.

The experiment consisted of 8 treatments *viz*. T_1: Wheat straw mulch, T_2: Black plastic mulch, T_3: Oxyfluorfen 0.30 kg ha-1 + H.W at 45 DAT, T_4: Butralin 23.5% EC (PE) + 1 HW at 45 DAT, T_5: Simazine 10% EC (POE) + 1 HW at 45 DAT, T_6: Oxadiazon 1.0 + Oxyfluorfen 0.30, T_7: Weed free, T8: Weedy check (control) which was arranged in Randomized Block Design with three replications. Fertilizer was applied at the rate of 200 kg N, 75 kg P2O5, & 75 kg MOP. The source of nutrients were urea for nitrogen, DAP for phosphorus, MOP for potash. Half of nitrogen and whole dose of phosphorus and potash were applied as basal dose before transplanting of cauliflower seedlings. While the remaining half dose of nitrogen was given in 2 equal split doses, first at 30 and second 45 days after transplanting. Thirty days old seedlings of uniform height were selected and transplanted in the field with the spacing of 50 x 45 cm. First weeding and hoeing was done after 25 days of sowing and subsequent two weeding and hoeing were done after 35 and 45 days of sowing. After transplanting, the cauliflower seedlings were protected from insect-pests and diseases by spray of insecticide (Imidachlopride @ 0.5 ml/l of water) and fungicide (Carbandazime @ 2 gm/l of water) at an interval of 15 days.

Results and Discussion yield attributes

Curd length (cm) and Curd width (cm)

The data on various yield attributes *viz*. curd length (cm), curd width (cm) as influenced by the weed management practices were recorded and presented in Table 1and figure 1. Treatment T_7 (Weed free) was recorded significant maximum Curd length (cm) *i.e.* 9.79 cm respectively. It was followed by treatment T_2 (Black plastic mulch) and T_1 (Wheat straw mulch). Significantly minimum Curd length (cm) *i.e.* 7.08 cm was measured in case of treatment T8 (Weedy check (control)). Treatment T_7 (Weed free) was recorded significant maximum Curd width (cm) *i.e.* 21.12 cm respectively. It was followed by treatment T_2 (Black plastic mulch) and T_1 (Wheat straw mulch). Significantly minimum Curd width (cm) *i.e.* 15.60 cm was measured in case of treatment T8 (Weedy check (control)). Similar result was found by Sen *et al.* (2018) [6] reported that the yield attributing characteristics curd length, curd width, average curd weight, harvest index and curd yield. It was followed by T_5 {Oxyfluorfen 23.5% EC (PE) + 1 HW at 30 DAT}. Maximum weed population, weed dry weight and weed index was recorded with the treatment T_1 (weedy check).

Average curd weight (g), Marketable curd yield (q ha-1) and Total curd yield (q ha-1)

The effect of weed management practices on average curd weight (g), marketable curd yield (q ha-1) and total curd yield (q ha-1). The data presented in Table 2 and Figure 2 depicts that treatment T_7 (Weed free) was recorded significant maximum average curd weight (g) *i.e.* 650.51 g respectively. It was followed by treatment T_2 (Black plastic mulch) and T_1 (Wheat straw mulch). Significantly minimum average curd weight (g) *i.e.* 268.60 g was measured in case of treatment T8 (Weedy check (control)).

Treatment T_7 (Weed free) was recorded significant maximum marketable curd yield (q ha-1) *i.e.* 280.65 q ha-1 respectively. It was followed by treatment T_2 (Black plastic mulch) and T_1 (Wheat straw mulch). Significantly minimum marketable curd yield (q ha-1) *i.e.* 107.03 q ha-1 was measured in case of treatment T8 (Weedy check (control)).

Treatment T_7 (Weed free) was recorded significant maximum total curd yield (q ha-1) *i.e.* 293.76 q ha-1 respectively. It was followed by treatment T_2 (Black plastic mulch) and T_1 (Wheat straw mulch). Significantly minimum total curd yield (q ha-1*) i.e.* 124.80 q ha-1 was measured in case of treatment T8 (Weedy check (control)).

Similar result was found by Mal *et al.* (2005) studied the effect of chemical weed control and nitrogen levels on cauliflower var. Snowball-16. The treatments consisted of six levels of weed control measures (*viz*., weedy check, hand weeding, pendimethalin and each @ 1.0 and 1.5 kg/ha) and three levels of nitrogen (*viz*. 0, 60 and 120 kg/ha). All the herbicidal treatments reduced weed population and weed dry matter significantly and increase in average weight of curd, total curd yield per bed and per hectare and protein content in curd over control. However, the maximum value of these parameters was recorded in pendimethalin @ 1.5 kg/ha.

Table 1: Curd length (cm) and Curd width (cm)

Tr. No.	Treatment Details	Curd length (cm)	Curd width (cm)
T_1	Wheat straw mulch	9.27	20.12
T_2	Black plastic mulch	9.58	20.32
T_3	Oxyfluorfen 0.30 kg ha-1 + H.W at 45 DAT	8.97	19.60
T_4	Butralin 23.5% EC (PE) + 1 HW at 45 DAT	8.64	19.08
T_5	Simazine 10% EC (POE) + 1 HW at 45 DAT	8.84	19.20
T_6	Oxadiazon 1.0 + Oxyfluorfen 0.30	7.96	18.47
T_7	Weed free	9.79	21.12
T8	Weedy check (Control)	7.08	15.60
S.Em (±)		0.52	1.00
CD (5%) =		1.58	3.03
CV =		10.31	9.03

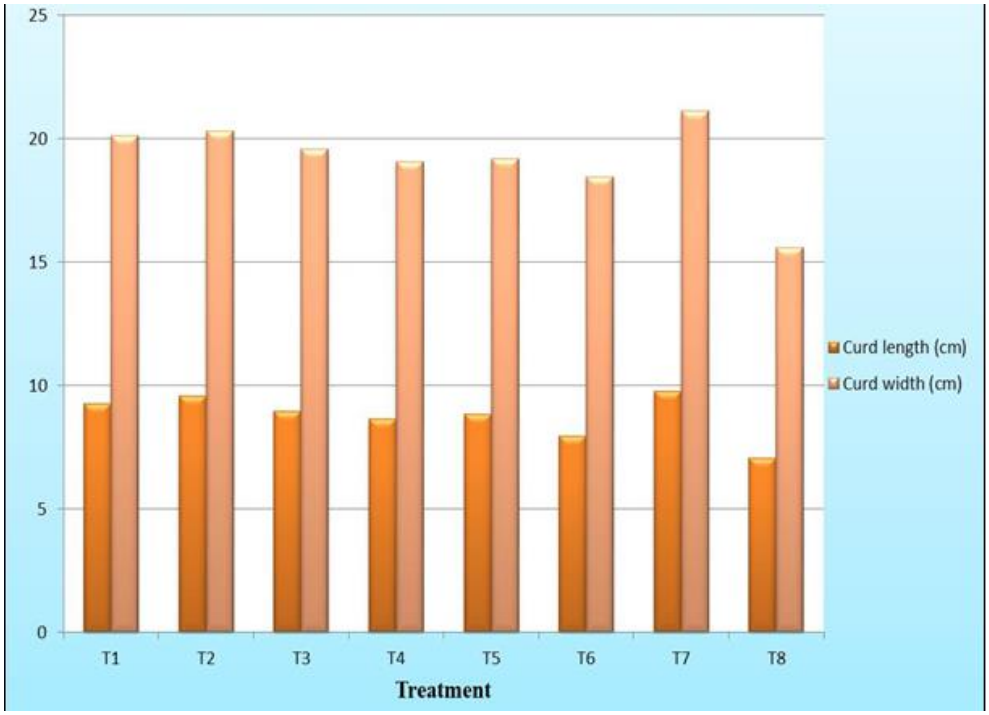

Fig 1: Curd length (cm) and Curd width (cm)

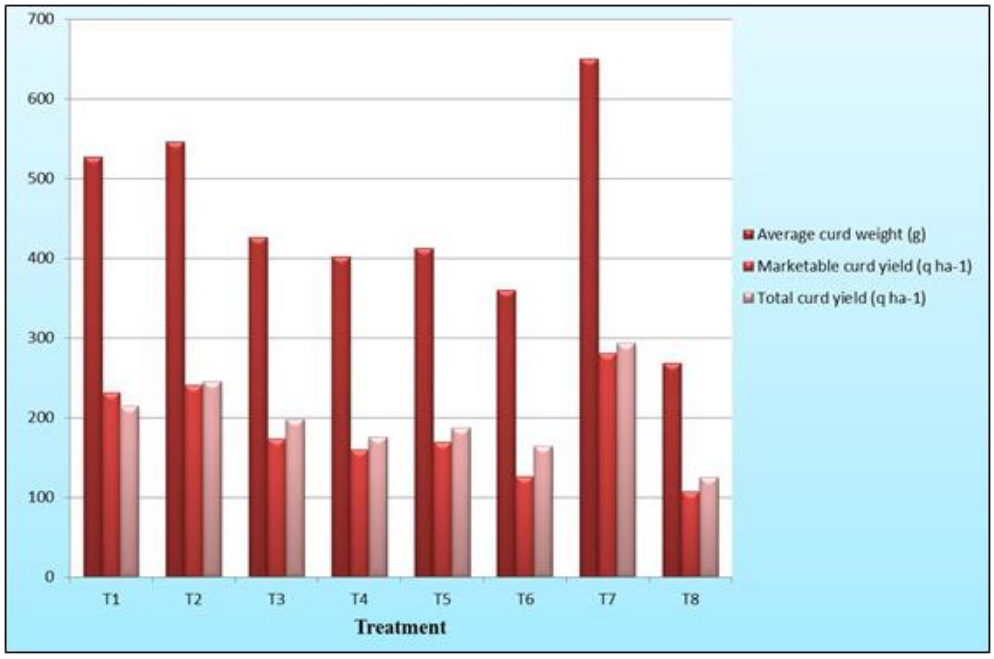

Fig 2: Average curd weight (g), Marketable curd yield (q ha-1) and Total curd yield (q ha-1)

Table 2: Average curd weight (g), Marketable curd yield (q ha-1) and Total curd yield (q ha^{-1})

Tr. No.	Treatment Details	Average curd weight (g)	Marketable curd yield (q ha^{-1})	Total curd yield (q ha-1)
T_1	Wheat straw mulch	526.83	231.50	234.53
T_2	Black plastic mulch	545.85	240.64	244.90
T_3	Oxyfluorfen 0.30 kg ha-1 + H.W at 45 DAT	426.30	173.60	197.67
T_4	Butralin 23.5% EC (PE) + 1 HW at 45 DAT	402.00	159.63	175.93
T_5	Simazine 10% EC (POE) + 1 HW at 45 DAT	412.43	169.10	187.27
T_6	Oxadiazon 1.0 + Oxyfluorfen 0.30	360.10	125.57	163.71
T_7	Weed free	650.51	280.65	293.76
T_8	Weedy check (Control)	268.60	107.03	124.80
S.Em (±)		28.65	11.01	11.65
CD (5%) =		86.90	33.41	35.36
CV =		11.05	10.26	10.08

Conclusion

On the basis of above findings, treatment T8 (Weedy check (control)) stand first in position and T_1 (Wheat straw mulch) stand in second order of preference of effective integrated weed management practices in cauliflower.

References

1. Anonymous. National Horticulture Database. National Horticulture Board Government of India, Gurgaon, India, 2018. www.nhb.gov.in.
2. Bana ML, Kaushik RA, Dhakar MK. Integrated weed management in cauliflower. Ann. Agric. Res. New Serie. 2012:33(3):163-169.
3. Jood S, Neelam K. Importance of vegetables in human nutrition and health. In: Rana, M.K. (ed.) Fundamentals of vegetable production, New Indian Publishing Agency, New Delhi, 2011, 70.
4. Mal K, Yadav RL, Paliwal R. Effect of chemical weed control and nitrogen level in cauliflower. Indian J. Hort,2005:62(3):257-259.
5. Qasem JR. Weed competition in cauliflower (*Brassica oleracea* L. var. bortytis) in the Jordan valley. Sci. Hort. 2009:121:255-259.
6. Sen Satish, Sharma RK, Kushwah SS, Dubey R. Effect of different weed management practices on growth and yield of cauliflower (*Brassica oleracea* var. *Botrytis* L.) Ann. of Pl. and Soil Rese,2018:20(1):63-68.