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**Effect of method of sowing and different weed
management practices on growth and yield of
cauliflower (*Brassica oleracea* var. *botrytis* L.)**

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Abstract

Field experiment was conducted at village Dharampura in the field of Mr. Rameshwar lal during August 2018, to study the effect of method of sowing and different weed management practices on growth and yield of cauliflower. The two methods of sowing i.e. Ridges and flat bed sowing and treatments Hand hoeing, Pendimethalin 30 Ec @ 1.5 Lt /ha were used in this experiment. The effects of method of sowing and these treatments on plant height (cm), number of leaves per plant, curd weight (g) and yield per plot (kg) were observed. Results showed that plant height was maximum in ridge sowing with hand hoeing. Number of leaves per plant was maximum in flat bed sowing with Pendimethalin 30 Ec @ 1.5Lt /ha. Curd weight and yield per plot was maximum in ridge sowing with hand hoeing treatment. On the basis of experiment it may be concluded that ridge sowing with hand hoeing treatment recorded superior performance for growth and yield of cauliflower.

Keywords: Cauliflower, *Brassica oleracea* var. *botrytis* L., ridge beds, flat beds, hand hoeing, pendimethalin

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 *Cruciferae* 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. 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. 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.*)^[1]. 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.

Material and Methods

The experiment was carried out at village Dharampura in the field of Mr. Rameshwar lal during August 2018.

An experiment was conducted in six different plots having ridges and flat bed with each plot having dimensions of 5 × 3 m. The field was prepared manually and mechanically. Field was ploughed with the help of cultivator and on flat bed leveling was done with the help of planker. Ridges were made with the help of spade manually. Cauliflower seedling was transplanted on the bed at 6th August. The spacing between row to row was 60cm and plant to plant 45cm on both ridges and flat bed. 40 tonnes of farmyard manure, with 50kg of N (110 kg of urea), 25 kg of P₂O₅ (155 kg of single superphosphate), 25 kg of K₂O (40 kg of muriate of potash) per plot was applied. Whole FYM and P₂O₅, K₂O and half N was applied before transplanting and the remaining half dose of N was applied as top dressing 4 weeks after transplanting. First irrigation was given instantly after transplanting seedlings on bed. In August, irrigation was given at interval of 5 days. In September, October irrigation was done at interval of 7 days. Last irrigation was given 12 days before harvesting. Harvesting was done manually by hands at 12 November. The height of five plants from each plot selected randomly were measured with the help of measuring tape from soil surface to the highest leaf of the plant at interval of 10 days. In this observation five plants were selected randomly from each plot. Then leaves of this cauliflower plants were counted manually at interval of 10 days. Five plants were selected randomly from each plot. Then weight of each curd was measured with the help of weighing balance after harvesting. Yield of per plot was measured after harvesting the cauliflower from each plot.

Treatments

On flat bed

- T1 - Hand Hoeing
T2 - Pendimethalin 30 EC @ 1.5 lt/ha
T3 - Control

On ridges

- T4 - Hand Hoeing
T5 - Pendimethalin 30 EC @ 1.5 lt/ha
T6 - Control

Results and Discussions

Plant height (cm)

From the experiment, it has been observed that plant height on ridges was maximum in T4 Hand hoeing followed by T5 Pendimethalin 30 EC and on flat bed maximum plant height in T1 hand hoeing followed by T2 Pendimethalin 30EC. All

over maximum height was observed in T4 Hand hoeing and minimum plant height observed in T3 control at 100 DAT. Similarly, Bana *et al.* studied the effect of different weed management practices on weed dynamics in cauliflower (*Brassica oleracea* var. *botrytis* L.) cv. 'Pusa Snowball K-1'. The result revealed that 60 DAT, maximum plant height was recorded under black plastic mulch followed by in Pendimethalin at 1.5 kg/ha treatment.

Number of leaves

From the experiment, it has been observed that maximum number of leaves was observed in T2 Pendimethalin 30 EC followed by T1 Hand hoeing. The average minimum number of leaves observed in T6 control at 100 DAT. Similarly, Sahoo *et al.* [2] were studied the effect of weed management on growth and yield of onion (*Allium cepa* L.). The experiment consist of nine treatments. The pooled numbers of leaves/plant was recorded maximum in T2 (Weed free check) followed by T8 (Pre-emergence spray of Oxyfluorfen 23.5% EC @ 0.25 kg/ha + Post-emergence spray of ½ dose of Quizalofop ethyl 5% EC @ 0.05 kg/ha + Oxyfluorfen 23.5% EC @ 0.25 kg/ha at 40 DAT) and minimum in T1 (control).

Curd weight (g)

From the experiment, it has been observed that the average maximum curd weight was observed in T4 hand hoeing followed by T5 and the average minimum curd weight was observed in T3 control followed by T1 and T2. Similarly, Kumar *et al.* [3] studied the Integrated weed management in cauliflower (*Brassica oleracea* var. *botrytis*) under dry temperate climate of western Himalayas. The result revealed that T1-Pendimethalin 1.5 kg/ha was observed to be best weed management treatment in terms of average curd weight and minimum average curd weight in T13-weedy check.

Yield per plot (kg)

From the experiment, it has been observed that maximum yield per plot was observed in T4 hand hoeing followed by T1 and the minimum yield per plot was observed in T3 control. Similarly, Vijayvergiya *et al.* [4] conducted an experiment to find out practically convenient and economically feasible weed management practice in onion. The maximum bulb yield/plot found in treatment in which 3 hand weeding at 25, 50 and 75 DAT applied.

Observations and Tables

Table 1: Effect of methods of sowing and different weed management practices on plant height (cm)

Treatments	Average Plant Height (cm)									
	10 DAT	20 DAT	30 DAT	40 DAT	50 DAT	60 DAT	70 DAT	80 DAT	90 DAT	100 DAT
T1	6.50	6.92	10.66	14.77	23.02	31.38	37.24	42.88	47.54	49.92
T2	6.14	6.44	9.88	13.38	21.88	30.74	37.16	40.72	44.06	46.18
T3	6.38	6.42	10.50	14.34	20.32	23.62	29.18	32.46	34.52	35.50
T4	6.62	7.02	10.65	14.31	23.64	31.38	36.52	42.20	45.78	50.22
T5	6.42	6.60	10.74	14.12	22.96	32.14	37.56	43.52	46.16	49.28
T6	6.62	6.84	10.56	14.92	19.54	23.16	27.66	31.86	34.78	36.16

Table 2: Effect of methods of sowing and different weed management practices on number of leaves per plant

Treatments	Average number of leaves per plant									
	10 DAT	20 DAT	30 DAT	40 DAT	50 DAT	60 DAT	70 DAT	80 DAT	90 DAT	100 DAT
T1	2.8	3.4	5.4	7.6	8.2	12.2	15.2	18.2	20.4	20.4
T2	2.8	3.4	4.8	7.2	8.6	11.2	14.2	17.6	20.4	21.2
T3	3.2	3.6	5.8	8.0	8.4	10.8	14.0	16.8	18.2	18.8
T4	2.8	3.4	5.2	7.4	8.8	11.8	14.4	17.0	18.8	19.2
T5	2.8	3.2	4.6	6.8	7.6	10.4	13.6	16.6	18.8	19.0
T6	2.6	3.2	4.8	7.0	8.0	10.4	12.6	14.8	16.8	17.0

Table 3: Effect of methods of sowing and different weed management practices on curd weight (g).

Treatments	At the time of harvesting					
	Curd 1	Curd 2	Curd 3	Curd 4	Curd 5	Average weight (g)
T1	458	477	439	389	412	435
T2	434	396	407	384	429	410
T3	210	198	234	277	206	225
T4	478	490	394	504	531	479
T5	350	410	394	390	411	391
T6	280	254	269	245	283	266

Table 4: Effect of methods of sowing and different weed management practices on yield per plot (kg).

Treatments	Yield per plot (kg)
T1	22.82
T2	21.75
T3	11.54
T4	24.54
T5	20.95
T6	13.53

Conclusion

The present experiment was conducted to study the effect of methods of sowing and different weed management practices on growth and yield of Cauliflower (*Brassica oleracea* var. *botrytis*). Various growth and yield attributes were studied i.e. average plant height, average number of leaves per plant, average curd weight and yield per plot. It was concluded that the of methods of sowing and different weed management practices influenced the growth characteristics and yield of Cauliflower i.e. Maximum average plant height was obtained in T4 hand hoeing, Average number of leaves per plant maximum in T2 Pendimethalin 30 EC. The average curd weight and total yield per plot was maximum in T4 hand hoeing treatment.

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