

Effect of chemicals on weed control in spray chrysanthemum

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Received:15-09-2014; Revised:22-11-2014; Accepted:05-12-2014

ABSTRACT

An experiment was conducted during 2011-12 and 2012-13 at All India Coordinated Research Project on Floriculture at Chiplima, Sambalpur, Odisha. Ten treatments with four pre-emergence chemicals in different concentrations were administered to spray chrysanthemum cultivar "Flirt" in three replications per treatment. The data collected was pooled over for two years. The result depicted that the treatments varied significantly with respect to weed count per square meter, fresh weight of weeds and dry weight of weeds. Pendimethalin 1.00 kg a.i.ha⁻¹ was found to be most effective in controlling weed growth as compared to other treatments and Pendimethalin – 0.75 kg a.i.ha⁻¹ was at par with Pendimethalin 1.00 kg a.i.ha⁻¹. The growth parameters like plant height, plant spread, number of sprays per plant, weight of flowers per plant, number of flowers per plant did not vary significantly with the treatments which suggest that the chemicals have no effect on the plants and can be used for controlling weeds in spray chrysanthemum.

Keywords: Chrysanthemum, pre-emergence spray, weedicides

Agricultural production depends on both biotic and abiotic factors whose interaction may enhance output or limit production (Peter., 2009). Among the constraints in production, weeds accounts for one-third of the loss. The damage is caused during early stage of crop growth.

In chrysanthemum, weeds like *Portulaca oleracea*, *Agropyron repens*, *Cyperus rotundus*, *Sidaacuta*, *Digitaria sanguinalis* etc were seen which compete with the crop for solar radiation, water, nutrients, and space. The spray type chrysanthemums are spreading and accommodation with the weeds restricted its growth and ultimately its yield drops drastically.

Spray chrysanthemum stems are very brittle and difficult to manage with any other weeding instruments. Hand weeding is quiet laborious and time taking, so the only alternative available to control weeds is the use of chemicals. Thus, this experiment was designed to find out the most effective chemical for controlling the weeds and also to know if the weedicides had any effect on the plant growth and its yield.

The experiment was conducted at College of Horticulture, OUAT, Chiplima, Odisha during the period 2012-2013. The experimental chemicals for controlling weeds in present study are Butachlor, Pendimethalin, Fluchloralin and Quinalophos in different concentrations and combinations (Table-1). The spray type chrysanthemum cultivar selected for the experiment was "Flirt" which is the ruling variety of the state.

The experiment was laid out in the open field in randomised block design with ten treatments and three

replications. The treatments are represented in the Table-1. The beds were of 2m × 2m and the spacing given to the plants was 40cm × 30cm accommodating 30 plants in each treatments. In all the treatments the chemicals were used as pre-emergence application and were applied 7 days prior to planting with sufficient moisture in the soil. Flooded irrigation was given before the application of the chemicals.

Observations were recorded on two main aspects viz-a viz weed parameters and plant growth parameters. Weed parameters include the weed count per square meter, fresh weight of the weed and dry weight of the weeds. The plant growth parameters includes-height at first flower appearance, plant spread (North-South and East-West), number of sprays per plant, days to 1st bud appearance, days to full bloom, days to withering, number of flowers per plant, weight of flowers per plant and weight of flower per plot. All the data were collected for two consecutive years and pooled data was calculated and analysis of variance was done using SPSS (var 7.5) There were two controls (T9) was hand weeded and no weeding was done (T10) to know the exact effect of the weedicide chemicals on the plant

In all the treatments the chemicals were used as pre-emergence application and were used 7 days prior to planting of the plants. The application of the chemical was done with sufficient moisture content in the field after a flooding irrigation administered to the plots.

The analysis of variance (ANOVA) varied significantly with respect to weed parameters. It was

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Table 1 :Effect of chemicals on weed control in spray chrysanthemum cv. Flirt at Chiplima.

Treatments	Weed count m ⁻²	Fresh weight (g)*	Dry weight (g)*	Height at 1 st flower bud appearance	NXS	EXW	No. of spray plant ⁻¹	Days to first bud appearance	Days to full bloom	Days to wither in (g)	No. of flowers plant ⁻¹	Weight of flowers plant ⁻¹ (g)	Weight of flowers plot ⁻¹ (Kg.)
T1	18.78	188.23	33.44	43.00	32.50	30.40	8.73	74.67	23.33	14.67	44.52	199.87	6.23
T2	14.64	149.88	23.00	46.43	34.62	33.31	7.52	75.33	24.33	14.33	40.44	195.38	5.43
T3	9.22	58.42	7.38	45.11	33.03	31.12	8.70	77.33	23.00	13.67	50.10	215.61	6.66
T4	7.35	35.61	4.83	49.36	32.59	32.65	7.23	75.67	22.33	13.33	50.24	226.00	6.87
T5	19.93	220.83	44.08	43.14	32.61	32.81	7.64	74.00	21.67	14.33	42.20	188.35	5.01
T6	16.54	153.52	25.76	44.89	33.85	32.63	7.03	76.33	23.67	13.67	45.00	203.31	6.10
T7	27.52	222.57	45.69	47.02	34.11	32.18	8.19	75.67	23.67	14.00	43.34	189.11	5.88
T8	17.83	142.13	21.61	44.28	32.00	31.21	7.76	74.00	21.33	13.67	42.00	156.05	5.63
T9	43.25	472.21	99.42	41.03	33.02	32.19	7.45	75.67	23.67	13.33	44.05	174.54	4.89
T10	0.00	0.00	0.00	50.74	32.13	30.54	7.12	74.67	24.00	13.00	44.38	193.63	5.91
LSD (0.05)	5.68	55.45	13.01	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

*Significant at 5%, level of significance

T₁ – Butachlor – 1 kg a.i.ha⁻¹ pre-emergence, T₂ – Butachlor – 1.5 kg. a.i.ha⁻¹ pre-emergence
 T₃ – Pendimethalin – 0.75 kg a.i.ha⁻¹ pre-emergence, T₄ – Pendimethalin 1.00 kg a.i.ha⁻¹ pre-emergence
 T₅ – Fluchloralin – 0.75 kg a.i.ha⁻¹ pre-emergence, T₆ – Fluchloralin – 1.00 kg a.i.ha⁻¹ pre-emergence
 T₇ – Quinalophos – 0.5 kg a.i.ha⁻¹ pre-emergence, T₈ – Quinalophos – 1.00 kg. a.i.ha⁻¹ pre-emergence
 T₉ – Control (Weed check) T₁₀ – Control (weed free check)

evident that T₄ (Pendimethalin @ 1 kg a.i ha⁻¹) was *at par* with T₃ (Pendimethalin 0.75 kg a.i ha⁻¹) with respect to weed count per square meter, fresh weight and dry weight of the weeds. Lowest weed count per meter square (7.38) was recorded in T₄ *i.e.* Pendimethalin when applied @ 1 kg a.i ha⁻¹ as per emergence treatment. Similarly the fresh weight and dry weight 43.71 g and 6.50 g was the lowest in this treatment as compared to other treatments. When plant growth parameters were analysed it was observed that there was no significant variation among the treatments showing that chemicals had no effect on the growth parameters (Stadtherr, *et al.*, 1959) similar observation was also found in transplanted rice (Pal D, *et al.* 2005.)

Thus, it can be concluded that in spray chrysanthemum variety Flirt, Pendimethalin @ 1 kg a.i ha⁻¹ as pre emergence spray is very effective in controlling weeds than Butachlor, Fluchloralin and Quinalophos. It was also observed that the weedicides have no significant effect on the growth and yield of the crop.

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