

Efficacy of Herbicides and Cultural Management on Weed Control in Gram (*Cicer Arietinum*).

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Abstract: A field experiment was conducted during winter season 2010-2011 at farm of Agronomy Department, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola, to study the effect of herbicides and cultural weed management on weed control in Gram (*Cicer arietinum*). Pendimethaline 1 kg ha⁻¹+1H at 40 DAS recorded least weed count, weed dry weight and highest yield in chemical treatment. But cultural weed control treatment 2H at 15 and 40 DAS + HW at 30DAS recorded highest grain yield and B:C ratio.

I. Introduction

Chickpea is an important crop of *rabi* crop besides limited moisture crop has to compete with weeds. Timely weed management practices play an important role in the successful cultivation of the crop. Chickpea suffers severely due to competition stress of weeds with yield reduction to the tune of 20 to 49.5 % depending on nature and density of weeds. The conventional method of weed control by hoeing and hand weeding are very laborious, expensive and time consuming and needs to be often repeated at different intervals, Therefore, the present investigation was planned to find out efficacy of herbicides and cultural management on weed control in Gram (*Cicer arietinum*).

II. Methodology

An investigation was carried out during 2010-2011 at farm of Agronomy Department, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola. The experiment was laid out in Randomized Block Design with 3 replication and 10 treatments. These treatments combination of pre and post emergence herbicides with cultural practices and one weedy checks. Treatments combinations as Weed check (T₁), Imazethapyr PRE 75 g ha⁻¹ (T₂), Imazethapyr POE 75 g ha⁻¹ (T₃), Pendimethalin PRE 1 kg ha⁻¹ (T₄), Quizalofop-p-ethyl POE 50g ha⁻¹ (T₅), Imazethapyr PRE 75 ha⁻¹ + 1H at 30 DAS (T₆), Imazethapyr POE 75g ha⁻¹ + 1H at 40 DAS (T₇), Pendimethalin PRE 1kg ha⁻¹ + 1H at 40 DAS (T₈), Quizalofop-p-ethyl POE 50g ha⁻¹ + 1 H at 40 DAS (T₉), 2H at 15 and 40 DAS + 1 HW at 30 DAS (T₁₀). The Chickpea variety (Jaki 9218) sown at Gross plot size 5 x 5.5 m and Net plot size 4.2 x 4 m, on 4th Nov.2010. Weed population, Weed dry matter, weed control efficiency, Grain yield of chickpea and economics of the treatments were worked out.

III. Results And Conclusion

In chickpea, major weed flora were observed during *rabi* season was *Agemone mexicana*, *Melilotus alba*, *Portulaca oleraceae*, *Euphorbia hirta*, *Digera arvensis*, *Phasalis minima*, *Cyperus rotundus*, *Convolvus arvensis*, *Amaranthus viridis* etc. in field.

Lowest weed population and weed dry weight was found in Pendimethalin 1 kg ha⁻¹ with 1H at 40 DAS which was at par with cultural treatments 2H at 15 and 40 DAS with HW at 30 DAS. Weed control efficiency is highest in cultural treatments 2H at 15 and 40 DAS with HW at 30 DAS (85.09%) which was at par with treatments PE Pendimethaline 1kg ha⁻¹ with H at 40 DAS. Weed index also minimum with treatments PE Pendimethaline 1kg ha⁻¹ with H at 40 DAS.

Table1- Weed dry weight, WCE, and weed index in chickpea as affected by different treatments.

Treatments	WDW(gm)	WCE(%)	WI(%)
Weedy check	17.31	0	61.59
Imz PE 75 g ha ⁻¹	4.64	73.19	17.71
Imz POE 75 g ha ⁻¹	4.54	73.77	22.88
PEN PE 1 kg ha ⁻¹	4	76.89	6.07
QEZ POE 50 g ha ⁻¹	4.41	74.52	12.53
Imz PE 75 g ha ⁻¹ +H at 30 DAS	4.20	75.73	16.39
Imz PE 75 g ha ⁻¹ +H at 40 DAS	4.36	74.81	18.89
PEN PE 1 kg ha ⁻¹ +H 40 DAS	3.10	82.09	2.28
QEZ POE 50 g ha ⁻¹ +H 40 DAS	4.13	76.14	12.38
2H at 15 and 40 DAS + HW at 30 DAS	2.58	85.09	0
SE	0.76		
CD	2.26		
GM	5.33	69.22	61.59

Plant height recorded highest with treatments PE Pendimethaline 1kg ha⁻¹ with H at 40 DAS which was at par with treatments 2H at 15 and 40 DAS with HW at 30 DAS. Alone PE

application of Pendimethaline 1 kg ha⁻¹ also recorded maximum plant height than rest of treatments. Similar result observed in Branches plant⁻¹. Number of pods plant⁻¹ recorded maximum with treatments 2H at 15 and 40 DAS with HW at 30 DAS which was at par with treatments PE Pendimethaline 1kg ha⁻¹ with H at 40 DAS. Similar result recorded with 100 seed wt and NMR. Among herbicidal treatment alone application of PE Pendimethaline 1 kg ha⁻¹ proves significantly superior over the rest of treatments. Similar result observed with NMR and B:C ratio observed with treatments 2H at 15 and 40 DAS with HW at 30 DAS which was at par with treatments PE Pendimethaline 1kg ha⁻¹ with H at 40 DAS. Similar observation was observed by Singh *et al* (2003), Balyan *et al* (1987).

Table 2: Growth, yield and 100 seed weight under different methods of weed control treatments

Treatments	Plant height (cm)	Branches plant ⁻¹	Pods Plant ⁻¹	100 seed weight	NMR
Weedy check	41.24	20.69	36.54	20.77	14407
Imz PE 75 g ha ⁻¹	51.63	24.92	41.20	23.43	39006
Imz POE 75 g ha ⁻¹	56.51	25.14	41.15	23.14	35665
PEN PE 1 kg ha ⁻¹	62.42	28.53	46.71	25.55	47186
QEZ POE 50 g ha ⁻¹	57.34	25.42	45.02	24.25	42929
Imz PE 75 g ha ⁻¹ +H at 30 DAS	57.66	25.97	42.19	23.14	40831
Imz PE 75 g ha ⁻¹ +H at 40 DAS	58.27	26.60	44.02	23.50	38053
PEN PE 1 kg ha ⁻¹ +H at 40 DAS	70.34	29.68	52.56	25.55	50670
QEZ POE 50 g ha ⁻¹ + H 40 DAS	63.31	27.29	49.92	24.40	43668
2H at 15 and 40 DAS + HW at 30 DAS	67.14	28.75	54.39	26.21	53217
CD	3.76	2.60	2.20	5.9	13919
GM	58.95	26.13	45.37	23.94	40563

Reference

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