



Weed management in black gram

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ABSTRACT

Black gram (Vigna mungo L.) is one of the most remunerative legume crop which grown in kharif or summer season. However, herbicides and conventional methods alone are not adequate for effective weed control. Hence, integrated weed management combining both chemical and mechanical methods is ideal.

Received 18.07.2017

Revised 15.08.2017

Accepted 29.08.2017

INTRODUCTION

Black gram (*Vigna mungo* L.) is one of the most remunerative legume crop which grown in kharif or summer season. Pulse have played a very important role in human diet of our country, as a source of protein (24.04%), carbohydrate (60%), fat (1.5%), amino acids, phosphoric acids, vitamins and minerals is consumed in the form of "dal". Urd bean improves soil fertility through symbiotic nitrogen fixation. It has remained as a mainstay of Indian agriculture for centuries. Pulses are a good cover crop; however, wider spacing and frequent irrigation provide congenial condition for weed growth in initial stage, which causes greater yield loss. The conventional method of weed control by manual weeding, though efficient, is expensive and laborious. The herbicides are effective and economical to control weeds. However, herbicides and conventional methods alone are not adequate for effective weed control. Hence, integrated weed management combining both chemical and mechanical methods is ideal.

METHODOLOGY

The field experiment was conducted during *kharif* season 2015-16 at Agronomy Research farm N.D. University of Agriculture and Technology Kumarganj Faizabad (UP). The soil of the experimental field was silt loam having pH 8.2 as well as low in available nitrogen (121 kg/ha), available phosphorus (15.5) and medium in available potash (245.5 kg/ha). The experiment comprising of 10 treatments viz., T1 Imazethapyr 70 g ha⁻¹ PRE, T2 Imazethapyr 80 g ha⁻¹ PRE, T3 Imazethapyr+ Imazamox (RM) 70 g ha⁻¹ PRE, T4 Metribuzin 200 g ha⁻¹ PRE, T5 Pendimethalin 1000 g ha⁻¹, T6 Imazethapyr 70 g ha⁻¹ POE, T7 Imazethapyr 80 g ha⁻¹ POE, T8 Imazethapyr+ Imazamox (RM) 70 g ha⁻¹ PRE, Hand weeding and weedy check was laid out in randomized block design with three replications. The pre-emergence herbicides were applied to soil on next day of sowing, while post-emergence spray was done at 15 DAS. The spray volume herbicide application was 500 l/ha. The crop was raised as per the recommended package of practices.

RESULT AND DISCUSSION

The major weed flora observed were *Echinochloa colona*, *Commelina nudiflora*, *Solanum nigrum*, *C. argentea* and *Phyllanthus niruri* among the dicot weeds and *Cyperus rotundus* as sedge weed. The data presented under (Table-1). The weed dry matter accumulation of all the weed species and total weeds was affected significantly due to different weed control treatments. Pre-emergence application of imazethapyr + imazamox 80 g ha⁻¹ (RM) recorded lowest dry matter of weeds (8.46 g m⁻²), but it was being at par with the application of metribuzin 200 g ha⁻¹ PRE (9.28 g m⁻²) and Pendimethalin 1000 g ha⁻¹ (10.49 g m⁻²) as compare to rest of the herbicide treatment. Superior weed control was observed under hand weeding (20 and 40 DAS) as compare over all treatment while higher weed dry matter was found under weedy check. Hand weeding (20 and 40 DAS) gave higher weed control efficiency (WCE) (54.53 %)

than other weed control treatments. Among the different herbicides, application of imazethapyr + imazamox 80 g ha⁻¹ PRE gave maximum (53.54 %) WCE followed by metribuzin 200 g ha⁻¹ and pendimethalin 1000 g ha⁻¹. Results showed that significantly higher grain yield was recorded in imazethapyr + imazamox 80 g ha⁻¹ PRE (12.37 q ha⁻¹) which was at par with metribuzin 200 g ha⁻¹ as compare to rest of the herbicide treatments. As far as the different post emergence herbicide, application of imazethapyr + imazamox 80 g ha⁻¹ POE was recorded significantly higher grain yield (9.76 q ha⁻¹) as compare to T₇ and T₆. Among all the treatments the highest grain yield (12.60 q ha⁻¹) of black gram was observed in hand weeding (20 and 40 DAS), while minimum under weedy check (5.80 q ha⁻¹). Maximum benefit cost ratio was found under imazethapyr + imazamox 80 g ha⁻¹ PRE (1.90) followed T₄, T₅ and T₈ compare to other treatment. Minimum B:C ratio value was observed in hand weeding due to labour cost. It may be due to best control of weed by herbicide causes increase grain yield and reduce crop weed competition due to provide sufficient of nutrients, moisture and light causes increase production and profitability. Similar result were found by Jakharet *al.* (2015) and Singh (2011).

CONCLUSION

Effective control of weeds in black gram along with higher yield could be achieved by HW twice (20 & 40 Days), imazethapyr + imazamox 80 g ha⁻¹ PRE and metribuzin 200 g ha⁻¹.

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Table:1 Effect of herbicides on weed dry weight, WCE, Grain yield and Economics of Black gram

Treatments	Weed dry Weight at harvest stage (g/m ²)	Weed control efficiency (%)	Grain yield (q/ha)	B:C ratio
T1 Imazethapyr 70 g ha ⁻¹ PRE	10.68 (113.68)	25.61	8.80	1.18
T2 Imazethapyr 80 g ha ⁻¹ PRE	10.66 (113.18)	25.94	9.26	1.27
T3 Imazethapyr+ Imazamox (RM) 80 g ha ⁻¹ PRE	8.46 (71.14)	53.45	12.37	1.90
T4 Metribuzin 200 g ha ⁻¹ PRE	9.28 (85.62)	43.97	11.85	1.87
T5 Pendimethalin 1000 g ha ⁻¹	10.49 (109.6)	28.28	10.36	1.53
T6 Imazethapyr 70 g ha ⁻¹ POE	11.66 (135.62)	11.26	7.50	0.86
T7 Imazethapyr 80 g ha ⁻¹ POE	11.39 (129.45)	15.29	8.41	1.06
T8 Imazethapyr+ Imazamox(RM) 80 g ha ⁻¹ PRE	10.68 (110.69)	27.57	9.76	1.30
T9 Hand weeding (20,40)	8.36 (69.48)	54.53	12.60	1.29
T10 Weedy check	12.38 (147.81)	0.00	5.80	0.59
SEm±	0.37	--	0.24	-
LSD (P=0.05)	1.09	--	0.70	-

CITATION OF THIS ARTICLE

Ravi Shanker Singh, Raj Kumar, Manoj Kumar and Ram Pratap Singh. Weed management in black gram.. Bull. Env. Pharmacol. Life Sci., Vol 6 Special issue 2, 2017: 199-200