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Effect of Imazethapyr on yield, yield attributes and economics of blackgram crop in blackgram-mustard cropping system

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Abstract

A field experiment was conducted at Birsra Agricultural University, Ranchi, Jharkhand during rainy and winter seasons of 2014-2015 and 2015-2016 in sandy-loam soil to study the effect of Imazethapyr on yield, yield attributes and economics of blackgram crop in blackgram-mustard cropping system. The experiment comprised of sixteen weed treatments i.e. Imazthapyr 50g/haPRE (T1), Imazthapyr 70g/haPRE (T2), Imazthapyr 80g/ha PRE (T3), Imazthapyr 50g/ha POE (T4), Imazthapyr 70g/haPOE (T5), Imazethapyr 80g/ha POE (T6), Imazethapyr. +Imazemox 50g/ha PRE (T7), Imazethapyr. +Imazemox 70g/ha PRE (T8), Imazethapyr. +Imazemox 80g/ha PRE (T9), Imazethapyr. +Imazemox 50g/ha POE (T10), Imazethapyr. +Imazemox 70g/ha POE (T11), Imazethapyr. +Imazemox 80g/ha POE (T12), Pendimethalin1000g/ha PRE (T13), Imazethapyr + Pendimethalin 1000g/ha (T14), Hoeing twice (T15) each performed at 20 and 40 DAS and weedy check (T16). The experiment was laid out in RBD. The result revealed that Imazethapyr + Imazemox @ 80g/ha post emergence (T12) recorded 108.78, 46.11 and 70.91 percent higher seed yield compared to weedy check during 2014, 2015 and under pooled and recorded significantly higher gross return, net return and B: C ratio to the tune of 53.89, 38.24, 45.62 percent, 148.53, 87.19, 113.37 percent and 148.53, 87.19 and 113.37 percent as compared to weedy check (T16) during 2014-2015, 2015-2016 and under pooled data.

Keywords: Blackgram, Imazethapyr, yield, economics

Introduction

India is a major pulse-growing country of the world. It is rich with protein (24%), carbohydrates (59.6%), fat (1.5%), minerals (3.2%) and it also contains 154 mg calcium, 9.1 mg iron and 38 mg beta-carotene per 100 g of dal. Black gram is an erect, fast-growing annual, herbaceous legume reaching 30-60 cm in height. In India, black gram is sown in an area of about 31 lakh ha with a production of 14 lakh tones and an average productivity of 451 kg ha⁻¹ (Anonymous 2012) [2]. Black gram faces severe competition from weeds due to its slow initial growth and lack of effective weed control measures. Gogoi *et al.* (1992) [3] reported that weeds reduce yield of black gram to the extent of 78% and sometimes lead to the total failure of crop. An initial period of 20-40 days is very critical (Saraswat and Mishra, 1993) [4] So, chemical method of weed management offers good scope for harvesting a good crop of black gram. Imazethapyr is applied as pre-plant incorporated, pre-emergence, and post-emergence to control grasses and broadleaved weeds in pulse crops (Anonymous 2006) [1].

Materials Methods

A field experiment was conducted at Birsra Agricultural University, Ranchi, Jharkhand during rainy and winter seasons of 2014-2015 and 2015-2016. The experimental soil was sandy-loam intexture with low organic carbon (3.4 g/kg), moderately acidic (pH 5.6) in nature, low available nitrogen (189.00 kg/ha), medium phosphorus (21 kg/ha) and medium potassium (155 kg/ha) content. The experiment was laid out in a RBD with 16 treatments i.e. Imazthapyr 50g/ha PRE (T1), Imazthapyr 70g/ha PRE (T2), Imazthapyr 80g/ha PRE (T3), Imazthapyr 50g/ha POE (T4), Imazthapyr 70g/ha POE (T5), Imazethapyr 80g/ha POE (T6), Imazethapyr. +Imazemox 50g/ha PRE (T7), Imazethapyr. +Imazemox 70g/ha PRE (T8), Imazethapyr. +Imazemox 80g/ha PRE (T9), Imazethapyr. +Imazemox 50g/ha POE (T10), Imazethapyr. +Imazemox 70g/ha POE (T11), Imazethapyr. +Imazemox 80g/ha POE (T12), Pendimethalin1000g/ha PRE (T13), Imazethapyr + Pendimethalin 1000g/ha (T14), Hoeing twice (T15) each performed at 20 and 40 DAS and weedy check (T16) replicated thrice. Blackgram *var.* T9 and mustard *var.* Shivani was sown at 30 cm using 30 and 5 kg seed/ha, with RDF 20:40:20 and 80:40:20 kg/ha, respectively. Protective irrigation were applied whenever it was necessary during crop growth.

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Result and Discussion

Weed Flora

The experimental field was infested with all the three categories of weed species in weedy check throughout the crop growth in blackgram during 2014 and 2015. Among species *Ageratum conyzoids* (44.21%), *Ellusine indica* (14.95%), *Cynodon dactylon* (13.08%), *Echinochloa crusgalli* (10.28%), *Commelina nudifolia* (7.47%) recorded the highest weed density and weed dry matter in blackgram, while in mustard field the relative composition of major weed species were accounted *Coronopus didymus* (L)-30.57%, *Anagallis arvensis* (L) -35.31%, *Stellaria media* (L) - 3.35%, *Cynodon dactylon* (L) - 10.42%, *Dactyloctenium aegyptium* (L) - 11.30% respectively during 2014-2015 and 2015-2016.

Yield Attributes and Yield

Number of pods per plant, 1000 seed weight of blackgram was significantly influenced during 2014, 2015 and under pooled data. Among various herbicides, application of imazethapyr + imazamox @ 80g/ha post emergence (T12) recorded 103.45, 93.10 and 98.28 percent higher number of pods per plant, 18.34, 24.63 and 21.46 percent significantly higher 1000 seed weight compared to weedy check (T16) during 2014, 2015 and under pooled data. Application of

imazethapyr + imazamox @ 80g/ha post emergence (T12) recorded 108.78, 46.11 and 70.91 percent higher seed yield compared to weedy check during 2014, 2015 and under pooled data, but it was on par with imazethapyr @ 80g/ha pre emergence (T3), imazethapyr + imazamox @ 80g/ha pre emergence (T9), imazethapyr + imazamox @ 70g/ha post emergence (T11) and pendimethalin 1000g/ha pre emergence (T13) during 2014, 2015 and under pooled data.

Economics

Among various herbicides, application of imazethapyr + imazamox @ 80g/ha post emergence (T12) recorded 108.78, 46.11 and 70.91 percent higher gross return during 2014, 2015 and under pooled data compared to weedy check (T16), similarly 535.6, 91.4 and 185.7 percent higher net return during 2014, 2015 and under pooled data compared to weedy check (T16) i.e. ₹ 4709, 17454 and 11082. Similar observation were recorded in blackgram-mustard cropping system i.e. it recorded significantly higher gross return, net return and B:C ratio to the tune of 53.89, 38.24, 45.62 percent, 148.53, 87.19, 113.37 percent and 148.53, 87.19 and 113.37 percent as compared to weedy check (T16) during 2014-2015, 2015-2016 and under pooled data.

Table 1: Yield (Kg/ha) as influenced by weed management in black gram crop.

Treatments	Yield of blackgram (Kg/ha)			System Yield(Kg/ha)		
	2014	2015	Pool	2014-2015	2015-2016	Pooled
	Seed Yield	Straw Yield	Seed Yield	System productivity (Kg/ha)	System productivity (Kg/ha)	System productivity (Kg/ha)
T1(Imaze. 50g/haPRE)	769	1000	884	1689	1689	1689
T2(Imaze. 70g/haPRE)	841	1018	929	1745	1745	1745
T3(Imaze. 80g/haPRE)	1045	1161	1103	1904	1904	1904
T4(Imaze. 50g/haPOE)	769	992	880	1617	1617	1617
T5(Imaze. 70g/haPOE)	830	1014	922	1683	1683	1683
T6(Imaze. 80g/haPOE)	974	1066	1020	1826	1826	1826
T7 (Imaze. + Imazemox 50g/haPRE)	769	954	861	1614	1614	1614
T8 (Imaze. + Imazemox 70g/haPRE)	974	1066	1020	1858	1858	1858
T9 (Imaze. + Imazemox 80g/haPRE)	1035	1103	1069	1936	1936	1936
T10 (Imaze. + Imazemox 50g/haPOE)	892	1031	961	1752	1752	1752
T11 (Imaze. + Imazemox 70g/haPOE)	1056	1162	1109	2001	2001	2001
T12 (Imaze. + Imazemox 80g/haPOE)	1091	1166	1129	2104	2104	2104
T13 (Pendim. 1000g/haPRE)	1045	1123	1084	1959	1959	1959
T14 (Imaze. +Pendi.1000g/ha)	871	1021	946	1744	1744	1744
T15 (Hoeing twice)	882	1022	952	1735	1735	1735
T16 (weedy check)	523	798	661	1367	1367	1367
S.Em±	55.78	57	36	110.27	110.27	110.27
CD=(0.05)	166.43	170	107	329.00	329.00	329.00
CV	10.76	9	6	10.71	10.71	10.71

Table 2: Economics as influenced by weed management in black gram crop.

Treatments	Economics of blackgram			System economics		
	Gross Return (₹/ha)	Net Return (₹/ha)	B:C Ratio	Gross Return (₹/ha)	Net Return (₹/ha)	B:C Ratio
T1(Imaze. 50g/haPRE)	40902	20197	1.0	83276	41018	1.9
T2(Imaze. 70g/haPRE)	42983	22088	1.1	82041	39593	1.8
T3(Imaze. 80g/haPRE)	51030	30040	1.4	88856	46313	2.1
T4(Imaze. 50g/haPOE)	40715	20010	1.0	77748	35490	1.6
T5(Imaze. 70g/haPOE)	42644	21749	1.0	80409	37961	1.8
T6(Imaze. 80g/haPOE)	47169	26179	1.2	87289	44746	2.1
T7 (Imaze. + Imazemox 50g/haPRE)	39837	19401	0.9	76948	34959	1.6
T8 (Imaze. + Imazemox 70g/haPRE)	47163	26653	1.3	88026	45963	2.1
T9 (Imaze. + Imazemox 80g/haPRE)	49452	28904	1.4	90993	48892	2.3
T10 (Imaze. + Imazemox 50g/haPOE)	44459	24023	1.2	84353	42364	2.0

T11 ((Imaze. + Imazemox 70g/haPOE)	51292	30782	1.5	94900	52837	2.5
T12 (Imaze. + Imazemox 80g/haPOE)	52212	31664	1.5	97643	55542	2.6
T13 (Pendim. 1000g/haPRE)	50141	28806	1.4	92028	49140	2.3
T14 (Imaze. + Pendi.1000g/ha)	43753	21475	1.0	83780	39949	1.9
T15 (Hoeing twice)	44018	23534	1.1	83678	41641	1.9
T16 (weedy check)	30550	11082	0.6	67052	26031	1.2
S.Em±	1428	1428	0.1	4840.25	4840.25	0.13
CD=(0.05)	4259	4259	0.2	14740.00	14740.00	0.39
CV	6	10	10.2	9.79	11.53	11.53

Conclusion

Among weed control methods Imazethapyr+ Imazamox 80g/ha as post emergence was most effective weed control methods for better crop growth, higher yield and economics of blackgram. recorded maximum system yield, net return and B:C ratio.

Reference

1. Anonymous. Regulations amending the food and drug regulations (1454 imazethapyr). Canada Gazette. 2006; 140:19.
2. Anonymous. Department of Agriculture and Co-operation, Ministry of Agriculture. Govt. of India, 2012.
3. Gogoi AK, Kalita H, Pathal AK, Deka J. Crop-weed competition in rainfed black gram. Ind. J Weed Sci. 1992; 24:81-83.
4. Sarswat VN, Mishra JS. Weed management in pulse crops. Proc. Int. Symp., Indian Soc. of Weed Science, CCS HAU, Hisar. 1993; 111:137-140.