



# Influence of Weed Control Practices on Yield and Economics of Blackgram

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## Abstract

An on farm testing (OFT) was conducted in the farmer's field of Kurumbalur village, Perambalur district, TamilNadu in kharif season of 2014, 2015 and 2016 to assess the effect of integrated weed management treatments on weed management and yield of blackgram (*Vigna mungo* L.). Application of imazethapyr 75 g/ha at 15 days after seeding (DAS) and hand weeding at 35 DAS gave 916.24 kg/ha mean higher blackgram grain yield as compare to farmer's practice (695.76 kg/ha). Further, this treatment also resulted in significantly higher blackgram plant height, pods/plant, net return and B:C ratio as compared to all other tested treatments and significantly reduced the weed density and biomass as recorded at 40 DAS as compared to all other treatments tested.

**Key words:** Blackgram, Economics, Weed

## Introduction

Blackgram (*Vigna mungo* L.) is one of the important pulse crops of India. It is cultivated mostly on the marginal lands, under rainfed situations. Majority of farmers in rainfed regions are unaware about new varieties and improved package of practice of cultivation. In India, blackgram are grown in 3.75 million ha area with a total production of 2.49 million tonnes and productivity of 664 kg/ha out of which 1.82 million ha area with a production of 1.35 million tonnes and productivity of 739 kg/ha is under TamilNadu with third rank (Anonymous 2018). The productivity of blackgram can be increased by adopting improved package of practices in a systematic manner with high yielding varieties of blackgram. Among different constraints to attain higher productivity and production of blackgram, weeds pose a serious problem during *Kharif* season and weeds cause losses up to 50-60% (Das *et al.* 2014). Weeds can be managed mechanically by one hand weeding at 20 DAS followed by another hand weeding at 40 DAS (Bhowmick *et al.* 2015), but hand weeding is labour intensive. Further, continuous rainfall during the initial growth period of crop makes the manual



weeding impracticable and Therefore, chemical herbicide becomes cost effective. Thus, it is a major challenge to maximize the productivity of blackgram during *Kharif* season. Under these situations, integrated weed management practice involving both chemical and agronomic practice is an effective tool to increase the productivity of crop (Kavad *et al.* 2016). Keeping all these in mind, an onfarm trial (OFT) was conducted to assess the efficacy of integrating post-emergence herbicides with other weed management practices for effectively control weeds in blackgram in Perambalur district of TamilNadu.

## Materials and Methods

An on-farm testing was conducted using randomized block design technique during three consecutive *Kharif* seasons of 2023, 2024 and 2025 in the adopted village Kurumbalur by Krishi Vigyan Kendra, Perambalur. This OFT was conducted at 10 farmer's fields with VBN 11 variety of blackgram during all the years. Each treatment was laid out in 2000 sqm area. The treatments were farmer practice (hand weeding at 15 and 35 DAS), imazethapyr 75 g/ha at 15 DAS and imazethapyr 75 g/ha at 15 DAS and hand weeding at 35 DAS. The herbicides were applied manually by knapsack sprayer fitted with flat-fan nozzle using spray volume of 500 L/ha. Blackgram was sown in the second week of July and harvested in first week of October. Recommended package of practices was followed to raise the crop. The observation on weed biomass and density were recorded at 40 DAS using quadrat (0.5 x 0.5 m), placed randomly at two places in each plot. Economics of weed management treatments were worked out by using current market price of inputs and blackgram. All the data recorded were analyzed statistically as per the methods suggested by Gomez and Gomez (1984).

## Results and Discussion

### Effect on weeds

The predominant weeds noticed in blackgram field were *Cyperus rotundus*, *Cynodon dactylon* Pers., *Echinochloa colona*, *Commelina benghalensis*, *Euphorbia hirta* and *Parthenium hysterophorus*. Imazethapyr 75 g/ha at 15 DAS and hand weeding at 35 DAS was found to be significantly superior to all other treatments including farmers practice in reducing **Weeds density/m<sup>2</sup>** (3.85) and **Weeds biomass (2.02g/m<sup>2</sup>)**. These results were in close conformity with those reported by Bhowmick *et al.* (2015) Chhodavadia *et al.* (2013) Das *et al.* (2014) Ramesh and Rathika (2016).

### Effect on blackgram

Application of imazethapyr 75 g/ha at 15 DAS and hand weeding at 35 DAS found significantly superior over farmers' practice and imazethapyr 75 g/ha at 15 DAS. All weed control treatments significantly increased the plant height (57.62 cm) of blackgram as compared to farmer practice (**Table 1**). The maximum plant height, pods per plant (31.72) and yield of blackgram (**Table 2**) observed with imazethapyr 75 g/ha at 15 DAS and hand weeding at 35 DAS and it was followed by treatment imazethapyr 75 g/ha at 15 DAS, which might be due to lesser weed competition as a result of better weed control by the herbicide combined with hand weeding as earlier reported by Shaktawat (2020), Kavad *et al.* (2016), Ramesh and Rathika (2016).

### Economics

On the basis of pooled data (**Table 3**), imazethapyr 75 g/ha at 15 DAS and hand weeding at 35 DAS treatment fetched the significantly highest net return and B:C ratio (Rs.31490/ha and 2.64) followed by imazethapyr 75 g/ha at 15 DAS treatment. The lowest B:C ratio (1.57) was observed under farmers' practice as compared to all other treatments tested. The lowest investment under imazethapyr 75 g/ha at 15 DAS and hand weeding at 35 DAS treatment coupled with good economic return of grain yield might be reason for highest net returns and B:C ratio. Similar findings were also reported by Chhodavadia *et al.* (2013) Ramesh and Rathika (2016).



**Table 1. Effect of weed management treatments on blackgram plant height and associated weeds density and biomass**

Treatment	Plant height (cm)				Weeds density/m <sup>2</sup>				Weeds biomass (g/m <sup>2</sup> )			
	2023	2024	2025	Mean	2023	2024	2025	Mean	2023	2024	2025	Mean
Farmer's practice (HW at 15, and 35 DAS)	53.04	38.48	42.64	44.72	15.60	21.22	18.72	18.51	14.35	18.60	16.08	16.34
Imazethapyr 75 g/ha at 15 DAS	63.13	43.47	48.88	51.79	7.28	7.49	6.45	7.07	2.18	1.99	3.93	2.69
Imazethapyr 75 g/ha at 15 DAS and HW at 35 DAS	66.66	51.48	54.60	57.62	2.08	5.30	4.16	3.85	1.63	1.38	3.03	2.02
LSD (p=0.05)	4.86	9.11	6.97	3.66	0.69	0.56	0.92	0.37	0.52	0.56	0.43	0.26

**Table 2. Effect of weed management treatments on number of pods, grain and straw yield of blackgram**

Treatment	No. of pods/plants				Grain yield (kg/ha)				Straw yield (t/ha)			
	2023	2024	2025	Mean	2023	2024	2025	Mean	2023	2024	2025	Mean
Farmer's practice (HW at 15, and 35 DAS)	25.38	23.30	23.71	24.13	693.68	540.80	852.80	695.76	1.57	1.22	1.91	1.57
Imazethapyr 75 g/ha at 15 DAS	31.62	27.46	29.12	29.43	740.48	655.20	1102.40	833.04	1.70	1.50	2.53	1.90
Imazethapyr 75 g/ha at 15 DAS and HW at 35 DAS	36.61	28.29	30.37	31.72	825.76	748.80	1175.20	916.24	1.91	1.75	2.74	2.13
LSD (p=0.05)	1.44	0.80	1.22	0.59	28.08	41.60	43.68	19.76	0.06	0.09	0.09	0.04

**Table 3. Effect of weed management treatments on gross return, net return and B:C ratio of blackgram**

Treatment	Gross return (x10 <sup>3</sup> Rs./ha)				Net return (x10 <sup>3</sup> Rs/ha)				B:C ratio			
	2023	2024	2025	Mean	2023	2024	2025	Mean	2023	2024	2025	Mean
Farmer's practice (HW at 15, and 35 DAS)	31.21	24.34	59.70	38.42	14.05	7.18	42.54	21.26	1.89	1.48	3.62	2.26
Imazethapyr 75 g/ha at 15 DAS	33.32	29.48	77.17	46.65	15.12	11.28	58.97	28.45	1.90	1.68	4.41	2.59
Imazethapyr 75 g/ha at 15 DAS and HW at 35 DAS	37.16	33.70	82.26	51.04	17.61	14.14	62.71	31.49	1.98	1.79	4.38	2.64
LSD (p=0.05)	1.28	1.88	3.06	1.11	1.28	1.88	3.06	1.11	0.07	0.10	0.18	0.06

### Conclusion

On the basis of three years data, it was concluded that application of imazethapyr 75 g/ha at 15 days after seeding (DAS) and hand weeding at 35 DAS gave significantly higher blackgram grain yield as compare to farmer's practice and reduced the weed density and biomass as recorded at 40 DAS as compared to all other treatments tested.



## Declarations

I hereby declare that the research work entitled "Influence of Weed Control Practices on Yield and Economics of Blackgram" is an original work carried out by us. This work has not been submitted elsewhere for the award of any publication. All sources of information used have been duly acknowledged.

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