Int.J.Curr.Microbiol.App.Sci (2024) *13*(03): 166-168

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 13 Number 3 (2024)**
Journal homepage: http://www.ijcmas.com

Original Research Article https://doi.org/10.20546/ijcmas.2024.1303.015

Influence of Weed Management Practices on Yield Attributes of Black Gram (*Vigna mungo* L.) under Dehradun Condition

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Keywords

Yield attributes, grain yield, straw yield, number of pods plant-1

Article Info

Received:
20 January 2024
Accepted:
28 February 2024
Available Online:
10 March 2024

A B S T R A C T

Black gram (*Vigna mungo*) is an ancient and well-known leguminous crop of Asia belonging to leguminaceae family. The field experiments were conducted at Shivalik Agricultural Farm, SIPS, Dehradun. The experiments were laid out in randomized block design with 7 treatments and three replications. The yield parameters were significantly influenced by application of weed control measures. The maximum yield attributing parameters observed number of pods plant^{-1}, numbers of seed pod-1 and grain yield, straw yield were recorded with the application of pendimethalin (PE) 1kg ha^{-1} followed by one HW at 40 DAS. It revealed from results that among all the treatments, the application of pendimethalin (PE) 1 kg ha^{-1} followed by one HW at 40 DAS given the better and profitable results with respect to yield attributes efficient treatment to control the weeds.

Introduction

Pulses are the important source of proteins, vitamins and minerals for the predominantly vegetarian population and are popularly known as “Poor man’s meat” and “rich man’s vegetable”. Pulses contain two to three times more protein than cereals ranging approximately between 20 to 40 per cent (Singh and Singh, 2010). Black gram (*Vigna mungo*) is an ancient and well-known leguminous crop of Asia belonging to leguminaceae family and is originated from India and Central Asia. It is the third most popular pulse crop cultivated throughout India. The importance of black gram in Indian economy is hardly over emphasized due to its valuable and easily digestible protein (24%), fat (1.3%), calcium (124 mg), phosphorus (326 mg), iron (7.3 mg) and vitamin B (Velayudham, 2007). The losses caused by weeds, any other type of agricultural pests, such as insects, nematode, disease, rodents etc (Asaduzzaman, *et al.*, 2010). The crop is not a good competitor against weeds during early stage (Chaudhary *et al.*, 2012). Black gram is generally grown in rainfed conditions during the *kharif* season, where weeds are the main cause of low crop productivity (Yadav and Singh, 2009). Weeds at critical period of

crop weed competition caused reduction of 80-90% in yield depending upon type and intensity of weed infestation (Kumar *et al.,* 2018). The present study was conducted entitled Influence of weed management practices on yield attributes of black gram (*Vigna mungo* L.) under Dehradun Condition.

Materials and Methods

The field experiments were conducted at Shivalik Agricultural Farm, SIPS, Dehradun. The experiments were laid out in randomized block design with 7 treatments and three replications. As per the treatment, weedy check, weed free, one hand weeding (HW) at 20days after sowing (DAS), two HW at 20 and 40 DAS, pendimethalin (PE) 1kg $ha^{-1,}$ imazethapyr (PoE) 0.075 kg ha^{-1} at 20 DAS. The data regarding yield parameters were recorded.

Results and Discussion

Response of weed management practices on the yield parameters of black gram

The yield parameters were significantly influenced by application of weed control parameters. table-3 revealed that the maximum yield attributing parameters observed number of pods $plant^{-1}$ (25.12), number of seed pod^{-1} (5.71) and seed index (4.94 g) as well as grain yield (14.59 q ha^{-1}) and straw yield (31.72 q ha^{-1}) were recorded with the application of pendimethalin (PE) 1kg ha^{-1} followed by one HW at 40 DAS.

While the minimum yield was recorded in weedy check. It might be due to the effective integrated weed control treatments because it minimized the state of crop-weed competition, therefore, plants do not face the moisture or nutrients stress conditions due to lesser weed infestation.

With the better nutrient supply and weed competition free optimum soil environment, the seed size of crop ultimately improves resultant enhancement of all the yield parameters. It revealed from results that among all the treatments, the application of pendimethalin (PE) 1 kg ha-1 followed by one HW at 40 DAS given the better and profitable results with respect to yield attributes efficient treatment to control the weeds.

Table.1 Details of layout

Experimental design	Randomized Block Design
No. of replications	3
No. of treatments	7
Total number of plots	21

Table.2 Details of treatment and symbol

Symbol	Treatments
T_1	Weedy check
T_2	Weed free
T_3	One HW at 20 DAS
T_4	Two HW at 20 and 40 DAS
T_5	Pendimethalin (PE) 1 kg ha^{-1}
T_6	Imazethapyr (PoE) 0.075 kg ha^{-1} at 20 DAS
T_7	Quizalofop-ethyl (PoE) 0.050 kg ha^{-1} at 20 DAS

Table.3 Influence of weed management practices on the yield attributes of black gram.

Treatments	No. of pods plant^{-1}	No. of seed pod^{-1}	Seed index (g)	Grain yield (q ha^{-1})	Straw yield (q ha^{-1})
Weedy check	23.10	4.87	4.16	7.74	18.05
Weed free	25.005	5.69	4.76	13.08	29.34
One HW at 20 DAS	23.56	5.1 5	4.18	9.75	23.75
Two HW at 20 and 40 DAS	24.87	5.65	4.74	11.06	25.97
Pendimethalin (PE) 1 kg ha^{-1}	25.12	5.71	4.94	14.59	31.72
Imazethapyr (PoE) 0.075 kg ha^{-1} at 20 DAS	24.40	5.58	4.61	10.57	24.38
Quizalofop-ethyl (PoE) 0.050 kg ha^{-1} at 20 DAS	24.32	5.39 4	4.54	10.20	24.23
SE M±	0.13	0.092	0.26	0.58	0.77
C.D. at 5%	0.28	0.23	0.68	01.37	1.56

Author Contribution

Aman Pathak: Investigation, formal analysis, writing—original draft. Gargi Shekhar: Validation, methodology, writing—reviewing. Happy Narang:—Formal analysis, writing—review and editing. Rghuvendra Kumar Aryan: Investigation, writing—reviewing. Vikas Singh Sengar: Resources, investigation writing—reviewing.

Data Availability

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethical Approval Not applicable.

Consent to Participate Not applicable.

Consent to Publish Not applicable.

Conflict of Interest The authors declare no competing interests.

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How to cite this article:

Aman Pathak, Gargi Shekhar, Happy Narang, Rghuvendra Kumar Aryan and Vikas Singh Sengar. 2024. Influence of Weed Management Practices on Yield Attributes of Black Gram (*Vigna mungo* L.) under Dehradun Condition. *Int.J.Curr.Microbiol.App.Sci.* 13(3): 165-168. **doi:** https://doi.org/10.20546/ijcmas.2024.1303.015