Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-6: 2012-2016

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7692 **Special Issue-6 pp. 2012-2016**
Journal homepage: http://www.ijcmas.com

Original Research Article

Effect of Weed Management on Growth and Yield of Green Gram (*Vigna radiata* L.)

D.D. Deshmukh[1*], D.N. Gokhale[2], V.A. Deshmukh[1] and G.M. Kote[3]

[1]Department of Agronomy, College of Agriculture, Naizaon (Bz.), India
[2]College of Agriculture, V.N.M.K.V. Parbhani (M.S.), India
[3]Department of Agronomy, V.N.M.K.V. Parbhani (M.S.), India

**Corresponding author*

Keywords

Green gram, Weed management, Yield

A B S T R A C T

A field experiment was conducted during rainy (*kharif*) seasons of 2012-13 and 2013-14 at Research Farm, Department of Agronomy, Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani to study the "effect of weed management on growth and yield of green gram (*Vigna radiata* L.)" Weed free treatment (W_5) registered significantly higher plant height at harvest (50.21 and 49.83), dry matter accumulation (g) plant^{-1} at harvest (14.87 and 14.18), yield and yield attributing characters *viz*., number of pods plant^{-1} (10.40 and 10.22) followed by W_1 (8.85and 20.40) and W_3 (8.79 and 19.73) respectively. The significantly higher seed yield (1550.93 and 1297.25 kg ha^{-1}) and Stover yield (2385.83 and 1994.11 kg ha^{-1}, respectively) were recorded in weed free treatment. Effective weed control in green gram can be achieved with an alternative is application of Imazethapyr + Imazamox (PoE) 70% WG @100 g/ha at 30 DAS.

Introduction

Among the pulses, green gram (*Vigna radiata* L.) is one of the most important and extensively cultivated crops in India, Which is cultivated in arid and semi arid region. Green gram is locally known as "*moong*". It contains about 25 % protein, 1.3 % fat, 3.5% mineral, 4.1 % fiber and 56.7 % carbohydrate. In spite of the importance of this crop in our daily diet average productivity of this crop is very low in India. The low production of this crop is mainly due to crop-weed competition and other reasons. Weed management is an important key factor for enhancing the productivity of green gram, as weeds compete for nutrient, water, light and space with crop plants during early growth period. Moreover, besides low yield of crop, they increase production cost, harbor insect-pest and diseases, decreasing quality of farm produce and reduce land value of the different factors known for reduction in crop production, among them weed stand first (Subramainian *et al.*, 1993). Weeds spread easily, because of their enormous seed production and once established are not easily eradicated. Life cycle of most of them coincide with that of crop they invade, thus ensuring mixing of their seed with those of the crops (Mahroof *et al.*, 2009). Depending on weed type and crop weed competition it reduces crop yield up to 96.5 % (Verma *et al.*, 2015), whereas

the loss of green gram yield due to weeds ranges from 65.4 to 79.0 % (Dungarwal *et al.,* 2003). The magnitude of losses largely depends upon the composition of weed flora, period of weed-crop competition and its intensity.

In the more developed agricultural systems, herbicides have already replaced mechanical weed control. Unavailability of labours at the time of weeding resulting in sever field infestation, which make mechanical weeding ineffective, tedious and costly. Under such circumstances, chemical control of weeds may be the viable and cost effective alternative for this crop. Effective herbicide at appropriate rate may prove as an effective weed control method and replace conventional methods of weed control. So, if weed growth is minimize during the period of crop weed competition, crop yield will be equivalent to that of weed free crop. Therefore, it is an essential to control weeds by any means during crop weed competition. This paper deals with the objective of to study effect of different weed control practices on growth and yield of different herbicide for controlling weeds in green gram.

Materials and Methods

The field experiments were conducted at Research Farm, Department of Agronomy, Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani during *kharif* seasons of 2012-13 and 2013-14. The experiment was laid out in randomized block design with three replications and six treatments comprising of weed management practices. The soil of the experimental field was clayey in texture and showed low, medium and high rating for available nitrogen (160.72 and 172.00 kg ha^{-1}) (Modified Alkaline permanganate method), phosphorus (11.78 and 12.10 kg ha^{-1}) (Olesen's method) and potassium (489 and 484 kg ha^{-1}) (Flame photometric method), respectively. The soil was found slightly alkaline (pH 8.00 & 8.10) with normal electric conductivity. The seed of green gram BM-2002-01 variety was sown on 5th July, 2012 and 21st June 2013. Pre and post-emergence herbicide spray was done using 500 liters of water per hectare as per treatments.

Results and Discussion

Effect on crop

Growth attributes

Different weed control treatments had significant effect on all the growth and yield attributing characters during both the years (Table 1).

The highest plant height at harvesting, dry matter accumulation (g) $plant^{-1}$, Number of pods $plant^{-1}$, Seed yield, Straw yield were recorded in Weed free treatment during both the years with mean values of 50.02cm, 14.52g, 10.31 pods $plant^{-1}$, 1424.09 kg ha^{-1} and 4379.94 kg ha^{-1}, respectively. However, among the herbicidal treatments, application of Imazethapyr + Imazimox 70% WG (PoE) @ 100g ha^{-1} at 30 DAS recorded the maximum plant height at harvesting (47.11 cm), dry matter accumulation (g) $plant^{-1}$ (13.01), Number of pods $plant^{-1}$ (9.25), Seed yield (1283.42 kg ha^{-1}) and Straw yield (1978.36 kg ha^{-1}) in individual years as well as on mean basis.

The increase in growth and yield attributes under these treatments might be attributed due to the reduction in weed competitiveness with the crop which ultimately favoured better environment for growth and development of crop. While, weedy check recorded significantly lowest values for growth, yield attributes and yields of green gram crop.

Table.1 Effect of different weed management practices on growth and yield of greengram (*Vigna radiata* L)

Treatments	Plant height at harvesting (cm)		dry matter accumulation (g) plant^{-1}		Number of pods plant^{-1}		Seed yield (kg ha^{-1})		Straw yield (kg ha^{-1})	
	2012-13	2013-14	2012-13	2013-14	2012-13	2013-14	2012-13	2013-14	2012-13	2013-14
W_1 - Imazethapyr + Imazimox 70% WG (PoE) @ 100 g/ha at 30 DAS	48.53	45.69	13.39	12.64	9.50	9.00	1388.17	1178.68	2136.04	1820.69
W_2 - Chlorimuron @ 9 g a.i. /ha *fb* Quizalfop ethyl @ 20 g a.i./ha at 30 DAS	43.98	41.93	12.80	11.40	8.37	8.20	1077.44	973.18	1701.05	1532.59
W_3 - Pendimethalin (PE) @ 750 g a.i. /ha *fb* one hand weeding at 30 DAS	45.65	43.87	12.97	12.08	8.90	8.74	1178.42	1057.74	1804.89	1608.44
W_4 - Imazethapyr (PoE) @ 750 g a.i./ha at 30 DAS	42.10	39.15	11.56	11.13	8.26	7.80	1019.97	888.14	1539.04	1338.30
W_5 - Weed free	50.21	49.83	14.87	14.18	10.40	10.22	1550.93	1297.25	2385.83	1994.11
W_6 - Weedy check	37.22	38.10	8.33	9.11	6.77	6.40	813.60	727.31	1246.76	1113.03
S.E. ±	1.84	1.78	0.58	0.51	0.39	0.46	54.75	54.94	90.30	76.18
C.D. at 5%	5.69	5.50	1.81	1.59	1.22	1.41	168.71	169.29	278.22	234.74
General mean	**44.61**	**43.10**	**12.32**	**11.76**	**8.70**	**8.39**	**1171.42**	**1020.38**	**1802.27**	**1567.86**

Seed yield and yield attributes

All the weed control treatments significantly increased both seed and straw yields of green gram in both the years of experimentation (Table 1). The increase in seed and stover yield mainly due to maintenance of weed free environment, especially during critical growth stages of crop, reduce crop weed competition helped in better growth and development of green gram crop resulting in higher seed and stover yield. It was found that the highest seed yield and straw yield of green gram was recorded in Weed free treatment followed by post-emergence application of of Imazethapyr + Imazimox 70% WG (PoE) @ 100g ha^{-1} at 30 DAS. Mean data for two years revealed per cent increase in seed yield due to Weed free treatment, Imazethapyr + Imazimox 70% WG (PoE) @ 100g ha^{-1}at30 DAS, Pendimethalin (PE) @ 750 g a.i. /ha *fb* one hand weeding at 30 DAS, Chlorimuron @ 9 g a.i. /ha *fb* Quizalfop ethyl @ 20 g a.i./ha at 30 DAS, and Imazethapyr (PoE) @ 750 g a.i./ha at 30 DAS and was 190.62, 170.62, 144.84, 132.43 and 125.36%, respectively compared to weedy check. The corresponding increase in straw yield under these treatments was 191.36, 171.33, 144.77, 136.43 and 123.44% as against the lowest recorded in weedy check. The yield levels during second year under different treatments were lower compared to first year because during second year, there were continuous rains at flowering stage resulting in falling of flowers as well as shattering of pods ultimately led to poor yield of crop. The highest yield under Weed free treatment due to the fact that this treatment controlled early as well as late flushes of weeds and provided weed free environment to the crop during critical period of crop weed competition. The results are in conformity with the findings of Rajput and Kushwah (2004). On the other hand Imazethapyr + Imazimox 70% WG (PoE) @ 100g ha^{-1} at 30 DAS had significantly controlled grassy weeds and the most dominated broad-leaved weed and saved the crop efficiently from its infestation and it reflected in terms of significant increase in growth and yield attributes which ultimately resulted into higher yield of crop. This result indicated that appreciable increase in seed yield and decrease total dry weight of weeds were recorded under these treatments are also responsible for better seed and stover yield of green gram. These findings are accordance with the finding those of Chhodavadia *et al.,* (2014). Similar findings were also reported by Khedkar *et al.,* (2009) and Meena *et al.,* (2009) in soybean.

References

Chhodavadia, S. K., Sagarka, B. K. and Gohil, B. S. 2014. Integrated management for improved weed suppression in summer greengram (*Vigna radiata* L. Wilczek). *The Bioscan.* 45(2): 137-139.

Dungarwal, H. S., Chalot, P. C. and Nagda, B. L. 2003. Chemical weed control in mungbean (*Pheseolus radiates* L.). *Indian J. Weed Science.* 35(3-4): 283-284.

Khedkar HP, Patel BD and Patel RB. 2009. Effect of post-emergence herbicides on yield and economics of Kharif soybean. Indian Journal of Weed Science 41: 204–206.

Mahroof, K., Satish, K. and Hamal, I. A. 2009. Diversity of weed associated with rabi and kharif crops of sewa river catchment area in the north west Himalaya. *The Bioscan*. 4(3): 437-440.

Meena DS, Baldev Ram and Jadon Chaman Kumari. 2009. Effect of Integrated weed management on growth and productivity of soybean. Indian

Journal of Weed Science, 41: 93–95.

Rajput PL and Kushwah, SS 2004. Integrated weed management in soybean on farmer field. Indian Journal of Weed Science, 36: 210–212.

Subramanian, S., Mohamed, A. and Jayakumar, R. 1993. All about weed control. Kalyani pub., New Delhi. pp. 1-5.

Verma, S. K., Singh, S. B., Meena, R. N., Prasad, S. K., Meena, R. S. and Gaurav. 2015. A review of weed management in India: the need of new directions for sustainable agriculture. *The Bioscan.* 10(1): 253-263.