

Effect of weed management treatments on weeds in Kharif Greengram (*Vigna radiata* L.) under middle Gujarat conditions

J. P. Patil, S. V. Ahire P.K. Suryawanshi and P. S. Sonawane

Anand Agricultural University, Anand, Gujarat -388 110

jayeshpatil18@gmail.com

ABSTRACT

A field experiment was conducted during Kharif season of the year 2010 at the farm of DWSR-Anand Centre, B. A. College of Agriculture, Anand Agricultural University, Anand (Gujarat). The soil of the experimental field was loamy sand in texture, medium in available nitrogen (228.0 kg ha^{-1}), high in available phosphorus (89.58 kg ha^{-1}) and medium in potassium ($230.48 \text{ kg ha}^{-1}$) with slightly alkaline (pH 8.60) in reaction. The twelve weed control treatments viz., pendimethalin @ 1000 g ha^{-1} (PE) (T_1), pendimethalin @ 1000 g ha^{-1} PE fb hand weeding at 30 days after sowing (T_2), quizalofop-ethyl @ 50 g ha^{-1} (POE) (T_3), quizalofop-ethyl @ 50 g ha^{-1} POE fb HW at 30 DAS (T_4), quizalofop-ethyl @ 100 g ha^{-1} POE (T_5), quizalofop-ethyl @ 100 g ha^{-1} POE fb HW at 30 DAS (T_6), imazethapyr @ 50 g ha^{-1} POE (T_7), imazethapyr @ 50 g ha^{-1} POE fb HW at 30 DAS (T_8), imazethapyr @ 100 g ha^{-1} POE (T_9), imazethapyr @ 100 g ha^{-1} POE fb HW at 30 DAS (T_{10}), Interculture and HW at 20 & 40 DAS (T_{11}) and weedy check (T_{12}) were studied in randomized block design with four replications. Result revealed that at 25 DAS, significantly lower weed population and dry weight of monocot and dicot as well as total weeds were recorded in Interculturing and hand weeding carried out at 20 & 40 DAS. At 50 DAS, Interculturing and hand weeding carried out at 20 & 40 DAS recorded significantly less monocot and dicot as well as total weed counts and weed dry weight.

Keywords: Kharif, Greengram, weed management, pesticides

Received 15.05.2019

Revised 22.06.2019

Accepted 21.07.2019

CITATION OF THIS ARTICLE

J. P. Patil, S. V. Ahire P.K. Suryawanshi and P. S. Sonawane. Effect of weed management treatments on weeds in Kharif Greengram (*Vigna radiata* L.) under middle Gujarat conditions. Int. Arch. App. Sci. Technol; Vol 11 [3] September 2020: 26-28

INTRODUCTION

Greengram occupies prime position among pulses by virtue of its short growth period, high tonnage capacity and outstanding nutrient value as food, feed and forage. Green gram is fairly rich in carbohydrate and appreciable amount of riboflavin and thiamine. Yield losses in greengram due to weeds have been estimated to 40-50 % [1] Weed competition observed maximum during the active growth stage of crop like vegetative and flowering. Weed control in greengram during the early period of crop growth is most important. Cultural as well as mechanical practices such as hand weeding and interculturing are effective but unavailability of labour and continuous rainfall in kharif season does not permit these to operate timely. The current trends and further development of intensive agriculture likely to seek the help of herbicides as an effective tool for weed control and replacing conventional methods of weed management.

MATERIAL AND METHODS

The present investigation was conducted during Kharif season of the year 2010 at DWSR - Anand Centre, B. A. College of Agriculture, Anand Agricultural University, Anand (Gujarat).

The climate of Anand region is semi-arid sub tropical with hot summer and cool winter. The soil of the region is loamy sand and locally known as “Goradu” soil. The soil is alluvial in nature of origin, very deep, well drained and fairly moisture retentive. The experiment was laid out in Randomized Block Design with four replications with twelve treatments viz., pendimethalin @ 1000 g ha⁻¹ (PE) (T₁), pendimethalin @ 1000 g ha⁻¹ PE fb handweeding at 30 days after sowing (T₂), quizalofop-ethyl @ 50 g ha⁻¹ (POE) (T₃), quizalofop-ethyl @ 50 g ha⁻¹ POE fb HW at 30 DAS (T₄), quizalofop-ethyl @ 100 g ha⁻¹ POE (T₅), quizalofop-ethyl @ 100 g ha⁻¹ POE fb HW at 30 DAS (T₆), imazethapyr @ 50 g ha⁻¹ POE (T₇), imazethapyr @ 50 g ha⁻¹ POE fb HW at 30 DAS (T₈), imazethapyr @ 100 g ha⁻¹ POE (T₉), imazethapyr @ 100 g ha⁻¹ POE fb HW at 30 DAS (T₁₀), Interculture and HW at 20 & 40 DAS (T₁₁) and weedy check (T₁₂). The seeds of Greengram variety Mehawere sowed in line at 30 cm spacing by weighing exact quantity for each plot @ 20 kg ha⁻¹. Full dose of nitrogen (25 kg ha⁻¹) and phosphorus (50 kg ha⁻¹) was applied as basal just prior to sowing in the form of SSP and Urea.

RESULTS AND DISCUSSION

At 25 and 50 DAS, significantly the lowest number of total weed counts (0.00 no. m⁻²) was registered under the interculturing and hand weeding carried out at 20 & 40 DAS treatment (T₁₁). Among the herbicidal treatments, the lower weed counts (8.27 no. m⁻²) were recorded under the treatment of pre emergence application of pendimethalin @ 1000 g ha⁻¹ fb HW at 30 DAS (T₂) and application of imazethapyr @ 100 g ha⁻¹ fb HW at 30 DAS (T₁₀) respectively. The highest total numbers of weeds were recorded under the weedy check (T₁₂). The superiority of said treatment might be due to the removal of weeds manually in whole plot which prevent the regeneration of weed and enhance the crop growth by providing excellent physical condition of soil and whatever weeds emerged later were effectively removed by subsequent hand weeding and interculturing at 40 DAS. Effective control of weeds through cultural practices was also reported by Dhungarwal et al., [2].

Table 1: Number of total weeds, Weed dry weight, Weed index and Weed control efficiency in Greengram as influenced by weed management treatments at different stages.

Treatment	Weed population (no. m ⁻²)		Weed dry weight			Weed index (WI %)	Weed control efficiency (WCE %)			Seed Yield (Kg/ha)
	25 DAS	50 DAS	25 DAS (g m ⁻²)	50 DAS (g m ⁻²)	At harvest (kg ha ⁻¹)		25 DAS	50 DAS	At harvest	
T ₁ :Pendimethalin @ 1000 g ha ⁻¹ PE	9.10 ^{de} (82.50)	10.94 ^b (120.50)	12.25 ^e	58.95 ^e	1535.50 ^{bed}	28.90	71.18	61.83	60.02	1017
T ₂ :Pendimethalin @ 1000 g ha ⁻¹ PE fb HW at 30 DAS	8.27 ^e (68.0)	7.41 ^d (54.50)	11.17 ^e	18.18 ^f	1174.00 ^{ed}	4.53	73.82	88.14	69.49	1367
T ₃ :Quizalofop-ethyl @ 50 g ha ⁻¹ POE	9.70 ^{bed} (94.0)	11.88 ^b (141.0)	12.40 ^e	115.95 ^b	1566.00 ^{bc}	46.22	71.04	24.79	59.51	770
T ₄ : Quizalofop-ethyl @ 50 g ha ⁻¹ POE fb HW at 30 DAS	9.44 ^{cd} (90.0)	8.93 ^c (79.50)	11.38 ^e	18.47 ^f	1440.50 ^{bed}	18.00	73.32	88.07	62.74	1174
T ₅ :Quizalofop-ethyl @ 100 g ha ⁻¹ POE	9.17 ^{cd} (84.0)	11.24 ^b (126.0)	11.68 ^e	120.24 ^b	1398.00 ^{cd}	42.94	72.52	22.31	63.50	817
T ₆ :Quizalofop-ethyl @ 100 g ha ⁻¹ POE fb HW at 30 DAS	8.74 ^{de} (77.0)	9.27 ^c (86.0)	11.09 ^e	15.20 ^f	1025.25 ^{de}	7.82	74.08	90.15	73.62	1320
T ₇ :Imazethapyr @ 50 g ha ⁻¹ POE	10.32 ^{bc} (106.00)	9.71 ^c (94.0)	20.18 ^{bc}	45.53 ^d	1939.50 ^b	40.43	52.61	70.61	49.79	853
T ₈ :Imazethapyr @ 50 g ha ⁻¹ POE fb HW at 30 DAS	10.65 ^b (113.0)	7.56 ^d (57.0)	22.58 ^b	38.63 ^{de}	1313.00 ^{cd}	7.47	47.44	75.02	65.77	1325
T ₉ :Imazethapyr @ 100 g ha ⁻¹ POE	8.97 ^{de} (80.0)	8.94 ^c (79.50)	16.18 ^d	48.06 ^d	1501.50 ^{bed}	16.55	61.81	69.57	60.59	1195
T ₁₀ :Imazethapyr @ 100 g ha ⁻¹ POE fb HW at 30 DAS	9.02 ^{de} (81.0)	6.09 ^c (37.0)	17.28 ^{cd}	34.50 ^e	1332.50 ^{cd}	6.49	58.77	77.71	64.92	1339
T ₁₁ : IC and HW at 20 & 40 DAS	0.71 ^f (0.00)	0.71 ^f (0.00)	0.00 ^f	0.00 ^g	619.50 ^e	0.00	100.00	100.00	83.59	1432
T ₁₂ : Weedy check	16.78 ^a (281.0)	18.14 ^a (391.0)	42.73 ^a	154.76 ^a	3886.50 ^a	51.26	-	-	-	698
S. Em. ± C. D. at 5 % C. V. %	0.35 Sig. 7.66		1.02 Sig. 13.01		158.70 Sig. 20.33		-	-	-	41.26 Sig. 7.44

The dry weight of total weeds at 25 and 50 DAS and at harvest are revealed that the interculturing and hand weeding carried out at 20 & 40 DAS (T₁₁) recorded significantly the lowest dry weight of total weed biomass. However, among herbicidal treatments lower weed dry weight of total weed biomass recorded under the treatment of quizalofop-ethyl @ 100 g

ha⁻¹ POE fb HW at 30 DAS (T₆) which was at par with the treatment of pendimethalin @ 1000 g ha⁻¹ PEfb HW at 30 DAS (T₂), quizalofop-ethyl @ 50 g ha⁻¹ PEfb HW at 30 DAS (T₄), quizalofop-ethyl @ 100 g ha⁻¹ POE (T₅), quizalofop-ethyl @ 50 g ha⁻¹ POE (T₃) and pendimethalin @ 1000 g ha⁻¹ PE (T₁). In integration, removal of weeds by interculturing and hand weeding at later stages was more effective to control weeds which directly showed beneficial effect on growth of greengram. These results are in agreement with the findings of Kumar and Kundra [3].

The treatment of interculturing and hand weeding carried out at 20 & 40 DAS (T₁₁) had the lowest weed index (0.0 %) and the weedy check (T₁₂) recorded the maximum weed index (51.26 %). This was due to controlling and good management of weeds. These results are in agreement with the results reported by Singh and Kumar [4].

At 25 DAS, 50 DAS and at harvest it is clear from the data that treatment of interculturing and hand weeding carried out at 20 & 40 DAS (T₁₁) had the maximum WCE (100 %), and (83.59 %) respectively.

REFERENCES

1. Anon., (2010). Indian Farming. Pp. 9-12.
2. Dhungarwal, H. S., Chaplot, P. C. and Nagda, B. L. (2003). Chemical weed control in greengram (*Phaseolus radiates* L.) *Indian J. Weed Sci.* **35** (3-4): 183-284.
3. Kumar, K. and Kundra, H. C. (2001). Chemical weed control in summer moong (*Vigna radiata* L.) and summer mash (*Vigna mungo* L.) Wilzeck under flood plains of the Punjab. *Indian J. Weed Sci.* **33** (3-4): 200-202.
4. Singh, P. and Kumar, R. (2008). Agro-economic feasibility of weed management in soybean grown in vertisols of south-eastern Rajasthan. *Indian J. Weed Sci.* **40** (1-2): 62-64.