
**RESPONSE OF RABI GREENGRAM (*Vigna radiate* L.) VARIETIES TO
WEED MANAGEMENT PRACTICES UNDER SOUTH GUJARAT
CONDITIONS**

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ABSTRACT

*A field experiment was conducted at College farm, N.M. College of Agriculture, Navsari Agricultural University, Navsari during the year 2010-11 to study "Response of rabi greengram (*Vigna radiate* L.) varieties to weed management practices under south Gujarat conditions". The experiment results revealed that treatment of weed free up to harvest (2 hand weeding & hand hoeing) recorded significantly highest plant height, number of branches per plant, dry matter production per plant, number of pods per plant, number of seeds per pod and test weight besides lowest dry weight of weed (5.17 g/m²) resulted in higher seed (1125 kg/ha) and haulm (2115 kg/ha) yields followed by the treatment of pendimethalin @ 1.00 kg/ha with one hand hoeing at 45 days after sowing. However, all the varieties found equally suitable with similar yield potential having no significant variations among each other.*

KEY WORDS : *Greengram, Growth parameter, Integrated weed management, Pendimethalin, , Yield attributes, Yield*

INTRODUCTION

Green gram locally known as *moong* normally grown during *kharif* and summer seasons. Owing to introduction of new variety suitable for *rabi* season and perennial irrigation facilities in south Gujarat, it has potential to replace other crops like gram and wheat. High infestation of weeds, especially at the early stage of crop growth poses considerable threat in achieving the desire yield of any

crop. Full season competition with the weeds led to 30-80 per cent reduction in grain yield of mung bean during summer and *kharif* seasons and 70-80 % during the spring season (Singh, 1993). Initial 45 days period considered to be critical period with respect to crop weed competition in green gram (Singh *et al.*, 1996). Therefore, inhibiting the growth of weed during initial growth phase of crop consider essential for

better crop yield. The conventional method of weed control (hoing or hand weeding) is labourious, expensive, insufficient and some time causes damage to crop. Chemical weed control certainly has its merit over the existing methods. However, it is not so common as it should have been practiced in commercial scale and also herbicide use may prove uneconomical due to low yield potential of green gram (Reddy, 2004). Under such circumstances, integration of chemical with one hand weeding offers economically suitable alternative. So, there is a huge scope to increase the productivity of this crop by adopting suitable weed management practice. Very scarce scientific information on weed management in *rabi* green gram is available. Hence, this experiment was planned to find out suitable method of weed management in different varieties of greengram.

MATERIALS AND METHODS

A field experiment was conducted during *rabi* season of 2010-2011 at the College Farm, Navsari Agricultural University, Navsari entitled “Response of *rabi* greengram (*Vigna radiate* L.) varieties to weed management practices under south Gujarat conditions”. The soil of the experimental field was clayey in texture, low in available nitrogen (254.00 kg/ha), medium in available phosphorus (32.83 kg/ha) and fairly rich in available potash (349.00 kg/ha).

Eighteen treatment combinations consisting of three

varieties viz., Meha (V₁), CO-4 (V₂) and RTM-1 (V₃) and six weed management treatments viz., Unweeded control (W₁), Weed free up to harvest (2 H.W. & hoeing) (W₂), Pendimethalin @ 1.00 kg/ha + 1 H.H. at 45 DAS (W₃), Imazythapyr @ 0.1 kg/ha at 15 DAS (W₄), Alachlor @ 1.00 kg/ha + 1 H.H. at 45 DAS (W₅) and Quizalofop-p-ethyl @ 0.05 kg/ha at 15 DAS (W₆) were tested by employing factorial randomized block design (FRBD) with three replications. Greengram varieties were sown a row spacing of 30 cm during second week of October. The crop was fertilized with recommend dose of 20-40-0 NPK kg/ha.

The crop was managed as per the standard package of practices. The observations on weed flora, dry weight of weeds at different growth stages as well as yield were taken from the net plot. The data related to each parameter of the experiment were statistically analyzed using MSTATC software. The purpose of analysis of variance was to determine the significant effect of treatments on weed and castor. LSD test at 5% probability level was applied when analysis of variance showed significant effect for treatments (Steel and Torrie, 1980).

RESULTS AND DISCUSSION

Effect of varieties:

All varieties of greengram found equally suitable with similar yield potential for *rabi* cultivation under south Gujarat conditions besides there were no significant difference in growth parameters and yield attributes among various varieties of green gram.

**Effect of weed management practices:
Effect of weed management on
growth parameters**

Significantly the highest plant height was observed (Table 1) under treatment having weed free upto harvest (2 HW & hand hoeing) followed by application of pendimethalin @ 1 kg/ha + 1 hand hoeing at 45 DAS (W₃) and alachlor @ 2 kg/ha + 1 hand hoeing at 45 DAS (W₅). This might be due to reduction in competition resulted in better availability of moisture, nutrient, light and space. The lowest plant height in unweeded control might be due to more competition between crop and weed for moisture nutrient, light and space. All the treatments increased the number of branches per plant and dry matter production per plant as compared to unweeded control (W₁). Treatment of weed free upto harvest (2 HW & HH) (W₂) recorded the highest number of branches and dry matter production per plant closely followed by treatments of pendimethalin @ 1 kg/ha + 1 HH at 45 DAS (W₃). The present results are in close conformity with the findings of Kaur *et al.* (2009) and Raj *et al.* (2010).

**Effect of weed management on yield
attributes and yield**

Almost all the yield attributing characters viz., number of pods per plant, number of seeds per pod and seed index were significantly influenced by various weed management practices. Treatment having weed free up to harvest by 2 H.W. & H.H. at 45 DAS (W₂) recorded significantly higher number of pods per plant (26.11), seeds per pod (11) and seed index (4.23) followed by treatment W₃ (pendimethalin @ 1.00 kg/ha + 1 H.H.) and W₅ (alachlor @ 1.00 kg/ha + 1 H.H. at 45 DAS). While the lowest values of all these characters were noted under the

treatment unweeded control (W₁). This might be due to significant reduction in crop weed competition due to effective control of weeds by these treatments reflected in better growth and development of the crop in term of higher number of pods per plant, seed per pod and test weight. The results are in close association with the findings of Gupta *et al.* (1990) and Borah (1994).

Various weed management treatments influenced significantly the seed and haulm yield of green gram. Significantly the highest seed yield (1125 kg/ha) and haulm yield (2115 kg/ha) were recorded under treatment W₂ (Weed free up to harvest- 2 H.W. & H.H.) being at par with treatment W₃ (Pendimethalin @ 1.00 kg/ha + 1 H.H at 45 DAS) and W₅ (Alachlor @ 1.00 kg/ha + 1 H.H at 45 DAS). The remarkable increase in seed and haulm yield under these treatments might be due to effective control of weeds in terms of reduced weed population and dry weight of weeds, which facilitated the crop to utilize more nutrients and moisture for better growth and development measured in terms of various growth attributing characters such as plant height, number of branches per plant and dry matter production per plant and yield attributing characters like number of pods per plant, number of seed per pod and seed index. All these parameters showed cumulatively positive and significant influence on seed and haulm yields of green gram. These findings are in close agreement with those reported by Borah (1994) and Raj *et al.* (2010). Significantly the lowest seed yield and haulm yield were recorded under unweeded control treatment (W₁).

Based on the results of the field experimentation, it seems quite logical to conclude

that higher yield of *rabi* greengram on vertisols of South Gujarat can be obtained by using either Meha, CO-4 or RTM-1 variety of *rabi* greengram and by keeping them weed free by two hand weedings and hoeings or by pre-emergence application of pendimethalin @ 1 kg/ha coupled with one hand hoeing at 45 days after sowing.

REFERENCES

- Borah, U. K. (1994). Effect of weed control and fertilizer application on productivity of greengram under rainfed condition. *Ann. Agric. Res.* **15** (4): 499-501.
- Gupta, Y. K., Katyal, S. K., Panwar, R. S. and Malik, R. K. (1990). Integrated weed management in summer greengram (*Vigna radiata* (L.) Wilzeck). *Indian J. Weed Sci.* **22** (3-4): 38-42.
- Kaur, G., Bran, H. S. and Singh, G. (2009). Effect of weed management on weeds, growth and yield of summer greengram (*Vigna radiata* (L.) Wilzeck). *Indian J. Weed Sci.* **41** (3-4): 228-231.
- Raj, V.C., Arvadia, M.K. and Patel, D.D. (2010). Effect of integrated weed management practices on *rabi* greengram. *Green Farming.* **1** (4) : 377-379.
- Reddy S.R. (2004). *Agronomy Field Crops*. Kalyani Publications, New Delhi : 359-364.
- Singh, A.N., Singh, S. and Bhan, V.M. (1996). *Indian Journal of Agronomy* **41**(4): 616.
- Singh, G. (1993). Integrated weed management in Pulses. In : *Proceedings of International Symposium organized by Indian Society of Weed Science* at Hissar, November, 18-20 **Vol. I**: 335-342.
- Steel, R.G.D. and Torrie, J.H. 1980. Principles and procedures of statistics, 2nd Edition, pp. 172-77. McGraw Hill Book Co., Singapore.

Table 1: Weed population/m² at 30, 45, 60 DAS and at harvest as influenced by various weed management treatments in *rabi* greengram

Treatments	Plant height (cm)	Number of branches per plant	Dry matter production /plant	Number of pods per plant	Number of seeds per pod	Seed index (g) (100 seed)	Seed yield (kg/ ha)	Haulm yield (kg /ha)
Varieties (V)								
V ₁ = Meha	52.23	3.03	16.66	22.81	9.68	3.91	950	1760
V ₂ = CO-4	55.38	3.21	17.20	23.56	10.26	4.18	965	1843
V ₃ = RTM-1	53.14	3.05	16.44	22.03	9.86	3.91	893	1740
S. Em. ±	1.19	0.07	0.38	0.44	0.22	0.09	23	43
C.D. (P=0.05)	NS	NS	NS	NS	NS	NS	NS	NS
Weed management (W)								
W ₁ =Unweeded Control	47.42	2.33	11.96	16.87	8.19	3.51	504	876
W ₂ =Weed free up to harvest (2 H.W. & hoeing)	59.47	3.61	18.70	26.11	11.00	4.23	1125	2115
W ₃ =Pendimethalin @ 1.00 kg/ha +1 H.H. at 45 DAS	56.74	3.41	18.67	25.20	10.96	4.21	1094	2032
W ₄ =Imazethapyr @ 0.1 kg/ha at 15 DAS	51.51	3.05	17.08	22.90	9.52	3.93	919	1876
W ₅ =Alacholar @ 1.00 kg/ha +1 H.H. at 45 DAS	54.17	3.33	17.12	24.30	10.44	4.11	1065	1953
W ₆ =Quizalofop-p-ethyl @ 0.05 kg/ha at 15 DAS	52.18	2.86	17.09	21.41	9.50	3.99	917	1844
S. Em. ±	1.68	0.09	0.53	0.62	0.31	0.12	32	61
C.D. (P=0.05)	4.82	0.27	1.53	1.77	0.90	0.35	93	174
Interaction								
V X W	NS	NS	NS	NS	NS	NS	NS	NS
C.V. %	9.40	9.03	9.50	8.10	9.41	9.07	10.30	10.21

NS = Non significant, HW = Hand weeding; HH = Hand hoeing
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