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Production Technologies of Red Gram (*Cajanus cajan* L) Adopted by Farmers of Karimnagar District of Telangana

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ABSTRACT

In order to study the adoption of production technologies of red gram by the KVKs adopted versus non-adopted farmers, a questionnaire was developed consisting of 21 technologies measured on 3 point continuum i.e. fully adopted, partially adopted and non adopted with the scores of 3,2,1, respectively. It was observed that, majority (40.0%) of the KVK adopted red gram farmers had medium extent of adoption followed by high (36.67%) and low (23.33%) whereas, majority (43.33%) of the KVK non-adopted farmers had medium extent of adoption followed by low (40.00%) and high (16.67%). Further, calculated 'Z' Value (2.25) was greater than table 'Z' value at 0.01 level of probability. Therefore, the null hypothesis was rejected and hence it could be concluded that there exists a significant difference between mean scores of KVK adopted and non adopted farmers.

Key Words: Adopted and Non Adopted Farmers, Red Gram, Production, Technologies.

INTRODUCTION

Red gram (*Cajanus cajan* L.) requires average rainfall of 600-650 mm with moist conditions for the first eight weeks and drier conditions during flowering and pod development stage, rains during flowering results in poor pollination. However, the critical growth stages are branching, flowering and pod filling where moisture stress causes adverse effect therefore in the absence of rains, heavy irrigation is required. Red gram needs a moist and warm weather i.e. 30 – 35 °C during germination and slightly lower temperature (20 -25°C) during active vegetative growth and at maturity it needs higher temperature of around 35 – 40°C. Water logging, heavy rains, frost are very harmful to the crop. Hailstorm or rain at maturity damages the entire crop. It has a good drought tolerant capacity because of its deep tap root system.

This crop grows well on all types of soils but loam to sandy loam soil is suitable. This crop also does well in sloppy lands in the mid-hills. It can be grown successfully on neutral soils having a pH range of 6.5 to 7.5. Land is prepared by at least one ploughing during the dry season followed by 2 or 3 harrowing and disc ploughing. The seed rate is 15 kg/ha. Red gram should be sown in rows at a distance of 50 cm with seed to seed spacing of 15-20 cm. The crop gives much higher yield if, it is sown in last week of May.

Treat the seeds with Carbendazim or Thiram @ 2 g/kg of seed 24 hours before sowing (or) with powder formulation of Trichoderma viride @ 4g/ kg of seed (or) Pseudomonas fluorescens @ 10 g/ kg seed. Apply 15 kg N and 45 kg P2O5 per hectare is sufficient for this crop. The crop grows very slowly during their early growth period of 45 – 50 days. This makes it less competitive with weeds and If not controlled in time, it can cause up to 90 per cent reductions in seed yield. Red gram should be harvested when 75-80 per cent of the pods turn

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Table 1. Extent of adoption of red gram production technologies.

Category	Adopted red gram farmers (n=60)			Non adopted red gram farmers (n=30)		
	Low (33-55)	Medium (56-78)	High (79-100)	Low (33-55)	Medium (56-78)	High (79-100)
Frequency	14	24	22	12	13	5
Percentage	23.33	40.00	36.67	40.00	43.33	16.67

brown and are dry. Delayed harvesting, during bad-weather, may increase the risk of damage to mature seed. Traditionally red gram plants are harvested by cutting the stem at the base with a sickle, but occasionally machines are used for cutting and followed by drying and threshing. The harvested plants are bundled and placed upright to dry for a week depending on the weather conditions. Pods and grain are separated by beating the dry plants with sticks or by using a thresher.

Being red gram is one of the important crops of Karimnagar district, it was felt to understand the adoption levels of the farmers regarding various production technologies of red gram.

MATERIALS AND METHODS

KVK Jammikunta of Telangana State along with its 15 adopted villages was selected for the study. A sample of 60 red gram growing farmers who were adopting the KVK technologies and another 30 red gram farmers who were not covered under KVK production technologies were selected from the adopted villages. A schedule was developed consisting of 21 technologies to assess the adoption level by the farmers, measured on 3 point continuum i.e. fully adopted, partially adopted and non adopted with the scores of 3,2,1, respectively. Accordingly the respondents were grouped on the basis of frequency and percentage.

RESULTS AND DISCUSSION

Extent of adoption of red gram production technologies by the farmers

It was observed (Table 1) that, majority (40.0%) of the KVK adopted red gram farmers had medium extent of adoption followed by high (36.67%) and low (23.33%) whereas, majority (43.33%) of the KVK non-adopted farmers had medium extent of adoption followed by low (40.00%) and high (16.67%). These results were in agreement with the findings of Rao *et al* (2012).

Comparison between KVK adopted and non adopted red gram farmers in terms of extent of adoption of red gram production technologies

It was evident (Table 2) that, calculated 'Z' Value (2.25) was greater than table 'Z' value at 0.01 level of probability. Therefore, the null hypothesis was rejected and hence it could be concluded that there exists a significant difference between mean scores of KVK adopted and non adopted farmers. These findings were in agreement with Rao *et al* (2017).

Table 2. Comparison between KVK adopted and non adopted red gram farmers in terms of extent of adoption of red gram production technologies.

Sr. No.	Respondent category	Size of the sample(n)	Mean	S.D.	'Z' value
1.	Adopted farmers	60	52.98	7.89	2.25*
2.	Non -adopted farmers	30	25.46	4.32	

*Significant at 0.01 level of probability

Table 3. Item wise analysis of extent of adoption of red gram production technologies by KVK adopted farmers in Karimnagar district. n=60

Sr. No.	Production technologies	Extent of adoption						Total score	Mean score	Rank
		Fully adopted		Partially adopted		Not adopted				
		F	%	F	%	F	%			
1	Optimum seed rate, more profitable as sole crop	60	100.0	0	0.0	0	0.0	180	3.00	I
2	Growing of wilt tolerance varieties PRG 158 and Laxmi in wilt prone area, application of Trichoderma viridi culture (Trichoderma viridi 2 kg in 100 kg FYM) at the time of sowing under optimum moisture conditions	52	86.7	8	13.3	0	0.0	172	2.86	II
3	Growing of LRG 41 is tolerant for helicoverpa	50	83.3	10	16.7	10	16.6	170	2.83	III
4	Providing irrigation at critical stages is important	49	81.9	10	16.6	1	1.5	168	2.80	IV
5	Deep ploughing during summer and destruction of crop residues help to reduce pest / disease incidence	50	83.4	5	8.3	5	8.3	165	2.75	V
6	Sowing of red gram with a spacing of 120 cm x 120 cm	46	76.7	10	16.7	4	6.6	150	2.70	VI
7	Seed treatment with Trichoderma viridi @ 8 gm/kg of seed	42	70.0	12	20.0	6	10.0	156	2.60	VII
8	Soil samples collected up to 15-20cm depth for soil testing	42	70.0	8	13.3	10	16.7	152	2.53	VIII
9	Soil test based fertilizer application is economical	41	68.3	9	15.0	10	16.7	151	2.51	IX
10	Incorporation of FYM into the soil during last ploughing, square plantation leads to higher yields, application of chemical pesticides on ETL levels gives good control of insect pests, spraying of neem oil at 50% flowering,	40	66.6	10	16.7	10	16.7	150	2.50	X
11	Use of Rhizobium bio-fertilizer reduce the usage of nitrogenous fertilizer, spraying of pre emergence herbicide pendimethalin @ 2.5 l/ha	33	55.0	12	20.0	15	25.0	138	2.30	XI
12	Application of biological pesticides controls insect pest, under limited irrigation facilities good net returns	30	50.0	15	25.0	15	25.0	135	2.25	XII

Table 4. Item wise analysis of extent of adoption of red gram production technologies by KVK non adopted farmers in Karimnagar district. n=30

Sr. No.	Red gram production technologies	Extent of adoption						Total score	Mean score	Rank
		Fully adopted		Partially adopted		Not adopted				
		F	%	F	%	F	%			
1	Growing of red gram variety LRG 41 is tolerant for helicoverpa Optimum seed rate is important	20	66.6	5	16.7	5	16.7	75	2.50	I
2	Square plantation facilitates good crop canopy, more profitable as sole crop ,spraying of neem oil at 50% flowering	15	50.0	10	33.3	5	16.7	70	2.33	II
3	Application of culture (Trichoderma viridi) 2 kg in 100 kg FYM) at the time of sowing will reduce the wilt incidence, application of chemical pesticides is economical,IPM in red gram reduces the pod borer incidence.	10	33.3	19	63.4	1	3.3	69	2.30	III
4	Growing of red gram variety PRG 158 and Laxmi in wilt prone area gives higher yields.	13	43.3	12	40.0	5	16.7	68	2.26	IV
5	Incorporation of FYM into the soil during last ploughing, square plantation leads to higher yields, application of chemical pesticides on ETL levels gives good control of insect pests.	12	40.0	12	40.0	6	20.0	66	2.20	V
6	Deep ploughing during summer and destruction of crop residues help to reduce pest / disease incidence	16	53.3	0	0.0	14	46.7	62	2.16	VI
7	Spraying of pre emergence herbicide pendimethalin @ 2.5 l/ha will reduce weed infestation.	5	16.7	10	33.3	15	50.0	50	1.66	VII
8	Use of Rhizobium bio fertilizer will reduce the usage of nitrogenous fertilizer	6	20.0	8	26.7	16	53.3	40	1.33	VIII

The data (Table 3) indicates the item analysis of the KVK adopted farmers in red gram crop on extent of adoption possessed by them on red gram technologies. It was noted that the technologies on which the respondent had high adoption were usage of optimum seed rate, more profitable as sole crop , ranked 1st followed by growing of PRG 158 variety, wilt management with Trichoderma viridi (2nd), growing of LRG 41 variety (3rd), providing irrigation at critical stages (4th), deep summer ploughing (5th), square plantation (6th) . The adopted farmers had lowest extent of adoption on usage of biological pesticides. On the other hand, most of the non adopted KVK farmers adopted practices like growing of LRG 41 variety, use of optimum seed rate, were ranked 1st followed by square plantation, spraying of neem oil, more profitable as sole crop (2nd), wilt management with Trichoderma viridi, providing irrigation at critical stages, adoption of IPM practices (3rd), growing of PRG 158 variety (4th), seed treatment(5th), deep summer ploughing (6th) etc.

Adopted farmers of red gram crop had high extent of adoption on usage of optimum seed rate, profitability of red gram as a sole crop, growing of LRG-41 and PRG-158 varieties, wilt management with Trichoderma viridi, square plantation etc. The reasons could be that KVK scientists conducted series of demonstrations at the farmers' fields of adopted village. In these demonstrations, the farmers were practically seen the performance of the technologies. KVK also taken up seed production of improved varieties at the KVK farm and supplied to the farmers which facilitated high extent of adoption. KVK scientists conducted several method demonstrations, group discussions, farmer – scientist interactions, front line demonstrations which paved way for high extent of adoption of these technologies. The adopted farmers had lowest adoption of usage of biological pesticides due to non availability of quality inputs in the local market.

Similarly, most of the non adopted farmers had high extent of adoption on usage of LRG-41 variety, use of optimum seed rate, square plantation, red gram as sole crop, wilt management, seed treatment etc. The reasons could be the non adopted farmers were motivated by the adopted farmers experience in achieving higher net returns by adopting more technologies. These non adopted farmers learnt by participating in extension activities and also shared the experiences of adopted farmers.

CONCLUSION

High extent of adoption of red gram production technologies was seen among the farmers adopted by the KVK Jammikunta compared to the non adopted farmers. This could be due to the multiplicity of the transfer of technology mechanisms followed by the KVK scientists in the adopted villages especially for the benefit of farmers adopted by the KVK.

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