

ADOPTION OF ANGRAU RECOMMENDED REDGRAM PRODUCTION TECHNOLOGY BY THE FARMERS OF GUNTUR DISTRICT OF ANDHRA PRADESH

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ABSTRACT

The study analyzed the adoption of recommended redgram production techniques among farmers in Guntur district during 2022-23. Findings revealed that while farmers largely followed advice on soil, spacing, and harvesting, adoption rates were lower for fertilizer and water management, seed treatment, disease and pest management, intercropping, and sowing time. Lack of awareness, confidence, and influence from dealers and neighboring farmers were cited as primary reasons for non-adoption. Positive correlations were found between farmers' education, experience, extension contacts, and training with their adoption levels. Farmers cited constraints such as Maruca and pod fly infestations, low yields, wilt, high cultivation costs, and water scarcity during critical stages.

KEYWORDS: Adoption, redgram, ANGRAU recommended production technology, correlation, constraints

India is the largest producer (25 per cent of global production), consumer (27 per cent of world consumption) and importer (14 per cent) of pulses in the world (Chavan *et al.*, 2017). India accounts for about 80 per cent of the total world redgram production. India ranks first in redgram production globally with 42.8 lakh tonnes cultivated under 48.24 lakh hectares with productivity of 887 kg/hectare in 2020-21 (agricoop.nic.in). It is one of the principal dry land crops in Andhra Pradesh with a very low productivity (601 kg ha⁻¹). Redgram is an important pulse crop of 170 days duration mainly sown in kharif and rabi and harvested in December. It is best suited to areas having low to moderate rainfall. The production is constrained by the use of less productive land, water logging or dry spells during critical stages of crop growth, spotted pod borer, pod fly and wilt problems, and lack of appropriate agronomic management. Andhra Pradesh produced 0.84 lakh tonnes contributing 1.96% to total India's production cultivated in an area of 2.31 lakh hectares with 363 kg/hectare productivity in 2020-21 (Final Estimates). According to 2nd advance estimates during 2021-22, redgram was grown in 2.51 lakh hectares with a production of 1.21 lakh tonnes and productivity was 482 kg/ha. In Guntur district, redgram is cultivated in 20,000 ha. with a production of 15,000 tonnes and with highest (729 kg/ha.) productivity in Andhra Pradesh state. (ANGRAU Redgram Outlook Report- January to December, 2021)

Redgram crop occupy considerable area in Guntur district, keeping the importance of this crop cultivation in the district, a need was felt to analyse and understand the adoption pattern of recommended technology. In this context, an attempt was made by the Extension department of Regional Agricultural Research Station, Lam, Acharya N.G.Ranga Agricultural university during the year 2022-23 to study the extent adoption of ANGRAU recommended Redgram production technology by the farmers of Guntur district, reasons for non-adoption, relationship between profile characteristics of farmers and their adoption and constraints in production.

MATERIAL AND METHODS

The present investigation was conducted during the year 2022-2023 by the extension department of Regional Agricultural Research Station, Lam, Guntur. Multistage sampling design has been adopted for selection of sample. Five mandals with highest redgram areas were selected purposively for the study. From each mandal, two villages with highest redgram areas were purposively selected. From each village, 10 farmers were randomly selected thus making the sample size to 100 redgram cultivating farmers. The data were collected through personnel interview, tabulated and analysed to find out the results and draw the conclusions. The results were analysed with the help of different statistical tools such as frequency, percentage rankings and correlation analysis.

Extent of adoption of recommended cultivation practices of Redgram was measured considering the ANGRAU recommended Redgram production technology. Adoption was studied with respect to recommended variety, sowing time, soils, seed rate, spacing, seed treatment, water management, fertilizer management, weed management, pest management, disease management and post-harvest management. Where ever considerable deviation was observed with respect to adoption of recommended practices, respondents were asked for reasons for non-adoption and they were tabulated using frequencies and percentages. Correlation analysis was carried out to understand the relationship between farmers' selective personal, socio-economic and psychological characteristics with their adoption of recommended package of practices. To know the prominent constraints in Redgram cultivation, open ended question was posed to farmers and based on their response constraints were categorized and tabulated using frequency and percentage.

RESULTS AND DISCUSSION

Adoption pattern of recommended Redgram production technology by the farmers

It could be noticed from Table 1 that cent per cent of the Redgram farmers adopted soils, spacing and harvesting as recommended by the ANGRA University. Great majority of the farmers adopted varieties (91.00%), seed rate (80.00%) and weed management (55.00%). But majority of the farmers were not adopting fertilizer management (93.00%), water management (89.00%), seed treatment (88.00%), disease management (77.00%), intercrops (72.00%), sowing time (68.00%) and pest management (62.00%). With respect to soils, spacing and varieties, similar results were reported by Khairnar *et al.*, 2019 in their study on Economic impact of redgram production technology on farm productivity and income in Western Maharashtra. The findings with respect to fertilizer management, irrigation and seed treatment were in conformity with the results of Mohd. Riyaz *et al.*, 2020

Reasons for non-adoption of ANGRAU recommended Redgram package of practices

Sowing time: It is evident from Table 2 that, delayed monsoon was the major reason for deviation in sowing time (66.00%).

Seed treatment : Lack of awareness was the first and foremost reason for non-adoption of seed treatment as expressed by sixty one per cent of farmers, followed by lack of confidence on the practice (32.00%) and non-availability of Trichoderma at the time of sowing (28.00%). Hence to create awareness and to establish confidence, State Department of Agriculture needs to organize demonstrations at village level and ensure availability of Trichoderma at the time of sowings through RBK system.

Fertilizer management: With respect to fertilizer management, non- availability of FYM (74.00%) was the reason for not using FYM as recommended. To overcome this issue, introducing shredders to incorporate redgram plants after harvesting may help to add organic matter to soils to some extent. More than fifty per cent of the farmers were using higher level of fertilizers than recommended due to the assumption, that as their soils are low fertile more fertilizers are required. Other side, forty five per cent of the redgram famers were not at all applying any fertilizer to redgram crop with a confidence that fertilizers applied for tobacco or chilli during the previous year are sufficient for redgram. Some of the farmers due to lack of awareness on exact fertilizer recommendation for redgram crop (23.00%) were not adopting as recommended. In order to address this issue, Integrated Nutrient Management in redgram demonstrations using soil analysis results may convince the farmers to adopt required fertilizers to realize optimum yields.

Water management: Even though redgram is cultivated under rain fed situation, in case of continuous dry spells, delayed sowings and rabi cultivation one or two light irrigations are recommended for redgram. But great majority (83.00%) of the farmers failed to provide irrigations even at critical stages due of non-availability of irrigation water.

Weed management: Sixty one per cent of the farmers were not using herbicides as the redgram crop cultivation is not remunerative with poor yields, in order to reduce the cost of cultivation they were avoiding herbicide use. Some of the farmers (32.00%) were not adopting weed management as recommended as they were not aware of herbicides recommended for redgram crop.

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Intercrops: Top most reason for avoiding intercrops in redgram was wild boar problem (65.00%), followed by difficulty in inter cultivation (41.00%), yields are effected when intercropped with bajra (38.00%) and difficulty in harvesting (29.00%). With these reasons farmers are preferring redgram as solo crop.

Pest management: Influence of dealers and neighbours was the prime reason for deviation in pest management by the farmers (71.00%). Sixty eight per cent of the farmers were using combination chemicals instead of recommended pesticides. Lack of awareness on pests identification was also one of the major reasons for improper pest management in case of almost fifty per cent of the farmers.

Disease management: Almost seventy per cent of the farmers were using unnecessary fungicides due to lack of awareness on disease management, particularly in case of Sterility Mosaic Disease (SMD) and wilt. Sixty per cent of the farmers were still using locally available varieties as they were not aware of disease resistant or tolerant varieties. Hence introduction of SMD and wilt resistant varieties is the need of the hour to sustain redgram cultivation in pandemic areas.

Based on the understanding of the reasons for the non-adoption of recommended redgram technology, it can be inferred that, majority of farmers

lack awareness on crucial practices such as seed treatment, fertilizer management, weed, pest, and disease management. This indicates a significant extension gap in the study area. Consequently, the Department of Agriculture should undertake concerted efforts to bridge this gap through robust awareness programs and field demonstrations. These initiatives aim to enhance knowledge levels among farmers, instill confidence in recommended production techniques, and ultimately boost yield potentials in redgram crops. By improving awareness and demonstrating the effectiveness of recommended practices, farmers can be empowered to adopt these technologies and enhance their agricultural productivity.

Relationship between profile of Redgram Farmers with their Adoption

The findings from Table 3 indicate a significant positive relationship between the education level and farming experience of redgram farmers and their adoption of recommended practices, at a significance level of 5%. Additionally, extension contacts and training undergone showed a highly significant positive relationship with adoption, at 1% significance level.

This result suggests that education, farming experience, extension contacts, and trainings

Table 1. Adoption pattern of recommended Redgram production technology by the farmers
n=100

S.No	Adoption	Adopted		Not Adopted	
		Frequency	Percentage	Frequency	Percentage
1	Varieties	91	91.00	9	9.00
2	Seed rate	80	80.00	20	20.00
3	Sowing time	32	32.00	68	68.00
4	Soils	100	100.00	0	0.00
5	Spacing	100	100.00	0	0.00
6	Seed treatment	12	12.00	88	88.00
7	Fertilizer management	7	7.00	93	93.00
8	Water management	11	11.00	89	89.00
9	Weed management	55	55.00	45	45.00
10	Intercrops	28	28.00	72	72.00
11	Pest management	38	38.00	62	62.00
12	Disease management	23	23.00	77	77.00
13	Harvesting	100	100.00	0	0.00

Table 2. Reasons for non-adoption of ANGRAU recommended Redgram package of practices**n=100**

S.No	Technology recommendation		Frequency	Percentage
1	Sowing time	Delayed monsoon	66	66.00
2	Seed treatment	Lack of awareness	61	61.00
		Lack of confidence	32	32.00
		Non availability of Trichoderma at the time of sowing	28	28.00
3	Fertilizer management	With a confidence that fertilizers applied for tobacco or chilli are sufficient for redgram	45	45.00
		Lack of awareness	23	23.00
		With an assumption that as their soils are low fertile more fertilizers are required	51	51.00
		Non availability of FYM	74	74.00
4	Water management	Non availability of irrigation water due to complete rainfed situation	83	83.00
5	Weed management	Lack of awareness on herbicides use	32	32.00
		To reduce cost of cultivation	61	61.00
6.	Intercrops	Wild boar problem	65	65.00
		yields are affected when intercropped with bajra	38	38.00
		Difficulty in inter cultivation	41	41.00
		Difficulty in harvesting	29	29.00
		Bird damage	33	33.00
7	Pest management	Using combination of pesticides	68	68.00
		Lack of awareness on pests identification	49	49.00
		Dealers and neighbor farmers influence	71	71.00
8	Disease management	Lack of awareness on SMD initial symptoms and management	46	46.00
		Lack of confidence on Trichoderma soil application	31	31.00
		Lack of awareness on disease management, using unnecessary fungicides	69	69.00
		Using locally available varieties	60	60.00

undergone play vital roles in enhancing farmers' knowledge of the latest technological advancements, thereby increasing the likelihood of adoption in their fields. Given the critical importance of extension contacts and training in driving adoption, there is a need to prioritize efforts to encourage farmers to engage more extensively

with extension services and participate in capacity-building programs at the village level. By facilitating greater access to extension services and providing comprehensive training opportunities, agricultural authorities can empower farmers with the knowledge and skills necessary to effectively implement

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Table 3. Relationship between profile of Redgram Farmers with their Adoption

S. No	Independent variable	Correlation co-efficient ('r')
1	Education	0.209 *
2	Land holding	0.152 NS
3	Farming experience	0.251 *
4	Economic motivation	0.142 NS
5	Social participation	0.157 NS
6	Extension contact	0.412 **
7	Risk orientation	0.106 NS
8	Trainings undergone	0.363 **

* and ** indicate significance of values at P=0.05 and 0.01 respectively NS = Non -significant

Below fifty per cent of redgram farmers felt severe incidence Sterility Mosaic Disease (48.00%), severe flower drop (45.00%), untimely rains (42.00%), no procurement by the Government (40.00%) and low Minimum Support Price (33.00%) were the constraints in redgram cultivation.

The constraints identified underscore the challenges associated with cultivating redgram in poor soils coupled with inadequate management practices, leading to poor yields and increased cultivation costs. Specifically, addressing pest and disease management requires a concerted effort from extension functionaries to bridge the existing extension gap. This can be achieved by organizing a greater number of capacity-building training programs and demonstrations, alongside introducing resistant or tolerant varieties.

Table 4. Constraints experienced by the farmers in Redgram cultivation

n=100

S.No	Constraint	Frequency	Percentage	Rank
1	Increased <i>Maruca</i> incidence	81	81.00	I
2	Poor yields due to pests and diseases	77	77.00	II
3	Increased Pod fly incidence	69	69.00	III
4	Severe wilt incidence	65	65.00	IV
5	Increased cost of cultivation	64	64.00	V
6	Non- availability of irrigation water at critical stages	62	62.00	VI
7	Severe Sterility Mosaic Disease incidence	48	48.00	VII
8	Severe flower drop	45	45.00	VIII
9	Untimely rains	42	42.00	IX
10	No procurement by the Government	40	40.00	X
11	Low Minimum Support Price	33	33.00	XII

recommended redgram production technologies. This, in turn, can lead to improved agricultural productivity and economic outcomes for farmers.

Constraints experienced by the farmers in Redgram cultivation

It is evident from Table 4 that majority of the redgram farmers were experiencing constraints like increased *Maruca* incidence (81.00%), poor yields due to pests and diseases (77.00%), increased pod fly incidence (69.00%), severe wilt incidence (65.00%), increased cost of cultivation (64.00%) and non-availability of irrigation water at critical stages (62.00%).

Moreover, government intervention is crucial in facilitating farmers by ensuring reasonable Minimum Support Prices (MSP) and timely procurement. By providing farmers with adequate support and resources, policymakers can alleviate some of the financial burdens associated with redgram cultivation, thereby promoting sustainable agricultural practices and improving overall crop yields. Vijaya Preethi and Uma Devi (2019), Ashokkumar Bansilal *et al.*, 2020 and Sumitra Singh *et al.*, 2022 in their study reported, increased cost of cultivation, pests and disease incidence were some of the major constraints expressed by the farmers in redgram cultivation.

CONCLUSION

The study indicates a near-complete adoption of basic practices such as soil management, spacing, and harvesting, suggesting that farmers are receptive to fundamental agricultural guidance. While there is substantial uptake of certain practices like selecting varieties and managing seed rates and weeds, there is notably low adoption of crucial practices such as fertilizer and water management, seed treatment, disease and pest management, intercropping, and timely sowing. Lack of awareness, confidence, and influence from dealers and neighbouring farmers emerge as key barriers to adopting recommended technologies. Addressing these barriers could potentially increase adoption rates. The study identifies a positive relationship between education, farming experience, extension contacts, and training with adoption levels. This suggests that targeted education and training programs could enhance adoption rates. Farmers cited various challenges including *Maruca* and pod fly infestations, low yields, wilt, high cultivation costs, and water scarcity during critical stages. Addressing these constraints through improved pest and disease management and cost-effective agricultural practices could improve overall productivity and profitability. In conclusion, while there are encouraging signs of adoption for certain practices, there is a clear need for targeted interventions to address barriers and constraints hindering the adoption of recommended technologies. This could involve tailored educational programs, extension services, and support systems to empower farmers and enhance agricultural productivity and resilience in Guntur district.

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