*Asian Journal of Agricultural Extension, Economics & Sociology*

***Volume 41, Issue 3, Page 139-144, 2023; Article no.AJAEES.97360***
***ISSN: 2320-7027***

# Constraints in Rice Fallow Pulses Production in Srikakulam District of Andhra Pradesh

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***Authors' contributions***

*This work was carried out in collaboration among all authors. Author PVR designed the study prepared the schedule and collection of data. Author GC performed the statistical analysis. Author SN wrote the protocol and wrote the first draft of the manuscript. Author JJ corrected the final manuscript. All authors read and approved the final manuscript.*

***Article Information***

DOI: 10.9734/AJAEES/2023/v41i31869

**Open Peer Review History:**
This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: https://www.sdiarticle5.com/review-history/97360

***Original Research Article***

***Received: 02/01/2023***
***Accepted: 06/03/2023***
***Published: 11/03/2023***

## ABSTRACT

Rice fallow cultivation constitutes the major portion of pulse production particularly black gram and green gram in Srikakulam district of A.P. Farmers are reaping lower yields of 3.75-5.00 q/ha against 15.0-20.0 q/ha of its potential. Keep this in view an extension study was conducted on the study of constraints and reasons for low productivity in Pulses in Srikakulam District. Ex-post-facto research design was used for the study with a total sample size of 60. Results revealed that the low soil fertility was the major constraint in pulses production (100%), the incidence of yellow vein mosaic virus (93.33), labour scarcity and incidence of low temperatures and fog during the flowering period i.e., the first fort night of January (88.33%), weed infestation particularly vicia, cuscuta. xanthium and Echinochloa (86.67%). Lack of YVMV resistant varieties and suitable

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varieties (83.33%) and lack of a regulated market (96.67%) were the major technical or situational constraints. Non-adoption of irrigation management (93.33%), non-adoption of seed treatment (91.67%), non -adoption of proper sowing (way of broadcast) method and seed rate (90.00), non-adoption of weed management practices (88.33%), non- adoption of foliar nutrient management in rice fallow pulses (86.67%) were the adoption gaps perceived as constraints. There is a need to conduct more Front Line Demonstrations (FLDs) in the farmer fields, more training programmes to the farmers and timely supply of inputs or make available to the farmers prior to the season.

*Keywords: Knowledge; adoption; partial adoption; constraints; situational constraints.*

## 1. INTRODUCTION

Pulses are major sources of proteins among vegetarians in India and complement the staple cereals in diets with proteins, essential amino acids, vitamins and minerals. They contain 22-24 % protein, which is almost twice the protein in wheat and thrice that of rice. Pulses contribute 11 per cent of the total intake of proteins in India [1]. Rice fallow cultivation constitutes the major portion of pulse production particularly black gram and green gram in Srikakulam district of A.P. Farmers are reaping lower yields of 3.75-5.00 q/ha against 15.0-20.0 q/ha of its potential. Keep this in view an extension study was conducted on the study of constraints and reasons for low productivity in Pulses in Srikakulam District as per the approval of the State Level Technical Programme (SLTP) 2021 [2]. This study was conducted by the Extension Scientist of the District Agricultural Advisory and Technology Transfer Centre(DAATTC) of Srikakulam, an extension unit of Acharya N.G Ranga Agricultural University.

## 2. MATERIALS AND METHODS

The study was conducted in selected six Mandals purposively based on crop coverage (pulses). They are Santhakaviti (3838ha), Palakonda (3660ha), Veeraghattam (3646ha), Burja(3286ha), Polaki (3840ha) and Narasannapeta (3000ha) Mandals. Two villages from each Mandal were selected. They are Mandavakurity (200ha) and Manthina (145ha) of Santhakaviti Mandal, Velagada (112ha) and Vadama ((128ha) of Palakonda Mandal, Nadimikella (98ha) and Nadukuru (95ha) of Veeraghttam Mandal, Neelakantapuram (102ha) and Lakkupuram(95ha) of Burja mandal, Thotada (96ha) and Vurjam (92ha) of Polaki Mandal, Vurlam (112ha) and Lukalam (85ha) of Narasannapata Mandal. Five farmers from each village were selected randomly for the study. Thus the total sample size was 60. Ex-post-facto research design was used for the study as the variables already occurred. The interview schedule was prepared and data collected from the farmers on knowledge, adoption and constraints faced and as perceived by them.

This study was based on a descriptive analysis of the collected data from the selected sample of farmers. Hejase et al. [3] contend that informed objective decisions are based on facts and numbers, real, realistic, and timely information. Furthermore, according to Hejase and Hejase [4], “descriptive statistics deals with describing a collection of data by condensing the amounts of data into simple representative numerical quantities or plots that can provide a better understanding of the collected data” (p. 272). Therefore, this study used frequencies and percentages as primary data to conduct further analysis. The data were quantified and ranked based on frequency and percentage of respondents.

## 3. RESULTS AND DISCUSSION

Results were tabulated based on the cumulative frequency of variables and their corresponding percentages. Total cumulative frequency of responses 720 (i.e., 12 question items for 60 farmers of the sample, N=60).

**Table 1. Knowledge level of respondent farmers**

| S. No | Knowledge item | Cumulative Frequency of responses | Percentage |
|---|---|---|---|
| 1 | Not Awareness | 302 | 41.94 |
| 2 | Awareness | 244 | 33.89 |
| 3 | Knowledge | 174 | 24.17 |
| | **Total** | **720** | **100** |

Table 1 and Fig. 1 show that about 42 % per cent of the farmers not aware of the package of practices of pulses particularly black gram and green gram as per the recommendations of ANGRAU [5] followed by those farmers who are aware (33.89%) and those who have the knowledge by 24.17 %.

The above-mentioned results may be due to the low education (literacy) and less extension contact of farmers [6]. Item analysis revealed that the farmers not aware about the recommended package of practices particularly use of farm machinery, sowing method, foliar nutrient management and the existence of high- yielding varieties.

It can be observed from Table 2 and Figure that about 48 % of the farmers did not adopt the recommended package of practices of black gram and green gram. About 35% of the farmers partially adopted the recommended package of practices of black gram and green gram. Finally, about 18% of the respondent farmers adopted the package of practices as per the recommendations. A low adoption rate might be due to the lack of knowledge of recommended technologies and situational constraints [6,7].

**Table 2. Adoption of package of practices of Rice fallow pulses**

| S. No | Adoption items | Cumulative Frequency of responses | Percentage |
|---|---|---|---|
| 1 | Non Adoption | 344 | 47.78 |
| 2 | Partially adoption | 249 | 34.58 |
| 3 | Full Adoption | 127 | 17.64 |
| | **Total** | **720** | **100** |

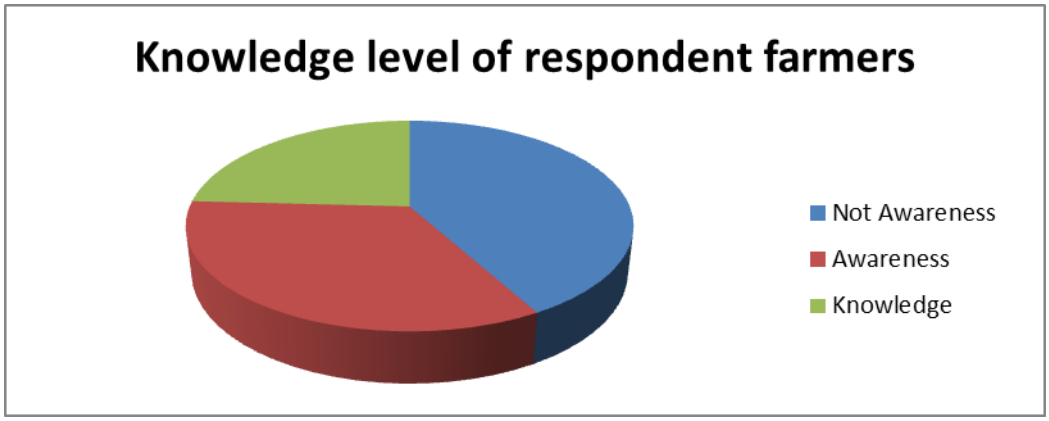


**Fig. 1. Respondent farmers' Knowledge level**

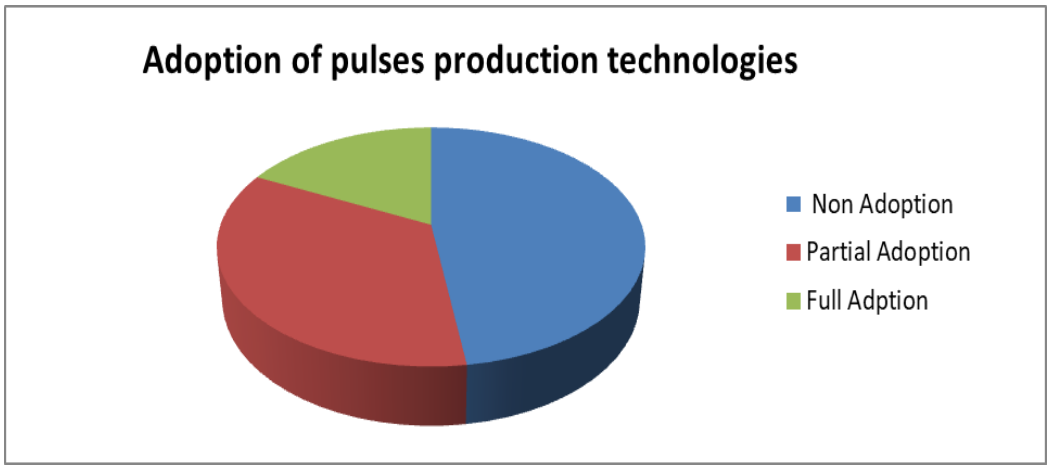


**Fig. 2. Adoption of Pulses production technologies**

**Constraints faced and perceived the respondent farmers:** Based on the literature [8-10] and on discussion with experts constraints are categorized into technical or situational and extension gaps perceived as constraints.

It can be revealed from Table 3 that low soil fertility was the major constraint in pulses productivity (100%).It might be due to the fact that the majority of the Srikakulam soils are red sandy loams, non-application of FYM and green manure years together, followed by the incidence of yellow vein mosaic virus (93.33%), labour scarcity, and incidence of low temperatures and fog during the flowering period i.e., first fortnight of January ( 88.33%), Weed infestation particularly vicia, cuscuta. xanthium and Echinochloa (86.67%) and the lack of YVMV resistant & suitable varieties (83.33%) and the lack of a regulated market (96.67%) were the major constraints. There is a need to create awareness among the farmers about the availability of resistant varieties and the measures to mitigate fog incidence.

Table 4 depicted that Non-adoption of irrigation management (93.33%)was perceived as a constraint, it might be due to two reasons one is due to the apprehension of the withering of plants due to excessive moisture and another one due to the non-availability of water at that time. Non -adoption of seed treatment (91.67%) is another constraint, it might be due to a lack of awareness of its benefits as it reduces the incidence of sucking pests. Non- adoption of proper sowing (way of broadcast) method and seed rate (90.00%) due to apprehension of poor germination and ignorance .Non adoption of weed management practices (88.33%) is another major constraint, it might be due to a lack of knowledge on weedicides suitable for different weeds, lack of moisture at that time, and apprehension about the injury to the crop. Non adoption of foliar nutrient management in rice fallow pulses (86.67%). In rice fallow pulses application of fertilizers is not possible and for better growth and yield it is very required to spray foliar nutrients but most of the farmers did not follow .Non- adoption of existing high-yielding varieties (80.00%). There are certain YMV resistant varieties like LGB787, TBG104, GBG1 of black gram and TM96-2, IPM2-14, and LGG460 varieties of green gram are available but most of the farmers did not adopt. So there is a need to conduct Front Line Demonstrations in the farmer's fields [11]. Non-adoption of pest management (76.67%), it might be due to a lack of knowledge on pests, ignorance and negligence. Non -adoption of sowing window in time (75.00%) were the major constraints.

**Table 3. Situational or technical constraints**

| S. No | Constraints | Frequency | Percentage | Rank |
|---|---|---|---|---|
| 1 | Low soil fertility (low organic carbon) | 60 | 100 | I |
| 2 | Lack of YVMV resistant varieties & suitable varieties | 50 | 83.33 | VI |
| 3 | Incidence of Yellow Mosaic Virus Disease | 56 | 93.33 | II |
| 4 | Uncontrolled water flow at the time of sowings | 28 | 46.67 | XIII |
| 5 | Cropcan not withstand even little water stagnation | 40 | 66.67 | X |
| 6 | Prevalence of moisture stress at the time flowering and pod development | 45 | 75.00 | VIII |
| 7 | Incidence of Low temperatures and fog during flowering period i.e first fort night of January | 53 | 88.33 | IV |
| 8 | No possibility of inter cultivation | 36 | 60.00 | XI |
| 9 | Weed infestation particularly vicia, cuscuta. xanthium and Echinochloa | 52 | 86.67 | V |
| 10 | Not withstand to soil salinity which is increasing year by year | 42 | 70.00 | IX |
| 11 | Incidence of maruca & spodoptera infestation | 48 | 80.00 | VII |
| 12 | Pod dehiscence at the time of harvesting | 30 | 50.00 | XII |
| 13 | Labour scarcity | 55 | 91.67 | III |
| 14 | Incidence of powdery mildew | 25 | 41.67 | XIV |
| | **Market related constraints** | | | |
| 15 | Lack of regulated market | 55 | 91.67 | I |
| 16 | Price fluctuation | 42 | 70.00 | II |

**Table 4. Extension gaps perceived as constraints**

| S. No | Constraint particulars | Frequency | Percentage | Rank |
|---|---|---|---|---|
| 1 | Due to lack of knowledge and ignorance | 42 | 70.00 | IX |
| 2 | Non- adoption of existing high yielding varieties | 48 | 80.00 | VI |
| 3 | Supply of seed by the Department not in time | 35 | 58.33 | X |
| 4 | Non- adoption of seed treatment | 55 | 91.67 | II |
| 5 | Non- adoption of proper sowing (way of broadcast) method and seed rate | 54 | 90.00 | III |
| 6 | Non- adoption of sowing window in time | 45 | 75.00 | VIII |
| 7 | Non- adoption of foliar nutrient management in rice fallow pulses | 52 | 86.67 | V |
| 8 | Non- adoption of weed management practices | 53 | 88.33 | IV |
| 9 | Non- adoption of pest management | 46 | 76.67 | VII |
| 10 | Non- adoption of irrigation management | 56 | 93.33 | I |

## 4. CONCLUSIONS

Low soil fertility was the major constraint in pulses productivity, Non- application of FYM and green manure years together, followed by the incidence of yellow vein mosaic virus, laour scarcity, and incidence of low temperatures and fog during the flowering period *i.e.,* first fort night of January, Weed infestation particularly vicia, cuscuta. Xanthium and Echinochloa, Non-adoption of irrigation management, Non-adoption of seed treatment, Non- adoption of weed management practices were the major constraints in pulses production. There is a need to conduct more FLDs in the farmer fields and training programmes for the farmers and timely supply of inputs or make them available to the farmers prior to the season.

## ACKNOWLEDGEMENTS

I am very thankful to my Associate Director of Research, RARS, Anakapalle, Dr. M. Bharata Lakshmi who gave me full cooperation in doing my work; I would also like to thank my university for timely instructions.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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