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## Enhancement of Production and Productivity of Arhar Crop through Front Line Demonstration

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### **Abstract:**

*This study investigates the enhancement of production and productivity of arhar crop through front line demonstration. The study was carried out during kharif season in six villages of Sambalpur district during 2010-11 to 2013-14 in 35 ha by active participation of 97 nos of farmers with the objective to demonstrate the improved technology of Arhar production potential. The improved technologies consisting use of modern variety, seed treatment with Rhizobium culture@20g/kg and Bavistin @ 2g/kg of seed, balanced fertilizer application on the basis of soil test value and pest management. The result showed that the front line demonstration over period of four years (2010-11 to 2013-14) shows that 39.34% increase in yield over farmers practice. The results also revealed that as an impact of FLD, there is a significant change in the extent of adoption of the interventions like varietal replacement with ICPL-87119( 67% ), Nutrient Management( 61.9%), Plant Protection Measures( 54.7%), seed treatment (59.7%) and weed management(35.6%).*

**Keyword:** Enhancement, frontline demonstration, pulse crops, technology

### **1. Introduction**

Arhar is the second most important pulse crop in India and mostly grown in all parts of the country. The area, production and productivity of Arhar in Odisha is 140.87 (000) ha, 128.48(000) MT and 9.12q/ha respectively. The area, production and productivity of Arhar in Sambalpur district is 2.50(000) ha, 2.49(000) MT and 9.94q/ha respectively. Hence the productivity is far below the potential yield (Avg.20q/ha).

Front Line Demonstration is the one of the most effective technology transfer method evolved by the Indian Council of Agricultural Research with the inception of the Technology Mission on Oilseed Crops during mid-eighties. The field demonstrations conducted under the close supervision of scientists of the National Agriculture Research System are called front-line demonstrations because the technologies are demonstrated and critically examined by the scientists themselves before being fed into the main extension system of the State Department of agriculture. The main objective of Front-Line Demonstrations is to demonstrate newly released crop production and protection technologies and its management practices in the farmers' field under different agro-climatic regions and farming situations. While demonstrating the technologies in the farmers' field, the scientists are required to study the factors contributing to higher crop production, production constraints and thereby, generate production data and feedback information. Front-Line Demonstrations are conducted in a block of two or four hectares land in order to have better impact of the demonstrated technologies on the farmers as well as field level extension functionaries. A study was therefore designed to assess the increase yield potential of Arhar crop, particularly in Sambalpur district of Odisha.

### **2. Methodology**

Front line demonstration was conducted by Krishi Vigyan Kendra, Sambalpur of Odisha State during 2010-11 to 2013-14 in villages i.e. Kechupani of Bamra block, Dangerpada, Thakurmal and Sanatanpalli of Jujomora block, Papdera of Dhankauda block and Rairakhhol of Rairakhhol block of Sambalpur districts. All total 97 numbers of farmers were covered under the above programme. The component demonstrated of frontier technologies in Arhar i.e. Improved variety ICPL-87119 (Asha), balanced dose of fertilizers (20:40:20 NPK, Kg/ha) and seed treatment with Rhizobium culture@ 20g/Kg and Bavistin @ 2g/kg of seeds. Areas were taken in 5 ha in the year 2010-11 and 10ha in the year from 2011-12 to 2013-14. All the production and protection interventions were applied in similar manner both to demonstration and farmers practices. Evaluation was made with focus group discussions, field days during

crop cutting and collecting information from individual farmer to assess the enhancement of production and productivity of Arhar crop through front line demonstration. All the 97 farmers were involved in the evaluation process.

### 3. Result and Discussion

Demonstrations were conducted on frontier technologies which were assessed and compared with farmers practice through participatory approach for the period 2010-11 to 2013-14 and the results have been reflected in Table-1

Sl. no	Component	Recommended practices	Farmers practices
1.	Variety	ICPL-87119 (Asha)	Local
2.	Seed rate	15kg/ha	20% higher
3.	Seed treatment	Rhizobium culture@20g/kg and Bavistin@ 2g/kg of seed	No seed treatment
4.	Spacing	60X20 cm	Not followed
5.	Fertilizer dose	20:40:20 NPK, Kg/ha	Imbalance use of fertilizer
6.	Weed management	Two mechanical weeding	As and when needed
7.	Plant protection	Need based application	Indiscriminate use without proper dose

Table 1: Recommended practices and famers' practices in Arhar crop

Table1 depicts the details of intervention (demonstration) as well as farmers practice. The interventions i.e. the recommended practices include the variety ICPL-87119 of Arhar (released by the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Patancheru, India) is high-yielding, resistant to fusarium wilt and sterility mosaic diseases, identified for release in the central and south zones of India in 1992. Similarly, Rhizobium culture @ 20g/kg and Bavistin @2g/kg of seed had been used as seed treatment for management of wilt disease. Also the fertilizer @20:40:20, NPK, Kg/ha had been applied as soil test based recommendation. The crop was sown in line with spacing of 60 cm row to row and 20 cm plant to plant. After 30 and 60 DAS two manual weeding had been demonstrated. Need based chemical pesticides were sprayed against pod borer and fly. The crop was sown in sandy loam soils in upland rainfed situation. Similarly in farmers practice the methods followed are mentioned in Table.1 All these components were selected on the basis participatory discussion with farmers.

Result obtained during the year from 2010-11 to 2013-14 with the above mentioned interventions have been analysed and presented in Table-2.

Sl. no	Year	No of Farmers	Area in ha	Avg.yield (q/ha) Demonstration	Avg.yield (q/ha) Farmers Practice	Increase in yield (%)
1	2010-11	11	5	10.1	5.1	98.00
2	2011-12	26	10	10.52	7.1	48.16
3	2012-13	20	10	12.3	7.8	57.69
4	2013-14	40	10	12.7	8.1	56.79
Total/ Average	4years	97	35	11.40	7.02	39.75

Table 2: Results on the front line demonstration

From Table-2 it is revealed that significant increases in yield were observed between demonstration plots over farmers practice. The analysis of the results of front line demonstration over period of four years (2010-11 to 2013-14) shows that 39.34% increase in yield over farmers practice. The findings conclude that the enhancement of production and productivity of Arhar crop through front line demonstration by the technological intervention of variety ICPL-87119 (Asha), seed treatment with rhizobium culture and bavistin and soil test based application of fertilizer found to significantly increase the production and productivity of Arhar. Moreover these components are more vital factors for production technology.

Sl. no	Practices	Before FLD Number (%)	After FLD Number (%)	Increase (%)
1	Variety	-	65(67)	67
2	Seed Rate	05(5.1)	45(46.3)	41.2
2	Seed Treatment	10(10.3)	68(70)	59.7
3	Nutrient Management	18(18.5)	78(80.4)	61.9
4	Weed Management	25(25.7)	60(61.3)	35.6
4	Plant Protection Measures	32(32.9)	85(87.6)	54.7

Table 3: Extent of Adoption of Improved / Recommended Practices of FLD  
N=97

The results revealed that as an impact of FLD, there is significant change in the extent of adoption of the interventions like varietal replacement with ICPL-87119 (67%), Nutrient Management( 61.9%), Plant Protection Measures (54.7%), seed treatment (59.7%) and weed management(35.6%). Therefore the study conclude that the enhancement of production and productivity of Arhar crop through front line demonstration by the technological intervention of variety ICPL-87119 (Asha), seed treatment with rhizobium culture and bavistin and soil test based application of fertilizer and need based pesticide application resulted in getting higher yield. The results shown an interesting fact that the farmers who cultivated ICPL-87119 (Asha) were following all the recommended practices. The study suggests that there is need for horizontal spread of the technologies through extension system. The extension system has to emphasize on participatory approach for technology transfer, easily availability of critical inputs (Seed, Fertilizer & Pesticide), rapport with farmers and need based supervision by the scientists so that farmers will get confidence on the efficacy of the technology as well as extension system and increase the rate of adoption for better production and productivity.

#### 4. References

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