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A CASE STUDY :

Knowledge management for improvement of pulse and oilseed crop production in south Tripura

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SUMMARY : Krishi Vigyan Kendra, South Tripura undertaken number of front line demonstration (FLD) to impart knowledge on different improved scientific technologies of non-traditional oilseeds and pulses crops like groundnut, lentil, red gram (arhar) and green gram (moong) during *Kharif* and *Rabi* season of 2009-10. To demonstrate the technology, six villages of South Tripura district of Tripura state were selected after assessment of the village through PRA method. Awareness programme were conducted in all villages. Farmers were trained on scientific cultivation practices of groundnut, lentil, red gram (Arhar) and green gram (Moong). Besides imparting training, printed leaflets on oilseed and pulses were distributed among the farmers. Field day programme was also conducted in the farmer's field during field demonstration. Altogether 8 hectare area of oilseed and 5 ha area of pulses was covered under this programme. Improved varieties of groundnut (GG-20, GG-7 and TG-37A), lentil (WBL-58), green gram (HUM-16) and red gram (UPAS-120) were distributed among the farmers. Under this programme, most of the farmers obtained better yield of pulses and oilseeds as compared to local varieties and traditional method of cultivation. The yield percentage increased from 21.43 to 40 per cent in case of pulses, and 30.43 to 65.45per cent in oilseed crops. Farmers earned up to Rs.31,100/ha by selling oilseed and up to Rs. 29,250/ha by selling pulses crops. The programme conducted by KVK, South Tripura succeeded to build the skills of farmers for expansion of pulses and oilseeds crops through number of knowledge management practices like group Meetings, awareness programmes, trainings, demonstrations, field day, etc. Farmers of the neighbouring villages also participated in this programme and expressed their willingness to take up such crops under scientific methods in the next crop season.

KEY WORDS :
Knowledge management, Pulses, Oilseeds, Front line demonstration

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BACKGROUND AND OBJECTIVES

The South district of Tripura is characterized by high rainfall, high humidity and undulating and hilly topography. The agriculture production system is mostly rainfed, mono-cropped and at subsistence level. Farming system of South Tripura is revolving around rice, fish and vegetables. Upland (Tilla lands) are kept fallow by the farmers without cultivating any crop during *Kharif* season. Farmers of the district

cultivate rice twice a year in almost all the rice field except some area where water is not adequate. Moreover, the productivity of pulses and oilseed continues to be quite low (pulses- 600 kg ha^{-1} and oilseed- 758 kg ha^{-1}) on account of several biotic and abiotic stresses besides unavailability of quality seeds of improved varieties, poor crop management and non-adoption of scientific packages of cultivation practices. Therefore, it is important to take up some extension programmes to demonstrate the high yielding varieties and improved pulse and oilseed production technologies by improving the skills of farmers.

Recognizing the importance of oilseed and pulses in agriculture and to enhance its production, Krishi Vigyan Kendra, South Tripura district undertaken number of trainings, front line demonstration (FLD), and other extension activities on groundnut, lentil, red gram (arhar) and green gram (moong) during the year 2009-10. The objectives of the program was

- To impart knowledge on improved scientific technologies of oilseeds and pulses,
- To exhibit the performance of recommended HYV of oilseed and pulses crops, and
- To compare the yield levels of test varieties of FLD over local check.

Location and climate of study area :

South Tripura district is situated between longitude 91° 19' and 91° 53' E and between latitude 22° 57' and 23° 45' N. The total geographical area of the district is 2,868 square kilometers, which is about 35 per cent of the total state area. The South Tripura district is the second biggest district of the state in terms of population having 7,67,440 persons (2001 census). The district's population is pre-dominantly engaged in the agriculture and allied activities. Only 31.61 per cent of the land in the district is cultivable and paddy (rice) is the main food crop grown. Potato, black gram, sesame, mustard and jute are some other crops grown in the district. Jackfruit, banana, pineapple, mango, rubber and tea, etc. are the major fruit and plantation crops.

The district fall under Agro-climatic Zone-III, having humid dissected mounds and valleys with sub-humid denuded hills of varying altitudes. Physiography of the district may be divided into 9 physiographic units *viz.*, high relief, medium relief, low relief, flat topped, residual, undulating plain, flood plain, alluvial plain and interhill valley. Climate of the South Tripura district is characterized by a humid summer and a dry cool winter with high rainfall during July to October. The annual rainfall in the district ranges from 2000 to 2200 mm. On an average, relative humidity ranges in between 70 to 80 per cent throughout the year and the temperature varies between a maximum of 35°C and a minimum of 7°C. Soils are alluvial and lateritic with less water absorption capacity. With regard to soil texture, sandy loam soil having the maximum area (78254.9 ha) followed by sandy soil (11904.85 ha) and clayey loam (5271 ha) soil. Most of the soils of the district are strongly acidic and low in nitrogen and phosphorus.

The study was carried out by the Krishi Vigyan Kendra of ICAR, South Tripura during the *Rabi* (Dec-March) and *Kharif* season (July-Oct.) of 2009-10 in the farmers field of six selected villages *viz.*, Hrishyamukh (Hrishyamukh Block), Dudhpushkarini (Kakraban Block), Mirza (Kakraban Block), South Takmacherra (Bokafa Block), Satchand (Satchand Block) and Chaltabankul (Rupaichari Block). The locations of the villages are depicted in Fig. A.

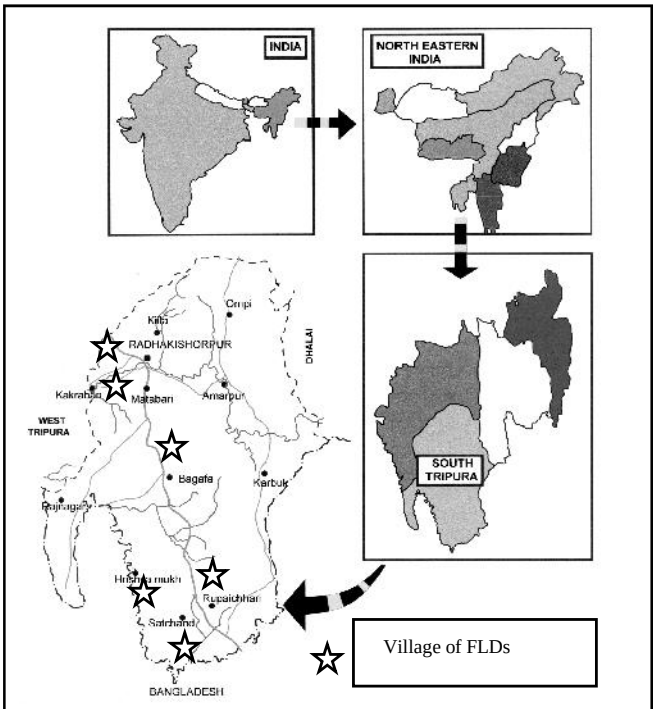

Fig. A : Location map of the study area in South district of Tripura

Socio-economic status of the villages:

Total population comprising SC, ST and others,

Table A : Socio-economic status of the selected villages of South Tripura district

Village	Total population			Numbers of cultivator's family	Literacy rate (%)
	SC	ST	Others		
Dudhpushkarini	1545	-	1880	102	67
Mirza	1254	286	2135	1065	80
Hrishyamukh	217	-	3073	954	65
Takmacherra (S)	273	2327	630	936	85
Satchand	467	561	254	293	85
Chaltabankul	18	2795	-	562	70

Table B : Details of FLD and cropping system of the selected villages of South Tripura district

Village	No. of FLD farmer	Farm land of the FLD farmer (ha)		Cropping system			Yield(qha^{-1})		
		Lowland	Upland (Tilla Land)	*Rabi*	*Kharif*	Summer	*Rabi*	*Kharif*	Summer
Dudhpushkarini	10	6.4	4.8	F*	F	F	-	-	-
Mirza	5	2.4	1.6	F	F	F	-	-	-
Hrishyamukh	10	8	3.2	Rice	Rice	F	30	25	-
Takmacherra (S)	2	0.32	0.48	F	F	F	-	-	-
Satchand	6	2.88	1.44	Rice	Rice	F	30	30	-
Chaltabnkul	7	1.12	3.36	F	F	F	-	-	-

*F: Fallow land

number of cultivator families, and literacy rate of the study area is given in Table A. Total farmland including lowland and upland, cropping system and yield of the crops of the FLD farmers of the study area are presented in Table B.

RESOURCES AND METHODS

The programme on 'Knowledge management for improvement of pulse and oilseed crop production in South Tripura' was conducted through number of extension practices like group meetings, awareness programmes, trainings, demonstrations, field day, etc.

Frontline demonstration (FLD) for green gram (Moong), lentil, red gram (Arhar) and groundnut was laid out in the selected villages after discussion with the farmers during the training programmes on pulses and oilseed crops. Based on the trials conducted by ICAR and KVK in Tripura, improved varieties of groundnut (GG-20, GG-7 and TG-37A), lentil (WBL-58), green gram (HUM-16) and red gram (UPAS -120) were selected for demonstration in the farmer's field. Altogether, 40 numbers of FLDs covering an area of 8 ha in six selected villages were conducted. Awareness programme on the importance of oilseed and pulses both in human diet was conducted by the Subject Matter Specialists (SMS) of KVK. A group meeting was also conducted in each village. Training programme on the topics like improved cultivation practices of groundnut, lentil, red gram (Arhar) and green gram (Moong), integrated nutrient management and integrated pest management was conducted before starting the FLD in the selected villages. In the training programme a pre- and post-training evaluation was done to see the change in knowledge level of the FLD farmers. Besides imparting training, printed leaflets on groundnut, green gram and red gram were distributed among the FLD farmers. Regular visits by the KVK scientist and SMS were ensured and made to guide the farmers. These visits were also utilized to collect feedback for further improvement in research and extension programmes. Field days were organized at the demonstration site to provide opportunities for other farmers to witness the benefits of demonstrated technologies. The critical inputs like seed, fertilizers, and insecticides/pesticides were supplied to the FLD farmers by KVK, South Tripura. Regular data on various parameters were collected from the farmer's field.

OBSERVATIONS AND ANALYSIS

The results obtained from the present study as well as discussions have been summarized under following heads:

Performance of improved practices of *Kharif* pulses:

Results of FLDs conducted during the *Kharif* and *Rabi* 2009-10 on pulses like green gram, red gram and lentil to exhibit the performance of recommended high yielding variety *i.e.* HUM-16 of green gram, WBL-58 of lentil and UPAS-120 of red gram is presented in Table 1.

The data in Table 1 revealed that in *Kharif* season of year 2009, five demonstration of green gram covering 1 hectare area in two villages, an average yield of 8.5 qha^{-1} of test variety (HUM-16) was obtained, as compared to 6.5 qha^{-1} of local check (Farmer's practice). The total per cent increased in yield was 30.76 per cent.

Ten demonstration of red gram covering 2 hectare area in 3 villages, an average yield of 8.5 qha^{-1} of the improved variety (UPAS-120) was obtained as compared to 7 qha^{-1} of local check (Farmer's practice). The per cent increase was accounted at 21.43 per cent (Table 1). Similarly, ten demonstration of lentil (variety WBL-58) was carried out in two villages covering 2 hectare area. An average yield of 7 qha^{-1} of test variety was obtained as compared to 5 qha^{-1} of local check. Increase in yield percentage was 40 per cent over local check. Economic analysis of the test varieties were done and presented in Table 2.

The data in Table 2 revealed that farmers obtained highest net return of Rs. 18750, Rs. 41750 and 16500 per hectare by adopting improved varieties and scientific packages of practices of green gram, red gram and lentil, respectively. Whereas the net return from existing farmer's practice (local check) was only Rs. 10250, Rs. 9000, Rs. 7500 from the local varieties of green gram, red gram and lentil. BC ratio was calculated and it was 1.96, 2.89 and 1.89 from the demonstrated practice of green gram, red gram and lentil which was higher than the local varieties of such crops.

Performance of improved practices of groundnut :

The result of FLDs of groundnut during *Kharif* and *Rabi* 2009 is presented in Table 3. Data indicate that during *Kharif* and *Rabi* 2009-10, total 15 demonstration of groundnut covering 3 ha area in 3 villages with

Table 1 : Performance of recommended high yielding varieties of pulses

Crop	Variety	Season	Number of FLD	Area (ha)	Yield (qha^{-1})		Increase in yield (%)
					Test variety	Farmer's practice	
Green gram	HUM-16	*Kharif* 2009	5	1	8.5	6.5	30.76
Red gram	UPAS-120	*Kharif* 2009	10	2	8.5	7.0	21.43
Lentil	WBL-58	*Rabi* 2009-10	10	2	7.0	5.0	40.00

Table 2 : Economic analysis of *Kharif* pulses taken for FLD

Crop	Cost of cultivation (Rs.)		Gross return (Rs.)		Net return (Rs.)		B:C ratio	
	Test variety	Local check	Test variety	Local check	Test variety	Local check	Test variety	Local check
Green gram	19500	19,000	38,250	29,250	18,750	10,250	1.96	1.54
Redgram	22,000	19,000	63,750	28,000	41,750	9,000	2.89	1.47
Lentil	18,500	17,500	35,000	25,000	16,500	7,500	1.89	1.43

Table 3 : Performance of recommended high yielding varieties of groundnut

Crop season	Groundnut variety	Number of FLD	Area (ha)	Yield(qha^{-1})		Increase in yield (%)
				Test variety	Local check	
Kharif 2009	GG-20	5	1	15.0	11.0	30.43
Rabi 2009-10	GG-7	5	1	16.5	11.0	50.00
	TG-37A	5	1	18.2	11.0	65.45

Table 4 : Economic analysis of groundnut cultivation during *Kharif* and *Rabi* 2009-10

Variety	Cost of cultivation (Rs.)		Gross return (Rs.)		Net return (Rs.)		B:C ratio	
	Test variety	Local check	Test variety	Local check	Test variety	Local check	Test variety	Local check
GG-20	23,000	22,000	45,000	34,500	22,000	12,000	1.96	1.56
GG-7	23,500	22,000	49,500	33,000	26,000	11,000	2.11	1.50
TG-37A	23,500	22,000	54,600	33,000	31,100	11,000	2.32	1.50

improved variety and scientific packages of practices yielded higher than the local check. The yield of test variety *viz.*, GG-20, GG-7 and TG-37A were 15, 16.5 and 18.2 qha^{-1}, respectively as compared to 11 qha^{-1} of local check. Increase in yield percentage was 30.43, 50 and 65.45 per cent for GG-20, GG-7 and TG-37A, respectively over the local check.

Economic analysis of the demonstrated varieties and local check was calculated and presented in Table 4.

Data presented in Table 4 indicated that farmers obtained highest net return of Rs. 22000, Rs. 26000 and Rs. 31100 with the varieties GG-20, GG-7 and TG-37A over the local yield. BC ratio was also higher for the tested variety than the local check.

Utilization of fallow farmland through knowledge management :

It is very clear from the data indicated in Table 5 that the existing fallow areas of lowland especially in *Rabi* season and upland/medium land (Tilla land) in *Kharif* season can be utilized efficiently in all villages of South Tripura district. Agro-climatic conditions of the district favour successful cultivation of such pulses and oil seeds crops by adopting scientific methods. This happened only due to knowledge enhancement of farmers through number of extension programmes conducted by the KVK. The farmers have realized that fallow areas of their farmland can be utilized by cultivating pulses and oilseeds crops with little but efficient water and nutrient management and can get additional income every year. In addition, farmers also felt that there was improvement of soil health due to cultivation of nitrogen fixing crops, utilization of family labour, fulfillment of protein rich food to farm family, etc. Similar investigation was also carried out by Hedge (2004); Kiresur *et al*. (2001); Kumar and Chauhan (2005) and Singh *et al*. (2005).

Table 5 : Benefit due to change in cropping system by KVK extension programmes in South Tripura

Village	Existing cropping system		Demonstrated cropping system		Increase in income (Rs.)	Benefit realised
	Kharif	*Rabi*	*Kharif*	*Rabi*		
Dudhpushkarini	Fallow	Fallow	Groundnut	Fallow	26,000	Improvement in soil fertility (Avail. N-24%).
			Red gram	Fallow	41,750	Increase in cropping intensity.
Mirza	Fallow	Fallow	Groundnut	Fallow	22,000	Increase in productivity
			Red gram	Fallow	41,750	Scientific cultivation of non- traditional crops
Hrishyamukh	Rice	Rice	Rice	Groundnut	20,500	Engagement of family labour
			Rice	Lentil	8,500	Utilisation of unutilized agricultural land.
South Takma	Fallow	Fallow	Groundnut	Fallow	31,100	Increase in income
Satchand	Rice	Rice	Rice	Groundnut	14,000	Supply of food protein to farmer's family
Chaltabankul	Fallow	Fallow	Groundnut	Fallow	22,000	

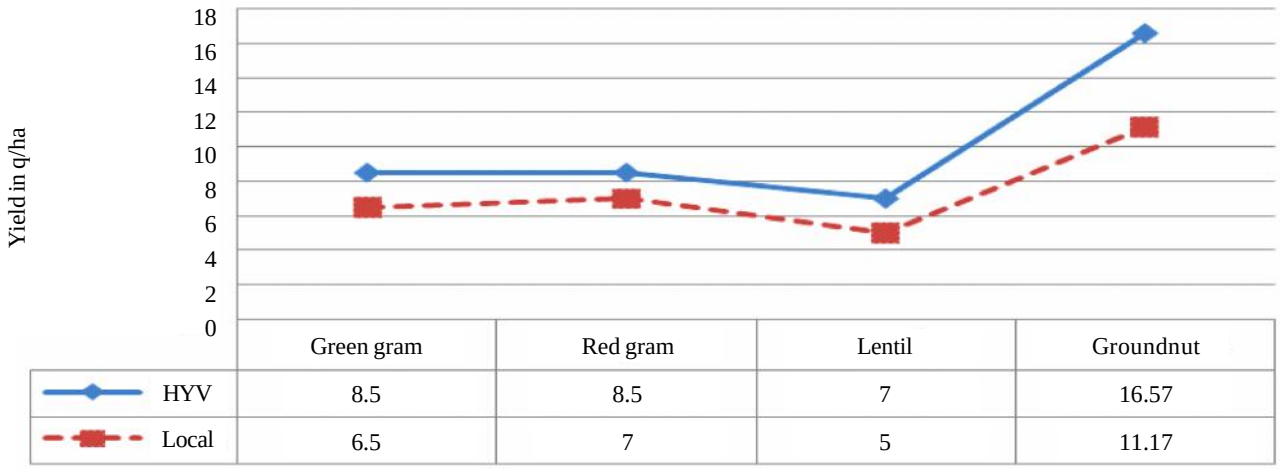

Fig. 1 : Yield change in improved practices of pulse and oilseed crops

Conclusion :

The results of the trainings, FLDs and other extension programmes on oilseed and pulses have given a good impact to farming community of South Tripura District. Application of extension methodology like trainings, group meetings, front line demonstration, field days and awareness programme helped farmer in improving their knowledge for cultivation of non-traditional crops in their farmland. On the basis of pre- and post-training evaluation, it was found that farmers had only 15 per cent knowledge before the KVK extension programmes and they gained knowledge up to 63 per cent after participation in the programmes. Farmers of the neighbouring villages also participated in the programmes and expressed their interest in scientific cultivation of pulses and oilseed crops in the fallow areas in the coming years. The knowledge management programmes helped in increasing the farm income, protein requirement of farm family and also strengthening of livelihood of the farming community to some extent. There is need to adopt such multi-pronged strategy that involves enhancing knowledge of the farmer in the district.

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REFERENCES

Hedge, D.M. (2004). Becoming self-reliant. Hindu survey of Indian Agriculture, 2004, pp . 45-47

Kiresur, V.R., Ramanna Rao, S.V. and Hedge, D.M. (2001). Improved technologies in oilseed production–An assessment of their economic potentials in India. *Agric. Econ. Res. Rev.*, **14** (2): 95-108.

Kumar, A. and Chauhan, J.S. (2005). Status and future thrust areas of rapeseed-mustard research in India. *Indian J. Agric. Sci.*, **75** (10): 621-635.

Singh, A., Singh, L. and Prasad, R. (2005). Pulse production under technology assessment, refinement and dissemination through KVKs in UP. Paper presented in 3rd National Ext. Edu. Congress 2005 held at NDRI. Karnal, April 27-29, 2005.