

LENTIL IN KARAIL SOIL-PARTICIPATORY EXTENSION IN BALLIA, U.P.

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ABSTRACT

Lentil is one of the main pulse crop of northern India and grown normally in light loam, alluvial and light black soils of the country. This crop is also raised in Karail soil of Ballia (U.P.). The lentil yield production is affected due to socio-economic and biophysical factors in the area. The Karail soil is characterized by high plasticity, low infiltration rate, susceptible to cracks during moisture scarcity and adhesive in nature. The Karail tracts are singularly devoid of tree growth. The present investigation was conducted during rabi season of 2003-04 to study the major problems faced in lentil cultivation and documenting farmers' experiences/wisdom in context to solving their difficulties over a period of time in Ballia district of eastern Uttar Pradesh. The study revealed that the KVK and farmers followed participatory extension approach for improving lentil cultivation e.g. conducting FLDs, OFTs, field days, kisan melas and participating in exposure visits, attending scientific advisory committee meetings, etc. The potential yield of improved cultivars was 21.7 q/ha. The yield gap of potential yield Vs FLD yield (7.26 q/ha) and FLD Vs local check (6.43 q/ha) was recorded. This yield gap can be bridged by adopting modern lentil cultivation practices coupled with using zero tillage machine for minimizing cost of cultivation and getting more net benefit per unit area and time by the farmers. Faith in KVK scientists by farmers was shown to a considerable extent.

Key Words : Participatory extension, Lentil cultivation in black soil, Front line demonstrations

INTRODUCTION

Lentil (*Lens esculenta L*) is grown in northern India. This crop covered area around 0.9 million hectare, with a production of 0.45 million tones in India. Unripe pods are used as a green vegetable, dry leaves, stalks, husk and broken grains used as cattle feed. The crop is raised on light loam and alluvial soils in upland, and on well drained, moderately deep, light black soils in India. It is also grown on low lying and poorer types of soils. The crop can stand a moderate amount of alkalinity.

Lentil is grown in *Karail* soil (black soil) of Ballia, a district of eastern Uttar Pradesh. The *Karail* soil is dark coloured and heavy textured soils, with highly fertility, rich in organic matter and in clay in content occur in the lower basin of the ganges in Uttar Pradesh. *Karail* soil found primarily in six blocks of Ballia district and adjoining Mohammadabad sub-division of Ghazipur district in the low-lying positions. Thus, the soil is characterized by high plasticity, low infiltration rate, poor soil permeability, susceptible to cracks during moisture scarcity and adhesive in nature. The *Karail* tracts are singularly devoid of tree growth (R.N. Rai, 1999). Kins infestation and other indigenous weeds are common features of the landscape. The major crops grown in *rabi* are wheat, gram, lentil, field pea, etc. The major crop rotation followed in the area is maize-wheat, maize-lentil, paddy-lentil, fallow-lentil, fallow-lentil+linseed, fallow intercropping of lentil with linseed and mustard, etc.

METHODOLOGY

The present investigation was conducted during *rabi* season of 2003-04 to study the major problems faced in lentil cultivation and documenting farmers' experiences/wisdom in context to solving their difficulties over a period of time in Ballia district of eastern Uttar Pradesh. Informal personal interaction with the farmers, field visits and attending farmers-scientists meetings along with development officials were used for data collection and facts findings. Secondary sources of data were also consulted. Cross-checking was done by asking few relevant questions to other experienced farmers.

Thirty farmers (medium and big categories) were identified for conducting FLDs on lentil. About 83 % of them were literate and progressive in nature. These farmers were acting as contact farmers for other villagers towards disseminating the modern farm technologies through giving advices, exchanging quality seeds, sharing farm related problems, motivating to come for exposure visits for Kisan mela at NDUAT, Faizabad, sharing literature available with them. Three improved varieties are found suitable in *Karail* soil viz., Narendra Masoor 1, PL 234 and PL 406.

Self-initiative by a Lentil Grower—A group of farmers was taken by KVK, Ballia to visit a Kisan mela at NDUAT, Faizabad in 2002. These farmers were exposed to know about latest lentil varieties particularly Narendra Masoor 1. The farmers were demanded lentil

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seed of latest cultivars. But, a farmer hardly could get 1/2 kg of lentil seed. That seed was sown in *Karail* soil (black soil). The bumper growth of the crop was observed and 40 kg of lentil yielded out of 1/2 kg seed. Next year, the seed was sown on 1 ha land in same micro-farming situation. During 2003-04, the crop visited by the investigators and a lush green growth was visualized. The farmers were very enthusiastic and satisfactory towards yield performance and adaptation to black (*karail*) soil in rainfed situation of the area. The yield (13.0 q/ha) was harvested. A field day was organized by the KVK Ballia to popularize the latest technologies of cultivation. Current season 2003-04, the lentil crop is sown by zero tillage machine by the KVK.

RESULTS & DISCUSSION

Perception of Farmers About Lentil Seed Production—Ballia is well recognized for production of *rabi* pulses particularly lentil. Farmers felt that lentil is more economic crop than other pulse crops. They grow it in substandard lands viz., heavy *Karail* soil, *diyara* soil. To overcome the problem of non-availability of quality seeds and becoming self depend, farmers (medium to big) started lentil seed production. PL 406,

PL 234 and Narendra Masoor 1 are being grown after seed treatment using trichoderma and rhizobium culture. They used foundation/certified seeds, sown in line by multicrop fertiseed drill and now started to use zero tillage machine. Few big farmers associated to Tarai Development Corporation for marketing the produced lentil seed on contract basis. Truthful seeds produced are processed locally and sell to other fellow farmers. For processing and bagging, they made contact to Ghazipur and Azamgarh districts. Farmers are sensitive about significance of good quality seed.

Perception of Extension Personnel—KVK scientists are being organized off campus and on campus trainings on improved lentil production and seed production technologies. They have also introduced zero tillage technology for lentil sowing in addition to wheat. Front line demonstrations on improved lentil production technologies and on farm trials were conducted with active farmers' involvement. A strong liaison is established by the KVK between farmers and other state government officials.

Participatory Extension—Front line demonstrations were conducted on lentil covering about 30 ha area at 65 locations in farmers' field situation. The farmers'

Table 1. Performances of Lentil Cultivars and Yield Gap Analysis at Different Levels

Lentil cultivars	No. of Demons.	Area (ha)	Potential yield (q/ha)	Yield (q/ha)		Yield gap (q/ha)		% increase
				FLD	Local check	Pot. Vs FLD	FLDVs Local	
PL 406	22	10	20.5	14.5	8.0	6.0	6.5	81.3
PL 234	20	10	23.6	12.8	8.0	10.8	4.8	60.0
Narendra Masoor 1	23	10	21.0	16.0	8.0	5.0	8.0	100.0
Total/Mean	65	30	21.7	14.43	8.0	7.26	6.43	80.3

Table 2. Comparison of Conventional and Modern Method of Lentil Cultivation

Activities	Conventional method	Modern method (Zero Tillage Sown)
Field preparation	One or two ploughings	No ploughing required
Sowing & intercultural operations	Sowing done by broadcasting or by fertiseed drill machine	Sowing done by ZT machine
	Intercropping of 8 rows of lentil with 1 row of linseed or mustard	No inter cropping followed
Overall growth	Seed rate (45 kg/ha)	Seed rate (35 kg/ha)
	No intercultural operations	No intercultural operations
	Average germination	95 % germination (>standard germination rate)
Weed management	Average growth	Bumper growth
	No weeding	Occasionally weedicides sprayed
Fertilizer use	More weed infestation	Less weed infestation
	No fertilizer used	DAP used (20-30 kg/ha)
Use of soil moisture	Early sowing not possible	Early sowing possible due to reducing time of field preparation
	Available soil moisture some time difficult to use	Available soil moisture used by early sowing
Harvesting	Difficulties in harvesting while sown by broadcasting	Easy in harvesting
Economic gain	Less net profit	More net profit comparatively

participation was ensured in selecting particular technology or components, identifying the location, applying critical inputs, recording information pertaining to lentil crop from sowing to seed yield. The data were analyzed by the farmers and scientists related to physical appearance, critical observations and yield criteria. It is noteworthy that yield of Narendra Masoor sown by ZT machine was recorded 16.0 q/ha in *Karail* soil. Net profit gained was of Rs 2080 per ha.

Out of three important cultivars, Narendra Masoor 1 resulted highest yield 16 q/ha followed by PL 406 (14.5 q/ha) and PL 234 (12.8 q/ha) under demonstration, where as local check yield (8.0 q/ha) was obtained. The total mean yield was recorded 14.43 q/ha under demonstrated situation as compared to local check. The yield increase was obtained 80.3%. The potential yield of these cultivars was 21.7 q/ha. So there is still yield gap of potential yield Vs FLD yield was 7.26 q/ha and FLD Vs local check was 6.43 q/ha. Therefore, the yield enhancement possibilities are more to explore through FLD at farmers' field conditions (Table 1).

Table 2 is self explanatory in the activities taken up by the farmers. The conventional method is most inferior as compared to modern method (zero tilled sown). Hence, the modern method is found profitable, sustainable and time saving in land preparation, etc.

It is revealed from Table 3 that social recognition increased (69.2% high category of lead fulfillment) and fear of crop loss has reduced among the farmers (70.8% high category) due to KVK efforts and other development officials. Awareness, economic gain, quality seed availability, exposure visits and skill development needs, moderately had been fulfilled (more than 60.0%) as perceived by the farmers. More attention is demanded by them particularly marketing of farm produce and availability seedlings/saplings etc. each at the KVK center itself.

Table 3. Need Fulfillment Level as Perceived by the Farmers N=65

Needs fulfilled	Extent of need fulfillment		
	Low f (%)	Medium f (%)	High f (%)
Social recognition	4 (6.2)	16 (24.6)	45 (69.2)
Awareness level	10 (15.4)	40 (61.5)	15 (30)
Economic gain	2 (3.1)	43 (66.2)	20 (40)
Seed availability	19 (29.2)	41 (63.1)	5 (7.7)
Marketing	50 (76.9)	10 (15.4)	5 (7.7)
Exposure visits	9 (13.8)	49 (75.4)	7 (10.8)
Fear of crop loss due to incidence of insects/diseases lessened	4 (6.2)	15 (30)	46 (70.8)
Skill development	10 (15.4)	40 (61.5)	15 (30)
Seedlings/saplings availability	45 (69.2)	15 (30)	5 (7.7)

CONCLUSION

The intervention done by the KVK, played a pivotal role in increasing lentil productivity, initiating participatory extension and research module fit in technologies in existing farming situation. The methods followed by the KVK and farmers for participatory extension of improving lentil cultivation were: conducting FLDs, OFTs, field days, kisan melas and participating in exposure visits, attending scientific advisory committee meetings, etc. The prevailing situation analysis, need assessment and finding alternative solutions again reflected a part of participatory extension and technology development and strengthening the feedback system from farmers to extensionist to scientists and vice versa through strong liaison among existing social, economic, research and development organizations. The yield gap can be filled-up by adopting modern lentil cultivation practices coupled with using zero tillage machine for minimizing cost of cultivation and getting more net benefit per unit area and time by the farmers. Faith in KVK scientists by farmers was shown to a considerable extent. It was reflected during visit and interaction with the villagers.

REFERENCES

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