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Ensuring food and nutritional security of farming community by increasing pulse production under frontline demonstrations

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ABSTRACT

The area, production and productivity of pulses in UP including district Azamgarh is quite low as compared to other states in respect of national acreage and production. Among various constraints poor crop management and protection technologies assume primary position. Considering the facts of low yield of pulses due to technological gap and various other constraints Krishi Vigyan Kendra, Azamgarh conducted frontline demonstration continuously for five years on improved agricultural technologies of pulses viz pigeon pea, chickpea, field pea and lentil in scientific manner at farmers' fields during 2008-09 to 2012-13. A total of 241 demonstrations of pulses were conducted in an area of 90.0 hectares. The results of five years under frontline demonstration on pulses revealed that the average grain yield of pigeon pea (19.1 q/ha), chickpea (19.7 q/ha) field pea (23.5 q/ha) and lentil (17.8 q/ha) with 56.5, 43.6, 40.8 and 45.1 per cent increase in yield respectively over farmers practice was recorded under demonstration plots. Implementation of improved technological interventions in all demonstrated crops were also found remunerative in terms of B:C ratio over existing practices. The enhanced yield achieved through adoption of improved production and protection technology in pulses maintained the soil health, incremental sustainable development in production, enhanced nutritional security and improved the livelihood of the farmers. The outcome of the trial inspired the farming community to replace their old non-descriptive varieties with resistant and high yielding varieties and other production and protection related technological options which were being implemented.

Keywords: FLDs; pulses; grain yield; food; nutritional security

INTRODUCTION

Historically India is the largest producer, consumer and importer of pulses. Although it is the world's largest pulses producer there is still a huge shortage of pulses and also the prices are not affordable to a large section of consumers. An immediate need is the development and dissemination of low-cost technologies in pulses production so that they can be affordable to the common man. The earlier experience shows that technological efforts need to be supported by the right policy environment to harvest fruits of research and development in agriculture (Reddy 2010). Majority of farming community in India comes under small and marginal farming where the size of the land holding is too small to achieve the standards of livelihood. Out of the 125 crore Indian population 83.3 crore people live in rural areas (Chandramouli 2011) and their main source of livelihood is agriculture and animal husbandry.

The projected pulse requirement for the year 2030 is 32 million tons with an anticipated required growth rate of 4.2 per cent (Anon 2011). The frequency of pulses consumption is much higher than any other source of protein; about 89.1 per cent consume pulses at least once a week while only 35.4 per cent of persons consume fish or chicken/meat at least once a week in India (Anon 2007). Any reduction in prices of pulses will increase consumption by the poor more than the rich consumers (Mittal 2006). Pulses can be grown in wide range of soils and climatic conditions and play important role in crop rotation, mixed and inter-cropping, maintaining soil fertility through biological nitrogen fixation and thus contribute significantly to sustainability of the farming systems (Gowda et al 2013). The major pulse producing states in India are MP (24%), UP (16%), Maharashtra (14%), AP (10%), Karnataka (7%) and Rajasthan (6%) which together form about 77 per cent of the total production (Reddy et al 2013). State productivity of pulses in UP is about 823 kg/ha while the area, production and productivity of pulses in district Azamgarh of UP are 28012 hectares, 27480 MT and 981 kg/ha respectively (hptt/www.azamgarh.nic.in). Any shortfall in pulses production potential has been attributed to a number of factors the major ones being the increasing population, rising income, inadequate transfer of appropriate technology, seed longevity, poor seed quality, geographical shift, abrupt climatic changes, complex disease, pest syndrome and socio-economic conditions (Ali and Gupta 2012).

Keeping the importance of front line demonstrations (FLDs) and shortfall of production potential of the pulse crops the KVK, Azamgarh conducted demonstrations on improved production and protection technologies of pulse crops in a scientific manner for establishment of production potential of pulse crops at farmers' fields during the year 2008-09 to 2012-13 to exhibit the performance of promising high yielding pulse varieties with advanced recommended package of practices for harvesting higher crop yields and to collect feedback information for further improvement desired in research and extension programmes.

MATERIAL and METHODS

FLDs on pulse crops were conducted by Krishi Vigyan Kendra, Azamgarh, Uttar Pradesh during the period from 2008-09 to 2012-13 in ten villages viz Sikraur, Dhanehua, Lasara Kala, Newada, Jagdishpur, Gopalpur, Ekrampur, Aunti, Pandri and Majhgava covering 6 blocks out of 22 blocks in the district. During these five consecutive years the demonstrations were conducted as per their respective seasons and a total of 109, 55, 57 and 20 farmers participated with area of 43.0, 18.0, 21.0 and 8.0 ha under pigeon pea, chickpea, field pea and lentil respectively. The soil of the operational area was generally sandy loam in texture which was low in nitrogen, phosphorous and low to medium in potash. The improved varieties were grown viz Narendra Arhar-2, PG 186, KPMR 400 and Narendra Lentil-1 of pigeon pea, chickpea, field pea and lentil respectively. A balanced dose of fertilizer (DAP 125 kg/ha) and use of *Trichoderma* (10 g/kg of seed) as seed treatment including rhizobium and PSB were taken at high priority. The farmers' practices (use of non-descriptive varieties, broadcasting of seed and fertilizer, no integration of biofertilizers, occasional manual weeding and indiscriminate use of plant protection measures etc) were taken as local check at each site. All the agronomical practices other than the interventions viz tillage, seed rate, irrigation, recommended weed management and plant protection measures were applied in similar manner on demonstrated crops. A multi-disciplinary scientific team of the centre inspected the demonstrations at regular intervals right from sowing to harvesting and guided the farmers. These visits were also utilized to collect location specific feedback information for further improvement in research and extension activities that must be matching with farmers needs and were stable, feasible and profitable. The yield data were collected from the demonstrations and control plots and analyzed with the suitable statistical tools to compare the yields of existing practices (local check) and FLDs plots.

RESULTS and DISCUSSION

The pooled data of five years obtained from demonstrations on pulse crops during 2008-09 to 2012-13 are presented in Table 1. Results clearly indicate that the yield of pulses increased successively over the years in demonstration plots. The crop-wise average yield was 19.1, 19.7, 23.5 and 17.8 q/ha in pigeon pea, chickpea, field pea and lentil demonstrated plots respectively while control plots recorded 10.8, 13.0, 16.1 and 12.3 q/ha respectively. The findings also depicted that the raised crop supplemented with proven production technologies and suggestions at regular intervals enhanced grain yield by 56.5, 43.6, 40.8 and 45.1 per cent respectively. The increase in yield ranged between 40-60 in pigeon pea, 28-58 in chickpea 21-56 in

Table 1. Performance of frontline demonstration on pulses during 2008-09 to 2012-13 (pooled data)

Crop	Demo technology	# demo	Area (ha)	Average yield (q/ha)		% increase in yield over check	Range of % increase in yield	Average net returns (Rs/ha)	BCR	
				Demo	Local check				Demo	Local check
Pigeon pea	Raised bed planting of Narendra Arhar- 2 + *Trichoderma* @ 10 g/kg seed + *Rhizobium* & PSB each @ 20 g/kg seed + DAP @125 kg/ha + PP	109	43	19.1	10.8	56.5	40-60	37202	4.49	3.94
Chickpea	PG 186 + *Trichoderma* @ 10 g/kg seed + *Rhizobium* & PSB each @ 20 g/kg seed + DAP @125 kg/ha + Pendimethaline + PP	55	18	19.1	13.02	43.6	28-58	40910	4.10	3.43
Field pea	KPMR 400 + *Trichoderma* @ 10 g/kg seed + *Rhizobium* & PSB each @ 20 g/kg seed DAP @125 kg/ha + Pendimethalin + PP	57	21	23.46	16.04	40.8	21-56	34592	3.53	3.04
Lentil	Narendera Lentil 1 + *Trichoderma* @ 10 g/kg seed + *Rhizobium* & PSB each @ 20 g/kg seed DAP @125 kg/ha + Pendimethaline + PP	20	8	17.8	12.3	45.1	32-59	29630	3.52	3.01
Total		241	90							

Demo= demonstration, BCR= Benefit:cost ratio, PP= Plant protection measures field pea and 32-59 per cent in lentil during the five years of study. The results showed the positive effect of FLDs over existing practice towards enhanced yield of pulses in demonstrated areas. The similar trend of yield enhancement in FLDs of pulse crops has been documented by Yadav et al (2007).

As per economic evaluations like net returns and B:C ratio of FLDs clearly revealed that all the pulse crops recovered the net returns and B:C ratio from the recommended practices was substantially higher than farmers' practices during all the years of demonstration. The pulses under improved technological interventions recorded Rs 37202, 40910, and 34592 and 29630 as average net returns on per hectare in pigeon pea, chickpea, field pea and lentil respectively. The average B:C ratio of demonstrated and control plots was 4.49, 4.18, 3.53 and 3.52 and under local check 3.94, 3.43, 3.04 and 3.01 in same sequence of pulses during demonstration period. Hence favorable B:C ratio proved the economic viability of the interventions and convinced the farmers for adoption of intervention imparted. Similar findings were also reported by Lathwal (2010) during his study on frontline evaluations on Urd bean in Haryana. Farmers were encouraged to adopt these scientific technologies through organizing field days, training programmes, farmers conventions etc at appropriate places at the demonstration sites.

REFERENCES

Ali M and Gupta S 2012. Carrying capacity of Indian agriculture: pulse crops. Current Science **102(6):** 874-881.

Anonymous 2007. National Family Health Survey (NFHS-3), 2005-06: India. IIPS and ORC Macro, Mumbai, India: International Institute for Population Sciences Mumbai, India.

Anonymous 2011. IIPR Vision 2030. Indian Institute of Pulses Research (ICAR), Kanpur, Uttar Pradesh, India.

Chandramouli C 2011. Census of India 2011: rural urban distribution of population. Ministry of Home Affairs, Government of India, New Delhi, India.

Gowda CLL, Srinivasan S, Gaur PM and Saxena KB 2013. Enhancing the productivity and production of pulses in India. In: Climate change and sustainable food security (PK Shetty, S Ayyappan and MS Swaminathan eds). National Institute of Advanced Studies, Bangalore and ICAR, New Delhi, India, pp 145-159.

hptt/www.azamgarh.nic.in.

Lathwal OP 2010. Evaluation of front line demonstrations on black gram in irrigated agro ecosystem. Annals of Agricultural Research **31(1-2):** 24-27.

Mittal S 2006. Structural shift in demand for food: projections to 2020. Working Paper # 184, Indian Council for Research on International Economic Relations, New Delhi, India.

Reddy AA 2010. Regional disparites in food habits and nutritonal intake in Andhra Pradesh, India. Regional and Sectoral Economic Studies **10-2:** 125-134.

Reddy AA, Bantilan MCS and Mohan G 2013. Pulses production scenario: policy and technological options. Policy Brief *# 26,* International Crops Research Institute for the Semi-Arid Tropics, Patancheru, Andhra Pradesh, India.

Yadav VPS, Kumar R, Deshwal AK, Raman RS, Sharma BK and Bhela SL 2007. Boosting pulse production through frontline demonstration. Indian Research Journal of Extension Education **7(2-3):** 12-14.

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