Impact of Frontline Demonstrations on Yield Enhancement of Potato

D. K. Mishra[1], Dinesh Kumar Paliwal[2], R. S. Tailor[3] and Alok Kumar Deshwal[4]

1, 2, 3, & 4. Krishi Vigyan Kendra, Kasturbagram, Khandwa Road, Indore, M.P.
Corresponding author Email: mishra.dk@indiatimes.com

ABSTRACT

Potato is a predominantly rabi *crop of Indore district of* 'Malwa' *plateau of Madhya Pradesh. The crop accounts for 30.28 and 30.30 % of area and production, respectively in Madhya Pradesh. However, the average district yield is 150 quintal/hectare, which is substantially lower than the national average (179.2 quintal/hectare) Considerable scope of enhancement in productivity leading to higher production exists, especially in Indore region, which is earmarked as important Agro Export Zone for potato in the country. It is feasible through regular surveys, farmers meetings and field diagnostics visit followed by persuasion for provision of balanced and adequate nutrition and timely management of blight disease in potato. To demonstrate this, 50 Front Line Demonstrations were organized by KVK, Indore between 2002 and 2007 at four different locations under real farm situations. Prevailing farmers practices were treated as control for comparison with recommended package i.e. balanced use of nitrogenous fertilizer and foliar spray of Mancozeb 75% WP at 30, 45, and 60 days after planting as prophylactic measure to contain the blight disease. The economics and cost benefit ratio of both control and demonstrated plot was worked out. An average of Rs 1,00,900was recorded net profit under recommended practice while it was Rs 87,430 under farmers practice. Cost benefit ratio was 2.62- 3.63 under demonstration, while it was 2.35 - 3.13 under control plots. By conducting Font Line Demonstration of proven technologies, yield potential and net income from potato cultivation can be enhanced to a great extent with increase in the income level of the farming community.*

Key word: *Transfer of Technology; Potato;*

Available agricultural technology does not serve its purpose till it reaches and adopted by its ultimate users, the farmers. Technology transfer refers to the spread of new ideas from originating sources to ultimate users (*Prasad et al. 1987*). Potato is predominantly cultivated in Indore district of Madhya Pradesh in soybean- potato, soybean- potato – Wheat cropping systems. In spite of increase in area from 7.3 thousand hectares in 1050-51 to 45.6 thousand hectares in 2004-05 and production from 40.7 thousand tones to 752 thousand tones during the same period, the share of Madhya Pradesh in national production is hardly 03 percent *(Pandey et al. 2007)*. However, Indore district alone is contributing around 30% in area as well as in production of the state of Madhya Pradesh. This rapid growth under area and production of potato in Madhya Pradesh, particularly in Indore district was possible through development, up-gradation and dissemination of the technology under real farming conditions. But the fact remains that the average yield of potato in Indore district (150 q/ha), which is earmarked as Agro Export Zone for potato in the country, is substantially lower than the national average yield i.e., 179.9 q/ha (*Singh, 2008*). There is ample scope for further improvement of production and productivity of potato for raising the income level of the farming community of the district. Yield loss under real farming condition can be attributed to several biotic and a biotic factors, important among them are imbalanced use of nitrogenous fertilizers and indiscriminate use of plant protection measure for leaf spot, and early and late blight diseases of potato. With an object to combat the causes of yield erosion and lower economic returns, dissemination of recommended technology through front line demonstration was successfullyattempted.

METHODOLOGY

Krishi Vigyan Kendra, Kasturbagram, Indore has conducted 50 Front Line Demonstration under real farming situations between 2002 and 2007 at four different

villages, namely Hatod, Khatipiplia, Datoda and Ralamandal located in different blocks, namely Depalpur, Sanwer, Mhow and Indore, respectively under K.V.K. operational area. The area under each demonstration was 0.4 ha (1 acre). Through survey, farmers meeting and field diagnostic visit during the cropping period, low yield of potato was conceived due to imbalanced use of nitrogenous fertilizer and indiscriminate practice to manage the leaf spot and late blight diseases on potato. To manage assessed problem, improved and recommended technologies were followed as intervention during the course of front line demonstrations programme. In case of recommended practice, balanced use of nitrogenous fertilizer and use of suitable fungicidal i.e. Mancozeb 75% WP as suggested by *Shiv Kumar et al.* (2002) and *Prasad (2000)* was used as technical interventions. Mancozeb 75% WP was sprayed as foliar at 30, 45 and 60 days after planting. In case of local check (control plots), existing practice being used by farmers i.e. imbalanced use of N:P:K. fertilizers, particularly lower dose (60-70 q/ha) of nitrogen and use of fungicide supplied by the local venders like carbendazim (Bavistin), to manage leaf spot and late blight diseases , was considered . Well before the conduct of demonstrations, training to the farmers of respective villages was imparted with respect to envisaged technological interventions. All other steps like site and farmer selection, layout of demonstration, farmer's participation etc were followed as suggested by *Choudhary (1999)*. Visits of the farmers and the extension functionaries were organized at demonstration plots to disseminate the message at large. Yield data was collected from control (Farmer's practice) and demonstration plots and cost of cultivation, net income and cost benefit ratio were computed and analyzed.

RESULTS AND DISCUSSION

The yield performance and economic indicators are presented in Table 1.The data reveal that under demonstration plot, the performance of potato yield was found to be substantially higher than that under local check during all the years (2003-04 to 2006-2007). The yield of potato under demonstration recorded was 214.0, 288.7, 207.6 and 234.6. q/ha during 2003-04, 2004-05, 2005-06 and 2006-07, respectively. The yield enhancement due to technological intervention was to the tune of 13.5, 19.0, 13.0, and 16.0 % over control. The cumulative effect of technological intervention over four years, revealed an average yield of 236 q/ha, 15.4% higher over local check. The year-to-year fluctuations in yield and cost of cultivation can be explained on the basis of variations in prevailing social, economical and prevailing microclimatic condition of that particular village. *Mukherjee (2003)* has also opined that depending on identification and use of farming situation, specific interventions may have greater implications in enhancing systems productivity. Yield enhancement in different crops in Front Line Demonstration has amply been documented by *Haque (2000), Tiwari and Saxena (2001), Tiwari et al. (2003*) and *Tomer et al. (2003).*

Economic indicators i.e. gross expenditure, gross returns, net returns and BC ratio of front line demonstrations are presented in Table 1. . The data clearly revealed that, the net returns from the recommended practice were substantially higher than control plot, i.e. farmers practice during all the years of demonstration. An average net return from recommended practice were observed to be Rs 69,915 in comparison to control plot i.e. Rs 56,955 On an

Table 1. Yield performance and economic indicators of Front Line Demonstration of Potato cv. K. Jyoti

Year	No. of demonstration	Yield (q/ha^{1})		% increase over	Gross expenditure		Gross Return		Net Return		CB Ratio	
		R P	F P	F P	R P	F P	R P	F P	R P	F P	R P	F P
2003-04	10	214.0	188.6	13.5	28600	2800	74900	66010	46300	38010	2.6	2.3
2004-05	15	288.7	242.7	19	29800	2900	108262	91012	78462	62012	3.7	3.1
2005-06	15	207.6	183.4	13	32800	32200	103800	91700	71000	59500	3.2	2.8
2006-07	10	234.6	202	16	33100	32700	117000	101000	83900	68300	4.22	3.75
Average	50	236.0	204	15.4	31075	30475	100990	87430	69915	56955	3.4	3.0

RP- Recommended practice, FP- Farmers practice, CB Ratio- Cost Benefit Ratio

average Rs 12,960 as additional income is attributed to the technological interventions provided in demonstrations plots, i.e. balanced nutrition and timely management of leaf spot and blight diseases.

Economic analysis of the yield performance revealed that cost benefit ratio of demonstration plots were observed significantly higher than control plots. The cost benefit ratio of demonstrated and control plots were 2.6 and 2.3, 3.7 and 3.1, 3.2 and 2.8, and 4.22 and 3.77 during 2003-04, 2004-05, 2005-06 and 2006-07 respectively. Hence, favourable cost benefit ratios proved the economic viability of the intervention made under demonstration and convinced the farmers on the utility of intervention. Similar findings were reported by *Sharma (2003)* in moth bean and *Gurumukhi and Misra (2003)* in sorghum. The data clearly revealed that the maximum increase in yield observed was during 2004-05, while maximum cost benefit ratio of 4.22 was observed during 2006-07. The variation in cost benefit ratio during different years may mainly be on account of yield performance and input out put cost in that particular year.

CONCLUSION

The results of front line demonstrations convincingly brought out that the yield of potato could be increased by 13.5% to 19.0% with the intervention on balanced nutrition coupled with the disease management in the Indore region. Favorable cost benefit ratio is self explanatory of economic viability of the demonstration and convinced the farmers for adoption of intervention imparted. The technology suitable for enhancing the productivity of potato crop and calls for conduct of such demonstrations under the transfer of technology programme by KVKs or other TOT centers.

REFERENCES

1. Choudhary B. N. (1999). Krishi Vigyan Kendra - A guide for KVK managers. Publication, Division of Agricultural Extension, ICAR. pp 73-78
2. Gurumukhi D. R. and Mishra Sumit (2003). Sorghum front line demonstration - A success story. *Agriculture Extension Review*. **15** (4): 22-23**.**
3. Haque M. S. (2000). Impact of compact block demonstration on increase in productivity of rice. *M. J. Ext. Edu*. **19** (1): 22-27
4. Mukherjee N. (2003). Participatory Learning and Action. Concept Publishing Company, New Delhi, India. pp 63-65
5. Pandy N. K., Arun Pandit K., Chandran P. and Pandey S. K.(2007). Potato statistics: India and world. *Technical Bulletin* no. 81 CPRI, Shimla, India. pp 78
6. Prasad B. (2000). Early blight and leaf spots, disease and pests of potato - *A manual* (S.M. Paul Khurana, ed). CPRI, Shimla. pp 6-10.
7. Prasad C., Chaudhary B. N. and Nayar B. B. (1987). First Line Transfer of Technology Project, ICAR, New Delhi. pp 87
8. Sharma O. P. (2003). Moth bean yield improvement through Front Line Demonstrations. *Agril. Exte.Review*. **15** (5): 11-13.
9. Shiv Kumar, Singh P. H., Garg I. D. and Khurana S. M. Paul (2002). Integrated management of potato diseases. *Ind. Hort.* **48** (2): 25-27.
10. Singh H. P. (2008). In Asia- Pacific Region Enriching Potato basket by accelerated technology adoption. *Ind. Hort.* **53** (4): 4.
11. Tiwari K. B. and Saxena A. (2001). Economic Analysis of FLD of oil seeds in Chindwara. *Bhartiya Krishi Anusandhan Patrika*. **16** (3&4) : 185-189.
12. Tiwari R. B, Singh Vinay and Parihar Pushpa (2003). Role of front line demonstration in transfer of gram production technology. *Maha. J. Ext. Edu*. **22** (1): 19.
13. Tomer L. S., Sharma P. B. and Joshi K. 2003. Study on yield gap and adaptation level of potato production technology in grid region. *Maha. J. Ext. Edu*. **22** (1): 15-18.