

## Yield Gap Analysis of Blight Disease Management in Potato through Front Line Demonstration

D.K. Mishra<sup>1</sup>, R.S. Tailor<sup>2</sup>, Gopesh Pathak<sup>3</sup>, and Alok Deshwal<sup>4</sup>

1. SMS (Horticulture), 2. SMS (Ag. Ext.), 3. Farm Manager, 4. Programme Coordinator, KVK, Kasturbagram, Indore

### ABSTRACT

*Potato is one of the basic vegetable of mass consumption in India and abroad and become 4th important staple food after rice wheat and maize. Further scope to substantially improve the production and productivity exists especially at Indore region, which identified as Agric Export Zone for potato. Through survey, farmers meeting and field diagnostic visit the yield gap was brought out due to incidence of blight disease in potato field. To overcome the yield gap 50 Front line demonstrations were conducted by K V K, Kasturbagram, Indore during 2002-2007 at 4 development blocks under different locations. Existing farmers practice was taken as a control for comparison and recommended packages involving balance application of nitrogen fertilizer along with Mancozeb 75 % WP as foliar spray at 30,45, and 60 days after planting (DAP). The yield performance of both control and demonstration plot were recorded, and their yield gap, technology gap, extension gap and technology index were analyzed. Potato yield of demonstrated plot recorded 13 to 19 percent higher over farmer practice. On an average technology gap was recorded 63.79 q/ha. Average extension gap was recorded 29.8Q/ha and average technology index was recorded 21.2%. The yield gap analysis emphasize the need to educate the farmers through various extension means for adoption of improved agricultural technologies to revert the trend of wide extension gap.*

**Key word :** F.L.D.; Potato; Yield gap analysis

**P**otato (*Solanum tuberosum* sp *Teberosum*) has been introduced in India by British missionaries in the late seventeenth century (Hawkes, 1978). Now Potato is one of the basic vegetables of mass consumption in India and abroad and become 4th important food crops after rice, wheat and maize. India is the third largest producer of potato in the world, producing 24.4 million tones of fresh potato from 1.15 million ha (Kalloo et al.). The country recorded an increase in area under potato from 0.24 million ha in 1950-51 to 1.3 Million hectare in 2004-05 with corresponding increase in production from 1.66 to 23.6 Million tonnes. The productivity also improved from 6.92 t /ha in 1950-51 to 18.15 t/ha in 2004-05 (Pandey *et al.* 2006). During 2004-05 potato occupied 0.007 million hectare with 0.11 Million tonnes production and 15 tonnes productivity in Madhya Pradesh. The Indore district of Madhya Pradesh, which is recognized as agri-export zone for potato occupied 0.002 million hectare with annual production and productivity 0.418 million tonnes and 19.00 tones per hectare, respectively during 2004-05 (Anonymous, 2005). Further scope to substantially improve the production and productivity in Madhya Pradesh, especially in Indore district exists.

Potato is input intensive and prone to many diseases, particularly early and late blight. The incidence and severity

of early and late blight is generally high in crop receiving imbalanced nutrition and devoid of disease control measure. The losses caused by late blight are reported (Kumar *et al.* 2003) to range between 25 to 85 percent in terms of yield. In *Malwa* plateau particularly operational area of Krishi Vigyan Kendra (KVK) Indore, such incidence was playing a major role in productivity losses or yield erosion. In the present investigation, the yield losses on account of blight diseases in potato have been assessed under real farm conditions utilizing Front Line Demonstrations and are reported

### METHODOLOGY

Fifty Front Line Demonstration on potato to control blight diseases were conducted by KVK, Kasturbagram during 2002-2007 at 4 villages namely Hatod, Khatipliya, Datoda and Ralamandal located in Depalpur, Sanwer, Datoda and Mhow blocks, respectively, of Indore district. The area under each demonstration was 0.46 ha (1 acre). Farmers' meetings, survey and field diagnostic visits in the targeted area during the cropping season brought out that the incidence of blight diseases led to severe losses in terms of yield in potato. To manage such problems improved and recommended package from Jawaharlan Nehru Krishi Vishwa Vidyalaya, Jabalpur and Central

Potato Research Institute, Shimla was followed in the Front Line Demonstration programme. The existing farmers' practice of potato cultivation was taken as control for comparison. The recommended package involving balanced application of nitrogenous fertilizer along with use of Mancozeb 75% WP as prophylactic foliar spray at 30, 45 and 60 days after planting (DAP) was taken as intervention to manage the problem. Well before the organizing the demonstrations, training to farmers of the respective villages were imparted. The necessary steps like selection of site and farmers, layout of demonstration etc. were followed as suggested by

Choudhary (1999). For demonstrations, the critical input Mancozeb 75 WP was provided by KVK, whereas the quality seed fertilizer, insecticide etc. were born by farmers themselves. The yield data were collected from both the demonstration and control plots (farmers practice) and their technology gap, extension gap and the technology index were worked out (Samui *et al*, 2000) as given below.

Technology gap = potential yield - demonstration yield  
Extension gap = demonstration yield - farmers yield

$$\text{Technology index} = \left\{ \frac{(\text{potential yield} - \text{demonstration yield})}{\text{potential yield}} \right\} \times 100$$

Table 1. Productivity, Technology Gap, Extension Gap and Technological Index % in Potato (CV Kufri Jyoti)

Year	No. of demonstration	Yield (q/ha)			% increase over check	Technology gap	Extension gap	Technological index %
		Potential	Demonstration	Local Check				
2003-04	10	300.00	214.00	188.60	13.5	86.0	25.4	28.6
2004-05	15	300.00	288.70	242.70	19.0	11.3	46.0	3.76
2005-06	15	300.00	207.60	183.40	13.0	92.4	24.2	30.8
2006-07	10	300.00	234.60	202.00	16.0	65.1	23.6	21.8
Total	50							
Mean		300.00	236.00	204.00	15.4	63.7	29.8	21.2

## RESULTS AND DISCUSSION

Perusal of data (Table 1) revealed that under demonstration plots, potato yield was found substantially higher than that under farmer's practice during all the year. Under different locations, the potato yield in demonstration plots ranged between 207.6 and 288.7 q/ha over observation period, which was 13 to 19 percent higher over farmers practice (local check). On an overall basis, 15.4 percent increase in yield was recorded. These results are in conformity with the findings of Tomar *et al.* (2003) in Front Line Demonstrations on potato and of Haque (2000), Tiwari and Saxena (2001) and Tiwari *et al.* (2003) in other crops. However, the variation in yield from location to location can be accounted for varying climatic conditions, prevailing microclimate and variation in agricultural practices followed. More or less similar reasoning was provided by other workers (Sagar and Chandra, 2004 and Tomar *et al.* 2003) also.

The technology gap, the difference between potential yield and yield of demonstration plots, were 86, 11.3, 92.40 and 65 q/ha during 2003-04, 2004-05, 2005-06 and 2006-07, respectively. On an average technology gap under 4 years FLD. programme was 63.7 q/ha. The technology gap observed may be attributed to dissimilarity in the soil fertility status, agriculture practices and local climatic situation.

Extension gap of 25.4, 46.0, 24.2 and 32.6 q/ha was

observed during 2003-04, 2004-05, 2005-06, 2006-07, respectively. Average extension gap was observed 29.8 q/ha, which emphasized the need to educate the farmers through various extension means like FLD., for adoption of improved agricultural technologies, to revert the trend of wide extension gap.

The technology index shows the feasibility of the demonstrated technology at the farmer's field. The lower the value of technology index, more is the feasibility of the technology demonstrated (Sager and Chandra, 2004). The technology index varied from 3.76 to 30.8 percent (Table-1). On an average technology index was observed 21.2 percent during the 4 years of FLD, which shows the efficacy good performance of technical interventions. This will accelerate the adoption of demonstrated technical intervention to increase the yield performance of potato and lower down the losses meant by blight disease in potato.

## CONCLUSION

The study of yield gap analysis of blight disease management through Front Line Demonstration revealed that the losses made by blight disease in terms of yield q/ha could be increased by 13 to 19 percent. The technology gap which shows the gap in the demonstration yield over potential yield were ranged between 11.3 and 92.40 q/ha and can be attributed to dissimilarity of the soil fertility and local climatic situation. Extension gap ranged between

24.2 and 32.6 q/ha, which emphasized the need to educate the farmers through various means like training, FLDs etc. Technology index show the feasibility of the

technology demonstrated which show the good performance of intervention point made to reduce the yield gap in potato.

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