Study on Performance of Improved Vegetable Varieties Through Community Approach in The Katni District of Madhya Pradesh

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ABSTRACT

Frontline demonstrations of seven improved vegetable varieties viz. Kashi Amrit, Kashi Anupam, Kashi Vishesh (Tomao), Kashi Sandesh (Brinjal), Kashi Anmol (Chilli), Kashi Kanchan (Cowpea) and Kashi Nandani (Gardenpea) with recommended production, productivity and improved technologies were conducted at randomly selected 95 farmers field in an area 13.0 hectare covering two blocks namely Bahoriband and Rithi zone of Kymoreplateau Satpurahills in Katni district of Madhya Pradesh during the period of 2011-12 to 2014-15. Results revealed that all the demonstrated improved vegetable varieties performed significantly better in terms of increase in yield with a minimum of 22.3 percent in brinjal to a maximum of 49.7 percent in tomato over the existing cultivars. This indicates the opportunities of wider seed replacement in the district and greater feasibility adoption of improved vegetable varieties by the farmers.

Keywords: *Vegetables, Varieties, Community approach*

The vegetables are the most important to the human diet for better health, because they possess high nutritive value and are rich source of carbohydrates, proteins, vitamins and minerals (*Suman, 2017*). But Indian consumers are consuming less than the WHO recommended quantity 400g per day (*National Horticultural Board, 2015*). Fruits and vegetables consumption is closely associated with increased risk of serious and chronic diseases. More than 40 kinds of vegetables belonging to different groups, namely, solanaceous, cucurbitaceous, leguminous, cruciferous (cole crops), root crops and leafy vegetables are grown in India in tropical, subtropical and temperate regions. Important vegetable crops grown in the country are tomato, onion, brinjal, cabbage, cauliflower, okra and peas. India is next only to China in area and production of vegetables (*Samantaray et al, 2009*).

Katni district of Madhya Pradesh is having a many potential of vegetable production round the year due to favourable soil and agro-climatic condition, majority of the farmers of this region are still practicing traditional farming as the quality vegetable seeds of private seed companies are expensive and are also not easily available in the rural areas. Therefore, for creating awareness among the farmers, efforts has been made to popularize the high yielding varieties of tomato, brinjal, chilli, cowpea and garden pea along with their production, productivity and improved technologies through community approach. Technology has been demonstrated through frontline demonstration (FLD) with an objective to evaluate the yield performance of vegetable varieties with the existing cultivars at farmer's field.

In vegetables tomato, brinjal and chilli require much attention starting from nursery to field preparation, transplanting, plant protection, harvesting stage and finally handling and marketing of produce. Similarly crops like cowpea and garden pea require attention towards selection of variety, method of sowing, proper plant protection measures, stage of picking, proper handling and marketing. The benefits of transformational technologies when derived as they are efficiently utilized by the individual farmers in their local situations (*Singh et al, 2012*).

METHODOLOGY

The present study was conducted in two blocks of Katni district of Madhya Pradesh namely Bahoriband and Rithi during the season of Kharif viz Tomao (Kashi Amrit, Kashi Anupam, Kashi Vishesh), Brinjal (Kashi Sandesh), Chilli (Kashi Anmol), Cowpea (Kashi Kanchan) and gardenpea (Kashi Nandani) Rabi season during the year of 2011-12 to 2014-15). A total of seven varieties of different vegetable crops, were randomly demonstrated in 95 farmer's field in total of 13.0 hectare area. The demonstration plots and farmer's plot were kept minimum plot size of 300 sq meters to visualize the differences and making self assessment by the farmers. The demonstration trials were regularly monitored and cross-sectional data on output of new varieties against traditional practices followed by farmers were collected. The collected data were further pooled for the four years and analyzed for estimating technology gap and extension gap of each demonstrated varieties.

Demonstrated technologies under community approach: Apart from improved varieties, following package and practices have been advocated in the cultivation of solanaceous vegetable crops (Pandey *et. al.,* 2003).

Preparation of field:

1. Deep ploughing during spring season to control soil borne insect-pest and disease pathogens.
2. Soil treatment with trichoderma @ 5.0 kg and PSB @ 2.5 kg/ha before sowing /transplanting.

Nursery raising technology:

1. Soil solarization of nursery beds in hot summer by covering with 30 micron silver transparent polyethylene sheet for 30 days.
2. Seed treatment with trichoderma + PSB @ 5.0 gm + imidacloprid @ 1.0 ml/kg seed.
3. Raising of nursery on raised bed 20 cm from the ground maintaining 45-50 cm space between two beds.
4. Sowing of seed in nursery beds line to line spacing 5 cm.
5. One spray of streptocycline @ 150 ppm to manage bacterial blight and one spray of mancozeb + metalaxyl @ 2.0 g/lit water to control of damping off disease.

Technology of transplanting:

1. Transplanting on raised bed at a distance of 60 X 45 cm (tomato and chilli) and 75 X 60 cm (brinjal).
2. Soil drenching of trichoderma @ 1 % at 20 days after transplanting.
3. Collection and destruction of tomato plants affected by TLCV and bacterial blight, chilli plants affected by leaf curl and branches and fruits of brinjal affected by shoot and fruit borer and need based application of profenophos @ 2 ml/liter of water.
4. Spray of streptocycline @ 200 ppm to control bacterial blight.
5. Weeding, hoeing, earthing and top-dressing of urea at 30-35 days after transplanting.

Production technology:

(i) Cowpea:

1. Sowing of cowpea at 45 X 30 cm distance on raised beds to save irrigation water.
2. Seed treatment of cowpea with trichoderma @ 5.0 g + rhizobium culture @ 10.0 g/kg + imidacloprid @ 2.0 ml/kg seed.
3. Spray of pendimethalin @ 3.5 lit/ha in 1000 liter of water within 70hours of sowing to control herbicide.
4. Weeding, hoeing, earthing and top-dressing of urea at 30 days after sowing.
5. Spray of imidacloprid @ 0.5 ml/liter of water to control white fly and thrips.

(ii) Gardenpea:

1. Seed treatment with trichoderma @ 5 g + rhizobium culture @ 10 g/kg seed.
2. Line sowing of pea at a distance of 25 X 5 cm.
3. Spray of pendimethalin @ 3.5 lit/ha in 1000 liter of water within 70 hours of sowing to control weeds.
4. Weeding, hoeing and earthing after 30 days.

RESULTS AND DISCUSSION

Tomato: The results revealed that demonstrated varieties of tomato (Kashi Amrit,Kashi Anupam and Kashi Vishesh) fetched an average yield of 415.33 q/ha at farmer's field as against 284.43 q/ha in local check. The data given in table-1 shows the significant increase of tomato yield i.e., upto 49.7 percent over control. Kashi Amrit variety is performing best in the farmer's field. Kashi Amrit as also advocated for improved solanaceous vegetables in eastern U.P. (Rai *et al*., 2005). As tolerance to BW and Early Blight is a major problem in tomato cultivation and the variety Kashi Amrit

demonstrated at farmer's field has showed moderately resistant during the early season cultivation of tomato, there is a great scope of its high adoptability among the growers. Scientist has been observed good performance of Kashi Amrit and Kashi Anupam at farmer's field and both varieties are gaining popularity among the farmers.

Chilli: Kashi Anmol early variety of chilli was demonstrated and compared with variety practiced by the farmers. An average yield of 135.80 q/ha has been recorded with 37.40% increase over control and indicating high feasibility of its adoption among farmers. This variety has become most popular in the area, as it is most suitable for the wheat growers who are taking wheat after chilli.

Brinjal: Efforts were made to evaluate the performance of Kashi Sandesh variety of brinjal at farmer's field through demonstration. It produced an average yield of 605.70 q/ha with 22.31% increase over local check. Therefore, it resulted in better adoption in Katni district and Kymore plateau region.

Cowpea: The results revealed that demonstrated varieties of cowpea (Kashi Kanchan) an average yield of 104.60 q/ha at farmer's field as against 72.80 q/ha in local check. The data given in table-1 shows the significant increase of cowpea yield upto 43.68% over control. Kashi Kanchan variety performed externally

Table No. 1 – Yield performance of demonstrated varieties and existing cultivars

Crop / Variety	No. of farmers	Demo. Area (ha.)	Yield (q/ha) Potential	FLD	Control	% Yield increase over control	Tech Gap (q/ha)	Ext. gap (q/ha
Tomato - Kashi Amrit	15	2.0	450.0	390.0	260.5	49.7	60.0	129.5
Tomato - Kashi Anupam	15	2.0	500.0	460.2	312.8	47.1	39.8	147.4
Tomato - Kashi Vishesh	15	2.0	525.0	395.8	280.0	41.3	129.2	115.8
Brinjal - Kashi Sandesh	15	2.0	700.0	605.7	495.0	22.31	94.3	110.7
Chilli – Kashi Anmol	15	2.0	180.0	135.8	98.8	37.4	44.2	37.0
Cowpea - Kashi Kanchan	10	1.5	125.0	104.6	72.8	43.6	20.4	31.8
Gardenpea -Kashi Nandani	10	1.5	110.0	95.0	68.6	38.4	15.0	26.4

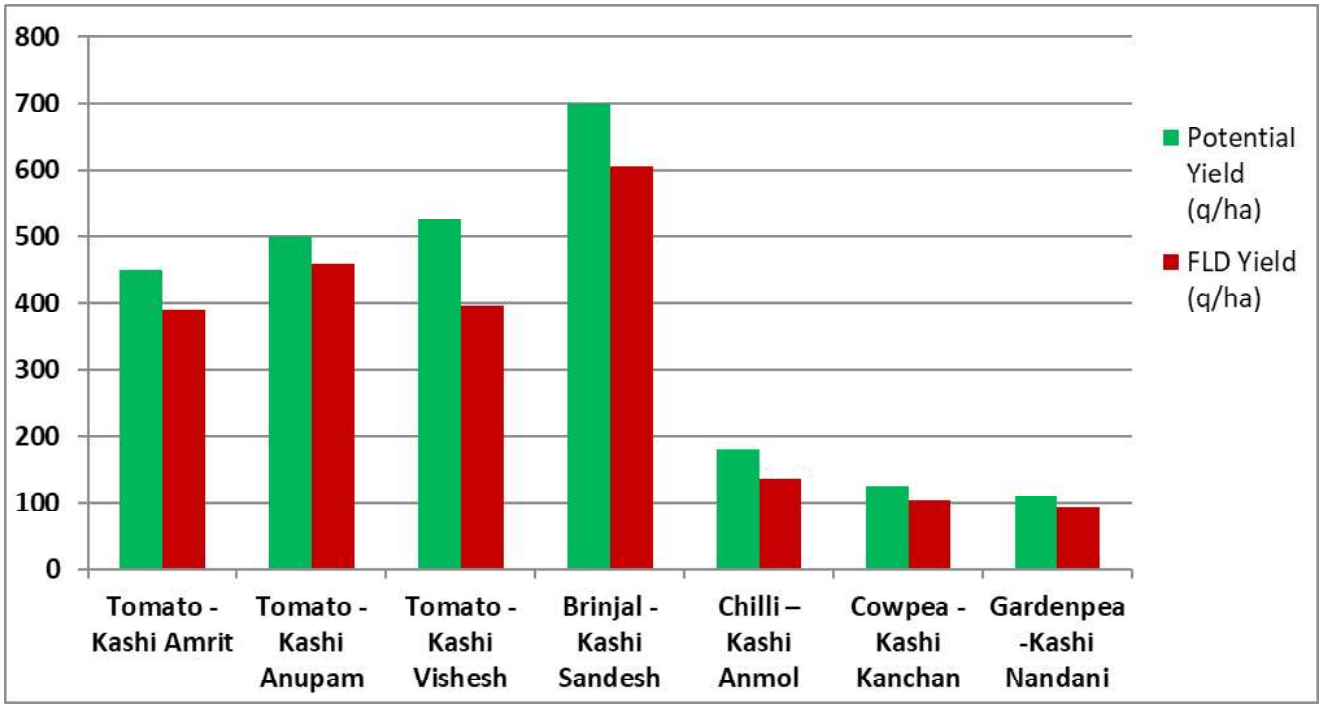

Fig. Yield performance of improved varieties

well in the farmer's field with a technology gap of 20.40q/ ha which resulted in better adoption and replacement of other varieties of cowpea.

Pea: Evaluating the demonstrated variety of pea Kashi Nandani performance extremely well in the farmer's field. Pea variety of Kashi Nandani an average yield of 65.0 q/ha at farmer's field as against 95.0 q/ha in local check, which resulted in better adoption and replacement of other varieties of pea from Katni district.

It is concluded that the existing extension gap can be bridged through participatory approach (*Mukhopadhyay, (2002*). The extension agencies could effectively communicate the improved technologies to farming community for better production. Similar findings has also been reported by *Kandian et al. (1997)* in oil seeds, *Singh et al. (2002)* in pulses, Singh et al. (2002) and Gupta et al. (2004) in soybean, *Rai et al. (2005)* in solanaceous vegetables and *Singh et al. (2008)* in vegetable crops.

CONCLUSION

Though the Frontline demonstration trials were determined under the supervision of scientists at farmer's field, still a gap between the potential yield and trial yield exists which ranges from 15.0 q/ha in pea (Kashi Nandani to 129.20q/ha in tomato (Kashi Vishesh). This may be due to soil fertility, weather and agro-climatic condition. Hence, the location specific recommendations are necessary to bridge this gap, which may have been due to the more traditional farmers practices followed in the region. It can be reduced by giving more frontline demonstration in this district and motivating farmers for adopting the improved vegetable technologies since indicates the opportunities of high level of adoption. The present study revealed district and more extension services in community approach will certainly enhance the production and productivity along with improving the livelihood of the farmers.

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