

EVALUATION OF IMPROVED VEGETABLE VARIETIES THROUGH COMMUNITY APPROACH IN KUSHINAGAR DISTRICT OF UTTAR PRADESH

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Summary

Frontline demonstrations of eight improved vegetable varieties viz., Kashi Anupam and Kashi Vishesh in tomato; Kashi Nandini and Kashi Shakti in pea; Kashi Anmol in chilli; Kashi Kanchan in cowpea; IVBR-14 in brinjal and Kashi Pragati in okra along with recommended production and protection technologies were conducted at randomly selected 100 farmers' field in an area of 10.86 hectare covering five blocks of Kushinagar district of Uttar Pradesh during 2004-07. Results revealed that all the demonstrated improved vegetable varieties performed significantly better in terms of increase in yield with a minimum of 14.0 per cent in pea to a maximum of 37.8 per cent in chilli over the existing cultivars. The extension index of 12.31-27.43 per cent indicates the opportunities of wider seed replacement in the district. Low technology index of 7.50-19.03 per cent also indicated the greater feasibility of adoption of improved vegetable varieties by the farmers.

सारांश

उत्तर प्रदेश के कुशीनगर जनपद के पाँच विकास खण्ड में वर्ष 2004-07 के दौरान सब्जियों की आठ उन्नतशील प्रजातियाँ जैसे टमाटर में काशी अनुपम और काशी विशेष, मटर में काशी नन्दनी एवं काशी शक्ति, मिर्च में काशी अनमोल, लोबिया में काशी कंचन, बैंगन में आई.बी.बी.आर.-14 एवं भिण्डी में काशी प्रगति का अग्रिम पंक्ति प्रदर्शन 100 किसानों के प्रक्षेत्र पर 10.86 हेक्टेयर भूमि में किया गया। सभी प्रदर्शनों के परिणाम यह दर्शाती है कि सब्जियों के उन्नतशील किस्में द्वारा अच्छा परिणाम दिया गया है जिससे उत्पादन में बढ़ोत्तरी हुई एवं प्रचलित किस्मों की तुलना में मटर में सबसे कम 14.0 प्रतिशत से लेकर मिर्च में सबसे अधिक 37.8 प्रतिशत हुई है। 12.31-27.43 प्रतिशत की प्रसार इन्डेक्स अन्तर जनपद में बीज बदलाव की अपार सम्भावनाओं को व्यक्त करती है। 7.50-19.03 प्रतिशत की निम्न तकनीकी इन्डेक्स कृषकों द्वारा उन्नतशील सब्जी प्रजातियों के अपनाने की अपार सम्भावनाओं को भी दर्शाती है।

Introduction

In vegetables, tomato, brinjal and chilli require much attention starting from nursery raising to field preparation, transplanting, plant protection, harvesting stage and finally handling and marketing of produce. Similarly crops like cowpea, okra and pea require attention towards selection of variety, method of sowing, proper plant protection measures, stage of picking, proper handling and marketing. Despite the fact that Kushinagar district of eastern Uttar Pradesh is having a great 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 readily available in the rural areas. Therefore, for creating awareness among the farmers, efforts have been made to popularize the high yielding varieties of tomato, brinjal, chilli, cowpea, okra and pea along with their production and

protection technologies through community approach. These recommended technologies have been demonstrated through frontline demonstration (FLD) with an objective to evaluate the yield performance of improved varieties with the existing cultivars at farmers' field.

Materials and methods

The present study was conducted in five blocks of Kushinagar district of Uttar Pradesh viz., Seorahi, Tamkuhi Raj, Dudhahi, Kasya and Padrauna during *zaid* (okra and cowpea), *kharif* (tomato, brinjal and chilli) and *rabi* (pea) during 2004-07. A total of 8 varieties of different vegetables including two each in tomato (Kashi Anupam and Kashi Vishesh) and pea (Kashi Nandini and Kashi Shakti) and one each in chilli (Kashi Anmol), brinjal (IVBR-14), cowpea (Kashi Kanchan) and okra (Kashi Pragati) were randomly demonstrated in 100 farmers' field in total of 10.86 hectare area. The demonstration plots and farmer's plot were kept side by side with minimum plot size of

200 sq meter 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 three years and analyzed for estimating technology gap, extension gap and technology index of each demonstrated vegetable 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).

Field preparation:

- i) Deep ploughing during summer to destroy soil borne insect-pest and disease pathogens.
- ii) Soil treatment with *Trichoderma* @ 5.0 kg/ha before sowing/transplanting.

Nursery raising technology:

- i) Soil solarization of nursery beds in hot summer by covering with transparent polyethylene sheet for 5 weeks.
- ii) Seed treatment with *Trichoderma* @ 2.0 g + imidacloprid @ 2.5 g/kg seed.
- iii) Raising of nursery on beds raised 20 cm from the ground maintaining 20-25 cm space between two beds.
- iv) Sowing of seed in lines made apart 5 cm.
- v) One spray of streptocycline @ 150 ppm to manage bacterial blight of seedlings.

Transplanting technology:

- i) Transplanting on raised beds at a distance of 60 x 45cm (tomato and brinjal) and 60 x 30 cm (chilli).
- ii) Soil drenching of *Trichoderma* @ 1% at 20 days after transplanting.
- iii) Collection and destruction of tomato plants affected by TLCV, chilli plants affected by leaf curl and branches and fruits of brinjal affected by shoot and fruit borer and need based application of Cartap hydrochloride @ 1 g/liter of water.

- iv) Spray of streptocycline @ 200 ppm to control bacterial blight.
- v) Weeding, topdressing of urea and earthing at 30 days after transplanting.

Production technology

Okra and cowpea

- i) Sowing of okra and cowpea at 45 x 30 cm distance on raised beds to save irrigation water.
- ii) Seed treatment of okra with *Trichoderma* @ 2 g + imidacloprid @ 2.5 g/kg seed.
- iii) Seed treatment of cowpea with *Trichoderma* @ 2 g + *Rizobium* culture @ 10 g/kg seed.
- iv) Spray of pendimethalin @ 3.3 lit/ha mixing in 1000 litre of water within 48 hours of sowing to control weeds.
- v) Weeding, top-dressing of urea and earthing at 30 days after sowing.
- vi) Spray of imidacloprid @ 0.3 ml/litre of water to manage white fly (vector of YVMV of okra) thrips.

Pea

- i) Seed treatment with *Trichoderma* @ 2 g + *Rizobium* culture @ 10g/kg seed.
- ii) Line sowing of pea at a distance of 30 x 5cm.
- iii) Spray of pendimethalin @ 3.3 lit/ha mixing in 1000 litre of water within 48 hours of sowing to control weeds.
- iv) Weeding and top-dressing of urea at 30 days after sowing.

Results and discussion

Tomato: The results revealed that demonstrated varieties of tomato, Kashi Anupam and Kashi Vishesh fetched an average yield of 312.00 q/ha at farmers' field as against 240.60q/ha in local check. The data given in table-1 shows the significant increase of tomato yield ie., up to 31.30 per cent over control. Technology index of 17.73% in case of Kashi Vishesh followed by Kashi Anupam (17.92%), which indicates that Kashi Vishesh variety is performing best in the farmers' field. Since the technology index of both the demonstrated varieties lies in lower quarter that indicates the high level of adoption of these varieties as also advocated for improved solanaceous

Table 1. Yield performance of demonstrated varieties and existing cultivars

Crop/ Variety	No. of farmers	Demonstrated area (ha)	Yield (q/ha)			% yield increase over control	Technology gap (q/ha)	Extension gap (q/ha)	Technology index (%)	Extension index (%)
			Potential	FLD	Control					
Tomato										
Kashi Anupam (DVRT-2)	18	0.5	385	316.00	240.60	31.30	69.00	75.40	17.92	23.86 (IV)
Kashi Vishesh (H-86)	18	0.5	375	308.50	240.60	28.20	66.50	67.90	17.73	22.01 (V)
Chilli										
Kashi Anmol (KA-2)	13	0.4	185	149.80	108.70	37.80	35.20	41.10	19.03	27.43 (I)
Brinjal										
IVBR-14	16	1.0	400	324.40	257.00	26.20	75.60	67.40	18.90	20.77 (VI)
Cowpea										
Kashi Kanchan (VRCP-4)	22	3.28	110	98.40	72.90	34.90	11.60	25.50	10.54	25.91 (III)
Okra										
Kashi Pragati (VRO-6)	19	3.68	140	119.20	87.30	36.50	20.80	31.90	14.86	26.76 (II)
Pea										
Kashi Nandini (VRP-5)	17	1.0	72	66.60	58.40	14.00	5.40	8.20	7.50	12.31 (VIII)
Kashi Shakti (VRP-7)	16	0.5	80	69.50	58.40	19.00	10.50	11.10	13.12	15.97 (VII)

vegetables in eastern U.P. (Rai *et al.*, 2005). As tomato leaf curl virus (TLCV) is a major problem in tomato cultivation and the variety Kashi Vishesh demonstrated at farmers' field has showed moderately resistant during the early season cultivation of tomato, there is a great scope of its high adoptability among the growers. Seeing the good performance of Kashi Vishesh and Kashi Anupam in field these varieties are gaining popularity among the farmers.

Chilli: Kashi Anmol variety of chilli was demonstrated and compared with variety practiced by the farmers. An average yield of 149.80 q/ha has been recorded with 37.80% increase over control. The extension index and technology index were 27.43 and 19.03%, respectively, 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 IVBR-14 variety of brinjal at farmers' field through demonstration. It produced an average yield of 324.40 q/ha with 26.20% increase over local check. Therefore, it resulted in better adoption in Kushinagar district as it showed low technology index (18.90%).

Cowpea: Kashi Kanchan of cowpea was also demonstrated and recorded an average yield of 98.40q/ha with 34.90 per cent increase over local check. It performed extremely well in the farmers' field with a technology gap of 11.60 q/ha and technology index

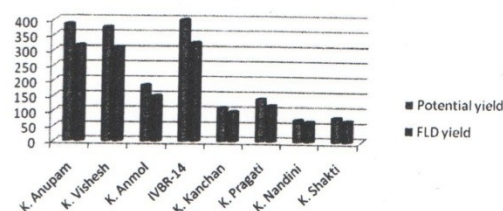


Fig. 1. Yield performance of improved varieties

of 10.54%, which resulted in better adoption and replacement of other varieties of cowpea. Seeing the performance of Kashi Kanchan of cowpea in demonstration, some of the farmers in the district have started producing seeds of this variety.

Okra: Attempt was also made to evaluate demonstrated Kashi Pragati of okra at farmers' field. An average yield of 119.20q/ha was recorded with 36.50 per cent increase of yield over control. Technology index was low (14.86%) which indicates the high level of adoption of Kashi Pragati. Seeing the performance of Kashi Pragati of okra in demonstration, some of the farmers in the district have started producing seeds of this variety.

Pea: While evaluating the demonstrated two varieties of pea viz., Kashi Nandini and Kashi Shakti and comparing their performance with existing varieties it

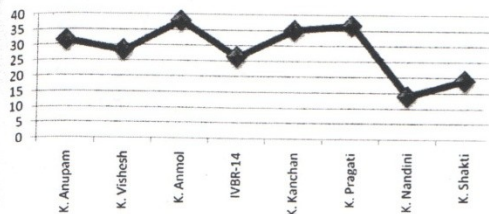


Fig. 2. Performance of improved vegetable in comparison to traditional varieties

was observed that Kashi Nandini performed extremely well in the farmers' field with technology index of 7.50 per cent, which resulted in better adoption and placement of other varieties of pea from Kushinagar district. Technology index of Kashi Nandini (7.50%) was also lowest indicating the feasibility of high adoption of this variety by farmers. Kashi Shakti also performed well with 19.00 per cent yield increase over local check with a technology index of 13.12%, which may be due to soil or environmental factors.

Though the FLD trials were laid down under the supervision of scientists at farmers' field, still a gap between the potential yield and trial yield exists which ranges from 5.40q/ha in pea (Kashi Nandini) to 69.00 q/ha in tomato (Kashi Anupam). This may be due to soil fertility and agro-climatic conditions. Hence, the location specific recommendations are necessary to bridge this gap. Extension index was also observed ranging from 12.31% in pea variety Kashi Nandini to 23.86% in tomato variety Kashi Anupam, which may have been due to the more traditional farmers/practices followed in the region. It can be reduced by giving more FLD in this district and motivating farmers for adopting the improved vegetable technologies. Since the technology index of all the demonstrated varieties varied between 7.50 and 19.03%, which lies in the lower quarter, indicates the opportunities of high level of adoption.

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 have also been reported by Kadian *et al.* (1997) in oil seeds, Singh *et al.* (2002) in pulses, Singh *et al.* (2002) and Gupta *et al.* (2004) in soybean, Thakral and Bhatnagar (2002) in chickpea and Rai *et al.* (2005) in solanaceous vegetables. The present study revealed that there is great scope of vegetable cultivation in the 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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