

## Performance of Improved Vegetable Varieties through Community Approach in the Tikamgarh District of Madhya Pradesh

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### Abstract

Frontline demonstrations of nine improved vegetable varieties viz. Kashi Ganga (Bottle gourd), Kashi Sandesh (Brinjal), Kashi Anmol (Chilli), Kashi Nidhi and Kashi Kanchan (Cowpea), Kashi Udai and Kashi Mukti (Tablepea), Arka Samrat and Kashi Vishesh (Tomato) with recommended production, productivity and protection technologies were conducted at randomly selected 108 farmers field in an area 10.8 hectare covering three blocks Jatara, Baldevgarh and Tikamgarh of Tikamgarh district of Madhya Pradesh during the period of 2016-17 to 2019-20. Results revealed that all the demonstrated improved vegetable varieties performed significantly better in terms of increase in yield with a minimum of 27.1 percent in chilli to a maximum of 98.7 percent in cowpea over the existing cultivars. The extension index of 21.33-47.57 percent indicates the opportunities of wider seed replacement in the district. Low technology index of 11.24-43.42 percent also indicated the greater feasibility of adoption of improved vegetable varieties by the farmers.

**Keywords:** Vegetable, Varieties, Community approach.

### Introduction

Tikamgarh district of Madhya 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 easily available in the rural areas. Therefore, for creating awareness among the farmers, efforts has been made

### Materials and Methods

The present study was conducted in three blocks of Tikamgarh district of Madhya Pradesh viz., Jatara, Baldevgarh and Tikamgarh during the season of Kharif (Bottle Gourd, Brinjal, Chilli, Cowpea and Tomato) and Rabi (Pea during the year of 2016-17 to 2019-20). A total of nine varieties of different vegetable including two each in Tomato (Arka Samrat and Kashi Vishesh), Cowpea (Kashi Kanchan and Kashi Nidhi), Pea (Kashi Udai and Kashi Mukti) and one each in Bottle gourd (Kashi Ganga), Brinjal (Kashi Sandesh)

to popularize the high yielding varieties of bottle gourd, brinjal, tomato, chilli, cowpea and pea along with their production, productivity and protection technologies through community approach. This recommended technology has been demonstrated through frontline demonstration (FLD) with an objective to evaluate the yield performance of improved varieties with the existing cultivars at farmer's field.

and Chilli (Kashi Anmol), were randomly demonstrated in 156 farmer's field in total of 14.40 hectare area. The demonstration plots and farmer's plot were kept side by side with minimum plot size of 250 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, extension gap and technology index of each

### **Demonstrated Technologies under Community Approach**

Apart from improved varieties, following package and practices have been advocated in the cultivation of solanaceous vegetable crops.

#### **Field preparation**

1. Deep ploughing during summer season to control soil borne insect-pest and disease pathogens.
2. Soil treatment with trichoderma @ 5 lit and PSB, ZSB, KSB @ 2.5 lit/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 ml + imidacloprid @ 2.0 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.

#### **Transplanting technology**

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.

demonstrated vegetable varieties.

4. Spray of streptocycline @ 200 ppm to control bacterial blight.
5. Weeding, hoeing, earthing and top-dressing of urea at 30 days after transplanting.

#### **Production technology**

##### **(i) Bottle Gourd**

1. Sowing of bottle gourd at 0.80 X 3.0 m distance with bower system to save fruit rot in Kharif season.
2. Seed treatment of bottle gourd with trichoderma @ 5 g + rhizobium culture @ 10 g/kg + imidacloprid @ 2.0 ml/kg seed.
3. Spray of profenophos @ 2.0 ml/liter of water to control fruit fly and other insects.

##### **(ii) 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 g + rhizobium culture @ 10 g/kg + imidacloprid @ 2.0 ml/kg seed.
3. Spray of pendimethalin @ 3.5 lit/ha in 1000 liter of water within 48 hours of sowing to control weeds.
4. Weeding, hoeing, earthing and top-dressing of urea at 30 days after sowing.
5. Spray of imidacloprid @ 2.0 ml/liter of water to control white fly and thrips.

##### **(iii) Pea**

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 48 hours of sowing to control weeds.

4. Weeding, hoeing, earthing and foliar spray of pseudomonas @ 5 lit/ha after

30 days.

### Results and Discussions

**Tomato:-** The results revealed (Table 1) that demonstrated varieties of tomato (Arka Samrat and Kashi Vishesh) fetched an average yield of 395.25 q/ha at farmer's field as against 278.5 q/ha in local check. The data given in table-1 showed the significant increase of tomato yield i.e., upto 31.3 percent over control. Technology index of 19.20% in case of Kashi Vishesh followed by Arka Samrat (25.31%) with indicates that Arka Samrat variety is performing best in the farmer's 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 vegetables in eastern U.P. (Rai *et al.*, 2005). As tomato triple disease resistance to TLCV, BW and Early Blight is a major problem in tomato cultivation and the variety Arka Samrat 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 Arka Samrat and Kashi Vishesh 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 131.7 q/ha has been recorded with 27.1% increase over control. The extension index and technology index were 21.33% and 11.24% 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 table 1.

**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 270.6 q/ha with 51.80% increase over local check. Therefore, it resulted in better adoption in Tikamgarh district and Bundelkhand region. The extension index and technology index were 34.14% and 15.4% respectively (Table 1, fig. 1).

**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 |                             |                       |                      |                      |                     |
| Bottle gourd – Kashi Ganga | 24             | 1.2                     | 528.0        | 452.2 | 274.6   | 64.7                        | 75.8                  | 177.6                | 14.35                | 39.27               |
| Tomato – Kashi Vishesh     | 12             | 1.2                     | 425.0        | 378.0 | 296.4   | 27.5                        | 47.0                  | 81.6                 | 19.2                 | 21.58               |
| Tomato - Arka Samrat       | 17             | 1.7                     | 600.0        | 412.5 | 260.6   | 58.2                        | 151.9                 | 151.9                | 25.31                | 36.82               |
| Brinjal – Kashi Sandesh    | 12             | 1.2                     | 600.0        | 270.6 | 178.2   | 51.8                        | 329.4                 | 92.4                 | 15.4                 | 34.14               |
| Chilli – Kashi Anmol       | 17             | 1.7                     | 250.0        | 131.7 | 103.6   | 27.1                        | 118.3                 | 28.1                 | 11.24                | 21.33               |
| Cowpea – Kashi Kanchan     | 20             | 2.0                     | 125.0        | 103.0 | 54.0    | 90.7                        | 22.0                  | 49.0                 | 39.2                 | 47.57               |
| Cowpea - Kashi Nidhi       | 20             | 2.0                     | 135.0        | 105.0 | 60.0    | 75.0                        | 30.0                  | 45.0                 | 33.33                | 42.85               |
| Pea – Kashi Udai           | 17             | 1.7                     | 105.0        | 102.0 | 56.4    | 80.8                        | 3.0                   | 45.6                 | 43.42                | 44.7                |
| Pea – Kashi Mukti          | 17             | 1.7                     | 100.0        | 98.8  | 59.4    | 66.3                        | 1.2                   | 39.4                 | 39.4                 | 39.87               |

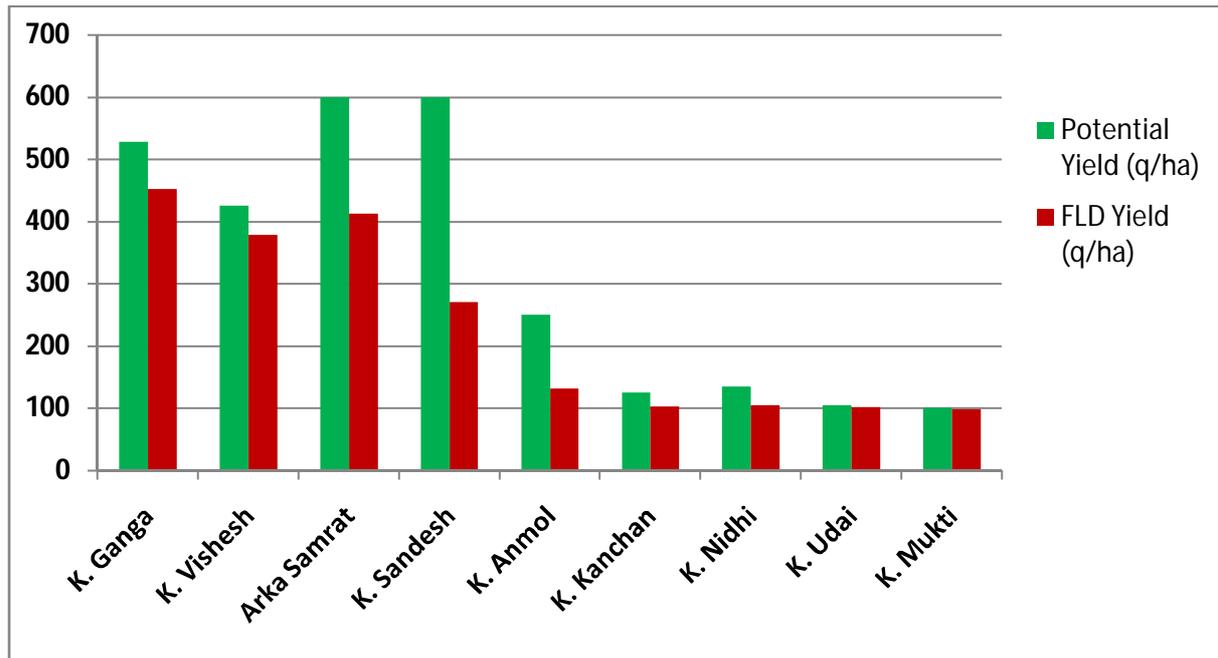


Fig. Yield performance of improved varieties

**Bottle Gourd:-** Kashi Ganga variety of bottle gourd with bower system was demonstrated and compared with variety practiced by the farmers. An average yield of 452.2 q/ha has been recorded with 64.7% increase over control. The extension index and technology index were 39.27% and 14.35% respectively, indicating high feasibility of its adoption among farmers. This variety and technology has become most popular in the area of vegetable growers. It is most suitable for the Kharif (Rainy) season.

**Cowpea:-** The results revealed that demonstrated varieties of cowpea (Kashi Kanchan and Kashi Nidhi) fetched an average yield of 104.0 q/ha at farmer's field as against 57.0 q/ha in local check. The data given in table-1 shows the significant increase of cowpea yield upto 97.7% over control. Technology index of 39.2% in case of Kashi Kanchan followed by Kashi Nidhi 33.33%. Kashi Kanchan variety performed externally well in the farmer's field with a technology gap of 22.0 q/ha which resulted in better adoption

and replacement of other varieties of cowpea.

**Pea:-** While evaluating the demonstrated two varieties of pea viz, Kashi Udai and Kashi Mukti and comparing their performance with existing varieties it was observed that Kashi Udai performance extremely well in the farmer's field with technology index of 43.42%, which resulted in better adoption and replacement of other varieties of pea from Tikamgarh district. Technology index of Kashi Udai (43.42%) was also lowest indicating the feasibility of high adoption of this variety by farmers. Kashi Mukti also performed well with 66.3% yield increase over local check with a technology index of 39.4%, which may be due to soil or climate factors.

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 1.2 q/ha in pea (Kashi Mukti) to 329.4 q/ha in Brinjal (Kashi Sandesh).

This may be due to soil fertility, weather and agro-climatic condition. Hence, the location specific recommendations are necessary to bridge this gap. Extension index was also observed ranging from 21.33% in Chilli variety Kashi Anmol to 44.57% in Cowpea variety Kashi Kanchan, 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 the technology index of all the demonstrated varieties lower quarter, indicates the opportunities of high level of adoption.

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