

EVALUATION OF SELECTED VARIETIES OF OKRA FOR YIELD AND RESISTANCE TO YELLOW VEIN MOSAIC

Sally K. Mathew, M. Abdul Vahab, V.S. Devadas and **Anitha Cherian**
College of Horticulture, Vellanikkara 680 654, Trichur, India

Abstract: Seven selected varieties of okra were evaluated for yield and YVMV disease resistance under field conditions for three years at the Department of Olericulture, College of Horticulture, Vellanikkara, Trichur. Considering yield and disease resistance, the performances of the varieties Selection-4 and Arka Anamika were promising.

INTRODUCTION

Among the various diseases affecting okra, yellow vein mosaic is the most destructive at all stages of the crop. It affects fruit quality and yield causing severe loss (50-90%) to the farmers. Reported first by Kulkarni in 1924 from Maharashtra State, this disease is now widespread throughout the Indian subcontinent. The disease is transmissible neither through sap nor seed; it is transmitted by the vector white fly (*Bemisia tabaci*).

Breeding for resistance to yellow vein mosaic initiated by Singh *et al.* (1962) utilizing the West Bengal genetic stock IC 1542 led to the development of the variety Pusa Sawani. This variety besides possessing good quality attributes had a high degree of tolerance to yellow vein mosaic virus disease. However, break down of resistance to yellow vein mosaic virus in this popular variety in the recent past received a great set back in okra cultivation. Further efforts to develop other resistant/tolerant varieties to yellow vein mosaic virus at various centres of the country evolved several varieties with varying degrees of

resistance. With the objective of identifying most promising variety(s) of okra with respect to yield and disease resistance, six resistant/tolerant varieties were evaluated along with Pusa Sawani at the Department of Olericulture, College of Horticulture, Vellanikkara for three seasons in 1987 (rabi), 1988 (kharif) and 1989 (kharif).

MATERIALS AND METHODS

The material included six resistant/tolerant varieties of bhindi from various parts of the country, viz., P-7 (Ludhiana), Sel-4 (IIHR), Arka Anamika (IIHR), EMS-8 (Ludhiana), AROH-1 (Nagpur) and Parbani Kranti (Parbani). These were evaluated along with Pusa Sawani. The trials were laid out in a randomised block design with three replications for three seasons during 1987 (rabi), 1988 (kharif) and 1989 (kharif) at the Department of Olericulture, College of Horticulture, Vellanikkara. The plot size was 8.1 m². Each plot consisted of five rows of 2.7 m length at 60 cm apart. Seeds were dibbled at 30 cm spacing at the rate of two seeds per hill, which were thinned to one per hill after two weeks. All the operations were

carried out as per the package of practices recommendations of the Kerala Agricultural University (KAU, 1989). Seeds of the most susceptible variety Pusa Makhmali were also sown along the borders of the entire plots. Observations were recorded on days to first harvest, yield (kg/plot) and percentage of yellow vein mosaic disease incidence.

RESULTS AND DISCUSSION

Days to first harvest

Pooled analysis of the data (Table 1) showed that varieties differed significantly for days to first harvest. Arka Anamika and AROH-1 were the earliest varieties which took 49.44 days for first harvest. Parbani Kranti took the maximum number of days (56.69) for first harvest.

Yield/plot

Analysis of the data showed significant yield differences among all the varieties in all the three seasons (Table 2). The mean yield pooled over the three seasons showed that AROH-1 had the highest yield (7.83 kg) followed by Arka Anamika (6.975 kg) and Sel-4 (6.974 kg). Parbani Kranti had the lowest yield under Vellanikkara conditions.

Percentage of disease incidence

Varieties showed significant differences for resistance to YMV (Table 3). Pooled analysis of the data showed that maximum disease incidence was in Pusa Sawani followed by AROH-1. The disease infection was minimum in Sel-4 and Arka Anamika.

Table 1. Days to first harvest in seven varieties of okra

Varieties	1987	1988	1989	Mean
	Rabi	Kharif	Kharif	
Sel-4	52.00	48.00	50.33	50.11
Arka Anamika	52.00	49.33	47.00	49.44
P-7	52.00	52.33	49.67	51.33
EMS-8	54.33	52.33	50.33	52.33
AROH-1	52.00	48.00	48.33	49.44
Parbani Kranti	63.00	53.33	55.33	56.89
Pusa Sawani	56.67	48.00	47.00	50.56
CD (0.05)	4.31	8.78	5.67	3.79

Table 2. Yield of seven varieties of okra, kg/8.1 m²

Varieties	1987	1988	1989	Mean
	Rabi	Kharif	Kharif	
Sel-4	6.617	8.417	5.888	6.974
Arka Anamika	7.833	5.913	7.178	6.975
P-7	6.517	3.927	4.448	4.964
EMS-8	5.242	1.813	5.597	4.217
AROH-1	6.267	8.670	8.552	7.829
Parbani Kranti	1.407	5.400	4.825	3.877
Pusa Sawani	3.358	6.613	9.680	6.551
CD (0.05)	2.01	2.94	1.21	1.99

Table 3. Percentage of YVMV infection in seven varieties of okra

Varieties	1987	1988	1989	Mean
	Rabi	Kharif	Kharif	
Sel-4	6.927	0.000	0.000	2.309
Arka Anamika	9.047	0.000	0.000	3.016
P-7	16.777	9.973	10.630	12.460
EMS-8	17.567	0.000	10.203	9.257
AROH-1	45.960	11.810	9.480	22.417
Parbani Kranti	28.177	14.837	6.123	16.379
Pusa Sawani	85.000	56.097	20.807	53.968
CD (0.05)	24.17	9.44	8.67	11.670

Values transformed into $\text{Sin } \sqrt[3]{x}$

The susceptibility of Pusa Sawani observed in present study is in accordance with several earlier workers who reported

break down of resistance in this variety (Chauhan *et al.*, 1981 and Nirmaladevi and Peter, 1986). Arka Anamika (Sel-10)

which was found resistant to YVMV for more than three years was also recommended by the Eleventh Workshop of the Project Directorate of Vegetable Research for all the regions in India, where YVM is a serious problem (PDVR, 1990).

Considering yield and disease resistance **Sel-4** and **Arka Anamika** are the promising varieties. **Eventhough AROH-1** had the highest mean yield over all the three seasons, this variety was found **susceptible** to YVMV under **Vellanikkara** conditions.

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REFERENCES

- Chauhan, M.S., Duhan, J.C. and Dhankar, B.S.** 1981. Infection of genetic stock of okra to yellow vein mosaic virus. *Haryana agric. Univ. J. Res.* 11 : 45-48
- KAU,** 1989. *Package of Practices Recommendations.* Directorate of Extension, Kerala Agricultural University, Trichur, Kerala, p. 216-217
- Kulkarni, C.S.** 1924. Mosaic and other related diseases of crops in Bombay Presidency. *Poona agric. Coll. Mag.* 6 : 6-12
- Nirmaladevi, S. and Peter, K.V.** 1986. Resistance mechanism in *Abelmoschus manihot* (Linn.) Medic. Introductions to yellow vein mosaic. *Veg.Sci.* 13 : 316-317
- PDVR** 1990. Proceedings of the 11th Vegetable Workshop held at **Dr.Y.S. Parmar** University of Horticulture & Forestry, Solan (H.P). ICAR, New Delhi, p. 138-141
- Singh, H.B., Joshi, B.S., Khanna, P.P. and Gupta, P.S.** 1962. Breeding for field resistance to yellow vein virus of okra. *Indian J. agric. Sci.* 54 : 917-920

