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PERFORMANCE OF DIFFERENT OKRA VARIETIES AGAINST PESTS AND DISEASES DURING DIFFERENT SEASONS

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ABSTRACT

The reactions of seven commercial varieties of okra (*Abelmoschus esculentus* L. Moench) were evaluated under field conditions against different pests and diseases. The experiment was conducted for two seasons i.e., rainy and summer season 2011 at Horticulture Instructional Farm, C. P. College of Agriculture, S. D. Agricultural University, Sardarkrushinagar. Where in seven okra varieties Arka Anamika (V1), Phule Utkarsha (V2), Gujarat Okra-2 (V3), Arka Abhay (V4), Perkins Long Green (V5), Gujarat Okra-1 (V6) and Parbhani Kranti (V7). The experiment, replicated three times was laid out in Randomised Block Design. During the rainy and summer season, significantly least population of leaf hopper, white fly and YVMV (%) was recorded with variety Gujarat Okra-2. The superior performance with respect to cost: benefit ratio was recorded with variety Gujarat Okra-2 (V3) during dual season i.e. rainy and summer season. The easiest and cheapest method of reducing incidence of pests and diseases of okra is cultivation of resistant varieties along with spraying imidacloprid and acetamaprid to contribute maximum cost: benefit ratio.

INTRODUCTION

Okra (*Abelmoschus esculentus* L. Moench) popularly known as bhindi or lady's finger. This is one of the chief and abundant vegetable grown extensively throughout the world in summer and rainy seasons. It shows it's presence in all corners of the globe because of easy cultivation, dependable yield and adaptability to varying moisture conditions. Okra is cultivated for its fibrous fruits or pods containing round, white seeds. Okra is an annual vegetable crop of tropical and subtropical regions. It is rich in vitamins, calcium, potassium and other mineral matters. It has wide usage in culinary purpose, paper industry and medicine. Okra is said to be very useful against genito-urinary disorders, spermatorrhoea and chronic dysentery.

There are a few insect pests such as leafhopper, aphid, whitefly, spider mite and fruit borer, which are important in okra. Among sucking pests, leaf hopper (*Amrasca biguttula*), aphids (*Aphis gossypii*) and white fly (*Bemisia tabaci*) cause severe damage to the young crop. Resistance to leaf hopper has been reported in certain cotton and okra lines (Sharma and Brar, 1993)

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but no commercial resistant type has so far been reported in okra. Yellow vein mosaic of okra is a virus disease transmitted by whiteflies and leafhoppers. If there yellow vein mosaic in the area, whiteflies feeding on the infected plants will carry or transmit the virus through its feeding on healthy plants. If infection is severe, plants become stunted and pods are of low quality.

This paper seeks to bring to light some management strategies or characteristics of some okra cultivars grown in the various regions of world; then to identify and assess accessions with superior performance and suitable for adoption by okra farmers; more so, accessions with unique features useful for the okra breeding programme and which would go a long way to help the vegetable crop industry and subsequently improve the per capita income.

MATERIAL AND METHODS

In the experiment at Horticulture Instructional Farm, C.P. College of Agriculture, S.D. Agricultural University, Sardarkrushinagar. Seven varieties were taken under the study viz., Arka Anamika (V_1), Phule Utkarsha (V_2), Gujarat Okra-2 (V_3), Arka Abhay (V_4), Perkins Long Green (V_5), Gujarat Okra-1 (V_6) and Parbhani Kranti (V_7) and these were evaluated during summer and rainy seasons. The planting material was obtained from the IIHR, Bangalore (Arka Anamika and Arka Abhay), Main Vegetable Research Centre AAU, Anand (GO-1 and GO-2), MPKV, Rahuri (Phule Utkarsha and Parbhani Kranti) and ICAR, Regional Research Station, Katrain (Perkins Long Green).

The experiment was laid out in a Randomised Block Design with three replications. To raise the crop recommended package of practices were followed. The crop was sown on July 2011 and February 2011 during rainy and summer season, respectively. The spacing was left 30 cm within rows and 15 cm within plant. The spraying of chemical insecticides i.e. imidacloprid 100 mL /ha and acetamaprid 40 g/ha quantity was done to control leaf hopper and white fly population. The spraying was done in two different crop stages i.e. at 40 DAS and 15 days interval after first spray. Kumar et al. (2001) studied efficacy of imidacloprid and thiamethoxan on okra against leafhopper and whitefly. Field experiments conducted in Bangalore (India) during the kharif and summer seasons of 1999 and 2000 had shown that various doses of imidacloprid and thiamethoxan had no phytotoxic effect on okra but effective against insects.

For taking counts of leaf hopper and white fly five plants were selected randomly in each plot and tagged. From such tagged plants, the pest population was recorded from 3 leaves, one each from top, middle and bottom portion of the canopy. The observations were made at 30 days after sowing during both the seasons and expressed in numbers per leaves. The yellow vein mosaic virus (YVMV) incidence was calculated in percent by counting the number of plants per plot infected by YVMV upto last picking.

$$\text{YVMV incidence} = \frac{\text{Number of plants infected/plot}}{\text{Total number of plants / plot}} \times 100$$

In order to evaluate the effectiveness of each individual treatment, the relative economics of each treatment was worked out in the terms of net profit. So that, most effective and remunerative treatment combination could be found out. The gross realization in terms of rupees per hectare was worked out on the basis of the yield of finger for each treatment and the price of the produce prevailing in the market. The cost of cultivation of treatment was calculated considering the current rate of Agricultural operations and market price of input involved. The total cost of cultivation was subtracted from the gross realization to obtain cost: benefit ratio (CBR) worked out as follow

$$\text{CBR} = \frac{\text{Gross realization}}{\text{Cost of cultivation}}$$

RESULTS AND DISCUSSION

During rainy season, the least leaf hopper population was recorded with variety V_3 (Gujarat Okra-2) 10.13 leaf hopper/3 leaves at 30 DAS which was inferior to the varieties V_7 (Parbhani Kranti), V_6 (Gujarat Okra-1), V_4 (Arka Abhay) and V5 (Perkins Long Green), respectively. Whereas, least leaf hopper population was recorded in variety V_3 (Gujarat Okra-2) 5.90 leaf hopper/3 leaves during summer season which was at par with variety V1 (Arka Anamika), respectively.
Present findings on morphological basis of resistance against okra sucking pests are in confirmation with the findings of Singh *et al*. (1988) who reported that incidence of leaf hopper was negatively correlated with hair density on lower leaf surface.

The minimum number of white flies 3.77 white flies/3 leaves at 30 DAS was recorded with variety V_3 (Gujarat Okra-2) which was inferior to the varieties V_5 (Perkins Long Green), V_4 (Arka Abhay) and V_6 (Gujarat

Table 1. Performance of different okra varieties against pests and diseases during different seasons

Variety	Number of leaf hopper/3 leaves		Number of white flies/3 leaves		YVMV incidence (%)		C:B ratio	
	Rainy season	Summer season	Rainy season	Summer season	Rainy season	Summer season	Rainy season	Summer season
V_1(Arka Anamika)	12.67	6.70	6.60	2.07	9.78	2.39	1:3.4	1:2.8
V_2(Phule Utkarsha)	11.47	8.67	6.23	2.83	9.06	4.00	1:2.1	1:2.1
V_3(Gujarat Okra-2)	10.13	5.90	3.77	1.23	4.00	1.24	1:4.1	1:3.3
V_4(Arka Abhay)	11.13	9.27	4.70	2.00	6.11	3.00	1:3.9	1:2.9
V_5(Perkins Long Green)	11.27	8.70	4.20	1.83	7.66	3.52	1:1.6	1:2.7
V_6(Gujarat Okra-1)	10.47	8.77	4.87	2.23	6.44	2.00	1:3.1	1:3.1
V_7(Parbhani Kranti)	10.33	8.57	6.07	2.17	7.77	2.08	1:3.4	1:2.4
S. Em±	0.42	0.67	0.62	0.27	1.44	0.45	-	-
C.D. at 5%	1.28	2.08	1.91	0.83	4.44	1.38	-	-

The sale price of okra was Rs 12/kg.

Okra-1) during rainy season. During summer season, the least white fly population was recorded in variety V3 (Gujarat Okra-2) 1.23 white flies/3 leaves at 60 DAS which was at par with V5 (Perkins Long Green) and V4 (Arka Abhay) varieties. Present findings are in line with the findings of (Pun et al. 1999) study was to evaluate different pesticides/bio-pesticides on suitable okra cultivars to manage whitefly.

The Yellow Vein Mosaic Virus incidence (%) as influenced by different varieties during rainy season summarized in Table 1 revealed that, least Yellow Vein Mosaic Virus incidence (4 %) was observed with variety V_3 (Gujarat Okra-2) which was inferior to the varieties V_4 (Arka Abhay), V_6 (Gujarat Okra-1), V_5 (Perkins Long Green) and V_7 (Parbhani Kranti), respectively. While, during summer season minimum Yellow Vein Mosaic Virus incidence (1.24 %) was recorded with variety V_3 (Gujarat Okra-2) and which was inferior to the varieties V_6 (Gujarat Okra-1), V_7 (Parbhani Kranti) and V1 (Arka Anamika), respectively.

Magar *et al*. (2010) there was less disease incidence in summer season that might be due to non-availability of vectors and environmental conditions, prevailed during summer season.

After close analyzing Table 1on the economic basis it was found that, variety V_3 (Gujarat Okra-2) emerged as most remunerative variety with respect to C: B ratio during rainy season (1:4.1) and summer season (1:3.3). Variation in C: B ratio was due to yield obtained from different treatments which was accountable for maximum returns and benefit from different treatments. Present findings are in line with the investigations of Sharma *et al.* (2011).

REFERENCES

Khan, M.M., Khundu, R. and Alam, M.Z. 2000. Impact of trichome density on the infestation of Aphis gossypii Glover. *Int. J. PestMgmt.* 4 : 201-204.

Kumar, N.K.K., Mooratht, P.N.K. and Reddy S.G.E. 2001. Imidacloprid and thiamethoxan for the control of okra leafhopper and *Bemisia tabaci*. *Pest Management. Hort. Eco.* 7 : 117-123.

Magar, R.G. and Madrap I.A. 2010. Performance of okra in relation to yellow vein mosaic virus in different seasons. *International Journal of Plant Sciences.* 5 (1): 33-35.

Pun, K.B., Sabitha, D., Jeyaran, R. and Doraiswammy, S. 1999. Screening of plant species for presence of antiviral principles against okra yellow vein mosaic virus. *Indian Phytopath*. 52 : 221-223.

Sharma, B.R. and Brar, K.S. 1993. Current status of insect resistance in vegetable crops. In: *Advances in Host plant Resistance to Insects*. New Delhi, pp. 277-325.

Sharma, T.R., Pandey, A.K., Upadhyaya, S.D. and Agrawal, S.B. 2011. Effect of sources of nutrients and their levels on yield, quality and economics of summer season okra. *Indian J. Hort*. 68 (4) : 498-502.

Singh, G.S., Sahni, M. and Shah, B.R. 1988. Biochemical and morphological basis of resistance to okra plant. *Euphytica.* 21 : 147-153.