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Varietal Resistance in Eggplant to Cotton Jassid (*Amrasca biguttula biguttula*)

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Abstract: Observation on number of leaf hoppers per leaf of different cultivars of brinjal crop was recorded. The cultivars Purple long, Nepali and Neelum were found quite resistant to leaf hopper. The varieties Sigatoka beauty and Sitara were found as moderately susceptible while Chayat, Greek, Local Gool, Violetta, Sciliana, Prospara and Violetta lunga were found to be the most susceptible cultivars. The variety Purple long had minimum mean leaf hoppers per leaf and gave highest yield than other cultivars. Although the variety local gool was found most susceptible yet gave yield at par with resistant cultivars like Nepali and Neelum.

Key words: Leaf hopper, susceptible, resistant, yield

Introduction

Leaf hopper, (*Amrasca biguttula biguttula*) is considered as an important pest of brinjal crop, *Solanum melongena* L. (Iqbal and Reddy, 1980; Ahmed and Verma, 1984; Shah *et al.*, 1984; Ahmed, 1986; Nagia *et al.*, 1993; Mall *et al.*, 1992). According to Rawat and Sahu (1973), the extent of jassid damage to number and weight could approach 54 %. Mukhopadhyay and Mandal, 1994 conducted an experiment to evaluate the relative degree of resistance offered by 41 cultivars of brinjal to fruit borer, cotton jassid and spotted leaf beetle. The experimental plots were exposed to natural infestation and data on insect population and damage were recorded at 20 days interval throughout the crop growth period. Significant differences in relation to the pest were observed among cultivars, although no cultivar was observed to be resistant to any pest. Effective prophylactic measures though available, but not considered adequate because they are too expansive, hazardous and also cause air pollution, soil and water. Thus screening of different brinjal cultivars against this pest would be useful for determining the level of resistance. These studies were therefore, aimed to screen 9 exotic and 3 local cultivars of brinjal for jassid resistance and higher yield.

Materials and Methods

The experiment was conducted at National Agricultural Research Center, Islamabad, Pakistan during 1994 and 1995. The brinjal seedlings were transplanted on 15th April. Plant to plant and row to row distances were 70 and 50 cm, respectively. There were three replications, each replication comprised of 12 cultivars (3 local and 9 exotic). Each cultivar was planted in two rows in each replication. The length of row was 5 m. For screening of brinjal cultivars, three periods of growth mentioned below were selected for counting leaf hopper number per leaf. Early season infestation (40 days after transplanting). Mid season infestation (80 days after transplanting) Late season infestation (120 days after transplanting).

Ten plants which looked similar in all respect in each cultivar per replication were selected and tagged. All data relating to jassid incidence, number of pickings, fruit number per plant and yield were taken from tagged plants. For counting jassid number, 45 leaves (15 each from upper, middle and lower part of plant) were randomly selected per cultivar per replication in each stage of crop growth. Mean jassid infestation was also determined. The data collected in both years were combined, analyzed and treatments were compared by using Duncan's Multiple Range (DMR) test (Steel and Torrie, 1980).

Results and Discussion

Data of leaf hopper infestation (*Amrasca biguttula biguttula)* on different brinjal cultivars during 1994 and 1995 has been presented in Table 1. At early stage of crop growth (40 days after transplanting), the varieties i.e., Prospara and Violetta lunga were found most susceptible cultivars. Mean number of jassid/ leaf on these two varieties were significantly higher than other cultivars. The lowest number of jassid/ leaf was observed in Nepali and Purple long. However, the jassid infestation on Nepali, Purple long, Neelum, Sigatoka beauty, Sitara, Chayat and Greek brinjal were non-significant between the varieties. Same trend was observed in mid season (80 days after transplanting) of crop growth. Ghouri (1976) and Yunus (1976) reported that the infestation of 2 leafhoppers / leaf on cotton formed an economic threshold. The economic threshold level of jassid on brinjal is not available so the finding of Ghouri (1976) and Yunus (1976) might be good for comparing the level of resistance of different brinjal cultivars.

Keeping in view the above criteria, the cultivars i.e., Nepali, Purple long and Neelum showed quite resistance and the jassid infestation is below the economic threshold level in mid season of crop growth. These results are different from Mkhopadhyay and Mandal 1994, they reported significant difference in relation to the pest (including cotton jassid) in 41 cultivars of brinjal but no cultivar was found resistant to pests including cotton jassid. Due to high jassid infestation in mid season crop growth, the cultivars Local gool, Violetta, Sciliana, Prospara and Violetta lunga were completely dried and to collect the data for these cultivars were not possible in late season of crop growth (120 days after transplanting). Apparently it was seen that the feeding of jassid produced small yellow spots followed by overall death and drop of leaves. Similar results were reported by Ahmed and Ahmed (1980). Overall mean number of leaf hopper/ leaf on brinjal crop showed that the

Table 1: Leaf Hopper Infestation on different Brinjal cultivars

Varieties	Status exotic/ local	Source of seed	Mean No. of jassids per leaf in early season of crop growth± S.E	Mean jassids per leaf in mid season of crops growth ± S.E	Mean jassids per season per leaf in late crop growth± S.E	Over all mean jassids per leaf on brinjal crop growth± S.E
Nepali	Exotic	Nepal	0.24±0.18d	1.86±0.41c	0.25±0.10d	0.78±0.19d
Purple Long	Local	-	0.24±0.06d	1.73±0.80c	0.27±0.08d	0.74±0.18d
Neelum	Local	-	0.44±0.10cd	1.65±0.46c	0.29±0.06d	0.79±0.14d
Sigatoka Beauty	Exotic	Figi	1.83±0.40bcd	4.73±1.69c	1.17±0.17abd	2.58±0.73cd
Sitara	Exotic	Figi	2.06±0.80bcd	8.76±1.02c	0.86±0.34bcd	3.89±0.71bcd
Chayat	Exotic	Figi	2.48±1.0bcd	10.28±2.13bc	1.35±0.17ab	4.70±0.80bcd
Greek brinjal	Exotic	Greek	3.33±0.34bcd	8.03±1.76c	1.92±0.29a	4.43±0.64bcd
Local gool	Local	-	4.24±0.35bc	13.12±1.30bc	Crop dried	8.68±0.49bc
Violetta	Exotic	Italy	4.35±0.30bc	11.73±2.29bc	Crop dried	8.04±0.99bc
Scilinana	Exotic	Italy	5.14±0.54b	10.67±2.13bc	Crop dried	7.90±0.82bc
Prospara	Exotic	Italy	8.93±0.56a	20.64±1.02ab	Crop dried	14.78±4.00a
Violetta lunga	Exotic	Italy	9.55±2.59a	23.86±7.42a	Crop dried	16.71± 4.86a

Values followed by the same letters do not differ significantly at 5% level of significance.

Table 2: Yield performance of different cultivars

Varieties	No. of fruit pickings	No. of fruits/ plant	Yield/ hectare (tones/ha)
Nepali	14.67a	41.67a	36.85ab
Purple Long	14.17a	33.23b	42.34a
Neelum	14.50a	14.58c	31.79b
Sigatoka Beauty	5.67cd	5.25de	10.99de
Sitara	9.00b	5.25de	18.21c
Chayat	6.67c	4.69de	15.91cd
Greek brinjal	6.33c	3.10ef	10.35de
Local gool	7.17bc	6.76d	33.79b
Violetta	6.00cd	4.92de	8.60ef
Scilinana	2.50e	0.47g	2.65f
Prospara	4.00de	1.66fg	6.16ef
Violetta lunga	6.33c	2.25fg	8.49ef

Values followed by the same letters do not differ significantly at 5% level of significance.

varieties Purple long, Nepali and Neelum showed the lowest and below the economic threshold infestation. All susceptible varieties except Local gool gave low number of fruit pickings, number of fruits/ plant and yield/ hectare (Table 2). The performance of Local gool was wonderful. Even as a very susceptible variety, it has produced yield at par with many resistant cultivars like Nepali and Neelum. The Purple long (local cultivar) had low number of leaf hopper/ leaf and gave higher yield than the other cultivars. Bindra and Mahal (1981) also reported the population of leaf hopper per leaf as a good criteria for screening cultivars. Twelve brinjal cultivars were tested for their resistance level to cotton jassid. The cultivars, purple long, Nepali and Neelum were found quite resistant. Sigatoka beauty and Sitara as moderately susceptible while Chayat, Greek, Local gool, Violetta, Sciliana, Prospara and Violetta lunga as the most susceptible to leaf hopper.

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