

## SCREENING BRINJAL VARIETIES FOR WILT RESISTANCE

R. GOPIMONY and MARY K. GEORGE

College of Agriculture, Vellayani, Kerala

Bacterial wilt caused by *Pseudomonas solanacearum* is a great menace for Brinjal cultivation in Kerala. Unpublished reports from various District Agricultural Farms in Kerala show that the percentage of wilt in certain improved varieties like Arkakusumkar and Banaras giant is as high as 100 whereas in local varieties this may vary from 6 to 20. The disease is very serious in other states like Karnataka, West Bengal, Orissa, Maharashtra, Madhya Pradesh and Bihar (Rao, 1972; Anonymous 1974). Yield losses upto 62.5% were observed by some workers (Das & Chattopadhyay, 1955). Screening of brinjal varieties for resistance to wilt has been made in several countries like Puerto Rico, Philippines, Ceylon, South Africa, Japan, Martinique and India (Rao *et al.* 1976). After screening 14 Indian varieties and 5 resistant foreign varieties Rao *et al.* (1976) have reported different grades of resistance in different varieties and rated two U.S.A. varieties namely Dingrass Multiple purple and Sinampiro and one Indian variety Pusa purple cluster as resistant.

The present study was undertaken at the College of Agriculture, Vellayani during 1975-1976 to screen 36 Indian Brinjal varieties including two wild ones against bacterial wilt.

### Materials and Methods

A preliminary screening was done by growing the 36 varieties in a highly disease infected plot where almost 100 per cent wilting occurred in a susceptible variety like Pusa purple long in the previous season. In this unreplicated trial 5 plants were grown under each variety and all those varieties in which at least one plant is wilted were eliminated as susceptible. The wilted plants were tested for bacterial ooze to confirm the cause. Twelve varieties as listed in Table I and II survived this trial for further screening. These 12 varieties which were either resistant or disease escape were subjected to another intensive screening trial under RBD with 3 replications and ten plants in each plot. The plants were grown under severe artificial wilt infection produced by (1) applying 500 g of sick soil collected from the root zone of recently wilted brinjal plants. (2) dipping roots of the seedlings in fresh bacterial ooze collected from recently wilted brinjal plants just before transplanting and (3) inoculating the seedlings, adopting streaking method, two weeks after transplanting (Winstead and Kelman, 1952). Weekly observations were made after transplanting and the number of wilted plants were

noted under each variety. The number of plants wilted in each plot was recorded and the data were subjected to statistical analysis.

### Results and Discussion

The weekly observations on the number of plants wilted and the mean number of plants wilted per plot under each variety are given in Table 1 and 2 respectively.

Table 1 Number of brinjal plants wilted under each variety

Time of wilting after transplanting	Vellayani	Local white	Local giant	S-507	S-501	Arka sheel	Annamalai	Pusa purple cluster	A-61	White oval	wild brinjal (medium fruited)	Wild brinjal (small fruited)	
First week	4	6	7	9	17	18	9	8	14	13	10	0	
Second week	2	8	1	1	4	7	6	3	8	6	8	9	0
Third week	2	3	5	2	...	2	...	4	1	...	2	0	
Fourth week	!	...	...	...	...	...	...	...	...	...	...	0	
Fifth week	4	3	..	2	3	..	..	3	..	..	1	0	
Sixth week	3	..	..	2	..	2	2	..	4	2	..	0	
Total	16	20	23	29	27	28	14	23	25	23	22	0	

The results show that there is only one variety namely the wild brinjal (small fruited) which is 100 per cent resistant to the disease. This variety was identified as *Solanum melongena* var *insanum* Prain., which is commonly found as a thorny weed growing wild on the road sides and waste lands throughout South India (Gamble, 1915). The other two varieties namely Vellayani and Annamalai which showed significantly lower level of disease incidence compared to the highly susceptible varieties were found to be small fruited and low yielding. The variety Pusa purple cluster which was reported to be resistant at Hassarghatta (Rao *et al.* 1976) was found to be susceptible under Vellayani conditions. This shows the existance of pathogenic strains of *P. solanacearum* with varying virulence in different parts of India.

The weekly observations on wilting showed that maximum number of plants wilted in the first week itself suggesting that the sick soil treatment combined with the dipping of seedlings in fresh bacterial ooze is an effective technique for inducing the disease. Rao *et al.* (1976) has noted that wilt symptoms appear 4–5 days after inoculation by root injury method (Winstead and Kelman, 1952) and the plants died within 10–12 days. The present study suggests that sick soil treatment combined with dipping seedlings in fresh bacterial ooze before transplanting is equally effective in inducing maximum disease infection.

**Table 2 Mean number of brinjal plants wilted per plot**

Variety	Mean No. wilted/plot
Vellayani	5.33
Local white	6.66
Local giant	7.66
S-507	9.66
S-501	9.00
Arkasheel	9.33
Annamalai	4.66
Pusa purple cluster	7.66
A-61	8.33
White oval	7.66
Wild brinjal (Medium fruits)	7.33
Wild brinjal (Small fruited)	0.00

Critical difference at 0.05 level for comparison between means = 2.584

### Summary

Thirty six brinjal varieties including two wild ones were screened against bacterial wilt disease at Agricultural College, Vellayani, during 1975-1976. Twelve varieties which were found to be disease free in the preliminary trial were subjected to artificial wilt infection under replicated trials and found that only one variety namely *S. melongena* var. *insanum* (wild brinjal) was resistant to wilt. Dipping of seedlings in fresh bacterial ooze just before transplanting was found to be equally effective in inducing the disease compared to the more complicated artificial inoculation methods.

## സംഗ്രഹം

rosng വന്യ ഇനങ്ങൾ ഉൾപ്പെടെ മൊത്തം 36 വഴുതിനയിനങ്ങളെ 1975-76 ro\$ വെള്ളായണി കാർഷിക കോളേജിൽ വച്ച് വാട്ടരോഗ പ്രതിരോധ ശക്തിയുണ്ടോയെന്നറിയാൻ വേണ്ടി പരീക്ഷണവിധേയമാക്കി. പ്രാഥമിക പഠനങ്ങളിൽ രോഗം ബാധിക്കാതിരുന്ന 12 ഇനങ്ങളെ കൃത്രിമമായ രോഗ പരിതസ്ഥിതികളിൽ വളർത്തി പരീക്ഷിച്ചതിൽ സൊളാനം മെലോൻജെന ഇനം ഇൻസാനം എന്ന ചുണ്ടയിനം മാത്രം പൂർണ്ണമായ രോഗപ്രതിരോധശക്തി പ്രകടിപ്പിക്കുന്നതായി കണ്ടു. പ്രതിരോധശക്തി പരീക്ഷണത്തിനു സങ്കീർണ്ണമായ കത്തിവയ്പ് രീതികൾക്കു പകരം തൈകളെ ബാക്ടീരിയ കലർന്ന വെള്ളത്തിൽ മുക്കി നട്ടാൽ മതിയെന്ന ഈ പരീക്ഷണം തെളിയിച്ചു.

## REFERENCES

- Anonymous 1974. Scientific report of Central Potato Research Institute for the triennium 1971—1973; 120—125.
- Das, C. R. and Chattopadhyay, S. B. 1955. Bacterial wilt of egg Plant. *Indian Phytopath.* 8, 130—35.
- Gamble, J. S. 1915. *Flora of presidency of Madras* Botanical Survey of India, Calcutta.
- Rao, M. V. B. 1972. Bacterial wilt due to *Pseudomonas solanacearum*. (c. f. *Bacterial diseases of plants in India*, Unpublished notes edited by P. N. Patel, prepared for summer school on Plant Bacteriology at IARI New Delhi).
- Rao, M. V. B., Sohi, H. S. and Vijay, D. P. 1976. Reaction of some varieties of brinjal to *Pseudomonas solanacearum*. *Veg. Sci.* 3, 1. 324—326.
- Winstead, N. N. and Kelman, A. 1952. Inoculation techniques for evaluating resistance to *P. solanacearum*. *Phyto Pathology* 42, 628—634.

(M. S. Received: 13-7-1978)