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EVALUATION OF BENGALGRAM VARIETIES AGAINST RENIFORM NEMATODE, *ROTYLENCHULUS RENIFORMIS*[1]

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ABSTRACT

Relative susceptibility of fortynine bengalgram varieties were tested in a replicated pot culture experiment. The varieties, PBNG-34,BGM-434, BGM-426, BG-268, BG-273, GNG-158, BGM-425 exhibited resistant reaction to *Rotylenchulus reniformis*. Other varietiess howed moderate resistance to highly susceptible reaction.

INTRODUCTION

Bengalgram (*Cicer arietinum* L.) is one of the important pulse crops grown widely in the State. Preliminary soil survey indicated that *Rotylenchulus reniformis* was associated with this crop (Khan, 1975 ; Starr, 1979). Pathogenic effects have been studied against *Meloidogyne incognita* (Gaur *et al.*, 1979 ; Nath *et al.*, 1979) and *M. javanica* (Srivastava *et al.*, 1974 ; Dhanger and Gupta, 1983). A good number of varieties have been tested for evaluating their relative susceptibility to *M. incognita* (Sandhu *et al.*, 1980). But so far no information is available regarding the resistance/susceptibility of bengalgram varieties to *R. reniformis*. In consideration of the importance of the crop and the seriousness of the nemic association, the present investigation was carried out to select some of the varieties showing resistance to reniform nematodes for the growers and also for their inclusion in the crop improvement programme.

MATERIALS AND METHODS

Surface sterilised (washed in 1% formalin solution) earthen pots (10 cmdia.) were filled with 500 g of autoclaved soil and were arranged in a Complete Randomised Design with five replications during Rabi, 1983. Seeds were disinfected with 0.1% mercurochrome solution and were washed thrice in sterile distilled water. Two to three seeds were sown in each pot. Five days after sowing, each pot was allowed to contain one healthy seedling. Two days later, one hundred immature females of *R. reniformis* obtained from a pure culture, were surface sterilised with 0.1% mercurochrome solution for one hour, washed in three changes of sterie distilled water and were finally inoculated around the root zones in 10 ml of water suspension per pot. Watering was subsequently done whenever necessary. Twelve days after inoculation, the plants were carefuly removed from the pots. The roots were gently

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washed and preserved in 4% formalin solution. The soil was wet-screened by Cobb's sieving and decanting techniques so as to collect the female nematodes in 60 mesh sieve and thus the total number of females per plant was recorded. Randomly one to five egg masses, as available, were picked from each plant and shaken well in 0.5% NaOCl solution and the total number of eggs/larvae was calculated. The indexing for the relative resistance and susceptibility of the varieties to this nematode was done as follows : 1=10 females per plant-resistant, 11-20 females/plant-moderately resistant; 21-30 females/plant-susceptible and more than 31 females/plant-highly susceptible. The recorded data have been presented in Table I.

RESULTS AND DISCUSSION

Different bengalgram varieties showed interesting reactions as regards the number of females, egg mass and eggs/larvae per plant (Table I). It may be seen that minimum number of females (2.0) was re-

TABLE I

EVALUATION OF BENGALGRAM VARIETIES AGAINST *Rotylenchulus reniformis*

Sl. No.	Name of the varieties/ lines	No. of females per plant	No. of egg mass per plant	No. of eggs/ larvae/plant	1*	Fresh shoot wt. (g)	Remarks
1	PBNG-34	2.0	2.2	64.2	1.762	1.24	R
2	BGM-434	3.2	2.0	58.4	1.726	1.31	R
3	BGM-426	5.2	2.4	60.0	1.733	1.48	R
4	BG-268	5.2	4.0	139.6	2.122	1.43	R
5	BG-273	6.2	3.6	121.4	2.066	1.39	R
6	GNG-158	8.6	5.2	157.8	2.185	1.32	R
7	BGM-425	8.8	3.8	101.6	1.980	1.41	R
8	GOG-2	11.6	7.0	213.0	2.294	1.34	MR
9	RSG-258	11.8	6.2	195.2	2.260	1.20	MR
10	ICCC-39	12.0	6.2	198.6	2.282	0.97	MR
11	H-81-73	12.2	6.4	179.6	2.230	0.85	MR
12	32-4	12.6	11.0	382.0	2.566	1.00	MR
13	BDNG-25	13.0	6.4	149.2	2.139	0.96	MR
14	BGM-418	13.4	7.8	258.8	2.400	1.13	MR
15	BG-292	14.0	8.2	229.2	2.351	0.90	MR
16	BG-274	14.0	8.4	246.6	2.383	0.92	MR
17	PHULE G-12	14.0	10.8	430.2	2.623	0.92	MR
18	BG-276	14.6	7.8	210.8	2.306	1.21	MR
19	PDG-1	14.8	6.4	220.0	2.318	1.00	MR
20	GNG-174	14.8	11.8	449.0	2.641	0.97	MR

TABLE I—(*Contd.*)

Sl. No.	Name of the varieties/ lines	No. of fcmales per plant	No. of egg mass per plant	No. of eggs/ larvae/plant	1 *	Fresh shoots wt. (g)	Remarks
21	RSG-255	15.0	8.8	325.2	2.504	0.96	MR
22	PG-80-39	15.4	7.8	227.8	2.338	0.84	MR
23	GBS-2	15.6	8.8	242.8	2.370	0.98	MR
24	BG-244	15.6	12.2	425.8	2.619	1.25	MR
25	PDG-2	18.0	7.6	306.4	2.461	0.99	MR
26	BG-209	19.8	10.4	412.2	2.578	1.11	MR
27	H-82-2	20.0	10.6	475.4	2.657	0.92	MR
28	RSG-45	21.4	10.0	502.2	2.696	0.64	S
29	CO-2	21.4	11.4	357.0	2.544	0.94	S
30	BGM-428	22.0	7.2	247.6	2.376	1.04	S
31	RSG-3	22.2	14.4	776.2	2.884	0.52	S
32	RSG-242	22.6	12.4	497.2	2.688	0.85	S
33	BG-279	23.4	17.0	934.2	2.959	0.48	S
34	GG-685	26.8	11.8	433.6	2.634	0.72	S
35	ICCC-36	27.6	14.4	601.2	2.767	0.77	S
36	RSG-130	30.0	11.6	541.4	2.728	0.94	S
37	BKL-D_2-83	33.2	14.0	378.4	2.568	0.72	HS
38	BGM-421	33.6	14.0	519.0	2.709	0.49	HS
39	KLD I-83	33.6	14.2	561.6	2.744	0.84	HS
40	H-81-87	34.6	14.6	411.2	2.609	0.75	HS
41	BDNG-69	34.8	14.4	649.6	2.811	0.95	HS
42	BGM-427	35.4	16.6	549-6	2.721	0.65	HS
43	ICCC-38	37.0	13.8	553.0	2.731	0.88	HS
44	PHULE G-6	38.0	18.2	581.0	2.760	1.01	HS
45	DG-80-6	38.6	19.2	850.8	2.920	0.59	HS
46	GBS-1	38.8	18.4	914.6	2.954	0.73	HS
47	DG-79-91	39.0	11.0	442.8	2.636	1.01	HS
48	DG-80-5	40.0	22.0	1053.4	3.017	0.61	HS
49	ICCC-40	43.6	17.0	865.0	2.932	0.48	HS
	CD (0.05)	4.85	3.30	—	0.11	0.14	—

N.B. : 1* Figures indicate the corresponding log values.
R=Resistant, MR=Moderately resistant
S=Susceptible, HS=Highly susceptible

corded in variety PBNG-34 with an average of 2.2 egg masses and 64.2 eggs/ larvae per plant and was considered to be highly resistant to *Rotylenchulus reniformis*. Other varieties showing no significant difference on these characters were BGM-434 and BGM-426. The varieties, BGM—426 exhibited highest shoot weiget (1.48g) among all the varieties tested. The variteies, BG-268, BG-273, GNG-158 and BGM 425 also showed resistant reaction.

Twenty varieties showed moderately resistant reaction whereas nine selections were susceptible. Among moderately resistant cultivars, BDNG-25 recorded lowest eggs/larvae per plant (149.2) indicating poor multiplication of the nematodes. Thirteen varieties were also categorised under highly susceptible. Maximum number of females/plant (43.6) was noted in variety ICCC-40 with minimum shoot weight (0.48g). The varieties ICCC-40 (43.6), DG-80-5 (40.0) and DG-79-91 (39 0) did not differ significantly with regards to the number of females/plant but the recorded number of egg mass in variety-DG- 79-91 was lowest (11.0) containing 442.8 number of eggs/ larvae per plant. The tabled data further indicated the maximum number of eggs/ larvae per plant (1053.4) was found in variety DG-80-5 demonstrating high susceptibility to this nematode species.

The differential reaction exhibited might have been due to the inherent physiological differences of the varieties and the specific host-parasite interaction among them.

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