Short Communication

Identification of resistant sources against bud-blight disease of soybean [Glycine max (L.) Merrill]

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Bud blight of soybean [Glycine max (L.) Merrill] is caused by a strain of groundnut bud necrosis virus (GBNV). GBNV has been identified very recently as the causal organism based on serology and nucleic acid hybridization [1] and further confirmed by nucleocapsid protein gene sequence identities [2]. Although its incidence in India was noticed as early as in 1976 [3], it is emerging as a major disease of soybean and its incidence has been reported from almost all major soybean growing regions in India such as Maharashtra, Rajasthan, Uttar Pradesh, Madhya Pradesh, Andhra Pradesh and Delhi [1, 3, 4]

Information on sources of resistance and genetics of resistance to causal virus is lacking. Identification of sources of resistance is the first and most important step towards development of resistant varieties for effective management of the disease. Therefore, to identify sources of field resistance, observations were taken on a total number of 48 genotypes in three trials namely, Initial Varietal Trial (IVT -34 genotypes), Advanced Varietal Trial I (AVT-I 6 genotypes) and Advanced Varietal Trial II (AVT-II 8 genotypes) at IARI, New Delhi, during kharif-2001. Total number of plants and infected plants (based on visible symptoms) were counted in the central row of each plot of IVT (3 rows of 3m each), AVT-I (8 rows of 5m each) and AVT-II (12 rows of 5m each). The percentage incidence was calculated and the data was subjected to suitable transformation before analysis (Table 1, 2 and 3)

On the basis of percentage incidence, genotypes were classified into different groups as given by Thakur et al. [4] and location severity index (LSI) was also calculated (Table 4).

None of the genotypes was found to be completely free from visible symptoms of the disease. Seven lines namely, MACS-754, NRC-55, VLS-55, JS-SH-96-04, TS-128-5, DSb-228 and SL-528 were found to be highly resistant (0.1 to 1% infected plants), while another six lines (HIMSO-1597, PK-1308, DSb-3, MACS-756, RKS-7 and MACS-798) exhibited moderately resistant reaction. Line JS-95-60 was highly susceptible (100% mortality).

Table 1. Incidence of bud-blight on soybean during kharif 2001 in IVT

Sl. No.	Line	Mean per cent incidence (Transformed values)
1.	HIMSO-1597	1.43 (6.030)
2.	VLS-56	30.10 (33.267)
3.	MAUS-144	5.11 (13.027)
4.	MACS-754	0.53 (3.277)
5.	KB-165	20.93 (27.183)
6.	SL-599	14.18 (27.503)
7.	TS-128-5	0.51 (49.05)
8.	NRC-55	0.33 (2.767)
9.	NRC-56	8.63 (16.963)
10.	VLS-55	0.27 (2.587)
11.	HIMSO-1596	4.68 (12.440)
12.	PK-1308	3.58 (10.770)
13.	KB-230	10.71 (18.897)
14.	TS-148	16.70 (24.103)
15.	SL-518	6.39 (14.597)
16.	NRC-57	9.73 (18.110)
17.	DSb-3	1.24 (5.60)
18.	MACS-756	1.61 (6.287)
19.	DS-9814	14.26 (22.177)
20.	JS-95-58	14.21 (22.140)
21.	MAUS-145	16.15 (23.531)
22.	JS (SH) 96-04	0.42 (3.037)
23.	MAUS-109	9.56 (17.993)
24.	PK-1314	10.96 (19.313)
25.	JS(SH)96-31	10.60 (18.983)
26.	JS-95-60	100.00 (90.00)
27.	RKS-7	2.90 (5.820)
28.	MACS-798	1.28 (4.60)
29.	PK-1303	24.51 (29.753)
30.	DSb-228	0.53 (3.277)
31.	Bragg	11.56 (19.843)
32.	PK-416	7.05 (15.347)
33.	Pusa-16	11.43 (19.720)
34.	PK-1042	5.54 (13.650)

S.E. = ± 1.3481; CD = 2.642; CV = 13.83%

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Genotypes in the second group (0.1 to 1% infected plants) can be used as an effective source of resistance against bud-blight disease of soybean.

Table 2. Incidence of bud blight on soybean during *kharif*-2001 in AVT-I

Sl. No.	Line	Mean % incidence (Transformed values)
1.	DS-97-12	7.55 (16.935)
2.	PK-1283	20.31 (26.56)
3.	Bragg	23.72 (29.130)
4.	PK-416	18.18 (25.18)
5.	PK-1042	16.12 (23.66)
6.	Pusa-16	16.50 (23.97)

S.E. at 5% = 0.8452; CD = 1.6566; CV = 6.52%

Table 3. Incidence of bud-blight on soybean during *kharif*-2001 in AVT-II

Sl. No.	Line	Mean % incidence (Transformed values)
1.	SL-525	11.50 (3.382)
2.	SL-517	8.29 (2.863)
3.	SL-528	0.65 (0.919)
4.	PK-1251	22.28 (4.713)
5.	Bragg	14.14 (3.76)
6.	PK-416	12.14 (3.476)
7.	PK-1042	11.67 (3.408)
8.	Pusa-16	15.86 (3.976)

S. E. at 5% = 0.1442; CD = 0.2826; CV = 9.32%

Table 4. Reaction of soybean genotypes to bud-blight disease

Reaction	Score[a]	No. of entries	Name of entries
Free (no infection)	0	0	-
Highly resistant (0.1 to 1% infection)	1	7	MACS-754, NRC-55, VLS-55, JS-SH-96-04, TS-128-5, DSb-228, SL-528
Resistant (1.1 to 5% infection)	3	6	HIMSO-1597, PK-1308, DSb-3, MACS-756, RKS-7, MACS-798
Moderately resistant (5.1 to 25% infection)	5	32	b
Susceptible (25.1 to 50% infection)	7	2	VLS-56, PK-1303
Highly susceptible (50.1 to 100%)	9	1	JS-95-60
Total number of entries		48	
Location severity index[c] (LSI)	4.31		

a - Score of bud-blight was based on incidence recorded in central row of each plot; b - Entries in the moderately resistant group were too many to list; c - LSI was calculated multiplying the disease score of each group by the number of entries and dividing by total no. of entries.

References

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