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Research Notes

Field Screening of cotton accessions for resistance to Cotton stem weevil *Pempherulus affinis* Faust

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Cotton stem weevil has attained some notoriety in South India as a pest of exotic and indigenous cotton and was at one time looked upon us the most serious enemy of the 'raiyat' in cotton growing tracts. Extensive out breaks of *P.affinis* have been initially reported in Bhavanisagar, Gobichettiplalayam areas (Thirumurthi *et al.,* 1974) and Cambodia tracts of Coimbatore district to the extent of 65 per cent The ruling varieties proved susceptible to the pest and no variety has been found to be totally immune so far. Among the many varieties tried for resistance, Nadan in Asiatic cottons and Bourbon, Quebrandinho, Verdao and Moco in American Group were highly resistant (Balasubramanian, 1963). Unfortunately, all the five resistant varieties were perennial, late in habit and in addition the members of the American group were defective in boll dehiscence and susceptible to leaf hoppers. Therefore, a study was conducted to find out resistant varieties among 153 cotton accessions.

Table 1. Screening for resistance to cotton stem weevil

Entries	Resistant (0 to 20% damage)	Moderately Resistant (21 to 40% damage)	Susceptible 41 to 60% damage)	Highly Susceptible Above 60% damage)
Br 03 (a)	LC (12.50), CCH 4 (6.25)	ARB 2005(25.00), CCH 727(25.00), CCH 342(25.00), L 755(25.00), ZC - Sumangala(25.00)	H 1250(43.75) ARB-2001(43.75)	
Br 04 (a)		TCH 1627(25.00), GJHV 370(25.00), ARB 8906(25.00), RAH 111(25.00), ZC - Sumangala(25.00), NDLH 1588(25.00), CPD 745(25.00), F 1914(25.00), ARB 70(25.00)1, GSHH 97-59(25.00), CCH 526612(25.00), GJHV 337(25.00), RAC 9563(25.00), ARB 9009(25.00), TCH 1599(25.00), GSHV 97/13(25.00), RAH 101(25.00)	Local check (43.75)	
Br 05 (a-1) NT	RCH 111(0.00), Sandeep(6.25), Navkar 123(0.00), GSHH 1808(6.25), PRCHH 109(0.00) Yashraj(12.50), AACH 1065(0.00) JRF 10(12.50), NRCH 1166(6.25), Priyanka NG 11(6.25), DHH 355(6.25), Mahabeej 17(0.00)	MRC 6305(25.00), GK 128(25.00), BSSCH 244(25.00), ARBHH 356(25.00), TCHH 2658(25.00), NCHH 557(25.00), MLCH 321(25.00), FHH 104(25.00), Indam 206(25.00), Nimbkar 215(25.00), HHH 270(25.00), CCHH 9012(25.00), JKCH 2000(25.00), LHH	PSCHH 102(43.75), Kasturi 888(43.75), VCHH 513(43.75),	CH710 (62.50)

Table 1. Contd..

Entries	Resistant (0 to 20% damage)	Moderately Resistant (21 to 40% damage)	Susceptible 41 to 60% damage)	Highly Susceptible Above 60% damage)
	NSPHH 11(6.25), CCHH 243(6.25), Gautham(O.OO), KDCHH 51(0.00), RHH 0390(25.00), RAHH 102(6.25) MPL 999(12.50), SPCH 135(6.25), SNSCH 04(12.50), KR 13(0.00),	935(25.00), VBCH 2204(25.00), ZCH 21405(25.00), SHH 18(25.00), VICH 55(25.00), ZC(25.00), Sandocot 708(25.00), Harita 225(25.00), BCHH 6249(25.00), RBHH 3(25.00),		
Br 05 (a-2) NT	PSCHH 213(6.25), Mahabeej-206(12.50) ARCHH-7010(6.25), NCMHH 53(0.00), ZCH-21408(12.50) GCMSH 25(6.25) ZC(12.50)	KDCMH 41(25.00), LC(25.00), ARBMSHH 281(25.00), CAHH 146(25.00), GCMSH (J) 32(25.00) VICH 504(25.00), DMSHH 282(25.00), Navkar 95(25.00), Sandocot 175(25.00), NCHH 571(25.00), LMSH 115(25.00), NRCH 1106(25.00), MRC 6312(25.00)	VCHH 1037(43.75) HHH 322(43.75) Ajeet 555(43.75)	
Br 05 (a-1) ZT	CSHH 238(6.25), LC (HYBRID)(0.00), AHH 90-4(12.50), SCHH 151(6.25), JKCH 10(12.50),	LC (VARIETY)(25.00), RAHH 92(25.00), PSCH 504(25.00), Nimbkar 195(25.00), NHH 44(25.00), NTHH 2001(25.00), PSCH 505(25.00), SHH 13(25.00), NRCH 744(25.00), SMSCH 112(25.00), KDCHH 905(25.00), Paras 99(25.00), RAHH 95(25.00)		

Table 1. Contd..

Entries	Resistant (0 to 20% damage)	Moderately Resistant (21 to 40% damage)	Susceptible 41 to 60% damage)	Highly Susceptible Above 60% damage)
University Trial	TCH 1608(6.25), TCH 1649(6.25), TCH 1637(6.25), TCH 1659(6.25), TCH 1702(12.50), AKH 2053(12.50), Hybrid Savitha(6.25)	TCH 1452(25.00), TCH 1660(25.00), TCH 1609(25.00), TCH 1681(25.00), TCH 1656(25.00), TCH 1658(25.00), TCH 1700(25.00), TCH 1698(25.00), TCH 1699(25.00), TCH 1623(25.00), TCHH 2634(25.00), TCH 5826(25.00), TCH 1649(25.00), TCH 1652(25.00)	TCH69(43.75) TCH1589(43.75) TCH12(43.75), TCH1661(43.75), TCH1622(43.75), TCH1655(43.75), TCH1680(43.75), TCH 1669(43.75), TCH 1701(43.75), TCH1671(43.75) TCHH 12(43.75) TCH1617(43.75), MCU 12(43.75)	TCH 1634(62.500), MCU(62.50)

One hundred and fifty three cotton accessions were available in connection with breeding programme screened for resistance to stem weevil during winter season, 2002. Test accessions were raised in ridges and furrows with a spacing of 30 cm between plants and 75cm between rows. In each row, two accessions were shown, each accession comprising of eight plants and each accession was replicated twice. Normal cultural practices were followed (Crop production Guide, 1999). The crop was protected from sucking pests by spraying methyl demeton 0.025 per cent on 20th day of sowing and subsequently no insecticide was applied to the crop. The total infested plants i.e., dead plants were counted at the end of the season. Levels of resistance were categorized based on per cent damage and presented in the Table. 1.

Among the one hundred and fifty three cotton accessions screened under field conditions, only forty three were rated as resistant. The level of stem weevil infestation ranged from 0.00 to 62.50 per cent in different cotton accessions. Though the resistant accessions showed larger galls and gummy exudation, there was no plant mortality. Earlier, Dharmarajulu (1935) studied the resistance mechanism and reported that formation of gall and callus took place first and a part of callus then broke down and produced the gum which flooded the burrow and killed the grubs. Later it was found that the gummy exudate consisted of sticky matrix which flooded the insect gallery and prevented the movement of grubs and ultimately killed them (Dharmarajulu *et al.*, 1948).

Parameswaran (1983) reported that biophysical mechanism through the secretion of gummy substance and biochemical mechanism through accumulation of phenolics imparted resistance to stem weevil. Balakrishnan *et al.* (2003) studied the biophysical bases of resistance against major pests of cotton and revealed that the presence of gossypol glands on calyx had negative effect on the incidence of *Helicoverpa armigera* (Hubner).

According to Nanda *et al.* (1999, 2000) and Ragumoorthi *et al.* (2003), low amount of total free amino acid and total starch content in cereals could be considered as the contributing factors of varietals resistance against brown plant hopper and grain moth.

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