Identification of Sources for Field Resistance to Peanut Bud Necrosis Disease in Groundnut

GURURAJ SUNKAD, P.V. KENCHANAGOURDAR AND V.B. NARAGUND

Regional Research Station, Raichur-584 101

(Received: November, 2001)

Abstract: A field experiment conducted at Regional Research Station, Raichur to identify the genotypes resistant to peanut bud necrosis disease (PBND) of groundnut for a period of three years, 1996-97 to 1998-99 where in 172 germplasm/cultivars were screened by using KRG-1 as check and resulted in the identification of seven highly resistant genotypes viz., DRG-18, IC-7812, IC-6(FDRS)-10, ICGV-80325, JSSP-3, KGN-22, PI-393516 and thirty-three resistant genotypes.

Introduction

Groundnut is one of the important oilseed crop, occupying nearly 45 per cent area and 55 per cent of the production of total oilseeds in the country. It has an average productivity of 900 kg/ha as against the Asian average of 1190 kg/ha (Amon, 1995). Several reasons, including damage caused by diseases, have been ascribed to its low productivity (Ghewande et al., 1987). Peanut bud necrosis disease (PBND) caused by peanut bud necrosis virus (PBNV) is an economically important disease. The disease was not a major problem till 1960's and since then it has assumed epiphytotic proportions in various groundnut growing areas of the country. The disease can cause yield losses of over 50 per cent and its incidence ranges from 5-80 per cent in all major groundnut growing areas in India (Ghanekar et al., 1979). The disease was present in patches causing frequent epidemics after 1975 (Amin, 1993). Now the disease has spread to all groundnut growing areas in the country. The PBND is an endemic disease and can appear in severe form during both rainy and post rainy/summer seasons at Raichur, Karnataka State (Dharamraj et al., 1995). On the basis of severity of PBND incidence, Raichur has been identified as one of the hot spots among number of hot spots in the country (Basu, 1995).

The regular occurrence of the disease both in rainy and post rainy/summer seasons in moderate to severe form at RRS farm, Raichur necessitated the field evaluation of germplasm collection and available cultivars. With a view to search for field resistance against PBND, a field screening of available germplasm and cultivars was done during rainy and post rainy/summer seasons from 1996 to 1999.

Material and Methods

For the purpose of screening resistant material, one hundred seventy two groundnut collections were planted in 5 m rows (30 x10 cm). One row of susceptible check KRG-1 was flanked after every four test lines as infector row. The screening was done under natural disease incidence conditions and final observation on reaction of genotypes to PBND was recorded one week before harvest of the crop. The entries have grouped into different categories following standard disease rating scale (0-5). The material was screened from 1996 to 1999.

Results and Discussion

The observation on per cent disease of 172 groundnut germplasm is presented in table 1. The data revealed that out of the total lines tested seven were highly resistant (incidence 0-1%); 33
In the field, genotypes can differ considerably in the incidence of PBND due to the effect of resistances of the host to the virus. Reduced incidence are indicated as field resistance. Among the genotypes tested, ICGR-11 was reported to be resistant to PBND by Amin (1985) and Singh et al. (1994). Further, the

Table 1. Reaction of groundnut germplasm / cultivars against peanut bud necrosis disease of groundnut at Regional Research Station, Raichur, Karnataka.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Disease score/grade (%)</th>
<th>Germplasm / cultivars</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Highly resistant (0 to 1%)</td>
<td>DRG-18, ICG-7812, ICG(FDRS)-10, ICGV-80325, JSSP-3, KGN-22, PI-393516 (Total 7)</td>
</tr>
<tr>
<td>2</td>
<td>Resistant (1.1 to 5%)</td>
<td>Dh-40, Dh-42, DRG-8, DRG-12, DRG-13, DRG-17, GPS-439, ICG-1696, ICG-1703, ICG-1710, ICG-2354, ICG-2368, ICG-3527, ICG-4790, ICG-5270, ICG-7885, ICG-7893, ICG-9938, ICG-10756, ICGR-11, ICG-86640, ICGR-88-2, ICGV-86522, ICGV-86590, ICGV-87307, ICHNG-88448, JSSP-5, M-13, M-52, PBNG-8, PBNG-9, PBNG-18, R-8808 (Total 33)</td>
</tr>
<tr>
<td>5</td>
<td>Susceptible (25.1 to 50%)</td>
<td>C-196, CSMG-884, DRG-6, DRG-10, DRG-15, DRG-19, Gimar-1, GPM-102, ICG-1696, ICG-1708, ICG-1710, ICG-3527, ICG-4790, ICG-7885, ICG-7893, ICG-7895, ICG-9938, ICGV-86640, ICGV-86690, ICGV-86692, KGN-1, KGN-22, KRG-1, S-206, S-230 (Total 25)</td>
</tr>
<tr>
<td>6</td>
<td>Highly susceptible (50.1 and above)</td>
<td>JL-24, TMV-2 (Total 2)</td>
</tr>
</tbody>
</table>
The present study was supported by Dharmaraj et al. (1995), who reported that screening over several seasons in hot spot areas resulted in the identification of R-8808, R-9214 and ICGV-69304 as promising genotypes with less than 5 percent PBND. Basu (1995) reported ICG-1703 and ICGV-98304 as resistant lines for PBND.

It was observed during this study that Peanut bud necrosis disease was a serious disease with a severity above 50 percent in certain cultivars. Patil (1993) and Dharmaraj et al. (1995) have reported 30-90 percent disease incidence under severe infectious conditions in both rainy and post rainy/summer seasons. Transfer of field resistance to elite lines or high yielding susceptible cultivars is required for effective management of disease. Hence, highly resistant lines identified in the present study can be used as donors in the breeding programme after confirming under artificially inoculated conditions.

References


