

## Screening Groundnut for Resistance to Early Leaf Spot in India

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Early leaf spot (ELS) caused by *Cercospora arachidicola* Hori. is an important foliar disease of groundnut worldwide. Usually early and late leaf spot [*Phaeoisariopsis personata* (Berk. & Curt.) v. Arx] are together referred to as "Cercospora leaf spots" or 'tikka leaf spots' causing yield losses of up to 50%. Losses can be more serious (up to 70%) particularly if leaf spots are associated with rust (*Puccinia arachidis* Speg.) disease. Early leaf spot usually occurs early in the growing season and its severity depends highly on the climatic conditions (humidity, temperature, rainfall, etc.). Although no major differential reaction of genotypes to early leaf spot were observed within India, differences do occur between Malawi and India. For example, PI 476176 (ICG 10946), which is resistant in India, is completely susceptible in Malawi. Furthermore, most of the genotypes identified to be resistant in the USA were susceptible in India and Malawi. In addition, benonmyl-resistant pathogenic strains have also been identified in the USA. This information may suggest the existence of pathotypes in *C. arachidicola*.

At ICRISAT Center, India, where severe rust

and late leaf spot epidemics occur regularly, development of early leaf spot epidemics are rare. However, screening for early leaf spot resistance was possible in 1987, when the disease was severe on the ICRISAT farm. At the same time, we tried to identify "hot spot" locations for early leaf spot elsewhere in India to facilitate regular screening of groundnut germplasm for resistance to early leaf spot. As a result, G.B. Pant University of Agriculture and Technology, Pantnagar, U.P., in northern India was identified as a suitable location to screen groundnut genotypes for early leaf spot.

**Table 1. Reaction of some groundnut genotypes against early leaf spot at two locations in India, 1987-88.**

ICG No.	Identity	Reaction to early leaf spot <sup>1</sup>	
		ICRISAT Center 1987	Pantnagar 1988
1703	NC Ac 17127	4.6	5.0
1710	NC Ac 17135	6.0	4.0
2711	NC 5	6.0	6.3
4995	NC Ac 17506	6.0	5.0
6284 <sup>2</sup>	NC Ac 17500	5.0	-
6330	PI 270806	6.3	4.3
6709	NC Ac 16163	3.6	4.3
6902	NC Ac 17894	5.6	5.0
7878 <sup>2</sup>	NC Ac 10811 A	5.0	-
9294	58-295	5.3	4.6
10040	PI 476176 SPZ		
	484 Gasp	5.0	5.0
10756	TGR 997	6.0	4.6
10920	PI 476152	6.0	4.6
10946	PI 476176	5.0	5.2
11099	ZFA 3525	5.3	4.0
221 <sup>3</sup>	TMV 2	8.0	8.6
SE		±0.28	±0.41
CV (%)		9.4	11.2

1. Evaluation on a 1-9 scale, where 1 = no disease, and 9 = 50-100% of foliage destroyed.
2. Found to be promising in Malawi (1987/88 and 1988/89) and in Burkina Faso (1989).
3. Susceptible control cultivar.

season groundnuts. Groundnut genotypes were screened successfully at this location and at ICRISAT Center during 1987 and 1988.

During 1987, 33 out of 618 germplasm lines, 3 out of 641 breeding lines, and 5 out of 1665 interspecific hybrid derivatives showed satisfactory levels of resistance to early leaf spot at ICRISAT Center.

During 1988 rainy season, 100 genotypes were tested at Pantnagar and at ICRISAT Center. These lines included new germplasm lines, in addition to the promising lines identified during 1987 at ICRISAT Center. Unfortunately early leaf spot development was not satisfactory enough for a meaningful evaluation during the 1988 rainy season at ICRISAT Center. On the other hand, screening was successful at Pantnagar; 13 genotypes identified to be resistant at ICRISAT Center during 1987 were also found to be resistant at Pantnagar in 1988 (Table 1). Further tests are required to confirm the stability of their resistance.

On the G.B. Pant University farm, ELS occurs on both rainy season and post-rainy season groundnuts every year, and is particularly severe on rainy-