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1) Resistance to anthracnose.

Anthracnose, caused by *Colletotrichum dematium* (Pers. ex Tr.) Grove var. *truncatum* (Sahw.) Arx., can be found in most U.S. soybean producing areas. It is the most prominent disease in much of the southern U.S. and for the Texas Gulf Coast. In recent years, estimates of yield losses caused by anthracnose in the southern U.S. have exceeded 28 million bushels per year, a 2.5% loss in potential yield (Sturgeon, 1980). Anthracnose has accounted for about 13% of all yield losses attributable to fungi, bacteria, viruses, and nematodes (Sturgeon, 1980).

Anthracnose control is achieved by foliar application of various fungicides. Neither resistance nor tolerance has been reported. The development of cultivars with resistance to anthracnose could increase yields and profitability. Partial resistance or tolerance could reduce the need for/or number of fungicide applications, thus helping reduce the costs of production.

From 1981 to 1983, approximately 1500 accessions of maturity group V through VIII from the USDA Germplasm Collection were screened for resistance to anthracnose. In field trials at Beaumont, two-row plots of each germplasm entry were observed and rated for pod and stem symptoms from natural infection. Plants were rated on a scale of 1 to 9, taking into account extent of lesion development on both pods and stems of mature plants. The rating was made on at least one occasion after R8 by two observers, with the average value being recorded. Anthracnose is severe at this location and good uniform infections occur without the use of spreader rows or inoculations. Entries with low levels of symptom development were evaluated in replicated trials the following year.

Table 1 lists the plant introductions rated as resistant from the 1983 second cycle of screening. These lines were rated as resistant for at least two and in some instances for as many as four years. The selected plant introductions do not include any entries from maturity group V or VI, which does not necessarily indicate a lack of resistance to typical pod and stem lesion formation in material of this maturity. The 1983 season was extremely wet, resulting in a serious and atypical outbreak of anthracnose on early maturing material. Symptoms included leaf abscission accompanied by petiole retention, green stems at maturity, and pod blanking. No differences were observed between any material of maturity groups V or VI in their reaction to these severe symptoms.

This screening program will continue with approximately 500 new plant introductions added each year. Lines rated as resistant will be reevaluated continually.

Table 1. Reaction of soybean germplasm to anthracnose infection

Cultivar or PI No. ^a	Maturity group	Disease rating ^b	Cultivar or PI No.	Maturity group	Disease rating
Dare	V	6.5	229.358	VII	3.0
Davis	VI	6.5	283.326	VIII	4.0
Bragg	VII	5.5	285.091	VIII	4.0
Dowling	VIII	6.0	285.095	VIII	4.0
171.451	VII	3.5	309.658	VIII	4.5
183.929	VII	4.0	319.533	VIII	4.5
183.930	VII	4.5	341.252	VIII	3.5
189.402	VII	3.5	374.172	VIII	4.5
200.452	VII	4.0	374.177	VIII	4.5
200.455	VII	4.5	376.845	VIII	3.5
200.456	VII	4.5	379.623	VIII	3.5
200.462	VII	4.0	416.764	VIII	3.0
200.465	VII	4.0	416.886	VIII	3.5
200.466	VII	3.5	417.061	VIII	3.0
200.476	VII	4.5	417.117	VIII	4.0
200.484	VII	3.5	417.134	VIII	3.5
200.532	VII	4.5	417.208	VIII	4.0
200.539	VII	4.5	417.215	VIII	3.5
210.351	VII	3.5	417.470	VIII	3.0
219.652	VII	4.5	417.566	VIII	4.5
224.273	VII	3.0	417.569	VIII	4.0
227.224	VII	4.0			

^aDare, Davis, Bragg, and Dowling were included as the check varieties.

^bDisease rating is on a scale of 1 to 9 with 9 being most severe.

Reference

Sturgeon, R. V., Jr. 1980. Southern United States soybean disease loss estimate - 1979. Proc. Southern Soybean Disease Workers Seventh Annual Meeting, pp. 77-81.

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