Registration of Phomopsis Seed Decay Resistant Soybean Germplasm MO/PSD-0259

SOYBEAN [Glycine max (L.) Merr.] line MO/PSD-0259 (Reg. no. GP-153, PI 562694) was jointly released in May 1992 by the Missouri Agricultural Experiment Station and the Nebraska Agricultural Research Division as an improved source of resistance to phomopsis seed decay (PSD), a disease of soybean caused by Diaporthe phaseolorum (Cooke & Ellis) and Phomopsis longicolla T.W. Hobbs (4,5). It is an F5-derived line from the cross PI 417479 × Merschman ‘Dallas’, made at Columbia, Missouri in 1984. PI 417479 (‘Yougetsu’, from Japan) is the source of resistance to PSD (2) and is of early group IV maturity and determinate growth type (6). Recent results indicate that the resistance to PSD found in PI 417479 is controlled by two complementary dominant nuclear genes (8). Merschman Dallas is a branded cultivar of Merschman Seeds, Inc., Pleasant, IA. It also is of Maturity Group IV but has an indeterminate growth type.

Pedigree selection with bioassay of seeds from all selected plants for presence of Phomopsis spp. was employed each generation from F2 through F5. The bioassay method used has been described by Sinclair (7) and involved the following steps: (i) surface sterilization of the seeds by immersion in a 5 g L-1 solution of sodium hypochlorite for 4 min followed by rinsing in deionized water for 2 min; (ii) plating 25 seeds from each plant on potato dextrose agar acidified to pH 3.5 with lactic acid; (iii) incubation on petri plates containing 5 seeds/plate for 7 d at 25 ± 1 °C; and (iv) recording the number of seeds infected by Phomopsis spp. and other seedborne fungi. To increase the possibility of infection by Phomopsis spp., harvest was delayed each year until 2 wk after maturity.

When rows were first selected in 1988, shattering was added to the selection criteria. MO/PSD-0259 was selected as an F5-derived line having no PSD and reduced shattering compared to PI 417479. Following selection of this line at Columbia, MO, further field and laboratory evaluations were conducted in both Missouri and Nebraska.

In 2 yr of yield testing in Missouri, the level of resistance to PSD in MO/PSD-0259 was similar to that in the donor parent, PI 417479, and significantly greater than that in the cultivar ‘Hobbit 87’ (3). Mean levels of Phomopsis-infected seed were 4.0, 3.5, and 44.0% in PI 417479, MO/PSD-0259, and Hobbit 87, respectively. MO/PSD-0259 showed a lower incidence of PSD-infected seed than did ‘Williams 82’ (1) only when the level of infection was high. The incidence of PSD at the Nebraska site was not high enough in either year to discriminate among the genotypes for resistance to the pathogen complex which causes this disease. Host response was not tested. Based on 2 yr of testing at two locations, yield of MO/PSD-0259 is superior to that of PI 417479 and was equal to that of Hobbit 87 and Williams 82, respectively. MO/PSD-0259 has a short statured with a determinate growth habit, gray pubescence, and brown pod walls. It has yellow seed with a dull luster and buff hilum color. It matures about 1 d later than Williams 82.

Small quantities of seed of MO/PSD-0259 are available for research and breeding purposes will be provided upon written request to the corresponding author. It is requested that recognition be made of the source of this germplasm when it contributes to the development of a cultivar or other plant.

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References and Notes