PATHOLOGY

EVALUATION OF THE 2015 MISSISSIPPI SOYBEAN VARIETY TRIALS TO STEM CANKER

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SCREENING SOYBEAN VARIETIES TO DETERMINE THEIR REACTION TO THE SOYBEAN STEM CANKER FUNGUS REMAINS AN IMPORTANT ANNUAL ENDEAVOR. EVEN THOUGH A LARGE NUMBER OF VARIETIES CONTAIN RESISTANCE TO THE STEM CANKER FUNGUS, SOME SUSCEPTIBLE VARIETIES REMAIN COMMERCIALLY AVAILABLE.

A major part of the plant pathology research program at the DREC involves determining the resistance of the soybean cultivars entered in the Mississippi State University Official Variety Trials (OVT) to yield-limiting soybean diseases. One of the more important stem diseases that annually has the potential to threaten soybean production is stem canker. Stem canker, caused by the fungus *Diaporthe aspalathi* (≡ *Diaporthe phaseolorum* var. *meridionalis*), can be one of the most dramatic and destructive soybean diseases in the Mid-South. Yield losses associated with the disease can approach 80% in susceptible soybean varieties when the environmental conditions remain favorable for disease development. Hot and generally humid conditions are the preferred environment for stem canker development. Selecting varieties with a high level of stem canker resistance may prevent serious economic loss for southern soybean producers adopting the early soybean planting system. Symptoms of stem canker first appear during the reproductive stages on leaves and stems (> R5). Leaf symptoms associated with the disease include severe interveinal chlorosis (middle photo, page 51). Lesions present on the stem can begin at the soil line and move up the stem or initiate anywhere a petiole or main stem branch occurs. Most soybean varieties have some resistance to the disease, yet every year we receive varieties that appear to be severely infected with the disease.

On an annual basis between 180 and 250 soybean varieties contained in the Maturity Group IV and V MSU OVT are evaluated. Single rows, replicated four

times, are planted containing each variety blocked by herbicide technology (conventional, LibertyLink, RoundUp Ready) as well as maturity group. The inoculation method relies on the use of a virulent fungal culture, reproduced on flat toothpicks that are then inserted into the plant approximately five weeks after planting. Inoculated plants are rated at approximately R6 and observed for foliar leaf symptoms as well as the production of a canker as a result of inoculation.

The entries in the 2015 Mississippi Soybean Variety Trials were field inoculated and the reaction of each variety was evaluated. Varieties were rated using a modified 0 to 9 scale whereby 0=no canker production and 9=severe canker and a dead plant. Greater than 90% of the entries in the 2015 OVT were observed to be either resistant (83.5%) or moderately-resistant (10%) based on no interveinal chlorosis and extremely limited canker production. The remainder of the varieties observed, 6.5%, produced a significant canker as well as interveinal chlorosis.

V5 soybean plant immediatelly after toothpick inoculation.

Stem canker leaf symptoms as observed exhibiting inveinal chlorosis-play at R6.

Toothpick inoculated plant exhibiting stem leasion at R7.