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(1 Page Limit)

Fusarium graminearum Schwabe (teleomorph *Gibberella zeae* (Schwein.)), (scab) is an increasingly important problem in the north-central region of the United States. Yield losses in Missouri are difficult to quantify but are thought to have exceeded \$400 million dollars since 1990. Losses in 1990 and 1991 alone were estimated to have cost the wheat industry in excess of \$250 million. In 2004 another widespread outbreak occurred in the northern half of the state that significantly reduced yields in susceptible varieties. The identification of different sources of resistance in adapted soft red winter wheat will accelerate the development of scab resistant varieties and provide more immediate relief to wheat growers in scab years. In August of 2003, the University of Missouri Agricultural Experiment Station announced the release of 'Truman' soft red wheat, which was released for its broad-based resistance to *Fusarium* head blight. In 2005, the University of Missouri announced the release of 'Bess', an early maturing full sib of Truman will equally high levels of scab resistance. Like Truman, Bess is widely adapted across the Corn Belt States with excellent yield and test weight potential. The objectives of our *Fusarium* head blight (FHB) research in 2006 will continue to include: (1) the identification and verification of useful sources of FHB resistance through routine greenhouse and field screening of all advanced breeding lines in the Missouri wheat breeding program; (2) the identification and verification of useful sources of FHB resistance through evaluation of both the Northern and Southern Uniform Winter Wheat Scab Nurseries in field screening environments; (3) the incorporation of new sources of resistance, as they are verified, into elite Missouri soft red winter wheat breeding lines; (4) phenotypic characterization of 500 F₇ recombinant inbred lines (RILs) FHB resistance in Truman; (5) diallel analysis of combining ability of 15 highly resistant winter wheat genotypes with and without the 3BS marker. In 2004/05, 345 advanced lines were tested for FHB resistance for the first time against check varieties including Sumai 3, Ning 7840, and Truman that had *Fusarium* head blight index (FHBI) ratings of 4.4%, 3.3%, and 4.2%, respectively. Data within these 345 lines ranged from 2.5% to 75.6% infection, however, 101 lines had an FHBI of less than or equal to 10%. These 101 lines represented 74 pedigrees, 8 of which were derived from Ernie and 12 were derived from Truman. This type of evaluation of advanced lines will continue in 2006 as resistance in these lines is verified and new lines will be evaluated for the first time. We continue try to pyramid resistance genes from different adapted Missouri sources within our breeding effort. Finally, in 2005/2006, 1200 recombinant inbred lines of the cross Truman x MO 94-317 will be advanced to the F₇. Approximately 500 of these lines will be preliminarily phenotyped in preparation for mapping the FHB loci in Truman. The mapping project is expected to begin in 2007.