

**PI: Milus, Eugene****Project ID: 0304-MI-069****Research Area: VDUN****Project Title: Developing FHB-Resistant Wheat Cultivars for the Midsouth.****PI's E-mail: gmilus@comp.uark.edu****ARS Agreement #: 59-0790-9-054****Duration of Award: 1 Year****PROJECT 2 ABSTRACT**

(1 Page Limit)

The unique combination of biotic and abiotic stresses on wheat in the Midsouth, the potential for devastating FHB epidemics, and the more than two million acres of wheat grown annually in this region, justifies the development of FHB-resistant cultivars adapted to this region. To develop cultivars as quickly as possible, lines from crosses between various adapted wheats and sources of FHB resistance are being selected for both agronomic traits and FHB resistance. One such line derived from a cross involving a Romanian variety, now appears as a possible release. Four of these lines are also being tested in the Southern Winter Wheat Scab Nursery, and 26 of these lines are being tested in Arkansas breeding nurseries. Additionally, the most advanced lines from the University's wheat breeding program are being screened to determine the level of resistance (or susceptibility). In the 2001-02 screening it was found that the most recently released Arkansas cultivar, 'Pat', appears to have a relatively high level of resistance. Additionally many different sources of resistance have been used to develop over 450 populations ( $F_1$  -  $F_4$ ) from which lines will be selected. To provide breeders with sources of resistance to FHB and other important diseases in the Midsouth and to form the basis for a recurrent selection program to obtain lines with higher levels of resistance, lines from the germplasm enhancement program have been selected for agronomic traits and for resistance to FHB and to contemporary races of leaf rust, stripe rust, and Septoria tritici blotch. Thirteen  $F_7$ ,  $BCF_6$ , or  $TCF_6$  lines from nine sources of resistance were selected in 2002, some or all of these lines were shared with Lucy Gilchrist, Mohan Kohli, Barton Fogleman, and Art Klatt (for Karnal bunt evaluation), and five lines were entered in the Southern Winter Wheat Scab Nursery. A genetic study to determine the number, uniqueness, and the heritability of FHB resistance in seven lines and a recurrent selection program utilizing a male-sterile population to develop lines with higher levels of FHB resistance were initiated in 2002. As a service to breeders, this project evaluates entries from the Northern and Southern Winter Wheat, Arkansas, and Louisiana Scab Nurseries for FHB resistance in the greenhouse and in inoculated, irrigated screening nurseries at two locations. A new addition to this proposal is the evaluation of entries from the scab nurseries for resistance to soilborne mosaic, spindle streak mosaic, leaf rust, stripe rust, leaf blotch, glume blotch, and tan spot in field screening nurseries that were developed for a project funded by the Arkansas Wheat Promotion Board.