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Project Title: Enhancement of Scab Resistant Wheat Cultivars Adapted to the Southeast.

PROJECT 1 ABSTRACT

(1 Page Limit)

Fusarium head blight (FHB) is a potential devastating disease in the southeast region in the United States where low temperature and misted weather occurs frequently during soft red winter wheat flowering. Severe epidemic of FHB have caused significant loss to the wheat producers in the Southeast because of both grain yield and high DON concentration. Breeding FHB resistant cultivars is the most effective option for disease control since the window for chemical control is very narrow.

Elite breeding lines from breeding programs in the southeast region were evaluated with Ernie as resistant check under misted conditions. Eleven lines showed similar level of resistance as the resistant control and 22 lines showed significantly higher severity. The Virginia line, VA05W-500, from a cross of Roane / PIO 2684 // OH 552 showed the best and consistent resistance. Several native sources of Type II resistance (Truman, Roane, Ernie, OH02-12686, and IL00-8530) and from derivatives of Sumai 3 (INW0411, VA04W433, VA 01-461) have being incorporated into GA elite lines. Breeding for Type I resistance is also in progress with populations derived from Truman and Frontana. Several elite breeding lines, GA 991109-6E8, GA 031307DH14, GA 031454DH7, GA 981621-5E34 have been identified as moderately scab resistant.

Marker assisted backcrossing of QTL from Sumai 3 (3BS, 5AS), Goldfield (2BS) and Ernie (5AS, 3BS, and 4BL) have been used to transfer resistance into AGS 2000 background. Several FHB resistant sources were evaluated for Type I resistance in the greenhouse. Bess and Tribute were the two checks that had a low infection spread (1.3 and 1.7, respectively). Lines that were equal to the checks for low infection spread were M04*5109, M03-3616B, NC05-25062, GA 031354-DH7, GA981621-5E34, and LA01141D-138. Lines that had the lowest DON levels were Bess, Jamestown, M04*5109, M03-3616B, GA 031354-DH7, and VA 05W-510. The lines with the low DON and low infection spread are being incorporated into GA elite lines.