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**Research Category: VDHR-SWW**

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

### **PROJECT 1 ABSTRACT**

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Fusarium head blight (FHB) can be a potential devastating disease in the southeast region in the United States. 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. Several different scab resistant sources are being incorporated in elite lines. Marker assisted selection is being used to assist in the selections within populations containing FHB QTL.

The level of native resistance within the elite lines of Georgia's program has significantly increased. Breeding lines, GA 991109-6E8 (Ernie background), GA 031307DH, GA031454DH, and Baldwin have shown moderate levels of FHB resistance in greenhouse and/or field evaluations. These and other lines will be further evaluated in our nurseries for over-all agronomic performance and disease resistance. Several elite breeding lines that have moderately scab resistance will be further evaluated in multi-locations for yield and agronomic performance and FHB resistance. Native sources of Type II resistance from other breeding programs, (Truman, Neuse, Jamestown, McCormick, OH 02-12686, OH 02-7217, IL8641, IL 02-18228, IL 02-1828, MO 050699, and MO 050146) have been crossed with GA scab resistant lines.

In cooperation with other scientists and the Genotyping Lab., populations derived from Truman, Neuse, and Frontana are being evaluated to identify lines with Type I resistance and good agronomic performance. Superior lines selected will be shared with collaborators. Additional cooperation will continue with the incorporation of the FHB resistance from Langdon (3A DIC) into GA breeding lines. Lines from the cross (Baldwin\*3// Neuse\*3/LDN) will be evaluated for agronomic and scab and leaf and stripe resistance.

Marker Assisted Backcrossing (MABC) of QTL (3BS, 5A, 2B, 2D, 3BSc, and 4B) and Truman into SRWW background will be performed using high yielding and moderately resistant FHB lines as recurrent parents. Pyramiding QTL will greatly facilitate development of cultivars that have more effective FHB resistance. Derived lines from VA01W-461 ( Roane / W14) will be evaluate for the presence of two major FHB resistant QTL on chromosome 3BS and 5AS among elite lines and backcross populations. The widely adapted, high yielding cultivar, AGS 2000 and several AGS 2000 derived lines have been used as recurrent parents to develop populations of BC1F2 and BC1F3 plants with improved FHB resistance.