

Regional Breeding for Wheat Stripe Rust Resistance in the Eastern United States

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Stripe rust (cause by *Puccinia striiformis* f. sp. *tritici*) has become an increasing problem east of the Rocky Mountains since about 2000, particularly in soft red winter wheats grown in the Mississippi River Valley and in the southeastern U.S. Reasons for this increase may include widespread planting of susceptible cultivars, increased overwintering or oversummering of the pathogen, changes in local or regional climatic variables and changes in pathogen aggressiveness. Regardless of the underlying reasons, it is clear that the disease has caused yield losses in areas not traditionally considered to be prone to stripe rust epidemics. Because of the emerging importance of stripe rust in the eastern U.S., a regional program, sponsored by the USDA/ARS, was initiated in the Fall of 2005 to identify sources of resistance in elite soft wheat breeding lines and germplasm, incorporate the resistance into a diverse set of adapted soft wheats, and begin to determine the major and minor *Yr* genes involved.

The first (2005-06) Uniform Eastern Soft Wheat Stripe Rust Nursery (UESWSRN) consisted of 300 entries made up of breeding lines and cultivars from State Experiment Stations in FL, GA, AR, NC, VA, MD, KY, MO, IL, IN, MI, and NY; the USDA/ARS; and AgriPro/Coker Seeds, WestBred, LLC, and Genesis Seeds. The 2nd UESWSRN (2006-07) had 380 entries. Field locations were established in Plains and Griffin, GA, Baton Rouge and Winnsboro, LA, Fayetteville, AR, Kinston, NC, and Mt. Vernon and Pullman, WA. The GA and AR locations were inoculated with a local field culture of stripe rust. Stripe rust infection type and percent severity data were assessed multiple times at each location in 2005-06. Significant stripe rust was present at Plains, Griffin, Winnsboro, and Fayetteville. Those entries that had stripe rust infection types and percent severities lower than the mean for the stripe rust resistant check, 'Pioneer 26R61' (IT=3.97 and %=19.74) were considered to have useful stripe rust resistance. A total of 102 lines from the nursery were identified as having a level of resistance better than that of 'Pioneer 26R61'. Also encouraging was the wide range of maturities in which stripe rust resistance was identified.