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Mission

Our corn breeding project addresses water, mycotoxins, high temperature, insects and other major issues that constrain corn production in Texas and around the world. The project is aimed (i) to enhance germplasm adapted to the Texas, (ii) develop multiple stress tolerant corn germplasm and hybrids, and (iii) to determine the genetic mechanisms of stress resistance.

Accomplishments:

- Developed three inbred lines with improved drought and heat tolerance, corn earworm resistance, and grain mold resistance;
- Developed three yellow hybrids and two white hybrids with equivalent or higher grain yields but significantly lower aflatoxin contamination in comparison to commercial checks;
- Characterized 100 new germplasm collections for drought tolerance, insect resistance, and other agronomic characters;
- Identified three QTLs that control leaf firing resistance in corn;
- Trained a M.S. graduate student and provided research experience for six undergraduate students.

Impact:

The new multiple stress tolerant corn germplasm can be used to produce corn hybrids adapted to Texas and other southern states, and can be a powerful tool to reduce yield loss caused by drought, high temperatures, and insects and to reduce aflatoxin contamination.

Germplasm Releases:

- Tx202: a white kernel line with good drought and heat tolerance, mite resistance.
- Tx203: a yellow kernel line with good combining ability.

Publications:

Xu, W.W., Pollak, L., and Bynum. E.D. Jr. 2003. Tropical x temperate germplasm resistant to corn earworm (Lepidoptera:noctuidae). Crop Protection 22:859-864.

Abstracts:

Bai, J., Xu, W., Klueva, N., Nguyen, N., Davis, G. 2003. Molecular mapping of heat tolerance genes in maize. 2003 ASA-CSSA-SSSA Annual Meetings Abstract C07-xu197534-poster. Denver, CO. Nov. 2-6, 2003.

Xu, W. Odvody, G., and Williams, P. 2003. Progress toward the development of stress-tolerant and low-aflatoxin corn hybrids for the Southern states. Aflatoxin/Fumonisin elimination and fungal genomics workshop. Savannah, GA, Oct. 13-15, 2003.

Xu, W.W. and Blanco, M.. 2003. Mining genes from tropical maize germplasm to improve drought tolerance and corn earworm resistance. pp. 74-54 in Book of Abstracts: Arnel R. Hallauer International Symposium on Plant Breeding, 17-22 August 2003, Mexico City, Mexico, D.F.