Registration of Maize Germplasm GT601 (AM-1) and GT602 (AM-2)

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GT601 (AM-1) (Reg. No. GP-551, PI 644026) and GT602 (AM-2) (Reg. no. GP-552, PI 644027) are yellow dent maize (Zea mays L.) lines developed and released jointly by the USDA-ARS Crop Protection and Management Research Unit and the University of Georgia Coastal Plain Experiment Station in 2006. GT601 (AM-1) and GT602 (AM-2) were developed by seven generations of self-pollination from a maize population GT-MAS:ggk (PI 561859) (McMillian et al., 1993). This population was derived from a commercial hybrid ear (a Pioneer hybrid) visibly segregating for fungal infection by Aspergillus flavus and selected for resistance to the fungal infection and reduction of aflatoxin contamination (Widstrom et al., 1987). McMillian et al. (1993) released the maize population GT-MAS:ggk as a source of resistance to aflatoxin accumulation.

To use the resistance traits from GT-MAS:ggk, such as physical pericarp wax (Guo et al., 1995, 1996; Russin et al., 1997) and antifungal proteins (Guo et al., 1997, 1998; Chen et al., 1998), efforts of self-pollination and selection have been made since 1996 for reduced aflatoxin contamination. By evaluating S1 families, Guo et al. (2001) demonstrated that considerable variation among the individual plants within the population GT-MAS:ggk was detectable using random amplified polymorphic DNA (RAPD) markers and a laboratory aflatoxin bioassay. Guo et al. (2002) also evaluated the S2 generation using 113 restriction fragment length polymorphism (RFLP) probes for genetic variation and conducted 2-yr field tests for aflatoxin contamination. The aflatoxin concentrations and maturity data among the S2 selfed lines were significantly different (Guo et al., 2002).

Field evaluation for aflatoxin contamination in 2004 and 2005, GT601 (AM-1) had 33 and 62 ng g⁻¹, and GT602 (AM-2) had 32 and 51 ng g⁻¹, respectively, while the resistant control Tex6 (Hamblin and White, 2000) had 69 and 120 ng g⁻¹. The aflatoxin levels in GT601 (AM-1) and GT602 (AM-2) were significantly different from the susceptible (677 S. Seger Rd., Madison, WI 53711 USA.

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References