Registration of Tx2962 through Tx2978 Biotype E and I Greenbug-resistant Sorghum Germplasm Lines

The sorghum [Sorghum bicolor (L.) Moench] germplasm lines Tx2962 through Tx2978 (Reg. no. GP-623 to GP-639, PI 642870 to PI 642886 respectively) were developed and released by the Texas Agricultural Experiment Station, the Texas A&M University System, Lubbock, TX, in 2006. All lines contain a moderate to high level of resistance to greenbug biotype E, Schizaphis graminum (L.) Rondani, and a moderate level of resistance to greenbug biotype I in seedling stage greenhouse tests. These lines are 3-dwarf (dw1Dw2Dw3Dw4) in height and provide resistance to two greenbug biotypes with unique combinations of plant color and various agronomic traits.

The source of greenbug resistance for Tx2962 through Tx2965, and Tx2970 through Tx2977 is PI 550607. The source of greenbug resistance for Tx2966 through Tx2969 and Tx2978 is PI 550610. Both lines were introduced into the United States from Russia (Andrews et al., 1993). Each of the released lines resulted from crossing either resistance source to an elite adapted line and then crossing the resulting F1 plant to either the recurrent parent or another elite adapted line at least one time. The pedigree method of breeding was used to develop all lines. Selections were made for improved yield potential, adaptation, disease resistance (head smut, rust, and zonate leaf spot), and grain weathering resistance at Lubbock, Halfway, Corpus Christi, and Beeville, TX and Guayanilla, PR. All lines restore fertility to the A1 cytoplasm system. Fertility restoration to other cytoplasmic systems is not known.

All of the lines have purple or red-purple plant color except for Tx2963, Tx2964, and Tx2976 which have tan plant color. The parents of Tx2963 and Tx2964 are not unknown but based on the parents used to develop this germplasm it is assumed that RTx436 (Miller et al., 1992) was used as a crossing parent. All of the lines have normal (non-yellow) endosperm except for Tx2966 through Tx2969 which have yellow endosperm. All of the lines have a thin epicarp except for Tx2976 and Tx2977 which are thick. All of the lines are awnless except for Tx2966 which is awned. Glume color of the tan plant lines Tx2963, Tx2964, and Tx2976 is tan.

Greenbug damage ratings, ratings for resistance to selected diseases, and selected agronomic characteristics are given in Table 1. All of the lines are more resistant to biotype E greenbug than Tx2783 (resistant check) except for Tx2975, Tx2976, and Tx2978. The lines express moderate levels of resistance to biotype I greenbug, Tx2962 through Tx2966, Tx2970, and Tx2977 are resistant to head smut (caused by Sphaecelotheca retiliana (Kuhn) Clinton). The remaining lines are moderately susceptible to moderately resistant. All lines possess a moderately high level of resistance to rust (caused by Puccinia purpurea Cooke). Resistance to grain mold is moderate depending on the environment. Resistance to insecticide phytotoxicity is high (1.5) to moderate (3.0). The lines are generally earlier in maturity and shorter in plant height than the standard checks Tx2783 (Peterson et al., 1983), RTx430 (Miller, 1984), and RTx436 (Miller et al., 1992).

Seed of Tx2962 through Tx2978 will be maintained by the Texas Agricultural Experiment Station, Texas A&M University Agricultural Research and Extension Center, 1102 E FM 1294, Lubbock, TX 79403–6603. Small samples (100 seeds) of these germplasms are available for distribution on written request. It is requested that appropriate recognition of the source be given if this germplasm contributes to the development of new germplasms or parental lines.

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References


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