REGISTRATION OF NINE GREENBUG-RESISTANT SORGHUM GERMPLASMS, N82 TO N90

Nine sorghum [Sorghum bicolor (L.) Moench] germplasms, N82 to N90 (Reg. no. GP-361 to GP-369, PI 559723 to PI 559731), were developed in the University of Nebraska West Central Research and Extension Center sorghum breeding program and were released by the Nebraska Agricultural Experiment Station and the USDA-ARS in 1986. These grain-type stocks have good or moderate resistance to Biotype B greenbug [Schizaphis graminum (Rondani)] (Table 1). Four of the stocks are resistant, three are moderately resistant, and two are susceptible to Biotype B greenbug (1). This particular form of Biotype B greenbug was isolated from a Kentucky bluegrass (Poa pratensis L.) lawn at Lincoln, NE, and is capable of breaking the resistance of some of the currently used sources of Biotype E resistant sorghum. The two types of resistance seem to be controlled by independently inherited dominant genes. The probable source for the B resistance was from TAM-BK 42 released by the Texas Agricultural Experiment Station in 1972 (not registered in Crop Science).

These germplasms have not been fully evaluated for all agronomic traits. They are sufficiently homozygous for testcross purposes; however, some of the stocks may still carry the ms3 gene. Plant height of the stocks and their hybrids indicates that they are 3-dwarf genotypes. Most have good combining ability in the combinations tested, and the lines are considered susceptible to the prevalent pathotypes of anthracnose in Georgia. During R1 to R5 generations, seed were bulked within families. Phenotypically similar selections were composited during the R6 generation in Isabela, Puerto Rico following growth at pH 5.5 (Coto clay: clayey, kaolinitic, isohyperthermic Tropentop Haplargid). Yield evaluations were conducted on a Pacolet sandy clay loam (clayey, kaolinitic, thermic Typic Kanhapludult) at pH 4.3, 50% Al saturation near Griffin, GA, during 1990 (R7 generation) in two-row plots 3 m long and during 1991 (R8) in single-row plots 35 m long. Each entry was replicated 4 to 7 times, depending on seed availability. Preliminary test crosses revealed that GC103 and GC104 restore fertility in A1 cytoplasm.

The regenerated lines were evaluated for acid soil tolerance response on a Suches silt loam (fine-loamy, mixed, nonaquic Argiudoll), a Rockdale clay loam (clayey, kaolinitic, thermic Typic Hapludalf), and a Cecil and Pacolet sandy clay loam (clayey, kaolinitic, thermic Typic Hapludult), a Cedarbluff silt loam (fine-loamy, mixed, nonaquic Argiudoll), and a Cecil and Pacolet sandy clay loam (clayey, kaolinitic, thermic Typic Hapludult) at Griffin, GA, during 1990 (R7 generation) in two-row plots 3 m long and during 1991 (R8) in single-row plots 35 m long. Each entry was replicated 4 to 7 times, depending on seed availability. Preliminary test crosses revealed that GC103 and GC104 restore fertility in A1 cytoplasm.

The released lines are Rr self-pollinated selections originating from TCCP75-46 (Rr family) that were tested as T75-46-20 and T75-46-50, respectively. Both lines are phenotypically similar to the nonregenerated RTx430 (9), with minor differences. Both regenerants have slightly more compact panicles than the normal RTx430 seminative configuration, but would be classified as having seminative panicles. Maturity in Georgia is similar for the original parent and regenerated lines. GC103 is 5 to 10 cm taller, but GC104 is comparable in height to RTx430 on soils with pH > 6.0. Both regenerated lines have slightly better anthracnose [Colletotrichum graminicola (Ces.) G.W. Wils.] (4.0 rating) than the original RTx430, which is extremely susceptible (5.0, plants killed by the disease); however, the lines are considered susceptible to the prevalent pathotypes of anthracnose in Georgia.

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