Registration of GT-FAWCC(CS) Maize Germplasm

GT-FAWCC(CS) (Reg. no. GP-242, PI566665), a maize (Zea mays L.) germplasm population, was developed via five cycles of S diverse progeny selection for resistance to leaf-feeding by larvae of the fall armyworm, Spodoptera frugiperda (J. E. Smith), and was jointly released in November 1992 by the USDA-ARS Insect Biology and Population Management Research Laboratory and the University of Georgia Coastal Plain Experiment Station, Tifton, GA; and the USDA-ARS Crop Science Research Laboratory and the Mississippi Agricultural and Forestry Experiment Station, Mississippi State, MS. The original breeding population was formed by compositing three broad-based breeding populations, each having resistance to leaf-feeding by larvae of the fall armyworm. One population was a bulk of more than 60 Mexican and Caribbean collections, the second a bulk of families from six collections with Antigua background, and the third a bulk of 100 Brazilian collections. After one generation of random mating, two hundred or more Ss were evaluated for damage under heavy FAW infestation in each cycle in Georgia and Mississippi, and 10% of the best performing Ss were recombinant by growing selected Ss from remnant seed. GT-FAWCC(CS) has mixed kernel and cob color. Plants vary in maturity from AES 1000 to AES 1100. Plant height of GT-FAWCC(CS) is variable, but averages about the same as many commercial hybrids, and ear height is 20 to 25 cm higher than the same hybrids. Yields of GT-FAWCC(CS) in hybrid combination with several other breeding populations and yields of many commercial hybrids are comparable (1).

On a scale of 0 to 9, where 0 = no damage and 9 = the plant completely destroyed, GT-FAWCC(CS) rates about a 5.6. This rating is typical when the population is under heavy artificial insect infestation and is more than 1.5 damage units lower than the original population (2). The population also has more resistance to ear-feeding insects than most commercial hybrids, but stalk lodging is 10 to 15% higher.

The population was released as a source of germplasm for developing fall armyworm-resistant inbreds, since its resistance to leaf-feeding and the resistance of our best performing experimental hybrids is comparable. Sufficient variability exists in GT-FAWCC(CS) to allow selection for desirable agronomic types during the inbreeding process. Breeder seed of nomic types during the inbreeding process. Breeder seed of GT-FAWCC(CS) will be maintained by USDA-ARS-IBPML, P.O. Box 748, Tifton, GA 31793, and can be obtained from the corresponding author. Recipients of seed are asked to acknowledge the source of the germplasm if it is used in the development of a new cultivar, germplasm, parental line, or genetic stock.

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References and Notes

3. N. W. Widstrom and B. R. Wiseman, USDA-ARS-IBPML, P.O. Box 748, Tifton, GA 31793, and W.P. Williams and F.M. Davis, Crop Science Res. Lab., USDA-ARS, Mississippi State, MS 39762-5367. Contribution of USDA-ARS in cooperation with the University of Georgia, Coastal Plain Exp. Sin. and the Mississippi Agricultural and Forestry Exp. Sin. Registration by CSSA. Accepted 30 April 1993. *Corresponding author.

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Registration of Three European Corn Borer Resistant Sweet Corn Germplasm Lines: A684su, A685su, and A686su

Three sugary (su) maize (Zea mays L.) lines were developed at the Minnesota Agricultural Experiment Station, University of Minnesota, St. Paul: A684su (Reg. no. GP-243, PI 567792); A685su (Reg. no. GP-244, PI567793); and A686su (Reg. no. GP-245 PI567794). These lines were released in March, 1992, because of their potential to produce experimental hybrids with resistance to ear-feeding damage by the European corn borer (Ostrinia nubilalis Hübner) (ECB). They emerged from a program designed to combine sources of ECB resistance to ear feeding.

A684su, A685su, and A686su were developed through a modified pedigree selection program. Pedigree selection was used on both sides of the parentage to create parents for the final cross. Following the final cross, a pedigree selection program was interrupted by sib mating prior to final selfing and seed increase. Each generation, selection was based on plant and ear type and on ECB response at about 40 d following artificial infestation with 20 to 30 neonate larvae at the ear tip at mid-silk. Larval numbers were increased to about 50 for the final two generations prior to final seed increase, and evaluations were made to 20 to 22 d after infestation to coincide with normal harvest maturity. In early generations, ECB selection was based on the response of individual plants in unreplicated plots, and, in the final two to three generations, on 3 to 7 replications of 5 to 10 plants each.

A684su was derived from the cross 'Apache' xAplicata 453/BS2-
S6. Based on screening trials, Apache, an su inbred, have moderate and low but significant resistance to ear feeding, respectively (2). Apache was selfed and selected for 3 generations for ear-feeding resistance. BS2, an su (field corn) inbred release of the Iowa Agricultural Experiment Station, possesses stalk, sheath, and collar-feeding resistance and low, but significant, resistance to ear feeding (2). The cross of Ia453/BS2 was followed, beginning in the F2, by six generations of single plant selection with selfing, with selection based on plant and ear traits, pollen production, and ECB ear-feeding resistance. Subsequent to the final cross, three generations of selfing with selection were followed by two generations of sib-mating of selected plants by use of bulked pollen from selected plants. This was followed by one generation of selfing, and by one generation of seed increase via open pollination in isolation. A684su has a 13- to 18-cm ear, with medium taper, a tight, narrow, 7-cm silk channel, dark silk color, and 16 to 18 rows, with some tendency for row spiraling. Ears have prominent husk leaves and snap easily, but are difficult to husk. Plants may possess one prominent tiller. A684su requires about 1540 heat units to anthesis. Pollen production is heavy.

A685su and A686su were derived from a composite created by intermating five lines: four Ss lines from Apache and one Ss line from Apache Ss/Ia453/BS2-Su. A685su and A686su were selected subsequently as Ss lines followed by two generations of selection and seed increase via open pollination in isolation. A685su and A686su have 13 to 15 cm ears with medium taper. Ears primarily have 16 kernel rows and snap easily, but are difficult to husk. A685su has dark and A686su somewhat lighter silk color. Both lines produce one to two