REGISTRATION OF CROP GERMPLASM

Up to 10 g of seed of the two germplasms may be obtained from the Dep. of Agronomy, Agric. Sci. Bldg. N., University of Kentucky, Lexington, KY 40546-0091.

NORMAN L. TAYLOR*(3)

Reference and Notes


REGISTRATION OF WGG(MP) C15 MAIZE GERMPLASM

MAIZE (Zea mays L.) population GG(MP) C15 (PI 531232; Reg. no. GP-197) was produced by 15 cycles of biparental mass selection for prolificacy in the maize population ‘Golden Glow’. The population was developed at the Agricultural Experiment Station, University of Wisconsin, Madison, WI under the direction of the late J.H. Lonnquist and J.G. Coors. The population was approved for release on 8 Dec. 1987 as a germplasm source for prolificacy.

For cycles C0 through C12, the population was planted in a 0.25-ha isolated plot, at a low density of 17 778 plants ha⁻¹. At flowering, the primary female inflorescences of plants showing development of a secondary female inflorescence were covered with shoot bags prior to silk appearance to prevent pollination. Plants were observed every other day until approximately 1 500 primary female inflorescences on prolific plants were covered. Subsequently, all plants without secondary female inflorescences were detasseled. One day later, shoot bags were removed from prolific plants. This procedure was designed to allow biparental control, thereby increasing expected genetic gain. For C13 through C15, similar procedures were used with the exceptions that the population density was increased to 53 597 plants ha⁻¹, and approximately 500 primary female inflorescences on prolific plants were covered.

At harvest, ears were collected from approximately 300 selected plants. Selection was based upon prolificacy, early maturity, good plant health, and root and stalk strength. A balanced composite was made by compositing an equal number of seeds from all harvested ears. Selection intensity was approximately 5% from C0 through C12 and 2% for C13 through C15.

Cycles C0, C3, C6, C9, and C12 of GG(MP) were evaluated in replicated trials in 1985 and 1986 (1). The evaluation was conducted at two locations, the earliest selection in 1987 was not made until approximately 1 500 primary female inflorescences on prolific plants by self-pollinating the second ear and exposing the upper ear to random pollen from the prolific and S₁ progenies thus formed were evaluated in trials using a blocks-within-replications design. The types had to equal or exceed the block mean for grain yield and be equal to or below the block mean for grain moisture in order to be selected for C1 through C3. A selection index incorporating both grain yield and moisture was used for C4. Half-sib progenies were used for recombinations through C2, S₁ progenies were recombined for C3, and S₂ progenies were used to create two subpopulations designated W3L COMP-HS C4 and W3L COMP-S₁ C4, respectively.

Based on replicated field trials performed at two locations in 1985 and 1986, and three locations in 1987, significant increases were not detected in test crosses of C4 with inbred lines A554 and WI 17, although test crosses between C4 and either inbred had significantly lower grain yield vs. 163.6 g plant⁻¹ and 194 g kg⁻¹ for the test cross WI 17 X W3L COMP-HS C4. The yield of bulked composites from test-yielding check hybrid, A632 X LH38, over three locations in 1987 was 165 g plant⁻¹ and 224 g kg⁻¹.