Registration of Acid Soil Tolerant Maize Populations SA-3 and SA-8

Populations SA-3 (Reg. no. GP-317, PI 584439) and SA-8 (Reg. no. GP-318, PI 584440) of maize (Zea mays L.) were developed by the South American Regional Maize Program of the International Maize and Wheat Improvement Center (CIMMYT) in collaboration with national agricultural research programs in South America and Asia, and were released in 1993. SA-3 and SA-8 silk in about 56 to 58 d and can be harvested in about 110 to 115 d after planting in the nonacidic tropical lowland environments. SA-3 has yellow semimflint grains and SA-8 has white semimflint grains. These populations possess a broad genetic base and have high grain yield potential in acid (pH < 5.6; Al saturation > 35%; and P < 15 mg kg\(^{-1}\)) and nonacidic fertile soils.

The germplasm included in SA-3 and SA-8 was selected from a total of 192 cultivars from Mexico, Colombia, Peru, Bolivia, and Thailand, grown in 40 and 80% Al saturation field plots at Santander de Quilichao, Colombia, in 1977 (1). Germplasm from CIMMYT, Mexico, included 37 cultivars homozygous for the recessive allele at the opaque-2 (\(o_2\)) locus and with hard endosperm, 34 experimental cultivars from 28 tropical and subtropical maize populations, 25 full-sib (FS) families from Tuxpeño-1, 9 FS families from La Posta, and 8 FS families from Campuesto Selección Precoz. Twenty-six cultivars homozygous for the recessive allele at the brachytic-2 (\(br_2\)) locus and six double-cross hybrids from Instituto Colombiano Agropecuario (ICA) and 18 \(br_2\) cultivars from the Centro Internacional de Agricultura Tropical (CIAT) were from Colombia. Twenty-two tropical yellow-endosperm cultivars were from a total of 192 cultivars from Mexico, Colombia, Peru, Bolivia, and Thailand, grown in 40 and 80% Al saturation plots, in a ratio of two females to one male. The male was a composite prepared by mixing 50 kernels from each ear, selected from high-yielding families and plants in the previous cycle. For cycle 16 (Co) of FS selection of SA-3, 500 S\(_1\) ears were bulked to produce Co of SA-8. During the following season, seed from selected ears was planted ear-to-row, and \(\approx 8\) plants were selfed in each of 50 selected rows. At harvest, 99 plants were planted ear-to-row, and plant-to-plant crosses were made among rows. At harvest, 99 ears with white-endosperm kernels were selected. During the next season, seed from selected ears was planted ear-to-row, and \(\approx 8\) plants were selfed in each of 50 selected ears. During the following season, seed from selected ears was planted ear-to-row, and plant-to-plant crosses were made among rows. At harvest, 99 ears with white-endosperm kernels were selected. During the next season, seed from selected ears was planted ear-to-row, and plant-to-plant crosses were made among rows. At harvest, 99 ears with white-endosperm kernels were selected.

During 1992–1993, C\(_4\) of FS selection of SA-3, 500 S\(_1\) ears with white-endosperm kernels were selected. During the following season, seed from selected ears was planted ear-to-row, and \(\approx 8\) plants were selfed in each of 50 selected ears. During the following season, seed from selected ears was planted ear-to-row, and plant-to-plant crosses were made among rows. At harvest, 99 ears with white-endosperm kernels were selected. During the following season, seed from selected ears was planted ear-to-row, and plant-to-plant crosses were made among rows. At harvest, 99 ears with white-endosperm kernels were selected. During the following season, seed from selected ears was planted ear-to-row, and plant-to-plant crosses were made among rows. At harvest, 99 ears with white-endosperm kernels were selected.

Both populations can be used for further research institutions, directly or in crosses with local germplasm. Small quantities (100 gm) of seed of SA-3 or SA-8 can be obtained from the corresponding author. We request that appropriate recognition be given to CIMMYT when the populations contribute to research or the development of new cultivars.

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References and Notes


References and Notes

4. USDA-ARS, Crop Sci. Res. Lab., Forage Res. Unit, P.O. Box 5367, Mississippi State, MS 39762-5367. Contribution of the USDA-ARS in cooperation with the Mississippi Agric. and For. Exp. Stn. Journal Article no. J-8539 of the Mississippi Agric. and For. Exp. Stn. Registration by CSSA. Accepted 30 Nov. 1994. *Corresponding author (Email: clover@ra.msstate.edu).