

ISU-GEM USDA Allelic Diversity Doubled Haploid Resource

A joint release by Iowa State University and the USDA-ARS Germplasm Enhancement of Maize Project

The USDA-ARS GEM Project and the Iowa State University Doubled Haploid Facility have collaborated to develop doubled haploid lines composed of 75% expired PVP and 25% exotic germplasm. These efforts are part of the GEM Allelic Diversity Project, to create a unique set of genetic resources representative of the allelic diversity of all of the races of maize.

Currently, 205 maize DH lines are being publicly released; additional lines will be released annually or as available. These derive from nearly 60 maize landrace accessions that were crossed with either or both PHZ51 (non-stiff stalk expired PVP) or B47 (stiff stalk expired PVP), and the F1s were backcrossed to the respective parent (74 total populations). Haploid seed was induced from the BC1 generation and doubling was accomplished in collaboration with the ISU DH Facility. Another 2600 lines will be created and released over the next 10 years to accomplish this objective.

Unlike traditional GEM breeding materials, these DH lines have not been evaluated for performance traits, and no intentional selection was practiced during their development. Some flowering, plant and ear height, and grain type information is available. Their breeding value is unknown and they are intended primarily as a resource for biological research and potential discovery of unique alleles/traits. Some will be difficult to maintain but are being released.

We anticipate that the DH lines will be genotyped at high resolution to identify introgressed regions from the landrace donor, and that these data will be publicly available. The GEM staff and Technical Steering Group are working to identify these and phenotyping resources. There is no commitment at present to incorporate these lines into the National Plant Germplasm System's maize collection; lines worthy of preservation will be determined based on findings.

Naming convention: BGEM-###-S or BGEM-###-N, where 'S' refers to the stiff stalk background and 'N' refers to the non-stiff stalk background.

Seed Distribution Policy:

This germplasm is available to public-sector and private-sector maize researchers with no restrictions on use.

Because of limited seed supply, a one-time distribution of 15-20 kernels will be made per institution (university or private company), conditional on the recipient's ability to increase and maintain stocks for researchers at that institution. A limited supply of seed for observation or testing may be available for some lines. All subsequent requests, within a company or institute that already received the DH lines, should be forwarded to the individual to whom the original DH set was sent. These lines will be multiplied again in 2014 by the GEM Project.