

Gonzalez*, M., L. Pollak, and A. S. Goggi. 2011. Genotype x environment interactions in populations possessing *Gal*s and *Gal* alleles for cross-incompatibility in maize. **Euphytica** DOI **10.1007/s10681-011-0543-6** (published online first).

Abstract:

Use of cross incompatibility in corn (*Zea mays* L.) by the *Gal-s* allele may reduce cross fertilization in specialty and conventional organic corn with pollen from genetically-modified (GM) corn. For effective use, information about environment, and genotype x environment effects on cross-fertilization by *gal* as well as heritability of cross incompatibility in maize is necessary. Our objective was to obtain this information. Four population pairs differing in their genotype at *gal* were evaluated for cross incompatibility with *gal* pollen in different environments. Populations were derived by crossing the recurrent parents B116, PHG35, ARZM16035:S19, and (CHZM05015: Mo17)Mo17 to *Gal-s* donor parent Mo508W/Mo506W. Two replicates of each treatment were grown in the center of 952 m² fields planted with purple corn as an adventitious source of *gal/gal* pollen. Open pollination was allowed and the amount of cross-fertilization estimated by averaging the percentage of purple seeds. Environment and genotype x environment effects were not significant. Contrasts to evaluate differences in cross-fertilization between *Gal-s* and *gal* populations revealed that mean percentages of cross-fertilization in *Gal-s* populations of B116, ARZM16035:S19, and (CHZM05015:Mo17)Mo17 were significantly lower than in *gal* populations. The estimated broad sense heritability on an entry-mean basis for cross incompatibility was 0.81. Results suggest differences in genotype at *gal* played a major role in cross-fertilization of populations differing in their genotype at the *gal* locus. Incompatibility may be selected effectively over different environments and the *Gal-s* system may be of value to reduce cross-fertilization with GM corn pollen.

URL

<http://www.springerlink.com/content/456t21127j554160/fulltext.pdf>