

ESTIMATING POLLEN-MEDIATED GENE FLOW IN COLORADO CORN FIELDS WITH THE BLUE KERNEL TRAIT. Patrick F. Byrne, Todd A. Gaines, Ron F. Meyer, and Robert Alexander. Associate Professor, Department of Soil and Crop Sciences, Colorado State University, Fort Collins, CO 80523-1170, Graduate student, Department of Bioagricultural Sciences and Pest Management, Colorado State University, Fort Collins, CO 80523-1177, Extension Agronomist, Colorado State University Cooperative Extension, Burlington, CO 80807-1674, and Agricultural Resource Specialist, Boulder County Parks and Open Space, Longmont, CO 80503.

Pollen-mediated gene flow (PMGF) from genetically engineered (GE) corn (*Zea mays* L.) has become a topic of intense interest. Organic growers and others seeking to avoid the presence of transgenic material in their corn harvests want to know how far to isolate their crops from GE hybrids. Although similar studies on corn gene flow have been conducted in other parts of the U.S., to our knowledge none had been carried out under conditions similar to Colorado's corn growing areas. Our objective was to determine the percent cross-pollination that occurred across a range of distances in multiple locations and years in Colorado's Front Range and eastern plains. We used the dominant blue kernel trait to track cross-pollination. Plots of blue corn were planted as central islands surrounded by large fields of yellow corn. Dates of pollen shed and silk emergence were recorded to verify a sufficient overlap in flowering time between pollen source and recipient plants. At harvest, samples of 10 ears each were collected in several directions from the blue corn plot at distances that generally ranged from 0.75 to 300 m. For each sample, the number of blue and yellow kernels were counted and the percentage of blue kernels was calculated as an indication of the frequency of cross-pollination. Data from a total of 13 locations over six years were used in the analysis. As expected, the amount of cross-pollination was high at the closest sampling sites (mean of 29.3% at 0.75 m). Cross-pollination decreased rapidly with distance, dropping to a mean of 0.20% at 46 m and 0.05% at 92 m. The farthest distance at which any blue kernels were observed was 320 m. The information collected in this study helped a Boulder County technical advisory committee determine an isolation distance of 46 m between GE corn crops and organic corn crops on county-owned Open Space lands. This study will also be relevant elsewhere in Colorado and similar environments where there are concerns about cross-pollination from GE corn.