MULTI-STATE EVALUATION OF SWEET CORN HYBRID TOLERANCE TO HERBICIDES. Chris M. Boerboom, Roger L. Becker, Martin M. Williams, Robin R. Bellinder, Mark J. VanGessel, and R. Edward Peachey, University of Wisconsin, Madison, WI 53706, University of Minnesota, St. Paul, MN 55108, USDA-ARS, Urbana, IL 61801, Cornell University, Ithaca, NY 14853, University of Delaware, Georgetown, DE 19947, and Oregon State University, Corvallis, OR 97331.

Sweet corn hybrids frequently exhibit differential tolerance to labeled herbicides and herbicides with pending registrations. The sweet corn seed industry and processors are interested in characterizing hybrid tolerance to avoid releasing susceptible hybrids or recommending herbicides that may cause injury. Replicated field evaluations at a single site may offer precision in evaluating injury, but can be costly and do not test the range of environmental conditions that may induce injury. Certain sweet corn seed companies are interested in partnering with universities to improve the efficiency of evaluation trials. This project's goal was to determine the feasibility of a herbicide tolerance evaluation network that is coordinated between seed companies and universities. For this pilot project, seed companies were solicited to determine their interest in providing the logistical support of planting the trials at their existing field stations to reduce costs. University collaborators were also solicited to determine if they would be available to treat and rate the trials. For the pilot project, three companies contributed logistical support and six university colleagues were interested in participating. Because fewer industry stations were volunteered than required, five of the eight trials were conducted on university stations.

Sweet corn tolerance to V3-stage postemergence applications of nicosulfuron and mesotrione was evaluated because differential tolerance is known to exist to these herbicides. Separate trials were established for each herbicide. Twenty hybrids were planted in three ranges of 6-m long single-row plots in a non-randomized strip plot arrangement at each location. The strip plots were re-randomized among locations. The first and third ranges were treated with labeled and twice labeled herbicide rates. The labeled rates were 35 g ai/ha nicosulfuron plus 1% v/v crop oil concentrate and 2.2 kg/ha ammonium sulfate and 105 g ai/ha mesotrione plus 1% v/v crop oil concentrate. The center range was a nontreated control to simplify visual ratings, which were taken at 7, 14, and 28 days after treatment (DAT).

Stunting from nicosulfuron among the 20 hybrids ranged from 5 to 16% at the labeled rate and from 8 to 26% at twice the labeled rate at 7 DAT. Stunting generally declined by 14 DAT and ranged from 0 to 13% at the labeled rate and from 5 to 19% at twice the labeled rate. At 7 DAT, 'Basin' had the widest range in injury among the locations with ratings of 0 to 60% and a mean of 18% injury. A variable response among locations was also noted at 14 DAT where 'Bonus' had the widest range in injury ratings of 0 to 45%.

Chlorosis from mesotrione among the 20 hybrids ranged from 0 to 12% at the labeled rate and from 1 to 26% at the twice labeled rate at 7 DAT. At twice the labeled mesotrione rate, 9 of the 20 hybrids had greater than 10% injury at 7 DAT, but the injury declined rapidly and only one hybrid had 10% injury at 14 DAT. 'Dynamo' had the greatest injury at both rates at 7 DAT and was included in the trials because it can be injured by mesotrione. Among the eight locations, the degree of injury to Dynamo was inconsistent and ranged from 0 to 35% at the labeled rate and from 0 to 60% at twice the labeled rate. The results for both herbicides illustrates the potential benefit of testing tolerance over several locations, which increases the likelihood of encountering environmental conditions that cause injury if a hybrid is less tolerant.

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