

SWEET CORN HYBRID TOLERANCE TO MESOTRIONE, NICOSULFURON, AND FORAMSULFURON. Joseph D. Bollman, Chris M. Boerboom, Don W. Morishita, Mark J. VanGessel, Robin R. Bellinder, Grant L. Jordan, and Wayne Cooley, Graduate Research Assistant, Professor, Department of Agronomy, University of Wisconsin, Madison, WI 53706, Professor, University of Idaho, Twin Falls, ID 83303, Professor, University of Delaware, Georgetown, DE 19947, Professor, Cornell University, Ithaca, NY, 14852, Researcher, A.C.D.S. Research, North Rose, NY, 14516, Extension Agent, Colorado State University, Delta, CO 81416.

A limited number of herbicides are labeled for postemergence application in sweet corn. Nicosulfuron and mesotrione are labeled and foramsulfuron is being developed for sweet corn, but each can injure sweet corn depending hybrid tolerance and environmental conditions at the time of application. A field study was conducted in 2005 to determine sweet corn hybrid tolerance to nicosulfuron, foramsulfuron, and mesotrione at twice labeled rates. The experimental design was split plot arrangement with eight replications where each replication was at a separate site. Sites were located in Idaho (2), Colorado (1), Wisconsin (3), Delaware (1), and New York (1). The main plot in the study was herbicide treatment and the subplot was sweet corn hybrid. One hundred fourteen hybrids were evaluated and included four endosperm types, normal, sugary enhanced, shrunken 2, and synergistic. The hybrids were planted in six ranges with 6-m long single-row plots in a non-randomized strip plot arrangement. The sweet corn that was planted in the alternate ranges served as a non-treated control to evaluate crop injury. The hybrids were randomized in the strip plots among each of the locations. Herbicide treatments were 70 g ai/ha nicosulfuron plus 1% v/v crop oil concentrate and 2.2 kg/ha ammonium sulfate, 74 g ai/ha foramsulfuron plus 1.8 L/ha methylated seed oil and 2.2 kg/ha ammonium sulfate, and 210 g/ha mesotrione plus 1% v/v crop oil concentrate. Treatments were applied at the V3 crop growth stage. Nicosulfuron and foramsulfuron were evaluated for percent stunting while mesotrione was evaluated for percent chlorosis at 7 and 14 days after treatment (DAT). A preemergence herbicide treatment was applied to the entire experiment to prevent early season weed competition.

Stunting from nicosulfuron ranged from 1 to 59% at 7 DAT and from 0 to 97% at 14 DAT. At 7 DAT, 23 hybrids had stunting greater than 10% compared with 18 hybrids at 14 DAT. Individual hybrid stunting varied among locations by as much as 60% at 7 DAT. Stunting from foramsulfuron ranged from 3 to 57% at 7 DAT and from 1 to 99% at 14 DAT. At 7 DAT, 48 hybrids had stunting greater than 10% compared with 16 hybrids at 14 DAT. Individual hybrid stunting varied among locations as much as 100% at 7 DAT. Chlorosis from mesotrione ranged from 1 to 32% at 7 DAT and from 0 to 21% at 14 DAT. At 7 DAT, 9 hybrids had chlorosis greater than 10% compared to 4 hybrids at 14 DAT. Individual hybrid chlorosis varied among locations as much as 70% at 7 DAT. For all three herbicides and at both dates, 'Merit' was the most sensitive hybrid followed by 'EX 08705770'.

A strong correlation existed between nicosulfuron and foramsulfuron injury with a  $R^2$ - value of 0.76. Crop injury typically was greater with foramsulfuron than with nicosulfuron. A strong correlation between nicosulfuron and mesotrione injury also existed with a  $R^2$ - value of 0.67. All endosperm types were susceptible to injury from each herbicide, which suggests that the tolerance of sweet corn hybrids should be evaluated regardless of endosperm type.

Foramsulfuron caused greater than 10% injury to four hybrids at the three western sites while nicosulfuron and mesotrione did not injure any hybrid at this level. The four eastern sites had 43, 74, and 24 hybrids with over 10% injury from nicosulfuron, foramsulfuron, and mesotrione respectively. The environmental condition that increased the amount of crop injury likely was the higher relative humidity at the eastern locations.