

BOLLMAN, SCOTT L.* and CHRISTY L. SPRAGUE, Michigan State University, 478 Plant and Soil Sciences Bldg., East Lansing, MI 48824. **Response of four commercial sugar beet varieties to *s*-metolachlor and dimethenamid-P.**

ABSTRACT

Previous field research in Michigan has shown that sugarbeet varieties respond differently to *s*-metolachlor and dimethenamid-P applied preemergence (PRE) and to 2-leaf sugar beets. Greenhouse trials were conducted to evaluate the response of four commercial sugarbeet varieties to *s*-metolachlor and dimethenamid-P and to determine if differences in tolerance were due to herbicide absorption through roots or leaves of sugar beets. At the 2-leaf stage of sugar beets, *s*-metolachlor and dimethenamid-P were applied directly to the soil, to the sugar beet leaf surface (vermiculite covering the soil surface), or to both the leaf and soil surfaces. The greatest injury to sugar beets occurred from applications directly to the soil compared with applications to the leaf surface, indicating that herbicide absorption through the roots or the hypocotyl of the plant is what is primarily responsible for the injury that is observed from these applications. Applications of dimethenamid-P caused greater sugar beet injury than applications of *s*-metolachlor. Of the four sugar beet varieties tested, Beta 5833 was more tolerant to both herbicides compared with the other three varieties and HM 7172 was the most susceptible variety. Additional experiments were conducted in hydroponics to determine if differences in soil behavior of these two herbicides influenced sugar beet tolerance to these herbicides. Under hydroponic conditions, there were no differences in sugar beet tolerance between *s*-metolachlor and dimethenamid-P, indicating that differences in how these herbicides behave in the soil is a main contributor to why there are differences in the magnitudes of injury observed between these herbicides in the field.