

SOIL MOISTURE AND CORN YIELD AS AFFECTED BY GLYPHOSATE APPLICATION TIMING AND ROW SPACING. Caleb D. Dalley, James J. Kells, and Karen A. Renner, Graduate Research Assistant, Professor, and Professor, Department of Crop and Soil Sciences, Michigan State University, East Lansing, MI 48824.

Glyphosate effectively controls annual weeds at a wide range of heights and growth stages. In glyphosate resistant crops, herbicide application can be delayed to a point where weed interference occurs resulting in yield losses. Weed competition for soil moisture may be an important factor early in the growing season to which yield losses may be attributed. Glyphosate resistant corn was planted at 79,000 seeds/ha in 38 and 76 cm rows at two locations (East Lansing and Clarksville) to study the effects of herbicide application timing and row spacing on corn yield and weed competition for soil moisture. Glyphosate was applied at 0.84 kg/ha with 2% ammonium sulfate when weeds reached 5, 10, 15, 23, and 30 cm in height. Weeds were effectively controlled at all treatment timings. Time domain reflectometry (TDR) access tubes were inserted into the soil to one meter in depth within the crop row to allow for soil moisture measurements. Soil moisture was measured weekly at five depths (0-18, 18-36, 36-54, 54-72, and 72-90 cm). At Clarksville, soil moisture was 2.4% less in weedy compared weed-free plots at the 0-18 cm depth 52 days after planting (DAP). At East Lansing, soil moisture at the 0-18 cm depth was reduced in weedy corn compared to weed-free corn by 2.7% at 63 DAP. Weed biomass was measured near the end of the growing season. Biomass of weeds emerging following glyphosate application was reduced as herbicide applications were delayed. Delaying glyphosate application until weeds reached 23 cm resulted in a 23 and 10% yield loss at East Lansing, and Clarksville, respectively. Yield losses also occurred when glyphosate was applied at the 5 cm weed height at both locations, possibly due to emergence of weeds following glyphosate application.