SPANGLER, ALICIA J.*, CHRISTY L. SPRAGUE and DARRYL D. WARNCKE, Michigan State University, Plant and Soil Sciences Building, East Lansing, MI 48824. **The effect of nitrogen and time of weed removal on sugarbeet yield and quality in glyphosate-resistant sugarbeet.**

## ABSTRACT

Effective weed control is a key component for achieving high quality yields in sugarbeet. A field experiment was conducted at two locations in Michigan during the 2010 growing season. The objectives of this experiment were to: 1) determine if early-season weed growth affected the amount of nitrogen available to sugarbeet, and 2) determine if nitrogen is a limiting factor in early-season weed competition for sugarbeet yield and quality. Nitrogen was applied preplant at 0, 67, 100, and 135 kg/ha. An additional treatment included a split-application of 135 kg/ha of nitrogen applied preplant and when sugarbeet was at the 4 to 6-leaf stage. Glyphosate at 0.84 kg ae/ha plus 2% w/w of ammonium sulfate was used to remove weeds at <2, 8, 15, and 30 cm tall. A non-treated control was also present. Plots were maintained weed-free after the initial glyphosate application. Sugarbeet were analyzed for total nitrogen at each weed removal timing and at the end of the growing season. At both locations, weeds removed significant amounts of nitrogen. Weeds that were 30 cm tall removed as much as 42 and 33 kg/ha of nitrogen from Richville and East Lansing, respectively. Weeds that were 8 cm tall removed less than 5 kg/ha of nitrogen and weeds that were 15 cm tall removed 3 to 13 kg/ha of nitrogen at both locations. Total nitrogen in sugarbeet was significant for nitrogen rate at Richville, but not East Lansing. Any application of nitrogen led to higher total nitrogen in sugarbeet. Sugarbeet yield and recoverable white sucrose were highest at both locations when weeds were removed prior to 2 cm, regardless of nitrogen rate.