HERBICIDE AND FUNGICIDE TANK MIXTURES FOR WEED AND DISEASE CONTROL IN SUGARBEETS. Ryan M. Robinson, Karen A. Renner, Undergraduate Student and Professor, Department of Crop and Soil Sciences, Michigan State University, East Lansing, MI 48824, and Jim Stewart, Research Manager, Michigan Sugar Company, Caro, MI 48723.

Sugarbeet growers face many challenges. Root rot diseases and weed control are two serious production problems. One important sugarbeet disease in Michigan is *Rhizoctonia solani*. This disease can cause up to 50% yield loss in sugarbeets. Furthermore, the reduction in sugarbeet stands caused by *Rhizoctonia solani* leaves open areas where weeds can grow. Weeds are controlled by both pre- and postemergence herbicides. In Michigan, 40% of the sugarbeet acres are treated twice with postemergence herbicides (standard splits) and 60% of the acres are treated four to five times with postemergence herbicides applied as micro-rates. Micro-rates are reduced herbicide rates applied with methylated seed oil. Azoxystrobin is a fungicide used to control *Rhizoctonia solani* in sugarbeets. Tank mixtures of postemergence herbicides with a fungicide to control *Rhizoctonia solani* are of interest to growers. However herbicide/fungicide tank mixtures may cause injury to sugarbeet. The objectives of this study were to determine sugarbeet response to postemergence herbicides applied alone and in tank mixtures with azoxystrobin fungicide, determine if adjuvants influence sugarbeet response to tank mixtures of postemergence herbicides and azoxystrobin fungicide, and lastly, evaluate *Rhizoctonia solani* control in sugarbeets when azoxystrobin was applied to 8-10 leaf sugarbeets in a tank mixture with herbicides.

Research was conducted at the Saginaw Valley Research Farm and treatments were arranged in a randomized complete block design with four replicates. On April 26, 2002 Hilleshog 'E-17' sugarbeet seed was planted. Postemergence micro-rate herbicide treatments were applied four times, beginning when sugarbeets were at the cotyledon growth stage. Standard split postemergence herbicides were applied twice, beginning when sugarbeets had two true leaves. The Betamix standard split included desmedipham & phenmedipham (Betamix) at 0.56 kg/ha, triflusulfuron (UpBeet) at 0.017 kg/ha and clopyralid (Stinger) at 0.094 kg/ha. Progress standard splits included desmedipham & phenmedipham & ethofumesate (Progress) at 0.56 kg/ha, triflusulfuron (UpBeet) at 0.017 kg/ha and clopyralid (Stinger) at 0.094 kg/ha. Betamix micro-rates contained desmedipham & phenmedipham (Betamix) at 0.09 kg/ha, triflusulfuron (UpBeet) at 0.004 kg/ha, clopyralid (Stinger) at 0.023 kg/ha and an adjuvant. Progress micro-rates included desmedipham & phenmedipham & ethofumesate (Progress) at 0.09 kg/ha, triflusulfuron (UpBeet) at 0.004 kg/ha, clopyralid (Stinger) at 0.023 and an adjuvant. Both standard split and micro-rate postemergence herbicides were applied alone or with different adjuvants, including methylated seed oil (MSO) (micro-rates only), Kinetic, Induce, and Freeway. All adjuvants were applied at recommended rates. All treatments were applied with a tractor mounted sprayer delivering 187 L/ha at 207 kPa using XR8003 spray tips. Azoxystrobin fungicide was applied with the last herbicide treatment of the micro-rate and standard split treatments on June 13, 2002 when sugarbeets were at the 8-10 leaf stage. All sugarbeets were inoculated with *Rhizoctonia solani* 14 days following the last herbicide treatment.

Azoxystrobin increased sugarbeet injury from desmedipham & phenmedipham & ethofumesate (Progress) compared to Progress alone. Azoxystrobin increased sugarbeet injury from desmedipham & phenmedipham (Betamix) only in micro-rate treatments that included MSO. The addition of a nonionic surfactant increased sugarbeet response to standard split applications of desmedipham & phenmedipham (Betamix). Sugarbeet injury from micro-rates of desmedipham & phenmedipham (Betamix) and desmedipham & phenmedipham & ethofumesate (Progress) was greater with MSO compared to NIS if azoxystrobin was included. Azoxystrobin reduced *Rhizoctonia solani* infection resulting in greater sugarbeet stands and yields compared to herbicide only treatments.