**DEXTER, ALAN G. and JOHN L. LUECKE, Department of Plant Sciences, North Dakota State University and the University of Minnesota, Fargo, ND 58105.** **Interaction of postemergence herbicides with sugarbeet varieties.**

## ABSTRACT

Sugarbeet growers generally are very interested in information on the relative susceptibility of sugarbeet varieties to postemergence sugarbeet herbicides since postemergence herbicides can cause significant sugarbeet injury. The objective of this experiment was to determine the influence of four postemergence herbicide treatments on seven sugarbeet varieties common to eastern North Dakota and Minnesota. Mitsui Monohikari, Hilleshog Mono-Hy Glacier, Hilleshog Mono-Hy Horizon, Maribo 875, Maribo 9363, Beta 3712 and VanderHave H66168 were seeded May 3, 1996 at Fargo, ND. Herbicide treatments were applied three times with the first treatment applied when sugarbeet plants were in the cotyledonary to two-leaf stage on May 29. The second treatment was on June 4 and the third on June 11.

Betanex at 0.33/0.4/0.5 lb/A, Betamix Progress at 0.33/0.4/0.5 lb/A, Betanex + Stinger at 0.33 + 0.11/0.4 + 0.11/0.5 + 0.11 lb/A and Betanex + UpBeet at 0.33 + 0.0019/0.4 + 0.019/0.5 + 0.019 lb/A were applied in 8.5 gpa of water carrier at 40 psi and 3 mph through 8001 nozzles. Herbicide rates were selected to be higher than normal application rates. Plots were cultivated twice and hand weeded throughout the season. Sugarbeet injury was evaluated visually June 17. Plots were harvested September 24.

Averaged over sugarbeet variety, visible sugarbeet injury was 24% from Betanex + Stinger, 21% from Betamix Progress, 17% from Betanex + UpBeet and 13% from Betanex. All herbicide treatments reduced root yield compared to the untreated check but only Betanex + Stinger and Betamix Progress caused a significant loss in extractable sucrose per acre. The greatest reduction was 520 lb/A of sucrose from Betanex + Stinger.

An untreated check for each sugarbeet variety was included in the experiment and the sugarbeet variety data was converted to % of untreated so the effect of herbicide on variety would not be confounded by differences in yield potential among the varieties. Averaged over herbicide treatment, visible sugarbeet injury was 25% for Monohikari, 19% for Beta 3712 and HM Glacier, 12% for HM Horizon, 11% for Maribo 9363, 10% for VDH 66168 and 9% for Maribo 875. Herbicides reduced the population of HM Glacier but had no effect on populations of the other varieties. Compared to the untreated check, herbicides reduced root yield of all varieties except Beta 3712 and Monohikari and reduced extractable sucrose per acre of Maribo 9363 and HM Glacier. Monohikari had the greatest visible symptoms of injury at 25% but Monohikari yield was not reduced. Also, yield of Maribo 9363 was reduced by herbicide treatment compared to untreated Maribo 9363 but the actual yield of extractable sucrose per acre from herbicide treated Maribo 9363 was similar to VDH 66168, the highest yielding variety in the experiment. Actual yields in the experiment varied from 8090 lb/A to 7290 lb/A of extractable sucrose and yield losses from herbicide treatment varied from 1 to 9%.

This experiment was only conducted in 1996. Past results of herbicide by variety experiments suggest that results often are not consistent from year to year. Dexter and Kern at Fargo, ND in 1977 and 1979 applied Eptam and Betanex to 12 sugarbeet varieties. Three varieties went from most yield loss to least yield loss or from least yield loss to most yield loss from 1977 to 1979. Smith and Schweizer at Fort Collins, CO in 1979 and 1980 applied three herbicide treatments to eight sugarbeet varieties. One variety went from most yield loss to least and another variety went from least yield

loss to most from 1979 to 1980. Wilson and others at Scottsbluff, NE in 1995 and 1996 applied five herbicide treatments to nine varieties. Monohikari was injured the most in 1995 but was among the least injured in 1996. The reason for the lack of reproducibility of results from year to year when testing herbicide by variety interactions is unknown. However, this lack of consistency should be considered when using herbicide by variety interaction data to assist in variety selection.