

MILLER, STEPHEN D., ABDEL MESBAH AND CRAIG M ALFORD. Department of Plant Sciences, University of Wyoming, Laramie, WY 82071-3354. Micro-rate performance in irrigated sugarbeets.

#### ABSTRACT

Sugarbeets, the number two cash crop in Wyoming are grown on 58,000 acres and provides producers over \$42,000,000 annually in revenue. In recent years the price of sugar has been declining, reducing profits for producers. Sugarbeets require large inputs to get good stands of weed free sugarbeets. One way producers have tried to counteract these high input costs is to band apply desmedipham and/or phenmedipham in combination with triflusaluron and clopyralid and cultivate between rows for weed control. However, this technique has increased the risk of sugarbeet injury and has remained a fairly labor intensive and expensive technique. Recent research in North Dakota and Minnesota indicated that the injury risk with these combination treatments became minimal when applied at low rates in combination with oil additives (micro-rates) while still maintaining acceptable weed control.

Plots were established under furrow and sprinkler irrigation at 12 locations from 1997 to 2000 to compare weed control and sugarbeet response with standard and micro-rate programs. Herbicide rates in the micro-rate program were reduced 66 to 75% compared to the standard rate program. All herbicide applications were made with a CO<sub>2</sub> pressurized knapsack sprayer delivering 10 to 20 gpa at 30 to 40 psi at 7 day application intervals.

Three applications of the micro-rate generally provided 3 to 5% better weed control than two applications of the conventional rate. However, three applications of the conventional rate gave 5 to 7% better weed control than three applications of the micro-rate, especially on difficult to control weeds such as kochia, redroot pigweed and common lambsquarters. If grassy weeds are a problem, micro-rates of grass herbicides could be added to the tank with each micro-rate application, or applied as a full rate with the final micro-rate application. There is considerably less antagonism of the grass herbicides in the micro-rate compared to the conventional rate program. In addition to providing more economical weed control, the micro-rate herbicide program provides several other advantages. Micro-rates are safer than conventional rates causing 8 to 13% less injury than conventional treatments across twelve locations. The micro-rate program does not provide adequate control of redstem filaree or ALS resistant kochia.