

## WATER USE EFFICIENCY FOR SUGAR BEET PRODUCTION

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### ABSTRACT

In response to concerns over sugarbeet irrigation efficiency, trials were conducted in 1992 and 1993 at Ontario, Oregon. The objectives were to determine what yield and sugar losses might result if irrigation was discontinued approximately 6 or 10 weeks prior to the normal mid September termination date and to compare production under full season furrow versus full season sprinkler irrigation. The following irrigation strategies were tested: 1) furrow, full season; 2) furrow, full season with one-half the water; 3) furrow, terminated July 1; 4) furrow, terminated July 1 plus one recharge irrigation; 5) furrow, terminated August 1; and 6) sprinkler, full season. Sugarbeets, WS PM-9, were planted on 22 inch row centers on both bottom soil (shallow water table) and bench soil (deep water table) in each year.

Over two years significantly more beets and sugar were produced under the full season furrow strategy than under the July 1 or August 1 termination strategies. On bottom soil the mean beet and sugar yields, respectively, were: full season furrow, 35.8 and 5.5 t/ac; July 1 termination, 20.0 and 3.0 t/ac; and August 1 termination, 27.6 and 2.4 t/ac. On bench soil the mean beet and sugar yields, respectively, were: full season furrow, 30.6 and 4.4 t/ac; July 1 termination, 15.8 and 2.4 t/ac; and August 1 termination, 19.6 and 3.0 t/ac. Over both sites and years, full season sprinkler beet and sugar yields averaged 35.3 t/ac and 5.3 t/ac, respectively, while full season furrow yields averaged 33.5 t/ac and 5.0 t/ac. Full season sprinkler irrigation used 36 percent less water. On bottom soil the two year mean beet and sugar yields/ac.ft. of water for sprinkler irrigated beets were, respectively, 19.2 and 19.0 percent greater than on bench soil.