

Response of Sweet Corn to Irrigation Management

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A microirrigation trial to evaluate sweet corn irrigation scheduling models was continued at the Western Research Farm (silt loam with AWC of 2.6 inch/foot), Castana. The seeding arrangement involved twin rows, 18 inches apart, with in-row spacing at 12 inches and with 2 plants per position. Center to center of the raised beds was 6 feet. Plant population was approximately 29,000 plants per acre. Trickle irrigation tubing (T-tape 508, delivering 0.34 gpm/100 feet) was placed down the center of each bed or 9 inches from each row.

Irrigation treatments were designed to compare four management techniques:

- 1) None
- 2) 0.4 of daily pan evaporation X % ground cover or growth stage
- 3) checkbook or the water balance method
- 4) the AZSCHED model (developed in Arizona)

Water amounts were adjusted according to growth, i.e. stages of 4th leaf, 12th leaf, and tassel and silk stage. Treatment 2 was based on replacement of 40% of pan evaporation, treatment 3 used the South Dakota field corn water use values, and treatment 4 was the Arizona computer scheduler model for sweet corn. The AZSCHED irrigation efficiency was 85% and the allowable depletion before irrigation set at 50%.

The main season sweet corn cultivar, Bodacious, was seeded May 6 and emerged May 12. Harvest was July 24 - 28, 2000. The growing season, from emergence to harvest, was 74 days. Unfortunately, as in the past 5 years, the growing season had slightly above normal rainfall (12.4 inches for the corn crop); and neither of the models (trts. 3 and 4) indicated a need for irrigation. The treatment 2 formula required 1.05 inches for the season.

The treatment 2 irrigation resulted in no yield or ear quality advantage, compared to the control (trt. 1), see Table 1. The AzSched model showed that the soil profile water content never was below 70%.

Conclusions

Over the 6 years of trials, the only advantage of applying irrigation water was to extend the length of the marketable ear by 0.5 inch. High quality sweet corn production on the high water holding capacity soils of the loess hills can be accomplished without irrigation most years.

Table 1. Irrigation effect on sweet corn, cv. Bodacious, yield and ear quality. Crop grown on a silt loam soil at the western Iowa research farm, Castana, 2000.

| Irrigation | Mkt. Yld. doz/acre | Tipfill % | Ear Wt. lbs | Ear Lt. inches |
|-------------|-----------------------|--------------|----------------|-------------------|
| None | 1694 | 96.4 | 0.55 | 7.68 |
| Pan Evap | 1755 | 95.5 | 0.52 | 7.66 |
| Sign. P<.05 | n.s. | n.s. | n.s. | n.s. |