Alfalfa Production with SDI

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The need for high quality alfalfa production for the dairy industry is growing in western Kansas. Because of its long growing season and long periods of full canopy, irrigation requirements for alfalfa are the highest for all agricultural crops in Kansas, often approaching 24 inches in the western part of the state.

Nearly all of the 250,000 irrigated acres of alfalfa in Kansas are irrigated with sprinklers or basin irrigation.

However, SDI can also be a good irrigation method choice for alfalfa.

Pros

- Reduction of soil water evaporation
- Higher yields due to more water available for transpiration
- Higher yields due to less harvest interruptions of irrigation
- Less water stress on plant crown
- Alfalfa suitable for deeper soil water extraction
- Less flushing of annual weeds
- Better quality of alfalfa
- Irrigation labor requirements may be less
- No surface ponding of irrigation water
- No foliar leaf burn from sprinkler irrigation with low quality water

Cons

- Rodents cause dripline leaks
- Root intrusion may plug driplines
- High initial system costs
- Germination concerns
- What spacing of driplines?

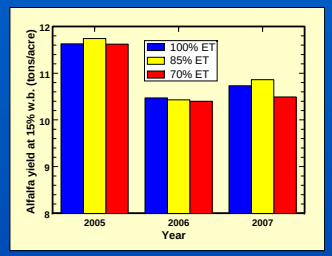
Funded by

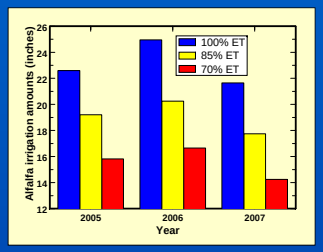
Study Methods

SDI at depth of 18-20 inches with 60 inch dripline spacing and 12 inch emitter spacing. Alfalfa was established in fall of 2003 with the first full production year was in 2004. The study results are from 2005-2007. Alfalfa production was measured at three irrigation levels (100, 85, and 70% ET rate). The production was measured at 3 distances from the drip line (0, 15, and 30 inches). Alfalfa quality was measured for all treatments and sampling points.

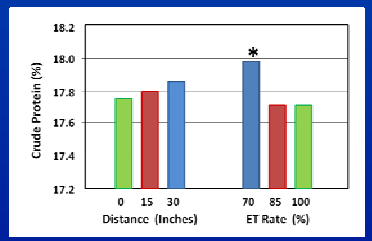
Results

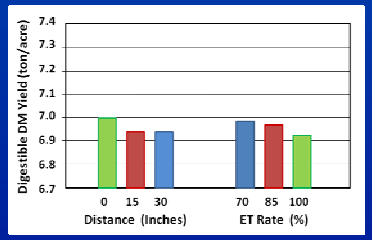
There were not large differences in forage yield but there were large differences in inseason irrigation requirements.





Over the course of the season there would tend to be a slight reduction in alfalfa yield with increasing distance from the dripline. This reduction was greater for the 70% ET treatment. However, crude protein (a measure of alfalfa quality) and digestibility was greater at the greater distances and reduced ET. This helped compensate for the yield reduction.





Implications and Caveats from the Study

SDI at 70% ET is efficient and would save water and money without sacrificing digestible nutrient yield. Approximately 5.5 inches of additional irrigation water was applied to all treatments in the late fall of each season to deter overwinter rodent activity. The soil is a deep silt loam. The results would not likely be applicable to sandy soil types.