

In-field Evaluation of Subsurface Drip Irrigation (SDI) Systems in Kansas

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Introduction: Drip irrigation for fruits and vegetables is a proven technology now, but use of drip for field crops like corn, soybean, and others remained questionable. The solution was to go for Subsurface Drip Irrigation or SDI. K-State research has shown that SDI improves efficiency and uniformity of distribution for field crops like corn. It is an emerging technology in the great plains of the USA. In Kansas, about 20,000 acres of field crops are now being irrigated using SDI. Since the technology is new and there is a concern about the high cost of the system, it was felt necessary to evaluate the present operational condition of these systems to provide field performance information to farmers intending to adopt SDI in their irrigation operation.

Methods: A survey was sent out for producers' response on level of satisfaction in using SDI. Depending on the age and location of a system, and producers willingness to field testing, several systems were evaluated for clogging, water quality, and maintenance.

System Design, Installation, and Water Quality Considerations are Important



View of a commercial SDI pumping plant and filter station

Producer Satisfaction Survey Results

Very satisfied	Satisfied	Almost satisfied	Somewhat satisfied	Unsatisfied
18	19	4	4	1

Producer Survey Results on SDI Concerns

Forty-nine producers returned comments. A summary of their concerns are as follows:

- *Damages caused by rodents and gophers (37)
- *Filtration is a concern, but with a good system and maintenance there was no problem (15)
- *Clogging due to iron bacteria and calcium precipitation (15)
- *Cost of system (8)
- *Wetting up of top soil for germination (3)

Field Evaluation Results

- Checked flow and pressure to evaluate if clogging has occurred
- Tested source water for chemical and biological clogging hazards, such as bicarbonate, iron, calcium, manganese, etc.
- Tested flush water to evaluate clogging hazards.



Illustration of instruments used to measure dripline pressure and flow.

Five evaluations showed the SDI systems were operating at design specification.

One field had a clogging problem due to an application of a fertilizer mix containing phosphorous. The system has been treated with acid resulting in a partial recovery.

One system had severe rodent damage.



Illustration of rodent damage SDI system showing areas not receiving water.

Conclusions

- SDI systems for field crop production are working well in Kansas. Survey results indicate that 98% are satisfied users.
- Field evaluations indicated properly designed and managed systems can perform over a long period of time.
- Rodent damage/control issues are a concern for many producers.

Resources

www.oznet.ksu.edu/sdi
www.oznet.ksu.edu/mil

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