

IMPACT



Canyon County, 501 Main; Caldwell, Idaho 83605; (208) 459-6003, Fax (208) 454-6349

Innovations with Subsurface Drip Irrigation to Enhance Crop Production and Environmental Protection

The Situation

Idaho's Treasure Valley produces many diversified and specialized crops under irrigation. The primary irrigation systems used are surface with a few sprinkler systems. Imperfect irrigation results in loss of crop yield and quality through both water stress, and excessive irrigation. Irrigation induced erosion and deep percolation also cause unintended sediment, phosphate, and bacteria problems in surface waters and nitrate problems in groundwater. Some of the most advanced irrigation technology is subsurface drip irrigation (SDI). SDI allows for maximum crop production without the negative impacts mentioned above. With SDI, water is applied directly into the root zone at a very slow rate through emitters evenly located along a buried dripperline.

Agronomic and economically viable sustainable irrigation practices such as SDI are needed for a wider range of the crops grown in the Treasure Valley. Research and anecdotal evidence on a variety of crops has shown that with properly managed SDI systems, crop water needs can be precisely met while soil and nutrients remain onsite. This project seeks to demonstrate to Treasure Valley farmers and the general public alfalfa seed production using SDI while simultaneously reducing adverse impacts to the environment.

Our Response

An eight acre SDI system consisting of two four-acre blocks was installed in a one-year old alfalfa seed field on the Dan Silveria farm in Canyon County. In April 2001 ten mil dripperline was shanked into the field to a depth of approximately 12 inches on 44 inch centers. Emitters in the tape are 18 inches apart and deliver 0.36 gallons of water per hour per emitter. The water source is groundwater that is filtered with media filters containing #20 silica sand. A water meter was installed to monitor water usage, and a set of soil moisture sensors connected to a datalogger were installed in the SDI block and an adjacent surface irrigated field.

Objectives

- To demonstrate to local growers, government agencies and the general public the use of SDI technology to raise an alfalfa seed crop.
- To collect data related to the performance of the SDI system and the alfalfa seed crop, and ultimately to determine the viability of this production system for southwest Idaho.

Funding, materials, and in-kind support for this project were provided by Mr. Dan Silveria, the Idaho Alfalfa and Clover Seed Commission, The U.S. Bureau of Reclamation, Netafim Irrigation Company, and the University of Idaho Cooperative Extension System.

Program Outcomes

Yield, water use, and electricity consumption data were collected from the SDI field and an adjacent field of surface irrigated alfalfa seed. During the course of the growing season, 8.5 inches of water were applied to the SDI field and approximately 34 inches were applied to the adjacent surface irrigated field. The yield from the SDI field was approximately 880 pounds of clean seed, while the yield from the comparison field was approximately 820 pounds of clean seed.

The source of all the irrigation water on this farm is groundwater that must be pumped. Seasonal electrical cost on a per acre basis for the SDI field was \$8.75, while the electrical cost for the surface irrigated field was \$35.00.

The farm in this project is located within the Dixie Slough watershed, which is an area targeted by the Idaho Soil Conservation Commission for the reduction of sediment losses. During the growing season there was no tailwater runoff from the SDI field, while on the surface irrigated field the usual tailwater runoff patterns were observed.

This project has broad implications for alfalfa seed production, water use, and tailwater runoff in southwest Idaho because there have been over 20,000 acres of alfalfa seed grown in Canyon County alone in recent years.

Information from this project is being transferred to the alfalfa seed growers through field tours, presentations at grower meetings, and publications.

The Future

The SDI system will be used in 2002 to irrigate another crop of alfalfa seed. After 2002, the alfalfa seed will be taken out and the field will be planted to grain and irrigated with the SDI system.

Collaborators

Steve Reddy, Washington County Ext. Educator
Dr. John Gallian, Sugarbeet Specialist
Tiegs Ag. Consulting
The Amalgamated Sugar Company

For More Information

Jerry Neufeld, Extension Educator
University of Idaho
Canyon County Extension
501 Main Street
Caldwell, Idaho 83605
Phone: 208.459.6003, Fax: 208.454.6349
E-Mail: jerryn@uidaho.edu

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