



WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: 2003WA41B

Title: Water Use of Potato under Sprinkler and Subsurface Drip Irrigation

Project Type: Research

Focus Categories: Irrigation, Water Use, Nitrate Contamination

Keywords: Drip, Irrigation, Water use, Nitrate, Potato

Start Date: 03/01/2003

End Date: 02/28/2004

Federal Funds: \$25000.00

Matching Funds: \$50000.00

Congressional District: Fourth

Principal Investigators: Fraisse, Clyde William; Claudio Stockle; Perry, Eileen; Pierce, Francis

Abstract: The Pacific Northwest (PNW) is an important area for potato production - 55% of the total production in the country and 45% of the total U.S. acreage under potato. The Columbia Basin in eastern Washington provides ideal conditions for high yields per unit area, up to 80 Mg ha⁻¹. However, irrigation use is competing with increasing demand for water needed by cities, industry and salmonid conservation. Clearly, management strategies need to be developed and implemented to maintain and protect soil and water resources while preserving the profitability of irrigated agriculture. Drip irrigation offers significant potential for improved water, nitrogen and pest management in potato cropping systems but is not being utilized in the PNW beyond experimental areas. While more costly than sprinkler irrigation, drip irrigation is considerably more efficient and offers the opportunity to inject nitrogen and pesticides into the root zone, and could potentially reduce application rates and leaching of contaminants to the groundwater. Quantification and better understanding of potential savings is the first step towards the adoption of the technology by growers.

The overall goal of this research project is to evaluate drip irrigation as a viable option for potato production in the PNW. This irrigation method and associated potato management strategies will promote protection of surface water and groundwater quantity and quality in the Pacific Northwest. The

specific objectives are:

- To quantify and compare water use for potato under drip and sprinkler irrigation systems.
- To provide education and research experience for a graduate student in the areas of soil-water-plant relations, irrigation science and remote sensing-
- To disseminate information to the public and agricultural producers on the potential for water savings using drip irrigation

These objectives will be achieved by conducting drip versus sprinkler studies under a linear move sprinkler system installed at the Irrigated Agriculture Research and Extension Center, located in Prosser, WA. Matching donations will support measurements of crop evapotranspiration, net radiation, soil heat flux, soil moisture, air temperature/dew point temperature, and canopy/soil reflectance in the sprinkler and drip-irrigated fields. Funding from this proposal will be used to support graduate student participation in the research. Information dissemination via website access will be supported by a WA DOE Water Quality Program - Direct Implementation Fund project, "Precision Irrigation Development and Demonstration Project".

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