



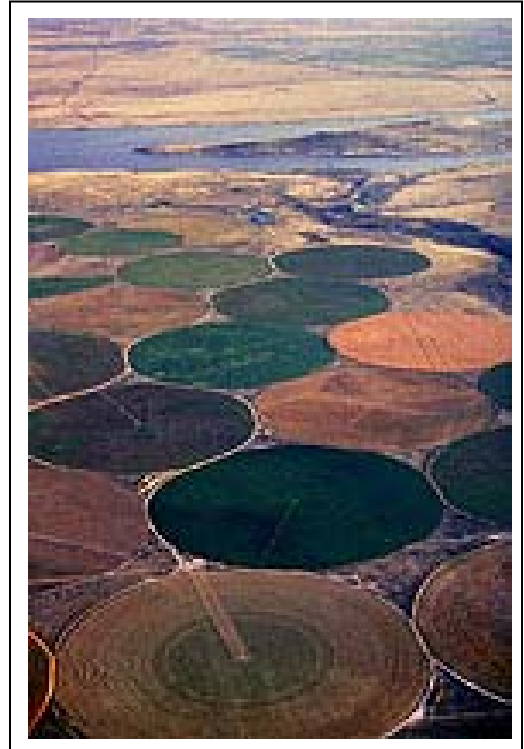
Water Management Research Unit

Natural Resources Research Center
USDA's Agricultural Research Service
Fort Collins, Colorado
www.wmuinfo.usda.gov



The Problem:

- Irrigated Ag is:
 - Critical to our food supply (40% of crop value; most of our fruits and vegetables, forages and grain for beef are from irrigated Ag).
 - Important to rural economies.
 - An integral part of arid ecosystems in the West.
- Available water supplies for irrigated ag are declining in the Central Great Plains:
 - Declining groundwater levels in many basins.
 - Enforcement of augmentation plans for tributary groundwater.
 - Inadequate surface water supplies during drought years.
 - Growing cities require additional water supplies.
 - In Colorado, >20% shortfall is projected by 2030 ... if all planned projects are developed.
- How to sustain irrigated agriculture in the Central Great Plains with limited irrigation water supplies
 - Maximize crop per drop (profit per unit water used).
 - Maximize utilization of rainfall.
 - Minimize production costs.



Research can help find solutions:

The USDA-ARS Water Management Research Unit develops water and weed management technologies and practices for irrigated agriculture in water deficit areas that use water efficiently, improve agricultural productivity and sustainability, and reduce negative environmental impacts.

WMR Research Plans: WATER AND WEED MANAGEMENT UNDER LIMITED IRRIGATION

Farmers are asking how to maximize the economic return per unit of water used. We will provide information on how to allocate limited water supplies annually and to recommend crop rotations, weed management practices and tillage practices to maximize economic return. To do this we will:

- Determine crop water production functions and weed, and herbicide response to irrigation amount for a four crop rotation under two tillage practices in the Great Plains.
- Develop methods, including remote sensing, to determine when irrigations should be applied to efficiently utilize limited water supplies.
- Develop tools and strategies for site-specific weed management.

Plans:

- Conduct a 5 yr. field trial with a 4 crop rotation (Wheat, Sunflower, Corn, Dry Beans) under 2 tillage practices (conventional, minimum) and 5 levels of irrigation (rain fed to full irrigation).
- Schedule irrigations based on weather, crop responses, and crop models.
- Develop water production functions for each crop ("Crop per Drop"), and better understanding of crop stress responses.
- Develop weed management practices under limited irrigation conditions.
- Determine the economic returns for each level of irrigation and how to optimally allocate a limited water supply.

Personnel:

Tom Trout- Ag. Engineer, Research Leader
Contact Info: 970-492-7419, thomas.trout@ars.usda.gov
Walter Bausch-Ag. Engineer
Gerald Buchleiter-Ag. Engineer
Dale Shaner-Weed Scientist
Lori Wiles-Weed Ecologist

Collaborators: We work closely with CSU and other universities, Extension, Growers, and other ARS researchers.

Contact Information: Water Management Research Unit
NRRC, Bldg. D, 2150 Centre Ave
Fort Collins, CO 80526
970-492-7400

