

# PATTERSON HOLLOW Hydrologic Unit Area

Colorado  
State  
University

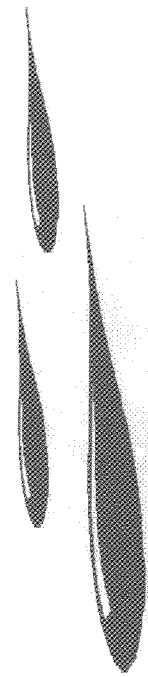
Cooperative Extension

Colorado State University

411 N. 10<sup>th</sup> Street

Rocky Ford, CO 81067

1997



*Stretching  
Our Water*

**BACKGROUND:** The Patterson Hollow Hydrologic Unit Area (HUA), which began in 1991, is a cooperative effort of Colorado State University Cooperative Extension and Agricultural Experiment Stations, Natural Resources Conservation Service, Farm Service Agency, and the East and West Otero Soil Conservation Districts. Its aim is to improve the water quality in the Arkansas River and its groundwater basin. The HUA encompasses the area south of the Arkansas River from eastern Pueblo County to east of La Junta in Otero County in southeast Colorado.

**OBJECTIVES:** The objective of the Project is to improve water quality in the river and its groundwater basin by implementing BMPs to reduce runoff and deep percolation that carry salts, nutrients and other non-point source pollutants back to the river. These practices are to be agronomically, environmentally and economically sound. The Project provides information to irrigators that encourages them to use these Best Management Practices (BMPs).

**START DATE:** January 1991.

**PROJECT SIZE:** 89,850 total acres; 59,700 irrigated acres.

**COUNTIES:** Pueblo, Otero.

**LAND USE:** 66% irrigated cropland, 30% rangeland, 3% urban, and 1% other.

**CROP PRODUCTION:** Alfalfa, corn, cantaloupes, watermelons, onions, sorghum, vegetables, wheat and pasture grass.

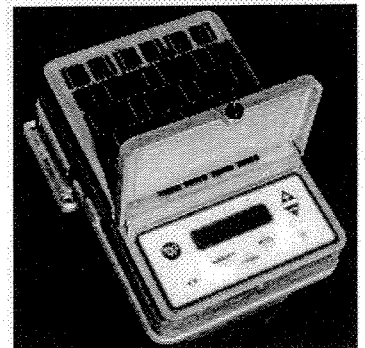
COLORADO STATE PUBLICATIONS LIBRARY  
UCSU20/6.2/H99/1997 c-2  
/Patterson Hollow hydrologic unit area



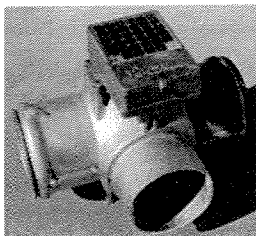
3 1799 00024 5282

## Proven Impacts:

- ⊗ The Patterson Hollow HUA has been innovative by introducing PAM, a linear-linked, soil stabilizing polyacrylamide, to area farmers in 1995. PAM is now used to reduce erosion and increase infiltration on over 10,000 acres in the Arkansas River Basin. Hydrogel, a cross-linked, water retaining polyacrylamide that can absorb up to 250 times its own weight in water, has also been used with great success. In demonstration trials, the untreated area produced 14.8 tons per acre of tomatoes as compared to a Hydrogel+PAM-treated area that yielded 20.8 tons per acre while reducing erosion 39%. Also, an untreated area of jalapeno peppers produced 6.5 tons while the combination of Hydrogel+PAM increased yields to 10.7 tons per acre and reduced erosion 47%.
- ⊗ Demonstrations at two locations for three years, 1991 through 1993, have shown that surge irrigated corn produced 186 bushels per acre, the same as conventional furrow irrigation but used 6.9 inches per acre or 24% less water. Irrigation runoff was reduced 20.4% using surge irrigation. Additional demonstrations at different locations from 1994 to 1996 again produced similar yields of 155 and 152 bu/ac on surge and conventional irrigation. Surge irrigation used 11% less irrigation water with 30% less runoff. Soil loss was reduced 52% by surge as compared to conventional irrigation.
- ⊗ Economic analyses of budgets were developed to help irrigators decide the best way to increase returns on their farm. These analyses have proven that improved irrigation technology can increase net farm income by more than \$50 per acre.
- ⊗ Controlled demonstrations have shown that total dissolved solids (salts) returning to the river can be reduced up to 37% with improved irrigation water management. Demonstrations have also shown that irrigation water loss due to seepage can average about 25% in a one-half mile dirt ditch. Underground pipe and lined ditches can prevent these losses. As a result of interdisciplinary efforts, irrigators' have installed over 60 miles of concrete ditch, underground pipe and gated pipe.



**Surge Controller**



**Surge Controller  
& Valve**

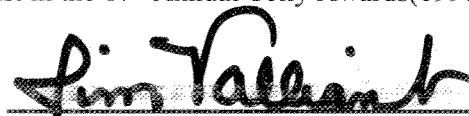
- ⊗ BMPs being used include surge valves, irrigation control structures, trash screens, concrete ditch, underground pipe, gated pipe and polyacrylamides. These BMPs have directly impacted about 35,000 irrigated acres or 59% of the targeted area by better control and use of irrigation water thus reducing runoff and soil loss while also reducing seepage and deep percolation.
- ⊗ The HUA brought \$1.1 million in federal cost-share money to the area. This stimulated an additional \$2.4 million in matching funds from local landowners for BMPs. The Project has demonstrated that improved water quality in the Arkansas River and its groundwater basin can be achieved by using BMPs while sustaining economic returns.

## Activities

- ⊗ Demonstration work includes (1) irrigation water management - using surge irrigation, trash screens and gated pipe or concrete lined ditches; (2) irrigation scheduling - using an HUA sponsored computer program on row crops and vegetables and (3) grazing and baling demonstrations with pasture grass and legumes. These programs have shown improved quality and/or yield of the different crops being grown.
- ⊗ Selected demonstration sites are toured each year showing different BMPs that are being used successfully by area farmers on corn, alfalfa, cantaloupes, watermelons, pasture grass, sorghum, onions, peppers and tomatoes.
- ⊗ Annual winter workshops update information on these irrigation water management demonstrations and bring together scientists from different areas in the U.S. to share their results and introduce new technology.
- ⊗ The Arkansas River Basin Water Forum, partially funded by the HUA, was started in 1995. This Forum brings together agricultural, environmental, government, industrial, mining, municipal and political/legal water users to work on problems and seek solutions together, rather than against each other in court.
- ⊗ An Arkansas River Basin Technical Group was started in 1997 to work collectively on water related problems. The group consists of people from city, state and federal agencies, ditch companies, and other interested people working on specific areas of concern. The group, which meets quarterly, also reviews proposed projects and keeps members informed about on-going activities of each organization.
- ⊗ Over 250 growers receive information gathered from area weather stations as well as research information, crop insect and disease scouting reports, economic thresholds and treatment recommendations. This information is provided weekly through newspapers, radio, and a satellite communication system which provides current weather, futures, market, crop and livestock information via a computer monitor. These satellite communication systems, funded by the project, are located in gathering places, such as local coffee shops and sale barns, frequented by farmers and ranchers in each community.
- ⊗ Colorado State University Cooperative Extension, East and West Otero Soil Conservation Districts, Natural Resource Conservation Service and Farm Service Agency teamed up to produce a 30-minute video in 1996 showing and explaining the HUA. This video is being used extensively for area and state programs as well as for accomplishment reports to legislators. Two public television stations made several showings of the video in 1996-97.

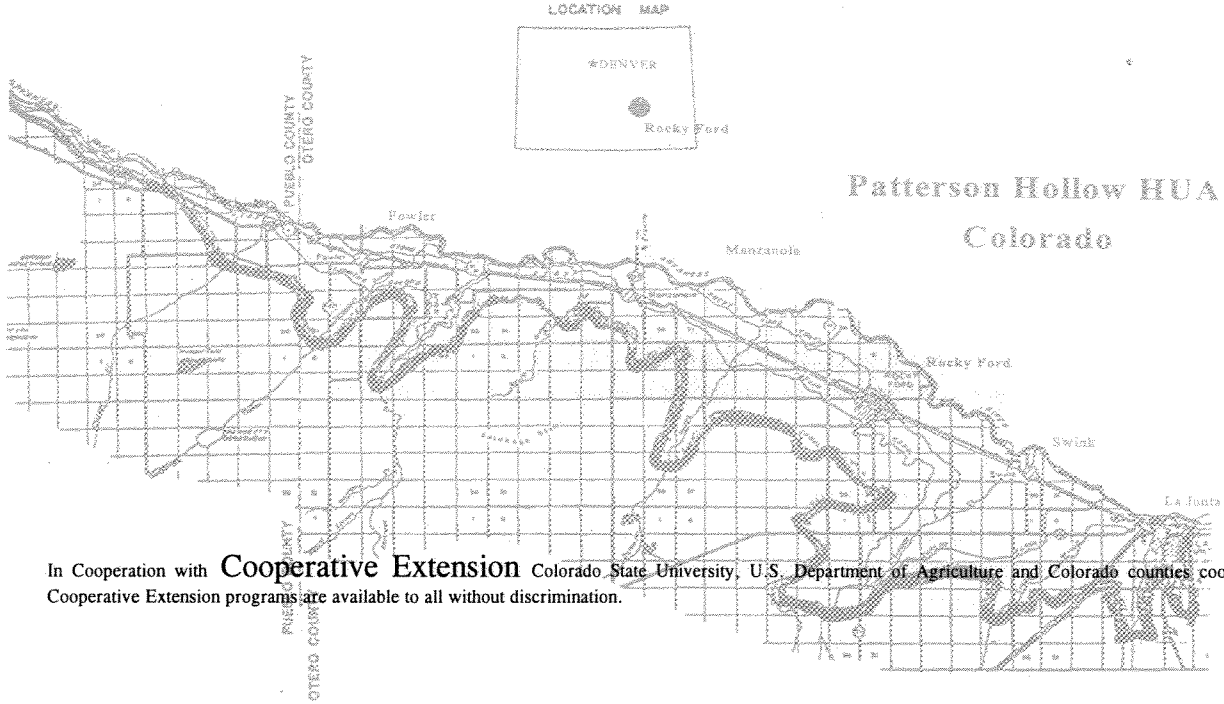
## Awards

- ⊗ The HUA is the recipient of the Colorado State University Cooperative Extension Team Award (1993), Epsilon Sigma Phi Western Regional Distinguished Team Award (1994) and the Governors Smart Growth and Development Award for Agriculture (1996).
- ⊗ The Patterson Hollow video was a finalist in the 17<sup>th</sup> Annual Telly Awards(1996).



Jim Valliant  
Regional Irrigation Specialist

This project is a joint venture of the Colorado State University Cooperative Extension, Colorado State University Agricultural Experiment Stations, Natural Resources Conservation Service, Farm Service Agency, East and West Otero Soil Conservation Districts.

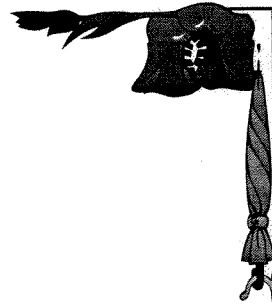


In Cooperation with **Cooperative Extension** Colorado State University, U.S. Department of Agriculture and Colorado counties cooperating. Cooperative Extension programs are available to all without discrimination.

**RECEIVED**

OCT 07 1997

STATE PUBLICATIONS  
Colorado State Library



BULK RATE  
POSTAGE & FEES PAID  
USDA  
PERMIT NO. G268

COOPERATIVE EXTENSION  
U.S. DEPARTMENT OF AGRICULTURE  
COLORADO STATE UNIVERSITY  
OFFICIAL BUSINESS