



Economic
Research
Service

ERS Elsewhere

MAJOR PUBLICATIONS FEATURING OUR RESEARCH

Irrigation Technology Transitions in the Mid-Plains States

International Journal of Water Resources Development

Volume 19, Number 1,
March 2003

Carfax Publishing
Taylor & Francis Ltd.
Abingdon, Oxfordshire, UK

"Irrigation Technology
Transitions in the Mid-Plains
States"
Pages 67-88

by Glenn D. Schaible and
Marcel P. Aillery

For more information,
contact: Glenn D. Schaible
at schaible@ers.usda.gov
and
Marcel P. Aillery at
maillery@ers.usda.gov

<http://www.ers.usda.gov>

AGRICULTURE'S

contribution to water quality degradation and environmental impairment is well documented. Irrigated agriculture faces the challenge of reducing its pollutants and their potentially harmful effects on human health and the ecosystem. Improving on-farm irrigation efficiency can reduce the volume of nutrients, pesticides, and trace elements in irrigation run-off to surface waters, as well as the volume of agri-chemicals leached into groundwater supplies.

This analysis addresses the issue of farm water-use efficiency and conservation for the U.S. Middle Plains region (Nebraska, South Dakota, Kansas, and Wyoming) and draws implications for water conservation policy and water-institutional arrangements. The research uses a probabilistic irrigation-technology adoption model to evaluate expected farm-level water conservation under alternative crop-price scenarios. Under baseline agro-economic assumptions, agricultural water-use efficiency for the Mid-Plains region could improve from 2.3 to 9.8 percent, compared with only 3.2 percent for the Pacific Northwest region (from an earlier study). However, that level of improvement alone may not be sufficient for the Mid-Plains region to achieve desired environmental goals. The conventional understanding is that increased agricultural water-use efficiency does not lead to enhanced downstream water flow. Results for this study challenge that conclusion. The results further suggest that integrating on-farm water-conservation incentives with regionally unique innovations in water institutions will likely make a more significant contribution to human health and environmental policy goals, as well as to agricultural sustainability.

