



Applying knowledge to improve water quality

Spring 2003
PNWWATER 015

Pacific Northwest

Regional Water Program

A Partnership of USDA NIFA
& Land Grant Colleges and Universities

Water Conservation and Agricultural Water Management



Overview

Pacific Northwest and Alaska rivers, lakes and groundwater sources provide water for industry, agriculture, residential uses and recreation, as well as support a diversity of ecosystems. Increased demands from an expanding population, industrial growth, increases in agricultural production and ecosystem management have resulted in localized, temporal shortages of available water. Agriculture is the single largest water user. However, inefficient irrigation methods are being replaced by modern science-based water saving techniques. Additionally, efficient water management reduces soil erosion. Land grant universities in the Pacific Northwest are engaged in research and educational outreach in water conservation techniques for agricultural operations. Regionally, there are also ongoing, community watershed planning efforts in which many local Cooperative Extension faculty are actively engaged. Members of the Pacific Northwest Water Quality Coordination Program have a broad range of research activities, educational materials and outreach programs to assist agriculturists and others to manage water quality and quantity.

Desired Outcomes

- Agricultural water users implement water-saving irrigation methods
- Individuals employ water conservation techniques
- Water conservation mitigates the need for increased numbers of water storage systems
- Water resources are better managed
- Soil erosion is reduced to sustainable levels



Pacific Northwest Conservation Tillage Handbook

Much of the effort in the Pacific Northwest to control soil erosion and effectively manage water in agriculture promotes the use of conservation tillage. This technology developed by scientists associated with the Solutions to Environmental and Economic Problems (STEEP) program is summarized in the *Pacific Northwest Conservation Tillage Handbook*. This handbook contains chapters covering soil erosion, conservation tillage systems and equipment, residue management, plant diseases, weeds, fertility and fertilizers, plant development and ground cover, wheat variety development and alternate crops, erosion control on irrigated cropland, economics, and application of new technology. This handbook can be ordered from publication offices at Oregon State University, Washington State University or the University of Idaho.

Pacific Northwest Regional Publications (note: these publications can be obtained from publication offices at Oregon State University, Washington State University and the University of Idaho):

- PNW 0286** Offsets for Stationary Sprinkler Systems
- PNW 0287** Irrigation Runoff Control Strategies
- PNW 0288** Irrigation Scheduling
- PNW 0289** Converting Sprinkler Systems to Lower Pressure
- PNW 0293** Walk-Through Irrigation Systems Analysis
- PNW 0323** Stretching Irrigation Water Supplies
- PNW 0354** Agronomic Zones for the Dryland Pacific Northwest
- PNW 0475** Soil Water Monitoring and Measurement

ALASKA Contacts

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ALASKA Publications

- FGV-00242** Soil Fundamentals
- FGV-00242A** Soil Fertility Basics
- FGV-00648** Trickle Irrigation for Alaska Gardeners
- FGV-00649** Managing Irrigation for High Value Crops
- GWQ-00547** Protect Water Resource-Understand Pesticide Movement
- GWQ-00548** Protecting Alaska's Water Resources
- HGA-00053** Home Landscaping Kits
- HGA-00236** Lawn Maintenance and Pesticides
- HGA-00239** Managing Alaskan Lawns
- HGA-00334** Lawn Maintenance

IDAHO Contacts

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IDAHO Publications

- BUL 784** Climates of Idaho
BUL 787 Economics of Low-Pressure Sprinkler Irrigation Systems: Center Pivot and Linear Move
BUL 788 Economics of Low-Pressure Sprinkler Irrigation Systems: Handline, Solid Set and Wheeline
BUL 800 Evaluating the Economic and Environmental Impacts of Farming Practices on the Palouse using PLANETOR
BUL 807 Irrigation Management in the HUA
BUL 808 Erosion Control Progress in the HUA
BUL 811 Groundwater and Wellhead Protection in the HUA
CIS 587 Reducing Soil Losses with Filter Strips
CIS 638 Five Point Program: Soil Erosion Control under Dryland Crop Production
CIS 696 Reducing Soil Losses by Sediment Retention
CIS 887 Idaho's Water Resource
CIS 893 Household Water — Dos and Don'ts
CIS 900 Groundwater in Idaho
CIS 1039 Irrigation Scheduling using Water-Use Tables
RES 133 Economic Evaluation of Practices for Reducing Sedimentation Under Irrigated Agriculture in Southcentral Idaho
RES 139 Costs and Benefits of Improving Irrigation Return Flow Water Quality in the Rock Creek, Idaho, Rural Clean Water Project



OREGON Contacts

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John Selker, Soil Water Movement, Department of Bioengineering, Corvallis, (541) 737-6304, john.selker@orst.edu

OREGON Publications

- EC 628** How to Take a Soil Sample . . . and Why
EC 1094 Calculating the Fertilizer of Manure from Livestock Operations
EC 1368 Measuring Well Water Levels
EC 1369 Estimating Water Flow Rates
EC 1374 Rural Domestic Water Supply
EC 1426 The State of Water in Oregon



WASHINGTON Contacts

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Pacific Northwest Regional Water Quality Coordination Project Partners

Land Grant Universities

Alaska

Cooperative Extension Service
Contact Fred Sorensen:
907-786-6311

<http://www.uaf.edu/ces/water/>

University Publications:

<http://www.alaska.edu/uaf/ces/publications/>

Idaho

University of Idaho
Cooperative Extension System
Contact Bob Mahler: 208-885-7025

<http://www.uidaho.edu/wq/wqhome.html>

University Publications:

<http://info.ag.uidaho.edu/Catalog/catalog.htm>

Oregon

Oregon State University
Extension Service
Contact Mike Gamroth: 541-737-3316

<http://extension.oregonstate.edu/>

University Publications:

<http://extension.oregonstate.edu/catalog/>

Washington

Washington State University
WSU Extension

Contact Bob Simmons:
360-427-9670 ext. 690

<http://wawater.wsu.edu/>

University Publications:

<http://pubs.wsu.edu/>

Northwest Indian College
Contact Charlotte Clausing:
360-392-4319

cclausing@nwic.edu or

<http://www.nwic.edu/>

Water Resource Research Institutes

Water and Environmental Research
Center (Alaska)

<http://www.uaf.edu/water/>

Idaho Water Resources
Research Institute

<http://www.boise.uidaho.edu/>

Institute for Water and
Watersheds (Oregon)

<http://water.oregonstate.edu/>

State of Washington
Water Research Center

<http://www.swwrc.wsu.edu/>

Environmental Protection Agency

EPA, Region 10

The Pacific Northwest

<http://www.epa.gov/r10earth/>

Office of Research and Development,
Corvallis Laboratory

<http://www.epa.gov/wed/>

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The Project

Land Grant Universities, Water Research Institutes, and EPA Region 10 have formed a partnership to provide research and education to communities about protecting or restoring the quality of water resources. This partnership is being supported in part by the USDA's National Institute of Food and Agriculture (NIFA).

Our Goal and Approach

The goal of this Project is to provide leadership for water resources research, education, and outreach to help people, industry, and governments to prevent and solve current and emerging water quality and quantity problems. The approach to achieving this goal is for the Partners to develop a coordinated water quality effort based on, and strengthening, individual state programs.

Our Strengths

The Project promotes regional collaboration by acknowledging existing programs and successful efforts; assisting program gaps; identifying potential issues for cross-agency and private sector collaboration; and developing a clearinghouse of expertise and programs. In addition, the Project establishes or enhances partnerships with federal, state, and local environmental and water resource management agencies, such as by placing a University Liaison within the offices of EPA Region 10.

WASHINGTON Publications

- EB 1090** Water Home Gardens and Landscape Plants
- EB 1102** Soil Management in Yards and Gardens
- EB 1304** Simple Irrigation Scheduling Using Pan Evaporation
- EB 1305** Sprinkler Irrigation: Application Rates and Depths
- EB 1579** Landscape Plants for the Inland Northwest
- EB 1716** Farming Practices for Groundwater Protection
- EB 1722** How Fertilizers and Plant Nutrients Affect Groundwater Quality
- EB 1730** Pesticide Mixing and Loading Options to Protect Water Quality
- EB 1810** A Ready Reference for Irrigation Manual of Practice
- EB 1852e** Conserving Water Indoors
- EB 1858e** Hot Water Conservation
- EB 1895** Soil Management for Small Farms
- EM 3522** Interpretation of Chemical Analysis of Irrigation Water
- EM 4828** Surface Irrigation Systems
- EM 4830** Vegetable Crops
- EM 4832** Drought Advisory: Set-Move and Permanent Sprinkle Irrigation Systems
- EM 4834** Water Conservation in Gardens and Landscapes
- EM 4856** Drought Advisory: Water Conservation and Weed Control Go Hand in Hand
- EM 4885** Irrigation Management Practices to Protect Groundwater and Surface Water Quality in the State of Washington
- EM 4915** Managing Irrigated Pastures and Hay Land
- MISC0091** Application of Herbicides Through Irrigation Systems
- MISC0224** Conservation Farming in the United States
- MISC0294** Dry Land Gardening
- XB 1021** The Furrow Irrigation Erosion Simulator

National Water Quality Program Areas

The four land grant universities in the Pacific Northwest have aligned our water resource Extension and research efforts with eight themes of the USDA's National Institute of Food and Agriculture.

1. Animal Waste Management
2. Drinking Water and Human Health
3. Environmental Restoration
4. Nutrient and Pesticide Management
5. Pollution Assessment and Prevention
6. Watershed Management
7. Water Conservation and Management
8. Water Policy and Economics

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