



Applying knowledge to improve water quality

Pacific Northwest

Regional Water Program

A Partnership of USDA CSREES
& Land Grant Colleges and Universities

Fall 2002
PNWWATER 008

Nutrient and Pesticide Management



Overview

Pesticide and fertilizer use is almost everywhere across the Pacific Northwest's developed and agricultural landscapes. In order to provide larger harvests of affordable foods, farmers often supply crops with proper nutrients (fertilizers) and protect them from pests (weeds, insects, fungi, etc.) by applying pesticides. In maintaining their landscapes, homeowners tend to use proportionately more fertilizers and pesticides than do farmers and frequently have less training in proper application methods. Human and animal health problems can occur through excessive exposure to landscape and farm chemicals. Environmental pollution can occur when these chemicals enter waterways and groundwater systems. Nutrients and pesticides can enter surface and ground waters through misapplication, movement of treated soils, irrigation return flows, runoff from urban and agricultural land, stormwater runoff, and leaching through soils. Groundwater contamination from pesticides and nutrients is a difficult long-term issue due to the impracticality of cleansing groundwater aquifers. Responsible agricultural producers and homeowners employ methods to assure proper application of chemicals to minimize potential exposure to people, animals, and the environment. The land grant universities of the Pacific Northwest region engage in a broad range of research activities, outreach, and training programs to assist agriculturists, pesticide applicators, and homeowners in properly managing nutrients and pesticides, for optimal production and environmental stewardship. The universities provide research-based educational materials on soils, plant choices, irrigation management techniques, fertilizer, and pesticide use and a range of other related topics.

Outcomes

- Home gardeners and producers are more aware of dangers from improper management of pesticides and nutrients
- Return irrigation flows to rivers are cleaner
- Groundwater is protected from contamination
- Landowners and agricultural producers better manage chemicals used to enhance landscapes and to grow crops



Oregon State
UNIVERSITY



University of Idaho
A LEGACY OF LEADING





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 255 Tank-Mixing Herbicides

PNW 276 Current Nutrient Status of Soils in Idaho, Oregon and Washington

PNW 287 Irrigation Runoff Control Strategies

PNW 320 Calibrating and Using a Backpack Sprayer

PNW 505 Which Test Is Best? Dairy Manure Testing

PNW 508 Fertilizing with Biosolids

PNW 511 Worksheet for Calculating Biosolids Application Rates in Agriculture

PNW 513 Nitrogen Uptake and Utilization by Pacific Northwest Crops

PNW 533 Fertilizing With Manure

PNW 546 Nutrient Management for Onions in the Pacific Northwest

PNW 549 Keeping Track of Manure Nutrients in Dairy Pastures

PNW 570-E Monitoring Soil Nutrients Using a Management Unit Approach

Fertilizer Guides

Each of the four land grant universities in the Pacific Northwest (University of Alaska, University of Idaho, Oregon State University, Washington State University) provides up-to-date fertilizer recommendations for economically important crops. Please see the publication website (on the back page) for specific fertilizer guide publications in your state.

Pesticide Use Guidelines

Each of the four land grant universities in the Pacific Northwest (University of Alaska, University of Idaho, Oregon State University, Washington State University) provides up-to-date pesticide use recommendations and integrated pest management strategies for economically important crops. Each year WSU, OSU and UI produce the PNW Weed Management Handbook, the PNW Insect Management Handbook, and the PNW Plant Disease Management Handbook. Please see the publication website (on the back page) for the pesticide management handbooks and for specific pesticide use publications in your state.

ALASKA Contacts

Fred Sorensen, Water Quality Coordinator, Anchorage,
(907) 786-6311, dffes@uaa.alaska.edu

Bob Gorman, Extension Pesticide Coordinator, Anchorage,
(907) 786-6323, ffrf@uaf.edu

ALASKA Publications

FGV-00149A Forage Crops: Field Crop Fertilizer Recommendations for Alaska

FGV-00242A Soil Fertility Basics

FGV-00348 Nutrient /sources and Lime: Field Crop Fertilizer Recommendations for Alaska

FGV-00349 Organic Fertilizers

FGV-00442 Cereal Grains: Field Crop Fertilizer Recommendations for Alaska

FGV-00643 Vegetables: Field Crop Fertilizer Recommendations for Alaska



HGA-00131 Make Your Own Complete Fertilizer
HGA-00436 Tree Maintenance and Pesticides
HGA-00236 Lawn Maintenance and Pesticides
GWQ-00547 Protect Water Resources – Understand Pesticide Movement
LPM-00340 Animal Manure as Fertilizer

IDAHO Contacts

Robert L. Mahler, Water Quality/Nutrient Management, Moscow, (208) 885-7025, bmahler@uidaho.edu

Brad D. Brown, Crop/Nutrient Management, Parma, (208) 722-6701 Ext 216, bradb@uidaho.edu

Jason W. Ellsworth, Extension Soil Fertility, Twin Falls, (208) 736-3611, jellswo@uidaho.edu

Don W. Morishita, Extension Weed Science, Twin Falls, (208) 736-3616, don@uidaho.edu

Edward J. Bechinski, Extension Integrated Pest Management, Moscow, (208) 885-5972, ejb@uidaho.edu

Ronda Hirnyck, Pesticide Coordinator, Boise, (208) 364-4046, rhirnyck@uidaho.edu

IDAHO Publications

CIS 757 Nitrogen and Phosphorus BMPs: Fertilizer Placement
CIS 792 Calibration of Lawn and Garden Pesticide and Fertilizer Applicators for Homeowners
CIS 861 Pesticide Handling Practices to Protect Groundwater
CIS 863 Fertilizer Primer: Terminology, Calculations and Application
CIS 865 Pesticides and Their Movement in Soil and Water
CIS 872 Quality Water for Idaho – Nitrate and Groundwater
CIS 907 Phosphates in Detergents
CIS 938 Quality Water for Idaho: The Role of Integrated Pest Management
CIS 962 Best Management Practices for Nitrogen Management to Protect Groundwater
CIS 963 Best Management Practices for Phosphorus Management to Protect Surface Water
CIS 1065 Improving Sprayer Accuracy: Simple Methods for Correct Calibration

CIS 1070 Nutrient Management Plans: Who Needs Them and How to Prepare Your Own
CIS 1099 Idaho's Nitrate Areas of Concern

OREGON Contacts

Jeff Jenkins, Pesticide Extension Specialist, Corvallis, (541) 737-5993, jeffrey.jenkins@oregonstate.edu

Jed Colquhoun, Extension Weed Specialist, Corvallis, (541) 737-8868, jed.colquhoun@oregonstate.edu

Mike Gamroth, Extension Water Quality Coordinator, Corvallis, (541) 737-3316, mike.gamroth@oregonstate.edu

John Hart, Extension Soil Fertility, Corvallis, (541) 737-5714, john.hart@oregonstate.edu

Dan Sullivan, Extension Soil Fertility, Corvallis, (541) 737-5715, dan.sullivan@oregonstate.edu

OREGON Publications

EC 628 Soil Sampling for Home Gardens and Small Acreages
EC 1094 Calculating the Fertilizer Value of Manure from Livestock Operations
EC 1278 Fertilizing Lawns
EC 1478 Soil Test Interpretation Guide
EC 1503 Fertilizing Your Garden: Vegetables, Fruits, and Ornamentals
EM 8559 How Soil Properties Affect Groundwater Vulnerability to Pesticide Contamination
EM 8560 Site Assessment for Groundwater Vulnerability to Pesticide Contamination
EM 8561-E Understanding Pesticide Persistence and Mobility for Groundwater and Surface Water Protection (available only online)
EM 8585 Nutrient Management for Dairy Production: Manure Application Rates for Forage Production
EM 8586 Nutrient Management for Dairy Production: Dairy Manure as a Fertilizer Source
EM 8646 Nutrient Management for Dairy Production: Assessing Your Manure Management for Water Quality Risk
EM 8705 The Oregon Water Quality Decision Aid (OWQDA): An Overview
EM 8768 Calculating Dairy Manure Nutrient Application Rates
EM 8841-E Get to Know the Pesticide Label (available only online)

EM 8848-E Agricultural Phosphorus Management Using the Oregon/Washington Phosphorus Indexes (available only online)

EM 8850 Oregon Pesticide Safety Education Manual: A Guide to the Safe Use and Handling of Pesticides

EM 8913-E Feed Management as a Tool for Balancing Nutrients on Dairies and Other Livestock Operations (available only online)

EM 8920-E Monitoring Soil Nutrients in Dryland Systems Using Management Units (available only online)

FS 315 How to Avoid Chemical Trespass When Applying Pesticides

PNW 255 Tank-Mixing Herbicides

PNW 259 Valuing Forages Based on Moisture and Nutrient Content

PNW 278 First Aid for Pesticide Poisoning

PNW 320 Calibrating and Using a Backpack Sprayer

PNW 505 Nutrient Management for Dairy Production: Which Test Is Best? Customizing Dairy Manure Nutrient Testing

PNW 506 Date, Rate, and Place: The Field Book for Dairy Manure Applicators

PNW 511-E Worksheet for Calculating Biosolids Application Rates in Agriculture

PNW 549 Keeping Track of Manure Nutrients in Dairy Pastures

PNW 570-E Monitoring Soil Nutrients Using a Management Unit Approach (available only online)

PNW 591 How to Reduce Bee Poisoning from Pesticides

VTP 17 Calibrating and Using Backpack Sprayers video

WAEM 0167 Agricultural Weed Management Principles

WASHINGTON Contacts

Carol Ramsay, Pesticide Education Coordinator, Pullman, (509) 335-9222, ramsay@wsu.edu

Robert G. Stevens, Extension Soil Scientist, Prosser, (509) 786-9231, tapiod@wsu.edu

Craig Cogger, Soil Scientist, Puyallup, (253) 445-4512, cogger@wsu.edu

Allan Felsot, Agriculture Chemicals Toxicologist, Tri-Cities, (509) 372-7365, afelsot@tricity.wsu.edu

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/index.html>

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.html>

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: Michael Cochrane:
360-392-4299

mcocrane@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/>

For more information contact
Jan Seago at 206-553-0038 or
seago.jan@epa.gov

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 Cooperative State Research, Education, and Extension System (CSREES).

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.

Catherine Daniels, Pesticide
Information Center, Tri-Cities,
(509) 372-7495, cdaniels@beta.tricity.wsu.edu

Joe Harrison, Dairy Nutrient
Management, Puyallup,
(253) 445-4638, jhharrison@wsu.edu

John Stark, Environmental
Toxicology, Puyallup, (253)
445-4419, stark@puyallup.wsu.edu

WASHINGTON Publications

EB 0712 Soil Erosion and Sediment
Control Under Irrigation
EB 1386 Safe Disposal of Home Use
Pesticides
EB 1543 Pesticide Movement in Soils-
Groundwater Protection
EB 1716 Farming Practices for
Groundwater Protection
EB 1631 Protect Your Groundwater:
Survey Your Home Environment
EB 1632 Why the Concern about
Agricultural Contamination in
Groundwater?
EB 1633 Role of Soil in Groundwater
Protection
EB 1644 Protecting Groundwater from
Pesticide Contamination

EB 1721 Defining Water Quality
EB 1722 How Fertilizers and Plant
Nutrients Affect Groundwater Quality
EB 1730 Pesticide Mixing and
Loading Options to Protect Water
Quality
EB 1744 Your Yard and Water
Quality: Simple Things Gardeners Can
Do To Prevent Water Contamination
EB 1751 Economic Issues in
Protecting Groundwater Quality
EM 4885 Irrigation Management
Practices to Protect Surface and
Ground Water Quality in the State of
Washington
PNW0287 Irrigation Runoff Control
Strategies
PNW0550 Encouraging Beneficial
Insects in Your Garden



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 Cooperative State Research, Education, and Extension System.

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

CSREES is the Cooperative States Research, Education, and Extension Service, a sub-agency of the United States Department of Agriculture, and is the federal partner in this water quality program.