

Causes of N-groundwater contamination

- More fertilizer applied than plants can use
- Over-watering after fertilizer is applied
- Timing of fertilizer application does not match plant needs
- Rain events after fertilizer application

What you can do to reduce N-losses

- Check with the OSU Extension Service for fertilizer recommendations for lawns, gardens, and agricultural crops.
- Test your soil and adjust pH before adding fertilizer.
- Consider the potential of nitrate to leach to groundwater when deciding fertilizer quantity, timing, and application method.
- Reduce the size of your lawn and let it go dormant in the summer.
- Select native plants for your landscape; they need no fertilizer and less water for optimal growth.
- Avoid fertilizer products that might contain potential contaminants.
- Most crops only need fertilizer during certain growth stages; only apply fertilizer during these critical times.

INSIDE THIS ISSUE ...

Who We Are and What We Do	2
Conservation Calendar	3
Urban Creek Help by Taylor	
Awards	4
Check out the BSWCD Web	4
Native Plant Sale - a watershed	
Joanna Karl	5
Get with the Program - Volunteer	
IWM and H&M Workshops	7
GWMA map	8

The Fate of Soil Nitrogen

Horizons

Volume 17 Issue 3

SERVING BENTON COUNTY OREGON SINCE 1956

Thanks to a grant from Oregon Department of Environmental Quality, Benton SWCD has launched an educational and assistance program designed to help land stewards decrease nitrate-N losses through responsible irrigation and fertilization practices based on plant need, soil conditions and weather monitoring.

Nitrogen (N) is often the limiting plant nutrient in growing systems, such as farms, gardens, lawns, landscapes, golf courses and sports fields. Understanding how N exists in soil is a critical part of soil fertility management.

Soil N cycles through a variety of physical and chemical forms, including the bodies of living organisms (for example, protein), detritus, mineral and gas. Microorganisms are involved in transforming N through various forms in the soil. Therefore, to manage the fate of soil N, it is important to consider factors that impact life, such as temperature, moisture content and time.

Regardless of the form of N fertilizer added - chemically synthesized, an organic mix, manure, or sewage sludge - soil organisms can convert it to two mineral forms that plants are able to use: ammonium (NH_4^+) and nitrate (NO_3^-). These various forms of nitrogen minerals are called "ammonium-N" and "nitrate-N." Just like magnets, these minerals carry positive and negative charges. The charges are responsible for the way the N minerals move in soil; opposite charges attract and like charges repel.

To visualize how these N minerals move, think of the soil as a kitchen sponge with tiny interconnected holes inside. Usually, the soil sponge has an overall negative charge, so the positive ammonium-N is held in place. On the other hand, negatively charged nitrate-N is not attracted to the soil sponge and it moves freely and quickly through the tiny holes. In an area like the Willamette Valley with lots of rainfall, this can cause large amounts of nitrate-N to be lost from the soil. These losses are not only costly and wasteful to anyone who has purchased N fertilizer, but they can also be a source of harmful environmental contamination when they reach lakes, rivers, and groundwater – the source for rural wells and drinking water. The process of nitrate-N moving though soil and getting into groundwater is called nitrate leaching. Since the movement of nitrate-N in soil depends on water movement, weather and irrigation can greatly impact nitrate leaching.

Management practices that synchronize nutrient (including N) availability with crop demand and uptake also minimize nutrient leaching. Both application timing and the amount of fertilizer applied are important. Splitting fertilizer applications into several smaller doses rather than a single, large treatment is especially important on sandy, well-drained soils. Excess nutrient applications can be reduced by developing a fertilization program based on these management tools: realistic yield goals, soil and plant tissue testing and accounting for all nutrient source inputs, such as manure, legumes, and other amendments.

Please see page 7 for up-coming workshops to help land stewards reduce N-leaching.

Also

We have funds from our Conservation Incentive Program and a DEQ 319 grant to help YOU implement conservation practices that reduce nutrient losses.



Who we are ~ During a recent RETREAT, the BSWCD Team gathered to review our mission statement, identify our organization strengths and weaknesses and evaluate our role in Benton County. From left to right: Front row: Tom Bedell, Joe Hinds, Jenny Ayotte, Heath Keirstead, Tim Dehne, Teresa Matteson. Back row: Frank Nusbaum, Taber Burton, Jen Floro, Donna Schmitz, Tom Snyder, Anne Rigor, Nick Chambers, Cliff Hall, and on the far back right, Cynthia Solie of the Oregon Cascades West Council of Governments, our March RETREAT facilitator. *Missing: Taylor Bortz, our LINKs intern, see page 4*

Meet two of our newest team members

Taber Burton Holder of a U of O Geography degree, Taber is the Benton Fish Passage Improvement Program Coordinator. His hobbies include hiking, reading, eating good food and listening to good music. Natural processes, mapping, socioeconomic development, and cross cultural/religious spatial constructs are at the top of Taber's interest list.

Taber quote - "The Fish Passage Improvement Program is fantastic! I love the fact that geographic



representation and spatial analysis can be used to help improve the natural environment and educate the community."



Frank Nusbaum A true son of Oregon's Willamette Valley, Frank lives and works with his wife and son, Sharon and Orin, on their family's century farm at Bellfountain. Frank finds time in his busy day to be a valued member of the BSWCD Board and a sincere representative of Benton County agricultural producers. Conservation practices are common on the Nusbaum farm. No-till Christmas tree management is enhanced with contour planting. Two-year volunteer grass seed cycles consider soil properties, reduce chemical inputs, minimize fuel consumption and capitalize on the ability of rye grass to reseed. Frank recalls that he has not seen unbroken sod on some of their rotationally-grazed pastures in his 55-year lifetime; pastures that are habitat for Western meadowlark and other ground nesting birds. Western pond turtles bask around their 20-acre pond.

Soil and Water Conservation Districts are non-regulatory agencies.

What we do ~

Benton SWCD promotes the responsible use and management of natural resources through two branches of services: Technical Assistance and Education & Outreach.

We help agricultural, forestry, rural and urban land stewards address their conservation concerns through technical assistance and funding sources. This on-theground work is voluntary and initiated by the landowner. The process includes a site visit and discussion regarding the concerns of the landowner. We strive to identify options that provide the greatest conservation benefit while meeting production and financial objectives. This service combines the skills of the land manager with the science-based knowledge of our staff.

We are NOT Eco Cops!

Although we often partner with regulatory agencies, such as Oregon Department of Agriculture and the Department of Environmental Quality, we respect landowner privacy and keep landowner records confidential.

Through our *Making Ripples: Community Building for Water Quality Program*, we offer a multitude of educational services and support, such as adult and educator workshops, K-12 natural resources education programs, grants for conservation education, scholarships and internships.

Building partnerships with other Natural Resources educators helps us maximize outreach, improve efficiency and provide consistent messages.

We are here to work with YOU!



Conservation Calendar for Spring 2008

Date & Time Location	Event Speaker	For more information contact:
Wednesday, March 26 10 AM - 4 PM Siuslaw National Forest Headquarters 4077 S.W. Research Way Corvallis	Irrigation Water Management Workshop Workshop presentations will include: irrigation systems - irrigation and fertilizer interactions - NRCS web soil survey and its use in irrigation water management - water rights - Ground Water Management Area - funding opportunities for landowners - local grower irrigation projects	Fee \$5 includes lunch and materials registration required - call Benton SWCD 541-753-7208 Sponsored by Department of Environmental Quality Benton SWCD and USDA- Natural Resouces Conservation Service
Monday, March 31 5:15 - 9 PM OSU CH2MHill Alumni Ctr	TOWN HALL MEETING 5:15 pm - Light refreshments, displays, networking 6:00 to 9:00 pm - Program CH2MHill Alumni Center - 725 SW 26th St. / OSU Campus	Free and open to the public PRE-REGISTER TODAY online http://www.surveymonkey.com/s.aspx?sm=qpV1 mOhVN7bxjdPxn1IeaQ_3d_3d
Wednesday, April 9 5 PM OSU CH2MHill Alumni Ctr	Silent Invasion A documentary on the threat of invasive species. OPB joins forces with SOLV, The Nature Conservancy and the Oregon Invasive Species Council to kick off a year-long effort to counter the environmental and economic threat of invasive species.	Free of charge. Space is limited. Seating is first come, first serve
Saturday, April 12 9 AM to 4 PM Benton County Fairgrounds Carriage House	Horses & Mud - workshop and tour hosted by Melissa Fery - OSU Estension Small Farms and Donna Schmitz - Benton SWCD. Learn about: Mud & Manure management - Pasture management - Sacrifice areas - Rotational grazing - Cost-share programs Bring about ½ cup of untreated well water in a clean, water-tight container for FREE nitrate screening	Registration required - \$20 includes lunch Contact Benton County OSU Extension 541-766-6750 online registration at http://smallfarms.oregonstate.edu
April 17 6:30 - 8 PM Corvallis Library Meeting Room	Water Quality: Improving Your Stormwater Learn what YOU can do to improve stormwater quality. Learn about local agencies' efforts to improve stormwater quality. Learn how YOU could represent your special interest group on a Stormwater Advisory Committee.	Free and open to the public! Take the next step in water stewardship!
Saturday, April 19 10 AM - 2 PM Riverfront Park Corvallis	EarthFaire and Procession of the Species Immerse yourself in a celebration of Earth	This event is free and open to the public!! Corvallis Environmental Center 541.753.9211 Email: info@corvallisenvironmentalcenter.org
Tuesday, April 22 3:30 - 7 PM OSU Organic Growers Farm Hwy 34	Earth Day 2008 - Hoo Haa hosted by the OSU Organic Growers Club Free transportation leaving from the MU Bookstore every 20 minutes! Free Food! - Free music! Bring your turning fork - and participate in THE HUMAN TILLING MACHINE	This event is free and open to the public. Bring a cup, a bowl, a spork, and a hunger for earthling-like activities! Leave the non-human animals at home please but bring the kids!
Sunday, May 4 11AM - 5 PM Madison Avenue Corvallis	plants - Spring Garden Festival - plants plants - indulge your garden fetish - plants plants, music, plants, information, plants, community, plants	This event is free and open to the public Did we mention plants?
Tuesday, May 13 TBA Lebanon	Habitat and Conservation Practices for Beneficial Insects on Farms: Predators, Parasites and Pollinators - a workshop - presentations on enhancing habitat for beneficial insects and a field trip to nearby farms to see examples of habitat on the ground.	FREE! - calling all agricultural professionals and growers - pre-registration required! Visit the IPPC web site for more details http://www.ipmnet.org/News-archive.htm
Saturady, May 17 1-4 PM Village Green Park Corvallis	SOLV Down By the Riverside see http://solv.org for other events and locations in Benton County	Join BSWCD and volunteers to clean up this common area. Bring your gloves, favorite blackberry eradication tools and water bottle Call Benton SWCD 753-7208

Urban Creek Restoration Gets a Helping Hand



Alison Priewe, with teachers Jeff Mitchell and Molly O'Malley

page 4

Hi, I'm Taylor Bortz and I'm a LINKS Americorps intern and the Urban Creek Collaborative Restoration Coordinator at BSWCD. I studied anthropology at the University of Oregon and my interests include hiking, gardening, recycling/composting, and native plants.

I am very excited to be part of the fabulous team at Benton SWCD and am currently planning several projects. One project is a native plant demonstration garden in Corvallis' Porter Park; homeowners and the general public will be able to visit the garden and learn how naturescaping both beautifies their streamside properties and promotes healthy ecological functioning of area creeks.

I am also planning a tour of urban creek restoration sites in conjunction with the schools and community groups engaged in these projects. If you know of a restoration project that should be showcased, please contact me.

If you have ideas for future creek restoration sites, would like to collaborate on restoration projects, or have advice on conducting successful projects, e-mail me at tbortz@bentonswcd.org.

Our work involves interacting with long-term Corvallis residents who share anecdotal creek history. Do you have a childhood memory of Benton County creeks to share? See email from John Porter below ~

January 29, 2008 I noticed an initiative to make some improvements State-wide Recognition on Porter City Park in Corvallis. I think I was visiting sustainablecorvallis org and found a reference in the **2007 Oregon Association of Conservation Districts AWARDS** minutes of a recent land use meeting. For whatever it's worth, I am the grandson of John F. Porter, and am living in Massachusetts. While alive, my grandfather spoke highly of his time in Corvallis and Grants Paul Bradley at Lincoln K-8 School Oregon's Conservation Teacher of the Year In the event that you should need some information or, perhaps, pictures, I might be able to locate some material for Pass. your use. Upon the completion of your improvement efforts, I might enjoy having a photograph of the park for my family Benton SWCD's I remember my grandfather as a great man and know he'd be Making Ripples Program proud of the efforts of your team throughout the city. album. Oregon's Outstanding District Education Program John Porter Burlington, MA New features on the BSWCD Website http://www.bentonswcd.org Natural Resource Scholarships application form and eligibility criteria subscribe to three lists Horizons newsletter only Announcements & Horizons Job announcements **Calendar of events** what's happening in Benton County PHS Compost web page PHS Compost Team left to right John Kish, Brian Wakefield, good news about great high school students

2008 Native Plant Sale – metaphorically, a watershed

Water Runs Down Hill

A hike to the Dimple Hill summit, Chance meeting with a familiar face, Smiles exchange and casual words reveal common ground – the Native Plant Sale.

Quickly a circle of hikers forms, An informal discussion on ivy management unfolds.

Ripples of invasive weed management seep into the community, improving the awareness, knowledge and skills of land stewards.

Joanna Karl: In Memoriam 1951 – 2008

Joanna was a valued member of the Corvallis Willamette Riverkeepers team. With fellow monitors, she sampled Marys River water at the Avery Park Bridge each month, testing for dissolved oxygen, turbidity, conductivity, temperature and pH.

Joanna, a mechanical and environmental engineer, worked professionally on projects involving water conservation, rainwater harvesting and rooftop gardens. Her personal life reflected her strong dedication to peace, social justice and a healthy environment.

Fluent

I would love to live Like a river flows, Carried by the surprise Of its own unfolding. - John O'Donnell *headwaters:* the beginning or source of our Native Plant Sale river is Alice Fairfield, coordinator extraordinaire. From Alice's ambition, planning and organization springs the smoothly flowing waters of our Native Plant Sale river.

mouth: the point where a river issues into a larger body of water – Eichler Hay Company is where the NPS energy meets the sea of land stewards. The native plant seedling resources are cycled back into the landscape.

landscape: Benton SWCD - an expanse of services that can be seen in a single view, that would be the county-wide role of Benton SWCD. County defined – yet knowledge and habitats overlap with adjacent regions – networking with natural resource partners near and far.

land stewards: over 290 customer orders represent the watershed's land stewards.

water: not unlike water, 36,863 native plant seedlings flowed into the community, spreading conservation intensions such as soil erosion control, naturescaping, riparian restoration and wildlife habitat enhancement.

tributaries: eight native plant nurseries serve as the tributaries through which the seedlings flow. Alphabetically, they are Althouse Nursery, Brooks Tree Farm, Champoeg Nursery, Clear Water Growers, Heritage Seedlings, Oak Point Nursery, Seven Oaks Natives Nursery and Willamette Gardens. Homegrown Gardens' carts were our *agents of transportation* as seedlings flowed to land stewards' cars. Huge thanks for sharing!!!

wildlife: truly the wildlife, our 59 volunteers work hard and play hard. At shifts' end they are filled with a strong sense of their role in the watershed landscape. *see page 6 for their names*

food web: local food establishments provide food for the wildlife. Heartfelt thanks to the donors who provided snacks. Alphabetically, they are American Dream Pizza, First Alternative Co-op, Papa's Pizza, Safeway and Starbucks.

services: watersheds provide myriad ecosystem services. The native plant sale funds scholarships, builds community, and initiates restoration action.



Time to Get with the Program

Make some ripples in Benton County - Volunteer!!!

Year Round Activities

Benton SWCD Needs Associate Directors

Calling all closet conservation advocates! Contribute your unique perspectives, experiences and skills to a variety of projects, such as creek restoration, wildlife habitat enhancement, volunteer coordination, strategic planning, technical assistance, community education and public outreach. Associate Directors should attend some or all Board meetings and strategic planning sessions, participate on a committee and attend assorted events. Annual commitment: 34 - 90 hours.

Benton Fish Passage Improvement Program

Volunteers help gather data for a comprehensive database of fish passage barriers in our local watersheds. If you are interested in working with a group of people to inventory fish passage barriers using survey equipment, GPS and ArcPad software please contact Taber Burton at (541) 766-6821 taber.burton@ co.benton.or.us

4-H Wildlife Stewards Work with K-12 students and their teachers to develop habitat sites on school grounds. Contribute to educational and restoration activities that impact the next generation of decision makers. Become a trained 4-H Wildlife Stewards Leader. Contact Maggie Livesay: (541) 766-6750, maggie.livesay@oregonstate.edu

Bug Night, an informal gathering designed to train a group of individuals for work on future projects. Hosted by Earth Design Consultants, Inc., a local ecological research and assessment firm, specializing in wetlands and watersheds. Every Monday! Come anytime during the hours of 3:30-7:30PM. Pizza is served around 5:30 or 6PM. Location: 230 SW 3rd St, Suite 212 in the Crees Building (upstairs, above the Inkwell). Please RSVP by email: bugnight@earthdesign.com or call (541) 757-7896. Visit www.earthdesign.com

Short Term Events -

For information on how you can get involved, contact Benton SWCD phone: 541-753-7208 or email: office@bentonswcd.org

Portland's Better Living Show

What: a sustainability expo - Heath would love company while manning the Oregon Green Schools booth When: March 28-30 Where: carpool to Expo Center

Forest Expo

What: over 700 elementary school kids over 3 days When: April 15, 16 & 17 Where: Benton County Fair Grounds

4-H Wildlife Stewards Summit

What: Provide soils activity for K-6 students When: April 24 Where: Corvallis

Spring Field Days

What: Teach 6th and 7th graders about culverts & fish passage. When: May 14, 21, 27 Where: Philomath

Envirothon

What: Proctor the soil tests for high school teams When: May 9 Where: carpool to Oregon Garden, Silverton

SOLV Down by the Riverside Weed Pull

What: pull blackberries for restoration When: May 17 Where: Village Green Park across from Cheldelin Middle School.

Forest Camp

What: Teach soil basics to students When: April 28 - May 2 Where: Camp Tadmor, Lebanon

Urban Creek Restoration Tour

What: help organize a tour of urban creek restoration projects or staff sites. When: TBA Where: Selected sites on urban creeks

2008 NATIVE PLANT SALE VOLUNTEERS - SMALL PRINT; HUGE THANKS!!!

Kristin Anderson Trygve Anderson Lyla Anderson Matthew Barmann Corinne Butzin Tom Bedell Sabrina Beseke Matt Borg Taylor Bortz Jenny Brausch

Bill Brownlee Gerri Buckles Devon Buckles Lynda Capel Tom Capel John Caputo Kim Carson Sara Cash

Shannon Daniels Tim Dehne Violet DePoe Cheryl Good Michael Good Lou Gordon Iosie Gribskov Meredith Howell Oktar Khudayar

Ellen Lamothe Dirk Lanning Debbie Lynne Chris Midwater Norina Nettleton Joan Noyce Susan Pachuta Bill Pearcy Mark Peterson

Jeff Picton Logan Picton Dave Pitot Chris Poulke Carol Prueitt Anne Rigor Tony Rikli Gary Rodgers Cyndee Ross

Sally Shaw Julie Skopal Alana Smith Gabrielle Snider Lvnn Snider Tom Snyder Dana Stepp Tammee Stump Diana Sutherin

John Thaw Hannah Tucker Mayrah Udvardi Brian Wilson Beth Young



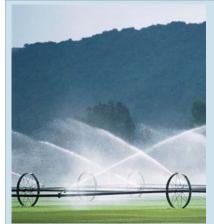
Workshops Aim to Reduce Harmful Groundwater Nitrates

The southern Willamette Valley has been the focus of studies for 20 years because of concerns about confirmed elevated levels of nitrate in the shallow groundwater. In 2004, The Department of Environmental Quality (DEQ) took action to help ensure that Willamette Valley groundwater could continue to provide a high quality resource for present and future use by declaring a "Groundwater Management Area" for a portion of the southern Willamette Valley.

The Southern Willamette Valley Groundwater Management Area Committee finalized the Action Plan for the Groundwater Management Area (GWMA) in December 2006. The Plan makes stakeholder-based recommendations to the Department of Environmental Quality (DEQ) for selected voluntary actions that, when conducted, will lower nitrate levels and reduce risks from other potential contaminants in the region's groundwater. The Action Plan developed by the GWMA Committee will help protect the drinking water supply for over 21,000 residents in the GWMA. While approximately 12,500 urban residents get their drinking water from public water systems, there are an estimated 8,700 rural residents living within the GWMA who use groundwater from their private wells.

The GWMA Plan established specific trigger levels for certain contaminants. For nitrate, that level is 7mg/L (milligrams per liter) nitrate-nitrogen; the EPA drinking water standard for nitrate is 10 mg/L. Sometimes, very low levels of nitrate can be present naturally, but in the Southern Willamette Valley elevated levels of nitrate are likely caused by sources related to human activity such as fertilizer use, large wastewater facilities, animal waste, and septic systems.

For GWMA info visit http://groundwaterorst.edu/Willamette



Irrigation Water Management Workshop March 26th, 2008 - 10 AM to 4 PM Siuslaw National Forest Headquarters 4077 S.W. Research Way • Corvallis Registration is required. Call 541-753-7208 \$5.00 charge for lunch and materials

While agricultural activities are not the only contributors to increased levels of nitrates, studies have shown that proper management of irrigation water can reduce nitrate leaching to the groundwater. Irrigation practices, such as checking for operating pressure uniformity, replacing nozzles, monitoring soil water, and scheduling irrigation based on plant water use and weather, can help tremendously. To improve your irrigation practices, attend this workshop.

Workshop presentations will include:

- irrigation systems
- irrigation and fertilizer interactions
- NRCS web soil survey and its use in irrigation water management
- water rights

- Ground Water Management Area
- funding opportunities to help

Sponsored by BSWCD NRCS & DEQ See page 8 for a map of the GWMA.

landowners implement proper irrigation management local grower irrigation projects



Horses and Mud Workshop and Tour April 12, 2008 - 9 AM to 4 PM Benton County Fairgrounds Carriage House 110 SW 53rd St. • Corvallis

Registration required: call 541-766-3556 or register on-line at http://smallfarms.oregonstate.edu \$20 charge for lunch and materials

Sponsored by BSWCD & Benton County Extension Small Farms

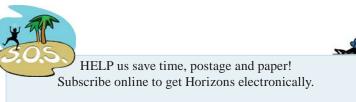
Learn about:

- mud & manure management
- pasture management
- cost share programs
- how the landowners are protecting their horses and the environment.

Free Nitrate screening of your well water: bring about $\frac{1}{2}$ cup of untreated water in a clean, water-tight container



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Visit http://www.bentonswcd.org/mailing_lists to e-subscribe.

Southern Willamette Groundwater Management Area shaded area: elevated levels of nitrate in shallow groundwater



Irrigation Water Management Workshop

March 26 10 AM to 4 PM details on page 7

to help agricultural producers in this area better understand irrigation practices, such as checking for operating pressure uniformity, replacing nozzles, monitoring soil water, and scheduling irrigation based on plant water use and weather

Cost share programs for improving irrigation systems are available When possible, this newsletter is printed on recycled paper! Please recycle it or better yet, pass it to a friend!



THE BENTON SWCD MISSION is to provide leadership to Benton County residents through education and technical assistance for conservation and responsible use of soil, water and related resources through a balanced, cooperative program that protects, restores, and improves these resources.

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