



**NRCS**  
**Technology News**

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**May 2003**

“NRCS *Technology News*,” provided by Science and Technology, delivers pertinent information to our customers about new technology, products, and services available from the Soil Survey and Resource Assessment and the Science and Technology deputy areas.

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## **MESSAGE FROM THE DEPUTY CHIEFS**

### **“Drought Highlights the Need for Soil Moisture Monitoring”**

**Lawrence E. Clark and Maurice J. Mausbach**

With a majority of the West and Midwest gripped by drought, improving water supply forecasts, assessing drought, and mitigating the effects of drought have taken on a new sense of urgency. Real-time monitoring of soil climate conditions is now feasible and is one of the keys to assessing drought, mitigating drought, and understanding better the relationships among weather, management practices, soil moisture, hydrology, and climate change.

The Natural Resources Conservation Service (NRCS) has been testing different soil moisture and soil temperature monitoring technologies since the mid-1990's through the Soil Climate Analysis Network (SCAN). Soil moisture and soil temperature monitoring technology is now operational and is being deployed.

In the West, this monitoring technology is now an important part of the Snow Survey and Water Supply Forecasting system. The NRCS SNOTEL (SNOWpackTElemetry) system uses 670 remote stations to monitor mountain snowpack conditions in the 12 Western States and Alaska to support forecasting spring and summer water supplies. About 60 of the SNOTEL stations now include soil climate sensors in their suite of measurements, enabling NRCS hydrologists to significantly improve the accuracy of water supply forecasts in basins where soil moisture data are available. Soil moisture and temperature monitoring is being added to SNOTEL stations as resources allow.

The SCAN system monitors soil moisture, soil temperature, and other climatic variables in lower elevation agricultural production areas across the entire United States. The National Water and Climate Center and the National Soil Survey Center jointly manage the SCAN. Still in fledgling form, the SCAN system consists of 71 monitoring stations in 38 states. The system uses the same infrastructure as the SNOTEL system to operate automated stations, transmit data using meteorburst data telemetry, manage the data, and make it available to users in near real-time. Full implementation of the SCAN calls for 1,000 new stations. And, up to 1,000 existing stations operated by partners need to be modified by adding soil moisture and temperature sensors and meteorburst data telemetry.

The information provided by these networks is essential to efficient water and drought management. Real-time information on soil moisture and temperature conditions will improve decision-making on a broad range of topics—from cropping, irrigation, and waste spreading decisions by land owners to regional drought assessment, agricultural production forecasting, and disaster planning. The data will also lead to significant advances in our scientific understanding of how the soil interacts with climate and hydrology. As this information becomes more available, we encourage conservationists

at all levels to explore ways to incorporate it into conservation planning. For more information, visit <http://www.wcc.nrcs.usda.gov>.

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## **CONSERVATIONIST'S CORNER**

**Robin Heard**

**State Conservationist, Pennsylvania**

When you say “grazing,” most people think of the Western United States and large cattle ranches. Well, Pennsylvania has almost 29 million acres of land. We have 59,000 farmers on approximately 28 percent of those acres, and the average farm is 131 acres. Large, we are not. However, with the help of Natural Resources Conservation Service (NRCS) conservation professionals, grazing and grazing management are becoming a means of increasing income on dairy farms in Pennsylvania.

Traditional Pennsylvania dairy farming consisted of the milking parlor, a dirt lot outside where the cattle were fed, and a small pasture with a stream meandering through the edge of it to water the animals. Corn was grown for silage feed, and the manure piles from the barn were stacked in corners, then loaded up and spread on the field. NRCS, through the Grazing Lands Conservation Initiative and with other partners, is changing the scene. Grazing development efforts began in the southwestern part of the State in 1980 when NRCS and other partners sponsored Project Grass, a grazing coalition. That effort now covers the entire State. As the Project Grass coordinator worked with farmers individually and farmers talked to each other, efforts increased to use more time moving cattle in grazing areas and less time with veterinarians, large expensive field equipment, and mucking out barns.

The State has joined NRCS in promoting nutrient management with its ACT 6 law that, in addition to NRCS Farm Bill programs, has helped cost-share many manure storage systems and helps plan for quantified nutrient application. Barnyard stabilization and streambank fencing have reduced the sediment and nutrient waste in small streams throughout the State. And, farmers are learning that planting some of the corn fields into pasture and getting the cows out of the barn lot makes farming more efficient and results in more cash per cow from healthier herds, more milk per input cost, and reduced management time.

Developing proper pasture plantings to lengthen the amount of time cattle can graze has been crucial to increasing the use of grazing. State specialists and field office professionals have worked with the NRCS Plant Materials Center of Big Flats, New York, to determine which warm-season grasses will work with the predominate soils in Pennsylvania. Demonstration plots were established at Pennsylvania State University (PSU) to show farmers how these grasses grow and work together. Representatives from the Plant Materials Center have attended PSU's Ag Progress Day to help answer farmers' questions. NRCS is also working to improve pasture quality by running organic matter

tests with the help of the Soil Quality Institute. The Grazing Lands Technology Institute (GLTI) is helping with grazing education by providing staff and farmers with new technology and research, such as the newly revised Range and Pasture Handbook and a pocket-size notebook with tip sheets to help producers evaluate their own pasture and determine when to rotate livestock.

Pennsylvania is fortunate to be the location for Cove Mountain Farm, a small-farm research project with the American Farmland Trust, USDA Agricultural Research Service, Pennsylvania State University, and NRCS. Studies there have shown profitability does not have to come from increased milk production, but can be greatly increased by reduced labor costs and lower operating expenses from seasonal grazing. More information on Cove Mountain Farm is available at <http://www.grassfarmer.com>.

Pennsylvania conservation professionals continue to search out research and new products from the GLTI and others to help farmers throughout the Commonwealth improve their income and maintain livestock agriculture as a way of life while continuing to protect natural resources.

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## **NEW PRODUCTS AND SERVICES**

### **#1 “Wetland Restoration, Enhancement, & Management” Guide Available Soon**

The Wetland Science Institute (WSI) is releasing "Wetland Restoration, Enhancement, and Management." This guide is a compilation of individual technical papers outlining restoration techniques and resources. It is designed to assist Natural Resources Conservation Service (NRCS) field employees by providing the most recent available technical information on wetland restoration, enhancement, and management. The papers are written by experts in their fields, including those from academia, partners (The Nature Conservancy, Ducks Unlimited), and units within NRCS, such as Plant Material Centers, State specialists, and Institute scientists. The guide will be released this month.

The papers in the guide are organized into four sections. Section I is “how-to” on specific wetland restoration and enhancement techniques. Section II includes papers on ecological monitoring. Section III is on management and Section IV covers regional issues of importance.

A sampling of papers from these sections includes the following topics: restoring microtopography; reading seed labels, calculating seed mixtures, and estimating costs; locating specific plants that are available commercially by species and vendor; vegetation planting techniques; monitoring structures; managing for reptiles and amphibians;

managing against beavers and muskrats; identifying woody and herbaceous plants useful for restoration in the South; and restoring wetland complexes in the prairie pothole region. Also included are methods of control, including biological techniques, for 10 of the worst invasive plant species that infest our wetland restorations.

Notification of the release of the "Wetland Restoration, Enhancement, and Management" guide will be through the NRCS eDirectives system. Once released, the guide will be posted on the WSI Web site, [www.pwrc.usgs.gov/wli/default.htm](http://www.pwrc.usgs.gov/wli/default.htm), and will be available for downloading in its entirety or by individual paper. The guide is fully Web capable, readable through any Web browser, and contains imbedded links to allow movement through the entire document by "clicking" titles in the table of contents and using the "back" button on the browser.

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## **#2 Nutrient Management Report Now Available on Web Site**

The technical report "Barriers and Strategies Influencing the Adoption of Nutrient Management" is now available on the Social Sciences Institute's (SSI) Web site. The report examines current issues in planning and implementing nutrient management practices from an on-the-ground planning perspective. It applies field experience, reviews current research, and interviews staff members from The Conservation Partnership to identify social science barriers and the strategies needed to overcome these barriers. This report is organized by categories: Producer Attitudes, Information Issues, Technology, Operation and Management Issues, Training Issues, and Farmer/Rancher Record Keeping. The opening section of the report (Key Points) summarizes observations drawn from the identified barriers and strategies.

An electronic version of the report is available for viewing and printing through SSI's Web site, <http://www.ssi.nrcs.usda.gov/ssi/> under "What's New" and "Technical Reports" (T 025).

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### **#3 2003 Version of the “Dictionary of American History” Published**

The 2003 edition of the "Dictionary of American History" has been published. Doug Helms, senior historian, Resource Economics and Social Sciences Division, authored the article on "Insecticides and Pesticides."

The ten-volume Dictionary is one of the primary reference works in American History. This is the third edition of the “Dictionary of American History.” Earlier editions were published in 1940 and 1976.

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## **TECHNOLOGICAL ADVANCES**

### **#4 Version 5.01 “Field Indicators of Hydric Soils in the United States” Available on CD**

"Field Indicators of Hydric Soils in the United States," version 5.01, 2003, is now available on a CD from the National Soil Survey Center (NSSC). A pdf version is available at [http://soils.usda.gov/soil\\_use/hydric/main.htm](http://soils.usda.gov/soil_use/hydric/main.htm) or from the Soils Web page, <http://soils.usda.gov/>, select “Soil Use” and then “Hydric Soils.” This version was created after the 2003 annual meeting of the National Technical Committee for Hydric Soils (NTCHS), which was held at the NSSC.

At the meeting, several changes were approved to the "Field Indicators of Hydric Soils in the United States" version 5.0, issued 2002. One example is the changes to the procedure for adding new hydric soil test indicators and/or modifying existing test indicators. The new procedure requires a short written plan that provides the NTCHS with contact and cooperator names, addresses, and phone numbers. It also establishes timelines for project startup, completion, and date for project data delivery to the NTCHS. The report will request a timeline for an approval/disapproval decision from the NTCHS. Many test indicators have been added over the past several years, but little data to support them

have been received by the NTCHS at this time. It is critical to provide test indicator data to the NTCHS by September 30, 2004, because a final decision to keep or discard each test indicator will be made by January 15, 2005.

The NTCHS also adopted a definition of "biological zero" to further clarify the hydric soil indicator criteria. Alaska research data show that plant respiration in cold environments (an indicator of plant growth and function) was measured at temperatures well below 5 degrees Celsius. The biological zero issue was clarified for possible use within the hydric soil criteria.

The "Field Indicators of Hydric Soils in the United States," version 5.0, 2002, will be distributed with an errata sheet.

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## **TRAINING**

### **#5 Learn to Lead Through Influence with "The Leader in You"**

Leading through influence can be more useful than having power. In her June 3, 2003, seminar, from 1:00 to 3:00 p.m. e.t., Laree Kiely, Ph.D., will teach viewers how to change attitudes and behaviors through influence. In this satellite seminar, the second in the spring series of "**The Leader in You**," viewers will learn a number of techniques and communication skills. Some of these skills include building a communication strategy, listening, creating a persuasive message, getting others to share your ideas, and enhancing your credibility.

Dr. Kiely has worldwide experience with consulting, facilitating, and teaching organizational behavior. She is the author of a number of papers and articles, as well as the book "From Supervise to Energize," published in 2002. Her award-winning program "Managerial Communication: Tools for Leadership" airs regularly on PBS/ETV.

Don't forget! "FISH! Sticks...Keeping the Vision Alive" will be broadcast Thursday, May 15, 2003, from 1 p.m. to 3 p.m. e.t. This exciting seminar will teach viewers how to maintain positive changes within their organizations. Handouts and satellite coordinates are available on the Social Sciences Institute's Web site at [www.ssi.nrcs.usda.gov](http://www.ssi.nrcs.usda.gov).

**"The Leader in You,"** sponsored by the Social Sciences Institute (SSI) and the National Employee Development Center, is designed to support the locally led conservation aspects of the Farm Bill and the President's Management Agenda. The National Association of Conservation Districts, the National Association of State Conservation Agencies, National Conservation District Employees Association, and the Federal Training Network are cooperating sponsors of this program.

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## **HONORS**

### **#6 Wildlife Habitat Conservation Case Study Wins Award**

The Henry's Fork Agricultural Corridor Wildlife Habitat Conservation Case Study recently won the Utah Chapter of the American Society of Landscape Architects Merit Award in the Planning and Analysis category. Utah State University prepared the case study in coordination with the Natural Resources Conservation Service (NRCS) Watershed Science and Wildlife Habitat Management Institutes. The purpose of the case study was to test the principles and methodologies presented in the NRCS technical handbook "Conservation Corridor Planning at the Landscape Level: Managing for Wildlife Habitat."

The study area was a 40-mile stretch of the Henry's Fork of the Snake River in Southeastern Idaho. This portion of the river flows through privately owned ranch land and productive wheat, barley, and potato farms. This area is also known for its scenic quality, world-renowned fishery, and provides habitat for trumpeter swans, bald eagles, waterfowl, mule deer, whitetail deer, moose, and a diversity of other wildlife. Conservation of open space, agricultural resources, and fish and wildlife habitat along this corridor were the focus of several non-profit organizations and government agencies, including the Natural Resources Conservation Service, for many years. This case study was directed at assisting conservationists involved in watershed-scale wildlife corridor planning projects in agriculturally dominated landscapes like the Henry's Fork.

Both the case study and the Conservation Corridor handbook have been submitted to the American League of Landscape Architects National Awards competition in the communication category.

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“**NRCS *Technology News***,” which is published ten times per year, is in a format that is available to all NRCS field staff. Back issues of “**NRCS *Technology News***” are available at the Science and Technology Consortium Web page at <http://www.nrcs.usda.gov/technical/SandT/index.html> – select NRCS Technology News from the menu at the top of the page.

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