"USDA NRCS Technology News" ~ October 2001

United States Department of Agriculture
Natural Resources Conservation Service
Science and Technology

"USDA NRCS *Technology News*" is a monthly electronic information piece provided by Science and Technology. It is designed to deliver 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. **"USDA NRCS *Technology News*"** is in a format that is available to all NRCS field staff.

Features in this issue include:

MESSAGE FROM THE DEPUTY CHIEFS

Lawrence E. Clark and Maurice J. Mausbach

It would be impossible to write an article this month without acknowledging the tragic events of the past few weeks. The sights and sounds of horror, pain, grief, and heroism will be with us for the rest of our lives. As with many other tragic events—the assassination of President John F. Kennedy, the explosion of the Challenger—most of us will never forget where we were and what we were doing on that fateful day.

All of us will respond differently to the trauma we have experienced. The way we are affected by an event such as the destruction of the World Trade Center is at least partially determined by genes, experience, and the support systems around us. Some people are simply more able to deal with trauma than others are. Mental health experts who have studied responses to disasters such as the Oklahoma City bombing know that some people will recover faster and better than others will. They call this ability "resiliency" and attribute it to personal characteristics such as optimism, flexibility, willingness to talk about feelings, a good social support system, and a strong belief in something larger than oneself. (1)

Even people who were no more closely involved than watching the tragedy on television can be deeply affected. They may go into a state of acute stress reaction where they are unable to function as before. This is a time for all of us to be aware of our fellow workers and for supervisors to be keenly alert for behavioral changes in their employees that might indicate a need for assistance. It is also a time for all of us to understand that times are stressful not only for us, but also for our customers. As Rhona Post has written in the *Government Executive Magazine*: "The qualities we should encourage in the workplace—honesty, respect and trust—are highly valued in this period of unspeakable sadness. We rise up to share ourselves with both friends and strangers." (2)

We all know that life in the United States will never again be the same as it was before the morning of September 11, 2001. Yet, life goes on. A disaster assistance handbook produced by the Office of Personnel Management reminds us of the "healing power of work." (3) In spite of the unspeakable assault upon our nation, we can see work all around us and customers who need our help. The rains still come down, washing soil and fertilizers into rivers and streams. The wind still blows, carrying particles of soil and drops of pesticide to distant locations. We still have strong, prosperous farms and ranches that need our technical assistance and expertise, and small, limited resource farms that need even more of our help to survive and prosper.

Immediately after the tragedy, Patricia McGinnis, President and CEO of the Council for Excellence in Government, said: "The events of yesterday have drawn attention, especially among young people, to the important roles that government plays in their lives—from mayors, to police, to the rescuers, to the agencies, to the President." (4) As government employees, we have a renewed opportunity to take our place with our local, state, and federal colleagues in recovery and rebuilding. The scientific and technical talents that we possess are our significant contribution to the life of all Americans — in bad times as well as good.

(1) Squires, Sally, "Weathering the Storm: Researchers Have Learned Why Some People are More Resilient in Tragedies," The Washington Post, September 18, 2001
(2) Post, Rhona, "Helping to Heal," Government Executive Magazine, September 18, 2001
(3) Tyler, Mary, Ph.D., Handling Traumatic Events: A Manager's Handbook, Employee Health Services Policy Center, Office of Personnel Management (OPM), December, 1996 (Also on the OPM Web Site at: <www.opm.gov/ehs/pdf/trauma.pdf>)
(4) McGinnis, Patricia, "Quote of the Day," Government Executive Magazine, September 19, 2001

CONSERVATIONIST'S CORNER
Jane Hardisty, State Conservationist, Indiana

The NRCS in Indiana appreciates, and our customers benefit from, support of the NRCS Science and Technology Consortium. We use their expertise and technical products regularly to enhance and improve delivery of our technical services to customers. Our collaborations with the Centers and Institutes have been many and valuable.

Confined feeding operations for livestock are getting closer scrutiny from environmentalists, regulatory agencies, and the public. While we have always considered our soils knowledge base quite good, we have used the Soil Mechanics Center's testing and expertise to great value in planning and designing manure storage facilities. Five years ago we began to do soil mechanics testing for all earthen waste storage facilities we designed. The Soil Mechanics Center provided expertise and advice to us in our effort to improve the design and construction of the earthen storage facilities and, ultimately, to reduce the potential for environmental pollution in Indiana.

When one landowner in southwest Indiana decided to enroll over 7,000 acres in the Wetlands Reserve Program, we began planning one of the largest restoration sites in the nation. The Goose Pond and Beehunter Marsh sites became the focus of a weeklong planning session with 25 state, federal, and local wetlands specialists, including Wetland Sciences Institute staff**.** The result is a restoration plan that today guides restoration of this site to a diverse ecological landscape. As project planning progressed we found that hydrologic modeling information was needed to obtain permits for some of the work. The National Water Management Center is providing the expertise to accomplish this complex task. The overall result is a site that could be one of the most important features in the Mississippi Flyway for migrant waterfowl and shore birds.

The Grazing Lands Technology Institute works closely with us on the NUTBAL computer program which helps balance nutritional needs of grazing livestock on pasture. This valuable tool enables us to work with producers in revealing their operational shortfalls and helps us work through solutions with them. The Institute is also an authoritative source of information for articles, for solving unique problems, for determining forage suitability groups, for dealing with unique livestock, and for forages. Our grazing lands specialists contact the Institute at least once a month.

About half of the southern part of Indiana is perforated by Karst topography. The predominant feature of this formation is sinkholes that are formed when limestone below the surface dissolves and the soil above it caves in to form an opening to the surface. These openings provide a conduit from the surface directly to water tables and aquifers below ground. Land use close to the sinkholes can have a direct impact on the water supply below. The National Soil Survey Center used an Electromagnetic Conductivity Meter to do bedrock studies in three counties in Indiana to help soil scientists determine where the soils associated with sinkholes occur in the landscape. That knowledge helps us analyze site limitations and to analyze soils for potential contaminating uses.

Carbon sequestration, and its potential to reduce adverse effects from the greenhouse gas carbon dioxide, is an emerging national issue. The scientific community has recognized that plants are important in removing carbon dioxide from the atmosphere and storing it. Agricultural land can play an important role in the uptake and storage of carbon dioxide emissions.

Carbon sequestration is often referred to as a "win-win-win situation" with multiple benefits. The conservation practices that store carbon in the soil and improve air quality are the same practices that improve soil quality and water quality. They also improve habitat and increase biodiversity. Indiana is just the second state to measure the amounts of carbon that conservation practices can store. Working with the Natural Resources Environmental Lab at Colorado State University, which is supported in part by the NRCS Science and Technology Consortium, we undertook the Indiana Carbon Storage Project as a conservation partnership project in Indiana. We gathered historical information from every county about soil management. That data will be combined with soil and climatic data to model carbon levels in Indiana soils.

NEW PRODUCTS AND SERVICES

Animal Waste Management Software Approved for Field Use

The Animal Waste Management (AWM) software is up and running and approved for use in the field. AWM is a planning and design tool for estimating the production of waste materials within an animal feeding operation and determining the size of storage/treatment facilities. The process and calculations used in AWM are based on the USDA NRCS Agricultural Waste Management Field Handbook. Its strengths include ease of use, flexibility, and documentation. A weakness is the lack of nutrient tracking for land application. More information about AWM, including instructions for loading, is available at http://www.wcc.nrcs.usda.gov/water/quality/common/wastemgmt/awm.html.

A separate program, Manure Management Planner (MMP), is a nutrient management tool under development that will track nutrients through a waste management system and provide information for better land application decisions. The goal of the AWM and

MMP development teams is to integrate or link these two programs. As an alternative to MMP, or as a short-term measure, the AWM team will also be exploring ways to use AWM in conjunction with Manure Master (MM), a basic nutrient balance program available through the NRCS web page at http://www2.ftw.nrcs.usda.gov/ManureMaster/.

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Earthworm Technical Note Released

A new Soil Quality–Agronomy Technical Note, "Agricultural Management Effects on Earthworm Populations," is available. The note describes the effects of earthworms on soil, what factors determine earthworm abundance, and how agricultural management practices affect earthworm populations.

Single copies have been distributed to all offices. The note is available from the Soil Quality Institute web site at: http://www.statlab.iastate.edu/survey/SQI/agronomy.shtml

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Fact Sheet Emphasizes Human Aspects of Conservation Planning

"Human Aspects of the Conservation Planning Environment" is a new fact sheet in the Social Sciences Institute's People, Partnerships, and Communities (PPC) series. It defines factors in the four main segments of the conservation planning environment – (1) natural resources, (2) social issues, (3) economic issues, and (4) policy and legal issues. A graphic illustrates how the four segments intersect in the conservation planning process to make up the conservation planning environment.

The conservation planning environment concept is appropriate for conservation planners of individual to areawide conservation plans. This concept is an integral part of the Conservation Planning training course offered by the NRCS National Employee Development Center to all employees having conservation planning responsibilities.

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Irrigation Weir Design Spreadsheet Available for Download

NRCS Arkansas developed an Irrigation Weir Design spreadsheet with the assistance of the National Water Management Center. The tool can be used for the design of low-stage rock weirs that create pumping pools and enable farmers to capture and use excess surface water runoff for irrigation purposes. This technology and spreadsheet are applicable in the lower Mississippi delta region's flat topography and low gradient streams and channels. The technology may also be useful in other locations with similar topography and stream gradients.

The Irrigation Weir Design spreadsheet uses the criteria developed by the Agricultural Research Service for the design of rock chutes in sizing rock riprap armor for the downstream slope of the weir. The spreadsheet can be downloaded from http://wmc.ar.nrcs.usda.gov/tech.dir/IrrWeirDesign.htm.

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Soil Quality Information Series Adds Rangeland Soils

The popular Soil Quality Information Sheet series has been expanded to cover topics relevant to rangeland soils. The series describes soil properties that change in response to management and provide information related to several indicators used in rangeland health assessments. They support rangeland inventories and monitoring and provide management strategies for planning purposes.

The information sheets are intended for as wide an audience as possible. The information is primarily intended for use in the planning process; however, it can also be used as an educational resource for teaching about soil quality on rangeland. These information sheets are a collaborative effort of the Soil Quality Institute (SQI), the Grazing Lands Technology Institute, the National Soil Survey Center, the USDA Agricultural Research Service, and the USDI Bureau of Land Management.

The Rangeland Soil Quality Information Sheet titles include: Introduction, Indicators for Assessment and Monitoring, Aggregate Stability, Compaction, Infiltration, Organic Matter, Physical and Biological Soil Crusts, Soil Biota, Water Erosion, and Wind Erosion. The information sheets are available on the SQI web site at: http://www.statlab.iastate.edu/survey/SQI/range.htm. Hard copies can be ordered by e-mailing a request to: margaret.hitz@nssc.nrcs.usda.gov.

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TECHNOLOGY TRANSFER

Interest Grows in Soil Climate Analysis Network

The Soil Climate Analysis Network (SCAN) continues to expand thanks to funding provided to the NRCS National Water and Climate Center from Federal and State agencies, universities, and private groups. SCAN consists of remote automated stations that measure climate, soil moisture, and soil temperature, as well as the infrastructure to collect and manage the data. There are 45 stations scattered across the country. Four new SCAN sites were installed in September funded primarily by other agencies and non-profit groups. Two sites in Missouri were installed in cooperation with the Missouri State Climatologist. The Agricultural Research Service National Soil Tilth Laboratory sponsored one site near Ames, Iowa. The final site was installed in northern Minnesota as a joint venture with The Nature Conservancy on a newly acquired 23,000-acre wetland. A new master station for relaying data went online this summer at Stoneville, Mississippi. The USDA World Agriculture Outlook Board (WAOB) has provided funding for five more SCAN sites scheduled for installation in FY02. Requests have been received for additional SCAN sites for Iowa, Alabama, and Mississippi.

The number of users downloading SCAN data continues to increase. Data users are varied. For example, the WAOB uses the SCAN network to predict crop yields and assess drought risk throughout the United States. Data are used as input for the new interagency Drought Monitor (see http://enso.unl.edu/monitor/monitor.html). SCAN data also provide valuable information for flood mitigation and more farmers are relying on local SCAN data to make tough resource management decisions. Researchers are using the data to explore relationships between climate and soil responses and the implications of global climate change.

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NRCS Contributes to North American Agroforestry Conference

The USDA National Agroforestry Center provided three presentations and two posters at the recent North American Agroforestry Conference held in Regina, Saskatchewan. Bruce Wight, NRCS lead agroforester, was one of five keynote speakers. His presentation was titled "Shelterbelts: Their place in a changing agriculture." The conference focused on agroforestry as it relates to changes in social and economic patterns, including technology change, agricultural economy, and demand and supply of wood products. Approximately 200 participants from 24 states and seven Canadian provinces representing natural resource agencies, universities, private companies, private sector organizations, and interested individuals came together to discuss the latest advances in temperate agroforestry. Over 90 oral and poster presentations covered the general themes of silvopasture, greenhouse gases, socio-economic issues, intercropping/alley cropping, shelterbelts, riparian buffers, phytoremediation, and hybrid poplar technology.

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Silvopasture Technology Spreads Across the South

Silvopasture is the growing of trees and forages on the same acreage for economic and conservation benefits. The National Agroforestry Center, in cooperation with the Grazing Lands Conservation Initiative, has begun transferring silvopasture technology to Agency specialists and landowners in South Carolina, Georgia, Florida, and Alabama. This effort was kicked off with three silvopasture workshops in August.

The first workshop was conducted in Epps, Alabama, for The Federation of Southern Cooperatives, a federation of black farmers that work for community development and resource management. A second workshop was held in conjunction with the Soil and Water Conservation Society Meeting in Myrtle Beach, South Carolina.

A Silvopasture Leadership Training Workshop, sponsored by the USDA National Agroforestry Center and the USDA Forest Service - Southern Region, was held in Crestview, Florida in late August. Technical specialists from NRCS, Extension, and state forestry agencies from South Carolina, Georgia, Florida, and Alabama attended the

session. There were also two participants each from North Carolina State University and the Alabama Consulting Foresters Association. Participants at this workshop will make up the core trainers for developing coordinated technology training in silvopasture to Agency field personnel and for increasing landowner awareness.

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U.S.-Russia to Cooperate to Combat Invasive Species

Leafy spurge, Russian thistle, zebra mussels, cheatgrass, spotted knapweed, Russian olive, and Russian tamarisk are just a few of the invasive species that have originated in Russia and found their way to the U.S.

Scott Peterson, National Plant Data Center (NPDC), recently participated in a workshop in Borok, Russia, 8 hours north of Moscow on the Volga. There, 100 U.S. and Russian scientists developed ways of exchanging information about species of mutual concern, establishing joint research projects, and developing protocols for halting the spread of invasive species. The NPDC will cooperate with the Komarov Botanical Institute, St. Petersburg, Russia to obtain information about our current weeds originating in Russia and potential invasive plants. This information will eventually be integrated into the Plant Guides available through PLANTS <plants.usda.gov> to better assist you in combating the weed problem.

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TRAINING

Buffer Management Workshop

Earlier this year, the NRCS Watershed Science and Wildlife Habitat Management Institutes, in conjunction with Mississippi State University (MSU), sponsored a 2 1/2-day workshop on buffer management. The workshop, titled "Buffer Practices and Wildlife in Southeastern Agricultural Systems" was held on the MSU campus. Its purpose was to provide participants with science based information on designing and maintaining field

borders and filter strips to improve wildlife habitat diversity on intensively managed agricultural lands. The related issues of propagation of insects, weeds, and economic opportunity costs to landowners who install these buffer practices were also discussed. In addition to the presentations, participants visited field study sites where MSU researchers are testing various buffer management techniques.

The well-attended workshop included NRCS biologists, agronomists, resource conservationists, agricultural engineers, landscape architects, foresters, district conservationists, and soil conservationists from 10 states. There were also participants from state wildlife agencies, Farm Service Agency, U.S. Fish and Wildlife Service, Cooperative Extensive Service, and private organizations.

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Soil Quality Courses Scheduled

The Soil Quality Institute is sponsoring the course, "Soil Quality – Assessment and Applications for Field Staff." The following locations and dates are set: Cortland, New York – October 2 Week; Kearney, Nebraska – October 22 Week; Alexandria, Louisiana – February 11, 2002 Week; Knoxville, Tennessee – March 24, 2002 Week; To Be Announced, Iowa – April 22, 2002 Week; and To Be Announced, Washington – May 24, 2002 Week.

Instruction will be Tuesday through Thursday. Monday and Friday are for travel. The Institute will furnish instructors and all needed materials for the course. The state will provide the room and students.

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HONORS

Harper Receives Agroforestry Award

Larry Harper of Columbia, Missouri is the recipient of the 2001 Terry Johnson Memorial Award for his work in agroforestry. The award is presented each year on behalf of the USDA Natural Resources Conservation Service, the USDA National Agroforestry Center, and the National Woodland Owners Association to the professional or landowner who has made significant contributions to furthering the development and transfer of agroforestry technologies.

As editor for the "Missouri Ruralist" magazine and a regular contributor to the "Green Horizons" newsletter, Harper has provided outstanding leadership as a spokesperson for agroforestry throughout Missouri and the Midwest. He has installed alley cropping and silvopasture technologies on his Butler County farm and hosted numerous field days, in cooperation with the University of Missouri Center for Agroforestry. In addition, Harper has personally assisted other landowners who are considering agroforestry, and is active with the Walnut Council and the Association for Temperate Agroforestry.

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USDA NRCS TECHNOLOGY NEWS

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