"NRCS Technology News" ~ June 2002

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

"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. **"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

Through the 2002 Farm Bill, the Congress and the conservation constituency have challenged USDA to move forward on voluntary conservation in the United States. Additional funding and programs have been authorized, broader eligibilities produce workload challenges, and opportunities for innovation have been created. Up to date and easily accessible Science and Technology products are a key to effective Farm Bill implementation.

The Congress provided $10.4 billion in mandatory conservation funding through FY 2007. Most of the increase is for existing programs like the Environmental Quality Incentives Program (EQIP) and the Wetlands Reserve Program. New programs, such as the Conservation Security Program, the Grasslands Reserve Program, and the Ground and Surface Water Conservation Program, and expansions of existing programs such as the Agricultural Management Assistance Program, will also comprise a large part of the conservation funding in the coming years. These additional resources provide a challenge to NRCS and our partners for getting sound conservation practices and systems on the land effectively, efficiently, and fairly.

Most of the requirements in the new Farm Bill challenge NRCS to be more effective in developing standards and providing technical assistance in traditional areas such as protecting soil and water quality. In addition, air quality protection has been added as a purpose for EQIP. A major challenge for technology will be to develop workable and scientifically defensible bases and criteria for payments under the new Conservation Security Program.

The Farm Bill will have a great impact on NRCS but will have a far greater effect on the environment. It expands our abilities and opportunities to shape private lands conservation in the United States and to demonstrate our conservation technologies to the rest of the world. The challenges it presents include an increased workload that will be met by us in concert with a growing cadre of certified third-party vendors, conservation partners, and our Federal partners. Historically underserved land managers, minority producers, organic farmers, and others who may not have participated in conservation programs will provide new challenges. The Farm Bill also encourages us to seek out and test innovative conservation technologies.

Much is being done within the Science and Technology Consortium to get NRCS ready for these challenges. All technical handbooks, manuals, and guidance documents are being reviewed and updated in support of Farm Bill needs. The Electronic Field Office Technical Guide (e-FOTG) is being released for use on June 6, 2002. It promises to give us increasingly effective access to conservation information. National Practice Standards are in the latter stages of the first complete overhaul on the new, 5-year cycle. Up-to-date National Standards and State Standards are key to working effectively with clients and with third-party vendors who will be working with clients. Technical training is being revised to better support Farm Bill implementation.

It is our hope that when Congress considers the next farm legislation six years from now, we can all point with pride to our conservation accomplishments—accomplishments that demonstrate the strengths of our U.S voluntary approach to conservation. Six years from now Congress will be reading the conservation history that we are now writing. We must work to make it a history worth reading.

A table of the Conservation Title Budget Authority and Funding that displays program funding by fiscal year through FY 2007 will be available by June 7, 2002, at http://www.nrcs.usda.gov//technical/ress/whatsnew.html

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CONSERVATIONIST'S CORNER
T. Niles Glasgow, State Conservationist, Florida

Florida is agriculturally, socially, and economically diverse. Most of the State's population of 16 million, and 800-plus potential residents entering the State every day, find these attributes most appealing. Many people move to or stay in Florida because of its favorable climate. Climatic conditions vary from region to region and are conducive to growing a variety of crops. As a result, agriculture ranks second only to tourism in economic importance in the State, and Florida's net farm income ranks fifth nationally. Florida leads the Nation in the production of 20 different agricultural commodities. Producers grow 20 percent of the Nation's vegetables, 76 percent of the Nation's oranges, and 77 percent of the Nation's grapefruit.

Even with this kind of prosperity, producers are working with the NRCS Florida to understand the State's critical natural resource issues and how to resolve them. NRCS Florida and its partners have identified water conservation, water quality, soil erosion, grazing land health, wetlands, and threatened and endangered species as important State issues. Florida's farmers realize these problems affect Florida's landscape.

Florida's landscape is comprised of a variety of ecological sites. Many of these sites are fire dependent and require periodic burning to maintain the health and biodiversity of the land. Natural fire regimes have significantly altered agricultural conditions in Florida over the past decade. Plant communities have been changed, and there has been an impact on land values, range and forest production, and wildlife habitats in the State. To address natural fire regimes, the Grazing Lands Technology Institute developed "Introduction to Fire Ecology," a course on the ecology and effects of burning land. This has been a beneficial course for NRCS Florida field staff, partner organizations, and third party vendors.

The National Water Management Center and the Watershed Science Institute have helped Florida's watershed planning staff to develop a PL-566 watershed project in the Lake Okeechobee TMDL Basins. Lake Okeechobee's Basins contribute surface water directly into Lake Okeechobee, the second largest inland freshwater lake in the continental

United States. The water quality of Lake Okeechobee is a direct concern for agricultural, domestic, and the Florida Everglades water users downstream. NRCS Florida has also developed a plan, soon to be released, to address water quality issues associated with phosphorus loading from dairies and cow-calf operators inside the watershed.

The Agricultural Facilities Administration and Management Corporation, a not-for-profit Florida corporation, is cooperating with NRCS to implement and maintain innovative technology for confined animal feeding operations. Four demonstration farms have been chosen to showcase innovative technology. To speed the development of comprehensive nutrient management plans (CNMP), the Ecological Sciences Division and the Conservation Engineering Division provided training to third-party vendors for two of the demonstration farms. Now that water quality and soil erosion are concerns on confined animal feeding operations, a CNMP will be required for every demonstration farm. Along with innovative waste treatment technology from NRCS Florida, many of the farmer's actions have been integrated into the plans.

Dr. William Puckett and Soil Quality Institute staff members recently teamed up with Florida soil scientists and the Southeast Region's MLRA office to show them how to use the Agency's new Soil Quality Kit. Staff members from the National Park Service's Big Cypress National Preserve in Collier County attended the demonstrations.

Florida offers much to new residents as well as to those who call themselves native residents. Natural resource issues will always be a concern to those engaged in agriculture as well as those who want to enjoy the State's good weather.

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NEW PRODUCTS AND SERVICES

#1 "Developing and Maintaining a Network" Fact Sheet Available

"Developing and Maintaining a Network," available later this month, is the latest addition to the Social Sciences Institute's (SSI) People, Partnerships, and Communities (PPC) fact sheet series. The Conservation Partnership at all levels can use networking to enhance and expand its involvement with various customer groups. In addition, networking helps keep a diverse customer base aware of its stake in the NRCS mission. Networking can be a tool for individuals and organizations to expand resources while maintaining autonomy. This PPC provides tips to help you to identify potential customers for your network and to recognize or create networking opportunities. It also presents ideas and steps for building and maintaining a beneficial and active network.

"Developing and Maintaining a Network" will be available, with the many other SSI products that address the people aspects of conservation work, at the SSI Web site http://www.ssi.nrcs.usda.gov. Printed copies of most SSI products, including the new

fact sheet, can be requested from <ssinter2@po.nrcs.usda.gov>.

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#2 Sunn Hemp: A New Alternative for South Florida Producers

Sunn hemp is an annual legume that can produce over 5,000 pounds of biomass and 100 pounds of nitrogen per acre in just a few months. It also suppresses some types of nematodes. Because of its potential use in alternative pest management systems and as a sustainable biological source of nitrogen, sunn hemp is a promising cover crop for rotation with vegetables throughout the Southeastern U.S. Unfortunately, its use has been limited by the high cost of seed; seed production requires a tropical climate and most seed is produced and shipped from Hawaii.

In 2000, the Plant Materials Center in Brooksville, Florida, initiated a study to determine the zones in Florida where sunn hemp seed can be economically produced. Seed was distributed to 15 growers throughout Florida. Not surprisingly, many locations lost their crop to frost before seed had a chance to mature. Despite frost damage, sunn hemp stands in coastal counties below the 27th parallel were consistently able to mature and produce up to 370 pounds of seed per acre. Growers in more southern areas, such as Homestead, obtained even higher yields. Study results indicate that sunn hemp seed can be produced and provide an alternative cash crop for southern Florida growers.

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TECHNOLOGICAL ADVANCES

#3 Soil Visualization with Micromorphology Technique Enhances Soil Study

Micromorphology, the microscopic examination of thin slices of undisturbed soil fabric, provides scientific information that complements analytical data of soils. It is the one laboratory technique that preserves the natural arrangement of soil materials in the study of the properties and relationships of soil mineral and organic constituents.

The National Soil Survey Center (NSSC) laboratory in Lincoln, Nebraska, has produced thin sections of soil fabric for many of the pedons being analyzed for chemical, physical, and mineralogical properties. Thin sections are made by first impregnating soil material with a resin that hardens upon heating. The soil is then sliced to fit a glass slide and ground to about 30-µm thickness. Particle features, such as arrangement, size, mineralogy, and weathering, can then be examined with a petrographic microscope. Primary soil structural units as well as the shape and continuity of pores are readily visible.

Micromorphology has been instrumental in developing certain criteria of Soil Taxonomy and elucidating pedogenetic processes such as argillation, pan formation, and crusting. This science has wide application in disciplines such as soil chemistry, soil physics, land-use management, biology, and archaeology. Photomicrographs of soil fabrics are increasingly used to educate students of all ages and levels (K-12, university, professionals). These images help to visualize soil composition and genetic processes. The slide presentation, "Soil Under a Microscope", http://www.nrcs.usda.gov/technical/worldsoils/microscope/, is an example of the educational use of micromorphology. NSSC's "The Colors of Soil" poster, in addition to providing information about the science of soils, features an enlarged image of a thin section of soil fabric.
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#4 Native Plant Growth Improves with Worm Castings and Mycorrhizae

Two studies were undertaken at the Plant Materials Center in Lockeford, California, to examine the effects of worm castings and the endomycorrhizal inoculum, Glomus intraradices, on container production of three California native plants: 'Duro' California buckwheat, 'Rio' beardless wildrye, and LK115d purple needle grass.

In one study, vermaculture worm castings at various rates (1/3 of soil mix, 2/3 of soil mix, and all worm castings) were used in the propagation soil mix. 'Duro' exhibited excellent growth at the 2/3-worm casting treatment level, and 'Rio' showed excellent growth when all worm castings were used. LK115d presented gradual growth increases

with increasing quantities of worm castings, and the all worm castings treatment demonstrated good performance when compared to the control.

In a second study, mycorrhizal inoculum (tested at three rates: 0.9 gram, 1.8 gram, and 2.7 gram per gallon container) was successful in increasing plant vigor, growth height, and drought tolerance. 'Duro' had excellent vigor at the 1.8 gram rate. 'Rio' and LK115d had excellent vigor at the 2.7 gram rate and were 17.78 cm and 7.62 cm taller, respectively, than the control.

The results of these evaluations show promise for broader applications. The increased use of worm castings may have benefits for sustainable agriculture, and inoculation of plant material with mycorrhizae may aid California native plant competition and establishment over invasive and non-native plant species. More details of the studies are available in Technical Notes 62 and 63.
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#5 WIN-PST Software Upgrade Prints Directly From Report Screen

A new CCE version of the Windows Pesticide Screening Tool (WIN-PST) is available from the National Water and Climate Center at: http://www.wcc.nrcs.usda.gov/water/quality/frame/pestmgt.html. Version 2.0062B includes an updated pesticide database with 21 new active ingredients and new Environmental Protection Agency product registration data. The most important enhancement is the ability to print reports directly from the WIN-PST report screen on any available network printer.

NRCS Pest Management Policy (November 2001) requires the use of WIN-PST or other NRCS-approved environmental risk analysis tools to support the development of the pest management component of conservation plans. NRCS, conservation districts, third party vendors, Extension, private crop consultants, and producers can use WIN-PST.

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TECHNOLOGY TRANSFER

#6 National Water and Climate Center Web Site Traffic Doubles

In January of this year, the National Water and Climate Center's (NWCC) Web site exceeded the customer access rate of one million hits per month. This rate of activity is more than double the amount of last year's January traffic. Customer access continued to increase in February and March, with 1,355,154 hits in March alone. NWCC also provides data to customers via anonymous FTP access. During March 2002 there were 252,882 FTP file downloads – also a two-fold increase from last year.

The NWCC Web site provides water supply forecasts for the Western U.S., snowpack information, soil moisture and temperature data from the Soil Climate Analysis Network (SCAN), climate data and analysis, and water quality, hydrology, and water management technology. The increase in access this year may be due in part to the severe drought conditions developing in many parts of the country, especially in the Southwestern U.S. where streamflows are forecast to fall below record minimums. A weekly drought summary can be obtained from the NWCC Web page at http://www.wcc.nrcs.usda.gov/water/w_qnty.html. NWCC also contributes data for the latest drought information provided at http//drought.unl.edu/dm/index.html.

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#7 Organic Industry Looks to NRCS for Help

The NRCS Science and Technology Consortium exhibited recently at the Organic Trade Association (OTA) Conference and Trade Show in Austin, Texas. NRCS Texas demonstrated the Customer Service Toolkit, and the Consortium presented a sample of technical assistance products. Several speakers promoted NRCS and conservation programs as a source of technical and financial assistance for organic growers. The organic producers were particularly interested in how the new Farm Bill will impact them and how participation in conservation programs may be beneficial to their industry.

NRCS increased its awareness of the need to involve organic growers to ensure that practice standards and program rules do not inadvertently exclude organic growers by specifying the use of chemicals or practices that are not allowed under organic rules. NRCS field offices may be asked more often to serve organic growers by helping them

apply conservation practices and develop conservation plans that coordinate with organic farm plans. Organic growers may provide additional models to demonstrate conservation practices that can also be applied to conventional agricultural operations.

The Science and Technology Consortium was part of a USDA exhibit shared by four other agencies: Risk Management, Agricultural Marketing, Foreign Agriculture, and the National Organic Program. Computers with Internet connections were used to answer visitors' specific requests for resources.

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WEB-BASED TECHNOLOGY

#8 Plant Profiles Enhanced With More User–Friendly Features

Plant Profiles at PLANTS have been improved with added thumbnail distribution maps and navigational aids, and with a "Printer-Friendly Version" that condenses the information on each profile.

Each Plant Profile is now vertically integrated with thumbnail distribution maps for all species within a genus and with clickable links to other genera in the same plant family. Each species shows thumbnail maps for its subspecies or varieties and provides links to genus and family. The result is that you can move easily between the profiles for closely related plants and compare their features. The thumbnail distribution maps help you narrow the possibilities geographically, and clicking on a thumbnail map takes you directly to the Plant Profile for that plant. You can also right-click on a thumbnail to save it on your computer, and then use it in documents. In addition, the updated Plant Profile provides quick access to all images of the relevant genus that are in the Gallery. To see these new features, go to the Plants Name Search at http://plants.usda.gov and do a "symbol" search for "PINUS."

Plant Profiles offers a new "Printer-Friendly Version." The document that results from selection of this option presents the essential profile information without links and other information that are irrelevant in a printed document. To view an example, go to the Plants Name Search at http://plants.usda.gov, do a "symbol" search for "PIAR," and then select Pinus aristata (bristlecone pine). The resulting Plant Profile will show a printer icon labeled "Printer-Friendly Version."

These features are part of the ongoing effort to make the PLANTS site increasingly user-friendly. A recent e-mail from a satisfied user states: "Thanks for having this awesome informative site…. Kudos to all who helped put this database together."

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TRAINING

#9 "The Leader in You" Spring 2002 Series Concludes June 12

"The Leader in You" spring 2002 series wraps up on Wednesday, June 12, with "Strategy in the New Competitive Landscape." The seminar will air from 11:00 a.m.-12:30 p.m. e.t.

Trainer C. K. Prahalad, professor of Corporate Strategy and International Business at the University of Michigan Business School, will examine a) the contours of the new competitive environment, b) the changes in the process by which managers can create value, c) the need for a rapid learning curve and an equally important quick "forgetting curve," d) the process of becoming opportunity driven, and e) the leadership demands on managers.

Satellite broadcast and handout information was distributed in an all employee e-mail.

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#10 Video Training Course Addresses Landscape Considerations in Conservation Planning

"Understanding the Landscape" is a video training course that will provide NRCS field staff with the basic knowledge and skills needed to incorporate landscape considerations into conservation planning. Through a series of 12 lectures and 5 case studies, students will be introduced to key ecological and social components of landscapes. The case studies, from diverse landscapes across the continental United States (Malpai Borderlands, Upper Midwest, Lower Mississippi Valley, Connecticut River, and Willamette River), integrate principles highlighted in the lectures. The course workbook includes references, a glossary, and interactive classroom exercises designed to reinforce the students' insights and knowledge gained from the lectures.

"Understanding the Landscape" was developed for the National Employee Development Center under the leadership of the Wildlife Habitat Management Institute (WHMI), in partnership with Oregon State University (OSU) and Colorado State University (CSU). WHMI Director Pete Heard states, "The quality of this production by our colleagues at OSU and CSU is excellent. In fact, the Upper Midwest and the Lower Mississippi Valley case studies have been selected as recipients of the highly coveted Telly Award for their excellence."

Updated availability information for "Understanding the Landscape," scheduled for a July release, is on the WHMI Web site at http://www.ms.nrcs.usda.gov/whmi/.

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