NRCS Technology News

July/August 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.

Features in this issue include:

MESSAGE FROM THE DEPUTY CHIEFS

"Technological Advances to Help Field Staff and TSPs"

Lawrence E. Clark and Maurice J. Mausbach

The Farm Security and Rural Investment Act of 2002 is a significant commitment to the Nation by its increase of funds directed towards conservation on private lands. This legislation will increase funding for conservation by more than $18 billion over the next 10 years. Chief Knight stated at the one-year anniversary of the 2002 Farm Bill, "...the President's budget proposal for 2004 includes nearly $3.9 billion for conservation programs." With this substantial increase of funds for conservation initiatives and the associated increase in technical assistance demands, many avenues are being pursued that will promote the efficiency and productivity of our employees and distribute the conservation workload through increased involvement of our partners as well as technical service providers (TSP) from private industry.

An example of improved infrastructure to support increased productivity is new electronic technology capabilities in field offices. These changes will assist NRCS field office employees, TSPs, and anyone with login access to the electronic-Field Office Technical Guide (e-FOTG). As all field office CCE (common computing environment) computers are advanced to Microsoft Windows XP®, users–especially those with laptops–will be able to use Thunderbook, a digital technology briefcase, to its full advantage. Field office staffs will receive more timely announcements by way of State "splash pages" that will highlight new items, special tools and technical resources, and provide convenient access to notices and draft material under review. County-centric Web page designs will eventually allow for more county-specific items in the e-FOTG. Internet search capabilities will become more comprehensive. Geospatial data warehouse will facilitate remote access to reports from NASIS (National Soil Information System) and other geospatial databases. Phase III of e-FOTG implementation will escalate our use of electronic technologies—Internet, intranet, PC, laptop, etc. Phase III,

scheduled for implementation in FY-04, will enable use of planning and application guidance information across different computing devices and systems. Field staffs will experience a more seamless flow of information from geospatial databases and guidance documents to planning, contracting, and application tools.

Another example of infrastructure development is improvement to the process of calculating technical assistance costs, which will facilitate payments to our partners and TSPs. A team of economists from National headquarters, the States, Institutes, and the Economic Research Service has been working on setting the initial not to exceed (NTE) rates for technical assistance. The team reviewed three sources of cost information: the data submitted by TSPs through Federal Business Opportunities, available NRCS contract data, and the data in the Technical Assistance Cost of Conservation Practice (TACCP) data base. The team concluded that the TACCP database is the most comprehensive and reliable data source and has recommended that it be used as a basis for the NTE rate. It includes the NRCS costs of technical assistance for typical practices in each of the 214 time team areas. However, the TAACP data have some limitations for estimating NTE rates. For instance, in a given time team area there are no observations for practices smaller or larger than the one considered typical, and in many time team areas no observations for any practices at all. The economics team is developing models to address these weaknesses to provide guidance to state conservationists. For typical jobs on all land uses across the country, regression curves will be fit for all observations for given practice components. These curves will relate the cost of the technical assistance per unit to the size of the unit receiving the technical assistance. The curves will help form a basis for estimating costs outside the range of typically sized jobs. In some cases, the difference in costs among adjacent time team areas is only a few cents and state conservationists will be encouraged to combine the rates to reduce administrative costs.

The preceding are only two examples of activities that will support productivity and bring additional TSP assistance to expanded conservation programs. NRCS will continue to be innovative with regard to infrastructure processes and technological advances so that as an Agency we do our part to fully meet the 2002 Farm Bill's commitment to conservation.

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CONSERVATIONIST'S CORNER

Bob Graham
State Conservationist - Oregon

Oregon is the land of rain. Or is it? Pictures of Oregon found in calendars and coffee table books typically feature moss-draped trees, lush pastures, and flowering orchards against a backdrop of snow-capped peaks. While scenes like these do exist, they mask a well-kept secret—beyond the mountains lies the "dry side." Close to half of Oregon

receives less than 20 inches of precipitation a year—much of it less than 8 inches—and almost all of Oregon is virtually "rain free" from July through September.

Oregon, like much of the country, is experiencing drought with high frequency and severity. The 2001 Klamath Basin drought in southern Oregon and northern California eliminated irrigation water for over 1,300 farmers during the growing season. NRCS Oregon and the agriculture community are increasingly turning to the National Water and Climate Center for water-related information. The Center operates the Snowpack Telemetry (SNOTEL) data collection system that provides snowpack data for 12 Western States. SNOTEL data help the Center produce water supply forecasts used by NRCS planners and irrigation districts to determine where, when, and how much water will be available for crops, livestock, wildlife, and humans. The Center provides NRCS with climate data to support conservation planning tools, such as RUSLE II (Revised Universal Soil Loss Equation) and water quality and quantity assistance in farm and watershed evaluations. The Klamath Basin Special Report, an example of a NWCC product, is available at http://www.wcc.nrcs.usda.gov/special/klamath.html.

The conservation challenges surrounding threatened and endangered species are also tied directly to the quality and quantity of water resources in Oregon's watersheds. The work of NRCS and many other groups to address these challenges has led to cooperative studies with the Wildlife Habitat Management Institute (WHMI). An active WHMI study, funded in part by the USDA Agricultural Research Service and the Oregon Seed Council, aims to document the importance of drainage ditches in Willamette Valley grass seed fields as winter habitat for fish and amphibians. This information will be useful to NRCS planners designing conservation systems that enhance protection and recovery efforts for threatened and endangered fish and other aquatic species.

The protection and recovery of endangered plants and insects is an emerging focus of the Plant Material Centers (PMC) that serve Oregon. The PMCs are instrumental in increasing the numbers of threatened Howell's spectacular thelypody and Nelson's checkermallow, contributing to the recovery and possible de-listing of these plants. Negotiations are underway with various interest groups to begin cooperative programs that will aid the recovery of threatened plants. They include the rapidly declining Oak-Savanna plant community, the Willamette daisy, and Kincaid's lupine (host to the endangered Fender's blue butterfly).

The NRCS, in cooperation with the local conservation districts, continues to develop and improve our technology and expertise as we address the diversity and complexity of Oregon's natural resources.

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NEW PRODUCTS AND SERVICES

#1 Streambank Bioengineering Field Guide for Low Precipitation Areas Available

Looking for a handy streambank bioengineering tool while in the field? The recently published "Streambank Bioengineering Field Guide for Low Precipitation Areas" provides general information about riparian planting zones, plant materials selection criteria, and different bioengineering treatments, including installation guidelines and materials requirements. Intended as a quick onsite reference source rather than an exhaustive design tool for bioengineering structures, the guide is small enough to fit in a field pack and is printed on water resistant paper.

Information from the field guide is being incorporated into the NRCS Stream Design Guide that is under development. The field guide and its parent publication, the more comprehensive "Practical Streambank Bioengineering Guide," are online at http://Plant-Materials.nrcs.usda.gov/idpmc/. Click on Riparian/Wetland Project in the lower right corner.

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#2 SPAW Version 6.1 Water Budget Model Released

Version 6.1 of the Soil-Plant-Air-Water (SPAW) water budget model is now available from the National Water and Climate Center (NWCC). SPAW Version 6.1 is CCE (common computing environment) compliant for both Microsoft Windows ® XP and NT operating systems.

SPAW is a field-level tool that uses a modified SCS (Soil Conservation Service) Curve Number method to develop water budgets for agricultural fields. Water budget processes are evaluated by making daily adjustments to crop canopy cover and antecedent soil moisture. Daily, monthly, and annual water budgets are presented in table and graph format. Field water budgets can be used by field staff for evaluating runoff and infiltration from precipitation events.

SPAW also provides an integrated pond module to develop pond water budgets. The primary inflows to the pond are surface runoff and precipitation. Auxiliary inflows, such as well and stream diversions or dairy wash water, allow budgets to represent processes

for storage reservoirs as well as waste lagoons. Pond areas can also represent inundated wetland areas. A statistical evaluation provides an analysis of inundation frequency. Pumping simulations to replicate managed inflow/outflow can be set for automatic or manual activation. Tabular and graphical outputs provide daily, monthly, and annual summaries for the major water budget processes.

The SPAW model is a product of the Agricultural Research Service and NRCS. The SPAW download is available from either the NWCC Web site at http://www.wcc.nrcs.usda.gov/wetdrain/wetdrain-tools.html, or from the USDA Service Center for CCE software at http://servicecenter.kcc.usda.gov/.

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#3 Monthly Wind Summary Graphics Available Online

Monthly wind summary graphics, called wind roses, have been developed for nearly 250 weather stations in all 50 States as well as Guam and Puerto Rico. The wind roses are available from the National Water and Climate Center at http://www.wcc.nrcs.usda.gov/climate/windrose.html. Wind roses provide a graphic summary of how wind speed and direction are typically distributed at a particular location.

Each wind rose presents the wind speed and frequency of time (in percent) that winds blow from particular directions. The graphic resembles a wheel, with the spokes representing the 16 cardinal wind directions (N, NNE, NE, etc.). Wind roses provide a snapshot view of wind conditions at various locations. They can be a useful planning tool for a variety of air quality and wind erosion related tasks including site placement of livestock and poultry facilities, preparing windbreaks, and estimating drift from pesticide applications.

These graphics were developed using 30 years (1961-1990) of hourly wind data for each station. Recently, the use of wind roses has been integrated into the NRCS buffers courses, providing needed wind information for planning windbreaks.

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TECHNOLOGICAL ADVANCES

#4 Alternative Cover Crop Kill Method Developed: Knife Roller/Crimper

The knife roller or crimper is a relatively new tool that can effectively kill cover crops with minimal herbicides. Cover crops, an important part of no-till cropping systems, can improve productivity and increase soil organic matter while reducing nutrient leaching, erosion, and herbicide and pesticide needs. However, a critical component of cover crop management is adequately killing the cover so it does not compete with the cash crop. The knife roller or crimper performs this essential function. The tool rolls the crop so stalks lie parallel to the direction of the direct-seed planter, leaving a heavy and even ground cover that is easy to plant. For more information about how and when to use a knife roller/crimper, see Soil Quality Agronomy Technical Notes 13, 14, and 15, available at: http://soils.usda.gov/sqi.

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5 New Soil Climate Analysis Network Stations Aid Remote Sensing Study

As part of a large study on remote sensing of spatial soil moisture by NASA, ARS (Agricultural Research Service), and Alabama A&M University, three new SCAN (Soil Climate Analysis Network) stations were installed in Tennessee recently by the National Water and Climate Center (NWCC), in partnership with Alabama A&M. The objectives of the study are to better understand land-atmosphere interactions, extend instrument observations to a broader range of vegetation conditions, validate land surface signals retrieved from AMSR (Advanced Microwave Scanning Radiometer) data, and evaluate new remote sensing instruments for soil moisture. The new SCAN stations and the existing stations in the United States provide ground truth soil moisture and climate measurements to evaluate the new AMSR satellite. The study is being conducted in Tennessee, Alabama, Oklahoma, Georgia, and Brazil. More information about the SMEX03 (Soil Moisture Experiment 2003) experiment is available at: http://hydrolab.arsusda.gov/smex03.

In addition to supporting research, the SCAN stations provide important information to support drought mitigation responses and other agricultural decisionmaking activities. SCAN data are available in Real-Time at the NWCC homepage at http://www.wcc.nrcs.usda.gov/scan.

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#6 Constructed Wetlands Developed for Non-Point Source Runoff Research

The NRCS Wetland Science Institute (WSI), in cooperation with several States and agencies, designed and developed two constructed wetlands for non-point source runoff. Research will determine the resulting water quality benefits. Designs were based upon NRCS technical information: Technical Note 4, "Nutrient and Sediment Control Systems," produced by the former Northeast National Technical Center; "Pesticide Reduction in Constructed Wetlands for Agricultural Non-point Source Runoff Treatment;" and Wetland Assessment Information Series Number 3, developed from Technical Note 4.

In Mississippi, the Agricultural Research Service (ARS) National Sedimentation Laboratory installed a constructed wetland in May 2002 in cooperation with the Mississippi Soil and Water Conservation Commission and the Mississippi Department of Environmental Quality 319 Program. The wetland is on the outlet of a 35-acre watershed before it enters Beasley Lake, part of the Mississippi System Evaluation Area on which large-scale on-farm research is conducted. A series of tests to evaluate the performance of the wetlands in mitigating the effect of sediment, nutrients, and pesticides in runoff will be conducted this summer by the National Sedimentation Laboratory Water Quality and Ecological Processes Research Unit, along with the ARS Jamie Whitten Delta States Research Center and Arkansas State University.

In Louisiana, an NRCS engineer designed a constructed wetland for the Louisiana State University Red River Experiment Station. This wetland will be on the outlet of 340 acres of row crops and 60 acres of pasture. After its construction in the fall, the wetland will be evaluated for its success in mitigating non-point source runoff. Plant materials for the wetland will be selected by the NRCS Louisiana state plant materials specialist, with additional information from the Jamie L. Whitten Plant Materials Center. Financial

assistance was provided through the Louisiana Department of Environmental Quality 319 Program.

Additional information for constructed wetlands for non-point source runoff is available at the WSI Web site. Follow the link for the Oxford site, then click on Constructed Wetlands for Agricultural Non-point Source Runoff. (The site is currently undergoing security upgrades and may be temporarily unavailable.) The site contains the design information and other constructed wetlands information. As results from the constructed wetlands research become available, additional articles will be available.

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TECHNOLOGY TRANSFER

#7 NRCS Science and Technology Featured at International Ministerial Conference

NRCS demonstrated its conservation technology at the Ministerial Conference and Expo on Agricultural Science and Technology held from June 23 to 25 in Sacramento, California. The theme of the conference was "A Leader in Conservation Technology." "The NRCS was one of 10 participating USDA agencies at the conference," said Lawrence Clark, Deputy Chief of Science and Technology. About 150 ministerial delegations from over 100 countries attended the expo, which was hosted by Ann Veneman, Secretary of Agriculture.

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#8 New Records Set at National Plant Data Center

This May, the National Plant Data Center set all-time records on its PLANTS Web site. The site logged more than 8.35 million hits, over 1.8 million pages of information served, and 288,791 visits (sessions), for an average of 58,820 pages of information served each day. This is a significant increase from April 2003, when nearly 7.5 million hits were logged, 1.7 million pages of information served, and 274,119 visits (sessions) made, for an average of 57,191 pages of information served each day.

In May 2002, there were 6.2 million hits, 1.5 million pages of information served, 225,235 visits (sessions), and an average of 48,346 pages of information served each day. These statistics confirm continued and growing interest in the PLANTS comprehensive plant science database.

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#9 Wildfire Update and Information Resources

The current wildfire season is well underway. As of June 26, 2003, ten large wildfires are burning in three states (Alaska - 1, Arizona - 4, and New Mexico - 5), though the number of fires is significantly below average to date. As of the end of June, the projected number of fires this season is 29,376. These fires are expected to burn 969,239 acres nationally. This represents an approximate 30 percent decrease compared to historic fire activity in terms of fires and acres (1994-2002).

The Southern and Eastern areas are expecting below normal to normal fire activity this season. However, the Southwest, Great Basin, Northwest, California Rocky Mountains, and the Northern Rockies are expected to experience above normal fire activity for the remainder of the season. There are several reasons for this forecast:

- Long-term drought persists over much of the interior West, and June, which is a critical month in setting the stage for the summer fire season, has started out warm and dry and is expected to remain that way over most of the Western States.
- Drought-stressed and/or insect damaged vegetation is becoming more prevalent across the Western States and will increase the potential for large wildfires at mid to high elevations.
- Spring rains and cool weather, while delaying the onset of fire season, have resulted in an abundance of grass and fine fuels over the majority of the West. These fuels are rapidly curing and will contribute to the rapid spread of fires once ignitions occur.
- Many areas in the West have already reached or will be experiencing critical fire danger indices by the end of June.

Forecasts continue to call for a very active tropical storm season, which could result in an above average number of hurricanes. This may impact the Southern States through the

summer months. Updated information on the current wildfire situation can be obtained at the following Web site: http://www.nifc.gov.

The effects of wildfire on vegetation and animals are always a concern. NRCS employees need to be ready to respond to client requests concerning the possible consequences of a fire. A national database is available to help examine the possible impact of fire on the ecosystem. See http://www.fs.fed.us/database/feis for this information.

Several Web sites are available to help homeowners plan and apply practices to their property to help maintain fire safety and reduce the opportunity for fire to destroy homes and other buildings. The Firewise Web site, http://firewise.org/, provides useful information and links to other sites that can be helpful and informative. These sites offer tips about developing strategies for fire resistant landscaping, tree spacing recommendations for fire safety, maintenance plans for reducing fuel loads, continuity and ladder fuels, and developing and conducting a fuel hazard assessment. All of this information can help develop a wildfire defendable zone in the wildland/urban interface areas that have suffered real losses in wildfires over this year and the past few years.

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WEB-BASED TECHNOLOGY

#10 New Information Available at PLANTS

The National Plant Data Center (NPDC) has made changes to its Vascular Plants Checklist and added new images. A major update of PLANTS' vascular plant checklist and distributional data in PLANTS is near completion. State data are more complete with county distribution data for 45 states. If users note gaps in the State or county distribution data, new records can be submitted through the PLANTS Distribution Update module.

More than 16,000 color photos and line drawings are now available through PLANTS. The images are accessible from the search criteria at the Gallery or present on the Plant Profile for individual species. In addition to the standard profile image, large and publication-quality images are available. If you have a set of 100 or more plant images (identified to species) that you would like to have integrated into PLANTS, please contact the NPDC.

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#11 Plant Materials Program Publications on the Web

NRCS Plant Materials Program (PMP) publications are directly accessible at the PMP home page, http://plant-materials.nrcs.usda.gov, or from PLANTS Topics, http://plants.usda.gov. Available publications pertain to practices, plant establishment, and other technologies. More publications, newly and previously published, will be obtainable as Plant Materials Centers make them available. This module results from collaboration of the Plant Materials Program and the National Plant Data Center.

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TRAINING

#12 *The Leader in You* Fall Seminar Series Announced

Plan to join us for "Give 'Em the Pickle!," "Power Tools for Women," and "Excellence in Leadership and Management." These topics in *The Leader In You* fall satellite seminar series will feature presenters Bob Farrell, Joni Daniels, and Ken Blanchard.

The first seminar in the series, "Excellence in Leadership and Management," features internationally known author Ken Blanchard. It will broadcast on Wednesday, September 24, 2003, from 11:00 a.m. to 12:30 p.m. e.t. This program will emphasize the keys to self leadership, how to be an effective manager in a one-on-one context, and the elements of team and organizational leadership.

"Give 'Em the Pickle!" will broadcast on Wednesday, October 15, 2003, from 1:00 to 3:00 p.m. e.t. Presenter Bob Farrell will discuss customer service and some of the best techniques to meet the needs of your customers. "Pickles" are those special or extra things that can promote customer satisfaction. The trick is figuring out what your customers want, and then make sure they get it—that's the pickle!

"Power Tools for Women," the third and final fall seminar, will broadcast Wednesday, December 10, 2003, from 1:00 p.m. to 3:00 p.m. e.t. This seminar, co-sponsored by the Federal Women's Program, Earth Care Connection, USA, and our cooperating sponsors shown below, features consultant Joni Daniels. This program will help recharge your personal and professional energy and teach you creative strategies for new and emerging priorities.

The Leader in You program, sponsored by the NRCS Social Sciences Institute and the NRCS 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, National Association of State Conservation Agencies, National Conservation District Employees Association, and the Federal Training Network are cooperating sponsors of the program.

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NEW PERSONNEL APPOINTMENTS

#13 New Employee Appointments Announced

Wendell Gilgert, wildlife biologist for NRCS Wildlife Habitat Management Institute, Ft. Collins, Colorado, was selected as regional technology specialist for the West Region, Davis, California. This selection is effective August 10, 2003.

Ronald (Ron) Heavner, manager of cooperative agreements for the U.S. Department of Energy, was selected as the national air quality specialist in the Conservation Engineering Division, Washington, D.C., effective June 1, 2003.

Charles (Chuck) M. Lander, staff agronomist and nutrient management specialist for the Ecological Sciences Division, was selected to fill the position of national agronomist in the Ecological Sciences Division, Washington, D.C., effective May 4, 2003.

Clarence (Clare) Prestwich, irrigation engineer for the State of Idaho, was selected to fill the agricultural engineer position at the National Water and Climate Center in Portland, Oregon, within the Conservation Engineering Division, effective June 30, 2003.

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