

“USDA NRCS Technology News” ~ June 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.

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MESSAGE FROM THE DEPUTY CHIEFS

Lawrence E. Clark and Maurice J. Mausbach

It may seem unusual to be analyzing private sector marketing studies to find information that might be helpful to us. When you stop to think about it though, we really are engaged in marketing conservation to the people we work with—farmers, ranchers, and other private landowners. We can learn a great deal about their potential responses to our outreach efforts from studies that strive to understand consumer behavior. Just as the private sector needs to understand how to market cars, soft drinks, and the myriad of other consumer products we encounter every day, we need to understand how to do a better job of marketing our product—voluntary conservation—to our customers.

A recent private sector marketing study analyzed the attitudes of different cultural groups toward the Internet.(1) Although some aspects of the study refer to consumer attitudes toward on-line credit card use, other results can be extrapolated to provide some interesting “food for thought” for the Natural Resources Conservation Service (NRCS) and our voluntary conservation partners, especially if we are seeking ways to communicate our mission via the Internet. The study finds, for example, that different ethnic and cultural groups use and perceive the Internet in very different ways. While some may focus on career advancement and professional development, others are more likely to focus on the Internet as an information resource.

The Federal government also recognizes differences in utilization of the Internet and in computer expertise among varying income, racial, and ethnic groups—referred to as the “Digital Divide.”(2) The most recent analysis reports that the digital divide is rapidly closing, although at different rates in different situations. Of particular interest to an agency such as ours is the fact that the gap in access to the Internet between households in rural areas and those in households nationwide has narrowed considerably since 1998.

Certainly, one thing we can learn from these and other studies is that technology transfer to our customers via the Internet is, and will continue to be, a complex process. Developing technology that is appropriate, economically feasible, and easy to apply is only the first step. To use the Internet effectively, we must understand whether and why our customers might go to the Internet for resource conservation information, whether they would have confidence in the information, and how they might apply the information to their own situations. As we begin to investigate the possibilities of using modern technology such as the Internet to provide technical information to our customers, we must be aware of unique needs and attitudes. We will find it difficult to communicate technical information to our constituencies via the Internet if we do not

consider language, ethnicity, and location of Internet sites other than NRCS. These studies suggest that these factors influence trust, acceptance, and relevance to the local community. We also need to be aware of the significant differences in Internet access and expertise between low- and high-income groups.

Currently, about a third of U.S. farms have access to the Internet, up from 13 percent in 1997.(3) These figures represent all sizes and types of farms. The technology is being adopted rapidly, particularly among large farms with sales of more than \$250,000 per year, where nearly 80 percent report they are utilizing the Internet. Our marketing challenge is to determine how resource conservation information can be formulated and displayed in ways that provide the best service to a widely diverse group of customers. We may not be responsible for the Digital Divide, or for its magnitude, but we are responsible for assuring that our customers, regardless of race, income or ethnic background, have access to the information they seek.

1. Tseng, Thomas, "Ethnicity in the Electronic Age: Looking at the Internet through Multicultural Lens". A report of The Cultural Access Group, Access Worldwide Communications, Inc, (January 2001)
2. U.S. Department of Commerce, National Telecommunications and Information Administration, "Falling Through the Net: Toward Digital Inclusion" (2001)
3. U.S. Department of Agriculture, National Agricultural Statistics Service, "Farm Computer Usage and Ownership", (July, 1999)

CONSERVATIONIST'S CORNER

John C. Titchner, State Conservationist, Vermont

Nowhere is the concept "healthy watersheds and sustainable landscapes" more apropos than in Vermont, a state that is struggling to maintain its dairy industry and the rural landscape that supports it, even as it deals with and encourages growth and development. Water quality is the state's major environmental focus, as it has been for the past 25 years. How appropriate, then, to have the NRCS Watershed Science Institute (WSSI) headquartered at the University of Vermont, overlooking Lake Champlain.

Lake Champlain, bordered by Quebec, Canada, on its northern most reaches, is situated between Vermont and New York State. The Lake serves as a source of drinking water for 180,000 New Yorkers and Vermonters, 4,000 taking water directly.

The United Nations designated the Lake as an International Biosphere Reserve and, by a special act of Congress, it enjoys the same protection status as the Great Lakes and Chesapeake Bay.

Point and non-point sources of pollution have plagued Lake Champlain for years. In summer 2000, three dogs died after they drank water from the Lake where a blue-green algae was in bloom. This algae, also known as cyanobacteria, was thought to produce a toxin. In response, a project was developed by the WSSI entitled "Evaluation of Potential Blue-green Algae Toxins in Lake Champlain" where tests conducted on raw

and finished drinking water and on zebra mussels confirmed the presence of toxins. A widespread bloom of this organism could impact drinking water and recreational users of the lake.

WSSI also supported a watershed-scale, phosphorus mass-balance model developed by the University of Vermont's School of Natural Resources and funded by Vermont's NRCS. This model has been used to determine the complex interaction between urban, forest, and agriculture to predict changes in phosphorus loading to Lake Champlain. From this model, WSSI created and evaluated various management scenarios based on projected population changes over the course of 50 years. Subsequently, this model has been used in other states and is now receiving international attention.

The Social Sciences Institute (SSI) is another useful and timely resource for Vermont. SSI has several programs, appropriate for staff at all levels, which address managing change and periods of transition. The professional development series "The Leader in You," in particular, addresses organizational change and leadership development. My retirement this year will precipitate change at NRCS Vermont. We anticipate that we will be well served by SSI as we have been by WSSI and the other Institutes and Centers throughout the years.

NEW PRODUCTS AND SERVICES

Alternative Crop Information Module Now On-line

An Alternative Crop module is now available on the PLANTS web site <<http://plants.usda.gov>>. This module provides quick access to information about alternative crops that may be suitable for small scale farming by small-operation and limited-resource farmers. Web links are provided to cultural requirements and marketing strategies for the crops and states that you select.

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Easy Access to Related Plant Species Information

Expanded functionality of the PLANTS web site allows easy access to information on plant species related to the plant selected. From there, you can select related species that could provide alternatives for your conservation activities. For example, select the "Plant

of the Week” on the PLANTS home page <<http://plants.usda.gov>>. Under “More Information” select the “Plant Classification” report. Then, select “Genus” in the hierarchy, and a list is provided of all species within that genus.

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Small-operation and Limited-resource Farmers Survey Findings Summarized

“Core Conservation Practices: Paths and Barriers Perceived by Small and Limited Resource Farmers” is scheduled for release in July 2001 by the NRCS Social Sciences Institute. The first study of its kind, this technical report summarizes findings from a survey of 834 small-operation and limited-resource farmers in Alabama, Georgia and Mississippi. The report presents detailed profiles of the use and understanding of the Core 4 Conservation practices among African American and Caucasian, small-operation and limited-resource farmers. Barriers to the adoption of the Core 4 are identified. A list of suggested NRCS actions based on key findings is also included in the report.

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Stress Management Fact Sheet Available in July

Stress is inevitable and continues to be a challenge in today’s society at work and at home according to stress management experts. A recent survey completed by NRCS field staff revealed that their stress levels were very high when compared to other organizations. “Stress Management” is a new publication in the fact sheet series entitled People, Partnerships, and Communities (PPC). It will define stress and its symptoms, job stress, and stressors. Stress management tips, techniques, and habits of effective stress managers are also covered as they relate to NRCS operations. Additional references are provided for those who want more in-depth information on this topic. “Stress Management” will be added in July to the PPC series of fact sheets now available at <<http://people.nrcs.wisc.edu/SocSciInstitute/ppcInformation.htm>>.

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Tool Aids Selection of Columbia Basin Cover Crops

To help determine which cover crops might be suitable for protecting Columbia Basin soils the Plant Materials Center in Pullman, Washington has developed mathematical models. The soils of the semiarid Columbia Basin region are weak-structured sands and silts. They erode so severely during common windstorms that as much as seven times the tolerable soil loss level can be removed during one windstorm. Cover crops are critical to holding these soils in place. The models use average daily temperatures, growth rates of several cover crops, and historic weather records of 14 communities in the Columbia Basin to predict how much cover crop growth can be expected. Some of the more promising crops for the region include triticale, winter wheat, mustard, and turnips.

Data from the models have also been incorporated into a Geographic Information System (GIS) database. Integrating cover crop data with the soil, wind, and topographical information in the GIS database gives growers and conservationists the ability to develop best management practices for each field to reduce the hazard of wind erosion.

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TECHNOLOGY RELATED TO KEY AGENCY DECISIONS

The Agency leadership has identified two key Agency decisions for emphasis in FY2001. Conservation planning and nutrient management are at the top of the list of work for the Agency. Products and services that are most closely related to these two key Agency decisions will be identified in USDA NRCS Technology News from time to time in this section.

New Tool Automates Estimates of Nutrient Removal by Crops

The Crop Nutrient Tool, now available through the PLANTS web site, <<http://plants.usda.gov>>, provides estimates of nutrient removal [nitrogen (N), phosphorus (P), potassium (K)] by crops. The values in the tool represent national estimates of the nutrient content in harvested plant biomass for many crops. These estimates are used to calculate nutrient balance sheets, which are employed in the design

of animal waste management systems, and to assist in national and regional policy development and decision-making. The Crop Nutrient Tool automates and augments the information that is currently in chapter 6 of the NRCS Agricultural Waste Management Field Handbook.

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Report Updates Information on Land Capacity Versus Manure Volume

A report detailing the shift in livestock production during the last two decades has been released by NRCS. "Manure Nutrients Report Relative to the Capacity of Cropland and Pastureland to Assimilate Nutrients" takes information from the Agricultural Census from 1982 to 1997 and compares manure nutrients with the land available for application.

The report indicates that the production of recoverable manure nutrients exceeds the assimilative capacity of all cropland and pastureland in some counties. The number of these counties significantly increased since 1982, indicating a need for innovative uses of manure or long distance off-site transport.

A few copies of the report were sent to each state. The report in its entirety can be accessed through the National Water Management Center homepage at <http://wmc.ar.nrcs.usda.gov> or directly from the national headquarters (NHQ) site <http://www.nhq.nrcs.usda.gov/land/pubs/mannt.html>. The NHQ site has instructions for ordering additional copies of the report.

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TECHNOLOGICAL ADVANCES

Improvements Increase Utility of National Soil Information System (NASIS)

The results of several recent improvements to the National Soil Information System (NASIS) are better and faster access and entry of soil data and properties. The NASIS Central Server, which hosts the first application on the USDA Web Farm at Fort Collins,

increases performance at the field office level and allows interpretations and map unit data to be shared among all users.

Soil survey data can be exported from NASIS in the new SSURGO Version 2 data standard. These data can be loaded into an MS Access template, which is available from the NASIS web site at <www.nasis.nrcs.usda.gov>. The exports include “fuzzy logic” interpretations, which provide users more meaningful information to aid decision-making on the use and management of soils.

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Master Station Enhances Use of Meteor Burst Communication

A new meteor burst master station for remote monitoring of soil moisture and climate conditions in the Central, Southern, and Eastern United States came on-line late last year. The addition of the Stoneville master station has enhanced the National Water and Climate Center’s (NWCC) capability to use meteor burst communication for the Soil Climate Analysis Network (SCAN). Currently, about 11 SCAN sites are reporting to the Stoneville master station, and the data are forwarded to NWCC for processing. Once the data are received by NWCC, they are placed onto the NWCC homepage for users. All of the SCAN data are available in real-time by going to <http://www.wcc.nrcs.usda.gov>.

NRCS NWCC, USDA Joint Agriculture Weather Forecasting Office, Mississippi State University, and Meteor Communication Corporation are partners in this cooperative effort.

Additional information about SCAN, Snowpack Telemetry (SNOTEL), and Meteor Burst Communication Technology is available by visiting the NWCC homepage, <http://www.wcc.nrcs.usda.gov>.

For more information, contact:

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Native Grass Hay Bales Produce Positive Revegetation Results

Native grass hay, baled from seed production fields at the Plant Materials Center in Tucson, Arizona has been used to successfully revegetate deteriorated rangeland at

several sites. The technique involves spreading native grass hay over an area and using livestock trampling over the distributed hay as a tool to plant grass seed. Livestock trampling to incorporate seed is a technique that dates back to the 1950s. Plant Materials Center staff and cooperators at the University of Arizona Cooperative Extension Service, Bureau of Land Management, Malpai Borderlands Group, U.S. Forest Service, and the NRCS Douglas (Cochise County, AZ) Field Office have been able to use the practice successfully with native grass material. Native grass hay is similar to conventional straw and can be applied at the same rates as straw mulch; however, using native materials in revegetation projects encourages development of a diverse native plant community.

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Planting Techniques Improve Establishment of Native Warm-Season Grass

Native grass establishment is often hampered by weed competition. Ways to overcome some establishment problems of native warm-season grass were investigated by the Jamie L. Whitten Plant Materials Center. Eight planting techniques for switchgrass were evaluated over a 2-year period.

Best results were obtained from spraying Roundup at 1 quart per acre in late summer, preparing the seedbed in the fall, and no-till drilling the seed (to avoid disturbing the seedbed) in early spring. Another promising treatment involved controlling weeds with Gramoxone at 1.5 quarts per acre in early spring, preparing the seedbed, and broadcast planting during the first part of May with no additional seedbed disturbance.

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Watershed Tool TR-55 Upgraded to WINDOWS

“Urban Hydrology for Small Watersheds,” TR-55, has long been in use within the Agency and is popular among private consultants for sizing detention basins for small watershed areas. NRCS personnel from Illinois, Iowa, and South Carolina, as well as the National Water Management Center, the National Water and Climate Center (NWCC), and national headquarters are working with the Agricultural Research Service to develop the Windows-based version of TR-55.

Unlike the current version, the Windows-based version no longer relies on the unit discharge tables and csm/in versus Time of Concentration curves. Additionally, the detention basin sizing routine has been revised to a routing procedure, as opposed to relying on the “approximate detention basin routing” graph in the existing version.

The Windows-based TR-55 computer program is now available for BETA testing through the NWCC web site. To learn more about becoming a BETA tester visit the web site at <http://www.wcc.nrcs.usda.gov>. From the main NWCC web page, follow the links to “Water Quality and Quantity Sciences,” then to “Hydrology/Hydraulics,” and finally, to “TR-55 Beta Test.”

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TECHNOLOGY TRANSFER

Visitors to PLANTS Up 74 Percent over March 2000

For March 2001 the PLANTS web site experienced a 34 percent increase in activity over January 2001 and a 74 percent increase over March of last year. With total hits of 2.7 million, PLANTS provided the equivalent of 15,313 hours or 7.36 person-years of technical assistance. Statistics are from PLANTS web site dissemination point only.

For more information, contact:

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TRAINING

Locally Led Conservation Train-the-Trainer Workshop Scheduled

The Social Sciences Institute (SSI) is conducting a train-the-trainer workshop for a course entitled, “Developing Your Skills to INVOLVE COMMUNITIES in Implementing Locally Led Conservation.” This training supports the Natural Resource Conservation Service Strategic Plan and the current Farm Bill. The twofold purpose of

the training is (1) to familiarize participants with the nine-module training program developed by the SSI and Michigan State University, and (2) to provide participants with the tools to customize and cost-effectively implement the training in their state or region.

The train-the-trainer workshop will take place June 25 to 29 in Grand Rapids, Michigan.

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“Stress Mastery” Completes The Leader in You Spring Series

“Stress Mastery,” the fourth and final broadcast in this spring’s The Leader in You series, will teach you how to identify those common causes of stress and how to take charge of your own mastery of them. Learn to access the power of relaxation to rejuvenate and to restore energy and motivation in minimum time. Anyone dealing with stress in the workplace or who is trying to avoid stress in the working environment will benefit from the techniques presented by Dr. Todd Nelson who is a naturopathic doctor, wellness educator, and practitioner with 17 years experience. Nelson is a popular radio talk show host, as well as president/owner of the largest, most successful naturopathic clinic in Colorado.

“Stress Mastery” will be broadcast from 1 to 3 p.m. ET on June 14. Satellite broadcast coordinates and information about the handouts will be provided to NRCS employees, districts, and state conservation agencies as soon as they are available.

For more information, contact:

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Training Reinforces Antenna Tower Climbing and Rescue Readiness

The Snow Survey and Water Supply Forecasting Program and the Soil Climate Analysis Network (SCAN) make extensive use of antenna towers for the meteor burst remote data collection system of the SNOTEL (SNOWpack TELemetry) and SCAN networks. Most of the 1,500 antenna towers that are used in these two networks range from 20 to 30 feet tall with sensors, solar panels and transmit antenna mounted at the top.

The National Water and Climate Center purchased appropriate state-of-the-art climbing equipment and provided an antenna tower climbing and rescue school for program

employees at the Boise, Idaho NRCS meteor burst communication facility. The course was a 2-day event that included learning how to repel down 30-foot antenna towers and perform an “on tower” rescue. Thirty employees were trained and certified to climb and perform a safe rescue.

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WINDOWS-based Erosion Prediction Software to be Introduced

Revised Universal Soil Loss Equation, Version 2 (RUSLE2) is a new Windows-based erosion prediction software developed under the leadership of the Agricultural Research Service (ARS), in cooperation with the NRCS Ecological Sciences Division. NRCS will begin using this new technology in field offices by the end of calendar year 2002.

A RUSLE2 concurrent session will be conducted at the Soil and Water Conservation Society (SWCS) annual meeting in Myrtle Beach, South Carolina, on Monday, August 6, 2001, from 10:30 a.m. to 12:15 p.m. The Ecological Sciences Division, a co-sponsor of this session, encourages NRCS personnel at the SWCS meeting to attend this session. Attendees will learn why this model was developed, why NRCS decided to implement it, and the schedule for implementation at the field office level. The latter half of the session will cover some technical aspects of the model, including a computer demonstration of how the model can be implemented at the field office level with minimal training.

This session is geared toward NRCS administrators, managers, and anyone with natural resource program responsibilities at the national, regional, state, or local level.

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