

“NRCS Technology News” ~ July-August 2002

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

*****NRCS Chief Bruce Knight featured in this issue*****

“NRCS *Technology News*” is an electronic information piece provided by Science and Technology ten times a year. 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

A special message from Bruce Knight, the new Chief of the Natural Resources Conservation Service, is featured in the “Conservationist’s Corner” of this issue of NRCS Technology News. “Message from the Deputy Chiefs” will return in our September issue.

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CONSERVATIONIST’S CORNER

Bruce I. Knight, Chief

Some of the most exciting things I have learned since becoming Chief have to do with Natural Resources Conservation Service (NRCS) activities in the areas of science and technology. I thought I was fairly aware of the importance of good science in conservation. Certainly, conservation science and technology have been a part of my thinking as a farmer and rancher, a college student, a congressional staffer, and a lobbyist. But, being Chief –with all the briefings I have attended and the decisions I am now responsible for making – has changed that awareness to total amazement.

Science and technology are more than a tradition here at NRCS, they are a way of viewing the world and a fundamental tool for making conservation work. Our history in the areas of science and technology is impressive. That history has included early studies of small stream hydrology, the Cooperative Soil Survey Program and the National Soil Survey Information System, the Cooperative Snow Survey Program, the Plant Science and Technology Program, our Field Office Technical Guides, and many other accomplishments. Our efforts in science and technology have provided science-based information for all our field activities and many state and local activities.

As Chief, I am responsible for making our small part of government more efficient and more accessible to our customers through the Internet and other electronic means. The President’s e-government initiative directs all agencies to make more services available electronically.

I know NRCS will continue to be a leader in the e-government effort, because we have been working toward this goal for several years. The e-government services that are ready for use today are the result of decisions NRCS made years ago. Some good examples are creating the Soil Climate Analysis Network (SCAN); making the Natural Resources Inventory a continuous survey, rather than a periodic survey; putting the Field Office Technical Guides on the Web; creating software for the Customer Service Toolkit; and creating our PLANTS database.

Our challenge now is to keep innovating and to stay ahead of the need for e-government services. The Farm Security and Rural Investment Act of 2002 (the Farm Bill) creates opportunities that require new approaches and more efficient ways of planning and delivering conservation practices. The decisions we make today and the work we do now will help us deliver new science and technology applications to meet the

needs of the future. The progress we make in science and technology will help our employees, our partners, and our customers put the Farm Bill to work on the land.

To succeed, we must develop new ways to serve our clients and to meet their needs through Web-based tools and user-friendly decision support tools. We must continue to provide the highest quality technical assistance to landowners, based on the most recent technology and economic analysis. We must provide ready access to technical data through electronic and other means.

Beyond that, we must find ways to get our employees, partners, and customers to use new technologies as they become available. Some people are quick to use new technology. Other people – most of us, in fact – need to see the benefits of a new technology, and be convinced that it is easy and convenient, before we will start using it. Our success will depend on how many people we can reach with our emerging e-government services.

Getting the right science and technology to the people who need it is a major challenge. I will support the efforts of our divisions, institutes, and centers and the Science and Technology Consortium to help us acquire, develop, and transfer technology that meets landowner needs. Our work in science and technology will continue to support the efforts of people to conserve, improve, and sustain our Nation's natural resources and environment.

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NEW PRODUCTS AND SERVICES

#1 Cool-Season Legume Cultivars Released for Southeast

Four new cool-season annual legumes for the Southeast have been released cooperatively by the Plant Materials Center (PMC) in Americus, Georgia, together with Auburn University (AU) and the University of Georgia. These legumes were developed for use as conservation tillage plants, green manure, and cool-season cover crops, as well as nitrogen fixation providers. The release and use of these new cultivars are documented in the video, "New Legumes for Cover Crops," produced by Clemson University in collaboration with NRCS.

AU EarlyCover is an early blooming hairy vetch that provides early growth and maturity. Another hairy vetch, Americus, develops much later and provides more dry matter production and coverage for soil and water protection. AU Sunrise crimson clover, developed to be the earliest developing crimson clover on the market, blooms earlier than other crimson clovers, including AU Robin. Along with AU EarlyCover, AU Sunrise can expand the flexibility of conservation tillage and cover crop systems. AU GroundCover caly pea is used for forage production in heavy calcareous clay soils and

provides good cover for conservation tillage. All of these legumes can be used in green manure and organic gardening systems.

For more information, contact:

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#2 Model Area-wide Planning Guide Available

A Model Area-wide Planning Guide is a “generic” areawide planning guide for use by NRCS staff, conservation partners, or communities engaged in natural resource or conservation planning over a broad area or within a watershed. It is a resource of user-friendly material that States can modify, customize, and produce as their own to guide their large-scale planning activities. The document contains a gallery of photos from across the country, graphics, and text boxes—which can be selected and used as desired—or local material of interest can be substituted. The document is general enough to guide any group of planners, who need not be engaged in NRCS activities, and specific enough for the Agency’s own use in areawide or watershed planning, either program specific or not.

The guide was developed cooperatively by the Watershed Science Institute (WSI) and NRCS staffs in Connecticut, Illinois, and Missouri. The material is provided in Word “doc” format for easy access and editing. It can be downloaded from the WSI homepage at <http://www.wcc.nrcs.usda.gov/watershed/>. Select “Product” and then “Planning Tools.” The guide is the eleventh item down the list and is highlighted with the “new” flag. The file is 21 MB so it takes some time to download, but once download is complete the editor is ready to go.

The WSI homepage provides a variety of products, such as planning tools, that support the development and transfer of appropriate technology in response to comprehensive watershed needs and environmental sustainability at the watershed and landscape scales.

For more information, contact:

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noonan@wvu.edu

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#3 New Seed Production Manual Available for Florida Native Species

The *Florida Native Seed Production Manual* contains comprehensive information about growing Florida native species for seed, including information about state-of-the-art planting and production technology. Planting and collection equipment that is on the market is reviewed and detailed information is provided about seed conditioning equipment.

As interest in planting native species continues to grow, the demand for high quality native seed also increases. Seed producers need reliable, timely information on growing a variety of native species, and the Plant Materials Program is drawing on its years of production experience to provide that information. With funding from the Florida Institute of Phosphate Research, the Plant Materials Center (PMC) in Brooksville, Florida produced this publication to be a valuable resource for native seed producers.

The 65-page manual is available on the Plant Materials Program Web site at <http://plant-materials.nrcs.usda.gov/pubs/flpmcpufldsprod.pdf>. Printed copies with additional seed and plant photographs can be obtained from the PMC at Brooksville.

For more information, contact:

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Sharon.Pfaff@fl.usda.gov

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#4 Plant Materials Program Releases Useful for Wildfire Revegetation

Revegetation is critical to preventing soil erosion after wildfires. A number of native grasses released by the Plant Materials Program are highly successful at providing this needed cover. Seed is readily available for long-time performers like ‘Critana’ and ‘Bannock’ thickspike wheatgrass, ‘Pryor’ and ‘San Luis’ slender wheatgrass, ‘Sherman’ big bluegrass, ‘Goldar’ and ‘Whitmar’ bluebunch wheatgrass, ‘Secar’ Snake River wheatgrass, and ‘Sodar’ streambank wheatgrass.

New releases appropriate for post-wildfire seeding are Garnet Germplasm mountain brome, commercially available, and Tusas Germplasm bottlebrush squirreltail, in commercial production and soon to be available from growers. Details about these plants and other releases suitable for wildfire revegetation are available from regional plant materials specialists.

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dan.ogle@id.usda.gov

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TECHNOLOGICAL ADVANCES

#5 Highway Studies Yield Erosion Control Information

Studies to examine various aspects of vegetation establishment have been initiated throughout Arkansas by the Plant Materials Center at Booneville, Arkansas, in cooperation with the Arkansas Highway and Transportation Department. Establishing vegetation is critical for controlling erosion along new or rehabilitated highways. Under investigation are annual and perennial species selection, seedbed preparation techniques, soil amendments and mulch application methods, and application of new products like hydrogel. Two early tests appear promising for highways and, potentially, other critical areas, such as abandoned gas well drilling sites, county roads, and logging roads.

At the Batesville test site in northwest Arkansas, poultry litter (readily available in the region) was compared to commercial fertilizers in promoting plant establishment on 3:1 slopes. The poultry litter's high organic matter content held more moisture, provided an environment for better germination and seedling vigor, and its effects were obvious longer than those of the commercial fertilizer. Application of the litter is more difficult than that of commercial (uniform) fertilizer, but this problem can be overcome with development of specialized application equipment.

At the Fort Smith site, PMC staff tested the effectiveness of a new mulch product. The material is a loose 3/8-inch pellet made of recycled paper and composted animal waste, packaged in 30-pound bags. It was applied about 1/4-inch deep to a bare 3:1 slope. The May 2000 application is still in place with no soil erosion since placement. The PMC is designing additional studies using this new mulch to determine best seed placement—above or below mulch—and will be collecting data on germination and seedling vigor.

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#6 NRCS SNOTEL Master Stations Will Undergo Improvements

The SNOTEL system in the West uses two NRCS-owned communication master stations to support meteor burst radio communication with the remote automated stations that monitor snowpack and climate conditions for water supply forecasting. The master station in Idaho is scheduled to receive additional receivers and new high-gain antennas that will improve system performance. The master station in Utah will undergo more extensive improvements later this year.

The master stations were designed in 1975 and had only four receivers that supported communication with 160 SNOTEL sites. Since then, the number of SNOTEL sites has grown to 660, and many have enhanced sensors, higher capacity data loggers, and upgraded meteor burst radios. Therefore, the master stations require better antenna coverage to decrease the wait time for data from the remote sites. The data from SNOTEL is used to access current drought and fire risk assessment and is also used by the National Weather Service for flash flood warnings and watches.

Data from the SNOTEL system are available in near real-time from the NWCC homepage at: <http://www.wcc.nrcs.usda.gov>.

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TECHNOLOGY TRANSFER

#7 Carbon Sequestration Study Results Available

State-level assessments in Iowa, Indiana, and Nebraska detail how management decisions about cropping and tillage systems on 60 million acres of cropland are affecting soil organic matter. The objectives of these studies were to assess the rates of carbon sequestration that result from conservation practices and to provide locally relevant estimates and decision tools for evaluating the potential of alternative management strategies to sequester carbon in soils.

Assessment results for the three states reveal that agricultural soils are sequestering 5.2 million metric tons of carbon per year—equivalent to removing 18.9 million metric tons of CO₂ per year from the atmosphere—largely through increased adoption of conservation practices over the past 10 to 20 years. This is equivalent to 6 percent of all the fossil fuel combustion in the three states—an offset of 70,000 train cars of coal or 2.4 billion gallons

of gasoline.

The assessments were conducted by NRCS in collaboration with Colorado State University (CSU). Our approach used a variety of resource data (climate, soils, land use, and management), long-term field experiment results, and the Century EcoSystem Soil Organic Matter Computer Model developed at CSU. A new survey instrument, the Carbon Sequestration Rural Appraisal, was developed to collect local data that captured the uniqueness of each state and the differences among all 284 counties. Using GIS (geographic information systems) and existing database of land use and soils, individual tailored spreadsheets were prepared for each county that detail existing land use and soils interactions. The CarbOn Management Evaluation Tool (COMET) databases for each county show century estimates for the millions of scenarios that show C changes. They are being distributed through the NRCS Iowa, Indiana, and Nebraska State Offices.

For additional information, contact:

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jrbrenner@nrel.colostate.edu

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#8 Hawaiian Districts Receive Locally Led Conservation Planning Training

Leadership, recruitment of volunteers, and how to involve the community were all emphasized in a training session at the recent Hawaii Association of Conservation District's meeting. District directors received handout packets that included additional training opportunities, case studies, and procedures for estimating participation rates, estimating community trust, and evaluating locally led conservation planning. The latter two procedures are available on SSI's Web site at <http://www.ssi.nrcs.usda.gov/>.

Frank Clearfield, director of the Social Sciences Institute, delivered the presentation to representatives of Hawaii's 16 Conservation Districts and 4 Resource Conservation and Development areas. SSI develops and delivers a variety of tools to assist The Conservation Partnership with the “people aspects” of conservation work.

For more information, contact:

Frank Clearfield
Social Sciences Institute
(336) 334-7058
clearf@ncat.edu

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#9 NRCS Network Facilitates Technology Transfer

An informal NRCS Community Collaboration Network has been formed to provide peer-to-peer support for interested NRCS staff related to their community collaboration planning activities. Resources available via the Network include e-mail contacts and a Web site. Additional activities are in the planning phase. The Network hopes to enhance technology transfer within NRCS while sharing ideas, strategies, tools, resources, and other information related to community collaboration and planning.

The NRCS Community Collaboration Network is maintained and supported by eleven committee members and sponsors, which include the Watershed Science Institute (WSI), State Conservationist–Connecticut, Resource Conservation and Development Council Program Manager, Social Sciences Institute, and the Farmland Preservation and Community Planning Division. The Network Web site is hosted by WSI and is accessed through its home page, <http://www.wcc.nrcs.usda.gov/watershed/>. The Web site displays a “Shared Resource” section with just a few topics listed. It is expected that this section will grow over time and will offer items of interest to the group participants.

NRCS staff interested in participating in the network need to provide your name, title, address, telephone and fax number, voicemail number, and e-mail address to Phil Morneault.

For more information, contact:

Phil Morneault
Community Planner - NRCS Connecticut
(860) 871-4028
Phil.Morneault@ct.usda.gov

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#10 PLANTS Web Page Activity Increases 72 Percent

Visits to PLANTS showed a marked increase for May 2002. Statistics for the early part of the year were just over 3 million hits per month, but May hits increased to 6.2 million. This is a 72 percent increase over May 2001.

For more information, contact:

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scott.peterson@usda.gov

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#11 Russian Fulbright Scholar Aids Northern Circumpolar Soil Database Development

To further the development of the Northern Circumpolar Soil Database, Dr. Sergey V. Goryachkin from the Institute of Geography, Russian Academy of Sciences, Moscow, Russia, worked with the National Soil Survey Center (NSSC) in Lincoln, Nebraska, for 7 months under a Fulbright Grant. He was part of the Russian group that had contributed to the development of the Gelisol Order of Soil Taxonomy and the Cryosols of the World Reference Base for Soil Resources (WRB) in the late 1980s and early 1990s. That work had been an activity of NRCS, the International Union of Soil Scientists, and International Permafrost Association to improve the classification of soils with permafrost. While this activity was ongoing, they began creating a large soils database for the circumpolar region. Dr. Goryachkin's Fulbright Scholar was to allow him to help improve the Circumpolar Soil Database.

Dr. Goryachkin analyzed the relationships among Soil Taxonomy and the Canadian, WRB, and Russian soil classification systems to determine whether information available in one could be combined with that in another, and whether an overall database for many uses and users could be created. He found large differences in approaches among the four classification systems. For example, the Canadian system uses soil nomenclature that is closer to that of the Russian system than to that of the U.S. system, but the Canadian and Russian systems differ in their understanding and diagnostics of the gleysolic order and subgroups. In addition, the U.S. and Russian systems are very similar in their approaches to aquic and gleyic features.

In spite of these challenges, progress was made in the development of the Northern Circumpolar Soil Database. The Russian pedon database, which has 250 georeferenced profiles, was linked to the NSSC database. The Russian national map was correlated to the subgroup level of Soil Taxonomy, and, on this level, Soil Taxonomy worked very well. Dr. Goryachkin, together with NSSC staff, developed a map of subgroups of the Gelisol order using the Russian classification. Finally, the whole Northern Circumpolar Soil Database was fit into the four classification systems—U.S., WRB, Canadian, and Russian—mainly at the subgroup level of Soil Taxonomy or equivalent levels in the other systems. The database was tested in an application for vulnerability of northern soils to physical disturbances. The resulting map shows the areas that have a high potential for erosion, such as Iceland and the northern part of European Russia.

Having a Fulbright scholar at the National Soil Survey Center was a benefit to the NSSC and its activities in the National Cooperative Soil Survey. Dr. Goryachkin's visit has enhanced our contacts with many scientists in Russia, and his contribution while here increases the compatibility and flexibility of the northern soils database and the understanding of different soil classification systems. We hope that similar exchanges will take place in the future.

For more information, contact:

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National Soil Survey Center
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john.kimble@nssc.nrcs.usda.gov

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#12 Soil Interpretations Needed for Comprehensive Nutrient Management Planning

Comprehensive nutrient management planning (CNMP) requires that soils maps and appropriate interpretations are included. National Soil Information System (NASIS) CNMP-related soil interpretations are available via the Soil Data Viewer technology available in the Field Office Toolkit. Resource planners can work with state soil scientists to review the available interpretations and determine which are appropriate for inclusion in a CNMP. Where available interpretations do not meet the local CNMP requirements, local variations of appropriate CNMP interpretations can be created and included in the Soil Data Viewer. The Soil Data Viewer technology also allows interpretive maps of the client's property, rather than just the soil map, to be part of the CNMP. For each of the interpretations determined to be included in the CNMP, a map showing the suitability of soils for that particular interpretation is easily provided. This map is the more appropriate information for planners. Not only is the suitability of a soil indicated, but the limiting features can also be provided. Thus, the planner will know what soil feature(s) must be considered when determining the best management practices for a particular area.

NASIS interpretations, "AWM–Manure and Food Processing Waste," "ENG–Sewage Lagoons," and "AWM–Irrigation Disposal of Wastewater," are some examples of soil interpretations that can be considered appropriate for use in the development of a CNMP.

"AWM–Manure and Food Processing Waste" is based on criteria published in the *Agricultural Waste Management Field Handbook*, Part 651 of the NRCS National Engineering Handbook series. Although the name implies that food processing waste disposal is part of the interpretation, the real purpose of the interpretation is to assess the soil-related limitations affecting applications of manure to the land. These limitations may affect environmental or health concerns. The resultant soil ratings are based on the assumption that the nutrients in the manure are used for crop production and the manure is maintained on the application site. The soil properties and qualities considered in this interpretation are those that affect soil absorption, plant growth, microbial activity, the susceptibility to wind or water erosion, and application methods. Certain soil properties, such as permeability, the depth to a seasonal high water table, sodium adsorption ratio, depth to bedrock or a cemented pan, available water capacity, wind erodibility, and stones, can interfere with the various methods of waste application. For further information, see chapter 5 of the field handbook.

"ENG Sewage Lagoons" is an interpretation appropriate for determining the general location of an agricultural waste-holding lagoon and shows the potential limitations that

could be found in a given area. One caveat is that this interpretation should be used only for general site selection. Onsite evaluation and testing are needed before the lagoon is installed. Waste-holding lagoons have nearly level, relatively impervious floors surrounded by compacted cut slopes or embankments. When a soil is evaluated as a potential site for a waste-holding lagoon, permeability is a critical property, along with factors of fractured bedrock within a depth of 40 inches, soil material thick enough over bedrock or a cemented pan to make smoothing for uniform depth practical, susceptibility to flooding, and depth to water table.

"AWM–Irrigation Disposal of Wastewater" rates the soil limitations affecting surface or sprinkler irrigation applications of agricultural waste materials. Considered in the ratings are the potential capability of the soil to attenuate waste product and to support plant growth and the decomposition processes. This capacity is expressed in terms of soil-limiting factors that may affect environmental or health concerns.

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WEB-BASED TECHNOLOGY

#13 Economic Decisionmaking Facilitated by New Web Site

Economic Tools for Technical Assistance, <http://waterhome.brc.tamus.edu/NRCSdata/tools/>, is a new Web site that provides electronic programs developed and used by NRCS economists and planners. There are over 100 programs organized by land use to assist land users in making economic decisions. The tools can be a practical "starting point" for providing economic assistance. Most tools can be modified to meet site-specific planning conditions. The tools can be downloaded to your computer and the author contacted for additional information. In addition, you can bookmark this site, and encourage others to link to the Economic Tools site.

The Web site is a useful reference site for conservation planners and partners in the field. Additional programs may be added by sending them to the following contacts.

For more information, contact:

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(503) 414-3234
hal.gordon@or.usda.gov

or

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Natural Resources Inventory and Analysis Institute
(254) 770-6522
buland@brc.tamus.edu
<http://waterhome.tamu.edu/NRCSdata/>

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#14 “VegSpec” Suggests Site-Specific Plants

VegSpec is a Web-based decision support system that assists land managers in the selection of plant species appropriate for site-specific conservation problems. Users characterize a site by selecting a soil map unit and climate and by entering site conditions and objectives of the planting. VegSpec uses these specifications as filters to select plants from its plant library of approximately 2100 species and 400 cultivars, each characterized by nearly 100 attributes. VegSpec selects the plants that are site-specifically adapted, suitable for the selected practice, and appropriate for the purposes and objectives for which the planting is intended. States may wish to consider adding some of these alternative species to their FOTG. The planting design module provides information about propagule types, optimum planting dates, species compatibility in mixed plantings, and establishment. Spreadsheets are provided to calculate the required seed and vegetative propagule amounts for both single and multiple species plantings.

VegSpec was developed by NRCS in cooperation with the U.S. Geological Survey and the U.S. Army Corps of Engineers. An introduction to VegSpec and text for a step-by-step demonstration session were distributed recently to all state PLANTS coordinators. VegSpec is accessed at the PLANTS Web site, <http://plants.usda.gov>, under “Tools.”

For more information, contact:

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james.henson@usda.gov

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#15 Wildfire Recovery Tips Online

A resource for homeowners, “Wildfire Risk Reduction and Recovery Tips For Homeowners,” is available online at <http://plant-materials.nrcs.usda.gov/pubs/azpmsarwldfirecover.pdf>. This publication provides homeowners with basic information on making their property firewise and contains techniques and details for re-establishing vegetation to limit soil erosion after a wildfire. The Vegetative Practices section explains the phenomenon of hydrophobic soils that can occur after a wildfire, the hazards of debris flow, and when to use hydroseeding and hydromulching. The Structural Practices section explains, with specifications and illustrations, the use of jute netting for erosion control and when and how to use silt fences, straw mulching, straw bale check dams and dikes, and burlap bag check dams. A list of additional resources for information about risk reduction and recovery is on Page 4 of the document.

As more homeowners move into rural areas to get away from crowded urban areas, they can unknowingly place themselves in harm’s way. Building homes in wooded and/or brushy areas is aesthetically pleasing, but homeowners need to be aware of the potential dangers from wildfire and how to protect their homesites. NRCS and local conservation districts are available to answer questions and provide assistance.

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NRCS TECHNOLOGY NEWS

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