



2015 Progress Report of Activities

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2015 Presentations, Training and Publications

The PMC hosted two soil health workshops and one grazing field day during 2014. In addition, the PMC published nine Propagation Protocols, one Technical Report, and one Progress Report in 2014.

2015 Summary of Projects

Soil Quality Improvement Project

In October of 2011, the NRCS kicked off its' soil health campaign and began spreading the word about soil health and its benefits far and wide – to producers, partners and the public. Initially, NRCS's attention is focused on cropland, with plans to rapidly expand this soil health effort to range, pasture, and forest lands. In support of this soil health campaign, the Appalachian Plant Materials Center in Alderson developed and initiated a ten year duration Soil Quality Improvement Project in 2011.

This project is designed to verify and/or compare plant productivity (yield), harvested feed value and/or seed quality, commercial fertilizer and pesticide usage, and changes in soil quality when cations are balanced on the base saturation of the soil cation exchange capacity (CEC) and when soil quality practices are implemented on fields.

All plots will use the same crop rotation. A total of five soil treatments are being used and each treatment is replicated four times for statistical purposes. Plots are to be evaluated annually using a broad diversity of parameters, including: cation exchange capacity, base saturation, infiltration, soil respiration, active organic matter, available nitrogen, crop yield and feed harvest values and seed quality. These and other measurements will be used to develop a comprehensive soil health picture in response to the soil treatments imposed on each plot. With time, it is anticipated that commercial fertilizer and pesticide requirements will decrease and that overall soil health will improve with these treatment regimens. Such information will no doubt be invaluable to field offices, farmers and the general public as costs of commercial fertilizers and pesticides continue to increase.

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2015 marked the fourth year of this study and soybeans was the cash crop.

Cover Crop Roll down Date Study

A project to determine optimum dates for roll down efficacy of cover crops was established in the fall of 2012. Traditional cover crop management within much of the PMC service area have been to control the crop either through herbicide applications or harvest of the crop as hay or haylage prior to establishment of the succeeding crop. Mechanical management (roller crimping) of cover crops is a relatively new management technique in the PMC's service area, and timing roller crimping to achieve optimum control (kill) of the cover crop is not well understood. The PMC established strips of four cover crop mixtures commonly used in the region in September 2012. These plots were sequentially roller crimped in the spring of 2013 and evaluated for control efficacy in relation to crop maturity versus time (date) of mechanical control. Data from this study will be used to develop roll down recommendations for inclusion in NRCS's Residue Management (329) Standard. This project will be resumed in 2016.

USFS Mower Tract Ecological Restoration Cooperative Study

Revegetation of portions of the Mower Tract with indigenous species of trees and shrubs continued in 2015. The Mower Tract is a large land area within the Monongahela National Forest at

roughly 4,000 feet in elevation. The objective of the project is to restore native flora on previously strip mined benches that are currently dominated by a thick, non-native, tall fescue dominant sod layer. This restoration work will greatly benefit high-interest species including the cheat mountain salamander, northern flying squirrel, snowshoe hare, white-tailed deer, black bear, golden eagles, woodcock, ruffed grouse, saw whet owl, and a number of pollinating animals by providing a variety of food sources and niches. Additionally, reintroduction of bigtooth aspen will help further the goals of programs and organizations for priority game species, such as the Woodcock Management Initiative and Ruffed Grouse Society.

In 2015, the Appalachian PMC continued delivery of containerized plants comprising about 20 native species to the USFS in Bartow, WV. The species delivered included: *Populus grandidentata*, big tooth aspen; *Populus tremuloides*, quaking aspen; *Amelanchier laevis*, Allegheny serviceberry; *Viburnum cassinoides*, wild raisin; *Sambucus racemosa*, red elderberry; *Veronia noveboracensis*, New York ironweed; and *Sisyrinchium angustifolium*, blue-eyed grass. Plant Guides and Fact Sheets and Propagation Protocols are being developed for several of these species.

Evaluating the Use of Co-Product Bentonite Drilling Mud as a Soil Amendment

Horizontal directional drilling operations at the Marcellus shale formation of the Appalachian Basin produces large

quantities of co-product bentonite drilling mud in need of proper disposal. The Pennsylvania Department of Environmental Protection recently recognized the drilling mud as 'co-product' suitable for land applications. Pennsylvania NRCS was approached by local Soil conservation Districts to provide recommendations and guidelines for land application of the drilling mud. Currently, there is no data to support a decision-making process for development of such recommendations (and/or limitations) for soils in the Appalachian Basin. Such need for an input on agronomically beneficial and environmentally sound use/disposal of the drilling mud by land application is likely to rise in West Virginia as well as in other Marcellus overlaying landscapes.

Thus, NRCS in Pennsylvania entered into a cooperative research agreement with West Virginia State University, West Virginia's 1890 Land Grant University, to assess the benefits, limitations, and risks associated with land use of drilling mud, and evaluation of its impact on dynamic soil properties, soil fertility, and the environment. Dr. Amir Haas, the principal drilling mud investigator at West Virginia State University in turn solicited assistance from the Appalachian PMC to establish a series of laboratory, greenhouse and field experiments on selected soil series within the affected region.

Soil laboratory analysis and soil property data resulting from this study will be entered into the NASIS to supplement MLRA soil survey activities. In addition, management practice guidelines will be developed to support sound and beneficial use of the drilling mud.

Management practice guidelines will be delivered to NRCS field personnel via technical notes, and revisions and supplements to applicable Standards and Specifications found in Section IV of the NRCS Field Office Technical Guide.

Shady Valley, Tennessee Cranberry Bog WRP Project

Tennessee NRCS has requested assistance from the Appalachian Plant Materials Center for a WRP restoration project located in the Shady Valley community of Johnson County, TN. Shady Valley is a diverse and unique southern Appalachian ecosystem that is home to at least 26 rare plants and animals. The valley's high elevation wetlands are one of only two places in Tennessee where cranberries (*Vaccinium macrocarpon*) grow naturally. This rare wetland ecosystem was once covered with a network of sphagnum/cranberry peat bogs and is also home to several Federal and State listed Threatened and Endangered species. The restoration objectives of this WRP plan are tailored to the federally threatened Bog Turtle (*Glyptemys muhlenbergii*), which use the bogs throughout their life cycle. Presently, the WRP site is overgrown with Tall Fescue (*Schenorus arundinaceus*) and Reed Canarygrass (*Phlaris arundinacea*). NRCS' objective, in partnership with the Tennessee Wildlife Resources Agency, the US Fish and Wildlife Service and The Nature Conservancy, is to restore a more natural community within the larger landscape of Shady Valley by re-establishing sphagnum moss/cranberry bogs to improve the habitat for the Bog Turtle and other rare and endangered species. Other plant species of interest that have been shown to be associated

with Bog Turtle habitat include: upright sedge (*Carex stricta*), jewelweed (*Impatiens capensis*), arrowhead (*Sagittaria*), rice cutgrass (*Leersia oryzoides*), and smartweed (*Polygonum*). Since this is a unique restoration project targeting specific species found in the valley, there is not an open market seed/plant source for any of these ecotypes. Thus, Tennessee NRCS requires and has requested specialized technical assistance from the Appalachian PMC with collection of seed and cuttings, propagation of the species, and guidance when planting the species on the site. Plant Guides and Fact Sheets and Propagation Protocols will be developed for several of these species.

Who We Are

The Appalachian Plant Materials Center, located in Alderson, West Virginia, serves 10 states in the Appalachian Region from Pennsylvania to Georgia. The Center is operated by the USDA-NRCS in cooperation with the USDA-Agriculture Research Service, U.S. Forest Service and the Agriculture Experiment Stations of West Virginia University, Virginia Polytechnic Institute and State University and the University of Kentucky. Alderson is located in the heart of Appalachia, and the Center is situated on County Route 3/29, also known as Old Prison Farm Road, approximately 20 miles Southeast of Lewisburg, West Virginia. This center is new with regard to land resource and physical plant, but is the product of the transfer of programs and equipment from Quicksand, Kentucky to Alderson,

West Virginia. The transfer of center functions began in 1996 and was completed in 2000.

What We Do

The Plant Materials Center serves Appalachia by evaluating plants for their ability to solve specific conservation problems related to climate, the rugged topography, soil limitations, various land uses, fish and wildlife needs and desires of the landowners. The center provides a place for conducting systematic observations and evaluations of plants needed to protect our natural resources. New techniques are developed for the propagation, establishment, management and use for new or improved species of grasses, legumes, shrubs and trees.

The Center's program emphasizes improving forage production on hillside pastures, address problems associated with concentrated livestock, reclamation of mined lands, streambank stabilization, agro-forestry, wildlife habitat improvement, and utilization of economic and culturally valuable plants. The center assembles plants from the entire service area with similar soils and climate, evaluates the plants, develops management techniques, and provides seed and plants for planting to test performance throughout the area. Most of the plant materials produced at the center are used in West Virginia, Kentucky, Tennessee, Pennsylvania, Ohio, Virginia, and North Carolina.