



Norman A. Berg National Plant Materials Center Annual Progress Report of Activities 2013



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The National Plant Materials Center (NPMC) located in Beltsville, Maryland is one of 27 Plant Materials Centers (PMCs) in the Plant Materials Program of USDA's Natural Resources Conservation Service. The mission and activities of the NPMC are twofold: (1) to provide assistance to and coordination for the National Plant Materials Program, and (2) to assist with high-priority conservation issues in the Mid-Atlantic region of the U.S.

The PMC is currently participating in a national study evaluating the effects of cover crop mixes on soil health, collecting plant attribute data to refine managed grazing systems, and designing vegetated buffers to control poultry house emissions. These studies combined with our other activities assist us in developing and distributing up to date conservation technical information to NRCS field staff, partners, and the public.

Effect of Mixed Cover Crop Species on Soil Health



Figure 1. Soil Health Study plots 225 days after seeding cover crop mixes.

primarily control the weeds in the very weedy control plots. Beginning the next cycle, cover crop treatments were replanted September 30, 2013.

After the initial fall growth of the cover crop mixes, the winter temperatures halted growth and the canopy cover dropped slightly over the winter. As our oats and radish winterkilled, the rye and crimson clover continued growth later and provided most of the cover over the winter. The weeds in the control plots were small over the winter and did not provide much cover until after rapid spring growth. Over the fall and winter, there was a much greater difference in canopy cover between the 20 and 40 seeds/square foot seeding rate plots than the 40 and 60. In the spring 100% cover was achieved in all cover crop plots by 240 days after seeding. At cover crop termination, above ground biomass was very similar between cover crop treatments, ranging between 4800 and 5400 pounds per acre. With this much biomass, there was very little room for weeds to grow. We were fortunate to receive ample precipitation for corn growth through spring until late summer. Corn yield samples were collected in September and the results are being compiled.

The NPMC has completed the first of three cycles of cover crop mixes followed by corn. The initial cover crop treatments were planted on September 20, 2012 and terminated June 4, 2013. The cover crop was terminated and the corn was planted with one pass over the field, saving fuel and time (figure 2 and cover photo). We used a tractor with a roller crimper on the front and a corn planter on the back. The roller crimper did an excellent job of killing the cover crop and we were certainly impressed by the amount of weed suppression provided by the rolled cover crops. Most of the cover crop treatments had very few weeds, however we did spray roundup once after corn planting to



Figure 2. Rolling cover crops and planting corn in the Soil Health Study plots.



Figure 3. Soil Health Study plots 77 days after seeding corn.

BERMUDAGRASS FOR HIGH USE AREAS AND HAY

It has been a very successful year for demonstrating the value of Bermudagrass for high use areas. These forage trials and demonstrations are being conducted jointly by NRCS and Maryland Cooperative Extension, with considerable assistance from forage expert and University of Maryland professor emeritus Dr. Les Vough.

This summer, new trials were established on three farms in Howard and Frederick counties in Maryland. Three varieties of sprigged Bermudagrass are being tested. Aided by early summer rains, all of the sites have established very well. Our best site achieved near 100% cover by the first killing frost (figures 4-6).



Figure 4. Planting Bermudagrass sprigs (May 14, 2013).



Figure 5. Bermudagrass after one season of growth and beginning to go dormant. Photo taken the day of first frost, October 25, 2013.

Organic farmers have also expressed interest in using Bermudagrass; however, there is currently no source for certified organic sprigs. The PMC is utilizing its organic greenhouse to produce certified organic Bermudagrass sprigs for trial and demonstration on organic farms. This will reduce the certification period for certified sprigs from three years down to just one year.

Many livestock owners have expressed a great deal of interest in utilizing Bermudagrass in their operations; however, they are usually quite unfamiliar with the special establishment and maintenance considerations for Bermudagrass. Two sessions of Bermudagrass training were scheduled for October 2013, but were postponed due to the government shutdown. We are excited to show off the success of our plantings and assist farmers in achieving the same success by rescheduling these training sessions for the spring of 2014.



Figure 6. Density of Bermudagrass after one season of growth. Photo taken the day of first frost, October 25, 2013.

Poultry Air and Water Quality Improvement

Poultry farm vegetative environmental buffers (VEB's or windbreaks) foster good neighbor relations, mitigate emissions by reducing odors, dust, and ammonia, and improve the visual perception of the farms. The NPMC is working with researchers at Pennsylvania State University, University of Delaware, USDA Agricultural Research Service (ARS), and the Big Flats, New York PMC to develop vegetative environmental buffers (Figure 7) that absorb gaseous ammonia, trap dust and mitigate odors expelled by poultry farms.



Figure 7. A Sussex county Delaware test farm site showing switchgrass, black locust, bayberry, and Osage orange tolerating double house emissions. This is the most difficult site on a poultry farm for plant survival.

Currently 25 plant species are being tested on seven test sites (four in Maryland, one in Delaware, and two in Pennsylvania). Plants such as big bluestem, Florida paspalum, giant cane, wax myrtle, and black locust are some of the plants being evaluated for survival and growth. American elm is capable of surviving single house tunnel and sidewall fans areas, however cannot survive double house emissions (Figure 7). The most important factors influencing survival and growth are species selection, fan distance and irrigation/weed pressure.

Seed Production for the Great Smoky Mountains National Park

The 2010 Interagency Agreement between Great Smoky Mountains National Park (GRSM) and the Norman A. Berg National PMC was signed for 2011 – 2013. GRSM, and its Foothills Parkway, has a need to preserve their native plant resources while revegetating parklands. The National Park Service (NPS) requires that restoration of native plants be accomplished using germplasm from populations as closely related genetically and ecologically as possible to park populations. GRSM has harvested seed from indigenous populations, but does not have the personnel, expertise, facilities or equipment needed to clean process, test and store the seed. The Cades Cove increase fields resulted in a crop of over 801 lbs (bulk) of grass, legume and wildflower seed harvested. The seed was cleaned (de-bearded and then run through a clipper) by PMC staff to yield 271 lbs. of cleaned seed.

Virginia Wildrye Increase Field at the NPMC

Virginia wildrye (*Elymus virginicus*) quickly germinates, making it a highly used species for establishing roadside slope stability in the GRSM. Native seed mixes used for this purpose typically contain up to 25% Virginia wildrye. Three hundred pounds of seed ultimately will be produced for the park.

Images from top to bottom:

- Virginia wildrye harvested from the NPMC increase field
- Seed mixture being hydro seeded onto the Foot Hills Parkway
- Initial seedling growth and slope stabilization



2013 National Plant Materials Center Publications and Presentations

Publications

Warm-Season Grass Management Trials in Maryland. Poster

Forage Trials of Native Warm-Season Grass Varieties. Poster

Maryland Native Warm-Season Grass Forage Trial. Final Report

Southeastern Wildrye. Plant Guide

Native Grasses' Ability to Mitigate Poultry Emissions. Poster

Presentations

Pollinator Conservation Training Session; Seeding training and demonstration

Lancaster County PA Poultry Farms Windbreak Design and Plant Selection Tours

Bermudagrass Establishment for Livestock High Use Areas

Ag Discovery Camp

Kudzu and invasive removal training

Ecological Site Description Training and Assessment

Rangeland Training for MD Envirothon Team

National Soil Health Study Webinar

Helping People Help the Land

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