

# Natural Resources Conservation Service | Plant Materials Program

## 2023 Report of Activities



### Overview

In 2023, Plant Materials Centers (PMC) continued to build on the Plant Materials Program plant evaluation and release process to solve resource conservation problems nationwide. PMCs developed technology and information for using, establishing, and maintaining plants for a wide variety of natural resource conservation practices. PMCs also provided training and education to staff, partners, and the public on topics related to better soil health through cover crops technology, as well as strategies to mitigate the negative effects of climate change. New plant development and evaluations by PMCs in the west, evaluations of pollinator plants by PMCs in the central region and grazing and hayland activities and technical resources developed by PMCs in the east show the commitment of the Plant Materials Program to addressing high priority conservation needs recognized by NRCS field offices. PMCs continue to support the agency's mission to protect, enhance, and conserve our nation's natural resources by providing scientifically sound plant information and tools used by conservation planners, partners, producers, and private landowners.

To explore activity across the country, you can access [fiscal year 2023 activity reports for each PMC](#) on the Plant Materials website.

### New Conservation Plant Development

PMCs have released 759 conservation plants to the public over the past 80 years, of which 565 are active and commercially available today. These plants are used to support conservation practices that stabilize soil, improve pollinator and wildlife habitat, provide livestock forage, and increase the diversity in conservation plantings. All PMC plant releases support NRCS conservation activities on private lands as well as the [National Seed Strategy](#), a Federal interagency effort to select appropriate plants for restoration and conservation on both public and private lands. In 2023, PMCs did not release any new conservation plants, but they are actively working on several new conservation plants and gaining valuable information with new tools about older releases.

Collaborative efforts with the Agricultural Research Service (ARS) Forage and Range Research Laboratory in Logan, Utah, on genetic analysis of current plant releases and plant releases being developed are beginning to generate information to support decisions regarding the maintenance of the genetic diversity of new conservation plant releases. In addition, PMCs continue to expand the testing and utility of many of the conservation plants that have been released in past years.

- PMCs in Arkansas, Florida, Georgia, Mississippi, Missouri, Texas (Nacogdoches), and West Virginia are testing the adaptation and performance of new plant selections and commercially available conservation plant releases in different soil and climatic conditions to prepare for potential changes in conservation plant recommendations due to projected climate change.



'Nacogdoches' eastern gamagrass in an observational planting at the PMC in Brooksville, Florida

- PMCs in Georgia, New Mexico, and Washington have begun cooperating with ARS to use genetic analysis to ensure that past conservation plants are being maintained to retain the genetic integrity of the original release and to adjust our maintenance strategies if needed.
- PMCs in New Jersey and Maryland are collaborating with others to evaluate the utility of several conservation plants for use on marginal farmland areas in the Mid-Atlantic to mitigate the impacts of saltwater intrusion due to climate change.

## Training and Presentations

In 2023, Plant Materials Program staff conducted 63 technical training sessions for over 2,582 field staff and conservation partners to increase technical knowledge and provide conservation planner certifications. Training is provided in multiple ways, through in-person events on the PMC, through virtual platforms, and with PMC staff travelling to participants. For example, the PMC in Bismarck, North Dakota, delivered a multiday training at the PMC, a webinar to 79 participants in South Dakota, and “on the road” training to 82 participants at 3 locations in North Dakota. Training topics from all PMCs included: (1) selecting, planting, and managing cover crops; (2) selecting and establishing conservation plants; (3) identifying plants; (4) planning a conservation planting; (5) enhancing wildlife and pollinator habitat; (6) improving the productivity of range and pastureland; (7) managing weeds in conservation plantings; and (8) discussing the importance of vegetative covers for preventing erosion. Of special note, the NRCS Soil Health Division and Plant Materials Program launched a cooperative effort to deliver a hugely successful pilot course on “Cover Crops for Soil Health,” which was hosted at the PMC in Elsberry, Missouri. The training is planned at two additional PMC sites in FY 2024.

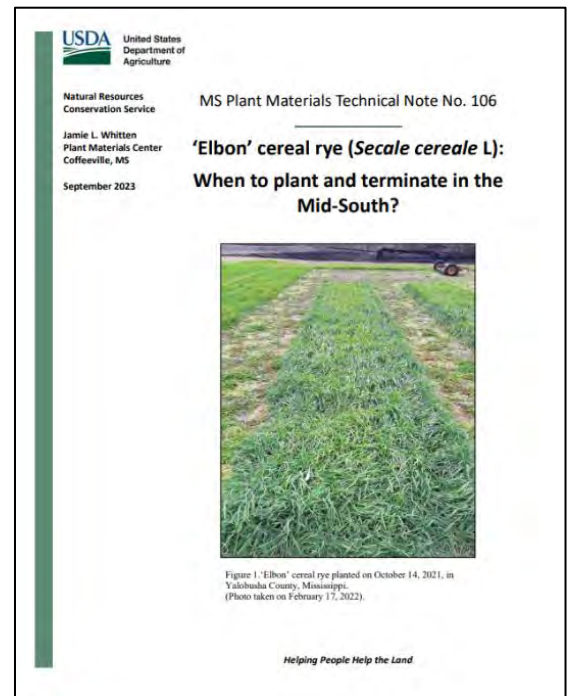


Plant Materials Specialist Monica Pokorny discussing foundation seed at the NRCS Bozeman Area Office Field Tour

PMCs also provided field days, tours, and presentations to 6,400 participants including NRCS employees, Federal and state government employees, farmers, ranchers, and the public, sharing technical knowledge of conservation plants and broadening customer outreach.

## Sharing Technology with Our Customers

PMCs provide agency staff, conservation partners, and the public with information needed to successfully perform natural resource conservation. Plant Materials Program studies resulted in over 107 new technical documents published to the plant materials website. PMCs continue to increase efforts to tailor plant materials information for specific conservation purposes and to support agency initiatives. PMCs published the results of studies in 7 new reports, the application of PMC vegetative information in 10 new technical notes on implementation requirements for conservation practices, and information on using, establishing, and managing conservation plants in 6 new or revised plant guides. The program continues its efforts to provide relevant, high quality vegetative information for NRCS conservation planners and customers to assist with implementing conservation practices.



An example of a technical notes released in 2023

## PMCs Accelerate Activities to Support Climate Smart Agriculture

The Plant Materials Program's Climate Smart Action Plan, which was established in 2021, provides the foundation for PMC support for USDA and NRCS goals to address the effects of climate change. In 2023, PMCs addressed the five goals of the action plan through targeted activities. The following examples highlight activities throughout the program.

- **Goal 1: Characteristics and adaptation of conservation plants.** PMCs in Georgia; Nacogdoches, Texas; and Arizona; completed a growth characteristics study for black oats and black seeded oats, popular small grain cover crops, to generate canopy cover, biomass, and other plant qualities for NRCS erosion prediction models for use by conservation planners nationwide.
- **Goal 2: New plant selections to increase adaptability and climate resilience.** The New Jersey PMC continues to evaluate plants to provide primary stabilization for living shorelines, including species such as seaside goldenrod, amerieque-bean, and Virginia saltmarsh mallow. Multiple PMCs continue to work on new conservation plants and work cooperatively with the Cover Crop Breeding Network, consisting of USDA and ARS scientists and Land Grant Universities, to develop new regionally adapted cover crops with improved traits for productivity and cold hardiness.
- **Goal 3: Evaluate establishment technologies and management strategies.** PMCs are conducting cover crop time-of-seeding and seeding density studies to determine if changes are needed in recommended planting dates and seeding rates to optimize performance. Other PMCs are evaluating alternative methods for establishing pollinator habitat or to find the best adapted selections of forage grasses to improve the success of conservation practices.
- **Goal 4: Increase outreach, training, and the development of documents and tools.** Many of the technical documents, training sessions, and presentations developed and delivered by PMCs support climate smart literacy by delivering the latest findings and most appropriate recommendations on the selection, use, establishment, and management of conservation plants in different parts of the nation.
- **Goal 5: Improve the sustainability of PMCs.** NRCS invested in facility improvements to boost the energy efficiency of PMC facilities and irrigation systems. PMCs also continue to improve the sustainability of field operations by increasing the soil health of PMC fields and reducing inputs when possible.

For additional information on Climate Smart Agriculture Activities refer to the latest [Plant Materials Program Climate Smart Agriculture report](#).

### Cover Crop Technology

Protecting and improving soil health is a nationwide priority for USDA and NRCS, and cover crops are key components to improving the health of America's cropland soils. Properly selecting and managing cover crops can reduce soil erosion, hold nutrients in the field, and enhance water quality, as well as provide other benefits such as creating habitat for pollinators and wildlife. Cover crop plantings have increased dramatically over the last 9 years, now encompassing an estimated 20 million acres annually and growing. Over the last 8 years, PMC cover crop activities have increased to about half of total program efforts. The Plant Materials Program has a framework for increased coordination and collaboration internally and with other entities to address NRCS priorities for using cover crops and improving soil health. PMCs are accelerating developing vegetative information and training for field staff to further promote adopting and using cover crops.



Students from the University of Louisville propagating coastal plants in a newly renovated greenhouse equipped with energy efficient irrigation and climate control features at the PMC in Galiano, Louisiana

A cover crop seeding study of cool season annual legumes was recently completed by PMCs in Knox City, Texas; Nacogdoches, Texas; Booneville, Arkansas; Americus, Georgia; and Beltsville, Maryland. They evaluated biomass yield and weed suppression of hairy vetch, common vetch, berseem clover, crimson clover, and winter pea planted as a monoculture at a quarter, a half, full, and 1.5 times the full planting rate. To compare the effects of a small grain and legume seed mix on biomass yield, cereal rye planted at half of the recommended rate was also planted with the legumes.

Results from the study found that, regardless of seeding rate, hairy vetch and crimson clover were the most productive legumes when planted as a monoculture or in mixture with cereal rye. Lower legume seeding rates (quarter and one half) produced statistically similar biomass as higher legume seeding rates (full and 1.5 times). Adding 30 PLS lb./acre of cereal rye to the legumes reduced weeds and increased total biomass production. Because there was no effect of legume seeding rate on total biomass yield of a monoculture legume or legume plus cereal rye mixtures, lower seeding rates produced the highest biomass yield per pound of seed and the greatest return on seed investment. For additional information on this study refer to the final study report on the [Seeding Rates of Annual Cool Season Legume Cover Crops in the Southern and Eastern United States](#).

To further refine establishment and management recommendations of cool season cover crops, the Plant Materials Program, in cooperation with ARS and North Carolina State University, initiated a study in the fall of 2023 to evaluate the effects of planting dates, seeding rates, and termination dates on regionally adapted varieties of [cereal rye](#). Fourteen PMCs, representing different climatic conditions across the United States, are participating in the study that aims to provide conservation planners with the latest guidance for successfully establishing and managing cereal rye cover crop.

PMCs in Arizona, California, and Nevada are conducting a regional study to identify drought-tolerant warm season cover crops for the southwestern United States that can be grown after summer row crops. The study focuses on different cultivars and species of millet, cowpeas, and sunn hemp.

The growth and productivity of living vegetative cover and subsequent residue cover are important cover crop attributes, especially for wind and water erosion prevention. To better understand the growth characteristics of black oats and black seeded oats, PMC staff in Georgia, Texas (Nacogdoches), and Arizona, measured monthly growth and productivity of black oats and black seeded oats for cover cropping considerations. Results provide conservation planners with key growth parameters for NRCS conservation planning tools. A final study report on [Cover Crop Growth Characteristics of 'SoilSaver' Black oats and 'Cosaque' Black Seeded Oats for Use in Conservation Planning Tools](#) contains information on biomass, canopy cover, and other growth characteristics of these popular cover crop species.



Early spring growth of 'Dixie' crimson clover and 'Wrens Abruzzi' cereal rye cover crop mix at the PMC in Booneville, Arkansas



Warm season cover crop evaluation plots at the PMC in Lockeford, CA

## Highlights of Plant Materials Activities

Activities at PMCs are driven by the needs of field office personnel and in each region (west, central, and east) there are often diverse topics. The following are examples from individual PMCs.

### In the Western States:

Initial evaluations of species with the potential to address resource concerns in the west are ongoing at the PMCs in Corvallis, Oregon (springbank clover); Pullman, Washington (sainfoin); and Aberdeen, Idaho (bristly fiddleneck, curlycup gumweed, and sand dropseed). If evaluations prove successful, new forbs (and a grass) for establishing wildlife habitat and improving seed mix diversity will be available in the future.

Beyond plant evaluations, PMCs in Tucson, Arizona, and Fallon, Nevada, have active field trials to evaluate the technology for establishing species in arid environments while the PMC in Bridger, Montana, collaborated on a new publication released this year discussing [control of invasive species during revegetation projects](#). All the western PMCs are actively working to fine tune cover crop recommendations for their respective areas, and PMC staff in Lockeford, California, and Los Lunas, New Mexico, have also implemented management trials in response to requests from field office staff.

### In the Central States:

Collection, evaluation, and selection of desirable pollinator plants are among the many Plant Materials Program activities at PMCs in the central region. High value pollinator plant species are being collected for observation and comparative evaluations by the PMC staff in Knox City, Texas; Kingsville, Texas; Nacogdoches, Texas; and Rose Lake, Michigan. These evaluations are being conducted to identify unique collections for release in their respective service areas and to develop pollinator seed mixes where forbs are more dominant than grasses in later years. Frostweed, blood sage, blue mistflower, Indian blanket, and golden prairie clover are among the forb species being collected and evaluated for pollinator conservation plantings. PMC staff in Manhattan, Kansas, and Bismarck, North Dakota, are evaluating cultural techniques to improve stand establishment of forbs and grasses commonly recommended for developing pollinator habitat in the Northern Great Plains and Midwest. Timing of seeding (dormant and spring), seeding methods (drill and broadcast), and seeding rates are among the different cultural techniques under evaluation to increase planting success and diversity in pollinator mixes.

### In the Eastern States and Tropical Areas

The PMCs in the East and Tropics released improved conservation tools and information to NRCS conservation planners in 2023. The PMC in Ho'olehua, Hawaii, developed the Rainfall Sufficiency Tool and the associated [Plant Materials Technical Note 12](#). The Rainfall Sufficiency Tool gives the planner a monthly approximation of the probability of sufficient rainfall to establish forage grass plantings and helps users understand associated risks.



Springbank clover plants flowering at the Corvallis PMC



PMC staff in Rose Lake, Michigan, and Earth Team Volunteer conducting plant counts

The PMC in Alderson, West Virginia, completed the third year of a study of endophyte-infected tall fescue, novel endophyte tall fescue, orchardgrass and a mixture of tall fescue, and white clover under four management practices. Initial results from this study were presented at the Mid-Atlantic Crop Management School in November of 2023. The study will continue for at least another year before compiling final data.

The PMC in Big Flats, New York, hosted a tree and shrub establishment training for 40 NRCS, Farm Service Agency (FSA), and Soil and Water Conservation District (SWCD) staff. Speakers presented multiple topics including the NRCS conservation planning process, tree and shrub establishment design elements, preparing planting plans, and the Conservation Reserve Program for buffer and tree plantings. The participants completed a hands-on exercise that entailed proper planting techniques of live stakes, seedlings, and rooted cuttings of various ages, and installing different protection methods for successful establishment.



Tree and shrub establishment training for NRCS, FSA, and SWCD staff at the PMC in Big Flats, New York

## Plant Materials Online Resources

There are currently over 3,000 documents with detailed information on over 440 conservation plants available on the Plant Materials Program webpages. Plant Materials Program updates (released as GovDelivery email messages to over 100,000 subscribers) continue to disseminate new information monthly. These enhancements are improving the accessibility and usefulness of the plant materials website for all users.

Links to useful resources on the [Plant Materials Program webpages](#):

- [Plant Materials Center Information](#)
- [Conservation Plants](#)
- [Technical Documents](#)
- [Training Resources](#)



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