

NRCS Norman A. Berg National Plant Materials Center 2021 Progress Report of Activities – February 2022

Special Project: Cover Crops on the National Mall

To showcase how cover crops can be used in urban agriculture to help mitigate climate change and water quality, the National Plant Materials Center (MDPMC) began work at USDA headquarters on the National Mall (Fig. 1). We prepared beds and planted cereal rye as cover crop to conserve soil, capture nutrients, and benefit soil health in the garden. To find out how cover crops can benefit both commercial farmers and urban gardeners visit USDA at [Farmers.gov](https://www.farmers.gov).



Figure 1. National PMC staff preparing garden beds and planting cover crops at USDA headquarters on the National Mall in Washington DC. Fall 2021

Cool-Season Cover Crop Biomass Study

The MDPMC evaluated the first-year planting (Figure 2. 2020 – 2021) and seeded the second-year planting (2021-2022) of a cool season cover crop biomass study. In the mid-Atlantic, cool season cereal grain cover crops are very common, with cereal rye as the most planted species. There have been field reports that termination at boot stage (which coincides with highest biomass and best contribution to soil health benefits) can complicate cash crop planting due to the large stature of rye at that time. Our objective is to determine which plants generate the greatest biomass at the lowest height. We planted five varieties (‘Cosaque’ black oats, SY TF813 triticale, P919 winter forage barley, ‘Atlantic’ winter barley, ‘Wintergrazer’ cereal rye, and ‘Wrens Abruzzi’ cereal rye) that have generated good biomass at shorter stature in Beltsville. Cereals were planted in two separate studies. One study was planted as cereal monoculture at 30 and 60 Pure Live Seed (PLS) pounds/acre. The other study was planted with cereals at 15 or 30 PLS pounds/acre

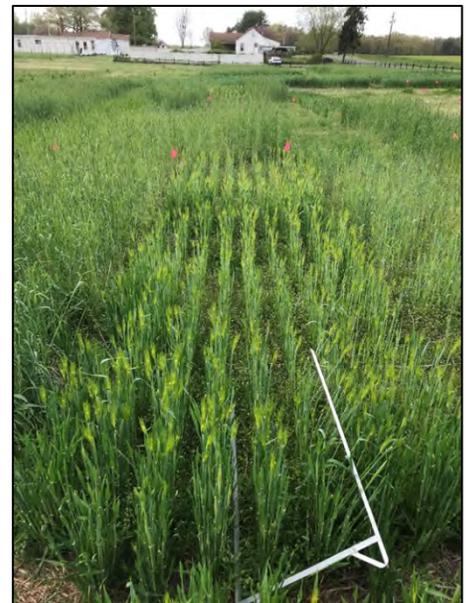


Figure 2. Cool-Season cover crop biomass manual harvest.

with and without ‘Kentucky Pride’ crimson clover (10 PLS pounds/acre). Preliminary results indicate that higher planting rates generally resulted in greater biomass. The highest planting rate (60 PLS pounds/acre) of ‘Cosaque’ black oats or SY TF813 triticale had biomass (5000 to 6000 pound/acre dry matter) similar to ‘Wintergrazer’ rye. The ‘Cosaque’ black oats and SY TF813 triticale were around 25 inches and 35 inches, respectively, compared to around 45 inches for rye. Boot stage for rye was on April 28, whereas it was May 12 for triticale and May 21 for black oats. To date, our results indicate that SY FT813 triticale reaches boot stage at the lowest height, matures later than rye. Second-year plantings will be evaluated in the spring and summer of 2022.

Cool-Season Grasses Forage Growth Curve Study

The MDPMC continued a study to measure dry matter yield of common forage grasses following a simulated grazing regime (Figure 3). The study will generate data for the RUSLE2 and/or WEPP applications and should better inform potential mid-Atlantic forage suitability groups. In the first of a three-year study the MDPMC harvested ‘Max Q’ tall fescue (non-toxic endophyte) and ‘Persist’ orchard grass following a simulated hay production regime for forage growth curves. ‘Max Q’ tall fescue was clipped twenty-eight times (every 7 – 10 days late March until mid-December) while ‘Persist’ orchard grass was clipped eighteen times (about every 7 – 10 days April until September).



Figure 3. Harvesting forage for growth curve study.

‘Persist’ orchard grass produced more biomass more quickly than ‘Max Q’ tall fescue at boot stage (3200 vs. 2900 lbs./Acre (June 2)). However, over the growing season tall fescue made up for and surpassed orchard grass with longer growth. Orchard grass growth waned in the heat of July – August such that increasing weed pressure caused harvests to stop. Stand persistence limitations made it necessary to overseed ‘Persist’ orchard grass in the Spring and Autumn 2021. Orchard grass may be better suited for growing in cooler more mesic areas of the mid-Atlantic but more information is necessary.

Multi-State Cool-Season Cover Crop Study

The MDPMC evaluated the second-year planting (2020 – 2021) and seeded the third-year planting (2021-2022) of a cool season cover crop study as part of trials being conducted across the mid-Atlantic and Southeast. We planted five legumes ('AU Merit' hairy vetch, common vetch, 'Frosty' berseem clover, 'Dixie' crimson clover, and 'WyoWinter' Austrian winter pea) at four planting densities both with and without 'Wrens Abruzzi' cereal rye (planted at 30 lbs/A) (Figure 4). The objectives are to evaluate overall biomass and the yield impact of the grass on the legume when in combination. This information may improve educational materials for Southeast US growers. Results will be analyzed after the third-year of data in 2022 and 2023.



Figure 4. Cool-Season cover crop varieties in multi-site study.

Solar Installation Grazing Demonstration

Farmland loss to large solar arrays is of concern to many producers and farming communities. We began working in 2021 with the American Solar Grazing Association, NRCS-New York, and the NYPMC to investigate forb/grass seed mixes which support pasture for sheep underneath or between solar panels. We planted seven different mixes to identify whether any existing mixes and/or species may perform well in the mid-Atlantic.

Florida Paspalum Production Block

The Mid-Atlantic germplasm Florida Paspalum field (Figure 5) was re-established in early summer 2021 in a field with better environmental conditions. As a demonstration opportunity, we planted teff alongside the paspalum as a nurse crop to look at the potential for weed suppression in native warm-season grass establishment.



Figure 5. Mid-Atlantic germplasm Florida paspalum production block with Teff nurse crop.

Teff Nurse Crop for Wildflower Plantings

Weeds often provide the biggest obstacle to establishing wildflower and wildlife habitat plantings. A teff cover crop grown prior to seeding or plugging wildflowers has the potential to greatly reduce weed competition where extensive herbicide treatments may not be possible or desirable. After a very successful demonstration at the MDPMC using teff as a nurse crop for wildflower plugs, the PMC entered into an agreement to assist NASA Goddard Space Flight Center with a wildflower planting/meadow establishment using this method to further test its efficacy in a larger planting with different conditions. In late May 2021, we tilled the existing fescue turfgrass and then seeded teff and planted plugs the next day (Figure 6). As needed, the space was irrigated on a weekly basis. Teff establishment was excellent and provided 90% or greater cover throughout the summer (Figure 6). The remaining 10% of cover was either crabgrass or the planted plugs.



Figure 6. Left: Tilling meadow site in May 2021. Right: Measuring plant cover in August 2021. At NASA Goddard Space Flight Center in Greenbelt, MD.

Plant Tolerance to Saltwater Intrusion

The Eastern Shore of Maryland is low in elevation and has an extensive ditch network, which is ultimately connected to saltwater. Saltwater, which easily moves into ground and surface water (saltwater intrusion (SWI)) affects large areas of farmland and increases crop failure. The lower Eastern Shore is projected to experience rising sea levels at three times the global average, which will have a significant negative impact on farmland. The MD and NJ PMCs are collaborating with the University of Maryland (UMD) and George Washington University (GWU) to examine plant materials for resistance to SWI and ability to conserve soil, retain nutrients, improve water quality, and provide wildlife habitat. The PMCs recommended salt and flood tolerant conservation plants and optimal planting methods. Six species of native grasses [coastal panicgrass (*Panicum amarum*), switchgrass (*Panicum virgatum*), Florida paspalum (*Paspalum floridanum*), Eastern gamagrass (*Tripsacum dactyloides*), prairie cordgrass (*Spartina pectinata*), saltmeadow cordgrass (*Spartina patens*)] were planted as vegetative propagules. Two forbs, seaside goldenrod (*Solidago sempervirens*) and Virginia saltmarsh mallow (*Kosteletzkya virginica*) were planted using seed. Over the course of the two-year project, GWU will examine plant survival, biomass, and plant cover and UMD will look at soil salinity and nutrient removal.

Technology Transfer, Publications, Presentations, Training, & Outreach

- Plant Name Release- Provided clearance for the name used on a new Plant Materials Center conservation plants released by NRCS to commercial growers: Sunrise germplasm eastern gamagrass (*Tripsacum dactyloides* L., TRDA3)
- [Selection and Use of Native Warm-Season Grass Varieties for the Mid-Atlantic Region](#) (PDF; 3.2 MB) Belt, S., Miller, C 2021. Beltsville. September 2021. 12p. (ID# 13820).
- [National Plant Materials Technical Note 6: Selecting, Planting, and Managing Grasses for Vegetative Barriers](#) (PDF; 800 KB) NRCS Plant Materials Program 2021. USDA Natural Resources Conservation Service. Washington, DC. July 2021. 12p. (ID# 13722).
- Hosted Howard County Greenworks for a site visit, growing operations overview, and equipment training session in May 2021.
- Plant ID training for NRCS and partner staff in September 2021 (Figure 7).



Figure 7. Plant Identification training for NRCS and partner staff in September 2021 at Beltsville, MD.

The Norman A. Berg National Plant Materials Center

The Norman A. Berg Plant Materials Center (MDPMC) 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 MDPMC 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.

National PMC Staff

Manager: David Kidwell-Slak
Horticulturist: Shawn Belt
Res. Conservationist: R Jay Ugiansky
Farm Manager: Dan Dusty

Address

Norman A. Berg National Plant Materials Center
8791 Beaver Dam Road, Bldg. 509 BARC E.
Beltsville, MD 20705
Tel: 301-289-9791

Contact Information

For more detailed information contact the [National PMC](#) or email: david.kidwellslak@usda.gov.



[Visit our website](#)

Helping People Help The Land

USDA IS AN EQUAL OPPORTUNITY PROVIDER, EMPLOYER AND LENDER.