



United States Department of Agriculture

2025 ANNUAL REPORT OF ACTIVITIES, NORMAN A. BERG NATIONAL PLANT MATERIALS CENTER

Effects of seeding rate, date & termination timing on biomass and other attributes of cool season legume & grass cover crops for production agriculture

The Norman A. Berg National Plant Materials Center (MD PMC) in Beltsville, MD is participating in a nationally coordinated study on the Effects of Seeding Rate, Date and Termination Timing on Biomass and other Attributes of Cool Season Legume and Grass Cover Crops for Production Agriculture. Cover crops can provide soil health benefits when they are planted and terminated in the recommended timing windows for the region. However, producers may choose sub-optimal cover crop planting and termination dates based on when they need to harvest their fall crop and when they need to plant their spring crop. The objective of this study is to evaluate the effect of seeding dates, rates, and timing of termination on attributes of adapted varieties of cool season legume and grass species across a range of climatic conditions. This study will enable the PMCs to provide region-specific guidance and recommendations for improving cover crop outcomes to increase adoption and economic feasibility.



Figure 1: Cereal rye at MD PMC, with 5 different seeding rates per plot and biomass harvest in progress, May 2025.



Figure 2: Hairy Vetch at MD PMC, with 5 different seeding rates per plot, May 2025.

We seeded cereal rye plots at Beltsville at 15, 30, 60, 90 and 120 PLS lb/A on Sept. 26, Oct. 20 and Nov. 13 in 2023; and on Sept. 24, Oct. 22 and Nov. 13 in 2024. In 2025, cereal rye plots were seeded on Sept. 24 and Nov. 18, with the October planting missing due to government shutdown. Hairy vetch plots were seeded in 2024 at 5, 10, 20, 30, and 45 PLS lb/A on Sept. 24, Oct. 8 and Oct. 22. In 2025, hairy vetch plots were seeded on Sept. 24 and Nov. 18, with October date missing and the Nov. 18 planting well outside the targeted planting window due to government shutdown. Each species is targeted for three years of evaluation, which may be extended due to the missing planting dates in 2025. In this study, we are also comparing results from remote sensing with the biomass harvest data. Canopy cover data is collected in the fall and spring and immediately prior to destructive biomass harvest. 3D camera biomass and height data are collected three times in the spring including immediately prior to destructive biomass harvest.

Special Project: USDA Headquarters People's Garden

After losing Ben Anderson, the People's Garden Manager, to the Deferred Resignation Program in April, we followed Ben's plan to grow up over 100 varieties of ornamental and edible plants in the People's Garden in the beginning of the 2025 growing season, with an emphasis on small plants suitable for container gardening. We also improved People's Garden collaborations. We participated with the US Botanic Garden on Ujamaa Seeds' Heirloom Collard Project, sharing extra plants with Prince George's Public Library, Building Bridges over the River Project, and DC Mutual Aid Apothecary. In collaboration with our partners, the Xerces Society for Invertebrate Conservation, we added 15 more species of native perennials in the garden. The Farm Journal Foundation began managing the garden in July.

Evaluating Salt Tolerance of Plants

Maryland producers in coastal regions are experiencing saltwater intrusion. This expanding issue (especially prevalent on MD's lower Eastern Shore) causes farmland and crop decline/losses. The MD PMC (in collaboration with the NJ PMC) is testing salinity tolerance of various (previously untested or little tested) conservation plants and seeds. In this first year of a four-year study, we tested transplanted Florida paspalum plants for survival, biomass, and forage quality in varying saltwater concentrations (0, 10, 20, 30 ppt.), growing them in reservoirs for 16 weeks (Figure 3). The study commenced in July. After a two-week acclimatization period, salinity was increased by 5 ppt. per week (six weeks total for the high salinity treatment). Root and vegetative biomass data was collected in November.



Figure 3: Florida paspalum plants in the MD PMC greenhouse, (July 2025), growing in flood tables where they are regularly irrigated with varying saltwater concentrations (0, 10, 20, 30 ppt) for 15 minutes twice daily.

Wildflower Establishment Using Teff Study

The MD PMC has continued studying innovative methods to control weeds when establishing wildflowers by using teff as a smother or nurse crop. Successful demonstrations at NASA and Watkins Regional Park warranted further study to evaluate best practices for seeding wildflowers into thick weed-suppressing teff residue. Study plots were established at NASA, Goddard in 2023/2024.

This study evaluates two wildflower seeding methods (drilling or broadcasting) and three wildflower seeding dates (November, January or April). Line transect data in 2024 showed very few wildflowers. Previous demonstrations have shown that wildflowers seeded into teff often take several years to establish since the teff also suppresses wildflowers along with the weeds. A

concurrent dormant planting at another NASA site had much greater establishment, suggesting site specific effects. This study site consisted of fill material with a rather high pH of 8 to 8.5. Wildflowers prefer soil that is more acidic, however it wasn't feasible to treat the soil with sulfur to lower the pH. Preliminary line transect data in September 2025 showed an average of 5% cover of seeded species across all treatments with no difference between drilled and broadcast seeding methods. The dormant seeded treatments planted in November or January averaged 6% cover of seeded species compared to 3% cover for the April seeded treatments. Additional dormant seeded plots are being established at the Beltsville PMC to evaluate establishment on additional soil types. Results from these demonstrations and study will inform seeding date and method recommendations for establishing wildflowers in teff residue in the Mid-Atlantic region.



Figure 4: Wildflowers established using teff at NASA Goddard. Left photo: Wildflower plots that were dormant seeded into teff residue in winter of 2023/2024, showing mostly late boneset that naturally seeded, photo September 2025. Right photo: Established wildflowers that were planted in July 2022 as plugs immediately after tilling the existing turf and seeding teff, photo September 2025.

Seed production study

The MD PMC is participating in a nationally coordinated study to evaluate cover crop seed production in alternate areas of the country and test production and management methods in conditions that closely resemble those of commercial seed production. The results of this study will help identify additional areas of the country where cover crop seed production may be commercially viable. The MD PMC seeded cereal rye and crimson clover in a replicated study on Sept. 24, 2024. Crimson clover plots were treated for downy brome in spring of 2025 with temporary successful suppression. Seed production was impacted by the quick fall growth of downy brome prior to treatment and a partial recovery of growth prior to crimson clover harvest. Seed was harvested in the spring of 2025 and yielded an average of 1,385 lb/A for cereal rye and

86 lb/A for crimson clover. Plots were again planted Sept. 24, 2025 for spring 2026 harvest and evaluation.



Figure 5 Crimson clover and cereal rye seed production study plots at MD PMC, May 2025.

Technology Transfer, Publications

- [2024 MD PMC Annual Report of Activities](#)
- [Black Locust *Robinia pseudoacacia* Plant Guide](#)
- [Swamp Milkweed *Asclepias incarnata* Plant Guide](#)

Presentations, Training, & Outreach

- 10/16: Peoples Garden & Center for Faith Based & Neighborhood Partnerships Sukkot
- 1/20: Future Harvest Tabling w/ MD-NRCS
- 4/7: Gardening Presentation at Two Rivers – Young Campus Public Charter School
- April to May: Four Smithsonian Early Explorers Tours at People's Garden
- 5/1: Prince George's County Envirothon Spring Competition w/ MD NRCS
- 5/20: Forage and Weed ID Training
- 5/21: DC Mutual Aid Apothecary Planting Outreach
- 6/11: International Agricultural Education Fellowship Program People's Garden Tour
- 6/11: USDA Center for Faith People's Garden Tour w/ Dr. King
- 6/20: USDA Office of Tribal Relations Interns Volunteer Day and Garden Tour
- 6/15: Prince George's Public Library Planting Outreach
- 7/15 and 8/7: MD-NRCS Wildflower ID Training
- 7/28: US Botanic Garden Tour of MD PMC
- 8/22: PMC presentation at Capital Area Natural Resource Management Symposium



Figure 6: Participants learned from instructors in small groups and individually about identifying grass forages and weeds.

The Norman A. Berg National Plant Materials Center

The MD PMC in Beltsville, Maryland is one of 25 Plant Materials Centers (PMCs) in the Plant Materials Program of USDA’s Natural Resources Conservation Service. The mission and activities of the MD PMC 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.

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