



**2018 ANNUAL PROGRESS  
REPORT OF ACTIVITIES**

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## **NATIONAL COVER CROP TRIALS**

The MDPMC, along with all other NRCS plant materials centers, has concluded the final year of the cover crop adaptation trials to examine growth and production of selected varieties and sources of common cover crops across geographic regions in the United States. The 8 species and 59 total varieties were selected by NRCS State Agronomists and PMC staff to provide a broad picture of regional cover crop adaptation and growth data. The study also aims to help inform local cover crop recommendations and future soil health studies. Data collected include germination, emergence, green up, bloom, flowering period, plant height, disease and insect incidence, and winter hardiness.

Overall, the varieties of cereal rye, crimson clover, hairy vetch and ‘Cosaque’ black hulled oats had the best establishment, winter hardiness, and growth performance. All cereal rye cultivars had 100% winter survival except for ‘FL 401’ and ‘Merced’ with less than 70% survival over three years. The cereal rye cultivars showed the greatest differences in maturity dates, which could allow growers to choose varieties more suited for their requirements. All crimson clover cultivars had over 85% winter survival but ‘Kentucky Pride’ was the only cultivar to have 100% survival and was also the latest to bloom. Hairy vetch cultivars had over 96% survival except for ‘Lana’ (woolypod vetch) which had by far the best fall growth but had inconsistently very poor to very good winter survival over the three years. The winter pea cultivars did not perform well. The varieties that did not winterkill, succumbed to disease in the spring. There were no significant disease or insect damage observed in any of the other cover crop species varieties. Red clover varieties had poorer germination and survival compared to the Crimson Clovers and bloomed later than all other species in the study. Radish cultivars inconsistently

winterkilled depending on the severity of the winter and size of the plants. ‘Graza’ and ‘Control’ had the greatest survival 74% and 68% respectively during the second years’ mild winter. The two balansa clover cultivars had extremely poor fall growth each season and very poor winter survival. ‘Cosaque’ black oats had comparable fall growth to the rye cultivars but bloomed much later than all rye cultivars in the spring, which could be desirable where the cover crop is to be grazed or for later terminations where overly mature cereal rye would have a high C/N ratio. ‘Cosaque’ had good winter survival with little foliar damage the first two winters but had poorer survival in the third and harshest winter. This study will provide very useful data for selecting appropriate cultivars for a given region and planting requirements. We expect data on bloom date could be especially useful in selecting cultivars that could be easily terminated with roller crimper and without herbicides.

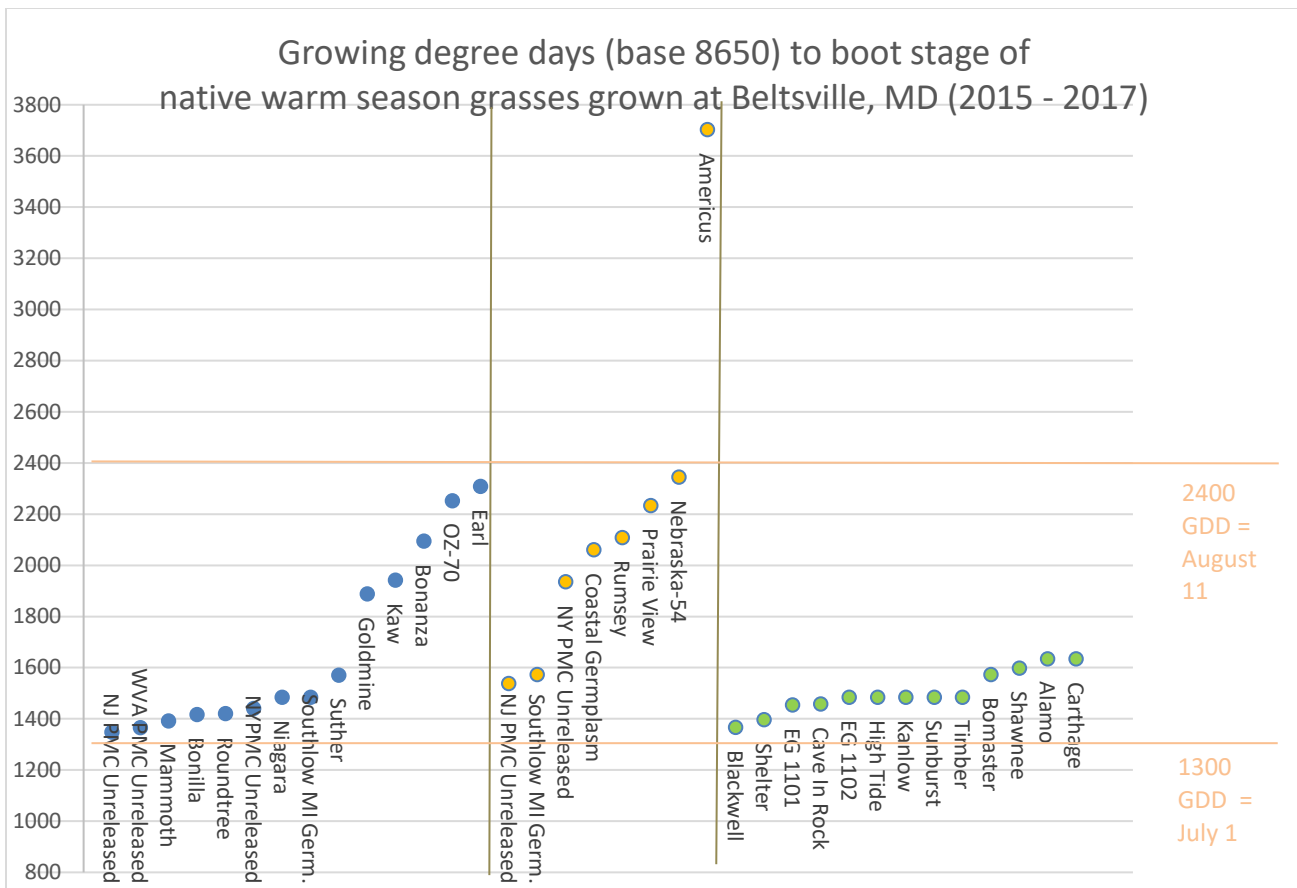
## FORAGE GROWTH CURVE CREATION

The MDPMC has initiated an experiment to create forage growth curves. The primary objective in the early years of this experiment will be to hone the methods for cutting (and re-cutting) and measuring primary and re-growth following harvest/simulated grazing. ‘Bronson’ tall fescue (60 lbs/a) was planted in the fall of 2017 and first cuts will take place in 2019, although the full cutting schedule will occur in 2019 and beyond. Ideally, this work will generate high resolution data for RUSLE2 and/or WEPP software programs to better inform potential forage suitability groups for Maryland. Dry matter yield data for stockpiled fescue (highly palatable and nutritive growth from September – December) will also be investigated beginning in 2020.

## WARM SEASON GRASS VARIETIES FOR THE MID-ATLANTIC



The MDPMC has begun analysis on three years of field evaluations of big bluestem, indiangrass, and switchgrass varieties to better understand which grasses are best suited for the mid-Atlantic region. We found that boot stage timing for big bluestem and indiangrass varied over a 5-week period while switchgrass was less variable. Plant size varies between species, but generally switchgrass was largest (51.5" x 40" wide) followed by big bluestem (43" x 30" wide) and indiangrass (42" x 27.5" wide). All eastern gamagrass varieties succumbed to the stalk borer (a previously unknown pest to this species).



### WARM-SEASON COVER CROP DEMONSTRATION

The MDPMC established a warm-season cover crop planting to demonstrate and evaluate various species and varieties of warm-season crops used or potentially could be used for warm-season cover. Warm-season cover crops are often planted following vegetable production and can be used to renovate depleted soils and reduce weed abundance. The planting included 46 species or varieties of millet, sorghum/sorghum sudan, teff, legumes, and forbs. A deer fence was erected after significant browse to the legumes and forbs; it remained in place until the end of the growing season, when it was removed to evaluate susceptibility to deer browse. All forbs were severely browsed except for sesame which was left untouched. Sesame also exhibited fast and dense growth that excluded weeds. Of the legumes, hairy indigo and American joint vetch showed the least deer browse, though joint vetch (aka deer vetch) is a common food plot crop for deer in the South. Hairy indigo had poor germination and subsequently poor plot cover though existing plants were vigorous; joint vetch had very good germination and dense weed suppressing cover. Teff provided quick and fine-stemmed dense cover that matured well before all other covers. Teff has potential for use where residue of larger grasses would interfere with crop planting or where chemical or mechanical control of the cover crop would not be desirable. Pearl millet



provided the densest cover, however Japanese provided better growth and denser cover on poorly draining soil. The sorghums and sorghum Sudan grasses all performed well, however the tall varieties with large stems provided a significant impediment to planting into the residue.

## POLLINATOR BUFFER ESTABLISHMENT

The MDPMC continues its collaboration with the State Biologist on a large project on the Eastern Shore of MD (owned by The Nature Conservancy) to investigate methods to better establish pollinator buffers. Six treatments for the preparation of the planting bed are being investigated at the MDPMC as well as in Wicomico County. The PMC is testing these methods on the pollinator mix, as well as on each species planted separately to identify how site preparation affects the establishment of species within a mix and individually. Planting was supposed to occur in 2018 but was delayed at the MDPMC in order to occur in parallel with the TNC project. Ideally, the project will help isolate the effects of planting method on germination and establishment of the pollinator mix and individual species within the mix. Current treatments will be frost-seeding in to winter-killed oats, drilling in to spring killed winter wheat, or broadcasting in to standing killed wheat.



## FLORIDA PASPALUM PRODUCTION BLOCK



The MDPMC has maintained the Mid-Atlantic Germplasm Florida Paspalum field with legume cover between rows to demonstrate an innovative sustainable management alternative to tillage. The legume cover has provided soil cover and weed suppression between the rows and provided nitrogen when mowed clippings decay. This field was

established and maintained without the use of herbicides to demonstrate strategies useable in organic growing systems. Subterranean clover, white clover and 'Aberlasting' Caucasian x white hybrid clover were established to evaluate suitability as inter-row covers. The 'Aberlasting' hybrid clover has had the best persistence and greatest cover. The Florida paspalum has grown well and produced abundant seed in 2018, however for the second year the seed was heavily infected with paspalum ergot (*Claviceps paspali*) making the seed unusable. Wet summers likely contributed to the high infection rate, but additional measures, such as tillage and burning, may be done to prevent reinfection.

## MALTING BARLEY AND PHOSPHORUS



During the fall of 2017, four commonly available varieties of grain barley (with malting potential or known malting value) were planted at 100#/acre in replicated blocks. All four varieties had good to excellent winter survival, although some plots had winter kill where there appeared to be low fertility and observed chlorosis. All varieties produced grain and all had 90% or more fusarium headblight infection. Due to headblight, the study changed focus to examine varieties for cover crop (and not grain production) potential. Seven commonly available varieties were planted at 70#/a alongside 20#/a of 'Purple Bounty' hairy vetch and 10#/a of 'Kentucky Pride' crimson clover. Winter survival, grass growth, and crimson clover establishment will be evaluated in the spring of 2019.

## 2018 Technology Transfer

### *Plant Name Releases*

Researched, certified, and released requested names for ten new plants from NRCS Plant Materials Centers:

Mariposa germplasm zizotes milkweed (*Asclepias oenotheroides*),  
Wilson germplasm yellow indiagrass (*Sorghastrum nutans*),  
Kenedy germplasm big bluestem (*Andropogon gerardii*),  
Permian germplasm whiplash pappusgrass (*Pappophorum vaginatum*),  
Santiago germplasm silver bluestem (*Bothriochloa laguroides*),  
Burnet germplasm hooded windmill grass (*Chloris cucullata*),  
Bristol germplasm rough tridens (*Tridens muticus*),  
Cibolo germplasm little barley (*Hordeum pusillum*),  
Taylor germplasm sand dropseed (*Sporobolus cryptandrus*),  
Bexar germplasm slim tridens (*Tridens muticus*)

### **Publications, Training, Presentations and Outreach:**

Poster: [Mid-Atlantic Native Grasses Tolerant of Poultry Farm Emissions](#). Eastern Native Grass Conference, Erie, PA.

Poster: [Evaluation of Various Native Warm-Season Grass Varieties at Beltsville, MD 2015-2017](#). Eastern Native Grass Conference - Erie, PA.

Newsletter: [Vegetative- Environmental Buffers for Mid-Atlantic Poultry Farms](#). USDA, National Agroforestry Center. Lincoln, NE. Volume 25, Issue 3. 2p.

PA NRCS Farm Show Display – January 2018

Warm-season cover crop tour and native warm-season grass and weed ID training (9/26/18).

Pasture plant ID training at two conservation planner training sessions: 7/17/18 and 7/19/18.



## *Staff*

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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.

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