

**UNITED STATES DEPARTMENT OF AGRICULTURE  
NATURAL RESOURCES CONSERVATION SERVICE  
BROOKSVILLE, FLORIDA**

**NOTICE OF RELEASE OF FORT COOPER GERmplasm  
SPLITBEARD BLUESTEM  
SOURCE-IDENTIFIED CLASS OF NATURAL GERmplasm**

The Natural Resources Conservation Service, U.S. Department of Agriculture announces the naming and release of Ft. Cooper Germplasm splitbeard bluestem (*Andropogon ternarius* Michx.). Ft. Cooper Germplasm splitbeard bluestem has been assigned the NRCS accession number 9060084. This accession was originally identified as pinewoods bluestem (*A. arctatus* Chapm.) and is classified as such in preliminary PMC research reports referenced in the preparation of this document.

Ft. Cooper Germplasm has not been subjected to extensive regional adaptation or performance testing. It is being released to meet an identified need to increase the availability of native grass seed sources that have demonstrated high establishment potential and desirable growth characteristics for use in Florida natural area and rangeland plantings. Immediate demand for this release is considered to be high due to a lack of native grass seed sources in commercial production in the state.

**Collection Site Information:** Seed of Ft. Cooper Germplasm was collected in 1995 by Sharon Pfaff and Mary Anne Gonter from a population of splitbeard bluestem in Citrus County, Florida using a Woodward flail-vac seed stripper (Ag-Renewal, Inc., Weatherford, Oklahoma) mounted on a tractor. The collection site was located on dry sandhills in the northern portion of Ft. Cooper State Park, near the city of Inverness (Section 21, Township 19S, Range 20E). The soil at the collection site was a Candler fine sand with 0 to 5 percent slope. Plants growing in association include longleaf pine (*Pinus palustris* Mill.); turkey oak (*Quercus laevis* Walter); sand post oak [*Q. margarettae* (Ashe) Small]; bluejack oak (*Q. incana* Bartram); wiregrass (*Aristida beyrichiana* Trin. & Rupr.); lopsided indiagrass [*Sorghastrum secundum* (Elliot) Nash]; and narrowleaf silkgrass [*Pityopsis graminifolia* (Michx.) Nutt.]. Mean annual precipitation at the collection site is 52 inches, average maximum temperatures are 83° F and average minimum temperatures are 59° F, with approximately 300 frost-free days per year.

**Description:** Ft. Cooper is a bunch grass with slender, erect, purplish culms 0.7- to 1-m tall. Basal sheaths are flattened, whereas the culm sheaths are rounded; leaf blades are up to 30 cm long and 2- to 3.5-mm wide, purplish in color and usually hairy. Some basal leaves generally remain green throughout the winter. The inconspicuous ligule is membranous. Racemes are paired or occasionally in threes, white, 1.5- to 5-cm long, and densely covered in white hairs (villous); rachis joints and pedicels also densely villous. Spikelets are 5- to 6-mm long, usually longer than the rachis joint; the awn on the lemma is generally slightly twisted, 1.2- to 2.5-cm long. After the seed disperses, a tuft of silver hairs remains at the base of the raceme. There is an average of 440,000 seeds/kg (200,000 seeds per pound).

Splitbeard bluestem is not considered to be a major component of the ecosystems in which it occurs. It is classified as a mid-successional species that will form fairly stable communities with broomsedge (*A. virginicus*) and panicgrasses (*Panicum* spp.) in abandoned fields and disturbed areas. This type of community generally persists as long as fire prevents encroachment of woody species. It will tolerate periodic fires; however, annual burning tends to eliminate it from the population. Plants regenerate from perennial buds at the base of the culm; however, its main mode of reproduction is by seed. It will tolerate moderate shading and is often found in the understory of open woods.

**Method of Breeding and Selection:** Ft. Cooper Germplasm was the only accession of splitbeard bluestem evaluated by PMC personnel. It was included in testing of direct seeding methods to revegetate phosphate minelands in Florida conducted from 1997 to 2001. In this study, 34 accessions of grasses and forbs were evaluated. Ft. Cooper Germplasm consistently germinated and established better on sand tailings than any of the other species tested (Table 1). The seed on the sand tailings sites were exposed to extreme drought conditions during the study period. Ft. Cooper Germplasm was not nearly as robust and vigorous on overburden soils (Table 2) and this was likely due to the higher clay content that is often found in these substrates.

Seed production data from the PMC production fields (Table 3) indicate that, although yields in 2000 may have been slightly higher on the irrigated site than on the non-irrigated site, seed germination was greatly reduced under irrigation. The seed may have been collected too early in the irrigated plots or the irrigation could have adversely affected pollination and subsequent seed production. Dehulling the seed to the bare caryopsis significantly improved germination of seed collected in 2001. Dehulling would allow the seed to pass through a grain drill without requiring a fluffy seed box; however, this treatment is extremely time consuming and reduces yields (Table 3). Also, the long-term consequences of dehulling on seed viability have not been tested and this may affect the ability to store this seed after treatment.

Table 1. Plant densities of 34 accessions of grasses and forbs planted on 6 different dates on reclaimed minedland sand tailings, and evaluated in May of 2001 (24 to 54 months after planting). From Pfaff et al., 2001.

| Species   | Planting Date |     |      |     |      |     |
|---|---------------|-----|------|-----|------|-----|
|   | 1997          |     | 1998 |     | 1999 |     |
|   | Jan.          | May | Jan. | May | Jan. | May |
| -----Plants/m-----                              |               |     |      |     |      |     |
| <b><i>Andropogon ternarius</i> (Ft. Cooper)</b> |               | <1  | 0    | <1  | 1    | 2   |
| <i>A. glomeratus</i> var. <i>glaucopsis</i>     | 0             | 0   |      |     |      |     |
| <i>A. gyrans</i>                                |               | 0   | <1   |     |      |     |
| <i>Aristida beyrichiana</i> (Avon Park)         | 4             |     | 0    | 0   | 0    | 0   |
| <i>A. beyrichiana</i> (Leon)                    |               |     |      |     |      | <1  |
| <i>A. beyrichiana</i> (Wekiwa)                  |               |     |      |     | 0    |     |
| <i>Carphephorus corymbosus</i>                  |               |     |      |     | 0    | 0   |
| <i>Chamaecrista fasciculata</i> (Citrus)        |               |     | 0    | 0   |      |     |
| <i>C. fasciculata</i> ('Comanche')              |               |     | 0    |     | 0    | 0   |
| <i>Chasmanthium laxum</i>                       | 0             | 0   | 0    |     |      |     |
| <i>Ctenium aromaticum</i>                       | 0             | 0   | 0    |     |      |     |
| <i>Eragrostis spectabilis</i> (Hernando)        |               |     | 0    | 0   |      |     |
| <i>E. spectabilis</i> (Avon Park)               |               |     | 0    |     |      |     |
| <i>Helianthus radula</i>                        |               | 0   |      |     |      |     |
| <i>Liatris elegans</i> (Floral City)            | 3             | 0   | 3    |     | 0    |     |
| <i>L. gracilis</i> (Avon Park)                  |               |     | 0    |     | 0    |     |
| <i>L. tenuifolia</i> (Ft. Cooper)               | <1            | 0   |      |     | 0    |     |
| <i>L. tenuifolia</i> (Avon Park)                |               |     |      |     | 0    |     |
| <i>Lupinus diffusus</i> (Croom)                 |               |     | *sp  | 0   |      |     |
| <i>L. diffusus</i> (Hernando) (non-inoculated)  |               |     | sp   | sp  | sp   | <1  |
| <i>L. diffusus</i> (Hernando) (inoculated)      |               |     |      |     |      | <1  |
| <i>L. diffusus</i> (Bay) (non-inoculated)       |               |     |      |     | sp   | 5   |
| <i>L. diffusus</i> (Bay) (inoculated)           |               |     |      |     |      | 4   |
| <i>Panicum anceps</i>                           |               |     | 0    |     |      |     |
| <i>P. virgatum</i> ('Alamo')                    | 10            | 0   | <1   | 0   | <1   | 0   |
| <i>P. virgatum</i> (Miami x Stuart)             |               |     | <1   | 2   | 0    | <1  |
| <i>Pityopsis graminifolia</i>                   |               |     |      |     | 0    | 0   |
| <i>Sorghastrum nutans</i> ('Lometa')            |               |     | 0    |     |      |     |
| <i>S. secundum</i> (Ft. Cooper)                 | 3             |     |      | 1   | 1    | 3   |
| <i>S. secundum</i> (Croom)                      |               |     |      |     | 1    | 0   |
| <i>Schizachyrium stoloniferum</i>               |               |     | <1   |     | 0    | 0   |
| <i>Sporobolus junceus</i>                       |               | 0   | 0    | <1  | 0    | 0   |
| <i>Tridens flavus</i>                           | 1             | 0   | 0    | 0   | 0    |     |
| <i>Tripsacum dactyloides</i> (Clay Co.)         |               | 0   | 0    |     |      |     |

\*sp = first plants that emerged died, but due to seed dormancy, new plants had sprouted

Table 2. Plant densities of 34 accessions of grasses and forbs planted on six different dates on reclaimed minedland overburden soils, evaluated in May of 2001 (24 to 54 months after planting). From Pfaff et al., 2001

| Species   | Planting Date |     |      |     |      |     |
|---|---------------|-----|------|-----|------|-----|
|   | 1997          |     | 1998 |     | 1999 |     |
|   | Jan.          | May | Jan. | May | Jan. | May |
| -----Plants/m-----                              |               |     |      |     |      |     |
| <b><i>Andropogon ternarius</i> (Ft. Cooper)</b> |               | <1  | 0    | 2   | 0    | 0   |
| <i>A. glomeratus</i> var. <i>glaucopsis</i>     | 0             | 0   |      |     |      |     |
| <i>A. gyrans</i>                                |               | 0   | 0    |     |      |     |
| <i>Aristida beyrichiana</i> (Avon Park)         | 7             |     | <1   | 0   | 0    | <1  |
| <i>A. beyrichiana</i> (Leon)                    |               |     |      |     |      | <1  |
| <i>A. beyrichiana</i> (Wekiwa)                  |               |     |      |     | 3    |     |
| <i>Carphephorus corymbosus</i>                  |               |     |      |     | 0    | 0   |
| <i>Chamaecrista fasciculata</i> (Citrus)        |               |     | 0    | 0   |      |     |
| <i>C. fasciculata</i> ('Comanche')              |               |     | 0    |     | 0    | 0   |
| <i>Chasmanthium laxum</i>                       | 0             | 0   | 0    |     |      |     |
| <i>Ctenium aromaticum</i>                       | 0             | 0   | 0    |     |      |     |
| <i>Eragrostis spectabilis</i> (Hernando)        |               |     | <1   | 3   |      |     |
| <i>E. spectabilis</i> (Avon Park)               |               |     | 0    |     |      |     |
| <i>Helianthus radula</i>                        |               | 0   |      |     |      |     |
| <i>Liatris elegans</i> (Floral City)            | 0             | 0   | 0    |     | 0    |     |
| <i>L. gracilis</i> (Avon Park)                  |               |     | 0    |     | 0    |     |
| <i>L. tenuifolia</i> (Ft. Cooper)               | 7             | 0   |      |     | 0    |     |
| <i>L. tenuifolia</i> (Avon Park)                |               |     |      |     | <1   |     |
| <i>Lupinus diffusus</i> (Croom)                 |               |     | 0    | 0   |      |     |
| <i>L. diffusus</i> (Hernando) (non-inoculated)  |               |     | 0    | 0   | 0    | 0   |
| <i>L. diffusus</i> (Hernando) (inoculated)      |               |     |      |     |      | 0   |
| <i>L. diffusus</i> (Bay) (non-inoculated)       |               |     |      |     | 0    | 0   |
| <i>L. diffusus</i> (Bay) (inoculated)           |               |     |      |     |      | 0   |
| <i>Panicum anceps</i>                           |               |     | 0    |     |      |     |
| <i>P. virgatum</i> ('Alamo')                    | 1             | 0   | <1   | <1  | 0    | 0   |
| <i>P. virgatum</i> (Miami x Stuart)             |               |     | 7    | 2   | 1    | <1  |
| <i>Pityopsis graminifolia</i>                   |               |     |      |     | 1    | <1  |
| <i>Sorghastrum nutans</i> ('Lometa')            |               |     | 0    |     |      |     |
| <i>S. secundum</i> (Ft. Cooper)                 | 1             |     |      | 10  | <1   | <1  |
| <i>S. secundum</i> (Croom)                      |               |     |      |     | 0    | 0   |
| <i>Schizachyrium stoloniferum</i>               |               |     | 3    | 0   | 20   | <1  |
| <i>Sporobolus junceus</i>                       |               | 1   | 10   | 1   | 7    | <1  |
| <i>Tridens flavus</i>                           | 0             | 0   | 0    | 0   | 0    |     |
| <i>Tripsacum dactyloides</i> (Clay Co.)         |               | 0   | 0    | 0   | 0    | 0   |

Table 3. Germination and yield data from production fields of Fort Cooper Germplasm splitbeard bluestem located at the USDA, NRCS Plant Materials Center, Brooksville, FL. From Brooksville, FL PMC 2001 and Brooksville, FL PMC 2002.

| Treatment     | Harvest Date | Germination | Estimated Purity | Pure Seed Wt. | Estimated Yield |
|---------------|--------------|-------------|------------------|---------------|-----------------|
|               |              | -----%      | -----            | -----g-----   | -----lb/ac----- |
| PMC-dryland   | 11/9/00      | 36          | 59               | 236           | 86              |
| PMC-irrigated | 11/21/00     | 18          | 59               | 368           | 90              |
| Dehulled      | 11/21/01     | 92          |                  |               | 11              |

**Ecological Considerations and Evaluation:** An environmental evaluation was completed for Ft. Cooper to assess its potential to adversely impact the environment. Splitbeard bluestem plants can produce a fairly high percentage of viable seed, which can give it a competitive advantage over several other perennial native Florida grasses which often produce limited quantities of germinable seed. However, its distribution is fairly site specific on dryland areas within the state. Because it exists as only a small component of the population in these particular ecosystems, its use therefore poses little overall possibility of causing negative ecological impacts.

**Conservation Use:** Ft. Cooper has excellent characteristics for use in critical area plantings, such as mined lands and timber harvest areas. It can also be used to restore natural community diversity on suitable sites. This species can also act as a native nurse crop for slower establishing native species such as wiregrass. It provides little food benefits for wildlife; however, it does provide cover for many species. Since it grows in scattered populations, it is more desirable than other *Andropogon* species that tend to form stands that are too dense for optimum use by many important wildlife species (i.e., Northern Bobwhite Quail, *Colinus virginianus*). In fact, an inventory of Bobwhite nesting sites in cultivated field borders and old fields in southern Georgia found that a total of 19% were built in splitbeard bluestem clumps. Livestock will graze splitbeard bluestem in the spring; however, the amount of forage produced is limited and the protein content is considered to be only fair. Its silvery seedheads give it ornamental appeal and, since the seeds adhere well to the stalk after cutting, it can be harvested and used in flower arrangements.

**Area of Adaptation:** Ft. Cooper is a source-identified release and it has not been widely tested. The species is common throughout the Coastal Plain; however, the potential area of use for Ft. Cooper is likely much more limited. It has grown well in increase fields at the PMC in Hernando County; however, the PMC is less than 15 miles south of its collection location. The mineland testing sites were near Ft. Meade, FL, almost 100 miles southwest of the PMC. Future observational plantings at other Plant Materials Centers may determine if it is adapted for use outside the state of Florida. It prefers sandy, droughty soils or medium-textured soils with good internal drainage. It is an extremely effective competitor for limited nutrients on sites with poor soils. Nitrogen and phosphorus fertilization adversely affects persistence of natural stands of splitbeard bluestem, although some fertilization will be required for seed production fields.

**Availability of Plant Materials:** The Brooksville Plant Materials Center will produce G1 (equivalent to foundation) seed. A limited quantity of this seed can be requested by commercial growers from the Florida Plant Materials Specialist, Gainesville, Florida for increase purposes.

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Signatures for the release of:

Fort Cooper Germplasm splitbeard bluestem (*Andropogon ternarius*)

  
Carlos Suarez

State Conservationist

United States Department of Agriculture  
Natural Resources Conservation Service  
Gainesville, Florida

7/28/08  
Date

  
Mike Hubbs

Director, Ecological Sciences Division  
United States Department of Agriculture  
Natural Resources Conservation Service  
Washington, D.C.

8/27/08  
Date