



# Year 2000



# Progress Report of Activities

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Brooksville, Florida Plant Materials Center

14119 Broad St., Brooksville, FL 34601, Tel: 352-796-9600, FAX: 352-799-7305, Web site: [Plant-Materials.nrcs.usda.gov](http://Plant-Materials.nrcs.usda.gov)

## Who We Are

The Brooksville Plant Materials Center (PMC) is a branch of the United States Department of Agriculture, Natural Resources Conservation Service. It is one of 26 plant materials centers located throughout the United States. Areas served include Florida, Puerto Rico, and coastal areas of South Carolina, Georgia, and Alabama. The Center is located approximately 7 miles north of Brooksville on U.S. Highway 41, and 15 miles inland from the Gulf of Mexico.

## What We Do

It is our mission to use plant materials and state-of-the-art plant science technology to solve natural resource problems and meet the objectives of environmental programs. Emphasis is on using native plants. Superior adapted plants are developed, tested and released to commercial growers along with production and management technology. Four major objectives are addressed:

- Water Quality Maintenance and Improvement
- Erosion Control
- Forage and Pasture Improvement
- Wildlife Habitat Improvement

A brief summary of year 2000 accomplishments follows. Request the 2000 Technical Report for a complete account of all activities.

## Eastern Gamagrasses Released in 2000

The state of Florida is favored with an unusually pleasant climate and two growing seasons. This has encouraged the introduction of nonnative species, along with heavy urban expansion. A very small percentage of these introductions have escaped and become serious pests. Thus native plants are now being promoted for wetland restoration, roadside stabilization and landscaping. However, proven Florida ecotypes are in short supply. Eastern gamagrass has tremendous potential for positively impacting the environment. Adapted Florida types are relatively drought and disease resistant, requiring less water and pesticides than nonnatives. Gamagrass functions well in buffers and filter strips, removing excess nutrients like phosphorous and nitrates. It also provides food and cover for wildlife. Two attractive blue-green Florida strains were released onto the commercial market in 2000. Adaptation in other states is currently being tested.



Martin Eastern Gamagrass

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Sunn Hemp Flowers and Seed Pods

## Developing Economical Seed Sources of the Cover Crop Sunn Hemp

Over 480,000 acres in Florida are used to produce vegetable and row crops. The impending withdrawal of methyl bromide and other critical pesticides from the market is causing farmers and scientists to scramble for alternative cropping and pest management systems. Sustainable sources of nitrogen in these systems would also reduce the movement of harmful nitrates into surface and groundwaters. Sunn hemp (a member of the *Crotalaria* family) is an annual legume capable of producing 5000 pounds of biomass and 100 pounds of nitrogen per acre. It also suppresses some types of nematodes. It therefore has tremendous potential for use as a cover crop in rotation with row crops, not only in Florida but also throughout the Southern US. Unfortunately the high cost of seed has discouraged the use of sunn hemp. Seed production primarily occurs during the winter months and is limited to areas with a tropical climate. In 2000, the Brooksville PMC initiated a study to determine the zones in Florida where seed can be economically produced. Results are to be compiled and published in 2001.

## A Ground Cover That Tackles Nonpoint Source Pollution

One of the most important crops in Florida is citrus, with over 780,000 producing acres. Low growing nitrogen producing ground covers, such as perennial peanut, planted in groves can reduce herbicide and chemical fertilizer use, as well as mechanical maintenance. Planted in strips around groves, they can filter soil and excess nutrients from runoff. Thus, the movement of hazardous chemicals into surface and groundwater could be substantially

reduced. Perennial peanut is also being planted in roadway medians, with similar benefits. The Brooksville PMC is currently developing low growing perennial peanut types that form a dense sod, and have good drought and disease resistance. Two strains, 'Waxy leaf', and 'Pointed Leaf', and the commercially available 'Arblick', and 'Ecoturf' were planted at a site in Citrus Co. in 1999. One year after planting all had established very well (picture inset) with supplemental irrigation, except Arblick. Waxy leaf was substantially taller than the other strains and had the densest cover. Pointed leaf produced a very low growing dense sod and many bright yellow blooms, making it an excellent candidate for use along roadsides. Test plots were established in a citrus grove in 2000 to gather further adaptation data.



Front to Back: Waxy Leaf, Ecoturf, Arblick and Pointed Leaf

## Citrus Maidencane Proves Itself In Wetland Restoration

Since 1994, over 47,000 acres of wetlands negatively impacted by agricultural production are reportedly being restored and protected in Florida under the Wetlands Reserve Program. Since 1975, Florida Bureau of Mines records show over 14,000 acres of surface minedlands as having been restored to wetlands. Demand for wetland plants is high in Florida. Yet there are very few proven Florida native wetland species available commercially. 'Citrus' common maidencane was released early in the evaluation process in 1998 to fill this need. Common maidencane is one of the main components in wetland systems. Due to its aggressive rhizomatous root system, it is very useful for stabilizing streambanks and the edges of

freshwater marshes. It also works well as a filter strip around water bodies.

A field planting of Citrus maidencane was placed on a reclaimed mined land wetland site in early October of 2000. Shoots had begun to emerge within 2 weeks after planting, including in areas that became submerged. Establishment has been excellent. The Bureau of Mines established a plot of Citrus maidencane in June of 2000 at their headquarters in Central Florida. They also planted rhizomes of maidencane they had collected locally. Citrus maidencane had formed a solid stand within 6 months, while very few plants from the local ecotype could be found. Currently, the commercial demand for Citrus maidencane exceeds the supply.

### **Developing Native Plants To Address Resource Needs**

Native species are needed for conservation and wildlife plantings, and restoring wetlands. In Florida, NRCS enrolled over 1,500 acres in the Wildlife Habitat Incentives Program in 2000. There is also a high demand for native plant materials that will stabilize inland shorelines, eroding streambanks, and disturbed areas such as mined lands and roadsides in Florida. The phosphate mine industry reclaims between 5000 and 6000 acres of land every year. They would like to restore a portion of this land to native vegetation, but have been hindered by a lack of commercial sources of native plant materials.

The Brooksville PMC has been working with the Florida Institute of Phosphate Research (FIPR) for over 7 years to develop native seed sources, along with the necessary establishment and production technology. It generally requires an average of 25 years to develop a proven cultivar. However, if demand is high, early release procedures have been developed that speed up the release process. Eight species currently under development are shown below, with those closest to release shown first.

- Eastern gamagrass
- Blue maidencane
- Pinewoods bluestem
- Blazing star
- Chalky bluestem
- Lopsided indiagrass

- Hairawn muhly
- Switchgrass

Along with plant development, studies have been or will be conducted on each species to determine such things as methods to break seed dormancy, methods for successful stand establishment, residue management and fertility practices to increase viable seed production. Completed studies are to be summarized in a report for FIPR in 2001.



Hairawn Muhly Study Plots at the PMC in October of 2000

### **Seed Establishment Research Yields Valuable Technology**

Wiregrass and lopsided indiagrass are two of the dominant grasses in Florida native upland systems. They are also on the top of the list for use in native habitat reclamation. However, early attempts to seed these two species often met with failure. Direct seeding verses planting transplants is much more economical if planting technology can be developed. In 1997 through 1999, the Brooksville PMC seeded a series of studies on reclaimed phosphate minedlands in Central Florida. Three factors of successful seedings were studied. The first series of studies examined seeding method. Drilling was compared with broadcasting. Both indiagrass and wiregrass seed have awns and hairy appendages that must be removed before the seed will flow through a drill. This process is called debearding. Debearded indiagrass and wiregrass seed successfully emerged from drilled and broadcast treatments in 1997. However, debearding severely damaged a large percentage of the brittle wiregrass seed, making drilling uneconomical for this species. Indiagrass seed was more compatible to drilling, though a specialized chaffy seed drill is

needed. Overall, indiangrass emergence was highest in broadcast plots.

A series of seeding rate studies were planted in 1998. Indiangrass was broadcast at 3.5, 7 and 10 pounds pure live seed (pls)/ac. Plant densities were similar for the high and medium rates, but inadequate at the low rate. At the medium to high rate, lopsided indiangrass was able to establish well under wet or dry conditions, despite weed competition, making it a good candidate for native erosion control plantings. Wiregrass (which is smaller in seed size than indiangrass) was seeded at 2, 3 and 4 pounds (pls)/ac. Seeding rate did not affect wiregrass emergence during the year this study was planted; densities were inadequate in all treatments. Wiregrass could not overcome a droughty spring and high weed competition. The success of wiregrass plantings appears to be highly dependent on a weed-free seedbed.

In 1999, wiregrass and indiangrass were broadcast in January and May to test the influence of seeding date. Despite a droughty spring, both species emerged relatively well from both treatments. Winter seedings may be advantageous for wiregrass, but only if weed competition is low and adequate soil moisture is available.

Lopsided indiangrass and wiregrass were also planted together in mixtures with other native species. Up to 20% indiangrass in the mix did not significantly reduce wiregrass emergence. The full results from these studies can be found in the Proceedings from the June 2000 American Soc. for Surface Mining and Reclamation Annual Meeting. The PMC website is also to have a copy of this paper posted on it in the near future.



Indiangrass, Wiregrass and Blazing Star on Mined Lands

## Developing Wiregrass Seed Production Technology

Of all the native Florida species, wiregrass is the most sought after for restoration of native pine upland systems. Wiregrass is valued in these systems because of its ability to carry fire - a necessary component needed to manage pinelands. Until recently, very little was known about wiregrass. One discovery has been that wiregrass requires a growing season burn to produce viable seed. The effect of fire has yet to be completely understood, and seed production technology is necessary to insure dependable commercial seed sources.



Harvesting Wiregrass From Test Plots at the PMC

Three studies were established at the Brooksville PMC in 1999 to research the influence of various factors on viable seed production. The first study considers whether there is any difference between removing residue by burning or mowing. No difference was found in total viable seed production in 1999 or 2000.

The second study considers the effect of fertilizer on viable seed production. No difference was found in 1999 or 2000 between fertilized and unfertilized plots. However, fertility may increase total seed production, and long-term plant survival.

The third study considers the effect of burn frequency on plant survival. Burning every year is thought to reduce plant populations. In this study, plants are to be burnt every 1, 2 or 3 years. Results will not be available for at least two more years.

To learn more about these and other PMC activities visit our website:

**[Plant-Materials.nrcs.usda.gov](http://Plant-Materials.nrcs.usda.gov)**