

Brooksville Plant Materials Center
Long Range Plan
2011-2015

I. Introduction

The mission of the NRCS Plant Materials Program is to “*Deliver plant science technology to meet the Nation’s natural resources conservation needs.*” The strategic goals of the National Plant Materials Program are to: 1) Identify and evaluate plants and develop technology for their successful establishment and maintenance in order to solve natural resource conservation problems, which include improving air and water quality as well as enhancing wildlife resources; 2) Provide plant materials and plant technology that are economically feasible for solving conservation problems; and 3) Provide equal access to the Plant Materials Program to all Americans.

The PMC Long Range Plan (LRP) identifies, guides, and directs PMC operation towards solving high-priority resource problems identified by the service area Plant Materials LRP. The PMC LRP is consistent with goals identified in the NRCS 2005-2010 Strategic Plan (<http://www.nrcs.usda.gov/about/strategicplan/>).

II. Long Range Plan Development

The LRP was developed in accordance with the revised National Plant Materials Manual, Part 540.22. The plan is intended to be used as a guide for directing plant materials center activities within the Brooksville, FL PMC service area which includes Florida, Puerto Rico, the U.S. Virgin Islands, and the coastal areas of Alabama, Georgia, and South Carolina. The PM Technical Committee is responsible for identifying customers, resources, and program needs. The PM Technical Committee consists of representatives from NRCS and other federal and state agencies, private industry, and universities.

Needs are categorized by the NRCS Goals as listed in the NRCS 2005-2010 Strategic Plan (<http://www.nrcs.usda.gov/about/strategicplan/#strategic%20plan>).

The PM Technical Committee recommends studies to be undertaken at the center to meet identified concerns. Specific study areas and special concerns are defined by the PM Technical Committee and reviewed by the State Conservationists Advisory Committee. Projected study budgets are incorporated into the Center’s Plan of Operation.

General Description of the Service Area

Climate – USDA Plant Hardiness Zone 8, 9, 10, and 11 are included in the service area. Rainfall is quite varied both in amount and distribution. In peninsular Florida and the Caribbean, rainfall distribution is very seasonal with definite dry and wet periods in the year. In the area, annual rainfall averages range from 40 to 65 inches. At the center, the mean annual precipitation is approximately 52 inches.

Major Land Resource Areas – Included in the service area are all or portions of thirteen Major Land Resource Areas (MLRA). Included are:

- 133a - Southern Coastal Plains
- 138 - North Central Florida Ridge
- 152a - Eastern Gulf Coast Flatwoods
- 153a - Atlantic Coast Flatwoods
- 153b - Tidewater Area
- 154 - South Central Florida Ridge
- 155 - Southern Florida Flatwoods
- 156a - Florida Everglades Areas
- 156b - Southern Florida Lowlands
- 270 - Humid Mountains and Valleys
- 271 - Semiarid Mountains and Valleys
- 272 - Humid Coastal Plains
- 273 - Semiarid Coastal Plains

A detailed description of the MLRA, land use, and climate may be found in Agricultural Handbook 296, Land Resource Regions and Major Land Resource Areas of the United States (<http://soils.usda.gov/survey/geography/mlra/>).

III. NRCS Objectives, Needs, Recommended Actions

The priority plant material needs of the Plant Materials Center fall into eight areas according to the PM Technical Committee.

NRCS Foundation Goal: High Quality, Productive Soils

Crop production in the peninsular region of Florida is dominated by citrus fruit, other subtropical fruit, and vegetable crops. Citrus production historically was located on South Central Ridge (MLRA 154) and the Southern Florida Lowlands (MLRA 156b). Due to a series of freeze events in the 1980s, citrus production in the northern part of this region has moved into the sites that were previously rangelands in the Southern Florida Flatwoods (MLRA 155). The winter vegetable production is centered in the Florida Everglades Area (MLRA 156a) and throughout the southern portion of the MLRA 155. Additionally, this region of the state serves as an important watershed supplying the Everglades National Park, Big Cypress Preserve, and other critically important and environmentally sensitive areas.

Problems

Existing cropping technologies are considered by many sources to be unsustainable. Current vegetable production systems in the region are dependent on synthetic fertilizers and pesticides, which are increasingly expensive due to rising energy costs and can negatively impact regional water quality when improperly used.

Needs

This region needs technology that reduces water usage and soil erosion and helps maintain soil fertility while reducing input costs. Plant materials exist that can address both of these issues, but the technology to incorporate them into production systems needs to be developed.

Targeted Plant Science Studies

- **PM-T-0901 ICST Adaptability of ‘Tropic Sun’ Sunn Hemp:** The first nationally coordinated intercenter strain trial; it will determine the areas of the country with the potential to use sunn hemp (*Crotalaria juncea*) for green manure and as a cover crop.

NRCS Foundation Goal: Clean and Abundant Water

Water quality and quantity are resource concerns for Florida and the Caribbean Area. Groundwater is important for urban, industrial, and agricultural activities in the region, particularly in Florida. Ground water quality is related to soil mineralogy, residence time in the ground water system, presence of nearby salt water, and, importantly, by the quality of the recharge water (all MLRAs in the area). Surface water quality is also an issue for the region. Point and non-point sources (NPS) of pollution, particularly fecal coliform levels, are an issue in the Caribbean, while in Florida, NPS now account for most of the water quality problems. An increasing share of the Florida’s NPS pollution is caused by runoff from residential development and urban expansion, although agricultural activities continue to contribute to the problem. Phosphorus is the primary factor effecting the eutrophication of many surface waters and is thought to limit the productivity of Lake Okeechobee and many of the lakes in Puerto Rico. A 2002 EPA report listed over 2000 of Puerto Rico’s 7,378 acres of lakes impaired due to high concentrations of sediments and nutrients, primarily P.

Problem

Preventing environmental contaminants from entering ground water reserves is challenging particularly in Florida due to the sandy soils karst geography. Another consequence of urbanization is declining water availability because of reduced recharge areas.

Needs

Plant materials that are tolerant of saturated soil conditions to serve as biofilters, forage species to enhance P uptake, and drought tolerant plants suitable for urban landscaping to reduce water use are needed.

Targeted Plant Science Studies

- **FLPMC-P-0201-UR Advanced Evaluation of Hairawn Muhly – Ornamental Types:** Adapted, native grasses for urban conservation are needed.
- **FLPMC-T-0801-PA Effect of Flooding Duration and Nitrogen Level on the Survival and Phosphorous Uptake of Three Forage Species in Florida:** Determine impact on production and survival of pasture grasses due to proposed surface water storage on South Florida cattle ranches (cooperative with ARS, STARS).
- **FLPMC-P-0904-WQ Evaluation of Pine Barren Goldenrod (*Solidago fistulosa* Mill.):** Seed sources are needed for flatwoods restoration efforts in South Florida.

NRCS Foundation Goal: Healthy Plant and Animal Communities

Grassland, Rangeland, and Forest Ecosystems – Grassland, rangeland, and forest ecosystems are productive, diverse, and resilient.

Grazingland, which includes both native rangeland and tame pastureland, is one of the major land uses in Florida (MLRA 154 and 155), Puerto Rico (MLRA 270, 271, 272, and 273), and the U.S. Virgin Islands (MLRA 271). Unlike Florida which has large areas of natural prairies and rangeland, the climax vegetation in Puerto Rico and the U.S. Virgin Islands is forest. Most of the grazinglands on these islands were previously used for sugarcane production.

Problems

Due to the high cost of imported concentrates, most of the livestock, particularly beef cattle, in the service area derive the majority of their caloric intake from tropical grasses. The nutritional value of these grasses and their seasonal growth pattern generally mean that the genetic potential of the livestock is not being expressed. Animal productivity is further impacted by encroachment of invasive weedy species that compete with desirable forage species for light and nutrients.

Needs

The region needs perennial adapted grasses, forbs, and legumes that better meet the year round nutritional requirements of livestock. Management techniques need to be developed that integrate existing plant materials into production systems that suppress weed encroachment or prevent reinfestation following removal of invasive species.

Targeted Plant Science Studies

- **FLPMC-P-9605-RA Evaluation of Eastern Gamagrass:** Adapted Florida ecotypes of eastern gamagrass are needed for pasture planting and rangeland restoration.
- **FLPMC-T-0106-RA Eastern Gamagrass (*Tripsacum dactyloides*) Row Space Fertility Study:** Determine the effect of row spacing and fertility on eastern gamagrass seed production.
- **FLPMC-P-0108-RA Advanced Evaluation of Hairawn Muhly Seeded Types:** Hairawn muhly is a vegetative component in many Florida rangelands and a source of seed for revegetation is needed.
- **FLPMC-P-0501-PA Evaluation of Slender Woodoats:** Adapted native cool season forages are needed in Florida.
- **FLPMC-P-0601-PA Rhizoma Perennial Peanut Cultivar Development:** Rhizoma perennial peanut adapted to wetter sites is needed.
- **FLPMC-T-0701-IN Biocontrol of Cogongrass (*Imperata cylindrica*) with Native Plant Species:** Determine the potential of selected native grasses to control cogongrass after herbicide and tillage treatments (cooperative with FAMU).
- **FLPMC-P-0905-WO Evaluation of Coastalplain Chaffhead [*Carphephorus corymbosus* (Nutt.) Torr. & A. Gray]:** Seed sources for understory species are needed for longleaf pine restoration.

- **FLPMC-P-0906-WO Evaluation of Narrowleaf Silkgrass [*Pittyopsis graminifolia* (Michx.) Nutt.]**: Seed sources for understory species are needed for longleaf pine restoration.
- **FLPMC-T1002-RA Forage Quality Sampling**: Better understanding of seasonal effects on the forage quality of selected native grasses compared to introduced grasses are needed.

Fish and Wildlife Habitat – Working lands and waters provide habitat for diverse and healthy wildlife, aquatic species, and plant communities

Rangelands and forestlands in Florida (primarily MLRA 138, 152a, 154, and 155), provide direct benefits to society by providing such things as hunting and wildlife observation. Leasing of hunting rights on private property is becoming a common way to gain access to a quality hunting experience and hunting leases can provide a substantial source of income. Although hunting is a very important reason for maintaining wildlife habitat, nationally, only about 20% of the wildlife-related activities involve hunting. People involved in wildlife observation, particularly bird watching, outnumber hunters two to one. In addition to resident bird species, rangelands and forestland in Florida provide is critical habitat for migratory bird species that pass through the state in the fall and the spring. Of increasing importance is the recognition of the value of wildlands to pollinator populations. Destruction and fragmentation of pollinator habitat by human activity has resulted in sharp declines in the populations of North American native pollinator species. New language in the Food, Conservation, and Energy Act of 2008 (the Farm Bill), makes preservation and restoration of pollinators and their habitat a priority for every USDA land manager and conservationist.

Problems

Loss of wildlife and pollinator habitat due to intensification of farming, mining, and urbanization is the major cause of declining wildlife populations in the state. Federal programs such as Conservation Reserve Program (CRP), Wildlife Habitat Incentive Program (WHIP), Environmental Quality Incentives Program (EQIP), and Wetlands Reserves Program (WRP) are directed all or in part to reversing this trend. Unfortunately, the availability of seed of native species, particularly regionally adapted natives, which are emphasized in these programs, greatly limits effectiveness of the programs.

Needs

There is a need to develop more plant materials suitable for habitat restoration and to overcome technical hurdles to commercial scale seed production of these materials.

Targeted Plant Science Studies

- **FLPMC-P-9602-RA Evaluation of Lopsided Indiangrass**: Tested germplasm of this important range species is needed for restoration planting.
- **FLPMC-P-0001-RA Evaluation of Native Switchgrass**: Better seed producing types of Florida-adapted material is needed for rangeland restoration.
- **FLPMC-T-0802-WL Interaction of Time of Year and Landscape Position on Survival of Selected Florida Tree and Shrub Species Planted as Whips**:

Direct planting of woody whips may be useful for increasing species diversity on pond margins in restored phosphate mineland.

- **FLPMC-T-0901-WL Interaction of Seeding Rate and Soil Type on Establishment of Native Seed Mix on Recontoured Mineland:** Optimum seeding rate needs to be determined for recontoured phosphate mineland which often consists of large patches of sand tailings and overburden.
- **FLPMC-T -0902-RA Seeding Rates for Native Range Plant Restoration:** Species- specific seeding rate recommendations for important native rangeland grasses are needed.
- **FLPMC-T-1003-WL Value of Native Perennial Forbs, Shrubs, and Trees for Pollinator Habitat:** Establishment, persistence, and growth rate of selected native perennial forbs, shrubs, and trees important to pollinators will be demonstrated.

NRCS Venture Goal: An Adequate Energy Supply

It is estimated that Florida currently uses 8.6 billion gallons of gasoline each year and this amount is expected to grow 300 million annually. Florida's oil industry produces less than 1% of the national crude oil production, but the state ranks in the top ten states in agricultural production. The state's agricultural sector produces nearly 10% of the current biomass output, or about 120 million tons annually. Charles Bronson, Florida Agriculture Commissioner, says the state has a goal of producing 25% of the state's energy needs from agricultural products. Technology now exists to more efficiently make "cellulosic ethanol", but more information is needed on dedicated biomass crops for use in the state. Previous work has emphasized introduced species, but concerns with the potential invasiveness of biomass crops such as elephantgrass (*Pennisetum purpureum*), leucana (*Leucaena leucocephala*), or giant reed (*Arundo donax*) are warranted.

Needs

Superiority of Florida adapted ecotypes of switchgrass in both dry matter production and stand persistence has been demonstrated. Utilization of these ecotypes is limited by lack of seed production. More information is needed on the potential of other native species for biomass production.

Targeted Plant Science Studies

- **FLPMC-T-0803-BF Evaluation of Switchgrass Lines for Biofuel:** Information is needed on the production of switchgrass biomass when grown on organic soils in south Florida.
- **FLPMC-P-0901-BF Development of Elephantgrass Germplasm for Bioenergy Production:** Higher producing elephantgrass cultivars are needed for biofuel production.

NRCS Venture Goal: Working Farm and Ranch Lands

Since the 1970s, about 3 million acres of farmland in Florida has been converted to non-agricultural uses. In Florida, although only Lafayette, Gilchrist, Hardee, Glades and Hendry Counties were identified in 2000 as being farming dependent (15% or more of employed residents farming dependent), this does not mean that agriculture is not

important to the local economy in many counties in the state. Economists believe that there is a certain level of agriculture producers or a critical mass of farmland necessary for businesses serving the industry, directly or indirectly, to survive. Once this lower threshold has been passed, industries that service the farming industry in a given area decline rapidly. An additional consequence of farmland conversion is often the loss of the intrinsic benefits of open space, good air quality, scenic beauty, wildlife habitats, and water recharge.

Problems

Government policies to promote agricultural land retention can do little to ensure continued agricultural production in the face of declining profitability. Development of plant resources, such as native wildflowers, grasses, and legumes, to supply specialty demand for roadside beautification, wildlife habitat, and ecosystem restoration potentially offer much higher return per acre and thus retention of land in agricultural production.

Needs

The state needs conservation plant materials that fill high value niche markets.

Targeted Plant Science Studies

- **FLPMC-T-0103-BU Blue-green eastern gamagrass (*Tripsacum dactyloides*) fertility study:** Determined the effect of fertilizer treatments on stability of blue-green color of ornamental eastern gamagrass lines.
- **FLPMC-P-0903-UR Evaluation of Powderpuff (*Mimosa strigillosa* Torr. and A. Gray):** Development of a native groundcover for urban landscapes.
- **FLPMC-T-1001-TE Interaction of Fertility and Container Size on Development of Sea Islands Germplasm Transplants and Their Subsequent Survival in the Field:** Greenhouse propagation methods that maximize field survival of Sea Island Germplasm sweetgrass are needed.

NRCS Management Goal: Ensuring Civil Rights

Problems

The NRCS Plant Materials Program has the potential to provide a wealth of information to land owners, land managers, and the public on the use and management of conservation plant species for the protection of the nation's natural resources. One of the responsibilities of NRCS and the Plant Materials Program is to ensure that all individuals have equal access to information on conservation plants and plant technology developed at the Plant Materials Center. Historically, there has been some difficulty in effectively transferring this information to all end users.

Needs

It is imperative that technical information developed by the Plant Materials Program be available through a variety of means to make sure that NRCS staff and conservation partners have the tools they need to address resource conservation problems.

Targeted Activities

- Translate key Plant Materials Center publications into Spanish.
- Explore partnership opportunities with groups that serve minority or limited resource groups that have demonstrated an interest in plant conservation concerns.

- Explore non-traditional methods and settings to transfer Plant Materials Center technology, such as inner city school vocational groups, tribal council meetings, etc.
- Mentor students with a demonstrated interest in plant conservation concerns identified as high priority items within the PMC service area.

NRCS Management Goal: Human Capital

Problems

Many NRCS employees have had limited exposure to the Plant Materials Program and therefore have little understanding of the services available from the Plant Materials Center. Also, the status of the Plant Materials Program and the services available from Plant Materials Centers has not been recognized by all potential partners in the scientific community. This lack of understanding hinders the effectiveness of the program in meeting employee, resource and program needs.

Needs

There is a need to provide awareness training to NRCS and other non-NRCS partners regarding the purpose and function of the Plant Materials Program.

Targeted Activities

- Develop and outreach training effort to provide awareness of the Plant Materials Program for NRCS employees and partners.
- Present technology developed at the Plant Materials Centers in various scientific forums.