

## Big Flats Plant Materials Center Biofeedstock Energy Program

The USDA-NRCS Plant Materials Program has 27 Plant Material Centers located throughout the country serving different climatic and physiographic regions. The Big Flats PMC is a 200 acre research farm with additional capability for growing, harvesting, cleaning and storing seed and growing nursery stock. The program was created in 1935 as the soil conservation service division of nurseries and the Big Flats PMC was a nursery that produced trees planted by the CCC. There are presently 3 full time staff, part time technician and myself a Plant Material Specialist who also has responsibilities to work on NRCS Plant Material related work in Maine, Vermont, New Hampshire, NY and Pa.

The mission of the plant materials program is to develop plants and cost effective technology to utilize plants to solve conservation problems and to enhance natural resources. Nationally the program has released over 600 conservation plants in which most are being grown by commercial growers with annual market value of \$100,000,000.

Resource concerns include: The maintenance and improvement of the productivity of agricultural lands, to maintain and improve air and water quality, to conserve wildlife, wetlands and pollinator habitat, and to improve energy efficiency in agriculture and sustainable biofeedstock energy production.

The Plant Materials Centers collaborates nationally with other PMC's, with Universities, USDA-Agricultural Research Service, SWCD's, other state and federal agencies, wildlife and conservation NGO's, as well as landowners and farmers. Due to our wide interests and working relationships including a network of NRCS field offices, providing direct assistance to landowners, we are able to identify research and plant technology needs and develop sustainable solutions to conservation problems.

## The Plant Materials Perennial Biomass Feedstock Energy Program

Historically the seed for the first switchgrass variety developed, 'Blackwell' was collected by the program in 1935. Other switchgrass varieties developed by the PM program and currently being used by growers and as parent material for breeders are: 'Cave-in-Rock', 'Kanlow' and 'Alamo'. The Big Flats PMC started its warm season grass program in 1954 and has resulted in the release of 4 cultivars. The agency has a history of working with warm season grasses for gravel mine reclamation, wildlife habitat improvement, prairie restoration and for grazing, and is well positioned to provide technical assistance for sustainable perennial biofeedstock production.

In the Northeast the PM program is aware that warm season grasses will not be the sole or primary answer for biomass and that a variety of biofeedstocks will be necessary to meet the potential demand of a biomass energy program. Past collaboration with the SUNY College of Environmental Science and Forestry (ESF) resulted in the release of a hybrid poplar cultivar "Spike".

The Big Flats PMC program is collaborating with several universities and USDA-ARS facilities to test and breed new warm and cool season grasses for bioenergy needs.

NYFVI grant “Evaluation for perennial grass and legume feedstocks for biofuels production in New York State” in collaboration with Cornell University’s Plant Breeding Department with Dr. Don Viands. The project is evaluating existing cultivars of warm season grasses and some cool season grasses for yield and chemical composition.

NE Sun Grant: “A biofuels screening program for grass feedstocks: diversity, physiological traits and compositional characteristics for optimal yield” in collaboration with Cornell University’s Plant Biology Department with Dr. Joss Rose. We provided existing mature warm season grasses and tall wheatgrass for initial chemical compositional analysis. We initiated a collection of native switchgrass and big bluestem from NY and PA for breeding.

Collaboration with Dr. Ken Vogel, one of earliest breeders of warm season grasses from USDA-ARS lab in Nebraska. We are evaluating in replicated plots 2 new cultivars of Big Bluestem and 13 advanced breeding lines of switchgrass. Some of these breeding lines are from a new hybrid system they developed. We are also evaluating 3 cultivars of intermediate wheatgrass (a cool season grass) with a breeding line being developed at Big Flats PMC.

Collaboration with Dr. Yanqi Wu from the University of Oklahoma who is advancing the earlier work of Dr. Charles Taliaferro with switchgrass, we are evaluating 5 lines in conjunction with 2 recent cultivars from North Carolina State and a release from the Cape May PMC.

Collaboration with Dr. Larson and Jones USDA-ARS Logan Utah, conducting an initial evaluation of 5 wildryes (cool season grass) from the genus (*Leymus*) from material obtained from the National Germplasm System as well as some interspecific hybrids from the research program of Tom Jones and Steve Larson.

Collaboration with the Hungarian Agricultural Research and Development Institute, we are evaluating a cultivar of tall wheatgrass (cool season grass) developed by the Institute in replicated trials with three cv’s of tall wheatgrass available in the US, the Big Flats intermediate wheatgrass and two cv’s of reed canarygrass. This study is being replicated at 10 PMC’s across the country. We are also conducting a time of cutting trial with the tall wheatgrass. It looks like it is possible to harvest the majority of the yearly growth of this species with a single cutting.

Other biofeedstock collaborations: Larry Smart (Cornell) formerly with SUNY ESF on an evaluation of his hybrid shrub willows. Dr. Gary Bergstrom (Cornell) in evaluating switchgrass for smut disease and Dr. Allan Taylor of the NYS experiment station in Geneva, NY looking at seed treatments for establishing switchgrass on marginal lands and for dormant seedings.

This work is being done in conjunction with other priority areas of work in cover cropping, native willow development for stream erosion control, pollinator establishment and other native plant development projects for multiple resource concerns.