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Mid-South Plant News

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PMC Tours

During the week of April 26, USDA-ARS in Oxford, MS hosted the International Soil Erosion Conference that was attended by 52 scientists from Asia, Europe, and Canada. A field trip to the PMC was held on April 29, during which Joel Douglas gave the visiting scientists a tour and information on the vegetative buffer research that was conducted at this site that helped lead to the development of NRCS Conservation Practice Standard 601.

The Semi-Annual Wildflower Tour, held in conjunction with the MS Soil and Water Conservation Commission, was June 3. The weather cooperated with us (unlike last year) and approximately 140 people attended. A broad spectrum of people from surrounding communities came to tour PMC production fields, learn about our research activities, and listen to Extension Service speakers.

On July 15, PMC personnel provided a tour of the PMC and training on native grass establishment to District Conservationists, Soil Conservationists, and Area Office Specialists from Area 1 (Northeast and north central MS) and Area 4 (the Delta). Forty-five people attended, which caused Joel to remark that he could not remember the last time that many NRCS people had visited the PMC. It gave us an excellent opportunity to let some of our field people know about research we are conducting on many plant materials concerns and let them know how the information we generate can be used in their daily activities.

The following day, we conducted a tour for about 15 individuals that work for the MS Department of Wildlife, Fisheries and Parks (photo above right). They were especially interested in our wildlife plant releases and the research we are conducting on native grasses.

On September 22, we hosted a PMC tour for nine NRCS employees from the Monroe Area arranged by Scott Edwards, LA Plant Materials Specialist. This portion of Louisiana is in our service area and this provided an opportunity to increase their awareness of what is going on at this PMC.

PMC Secretary Transfers

Well once again, we have had a personnel shakeup here at the PMC. Patricia Taylor, our secretary since 1998, left us to return to Rural Development on November 1. She is located at the USDA Service Center office in Grenada, MS. We will miss Tricia dearly, but we are glad that she was offered this opportunity for personal advancement.

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We're on the Web

Plant-Materials.nrcs.usda.gov

NRCS Natural Resources Conservation Service

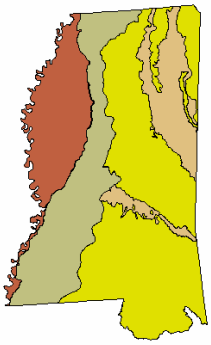
Putting GPS/GIS Technology to Use at the PMC

Earlier this year, the PMC received its Global Positioning System (GPS) instruments, which included a Garman hand-held GPS receiver and a WAAS differential for improved signal reception. We were given Geographic Information System (GIS) capabilities with ArcView software. Julie Daughdrill, GIS Specialist in the MS State Office, gave us preliminary training on using the GPS instruments and downloading geographic information from the PMC into ArcView.

We anticipate that we will be able to use this technology to better manage our field work. For one thing, the field map we are currently using is an old hard copy and the acreages are not accurate. Using the GPS instruments we will be able to walk our fields and create maps in ArcView with correct acreages. GPS/GIS will also give us greater flexibility. If we divide one field into two to accommodate a study or a smaller seed production block, we can update the field map accordingly. We can also tie items such as fertilizer or liming history to a particular field in the database in ArcView. Time to do this has been a little limited this year, but hopefully we can map the fields this winter. Gaining some competence is ArcView is going to take a little more time.

An additional use for the Garmin GPS unit is pinpointing plant collection and field planting locations. Janet Grabowski used it this summer when she collected accessions of little barley from various locations in Mississippi. It was much easier to read out longitude and latitude from the display than to try and describe the physical location using words as we had previously done. It will also be easier to return to these collection sites in the future if we should need to.

We can also utilize ArcView to create geographic-based images for documents such as the one below that shows the Major Land Resource Areas in Mississippi. This will allow us to have better control over the appearance of documents such as release brochures or planting guides.



Crop Rotation Implementation

In a related story, we completed the second year of implementing a crop rotation schedule that will also allow us to better manage our fields. When Jon Allison joined us in 2002, he suggested that since many of the releases we produce foundation seed of are annuals, that we should rotate our production fields of these species. In the years that we are not utilizing fields for seed production or plant evaluation studies, we grow maintenance crops such as glyphosate-tolerant (Roundup-Ready) soybeans (below left) or corn. We don't harvest seed from these crops, but while they are growing we can use recommended herbicides to control weeds that had built up over several years of foundation seed production.

We can also use maintenance crops that produce more biomass, such as corn or grain sorghum (milo), to build up organic matter that has been depleted in some of our soils. Unfortunately, we did not have good luck with much of the milo we planted this year due to water-logged soils, but we did have good corn in some locations.

Last fall, we took soil tests on most of our main production fields and lime was applied in the spring. A few newer fields will require a second application of lime this year to reach their optimum pH level. Also, some additional fields that were not tested last year will require testing so that their liming and fertilizer needs can be determined. We have a couple more years before the crop rotation will have run through its first cycle, but we are already seeing some results such as fewer weeds and improved soil tilth in fields where milo was planted in 2003.

Comparison of Purple Coneflower from Different Locations

Purple coneflower [*Echinacea purpurea* (L.) Moench] is a popular wildflower for use in home landscape, prairie, and roadside plantings, and it also has medicinal properties. It is generally found in east central Mississippi on well-drained soils.

Purple coneflower seeds were collected from the Tombigbee National Forest in Chickasaw County, MS and sent to the PMC to increase for the MS Native Wildflower Conservation Program. We wanted to compare this local accession (9077079) to seed from commercial sources to determine if there is justification for releasing it. The five commercial accessions were 9077089 (-089) from Seeds Trust-High Altitude Gardens, Hailey, ID; -090 from Prairie Moon Nursery, Winona, MN; -091 from Wildseed Farms, Fredricksburg, TX; -092 from Midwest Wildflowers, Rockton, IL; and -093 from Stock Seed Farms, Murdock, NE.

Seeds were stratified for 6 weeks and planted in the greenhouse on March 3, 1999. A single 5' by 8' plot of each accession was planted on May 20 using 25 plants, except for -093 where only 24 plants were planted. Plots were not fertilized the first year because slow-release fertilizer was added to the initial growing medium. In subsequent years, plots were fertilized at a rate of 100 lbs per acre of 13-13-13.

Plots were evaluated in June and September from 1999 to 2001. Plants counts and vigor ratings were made at both evaluation periods except vigor was excluded in June 1999, since it was so soon after planting. In September, number of flowering heads was counted on three randomly selected plants in each plot. Size of these plants was determined by using a string reaching from the tip of each outer-most leaf in the clump; the length of string was measured to determine the basal circumference. In 2000, drought caused early sencecence, so circumference measurements could not be taken. By 2001, volunteer seedlings were present in the plots and these were counted; however, only well-established seedlings were used for plant size measurements.

Seed from commercial sources has likely undergone selection pressure to improve plant performance. Early vigor of several of the commercial accessions was higher than that of the native -079, however, most declined throughout the study period, while that of -079 stayed fairly uniform. Conventional wisdom would suggest that plants from more northern locations would be poorly adapted. Rainfall was below normal in 1999 and 2000 and may explain why -093, from NE, a fairly dissimilar climate, did not have poor vigor ratings in these years. Survival of -092 from IL was poor, but this was probably not due to climate differences. Plant size of -079 was comparable to the commercial sources in both 1991 and 2001. Flower production was highest in 2000 and there was little difference between accessions. More seedlings grew in the -079 plots suggesting that it is probably the best adapted to our conditions, but it does not appear to be a good candidate for release since vigor and flower production were no better than the commercial sources.

1999 Purple coneflower evaluations

Accession	06/18[1]	09/15			
	# plants	# plants	Vigor[3]	# fl. heads[4]	Basal cir.[4]
					----in.----
9077079	20	16	5	0	42
9077092	17	15	1	4	39
9077089	22	18	3	0	46
9077093	24	22	3	4	48
9077090	24[2]	22	5	2	44
9077091	25	24	5	1	49

[1] Vigor ratings not taken at first evaluation after planting.
[2] Only 24 seedlings were planted in this plot.
[3] Vigor: 1 = excellent; 3 = good; 5 = average; 7 = fair; 9 = poor.
[4] Average of measurements from 3 plants.

2000 Purple coneflower evaluations

Accession	06/02		09/15		
	# plants	Vigor[1]	# plants	Vigor[1]	# fl. heads[2]
9077079	11	5	9	3	11
9077092	4	3	5	7	13
9077089	8	7	6	3	19
9077093	14	7	9	1	17
9077090	15	5	14	3	14
9077091	11	5	10	3	11

[1] Vigor: 1 = excellent; 2 = good; 5 = average; 7 = fair; 9 = poor.
[2] Average of measurements from 3 plants.

2001 Purple coneflower evaluations

Accession	06/02		09/15			
	# plants[1]	Vigor[2]	# plants[1]	Vigor[2]	# fl. heads[3]	Basal cir.[3]
						----in.---
9077079	12	3	26	3	3	41
9077092	3	5	5	5	1	31
9077089	6	7	6	5	1	38
9077093	1	7	8	5	0[4]	41[4]
9077090	6	1	7	3	6	55
9077091	7	3	7	5	1	42

[1] New seedlings were also counted.
[2] Vigor: 1 = excellent; 3 = good; 5 = average; 7 = fair; 9 = poor.
[3] Average of measurements taken from 3 plants.
[4] Only 1 established plant was available for evaluation.

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Correction

In the February 2004 edition of the newsletter, there was an error in the seeding rate article on Page 1. Where it states "In this example, we wish to plant 5 eastern gamagrass seeds…" it should have said 3. The equation that follows used the desired value of 3 seeds per foot and therefore the number of seeds per acre is correct as presented.

PMC Highlights

Tours	*See Article on Page 1*
March 23 and September 28	*Joel Douglas gave an overview of National PM Program and the Jamie L. Whitten PMC to participants of the NRCS Basic Field Conservation Training Course*
April 2 and November 12	*Joel Douglas gave a presentation on the plant materials program to the Panola County Exchange Club and the Grenada Lions Club*
October 3-6	*Janet Grabowski attended the 4th Eastern Native Grass Symposium and gave an oral presentation on little barley as a cover crop and presented posters for Joel Douglas and Walter Jackson on managing 'Highlander' eastern gamagrass*
October 15, 16	*Janet Grabowski gave two presentations on wildflower establishment at the Fall Field Day at the Truck Crops Experiment Station in Crystal Springs, MS*
October 19 and November 4	*Janet Grabowski gave presentations on wildflower seed production to garden clubs in Grenada and Marks, MS*

Ask the Expert

Q. Why do we recommend specific inoculants for leguminous plants?

A. Most of you probably know that there are bacteria (*Rhizobium* spp.) that associate with a legume causing the formation of nodules on the roots; these bacteria can fix nitrogen from the air into a form that both they and the plants can use. Inoculants are commercial formulations of these bacteria that can be applied to legume seeds before planting to ensure that nodulation occurs. There are many different strains of *Rhizobium* and they differ in their ability to associate with certain types of legumes. That's why it's important to choose the correct type for the legume you are planting. Bacteria are living organisms that can be killed by heat and drying, so inoculants should be stored in the refrigerator prior to use. It's generally recommended that you buy new inoculants each year to be sure of their activity. Inoculants are a whole lot cheaper than buying nitrogen fertilizer for the crop. Additional information can be found in the Plant Materials Resource Handbook.