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MANHATTAN PLANT MATERIALS CENTER
Manhattan, Kansas

Plants for the Heartland

A newsletter in support of the Plant Materials Program for Colorado, Kansas, Nebraska, and Oklahoma

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Lilacs from the '30's

INSIDE THIS ISSUE:

Plant Center Product

One of the responsibilities of the Plant Materials Center (PMC) staff is to produce items of technology transfer for our customers. To carry this out, the PMC staff works with the National Plant Data Center staff to produce a Plant Guide (PG) or Plant Fact Sheet (PFS) for use and distribution on the PLANTS Web site (http://plants.usda.gov). The PGs and PFSs are documents that provide information about conservation plants that are commonly used to improve the land. Many are important for plant community restoration, or are used in various conservation practices such as installing buffers, planting windbreaks, stabilizing soil, reclaiming former mined land, and providing habitat for wildlife. PFSs provide brief descriptions of a plant and its uses and offer the cultural significance of the plant, if any. PGs are similar to PFSs, but are usually much more extensive and typically describe the entire process of establishment, management, and production of a species. PGs contain additional scientific information and will provide the reader with references to the scientific literature cited in the text.

The Plant Materials Program has produced many PGs and PFSs for the plant enthusiast's information, entertainment, and use. The documents can be used in conjunction with other tools that are available through PLANTS. PLANTS' tools allow an individual to select plants based on geography, a plant's adaptability to soils and climate, an intended conservation use and other variables. When VegSpec Planting Design module (http://vegspec.nrcs.gov/vegSpec/index.jsp) provides a list of potential species for use, the individual can access the appropriate PG and PFS for information on the plants specific characteristics. Thus with better information on specific plant species, an individual can do a better job of selecting appropriate species for the conservation projects to be completed.

Manhattan PMC Gets New Oil House

Nobody recalls all the details on the old oil house that Jerry Longren, biological science technician (BST), tore down this past Spring. We know that his dad, Warren Longren, and Cal Conwell, both were technicians at the PMC, built the building from scrap lumber salvaged from the Fort Riley Military Reservation many years ago. Initially the building was used to store pesticides. The building served in that capacity until the 1990-Initiative cleared the way for some improvements at the PMC.

Longren constructs all metal building inside the PMC's shop.

In order to build a new office and conference center, two buildings were razed, a temporary seed storage building and the oil house. The contents of the oil house were temporarily moved to a machinery building. Then a chain of events began to take place. A new pesticide storage building was needed to comply with modern safety standards. Therefore, a metal building that provided lighting, heat, and ventila-

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PMC Gets New Oil House continued from page 1

tion was built not far from the old pesticide shed. Once completed, the vacated pesticide shed became the oil house. The building had no electricity and little ventilation. In this age of increased security concerns, it was time to replace that old wooden shed. Longren designed and built an all metal building inside the PMC's shop over the winter months. In late March after all the siding had been put on and the electrical wiring had been run, Jerry was ready to roll the building out. At the start, Jerry welded a couple of car axles, which included steel rim wheels, to the bottom frame of the building. After a great deal of maneuvering, Jerry managed to get the new building to its final resting place. The PMC now has a well-lighted, secure building with adequate ventilation for storing oil, fuel cans, and associated paraphernalia. The building also blends in nicely with the nearby pesticide storage building.

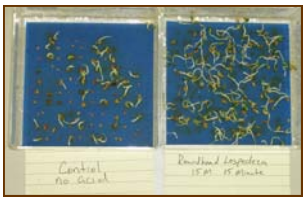
Longren tows Oil House to final resting place.

Acid Scarification Screening Procedure

"Each species has its individual, optimum point of scarification"

Acid scarification is a common technique used to improve the germination of some hard seed coated species. It accelerates the seed coat aging process and breaks down the seed coat allowing water to be imbibed. The uptake of water starts the biochemical processes that trigger germination. Acid and mechanical scarification are especially useful and recommended for many species of legume prior to planting. However, there is much variability in the seed coat thickness and seed size between species. Acid scarification has been described in seed testing manuals as placing the seeds in a concentrated acid bath for a specified length of time. This approach may be fine for large, thick-coated tree species, but it may destroy the smaller forage legumes that have thinner seed coats. Each species has its individual, optimum point of scarification, after which, damage to the seed unit would start to occur. This Seed Technology Laboratory study will identify the concentration of acid and time needed to produce optimum germination in species requiring scarification. Alan Shadow, PMC soil conservationist, will test different acid concentrations in combination with various exposure times on several legume species released from the Manhattan PMC. He began the testing phase with round-head lespedeza, *Lespedeza capitata*, and found that an application of a 15 Molar solution of sulfuric acid (H_2SO_4) for 30 minutes provided optimum germination. Alan will test other PMC releases and experimentals such as Illinois bundleflower, purple prairie clover, partridge pea, and white prairie clover.

Alan calibrating pH meter.



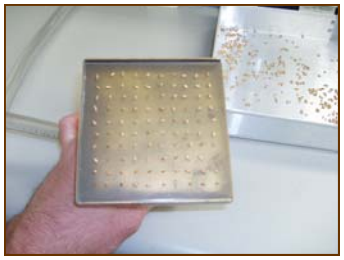
Non-acid scarified seed and acid scarified seed.

Advanced Study To Improve Giant Sandreed

For a plant variety to be successful with respect to seed production it must initially have good seedling vigor and other positive establishment characteristics to produce a viable stand the second year after planting. An establishment period greater than a year will pretty much ruin a variety's chances of being widely accepted in the seed trade. If the seed is valuable, it may be produced by a few individuals for the specialty market.

The Manhattan PMC has been working with giant sandreed (*Calamovilfa gigantea*) for several years now and had considered releasing the plant to the seed trade for commercial production. The main problem facing the plant release has been the fact that when trying to establish a foundation production seed field, it requires several years to establish and then may never produce an excellent stand. Thus our reluctance to release a plant variety that may very well end up not being productive or accepted by the conservation seed trade.

Therefore, we determined that if we wanted to actually make an impact with this plant and get some conservation in sandy locations, we needed to improve its establishment potential. Using the equipment available in our seed testing lab, we designed a program for improvement of giant sandreed. First, we used a South Dakota seed blower to divide the breeder seed of giant sandreed into four different weight classes. This was based on the idea that a bigger seed will produce a bigger more robust seedling. Next, the larger seed was subjected to stresses such as heat, cold, acidity, and salinity to produce seedlings that can withstand additional stress and still germinate quickly. The PMC used its germinators to set up the temperature stresses and speed of germination tests. Germination time of the seed was limited to one week to promote the selection of the rapidly germinating characteristic. The selected plants from these survival tests were planted in conetainers in the greenhouse initially and are now in a polycross nursery at the PMC. Once these plants reach maturity and produce seed, the seed will be harvested and compared to the original seed source used for size, speed of germination, and the other survival characteristics. Hopefully, we will see improvements in germination speed, seedling size, and ultimately, establishment.



Heavy seed shown on seed counter head.

Shop Notes

Revitalizing an old piece of equipment.

Our Side Winder tiller was a heavy duty piece of equipment ideal for roto-tilling between the rows of perennial crops. After giving us many years of service, the drive shaft twisted off. Several attempts to repair the tiller resulted in failure. A replacement tiller was procured and put into service. It was not heavy duty and soon began to show the wear and tear of trudging through trash and root stalks associated with the aftermath of perennial crops. With stubborn persistence, efforts were made to once again revitalize the old tiller. Jerry Longren, BST, looked beyond the drive shaft and found bearings that needed replacing. This was the primary cause of the drive shaft failure. Finding the parts for the repair was difficult.

Side Winder tiller awaiting parts in PMC's shop

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SEEKING VEGETATIVE SOLUTIONS TO CONSERVATION PROBLEMS

The mission of the Plant Materials Program is to develop and transfer state-of-the-art plant science technology to meet customer and resource needs. The primary products produced by the program include the production of improved varieties of plants for commercial use and the development of plant science technology for incorporation into the electronic Field Office Technical Guide (eFOTG).

We're on the Web! www.plant-materials.nrcs.usda.gov

Woodies: A Long-Term Commitment

When I arrived at the PMC nearly 20 years ago, the woodies was a grand place. Nearly all sections of the woodies were filled with trees and shrubs of a wide variety of species. On sunny fall days, the sun filtered through the sea of yellow leaves in the grove of ash. Some of the oldest plantings were in Field G where many entries had been removed prior to my arrival. We continued with this process as trees and shrubs died or become decadent. Soon there were large open spaces in the fields. Even though replanting continued, removal of the hawthorns and ash created some huge voids. Replanting has had its ups and downs but is steadily catching up. The small plants, though they fill up the rows, they do not fill the spaces the way the previous entries did.

Bloodtwig dogwoods are among recent additions to the woodies.

The woodies is going through a rebirth of sorts as the spaces fill back in and maybe it will be a grand place once again. The purpose of the woodies is to evaluate woody plant materials for their adaptation at Manhattan. Though the site is on the Kansas River Bottom where trees can do very well, it also can be a stressful place which in this case is not a bad thing. New plantings get watered in and may need drip irrigation for a couple of years. It depends on how much help we get from Mother Nature. Once established, plants are on their own, except for an occasional weeding. The deer have become such a problem that new plantings have to be fenced year round to reduce the deer's-damage.

~ John Row