

MANHATTAN PLANT MATERIALS CENTER
 Manhattan, Kansas



Ice-covered Washington hawthorn

INSIDE THIS ISSUE:

- Pines in a Death Spiral?** 2
- Mission Statement** 4
- Grass Facts** 4



Whole seed unit and caryopses

~Photo courtesy, Mid-West Seed Services, Inc.

Understanding Native Seed Quality

Landowners use native plants in many different ways. Some landowners are interested in restoring an area to its original native vegetative state. Other stewards of the land are interested in protecting their soil from erosive forces, feeding livestock, or providing cover and support for wildlife species. Whatever the landowner desires, native trees, grasses, forbs, legumes, and wildflowers can be used to help meet their goals.

Establishment of native species may not be an easy task. Germination of many native plant species and of species in a native seed mixture is generally not very uniform. Many native plant species do not become

established the year of planting. Perennial native species that do germinate tend to prioritize first year growth to its root system with reduced emphasis on the above ground stem and leaf production. Thus, slow or reduced shoot and leaf growth can be anticipated the first year of growth.

These facts are discouraging and somewhat disheartening for novice native plant enthusiasts that expect to witness aggressive growth and flower proliferation the initial planting season. Patience is the first lesson learned from growing native plant species. Successful establishment of native plants requires good tillable land, a firm and weed free seedbed, quality seed, good seed-to-soil contact,

adequate rainfall or irrigation, good weed control, time, and a certain amount of luck.

To truly understand native seed quality, an individual needs to follow the growth cycle of the native species. The final quality of harvested seed is a direct result of many intermediate steps that begin with the origin of the harvested field. The field needs to be properly prepared and initially planted with high quality seed. A field that is planted with low quality seed (i.e., low germination, high weed seed, or other crop seed) will not produce a high quality marketable product. Thus, a new field needs to be planted initially

continued on page 3

Customer Satisfaction Survey

The American Customer Satisfaction Index (ACSI) is the national indicator of customer evaluations of the quality of goods and services available to U.S. residents. ACSI is produced by the University of Michigan in partnership with the CFI (Claes Fornell International) Group and the American Society for Quality. The ACSI has been used to measure the customer satisfaction level of more

than 100 federal government programs since 1999.

The questionnaire used in this survey was developed through a collaborative effort between CFI Group and the USDA NRCS Plant Materials (PM) Program. Interviews using the questionnaire were conducted from December 1 to 19, 2006, by the professional interviewers of Discovery Research Group. A total of 187 interviews were conducted, of which

183 were valid for modeling purposes. Respondents were categorized into the following groups.

Respondent Type	Percent Surveyed
College or University	31
Commercial or business	17
Non-federal offices	15
NRCS offices/ non-profit agencies	14
Other	23

continued on page 4



Winter viewscape

Outside My Window

While working at my desk on a cold, snowy January day, I heard the sound of something hitting my window. It was a bright red male cardinal clinging to a grapevine attached to my window screen. I looked out my window to see several more cardinals, a song sparrow, and a tree sparrow foraging among the various grasses in the tall grass garden that extends from the south side of the office to woody

plantings and expanses of lawn. I observed for a minute and saw that these song birds were stripping seeds from the grasses and forbs that make up the garden. Indian grass dominated with a sprinkling of little bluestem, big bluestem, and switchgrass. The birds also work the seed heads of Canada goldenrod, the dominant forb in the garden. My observation illustrates the benefit of native plants in the landscape.

The leaning grasses not only provided food but shelter from the cold wind. I observed birds emerging from beneath the swards of grass where they were hiding from the elements or a potential predator. They may have just been resting or doing more foraging on the ground under the grass canopy.

The tall grass garden is a benefit to both wildlife and man as we long for spring to return.

~John M. Row, Plant Materials Specialist, Manhattan PMC

“People plant pines for the beauty that pines and other conifers lend to the landscape.”



Dead Scots pine in field windbreak at the PMC

Pines in a Death Spiral?

There is nothing like the sound of the wind whispering through the pines. People plant pines for the beauty that pines and other conifers lend to the landscape. The whispering sound is an added benefit that is soothing to one's ears. Unfortunately, many species of pine are no longer recommended for Kansas. The list includes Austrian, ponderosa, Scots; and mugo. These pine species can be attacked by foliar or shoot diseases that cause premature defoliation of needles, shoot and branch dieback, and can even kill a tree if the infestation is severe enough.

Sphaeropsis tip blight, for example, is most severe on mature trees (30 years or older) according to Ned Tisserat, former Kansas State University Extension Specialist, Plant

Pathology.

The Plant Materials Center's (PMC) pines have apparently come of age as we see diseases, drought, and insects attacking them. One hundred and sixty pines from 15 accessions represented by seven pine species have been under test at the PMC for more than 30 years.

At the turn of the century (not that long ago), Manhattan experienced a deficit of 11.05 inches precipitation. Drought, disease, and insects have impacted Scots pine in recent years at the PMC. Six accessions have been under test. Planted in the 70s, these accessions performed well until repeated periods of drought coupled with nematode and borer infestations (Pine Wilt Disease) devastated one acces-

sion. We are gradually seeing decline in the other accessions as well as the other species.

Symptoms mimicking Sphaeropsis (*formerly Diplodia*) tip blight that were observed in the spring 2007 were attributed to environmental stress which was a relief that an entire windbreak that forms the PMC's south border was not on its way out. However, the Scots pines in that windbreak have been dying off a few trees at a time. Last year was no exception and it looks like the trend will continue. We are seeing some Sphaeropsis in the PMC's ponderosa pines and Dothistroma needle blight in the Austrian pines. An old ponderosa pine windbreak has suffered a lot of tip damage but only one tree has died from tip blight.

continued on page 3

Understanding Native Seed Quality continued from page 1

with high quality foundation or certified seed.

To consistently produce high quality seed, there are a number of factors that need to be addressed. Weed control in the crop is the number one priority. Nothing will ruin a seed producer's day faster than contaminating a crop with noxious or restricted class weeds. It is critical to limit weed and other crop seed contamination from the final seed crop. Removal of weed seed from a harvested crop is much harder than removing the contaminant species from the production field. Other factors involved in the production of high quality seed are proper moisture conditions during growth, proper harvest timing, drying of the seed post harvest, and conditioning of the seed without cross contamination from other seed lots.

The high variability and rarity of some native species make seed testing and interpretation a challenge at times, as well. Native species are often marketed on the basis of Pure Live Seed (PLS) which is determined by multiplying the pure seed percentage by the germination percentage,

then dividing by 100. Considering native seed purity, the Pure Seed Unit (PSU) of some native species may not be as easy to understand or determine as more common agricultural crop species due to the fact that what appears to be a seed may not actually contain a caryopsis (i.e. Bluestems) and should be considered inert matter. The extensiveness of cleaning, sampling and seed fill, along with analyst interpretation can all lead to a high level of variability in pure seed results from one laboratory to another.

Many native herbaceous species do not have standardized germination and dormancy testing procedures listed in the Association of Official Seed Analysts (AOSA) Rules for Testing Seed. Native seed often contains high levels of dormancy within the seed unit. This dormancy is a natural adaptive characteristic that allows native plant species to germinate over an extended period of time. This adaptation will not limit the native plant species to a single germination event that could lead to establishment failure if unfavorable environmental conditions exist at the

time of germination. Understanding how a laboratory determines viability is imperative. Some seed testing laboratories use only a Tetrazolium Test (TZ) to determine germination potential while other labs use actual germination plus TZ on the non-germinated seed to determine the amount of dormancy. Still others may use germination alone. Thus, reporting of the same native seed lots germination and dormancy by different laboratory methods can cause widely different PLS determinations. This variability in native seed testing methods and reporting between laboratories means results may not be consistent from one laboratory to another. This is a big problem for the native plant industry, because it makes it difficult to determine the value of a seed lot.



TZ indicating viable and non-viable seed units.

~Courtesy Eric Fabrizius, Kansas Crop Improvement Association

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Pines in a Death Spiral? continued from page 2

Even though we are losing pines, their presence on the landscape has been worth it. The sad part is losing them and the changes it forces one to make. Joshua Pease, Conservation Forester, for the Kansas Forest Service holds out hope for pines in his article, *The Perfect Pine?* He stresses the importance of species selection based upon what part of Kansas you are planning to plant pines. If you are planning to plant pines in the near future, read his

article in the Spring 2007 Kansas Canopy Issue #22. <http://www.kansasforests.org/pubs/kscanopy/index.shtml>

For information on pine diseases, the following resources are a good place to start:

- Sphaeropsis Tip Blight, Dothistroma Needle Blight and Brown Spot of Pines by Ned A. Tisserat, Extension Specialist, Plant Pathology, Kansas State University

Agricultural Experiment Station and Cooperative Extension Service, L-722, Dec. 1993. <http://www.oznet.ksu.edu/library/plant2/samplers/L722.asp>

- Pine Wilt, A fatal disease of exotic pines in the Midwest. Sustainable Urban Landscapes. Gleason et al. Feb. 2000. <http://www.oznet.ksu.edu/library/plant2/samplers/MF2425.asp>



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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).



Customer Satisfaction Survey continued from page 1

The Customer Satisfaction Index (CSI) is a weighted average of three ACSI benchmark questions within the survey. The three questions measure overall satisfaction with the PM Program, satisfaction compared to expectations, and satisfaction compared to an ideal organization. The CSI for the PMCs is 83 on a 0-100 scale. This score is well above the federal government's customer satisfaction index for 2007 of 68. Of the three satisfaction index questions, "overall satisfaction" received the highest score with a rating of 90. Almost two-thirds (64 percent) of

respondents used plant releases from the PMCs. Satisfaction was higher among those who used plant releases (85) compared to those who did not (80). Those who had used plant releases found they were receiving them in a timely manner and for the most part the variety of plants was meeting their conservation needs. As a result of being highly satisfied with the PM Program, respondents were likely to recommend PMC to colleagues and showed a high degree of confidence in using the PMCs plant releases.

Grass Facts

- Grass plants are 70% - 80% water and clippings are 90% water
 - 90% of the weight of grass is in its roots
 - The grass and trees along the U.S. Interstate Highway System release enough oxygen to support 22 million people
 - Turf grasses trap much of an estimated 12 million tons of dust and dirt released annually into the U.S. atmosphere
- Department of Agriculture, State of Michigan

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