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Woody Notes

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NRCS Plant Materials Center, Bismarck, North Dakota
http://Plant-Materials.nrcs.usda.gov/ndpmc

Nematode Resistant Mongolian Scots Pine (*Pinus sylvestris* L. var. *mongolica*)?

Scots pine in the Midwest is succumbing to pine wilt transmitted by the pine nematode *Bursaphelenchus xylophilus*. In fact, many states no longer recommend Scots pine for windbreaks or forestry plantings. The nematode is native to North America.

A 1989 research study by Yang Baojun and Wang Qouli of the Research Institute of Forestry, Beijing, China, looked at the nematode impacts on assorted native Chinese and introduced pines. They inoculated 2-5 year old trees with a Chinese isolate of the nematode. Results indicated that *Pinus sylvestris* var. *mongolica* was only moderately susceptible to the nematode (10% mortality). Species of pine native to North America were generally resistant. Pines not native to North America showed greater than 50% mortality.

Mongolian Scots pine at the Plant Materials Center

In the fall of 2013, in attempts to further evaluate the pine nematode resistance of Mongolian Scots pine, cones were collected from three Minnesota accessions that originated from Mongolia, northeastern China. Seedlings from these seeds were provided to landowners in Minnesota, South Dakota, and North Dakota for field planting trials.

Mongolian Scots pine, tested at Plant Materials off-center evaluation sites in the three-state service area, has performed well over the past 14 years. It exhibits higher vigor ratings and shows more disease and insect resistance than commonly available Scots pines. It grew more than 2 feet/year at one of the Minnesota sites. However, since pine nematode is not present in North Dakota we have been unable to test for nematode resistance locally.

The Plant Materials Center (PMC) will offer seeds or seedlings to universities, state forestry agencies, and other plant materials centers for testing in the heart of the pine nematode infestation.

Douglas fir growing at the Northern Great Plains Research Laboratory (ARS)

Douglas fir (*Psuedotsuga menziesii* var. *glauca*)

Douglas fir *Psuedotsuga menziesii* var. *glauca* is a conifer native to the interior Rocky Mountains. Several stands in the Bismarck-Mandan area have grown here for over 60 years, indicating adaptation to North Dakota's climate. In 2015, seedlings grown from the ARS seed source were provided to landowners in Minnesota, North Dakota, and South Dakota. Field plantings will determine soil adaptability and the range of this seed source. These Bismarck-Mandan sources are some of the easternmost plantings of this species,

Who We Are

The Bismarck Plant Materials Center (PMC) is one of 27 PMCs operated by the USDA Natural Resources Conservation Service. The Bismarck PMC serves the States of Minnesota, North Dakota, and South Dakota. It is the mission of the plant materials program to develop plant materials and plant science technology for the conservation of our natural resources. The Bismarck PMC was established in 1954 as part of the Soil Conservation Service, now Natural Resources Conservation Service. A principal task of the PMC has always been tree improvement. There is a need to evaluate how different trees and shrubs will perform in various conservation plantings under diverse soils and climatic conditions.

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considerably east of its native range. Seeds or seedlings of this seed source could be made available to universities and other researchers looking for an additional conifer genus.

Lodgepole pine for windbreaks?

For 30 years, lodgepole pine has performed well in a provenance test at the Northern Great Plains Research Laboratory (ARS) and eight years in two PMC test plots. For many years in PMC trials, it competed equally with the ponderosa pine in growth rates and exhibited a brighter green foliage than ponderosa or Mongolian Scots pines. A hail storm in 2013 that impacted the multiple species tree planting at Hettinger, North Dakota, quite vividly showed a difference in each species' ability to withstand weather related stress.

Open wounds on lodgepole pine three years after the hail damage event

When inventoried in October of 2015, many of the lodgepole pine still showed severe scar damage and exposed xylem three growing seasons after the hail storm. Both the Mongolian Scots pine and the ponderosa pine had entirely callused over the injury sites. Interestingly, the hail storm affected each species differently with respect to apical bud injury response. Following the hail storm, the lodgepole pine initiated double leaders on 39% of the trees, the Mongolian Scots pine initiated double leaders on 38% of the trees while the ponderosa pine showed no double leaders. According to a USFS geneticist, some species when moved off site will survive for quite a few years and perform well until impacted by a set of climatic events such as an early freeze, a late freeze, extreme drought or wet, hail, heavy snows and high winds, etc. Adapted species will bounce back, while non-adapted species will not.

The lodgepole pine still shows promise, and further observations will be conducted to determine injury response and growth rates.

2015 Tree/Shrub Seed Harvest

The following table shows clean tree seed on hand from the 2015 harvest. These seeds are available to growers wishing to establish seed orchards or conduct research.

Accession	Common Name	Location	Amount
9094435	Douglas fir	Hillside Park, Bismarck, North Dakota	180 g
9094434	Douglas fir	ARS, Mandan, North Dakota	44 g
McKenzie	black chokeberry	Plant Materials Center, Bismarck, North Dakota	4.6 lb
Prairie Red	hybrid plum	Plant Materials Center, Bismarck, North Dakota	42.5 lb
Prairie Harvest	hackberry	Fisher, Minnesota	7.35 lb
9069164	Mongolian Scots pine	Becker, Minnesota	22.8 g
9094449	Mongolian Scots pine	Morris, Minnesota	48.1 g
9094442	gray birch	Becker, Minnesota	34 g

'McKenzie' black chokeberry 2015 fruit harvest

'Prairie Red' hybrid plum 2015 fruit harvest