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Pullman Plant Materials Center
Progress Report of Activities for 2007

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P.O. Box 646211, Pullman WA 99164 Tel: 509-335-6892 Fax: 509-335-2940 E-mail: mark.stannard@wa.usda.gov

Who We Are

The Plant Materials Program is an arm of the USDA Natural Resources Conservation Service, and its mission is to develop revegetation plants and revegetation technology. The Program consists of 27 Plant Materials Centers (PMC) scattered across the nation. The Pullman Plant Material Center lies in the Palouse Hills and serves northern Idaho, and Washington & Oregon east of the Cascades.

Stewardship Challenges of Northern Idaho and Washington & Oregon East of the Cascades

Eastern Washington & Oregon and northern Idaho is a mosaic of cropland, orchards & vineyards, rugged scablands, native range, and mountains. Over 2.5 million acres of dryland wheat is grown annually, and over 200 different crops are produced in the irrigated Columbia Basin. Annual rainfall is as little as 6-inches in the driest area, and snow lasts year round in the higher peaks. Winter winds strip unprotected topsoil and create dust clouds that degrade air quality for people living downwind. Melting snow erodes unprotected soil that pollutes receiving waters.

Many of the region's streams are important for salmon and steelhead trout spawning and rearing. Our riparian areas frequently lack desirable vegetation that provides shade and woody debris for fish habitat. Streambank revegetation with desirable plants is hindered by invasive plants.

Annual weeds have replaced native vegetation in many areas, and noxious weeds such as spotted knapweed are invading our forested areas. These undesirable plants greatly impede natural revegetation and threaten wildlife that depends on a healthy environment.

We have featured a few of our many studies in the *Progress Report of Activities for 2007,* and we hope they give a glimpse of our efforts at the Pullman PMC and the Washington State Plant Materials Specialist.

INVASIVE SPECIES SUPPRESSION - VENTENATA

Ventenata (*Ventenata dubia*) is a winter annual grass that is rapidly expanding in SE Washington, NE Oregon and NC Idaho. Studies of the seeds indicate that the rate of germination is comparable to cheatgrass. Furthermore, seedling growth was similar to cheatgrass and medusahead but much faster than 'Secar' Snake River Wheatgrass. Lastly, we learned that Ventenata seeds do not appear to persist long in the soil.

NRCS staff from the Grangeville FO, Moscow AO, Plant Materials Spec, and Pullman PMC seeded a Conservation Field Trial near Grangeville, Idaho on May 8, 2007. The objective of the trial is to determine which species have the highest potential to suppress Ventenata. Twenty-one species were included in the trial. Establishment was good to excellent. Persistence, suppression, and biomass production will be evaluated for the next several years.

Ventenata invades disturbed areas, pastures, hay fields, CRP, and mountain meadows.

Grass Buffer Strips Turn Areas

Straw residue is critical for reducing wind erosion and field edges tend to lose residue faster than other portions of the field. This is largely because farm equipment turning occurs here and some soil may be "overlap" tilled. If producers were able to raise their implements and turn in a grass strip, more residue would be left on the soil surface along field edges. The Pullman PMC in cooperation with the Prosser NRCS field office established a grass buffer strip in the Horse Heaven Hills. Mike Schmidt, the land owner, generously used his large 4WD tractor to test the durability of the grasses. Mr. Schmidt created what looks like a tractor obstacle course in 2007. We are collecting stand data in the tractor tire ruts and adjacent undisturbed grass. We will determine which grass species tolerate tire churning and which species best colonize the ruts.

NRCS staff inspect the grass strip prior to tractor turning.

A mixture of 'Nordan' Crested Wheatgrass (10 lb/ac) and 'Sherman' Big Bluegrass (3 lb/ac) were broadcast on the south end of the strip.

The north end of the strip was broadcast seeded to a mixture of 'Secar' Snake River Wheatgrass (3 lb/ac) + 'Sherman' Big Bluegrass (3 lb/ac) + 'Nordan' Crested Wheatgrass (4 lb/ac) + 'Schwendimar' Thickspike Wheatgrass (4 lb/ac).

REPLACING ‘LATAR’ ORCHARDGRASS

‘Latar’ orchardgrass is very “late” maturing, hence its name, and it was released in 1957 by the Pullman Plant Materials Center. Its maturity date has inadvertently shifted over the years, and we are unable to reconstitute the original genetic material. Since ‘Latar’ is still in high demand, we decided to generate an improved line. The “new” line couples late-maturation with high yield & lower lignin content.

Replicated trials were seeded in 2006 at the WSU Prosser Agriculture Research & Extension Center, WSU Othello Branch Experiment Station, and at the Pullman PMC. Nine orchardgrass cultivars were included in the trials. Harvest data from 2007 indicate that the new line of ‘Latar’ is very late maturing and yields well in August and September. Forage quality analysis will be completed soon.

Orchardgrass forage trials in late August at the WSU Prosser Agriculture Research & Extension Center. One of the early maturing varieties (toward the right) shows little regrowth compared to the adjacent late maturing varieties.

LIVING SNOW FENCE

Washington’s first living snow fence was planted 14 miles north of Davenport in 2003, and it is comprised of two strips of Rocky Mountain Juniper. Survival has been outstanding, and the mean height of the Junipers growing with the aid of weed barrier is over 6-feet tall. Junipers growing without weed barrier are on average 20-inches shorter. Clearly, weed barrier is worth the expense and effort to install.

Highway 25 Living Snow Fence
5-years after establishment.

Don Hanley, WSU Extension Forester, showing height differences of Rocky Mountain Junipers growing with and without weed barrier.

TALL WHEATGRASS BIOFUEL FEEDSTOCK

Switchgrass has received a great deal of attention due to its biofuel feedstock potential. Switchgrass is a great conservation plant but it does poorly in the PNW unless it is irrigated. Tall wheatgrass does far better in the PNW, and it has biofuel feedstock potential. Since the release of 'Alkar' tall wheatgrass in 1951, several cultivars have been registered. The most recent tall wheatgrass biotype/cultivar, 'Szarvasi 1' was developed in Hungary. 'Szarvasi 1' was developed specifically for the European Union biofuel market. Promotional literature suggests that 'Szarvasi 1' has an energy yield that compares favorably to brown coal. Testing of 'Szarvasi 1' in the United States has been very limited.

A replicated study was seeded on September 6, 2007 at the WSU Prosser Agriculture Research and Extension Center. This study compares 'Szarvasi 1' to 'Largo' tall wheatgrass, 'Jose' tall wheatgrass, and 'Alkar' tall wheatgrass. Emergence was excellent for all four cultivars 2 weeks later. Yield data and other agronomic traits will be monitored for the next few years. We also hope to compare energy yield (Kcal/ton and Kcal/acre) and ash content.

PONDEROSA PINE SEED ORCHARD

Foresters from the region (Inland Empire Tree Improvement Cooperative) initiated a program in 1968 to identify superior Ponderosa Pine saw log trees, test the progeny, and create a seed source of these trees. Scientists at the University of Idaho recently grafted branch tips of the superior trees to quality Ponderosa Pine rootstock. Foresters, technicians, and students from the Washington Department of Natural Resources, Pullman PMC, and University of Idaho planted over 2000 grafted trees on 9 acres at the Pullman PMC in 2007. Dr. Marc Rust, lead silviculturist, believes the orchard will begin producing superior Ponderosa Pine seed in roughly 10-12 years. The seed will be used for reforestation projects in the 2500-3500 feet elevation band of the northern Inland PNW.

Grafted Ponderosa Pine

Each tree has a tree protector, weed barrier, and drip irrigation.