



Pullman Plant Material Center Progress Report of Activities- 2000

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Divided-slope farming is a widely used erosion control practice in the Palouse River Basin.

Who We Are

The NRCS Plant Materials Program develops cost effective vegetative solutions for soil and water conservation problems. The Programs consist of 26 plant materials centers (PMC), which receive financial and/or technical assistance from NRCS. The Pullman Plant Material Center is located in the Palouse region of Eastern Washington.

Soil and Water Issues of Washington & Oregon East of the Cascades

Many of the soils in the region are loess deposits that are very susceptible to wind as well as water erosion despite the fact that much of the region receives less than 14 inches of annual precipitation. Dryland winter wheat farming and irrigated farming in the Columbia Basin are important enterprises. Several hundred thousand acres of cropland go into the winter with insufficient cover to protect the soil.

Annual weeds in many areas have largely replaced native rangeland vegetation. Forested areas are being invaded by noxious weeds. These undesirable plants greatly impede natural revegetation and threaten other natural processes and organisms.

Objectives

The Pullman PMC's primary research efforts include:

- Developing plant materials and associated technology for drought tolerance
- Cover cropping for wind erosion control
- Develop native plants for riparian areas and other natural areas
- Develop technology for vegetative suppression of invasive plants

The following is a brief summary of our projects and progress of last year.

Palouse Prairie Restoration

The Palouse Prairie once occupied large areas of eastern Washington and adjacent areas of northern Idaho and eastern Oregon. It is estimated there is less than 1% of this ecosystem that remains under its original vegetative cover.

The Pullman PMC began collecting seeds of native Palouse Prairie grasses and forbs in 1997. To date

about 70 species have been collected and procedures for cleaning and propagation have been successful for many of them. A long-term study established in 1998 will determine if inclusion of early seral grasses will aid in establishment of the climax grass component of a Palouse Prairie. Five mixes of perennial prairie grasses (three replications each) were seeded in plots. Beardless bluebunch wheatgrass and Idaho fescue (the late seral species) were seeded in all plots. Mountain brome grass, Prairie junegrass, Sandberg bluegrass, and Blue wildrye represented the early seral grasses in the planting.



Native Palouse Vegetation

In May 2000, a five-acre field was seeded to a native grass mix consisting primarily of Bluebunch wheatgrass and Idaho fescue. Smaller amounts of the early seral grasses were also included. Only grasses were seeded to allow for broadleaf weed control. The field has been in cropland since at least 1938. Native forbs and shrubs will be planted in the future using several different techniques to determine the best method of establishing a prairie of diverse species. Many species of the Palouse Prairie also occur in the drier regions west of the Palouse, thus much of the information gained will be widely applicable.

Native Legumes for Arid Environments

A study based on a collection of 104 sources of native legumes was planted in April 2000 at the Lind, Washington Dryland Research Unit. The collection was made by the Pullman PMC in 1998 and 1999 and is the first step in fulfilling a high priority need for native legumes for reseeding retired cropland to permanent vegetative cover. The collection includes native species such as lupines, clovers and vetches, which will be evaluated for

their ability to provide soil protection and persist in diverse environments with less than 14 inches of annual precipitation.

Serviceberry Releases

The Pullman PMC released three serviceberries in 2000. This is in support of riparian revegetation efforts that are ongoing in the Pacific Northwest. These plants represent selections from 169 different sources that were evaluated near Pullman, Washington from 1983 – 1995. These three materials were originally collected from Kendrick, Idaho; Newport, Washington; and Okanogan, Washington. Serviceberry is an excellent plant for erosion control on stream banks in the capillary zone. It is rated as good browse for cattle, good to excellent for sheep and goats, and excellent for deer and elk.

Invasive Plant Suppression

The Pullman PMC established a battery of studies that document the effect of bluebunch wheatgrass, the predominate native grass, on the growth and reproduction of yellow starthistle. Yellow starthistle is a noxious rangeland weed and is spreading in the canyonlands of several major rivers. Unlike many weed studies that focus on “cleaning up after the invasion,” the Pullman studies focus on the management of native vegetation to prevent yellow starthistle from being established.



Yellow Starthistle

One study determined that the trampling and grazing of bluebunch wheatgrass by livestock impeded its ability to suppress yellow starthistle. Another compared the water use patterns of bluebunch wheatgrass and yellow starthistle over the course of an entire growing season. A third

determined the size of the area around a bluebunch wheatgrass plant that yellow starthistle finds too competitive for good growth. These studies will help to determine the best management practices needed to implement on our native rangelands to prevent the further invasion of yellow starthistle.

The Pullman PMC also initiated studies in 2000 on reed canarygrass and rush skeletonweed, another group of weeds that have been causing problems for native species. These studies will determine which revegetation species have the greatest potential for establishment in infested landscapes, as well as the ability to suppress the development of these weeds. The Kalispel Indian Nation is collaborating on one particular study. They identified a native grass species that grows free of reed canarygrass along the banks of the Pend Oreille River. The Pullman PMC is collaborating with them to determine the potential of utilizing this grass to replace reed canarygrass on their land.

Cover Crops for the Irrigated Columbia Basin

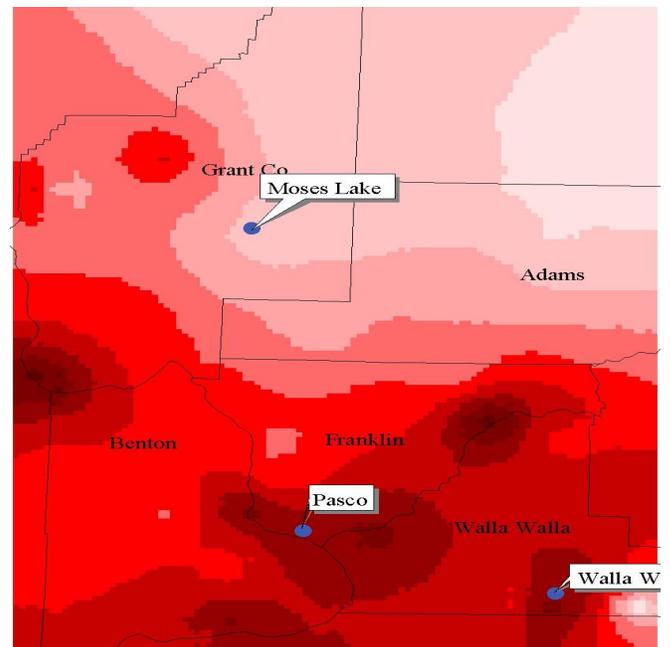
The semiarid Columbia Basin region lies in the rainshadow east of the Cascade Mountains, and a vast network of canals deliver water to over 1.6 million acres from the Columbia, Snake and Yakima rivers. The soils are made up of weak structured sands and silts derived from glacial deposits of the last ice age. Large bare fields struck by windstorms that blow up to 60 or 70 mile-per-hour can cause wind erosion so severe that as much as seven times the tolerable soil loss level is removed during one windstorm, and is a common occurrence during winter and early spring. These windstorms can also cause major highways to be closed due to lack of visibility.



A man braves a dust storm to inform other motorists about the danger ahead. Staff Photo by Karen Zacharias – East Oregonian

The Pullman PMC developed mathematical models based on average daily temperatures and growth

rates of several cover crops. Some of the more promising crops include triticale, winter wheat, mustard and turnips. These models were incorporated into historic weather records of 14 communities in the Columbia Basin. The “community” models predict how much cover crop growth can be expected, based on planting dates and local historical weather data. A Washington State University graduate student took this data and incorporated it into a Geographic Information System (GIS) database, which has allowed us to integrate cover crop data with soil, wind, and topographical data. This gives growers and conservationists the ability to develop best management practices for each field to reduce the hazard of wind erosion.



GIS map of areas with ability to produce fall cover (dark reds) following a late fall seeding.

To learn more about these and other PMC activities, visit our website: www.wsu.edu/pmc_nrcs/ or <http://Plant-materials.nrcs.usda.gov>.

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