

Pullman, Washington Plant Materials Center

Soil Health

Agricultural producers in the Inland Northwest have a short growing season and a winter-spring precipitation pattern which limit their ability to incorporate cover crops into existing crop rotations. The average annual precipitation varies from a near-desert of 6" in the Columbia Basin on the eastern side of the Cascade Mountains to 80" in the higher elevations of the Idaho sections of the Northern Rocky Mountains. Producers are growing cover crops successfully in the irrigated areas, but producers in dryland areas have more challenges.



Right: Fall planted cover crops biomass trial at Pullman, WA on May 22, 2014



Left: Plant Materials and NRCS field office staff harvesting cover crop biomass in Othello, WA on October 24, 2013

Research and producers' experiences in the central U.S. demonstrate cover crops can provide agronomic benefits, however there is relatively little information for our region. The Pullman PMC is conducting several experiments to investigate the ability of cover crops to improve soil health in the Inland Northwest. These include:

- National Soil Health Study – Pullman, WA
- Cover Crops under irrigated conditions – Othello, WA
- Cover Crops under dryland conditions – Pullman, WA
- Legume Cover Crops and Conservation Covers in Orchards – Prosser, WA
- Cover Crops effects on soil pH, and moisture – Pullman, WA
- Cover Crop Selection Tool for Oregon and Washington – with the Corvallis, Oregon PMC
- Cover Crop Biomass in 13" precipitation area – Okanogan, WA

Invasive Species

Invasive plant species have the potential to become dominant in an ecosystem and compete with desirable vegetation for resources. They can also alter nutrient cycles, hydrology, and ecological succession. These disruptions can have major economic and ecological impacts which are often hard to reverse once they begin. Most invasive species in the Inland Northwest originate in the Mediterranean region, an area with a similar climate. Invasive plants leave their natural enemies and pests behind, and are able to thrive in their new environment. They often have a biology and life cycle similar to the native plants and crops growing in the same area, which causes complications for control.

The Pullman PMC and multiple partners have projects throughout the region to investigate the life history of some invasive species and methods for managing vegetation to prevent invasion. Some of these projects are:

- Multiple seed biology studies of ventenata (*Ventenata dubia*) – Pullman, WA and Moscow, ID
- Evaluating CRP grasses and mixtures for resistance to invasion of rush skeletonweed (*Chondrilla juncea*) – Adams County, WA



Left: Cover crops and conservation cover in Orchards Study near Prosser, WA on May 9, 2014.

Below: *Ventenata (Ventenata dubia)* growing in a pasture in Idaho.



Right: Plant Materials Staff and University of Idaho student planting cover crops to investigate the effects on soil moisture and pH in August 2014.

Pollinators and Native Plants

Many crop species benefit from or require insect pollination for production. More than one-third of our diet comes from crops produced with bee pollination. In the Inland Northwest, over 180 different crops are grown, and many are tree fruit crops such as apples, cherries, pears, peaches, apricots, nectarines, and plums, which require insect pollination for fruit production. Pollinator populations have declined in recent years, causing great concern among agricultural growers and ecologists. The loss of pollinators has the potential to cause serious economic and ecological implications for humans and for maintaining natural ecosystem diversity and stability.



Left: Two bumble bees on a sunflower cover crop at the Pullman Plant Materials Center on August 26, 2014

Right: Monitoring Year 3 forb density at Latah County, Idaho, June 27, 2013. Comparing drill types at this site – plots seeded with a double disk versus plots seeded with a cross-slot drill.



One way to help mitigate pollinator population declines is to enhance pollinator habitat. Pollinator-friendly plants provide sources of shelter, pollen, and nectar for many of the life cycle stages of pollinating insects. The Pullman PMC and partners have projects across the region to gather information on the best species, establishment methods, and post establishment management for successful pollinator habitat. A few of the projects are:

- Native forb establishment with three different drills in multiple field types – Douglas County, WA
- Native forb establishment with two not-till drills and two seedbed preparations – Latah County, ID
- Conservation Field Trial for grass establishment before inter-seeding native forbs – Othello, WA
- Pollinator Habitat Demonstration Plantings – Pullman, WA