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The Pullman Plant Materials Center

The Sweep Net

January 2012

A newsletter to keep you up-to-date on pollinator and beneficial insect activities at the Pullman Plant Materials Center, the Washington NRCS State Office and beyond.

Bumble bee visiting a scarlet beebalm (*Monarda didyma*) flower in the Introduced Species Hedgerow at the Pullman PMC Pollinator Demonstration Planting. Pamela Pavek

Fall 2011 Pollinator Plantings

Our apologies are issued to all of you who missed the October 2011 Issue of the Sweep Net. We were busy installing pollinator trials throughout Washington in October and November. Two trials were planted in Douglas County; one to compare two drills for the establishment of native forbs in a new CRP field (previously in wheat-fallow rotation) and another to compare three drills for the establishment of native forbs in an old CRP field (using no-till techniques). A third trial was planted in Adams County as part of a CSP Pollinator Habitat Pilot Study to evaluate three seeding methods for native forb establishment: use of a drill, drill with tubes pulled, and seed broadcast and roller-packed. A fourth trial was established at the WSU Experiment Station in Grant County following a failed

attempt last year to establish native forbs. Western wheatgrass (*Pascopyrum smithii*) was planted, and no-till techniques will be used to establish forbs after one or two years.

From left to right, Bryce Krueger (Waterville FO), Karl Schulke (WDFW), and Pamela Pavek (PMC) riding the John Deere double disk drill to monitor seed flow while planting a forb establishment trial in a new CRP field in Douglas County, WA. Tractor driven by the landowner, Rod Peterson. Photo by Mark Bareither (ACES, Waterville FO)

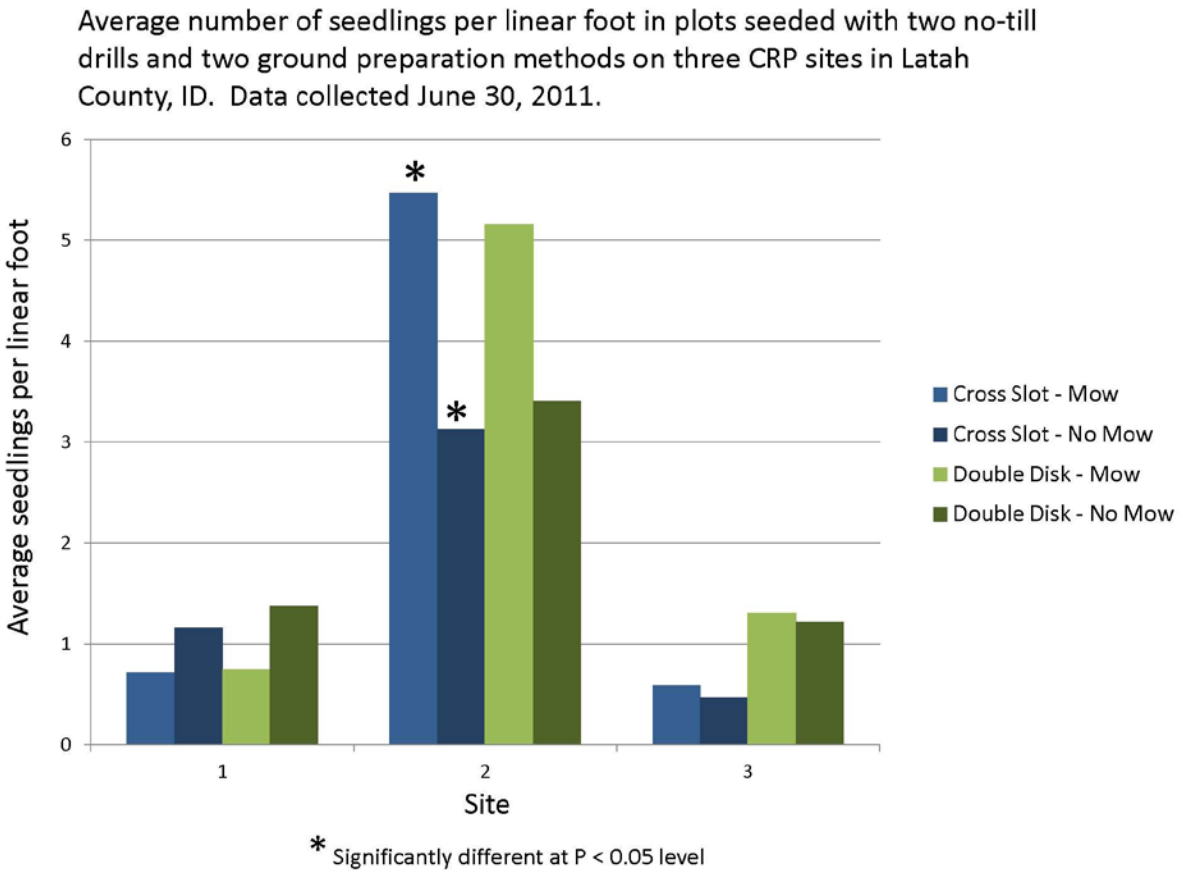
No-Till Forb Seeding Update

The no-till forb seeding trials in Latah County, Idaho (featured in the July 2011 issue of The Sweep Net) are beginning to provide some interesting data. In these trials, two seed bed preparation techniques (mowed and un-mowed) and two no-till drills (a Cross-Slot® and a Great Plains® double disk) were compared for the establishment of 16 native forb species in three existing CRP fields. Site 1 was a 3-year-old stand of native bunchgrasses with a level aspect, Site 2 was a 20-year-old stand of intermediate wheatgrass with an eastern aspect, and Site 3 was a 3-year-old stand of native bunchgrasses with a southern aspect. All sites were sprayed with 1.1 lb ae (acid equivalent)/ac glyphosate (32 oz/ac RT3™) in the spring and fall 2010 and 0.09 lb ai (active ingredient)/ac clethodim (12 oz/ac Select™) in spring 2011. Sites were seeded at a rate of 40 PLS/linear foot on October 21, 2010. The results are briefly summarized here.

Drill Type

The Double Disk drill resulted in slightly more seedlings per linear foot compared to the Cross Slot drill for all treatments under most conditions. However, none of the differences were statistically significant ($P < 0.05$).

Figure 1



Mowing Treatment

Plots mowed prior to seeding had higher numbers of seedlings per linear foot for both drills at Sites 2 and 3, but not at Site 1. We suspect the higher seedling count at Sites 2 and 3 may have resulted from more sunlight and warmth reaching the plants due to lack of a canopy. Also, the thatch provided by the mowing may have reduced extreme temperature fluctuations and maintained moister conditions at the soil surface. Site 1 has a nearly level aspect and remained wet and cold longer into the growing season than the other two sites. Excess thatch in the mowed plots at this site may have intensified the cold and wet conditions, delaying seedling emergence.

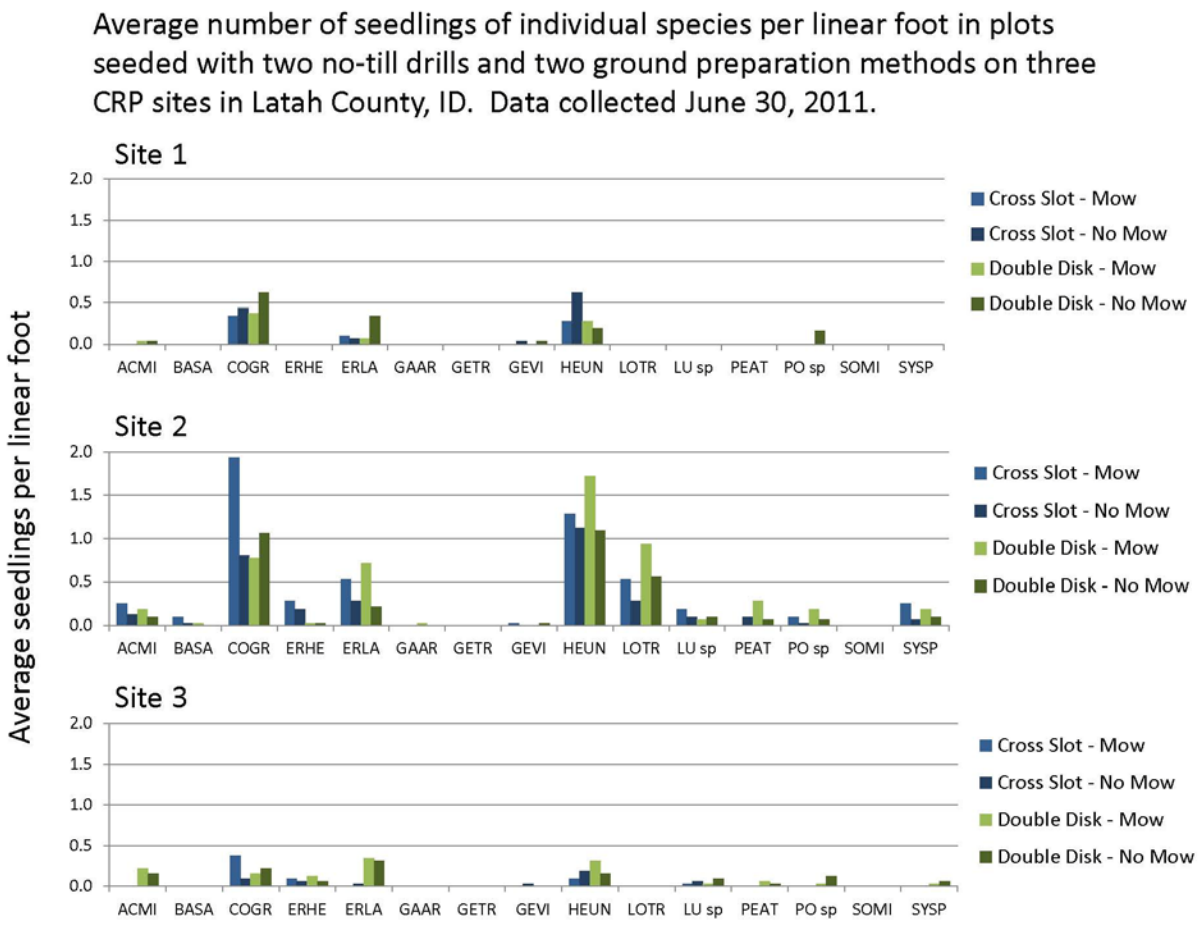
Original Cover

The 20-year-old stand of rhizomatous, non-native, intermediate wheatgrass provided a better seed bed for establishing native forbs with no-till drills than the 3-year-old stands of native bunchgrasses. We suspect old stands of other rhizomatous grass species would also provide favorable conditions. Old stands have fewer open niches and fewer weed seeds in the soil seed bank, therefore minimal weed competition is experienced by the forbs. Weeds were present in the intermediate wheatgrass stand: fiddleneck, bedstraw and pennycress, however their densities were not as high as the ventenata at Site 1 and the prickly lettuce at Site 3.

Individual species

The species with the highest rates of emergence in all plots were (in order of highest to lowest): *Collomia grandiflora* (an annual), *Helianthella uniflora, Lomatium triternatum, Eriophyllum lanatum, Achillea millefolium, Eriogonum heracleoides, Potentilla spp, Symphyotrichum spathulatum, Lupine spp, Penstemon attenuatus, Balsamorhiza sagittata, Geranium viscosissimum,* and *Gaillardia aristata. Geum triflorum* and *Solidago missouriensis* were not observed in June but these species may have emerged at a later date; the *Solidago* in particular is a warm season species.

Figure 2

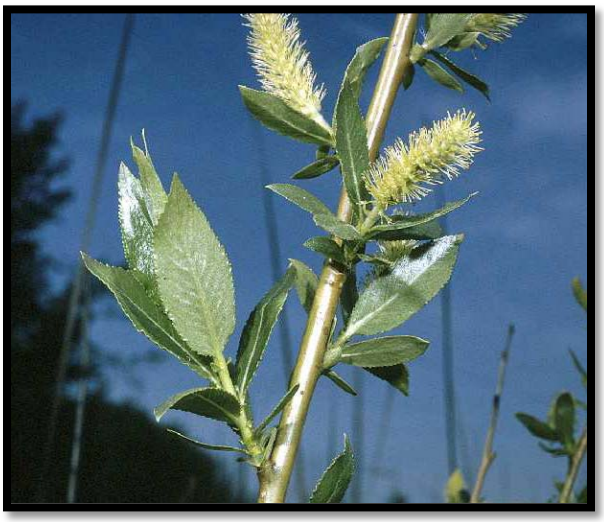


First-Year Conclusions

First-year data reveals seeding native forbs with no-till techniques may be possible, particularly if the site has a minimal weed pressure, is prepared properly, and if the right equipment is used. We will continue to collect data on these sites for the next several years and we will use this data to improve our pollinator habitat seeding recommendations.

Featured Pollinator Plant

Willows (*Salix spp*) are the first plants to bloom in many areas of the Inland Northwest, providing a very important source of pollen for early-emerging bee species. Bees known to visit willows include several specialist mining bees (*Andrena spp*). Willows also serve as a host plant for many butterflies and moths such as the Western tiger swallowtail, mourning cloak, Lorquin's admiral, viceroy, hairstreaks, skippers and sphinx moths. Most willows have a limited range of adaption, only thriving in wet soils along bodies of water or near wetlands. Common willow species in the Inland Northwest include peach-leaf (*Salix amygdaloides*), Bebb's (*S. bebbiana*), Drummond's (*S. drummondiana*), Coyote (*S. exigua*), Greyer's (*S. greyerii*), Pacific (*S. ludica*), arroyo (*S. lasiolepis*), Lemmon's (*S. lemmonii*), Columbia River (*S. melanopsis*), Mackenzie (*S. prolixa*), and Scouler's (*S. scouleriana*). Willows can be established by cuttings, and male plants are preferred for pollinator habitat because of their pollen production. (Sources: Trees, Shrubs and Flowers to Know in Washington and British Columbia; Attracting Native Pollinators; University of Washington Burke Herbarium)



Male catkins and leaves of Pacific willow (*Salix lucida*). Robert H. Mohlenbrock, USDA PLANTS

Featured Pollinator

***Osmia* bee. Steve Scott, www.bugguide.net**

Mason bees (*Osmia spp*) received this name because they construct walls of mud or chewed up plant material to divide the brood cells in their nest cavities. The bees are active early in the season, and collect pollen and nectar from a variety of plants, especially those in the rose family. There are about 150 *Osmia* species in North America, and more occur in the western US than the eastern US. Mason bees can be identified by their round, broad heads, metallic green, blue or purple color, and the patch of hairs (scopa) on the underside of their abdomen. One of the most well-known species in this genus is the blue orchard bee (*O. lignaria*), which is managed commercially for the pollination of orchards. (Source: Attracting Native Pollinators)

Did you know…

researchers in California have discovered a new parasite that may be playing a significant role in Colony Collapse Disorder? It is the phorid fly (*Apocephalus borealis*) and it is the first-identified parasitoid insect of honey bees in North America. The fly is native, and has been known to parasitize bumble bees and paper wasps, but only recently was found to attack honey bees. While the bees are out foraging, the flies oviposit their eggs into the bees, which cause the bees to abandon the hive at night and die. Seven days later, up to 13 phorid fly larvae emerge from the bee and pupate away from the bee. The phorid flies have also been found to be vectors of other honey bee pathogens, in particular the deformed wing virus and the microsporidian parasite *Nosema ceranae.* Of the honey bee hives sampled in the San Francisco Bay Area, 77% were found to be infected with phorid flies. The authors of the new study conclude this parasite poses a significant threat to not only apiculture in North America, but also to native bee populations and agricultural productivity worldwide. (Source: Core A, Runckel C, Ivers J, Quock C, Siapno T, et al. (2012) A New Threat to Honey Bees, the Parasitic Phorid Fly *Apocephalus borealis.* PLoS ONE 7(1): e29639. doi:10.1371/journal.pone.0029639v)

***Apocephalus borealis* ovipositing into the abdomen of a worker honey bee. Core et al. (2012)**

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