# INLAND NORTHWEST PLANTS

Pullman Plant Materials Center Newsletter Fall 2014

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## Focus on Soil Health

The National Plant Materials Program has recently made a few organizational changes to realign with the agency's needs. All 27 PMCs throughout the country have been tasked with focusing on the most important resource concerns of their region. The Pullman PMC will be spending 75% of our time on research and education to improve soil health, which may include erosion control, nutrient management and cover crops, and 25% of our time on range health. All of the major studies conducted by the Pullman PMC in Fiscal Year 2014 have focused on soil health. We've conducted cover crop biomass studies in irrigated and dryland areas to select the best species and mixes and determine optimal planting times, a study to determine the best legume species for an on-farm source of nitrogen in orchards, and two studies to assess the effect of cover crops on soil health: the National Soil Health Study and a study with locally-adapted species. More details of each of these studies are available in the articles below.

*Bumble bees on a sunflower cover crop at the Pullman PMC, August 2014.*

# Cover Crop Biomass Study in Central Washington

The practice of planting a mustard cover crop following potatoes is common in irrigated fields of central Washington. Mustard cover crops prevent wind erosion, sequester nutrients, suppress soil-borne pathogens, and improve soil organic matter. The Pullman PMC teamed up with Andy McGuire, WSU Irrigated Cropping Systems Agronomist to evaluate multiple cover crop species, cultivars and mixes, and compare different seeding dates for the fall and spring. Results demonstrated the importance of planting a cover crop no later than mid-August if the goal is to maximize biomass prior to late fall incorporation, and planting a cover crop in mid- to late-September if the cover crop is to over-winter. A spring cover crop should be planted as soon as the ground can be worked to maximize biomass before planting a late-spring crop such as corn or dry beans. Results from this study are summarized in Washington Plant Materials Technical Note 24.

*Cover crop plots at the WSU Othello Experiment Station, May 2014.*

# Cover Crop Biomass Study in Eastern Washington

Cover cropping in eastern Washington dryland rotations is not as common as in irrigated central Washington, however the practice was used extensively in this area prior to the advent of commercial fertilizers. Alfalfa, pea and sweet clover mixtures were often plowed in as green manures to add nitrogen to the soil before planting a wheat crop. Some growers in eastern Washington are currently experimenting with growing cover crops, either as fall-planted, over wintering cover crops that are terminated in the spring prior to planting a spring crop, or spring/early-summer planted, in place of a commodity crop. The objective of the biomass study was to determine the best cover crops for the potential periods for growth, and evaluate different planting times. Results show cover crops such as turnips, arugula and mustards produce good amounts of biomass and over-winter when planted in early fall, and warm season cover crops may be good choices for spring/early summer. Detailed results from this study are reported in Washington Plant Materials Technical Note 25.

*Cover crop plots at the Pullman PMC, May 2014*

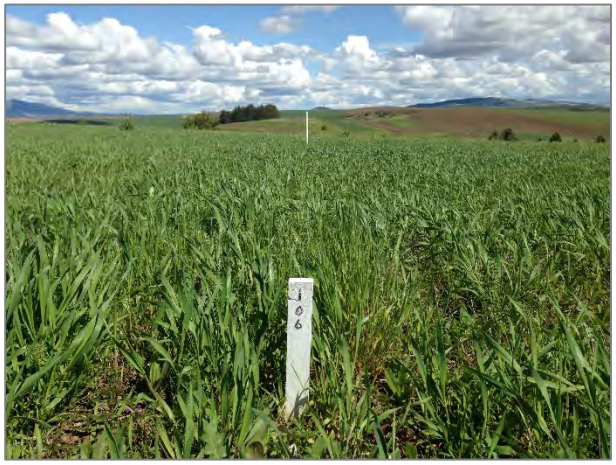
# Legume Cover Crops in Orchards

This year we collected second-year data from a study to determine the best legume cover crops that may supply orchards with an on-farm source of nitrogen. Organic orchardists are currently experiencing problems with soil and fruit quality as a result of using animal manures for their nutrient source. The practice of supplying nitrogen with legumes may benefit conventional orchardists as well, by helping to improve sustainability and reduce costs. There are still many unknowns about this practice, such as the timing and amount of nutrient release, and the potential for legumes to attract undesirable insect pests. We will collect one more year of biomass and nitrogen data before advancing potential legumes to trials for more intensive evaluation. Pamela and David Granatstein, WSU Sustainable Agriculture Specialist, wrote a review article about the potential for legume cover crops in Washington apple orchards that is available as Washington Plant Materials Technical Note 22.

*Alfalfa cover crop in an apple orchard near Prosser, WA, July 2014.*

# National Soil Health Study

The Pullman PMC collected second-year data for the National Soil Health Study, in which three cover crop mixes and three seeding rates are being evaluated for their effects on soil health. The Pullman PMC is one of seven Centers participating in the national study. Our first-year data showed cover crops reduced soil moisture and nitrate, and soil health slightly declined. A summary of first year data is available here. Second year data shows moisture remains a limiting factor and we may be experiencing effects of transitioning to no-till. The species and protocols used in the study, while successful elsewhere, may not be ideal for our region. We have plans to continue this study beyond the three-year period (ending in Fall 2015) and make changes to the protocols and species used.



*Soil Health Study cover crops in May 2014.*

# Above and Belowground Cover Crop Study

The Pullman PMC is collaborating with Dr. Jodi Johnson-Maynard, soil science professor, and her student, Brita Olson, at the University of Idaho to measure above-and below-ground biomass of 6 cover crops and 3 mixes, as well as assess the effects of the cover crops on soil nutrients, pH and organic matter. The cover crops being evaluated are the top two performers in each functional group (grass, legume, broadleaf) from the Pullman PMC Cover Crop Biomass Study. The cover crops were planted during the last week of August, however they did not emerge until the middle of October due to the lack of fall precipitation. The majority of data will be collected in Spring 2015.

*Brita and Dallas planting our new cover crop study, August 2014.*

# Staffing Update

Mark Stannard, manager of the Pullman PMC for over 20 years, retired in August 2014. Our new manager will be Allen Casey, who has worked as a Soil Conservationist at PMCs in Manhattan, Kansas and Elsberry, Missouri. We will welcome Allen in December 2014.

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