

PLANT MATERIALS TODAY

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Feature Topic

IMPROVING SOIL HEALTH: Cool and Warm Season Cover Crop Studies at the Bridger Plant Materials Center

The renewed interest in cover crops as a soil health improvement tool could not have come at a better time for the Bridger Plant Materials Center (PMC) program. For the last several years, the PMC staff has been taking steps to control weeds, increase soil organic matter, and improve soil tilth through various steps like using PAM (polyacrylamides), better rest-rotation, some use of cover crops, and reducing tillage. The challenge is particularly large for the PMC, with a relatively small land area and over 40 simultaneous projects and crops on different production schedules, almost all produced as row crops with conventional farming equipment. The result of years of this intensive farming has been reduced soil organic matter, degraded soil structure, and increased surface compaction. Crusting soil is particularly problematic as it can reduce seedling emergence of some slow-to-establish native plants. Spotty stand establishment results in greater weed invasion, increased field maintenance, reduced seed production, and increased seed cleaning time.

This spring PMC staff, in cooperation with the State Agronomist and the Montana Agricultural Experiment Stations (MAES), installed several cover crops studies and trials at the Bridger PMC. In the main study, 19 different plots of



Test pit for examining root development

single species were planted for observation and evaluation. In addition, 12 different mixes of legumes, as well as deep-rooted, and cool/warm season species, were established. Each research plot will be evaluated for stand establishment, weed invasion, flowering date, and biomass production. We are managing these studies much like we would expect a landowner to maintain them on their own farm or ranch operation. Economic data on the study's cultural practices will be tabulated and

included in the results. Preliminary data suggests mixes offer the greatest potential benefits for renovating the current cropping practices at the PMC and improving soil health.

At Havre and Sidney, Montana, the MAES has planted identical cover crop studies. At the Havre station, however, an additional test treatment will be grazing by cattle to determine preferences for each cover crop species, variety, and mix.

On July 25, 2012, David Lamm, National Soil Health and Sustainability Team Leader, Greensboro, North Carolina; Henry Ferguson, Soil Data Quality Specialist, Lincoln, Nebraska; Pat Hensleigh, Montana State Agronomist, Bozeman, Montana; Kate Norvell, Area Agronomist, Bozeman, Montana; and Roger Hybner, Research Agronomist, Bridger, Montana, led 30 NRCS employees through various soil health building exercises. The group inspected cover crop research plots, observed individual species' rooting depths in the soil, and saw a rainfall simulator demonstrated. Soil test kits were used to evaluate water infiltration, soil bulk density, and other soil quality characteristics.



Workshop participants examine cool and warm season cover crop test plots at the Bridger Plant Materials Center



David Lamm and Kate Norvell, demonstrate the rainfall simulator to the workshop participants



Sedimentation in the jars below the rainfall simulator demonstrates the importance of soil cover and structure

Roger Hybner, PMC Research Agronomist

Joe Scianna, PMC Manager

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