Novel Forages for Pasture and Livestock Health and Resilience

This fall we installed the first seedings for a new study to evaluate a long list of novel and common forages for their productivity, phenology, and adaptation to our site in Oregon’s Willamette Valley. Pastures in our region are usually dominated by a small number of cool season perennials (and occasionally some annuals), and the range of options for forages outside this list is large. So why look elsewhere when the forages commonly utilized in our region are successful in many respects and can be high performing? With an enhanced understanding of the comparative performance of a large selection of species and cultivars, producers are better able to diversify their pastures to provide an increasing array of agroecosystem services.

With increased utilization of novel perennial legumes, warm season annuals, winter annuals, brassicas, and other forage forbs that hold promise in this region, many additional services can be provided, including addressing fresh forage availability gaps in the summer and winter, improving nutrition and trace mineral availability to livestock, providing anti-parasitic function, reducing environmental contaminants such as methane from livestock operations, enhancing pollinator resources, improving pasture and forage resilience in the face of a changing climate, and improving soil health and its associated benefits.

Study entries include 104 cultivars of 62 different species, including both novel forages and, for comparison purposes, species common to our region. Each study entry will be planted on three separate dates (early fall, late winter, mid spring) that correspond to common planting windows in the Willamette Valley and will receive one of two irrigation regimes (irrigated and dryland). We’ll be assessing phenology of development and biomass production for multiple years and will also monitor self-recruitment of annual species in year two. To enhance this project, we’ve developed an exciting partnership with Dr. Serkan Ates of the Department of Animal and Rangeland Sciences at Oregon State University. He holds a keen interest in forages with high bioactive compound concentrations and will use this forages study to collect samples for various biochemical
analyses; one subproject is the evaluation of several varieties of chicory for the presence of natural antiparasitic compounds.

We’re in the initial planning stages for two subsequent studies that build on what we learn in this first phase. Future studies are intended to cover 1) site preparation and seeding techniques for pasture diversification with an array of forage cultivars that perform well in our initial study, and 2) forages for silvopasture systems, again utilizing the high performing forage cultivars from the first phase. We’re collaborating on these subsequent studies with the Pullman, WA PMC to better support producers on both the west and east sides of the Cascades in Oregon and Washington. We’re excited to communicate what we learn and intend to hold multiple field days over the coming years for partners, producers, NRCS, and the broader public to see things on the ground.

**FY21 Cover Crop Studies With ARS**

In 2021, we completed the third year of a four-year study in collaboration with the Agricultural Research Service (ARS), the Noble Foundation, and several university cover crop breeders from around the US. The goal of the project is to evaluate performance and identify promising new breeding lines of four leguminous cover crop species (winter pea, hairy vetch, crimson clover, and fava) in trials at twelve locations across the country. Data from these trials will be used, along with input from seed growers and farmers, to decide which lines will be further developed and released for commercial use. The Corvallis PMC also increases seed of the winning lines for larger studies (usually three breeding lines per year). In 2021, the PMC established a crossing block of the most promising hairy vetch breeding lines.

**Partnerships**

In addition to our partnership with ARS on cover crop studies, we continued our Interagency Agreement with USFWS. Kincaid’s lupine (*Lupinus oreganus*) is a listed threatened species that is found in western Oregon’s upland prairie/oak savannas and is the sole nectar plant of the endangered Fender’s blue butterfly. NRCS and partners are diligently working on conserving these habitats and associated populations of Kincaid’s lupine following the Service’s Recovery Plan for the Prairie Species of Western Oregon and Southwestern Washington. The Recovery Plan requires seed production of genetically unique varieties of Kincaid’s lupine based on recovery zones. The Service’s goal is to make available to all conservation efforts, regardless of funder, Kincaid’s lupine seed for the appropriate recovery zone. In 2021, the PMC expanded its current Salem West recovery zone production field and installed a new seed production field for the Douglas County recovery zone. Fields of two other rare (but not listed) species, peacock larkspur (*Delphinium pavonaceum*) and thin-leaved peavine (*Lathyrus holochlorus*) were established and more wild seed of both of these species was collected in 2021.
Development of Native Plant Technology for Coastal Pollinator Species

This year we dove deeper into a study on developing plant technology for native coastal pollinator species. We’re focusing on species close to the coast that inhabit dunes and inland meadows, and can play a role in improving pollinator resources, supporting rare and declining species and habitats, and stabilizing coastal dunes. Historically the Corvallis Plant Materials Center has done development work on many native coastal plant species to contribute to the recovery of the Federally threatened Oregon silverspot butterfly. We’re now working to understand the germination, container production, and seed amplification requirements and possibilities of more species from the coastal ecoregion. Examples of some of the species we’re working with are seawatch (Angelica lucida), large-headed sedge (Carex macrocephala), beach silver-top (Glehnia littoralis), beach pea (Lathyrus japonicus) and American dune-grass (Leymus mollis). We’re partnering with Oregon State University and Oregon Parks and Recreation Department in this effort, and a big picture goal is to be able to increase the success and diversity of coastal meadow and foredune restoration efforts.

Publications/Presentations

Our publications and presentations this year included the following:

- Ask the Expert: Selecting Pollinator Mixes; Q & A with Amy Bartow
- No-till Farmer Innovators and Influencers Podcast: Pollinator Habitat on the No-till Farm
- NRCS Programs for Pollinators In Vineyards- Oregon Wine Symposium
- Virtual Native Plant Workshop – Marion Co SWCD
- Strategies for Establishing Season-long Native Habitat and NRCS Cost Share Programs- Oregon BeeKeepers Association.
- Agroforestry and related research at the Corvallis PMC – Pacific Northwest Agroforestry Workshop

Training

In 2021, COVID restrictions halted many field days and trainings at the PMC. But as we moved into late summer, it was decided that outdoor trainings could be held safely at the PMC. There are many new faces in Oregon NRCS and we enjoy hosting a new employee/intern field day each year. It is a wonderful way to introduce new employees to the mission of the PMC and help facilitate connections between PMC and field office staff. On July 7th, new employees and interns gathered at the PMC for an introduction to the Plant Materials Program and a tour. Arun Jani, the new state agronomist, held a cover crop training at the PMC on September 24th, 2021. And as usual, we hosted the field portion of Soil Health and Sustainability training on October 12th, 2021.