2024 Washington State University Canola Variety Trial Summary

Jesse Ford, Washington State University, Davenport, WA

Washington State University has established an oilseed variety testing program within Washington with a current focus on spring and winter canola cultivars. The goals of this program are to demonstrate canola production potential and economic value as a rotational crop in eastern Washington, improve data quality and access for canola variety performance, and increase canola production across the region through relevant and timely research. Through partnership with farmers and the canola seed industry, WSU aims to improve stakeholder engagement via research involvement. In 2024, spring canola variety test plots were established at 10 locations across eastern Washington. 2024-2025 winter canola variety testing is also in progress with 4 trials established near Davenport, LaCrosse, Ritzville, and Wilbur, WA. Eastern Washington growers now have a resource that helps them evaluate the canola seed market and choose the right option for their production methods. The data produced from the variety testing program also provides the canola seed industry with valuable insight into the unique challenges and production environments for canola in Washington state.

Identifying aluminum tolerance in winter and spring wheat varieties adapted to the rainfed region of the Pacific Northwest

Kurtis Schroeder, University of Idaho, Moscow

Soils in the rainfed regions of the Pacific Northwest (PNW) are becoming increasingly acidic due to long term use of ammonium-based nitrogen fertilizers. The decrease in soil pH has led to increased quantities of soluble aluminum resulting in plant injury and decreased yields. Symptoms of aluminum toxicity are often overlooked, but some fields have become acutely acidic resulting in very poor plant performance and significant yield reductions. Spring and winter wheat lines adapted to the rainfed regions of the PNW were screened at the University of Idaho Parker Plant Science farm since 2016. The screening site has a soil pH of approximately 4.2 in the upper 6 in of soil with KCl extractable aluminum exceeding 300 ppm. Plots were evaluated using a 1 to 5 rating scale, with 1 being a healthy plant and 5 being a dead plant with only 2 to 3 leaves. Despite not specifically breeding for aluminum tolerance, a number of varieties of wheat adapted to the PNW are quite tolerant to aluminum toxicity. While the exact mechanism of tolerance has yet to be elucidated in the PNW germplasm, the information can be readily employed by producers in areas impacted by soil acidification and aluminum toxicity.

Influence of soil pH on weed growth and crop competition in northern Idaho

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Soil acidity can influence many aspects of crop production, namely reduced yield. While most crops grown in the region are susceptible to low soil pH and aluminum toxicity, there is little known about the impact of soil pH on problematic weeds in the Inland Pacific Northwest (IPNW). Liming trials were initiated in northern Idaho at Lenville (2023) and Potlatch (2016) using a one-time application of ground limestone at rates of 0, 1, 2 or 3 ton/A. Both locations were planted with an aluminum-tolerant winter wheat variety in 2024, while Lenville also included an aluminum-sensitive variety. Soil samples, weed seedling surveys, biomass collection, and tiller counts were taken throughout the growing season. Increasing soil pH improves wheat tillering and preliminary evidence suggests that mayweed-chamomile populations are reduced. Total grassy and broadleaf weed biomass also was reduced in limed plots compared to no lime. A greenhouse experiment was carried out to determine how soil pH impacts the growth of common IPNW broadleaf and grassy weeds. This study showed that most of these weeds can grow at a soil pH as low as 4.0. This research will provide insight into the usefulness of managing soil pH to aid in an integrated weed management strategy.

The Pacific Northwest Farmers' Network

Carol McFarland[1], Carlos Flores[1], Maren Friesen[1], Garett Heineck [2], Lynne Carpenter-Boggs[1], Bryan Carlson[2], Claire Phillips[2], and Dave Huggins[2]

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The PNW Farmers' Network (PNWFN) exists for members of the agriculture community interested in soil health and cropping system innovation. Our purpose is creating spaces to share and explore leading-edge ideas for advancing agricultural resiliency, and driving relevant research - on the farm, and in the lab, for the dryland grain production region of the iPNW.

The PNWFN works with partners at Washington State University (WSU), the USDA-Agricultural Research Service, and partners across the ag community working towards the shared vision of resilient cropping systems.

Join the conversation with:

- **The On-Farm Trials Podcast**: available across podcast platforms - hear interviews with farmers, researchers, and partners about their on-the-ground experiences of trials with soil health and conservation, crop and market diversification, increasing input efficiency, and innovation as an adaptation tool for ever-changing conditions in the iPNW dryland grain systems.
- **The Soil Health Coffee Hour - On Zoom:** highlighting regional soil health research and conversations among soil health enthusiasts
  - 10:00 PST, the last Wednesday of each month
- **The PNWFN newsletter** features events and resources (sign up on the website!)
- **Find the PNW Farmers Network:**
  on the web at pnwfarmersnetwork.org
  on YouTube *@pnwFarmersNetwork
  on X/Twitter *@pnwfarmersnetwork

Cropping Systems Conference - Poster Submission Details

Poster Title:

Palouse Prairie Mustard Variety Yield Assessment

Authors:

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Abstract:

There are two species of mustard grown primarily for condiments. Brown or oriental mustards are Brassica juncea and the yellow mustards are Sinapis alba. Mustard yield can vary under different pressures including rainfall, and insect damage, and which varieties perform best may vary by environment. Thus, multilocation testing can help breeders select varieties for broader adaptation or niche-specific environments.

The Palouse is a region along the Washington-Idaho boarder, where agriculture is mostly rainfed. This research evaluates the performance of B. juncea advanced breeding lines & commercially available mustard varieties, in multilocation trials on the Palouse.

Herbicide Resistant Italian Ryegrass (*Lolium perenne* spp. *multiflorum*) Survey in Northern Idaho and Eastern Washington

Traci Rauch and Joan Campbell, University of Idaho, Moscow

Italian ryegrass resistance to post-emergence grass herbicides commonly used in winter wheat-cropping systems was determined by surveying 95 fields in the Palouse region of the Pacific Northwest. Plants were grown in a greenhouse and were tested for resistance to quizalofop, sethoxydim, clethodim, pinoxaden, mesosulfuron, pyroxsulam, and glyphosate. Quizalofop, sethoxydim, clethodim are ACCase-inhibiting herbicides that are non-selective to grass crops and resistance was observed in 77, 57, and 23%, respectively, in the populations tested. This is a large increase compared to a survey of 75 fields in the same region in 2007, where quizalofop, sethoxydim and clethodim resistance was 48, 18, and 13%, respectively. Resistance to pinoxaden, an ACCase-inhibiting herbicide used in wheat and barley, occurred in 74% of the populations tested in 2018 compared to 31% in the 2007 survey. Mesosulfuron and pyroxsulam (ALS inhibiting-herbicides used in wheat) resistance was found in 90 and 89% of the populations. In the 2007 survey, mesosulfuron resistance occurred in 34% of the populations. All populations tested were susceptible to glyphosate. Populations susceptible to both ALS-inhibiting herbicides occurred at 9%, while populations susceptible to all four ACCase-inhibiting herbicides occurred at 6%. Only 6% of the population were completely susceptible to all seven herbicides tested.

Promoting Integrated Crop-Livestock Systems (ICLS) in Idaho Farming Systems

Jemila Chellappa, Area Extension Educator - Cropping Systems, University of Idaho Extension, Southern Districts, Caldwell, Idaho.

Abstract:
The University of Idaho (UI) Extension is spearheading efforts to promote the Integrated Crop-Livestock System (ICLS) in Idaho, addressing challenges such as limited knowledge, practical implementation barriers, and engagement gaps among agricultural professionals and producers. The "Fostering Integrated Crop-Livestock Systems in Idaho Farming Systems" initiative, supported by the Idaho Sustainable Agriculture Research and Education (SARE) Professional Development Mini-Grant, achieved significant success in just six months, engaging over 60 participants through hybrid workshops, field days, and on-farm tours.

The program emphasized the benefits of integrating livestock into crop systems, focusing on soil health, nutrient cycling, pest management, and economic resilience. It employed a comprehensive extension approach, including educational workshops featuring expert speakers, hands-on farm tours demonstrating successful ICLS practices, and opportunities for collaboration among growers, NRCS personnel, and agricultural professionals. Program outcomes included a 75% increase in participants' knowledge of ICLS practices, new behavioral changes among educators who integrated ICLS into outreach efforts and strengthened collaboration across the agricultural network in Idaho.

To build on these successes, future research and outreach efforts will focus on evaluating the impact of ICLS on soil health, crop productivity, and overall system resilience. A follow-up survey is being conducted to capture participants' perspectives on the benefits and barriers to ICLS adoption, providing critical insights to refine educational resources and implementation strategies. This initiative highlights the potential opportunities of ICLS to transform farming systems and foster sustainable agriculture across Idaho and beyond.

Empowering Sustainable Agriculture: 2024 Highlights and Future Vision of the Pacific Northwest Pest Alert Network

Jemila Chellappa, Area Extension Educator - Cropping Systems, University of Idaho Extension, Southern Districts, Caldwell, Idaho.

The Pacific Northwest Pest Alert Network (PNWPestAlert.net) is an innovative integrated pest management (IPM) tool providing real-time alerts on pest outbreaks in Idaho and Eastern Oregon. This collaborative platform connects agricultural producers, extension educators, and researchers, delivering critical information on pest presence, severity, and management strategies. The network empowers users to implement IPM practices, enhance scouting, optimize pesticide use, and reduce unnecessary sprays, promoting sustainable pest management.

PNWPestAlert.net served over 1,600 subscribers and issued 2,063 alerts, including 1,780 crop-specific updates for pests like potato psyllids, cereal leaf beetles, and lygus bugs. Strong engagement in 2024 was seen in regions like the Treasure Valley (626 subscribers) and crops such as potatoes (479 subscribers), grains, and sugar beets. Alerts covered pests, diseases, and training opportunities, including Lso-positive psyllids, cowpea aphids, Cercospora leaf spot, yellow rust, and frost damage. Events like pesticide certification seminars, weed research tours, and region field days reinforced sustainable practices and pest strategies. Collaborations with the University of Idaho Extension, Oregon State University, and sponsors like the Snake River Sugar Research and Seed Alliance and the Extension Implementation Program from the USDA National Institute of Food and Agriculture ensure accurate, localized pest updates. As PNWPestAlert.net celebrates 25 years of service in 2025, it remains dedicated to enhancing its region-wide reach, introducing website improvements, and delivering timely alerts to support sustainable and profitable farming across the Pacific Northwest.

Measuring Fungicide Application Response at Bloom for Spring and Winter Canola in Eastern Washington

Jesse Ford, Washington State University, Davenport, WA

One of the key elements to continued increases in production and profitability is stabilizing yield production of both winter and spring canola in the region. Research on fungicide application to canola is limited in the dryland Pacific Northwest and especially with regards to economic benefits when disease pressure is low. Six fungicide trials were conducted in 2024, four in spring canola and two in winter canola. All trials measured at least one fungicide product against the control and were conducted in fields that had no disease pressure. Fungicides used in these trials include Miravis Neo, Quash, Priaxor Xemium, and AzoxyStar 2SC. Trial sites for spring canola were established near Pullman, Davenport, Reardan and Fairfield. Winter canola trials were established near Davenport and Wilbur. A variety of methods were used to apply the fungicides including a drone, tractor and 3-point sprayer, airplane, and hand sprayer. Zero of the six trials showed a positive yield response to fungicide application. Further research over multiple years is necessary but growers should be cautious of investing in fungicide products when disease pressure is low and favorable conditions do not exist for disease to develop.

The R.J. Cook Agronomy Farm Long-Term Agroecosystem Research

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Dryland agriculture in the Inland Pacific Northwest faces critical challenges, including rising costs of inputs like seed, fertilizer, and agrichemicals; threats to soil health from erosion, organic matter decline, acidification, and compaction; nutrient imbalances; reduced cropping system diversity; herbicide resistance; and air and water quality concerns. While advancements in technologies such as artificial intelligence, cloud computing, and rapid data acquisition have spurred innovation, they have also complicated agricultural decision-making and research.

Addressing these challenges requires long-term research to assess trade-offs in agroecosystem services and advance sustainable, regenerative agricultural practices. The Washington State University Cook Agronomy Farm (CAF), a key site in the Long-Term Agroecosystem Research (LTAR) Network, exemplifies this commitment. Established in 1998 near Pullman, WA, the CAF site represents a 30-year field-scale experiment contrasting prevailing (reduced tillage, uniform inputs) and alternative (no-tillage, precision nitrogen management) wheat-based cropping systems. These systems include rotations with wheat, canola, chickpea, and winter pea.

Comprehensive georeferenced biophysical measurements assess soil health, crop yield, water and air quality, and agroecosystem service trade-offs and synergies. Future research at CAF emphasizes co-production approaches, fostering partnerships between researchers and stakeholders to collaboratively direct research priorities, accelerate innovation, and amplify impacts across agricultural systems.

The USDA Long-Term Agroecosystem Research Network

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The USDA Long-Term Agroecosystem Research (LTAR) Network is a nationally significant initiative aimed at advancing the sustainability of U.S. agricultural agroecosystems. Comprising 19 sites representing croplands, grazing lands, and integrated agroecosystems throughout the U.S., the USDA LTAR Network conducts long-term, transdisciplinary research to address the challenges of increasing food production while sustaining natural resources.

The LTAR Network generates insights into key socioeconomic factors (for example, social and economic indicators) and biophysical issues (indicators of productivity, air, soil and water quality/quantity, biodiversity, nutrient and water use efficiencies) by examining agroecosystem dynamics over time and across locations. Through its collaborative framework, the LTAR Network enables the development and evaluation of practices that enhance agricultural productivity, environmental stewardship, and economic viability.

By connecting science and practice, the LTAR Network engages with farmers, land managers, and stakeholders to implement sustainable solutions tailored to regional needs. This research is aimed at achieving national goals of food security, farming system resilience, and rural vitality. The LTAR Network's commitment to long-term research helps promote U.S. agricultural productivity and sustainability in the face of global challenges with the intent of safeguarding the nation's food systems and agroecosystem services for future generations.

Wheat performance classification to identify fertilizer prescription zones

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USDA Northwest Sustainable Agroecosystems Unit, Pullman, WA

Producers in the inland PNW have multiple considerations in determining nitrogen rates for wheat crops. Crop demands, protein targets, nitrogen costs, environmental impacts, and complexity of application all go into the decision-making process. In this research, we present a simple 6 class system for designing wheat performance zones that incorporates nitrogen efficiency, yield, and protein. Each performance class lends itself to different management, which highlights areas that benefit most from additional nitrogen, or perhaps stabilizers, cover crops, or different timing and placement of fertilizer. Using data from four farmers' yield and protein monitors, we demonstrate the use of the method and present a tool that can estimate zones using remote sensing, without yield or protein monitoring. Finally, on two farms using variable rate nitrogen, the economic optimum nitrogen rate is determined for each performance class to show how the system could be used to drive management decisions.

Pre-emergence Herbicide Resistant Italian Ryegrass Survey in Northern Idaho and Eastern Washington

Traci Rauch and Joan Campbell, University of Idaho, Moscow, ID

A survey of 96 fields in the Palouse region of the inland Pacific Northwest was conducted to determine the extent of Italian ryegrass resistance to grass herbicides commonly used in winter wheat-cropping systems. Plants were grown from collected seed samples in a greenhouse and were tested for resistance to triasulfuron, flufenacet/metribuzin, metolachlor, dimethenamid, and pyroxasulfone. Triasulfuron is an ALS inhibiting herbicide used in wheat and resistance was observed at 93% in the populations tested. This is a large increase compared to a survey of 75 fields in the same region in 2007 which triasulfuron resistance was 44%. Flufenacet/metribuzin is used in wheat and has two modes of action, which inhibits very long chain fatty acid synthesis (LCFA) and photosystem II electron transfer. Resistance occurred in 30% of the population tested in 2018 compared to 12% in the 2007 survey. Dimethenamid and metolachlor are both LCFA inhibitors used in legume crops and resistance was observed at 3 and 19%, respectively. All populations tested were susceptible to pyroxasulfone which is a LCFA-inhibiting herbicide. Populations susceptible to all four LCFA-inhibiting herbicides occurred at 64%. Only 7% of populations were completely susceptible to all five herbicides tested.

Wheat, Canola and Pulse tolerance to Pronamide

Joan Campbell and Traci Rauch, University of Idaho, Moscow

Kerb (pronamide) herbicide is effective at controlling Italian ryegrass in multiple high-value crops and turf. To test Kerb's suitability for the crop rotation of this region, two field sites (Moscow and Genessee, Idaho) were treated with Kerb at 1.25 and 2.5 pt/a applied in the fall and spring. Following the spring application, spring canola, pea, chickpea, and lentil were seeded. Winter wheat was seeded in the fall after harvest. Plant visual injury and yield were measured. The experiments were repeated at both locations. The first year, 2021, was the driest on record in almost half a century resulting in low spring crop yields. The extreme drought conditions likely slowed the breakdown of Kerb thus injuring subsequent winter wheat. Spring 2022 was wet and cold which resulted in low yields on some spring crops. The subsequent winter wheat crop grain yield in 2023 was moderately reduced from Kerb at the Genesee site and significantly reduced at the Moscow site. The variable results of winter wheat injury from Kerb suggest it may not be a good fit for winter wheat directly following spring rotational crops.