



# Expanding regional outreach: REACCH extension curriculum grants

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Effective communication and outreach products can help local producers make informed decisions and be better prepared to manage environmental risks associated with agriculture. The geographic range and scope of interests associated with cereal-based cropping systems in the inland Pacific Northwest (PNW) require that an extensive network of stakeholders who manage, regulate, advise, and care for agricultural land, work together to address producers' needs. To facilitate these interactions and thoroughly represent regional knowledge, REACCH extension supports outreach efforts through an Extension Curriculum Grants Program. To date, the program has provided nearly

\$122,000 in support to researchers, extension personnel, conservation districts, graduate students, and post-doctoral students, and will continue to do so until the end of the project. The following is a summary of ongoing projects; final products are available where noted.

## IMPACT

By providing support for outreach and extension throughout the Pacific Northwest, we will be able to provide growers and land managers with relevant, ready-to-use information that may not be addressed in REACCH, and strengthen the relationship among regional agricultural professionals.

## Advancing nitrogen use efficiency and direct seed farming methods

Researcher: Aaron Esser ([aarons@wsu.edu](mailto:aarons@wsu.edu)) WSU

Efficient use of nitrogen fertilizers by cereal crops is a primary concern for no-till producers as they strive to balance on-farm profits with environmental losses, but monitoring nitrogen use can be difficult. Two online calculators are available that help growers calculate (1) recommended nitrogen inputs and (2) post-

harvest nitrogen efficiency, to assist them in monitoring nitrogen use in the field. Users can calculate nitrogen use efficiency (NUE), make fertilizer application decisions, and implement methods to improve NUE. Calculators are available at:

[wheattools.wsu.edu/Applications/Fertilizer%20Use%20Calculator/NitrogenRecommendation](http://wheattools.wsu.edu/Applications/Fertilizer%20Use%20Calculator/NitrogenRecommendation)

[wheattools.wsu.edu/Applications/Fertilizer%20Use%20Calculator/PostHarvestEfficiency](http://wheattools.wsu.edu/Applications/Fertilizer%20Use%20Calculator/PostHarvestEfficiency)

## Farmer-to-farmer case study series: Increasing resilience among farmers in the inland Pacific Northwest

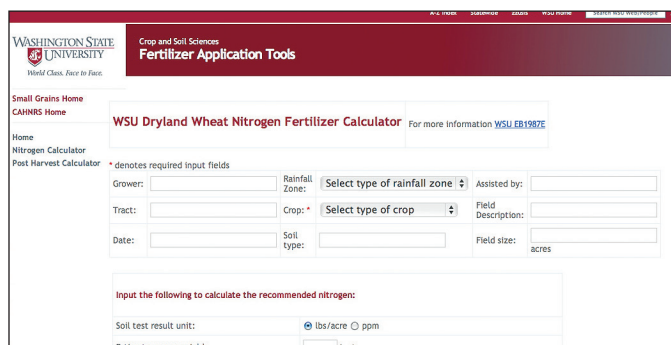
Researchers: Georgine Yorgey ([yorgey@wsu.edu](mailto:yorgey@wsu.edu)) WSU, Sylvia Kantor WSU, Kate Painter UI, Leigh Bernacchi UI, and Hilary Davis UI

Strategies for managing unprecedented risks associated with climate change can be learned from growers currently managing similar risks. This research has created case study videos and written materials that feature regional producers and focus on strategies that enhance environmental and economic resilience of cereal-based cropping systems across PNW agroecological zones. Highlighted adaptation practices include variable-rate nitrogen application, flex cropping to optimize soil moisture, diversified crops and rotations, use of cover crops, managing water deficiencies, and tillage practices and residue management. Two rounds of case studies were funded; completed materials are available at [www.casestudies.reacchpna.org/](http://www.casestudies.reacchpna.org/).

## Wheat industry's climate change communication strategy: A data-driven decision tool

Researchers: Leigh Bernacchi ([lbernacchi@uidaho.edu](mailto:lbernacchi@uidaho.edu)) UI, and J. D. Wulforst UI

Certified crop advisors (CCAs), serving between producers and input industries, were identified as the most trusted source for information about management strategies and climate change. What CCAs need to know about their region's producers and their perspectives on climate change has informed the development of a web-based, data-driven decision tool. This tool provides recommendations for climate change communication strategies and enables CCAs to view the REACCH Agricultural Producer Survey data by generalized location. Use of this tool will improve climate change communication and information strategies among multiple stakeholders and others.



Online tools can assist growers to manage nitrogen more efficiently by calculating inputs before and after harvest.

### **Ammonia volatilization associated with cereal production in inland OR and WA**

*Researchers: Donald Horneck (don.horneck@oregonstate.edu) OSU, and Marvin Butler OSU*

Nitrogen loss through ammonia volatilization is a matter for concern when incorporating urea and anhydrous ammonia fertilizers into the soil is not an option. Information about chemical additives (e.g., Agrotain) that inhibit nitrogen transformation and losses will be presented in publications and grower-based talks. Publications will be in both digital and printed format and will target wheat producers, industry representatives, and their affiliates. Grower presentations will be hosted in OR, ID, and WA. Assisting regional wheat growers to make better nutrient management decisions can help reduce the negative consequences associated with nitrogen loss.

### **Cover crop feasibility with livestock integration in low-rainfall summer-fallow region**

*Researchers: Leslie Michel (LeslieM@okanoganca.org) Okanogan Conservation District, and Dale Whaley WSU*

Cover crops have the potential to benefit agronomic systems but are difficult to maintain in moisture-limited regions. Suitable varieties of cover crops, planting and termination dates, and soil moisture data specific to a dryland summer-fallow region (Okanogan County, WA) will be featured in an extension fact sheet. Regional farmers will enhance their knowledge of and success for adapting cover crops to low-rainfall farming systems, particularly those that incorporate cattle, at winter meetings and a field day at grower-cooperator on-farm trials. Preliminary research supported by REACCH has resulted in continued support of this project from a U.S. Department of Agriculture Natural Resources Conservation Service (USDA NRCS) Conservation Innovation Grant.

### **Resistance to wheat aphids and the effect of climatic conditions on aphid populations and natural enemies**

*Researchers: Silvia Rondon OSU, Mary Corp OSU, Steve Van Vleet WSU, Aymeric Goyer OSU, and Qamar Zeb OSU*

Changes in climate and loss of crop resistance could affect the status of agricultural pests. Lack of new chemistries could make aphids difficult to control, but tolerant or resistant wheat varieties may help reduce aphid damage and pesticide use. Research results will be presented in an extension fact sheet and at multiple meetings to help growers learn more about insect-plant relationships and enable them to identify aphid-resistant wheat varieties. Effective management strategies could lead to reduced pesticide use and resistance in pests.

### **Cover crops with direct-seed wheat rotation in north central ID**

*Researchers: Ken Hart UI, Jim Church UI, Doug Finkelnburg UI, Kevin Seitz USDA NRCS, Vern McMaster Lewis County Soil Conservation District, and Ed Bechinski UI*

Researchers are investigating the use of fall- and spring-seeded cover crop pastures in rotation with direct-seeded winter wheat in northern ID. Funding supports extension activities for ongoing research. Livestock producers will learn about the potential to extend their grazing season using cover crops at field days, demonstration trials, and grower-cooperator farm sites. Through

live presentations and written outreach materials, growers will learn about cover crop yield, forage quality, soil nutrients, pH, soil ecology, and wheat yield following a cover crop.

### **Wireworm species diversity and distribution in southern ID**

*Researchers: Arash Rashad (arashed@uidaho.edu) UI, and Juliet Marshall UI*

Wireworms are a significant pest for PNW wheat producers, and more information about different species and their ecology can assist with control. This research will quantify species composition and distribution in relation to southern ID environmental variables. Grower cooperation and involvement will aid in the development of a digital distribution map of ID's most common wireworm species. The map will be featured on websites and in written handouts and other publications. Wheat and barley growers, as well as extension educators and crop advisors, will learn to effectively monitor and control wireworms.

### **Economic injury levels and a binomial sequential sampling plan for an invasive wheat aphid (*Metopolophium festucae cerealium*) and a readily abundant wheat aphid (*Rhopalosiphum padi*) on spring wheat**

*Researchers: Brad Stokes (bstokes@uidaho.edu) UI, and Sanford Eigenbrode UI*

Economic injury levels (EILs) aid in integrated pest management by helping growers know when to control a specific pest. Current EILs for two aphid pests are out of date or unknown. This research will identify and update EILs and incorporate them into a decision support tool that wheat producers can use to quickly sample fields and determine whether or not to use a pest control tactic. Use of this tool will help wheat producers effectively manage aphid pests.

### **TGet information on high-residue farming under irrigation into farmers' hands**

*Researcher: Andy McGuire (andrew.mcguire@wsu.edu) WSU*

While high-residue cereal farming practices have existed for many years in dryland regions, they are relatively new in irrigated systems. A series of five publications, (1) What and why: Benefits and challenges of high-residue farming; (2) Crop rotations: Crops, sequences, and special considerations; (3) Residue management: How to drill, plant, and fertilize; (4) Pest management considerations; and (5) Strip-tillage: Benefits, challenges, and implementation, will be combined into one comprehensive booklet focused on the irrigated Columbia Basin region in OR and WA. In combination with workshops and conferences, the booklets will increase grower awareness of high-residue farming opportunities and help support their adoption of these systems in irrigated regions.



*Aphid research is demonstrated at an OSU wheat field day in Hermiston, OR. Photo by Silvia Rondon.*