

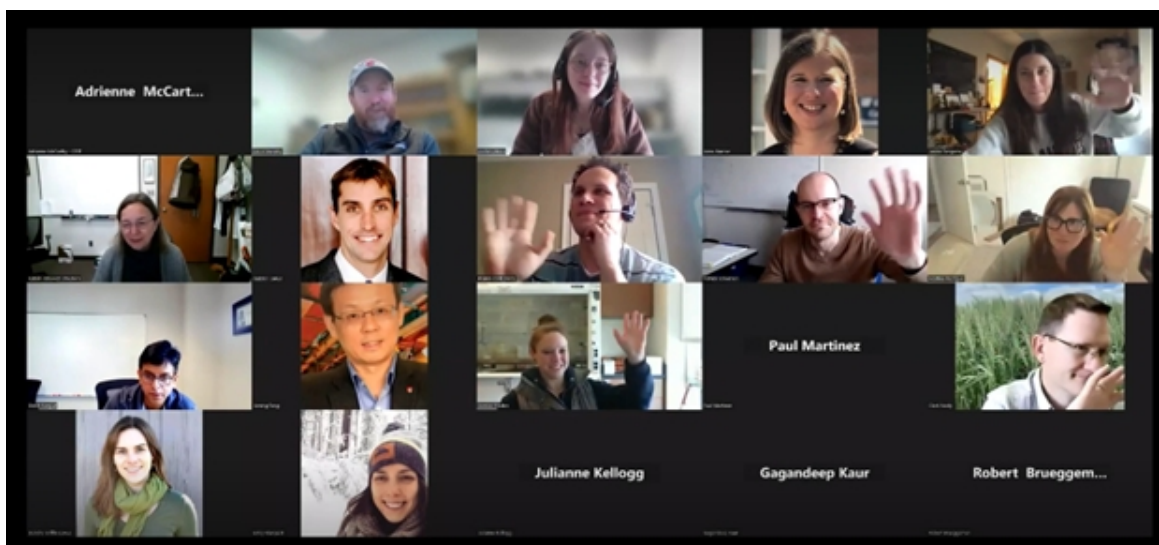


SOIL to SOCIETY
through **SCIENCE**



Halfway through Year 2

February marks the halfway point in this second year of the SAS grant. This occasion was celebrated with an all-project update meeting that took place on February 2nd via zoom. This was a great opportunity for researchers to hear what others are doing on the grant and share what they have accomplished since our in-person annual meeting in June 2022. We cannot wait to all get together in-person, in Pullman in July 2023.



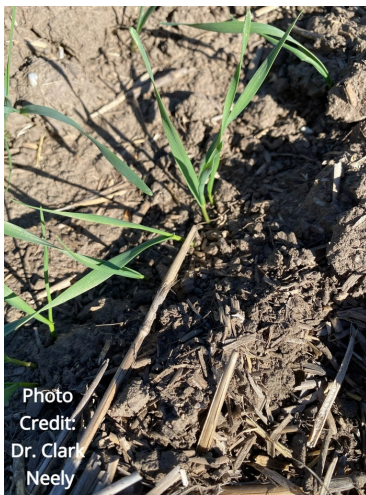
On February 2nd, our full project team met for a 2-hour meeting where team leads updated everyone on their

progress since our annual meeting in June 2022. This took place over zoom and we are very excited to meet in person in July 2023.

Updates

The **Soil & Cropping Systems Team** is preparing for spring planting. This will include getting the soil health management trials back into the ground in Pullman and Mt. Vernon, WA. The team in Mt. Vernon will be planting their micronutrient trials for the first time, looking at micronutrient timing and application method in quinoa. The Pullman team put their micronutrient trial in the ground in both Pullman and Reardon, WA this fall. They are also look at micronutrient timing and application method but in winter wheat and winter peas.

Our **Soil & Cropping Systems Team** and **Plant Breeding Team** is now officially two different teams with Dr. Kimberly Campbell serving as the new team lead for the Plant Breeding team.



This team has been working hard to hone in their sampling methods to analyze wheat seed samples from the last growing season. These samples are being tested for micronutrient content, specifically iron and zinc, as well as for phytate analysis and Fluorometric analysis of Arabinoxylans. Early indications are showing that the wheat populations from last year have acceptable diversity in zinc for progress in breeding. The WSU Breadlab planted all winter 100% whole wheat breeding lines in the field and is working to determine which spring wheat varieties to put in the field this week, based on a variety of 100% whole grain sourdough test bakes using each line.

Barley varieties, including naked barley crosses, are being increased and advanced in the greenhouse. Tissues from select populations are being collected for DNA isolation, exome capture, and DNA sequencing.



Photo Credit:
WSU Malt
Quality Lab



Photo Credit:
Dr. Rebecca McGee

Analysis of last year's pea and lentil harvest is also being conducted to determine protein and mineral concentrations. Winter peas and lentils were planted in late October and are growing happily in their respective fields.

Buckwheat varieties are growing both in Mt. Vernon and in Pullman, WA. Ten buckwheat populations are growing in Mt. Vernon, and Pullman researchers are working to establish a buckwheat population selected for early maturity and other traits.



Photo Credit: WSU
Sustainable Seeds
Systems Lab



Advanced quinoa breeding lines have been grown out in Mt. Vernon. In 2023, researchers will release 3-4 varieties based on protein, amino acid quality, and micronutrient population, as well as their performance in product development. Intermediate breeding lines are being grown out in Pullman, selecting for early maturity, yield, resistance to lodging, and nutritional value.

The **Food Science and Products Team** is working to characterize promising raw grain varieties by their components and functional properties to identify their optimal uses in product development. This includes ready to eat meals, which project researchers are currently recipe-testing for. Using these crops in ready-to-eat meals will preserve their nutrition and extend their shelf life.

WSU Breadlab has been teaching workshops on baking with whole grains, giving national talks on the subject, and going into schools and talking about whole grains. To help the plant breeding team select varieties with appealing baking qualities, they are conducting monthly test bakes of whole wheat breeding lines. Recently, they were licensed by the State of Washington and Washington State University to sell Breadlab bread and flour, so make sure to [follow along on their social media](#) to see when those pop-up bakery events are happening.



PhD food science student, Elizabeth Nalbandian, preparing quinoa cookies for taste testing in 2022. Photo by Shelly Hanks, WSU Photo Services

The **Population and Social Science Team** has primarily been focusing on developing a survey to look at whole grains and legumes in the context of population, food, and nutrient intake in the United States. They are doing this while continuing to review the literature to inform their research questions and tools. The team plans to utilize IPSOS/Knowledge Panel- selecting it for its national representative address-based panel that it has maintained for several decades. This survey will include both traditional survey questions where respondents self-report dietary behaviors, and choice experiments which ask people to choose between two or more options with different characteristics and prices. This survey will occur in the first half of 2023 and be followed up by a qualitative study in 2024.

The **Human Health and Nutrition Team** has finalized their lab space and protocol for upcoming in vitro experiments. They plan to test a variety of raw grains, extrusion, and baked products from the Food

Science and Products Team. This involves exposing cultured cells to fermentation metabolites. In the next couple of months, they plan to test their approach with buckwheat and baked bread from WSU Breadlab. By the end of year 5, they will have replicated this experimental process with the most promising varieties produced by the Plant Breeding Team.

The **Education Team** is just days away from launching our summer internship! This research opportunity is designed to...

1. Help students investigate the role of sustainable practices in agricultural and food systems on human health reasoning.
2. Develop scientific thinking and reasoning skills.
3. Apply ethical, safe, and best practices when engaging in research activities.
4. Collect, analyze, and interpret scientific data to inform decision making.
5. Communicate research efforts and results from assigned research team using written and oral communication.
6. Work effectively as a member of a team and collaborate across disciplines.

Follow us on social media to be the first to know when this opportunity goes live!



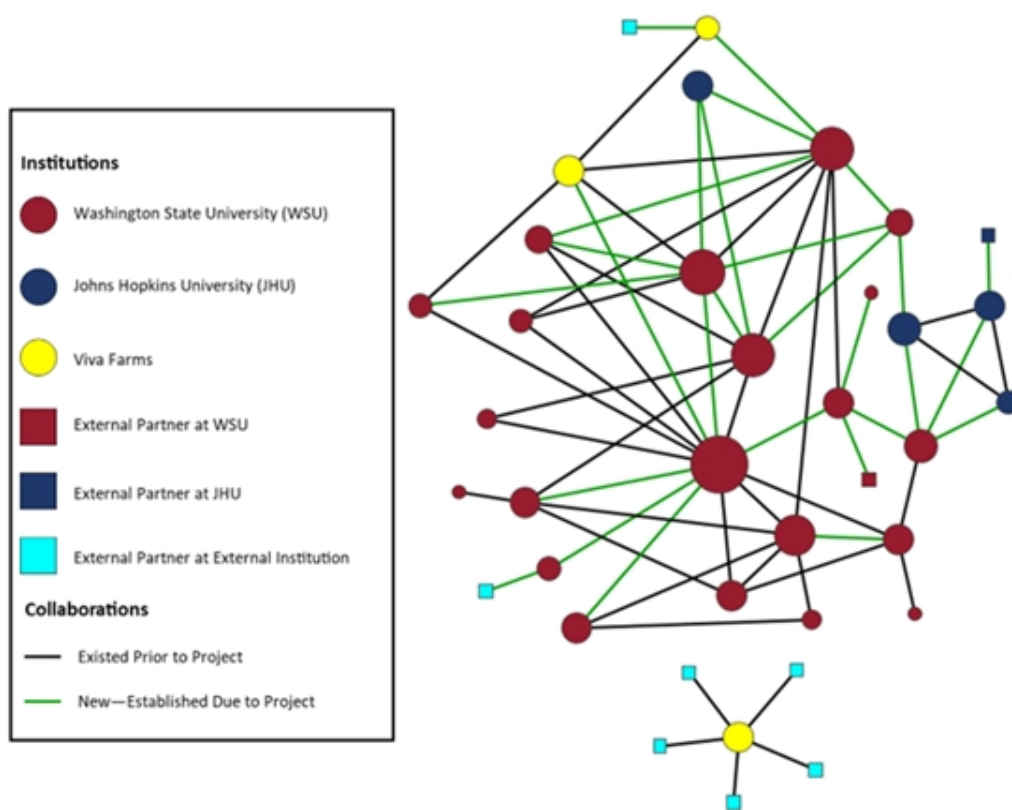
What is a social network analysis (SNA)?

A SNA is the analysis of a sociogram, or a plotted network of relationships between actants (or team members in this case). The types of relationships produce an abundance of information, including not just descriptive data, but also insights into the multifaceted social structures that underly network relationships.

The **Evaluation Team** at OEIE will be utilizing a variety of sociograms of the Soil to Society networks to assist in the evaluation of the project. Recently, an SNA was carried out on the collaboration data team members provided in the Progress and Collaboration Survey, providing a snapshot of the social network based on the survey timing and participation. The analysis provided a baseline of collaborations within the network, including between institutions (interinstitutional), within institutions, collaborations with external partners, and new versus preexisting relationships (please refer to the button below to view more details on this SNA).

Future SNAs of collaboration will provide insights into the growth of the project network compared to Year 1's baseline, ultimately providing insights on research development and dissemination from the perspective of participating team members. Later, OEIE plans to create a sociogram of the project's social media to provide insights into the project's online presence, its concomitant growth and development, outreach, and trends in research topics and posts. Such an analysis can help the project understand who their key audiences are online and how to better disseminate awareness of the project and its products.

AFRI SAS Soil to Society SNA Sociogram



SAS In the News

["WSU soil researchers seed long-term projects across Washington," WSU Insider](#) -- January 13, 2023

["Making staples more like superfoods" by Kimberly Garland-Campbell, Wheat Life Magazine](#) -- Dec. 2022

["Washington state quinoa can make a better cookie" by Sara Zaske, WSU News & Media Relations](#) -- Dec. 12, 2022

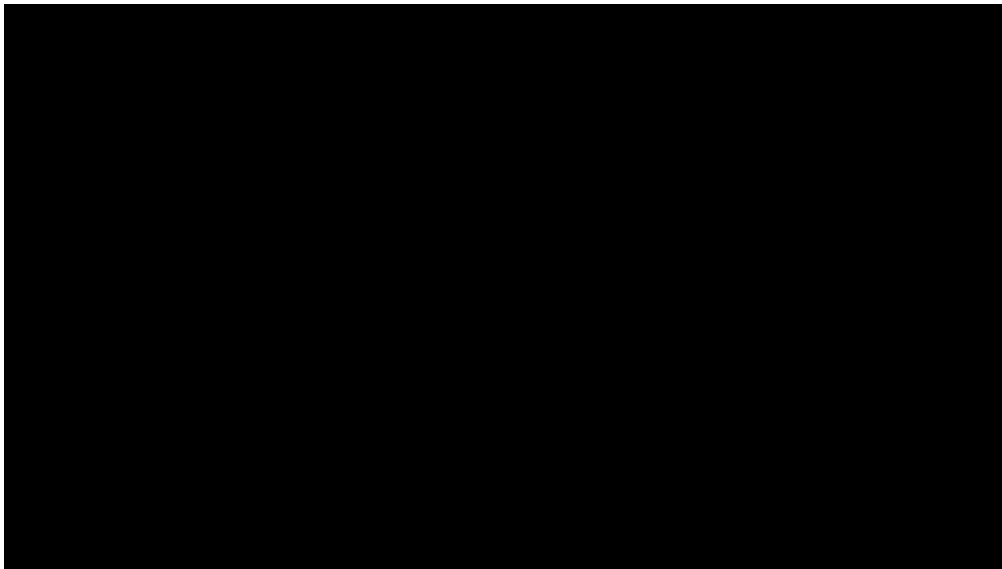
Events

SAS Annual Meeting is being held July 12th and 13th in Pullman, WA

Outreach

WSU Breadlab, PhD student Merri Metcalfe is speaking at the UCCS Grain School Online on the fiber gap and how to increase accessibility and affordability of grain-based products on **March 16th**. Register at coloradograinchain.com/events.

Project manager, Ali Schultheis gave a 3-minute lightening talk at SoilCon23 on the goals and objectives of the SAS Soil to Society project. Watch the full presentation below or on our [website](#).



Thank You to Our Partners!



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VIVA FARMS



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