

# Optimizing Human Health and Nutrition: AFRI SAS From Soil to Society

## Year 2 Graduate Student Survey Report May 2023

### Background

In 2021, Washington State University (WSU) and its partners received funding from the United States Department of Agriculture (USDA) National Institute of Food and Agriculture (NIFA) for an Agriculture and Food Research Initiative (AFRI) Sustainable Agricultural Systems (SAS) project, *Optimizing Human Health and Nutrition: From Soil to Society* (herein referred to as the AFRI SAS Soil to Society project). According to the project's proposal, the long-term goals of this project are to create more nutritious, affordable, and accessible whole grain-based foods through (1) the investigation of the contribution of novel, biofortified crop varieties and food products to human health through clinical and epidemiological evaluations, and (2) the development and deployment of nutritious food products made from improved crop varieties grown within sustainable cropping systems.

This multi-institutional and transdisciplinary project will employ a Soil-to-Society (S2S) pipeline strategy that addresses gaps in current knowledge and traces the flow of nutrients from agricultural systems and food production to human consumption. The strategy will culminate in the synthesis of more sustainable agricultural management strategies and healthy, affordable food products to meet the needs of diverse individuals and communities.

To address short-, medium-, and long-term goals, the project's key objectives are:

1. Soil Management and Cropping Systems: Understanding and applying the roles of environment, soil, and cropping system management on soil health, farm economics, and the nutritional content of the grain for each target crop.
2. Plant Breeding and Genetics: Developing new varieties of barley, wheat, peas, lentils, quinoa, and buckwheat with enhanced health and nutritive value.
3. Human Health and Nutrition: Confirming the impact of nutritionally enhanced varieties on key indicators of human health and assessing acceptance using consumer panels.
4. Food Science and Product Development: Developing a diverse and innovative suite of flavorful, affordable, and nutritious food products that will be accessible to consumers from all income levels.
5. Community-based Health and Nutrition: Conducting population studies to explore impacts on dietary quality by increasing target crop consumption in US diets and assessing consumer acceptance and valuation of whole grain- and legume-based foods.
6. Education: Focusing educational capacity on secondary student instruction, teacher professional development, and farmer training.
7. Extension: Disseminating knowledge gained and products developed to stakeholders across agriculture, food and health sciences, and communities, schools, and underserved populations through a wide-reaching extension effort.

### Purpose

As part of the project evaluation, the AFRI SAS Soil to Society project leadership contracted with the Office of Educational Innovation and Evaluation (OEIE) to conduct evaluation activities that assess the progress, implementation, and impacts of the project. Project leadership collaborated with OEIE to develop and

conduct a web-based survey with project graduate student team members to learn about their perceptions related to progress made toward project objectives, implementation, collaboration within the project, and perceived benefits from participating in the project. A copy of the survey is provided in Appendix A.

### Methods

On March 21, 2023, OEIE sent survey invitations to 15 AFRI SAS Soil to Society project graduate student team members identified by project leadership. The email invitation provided each contact with a personalized link through which they could complete the survey, with a request that they submit their completed survey by March 31, 2023. OEIE periodically sent email reminders to encourage team members to complete the survey. When the survey deadline passed, OEIE extended the deadline to April 10 to allow additional time for responses.

### Respondents

OEIE received responses from 9 of 15 team members, with 8 complete and 1 partial response (removed from analysis), for a 53.3% response rate.

- Nearly all student respondents were doctoral students ( $n = 7$  of 8, 87.5%), indicating a good representation of doctoral students but less representative of master's students ( $n = 1$  of 8, 12.5%).
- Student respondents identified with 6 of 7 objectives, indicating that only the Food Science and Product Development objective is not represented in the survey results. Most respondents indicated that they were primarily involved with the Plant Breeding and Genetics objective ( $n = 5$  of 8, 62.5%).

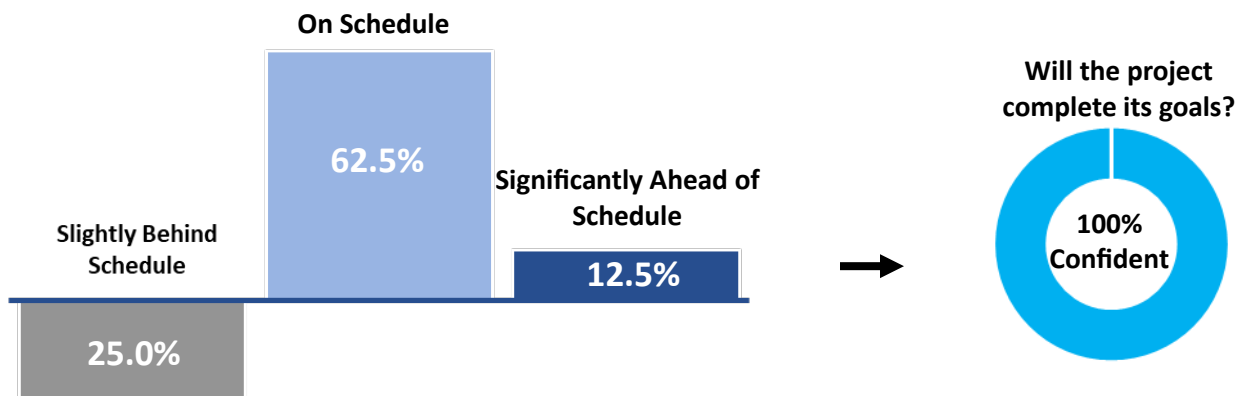
### Analysis

OEIE analyzed the survey data by calculating descriptive statistics on multiple choice and scaled items (frequency [ $n$ ], percentage [%], mean [ $M$ ], and standard deviation [ $SD$ ]) and coding qualitative responses for themes (with individual responses coded to single or multiple themes as applicable). Highlights of these analyses appear on the following pages. Full results are appended, including descriptive statistics for all survey items (Appendix B) and a list of responses to qualitative items (Appendix C).

## Highlights

### Progress and Satisfaction

Graduate student respondents were asked to **indicate the progress made toward the goals of the project**. Most respondents indicated that they were on schedule or significantly ahead of schedule ( $n = 6$  of 8; 75%), with only 2 respondents indicating they were slightly behind schedule ( $n = 2$  of 8; 25%).

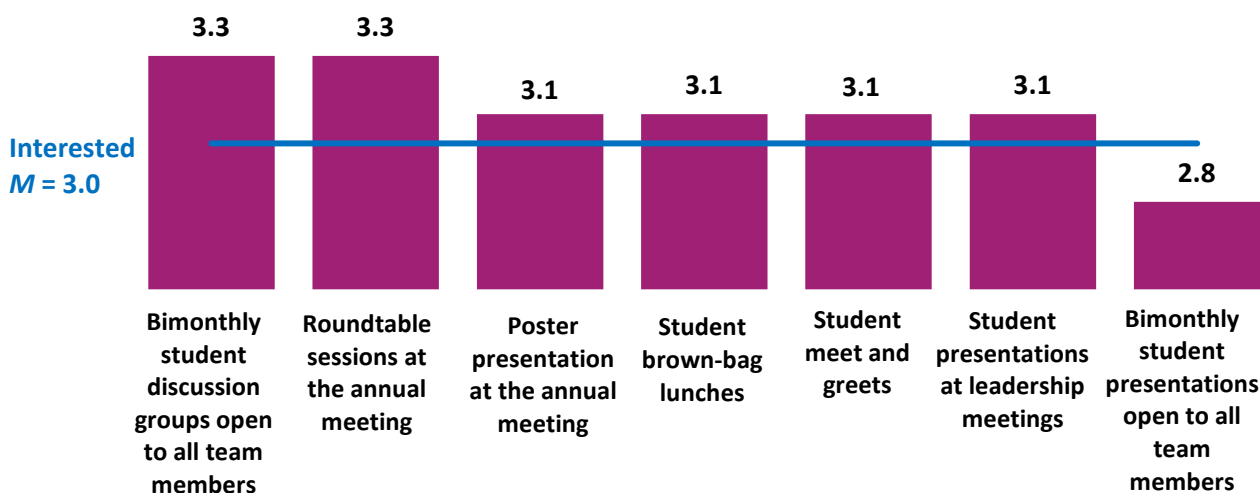


Participants were then asked on a 4-point scale (1 = not at all confident to 4 = very confident) **what their level of confidence was that the project can achieve its goal(s)** by the end of the project and all respondents reported that they were confident if not very confident ( $M = 3.4$ ).

Similarly, when asked to **rate their satisfaction with their project research experience** up to this point on a 5-point scale (1 = very dissatisfied to 5 = very satisfied), 7 of 8 respondents (87.5%) were satisfied or very satisfied ( $M = 4.0$ ). Only 1 individual (12.5%) indicated they were neither satisfied nor dissatisfied. When asked **what aspects of the Soil to Society research experience they were most satisfied with**, respondents cited most frequently the collaboration/networking across and within disciplines, the multidisciplinary nature of the project, and the transdisciplinary teamwork (which aids in addressing large research goals) ( $n = 3$  for each). **To improve such experiences**, respondents suggested most frequently to increase opportunities for collaboration (holding within-group meetings, having students work in labs from other disciplines, and problem-solving to address challenges) ( $n = 3$ ).

Student participants were asked to **indicate the level of interest they had on a list of potential student activities** on a 4-point scale (1 = no interest to 4 = very interested). 6 of 7 activities (85.7%) received a mean score of at least 3.0, indicating they were interested in partaking in those activities.

- The two activities with the highest means, indicating the most interest, were “bimonthly student discussion groups open to all team members” and “roundtable sessions at the annual meeting” ( $M = 3.3$  for both).
- The lowest rated activity, indicating the least interest, was “bimonthly student presentations open to all team members” ( $M = 2.8$ ).



When asked **what additional activities students may be interested in** participating in that were not listed above, students indicated the following in descending order of popularity:

- Dissemination activities (publications, podcasts, or presenting at conferences) ( $n = 2$ ).
- Involvement in Extension activities ( $n = 1$ ).
- Touring project institutions ( $n = 1$ ).
- Writing groups (to receive feedback during the writing process) ( $n = 1$ ).

Overall, most students agreed or strongly agreed that **they were motivated to contribute to the project** ( $n = 7$  of 8; 87.5%) indicated by an average score of 4.5 on a 5-point scale (1 = strongly disagree to 5 = strongly agree). Only 1 student (12.5%) indicated they neither agreed nor disagreed that they felt motivated to contribute to the project.

### **Mentorship**

*Note: Only responses from SAS-funded graduate students were included in the mentoring section of this report. The total number of respondents for this section ( $n$ ) is 5 after excluding the other students.*

All 5 respondents indicated that **they had received mentoring from others during their project experience** so far, with 1 individual also indicating that they were “not involved in mentoring activities during [their] experience but would like to be.” This response was interpreted to mean they received mentoring but would like to either continue to participate in activities or have more mentoring activity options.

When asked on a 5-point scale (1 = very dissatisfied to 5 = very satisfied) **how satisfied they were overall with their mentoring experience**, all 5 indicated they were satisfied or very satisfied ( $M = 4.1$ ). **Aspects of their mentoring experience that they were most satisfied with** up to the point of the survey included:

- Providing feedback, advice, and clarification ( $n = 3$ ).
- Having easy access to or open availability of mentor ( $n = 1$ ).
- Fostering scientific thinking ( $n = 1$ ).
- Providing different perspectives ( $n = 1$ ).

Respondents were asked to provide **some suggestions or ideas to improve the mentoring experience**. Two responses were recorded: One person was content with mentoring so far and the other indicated “as a mentee, I will very likely benefit from frequent feedback.”

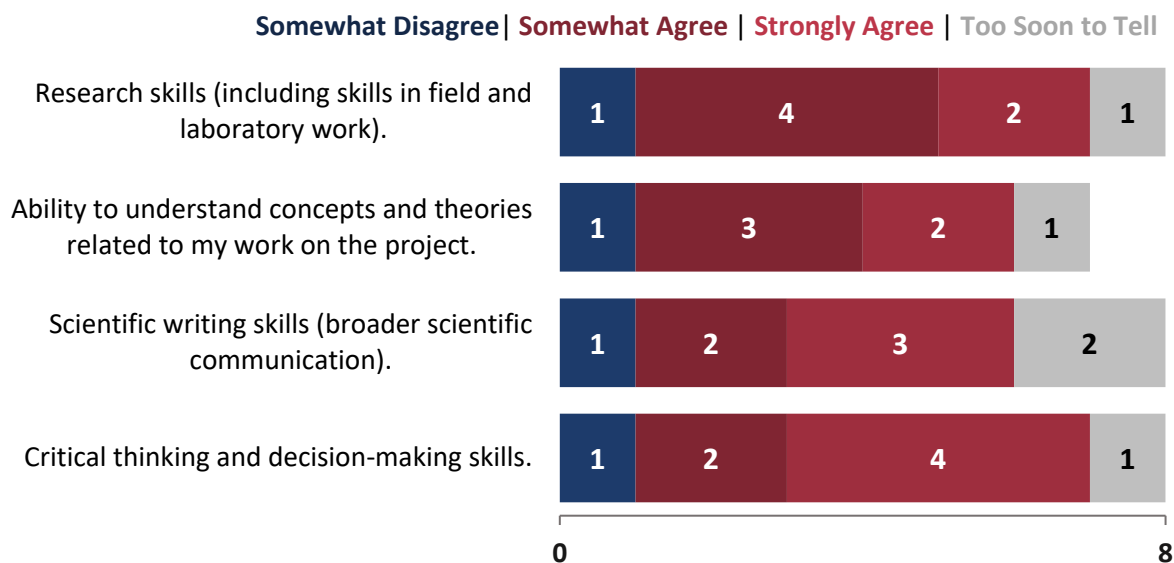
### Workforce Development and Career Preparedness

Participants were asked several questions regarding the relationship between their project experience and workforce development and career preparedness. Student respondents indicated they **gained the following personal or professional benefits** from participating in the project:

- Improvement in soft skills (communication, leadership, and completing applications) ( $n = 3$ ).
- Improvements in research knowledge and skills ( $n = 2$ ).
- Participation in interdisciplinary collaborations (learning about large interdisciplinary grants and their development/organization and improving interdisciplinary communication skills) ( $n = 2$ ).
- Opportunities for networking/collaboration ( $n = 1$ ).

From a list of four potential personal and professional skills, respondents were asked to **indicate whether participating in the project had increased such skills**. All four skills received a mean score of at least 4.0 on a 5-point scale (1 = strongly disagree to 5 = strongly agree), indicating most student respondents agree

#### Participating in Soil to Society increased my...



that they have increased all four skills due to participating in the project. Only one person for each skill indicated they somewhat disagreed that participating in the project increased the four skills.

- The skill that received the highest mean score of 4.3 was “critical thinking and decision-making skills.”
- The skills that received the lowest mean score of 4.0 was “ability to understand concepts and theories related to my work on the project” and “research skills (including skills in field and laboratory work).”

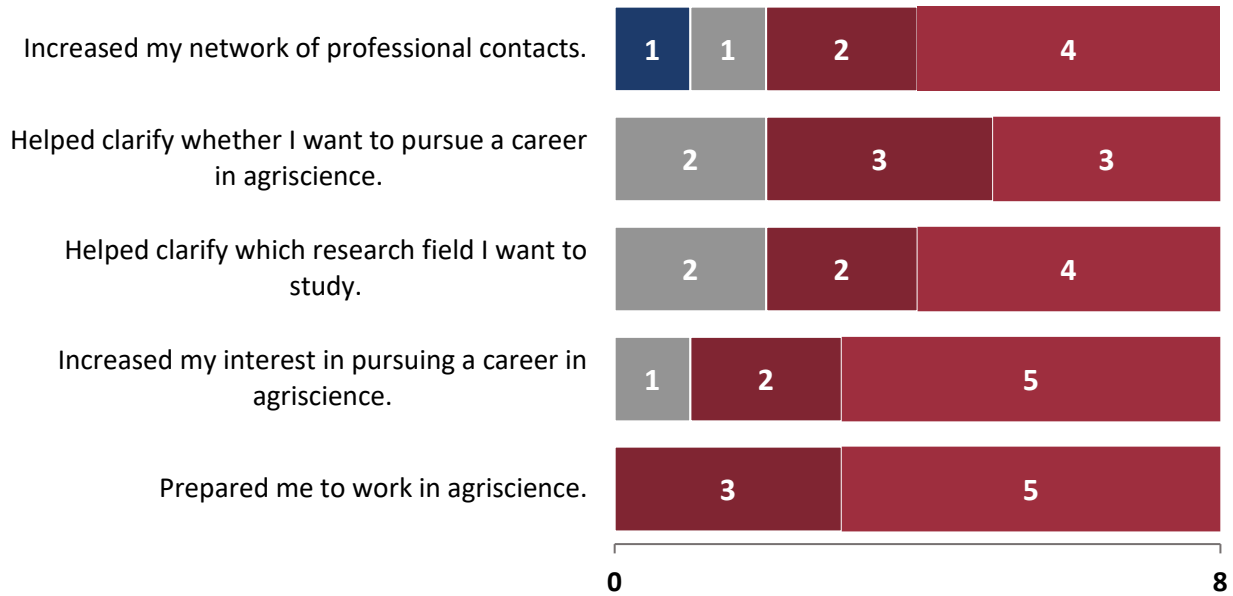
Similarly, participants were asked to indicate **whether participating in the project has prepared them for careers** by developing specific skills, on the same 5-point scale. All five career preparedness items received a mean score of at least 4.1, indicating that all participants on average agreed that they made gains in all five career preparedness items.

- The career preparedness item receiving the highest mean score of 4.6 was “prepared me to work in agriscience.”

- The career preparedness items receiving the lowest mean score of 4.1 were “helped clarify whether I want to pursue a career in agriscience” and “increased my network of professional contacts.”

**Participating in Soil to Society...**

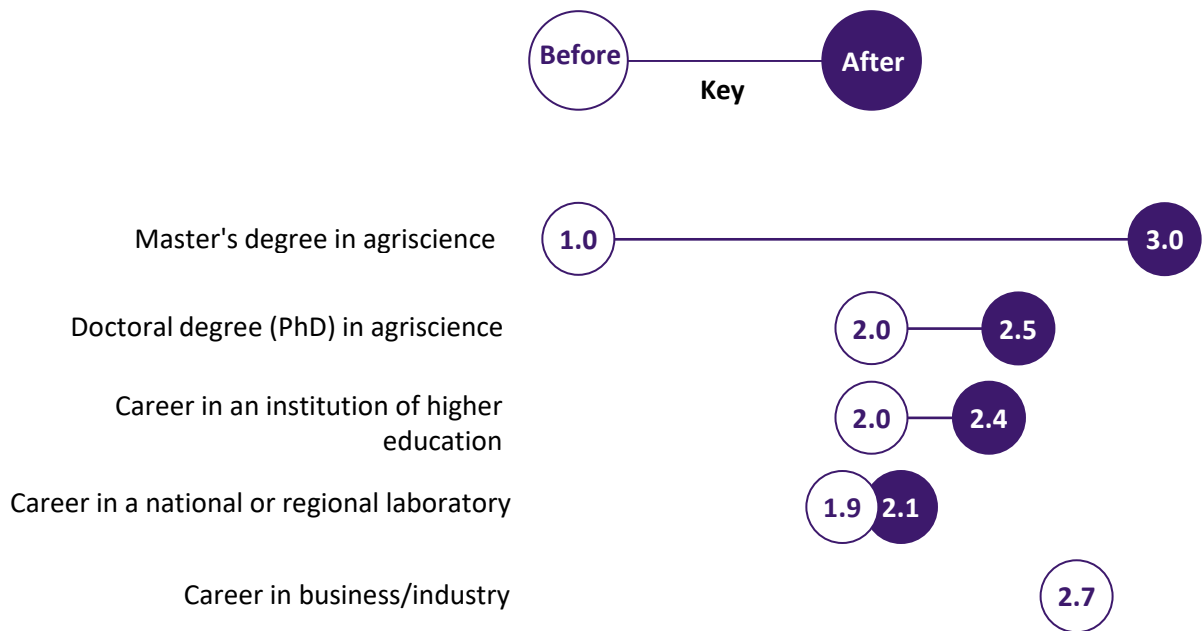
**Somewhat Disagree** | **Neither Agree Nor Disagree** | **Somewhat Agree** | **Strongly Agree**



Additionally, participants were asked to **indicate their likelihood to pursue educational/career-related items before and after their participation in the project** (see below). 4 of 5 items (80%) received a mean-score increase, indicating that project experience had increased their desire to pursue such items. Among the four items that received increases in means, the average increase was 0.8. Only 1 item (“career in business/industry”) did not change in its mean score, indicating that the project did not affect the likelihood of respondents pursuing this item.

- The item that received the largest increase (from  $M = 1.0$  to  $3.0$ ) in mean-scores after participating in the project was “master’s degree in agriscience.” This indicates that the project had the greatest impact on the perceived likelihood of pursuing this item. However, only 1 person responded to this question.

**Likelihood of pursuing educational/career paths BEFORE and AFTER participation in Soil to Society**



When asked in **what ways the project had influenced their career and/or educational plans**, student respondents indicated most frequently that the experience promoted exploration of other career/educational options related to project scope (careers in policing impacting agriculture or courses in nutrition) and that it provided examples of the benefits of transdisciplinary research ( $n = 2$  each).

***Transdisciplinary Collaboration***

Overall, student respondents appeared to recognize and benefit from transdisciplinary collaboration. When asked for their level in agreement as to **whether they had experienced improvements in abilities related to transdisciplinary collaborations** during their project experience, all six items received a mean score of at least 4.4 on a 5-point scale (1 = strongly disagree and 5 = strongly agree). This indicates that respondents on average agree or strongly agree that they improved their abilities amongst all items from their project experience.

- The highest-rated item was “engage in transdisciplinary collaboration” with a mean score of 4.9, indicating the project had the greatest impact in improving student abilities with this item.
- The items receiving the lowest mean score of 4.4 were “ability to summarize scientific results/impacts for people of interdisciplinary backgrounds” and “explain scientific concepts and theories related to my work on the project to people of interdisciplinary backgrounds,” indicating the project had the lowest increase in improving student abilities with these items.

When asked **how the project may improve collaborations among students/team members and with interdisciplinary collaborators**, student respondents suggested most frequently to “present a large-scale, transdisciplinary picture of project (ensure students perceive how their work fits into the larger picture and provide opportunities for project members to share research at a larger scale)” ( $n = 2$ ).

### ***Integration and Dissemination***

Student participants were asked for their perspectives on the integration of their research and knowledge with the project, types of products they have developed, and dissemination of project knowledge. Overall, student respondents on average ( $M \geq 4.0$ ) agreed on five different items that they **felt integrated into the project**. In particular, the highest-scored item was “I understand how my work contributes to the overall goals of the project” ( $M = 4.9$ ), indicating that student respondents feel strongly regarding the connection between their work and the project goals.

Regarding the variety of **products student respondents have contributed to**, 50% ( $n = 4$ ) reported being involved in an article for publication in a scientific or professional journal, 25% ( $n = 2$ ) reported being involved in a conference presentation, and 1 individual reported being involved in writing a grant proposal. Over a third of respondents ( $n = 3$ ; 37.5%) reported “not applicable,” indicating that they have thus far not been involved in research products.

Student participants were asked to **identify communication methods by which they received project information and rank the methods by effectiveness**. All listed methods disseminated project information to at least one student; however, the most popular methods were email ( $n = 4$ , 80%) and through mentors/advisors ( $n = 7$ ; 100%). Similarly, student respondents reported both these methods as the most effective methods of communication in addition to events (conferences, seminars, etc.) ( $M = 3$  each). The least effective methods of project communication were identified as the project website and social media ( $M = 2.3$  for both).

Finally, when asked **what motivated them to join the project**, student respondents most frequently identified the project’s interdisciplinary approach ( $n = 3$ ) as their motivating factor.

### ***Final Thoughts***

At the end of the survey, **student participants were asked how well integrated into the project they felt, to provide suggestions to facilitate a sense of integration, and to leave any additional comments they may have regarding their project experience**.

- Students most frequently reported that they currently feel integrated ( $n = 3$ ), with only 1 individual reporting that they do not feel integrated.
- It was suggested that integration could be facilitated by hosting a networking event for students working on similar projects in different institutions ( $n = 1$ ).
- Additional comments on the project indicated the respondents’ content with being a part of the research group and the ability to collaborate with people from different disciplines ( $n = 1$  for both).



## Observations and Recommendations

The Graduate Student Survey contributes to the evaluation of three different project outcomes: (1) the extent project objectives are being completed as proposed, (2) how transdisciplinary research collaboration has enhanced the work of the project, and (3) the mechanism put in place to sustain project initiatives.

### Observations

The survey results provide evidence of the project making progress toward all three outcomes. Such progress is evidenced by the following specifically:

1. **Extent project objectives are being completed as proposed:** The majority (75%) of student respondents indicated their project progress was on time, if not ahead of schedule. All respondents, including the 25% of students that indicated their project progress was slightly behind schedule, reported that they were confident if not very confident that they can achieve their project goals by the end of the project (not including the Food Science and Product Development objective, which was not represented by the respondents).



Overall, nearly all student respondents (87.5%) identified that they felt satisfied or very satisfied with their research and that they were motivated to contribute to the project. Student respondents did, however, identify a few ways in which the project could be improved in these respects, including increasing collaboration opportunities (hold within-group meetings, have students work in labs from other disciplines) and improve inter-team communication (regular project updates, providing an outline of project work, and continuing quarterly meetings or graduate student meetings).

2. **Project enhancement through transdisciplinary collaboration:** Student respondents identified that the trans- and multidisciplinary aspects (including collaboration) are the most satisfying part of their research experience. They found that the project influenced their career or educational plans by providing an example of the benefits of transdisciplinary research and, in turn, promoted their exploration of a greater scope of careers and educational disciplines. Importantly, all student respondents agreed or strongly agreed that the Soil to Society project on average improved their transdisciplinary collaboration experiences, from engaging in transdisciplinary collaboration to explaining scientific concepts and theories related to their work to people from interdisciplinary backgrounds (Table 21). Enhancement by transdisciplinary collaboration also demonstrates progress towards project objectives.




Student respondents identified a few ways to improve interdisciplinary collaboration among students and team members, which included presenting a large-scale, transdisciplinary picture of the project and placing graduate students in labs belonging to other disciplines.

3. **Sustaining project initiatives:** While early in the project, sustainability measures can be developed by disseminating project knowledge, fostering networks and collaborations, enhancing cognitive and technical skills, and acquiring funding. Such evidence has already budded with student respondents identifying their satisfaction and gains made in transdisciplinary-related skills and collaboration (see above). On average, most students reported improvement in professional and personal skills and outcomes, including improvements in soft skills, research

knowledge and skills (including critical thinking and decision-making, scientific writing, etc.) (Table 17), and increases in interest pursuing an agriscience careers, increasing network of professional contacts, and preparing to work in agriscience to name a few (Tables 18–20).

Participating in the project has also provided gains in student involvement with products, indicating progress toward creating a technical workforce pipeline. Almost two-thirds of the student respondents ( $n = 6$ ; 62.5%) worked on at least one product, one of which was a grant proposal submission (indicating progress toward sustainable funding). Students reported that project knowledge and communication was effective throughout all means of communication but most successfully and efficiently via emails, events (conferences, seminars), and from their mentors. Mentors specifically were reported to be a helpful asset for project-funded students, providing feedback, advice, clarification, and different perspectives, as well as fostering scientific experience. Student respondents on average reported that they agree that their participation on the project enhanced their understanding of project knowledge and research topics, integration with the project, how their work contributes to the overall goals of the project, etc. (Table 23).

 In addition to the suggestions indicated above that student respondents provided for enhancing transdisciplinary collaborations and communication, respondents also suggested creating a networking event for students working on similar projects in different institutions. Students reported interest in participating in other activities that may enhance inter- and intra- team communication and collaboration, including bimonthly student discussion groups open to all team members and roundtable sessions at the annual meeting (Table 9 contains the full list). Student respondents also reported they would like to engage with more dissemination activities such as presentations, publications, podcasts, and writing groups, as well as involvement in Extension activities and touring other project institutions (Table 10).

### **Recommendations**

The Soil to Society project has made much progress toward their project objectives as evidenced above. OEIE recommends that the project continue their excellence by selecting the top-rated suggestions by students indicated above (see sections designated by wheat icon) and incorporate them into project initiatives. OEIE specifically suggests project leadership consider improving inter-team communication using the most efficient dissemination methods students identified (email, events, and mentors) and bimonthly meetings. Additionally, project leadership should consider increasing opportunities for students to collaborate on publications, presentations, and other professional products. Students suggested several ways to achieve this, the most frequent of which included student visitation and/or participation in labs from other disciplines. While it may be too late to make modifications to the 2023 annual meeting agenda, leadership should consider incorporating the student suggestions of roundtables, networking events, and the like into future annual meetings and notify students of such intentions.

Optimizing Human Health and Nutrition:  
AFRI SAS From Soil to Society  
Year 2 Graduate Student Survey Report  
Appendix A - Survey

## Introduction and Consent

### **AFRI SAS Soil to Society Project Graduate Student Survey (Year 2)**

The purpose of this survey is to gain your experiences with and feedback on progress made by and collaboration within the AFRI SAS Optimizing Human Health and Nutrition: From Soil to Society (AFRI SAS Soil to Society) project. **Your participation is voluntary, and your responses to survey questions will be kept confidential to the extent that your responses will not be tied to your name in the reporting of results.** Responses from all participants, including text comments, will be combined with those of other survey respondents and reported to the AFRI SAS Soil to Society team for their use with project planning and reporting. Information shared will not be used or distributed for any other purpose. We ask that you please complete this survey by March 31, 2023.

The survey should take approximately **20-25 minutes** to complete. Your feedback is important, as your responses will contribute to successful project implementation and reporting to the AFRI SAS Soil to Society team.

For technical assistance related to the survey or questions about the evaluation, please contact the evaluation team Adrienne L. McCarthy ([mccarthy@ksu.edu](mailto:mccarthy@ksu.edu)) or Laurel Schmidt ([lrschmidt@ksu.edu](mailto:lrschmidt@ksu.edu)). Questions about the project and the evaluation can also be directed to Kevin Murphy, AFRI SAS Soil to Society Project Director. You may also contact the Research Compliance Office at Kansas State University with questions about the evaluation.

Thank you,  
Adrienne L. McCarthy and Laurel Schmidt  
AFRI SAS Soil to Society External Evaluation Team  
Office of Educational Innovation and Evaluation (OEIE)  
Kansas State University

**\*\*\* CONSENT Please indicate your consent to participate in this survey. By selecting "I agree to participate," you are providing your consent to participate in this survey. If you would like a copy of the consent form, please print this page for your own records.**

- I agree to participate.
- I do not agree.

## **Implementation & Satisfaction**

**Please indicate your role on the project**

- Doctoral student
- Masters student
- Other (Please specify)

**Please select the objective(s) with which you are primarily involved (please select all that apply):**

- Soil, Management, & Cropping Systems
- Plant Breeding & Genetics
- Human Health & Nutrition
- Food Science & Product Development
- Community-Based Health & Nutrition
- Education

- Extension
- Other (Please specify)

**Overall, which of the following options best describes the progress being made toward the goals of the project?**

- Significantly behind schedule
- Slightly behind schedule
- On schedule
- Slightly ahead of schedule
- Significantly ahead of schedule

**How confident are you that  $\{q://QID4/ChoiceGroup/SelectedChoices\}$  can achieve the goal(s) outlined in the proposal by the end of the project?**

- Not at all confident
- Somewhat not confident
- Confident
- Very confident

**Overall, how satisfied are you with your Soil to Society research experience up to this point?**

- Very dissatisfied
- Dissatisfied
- Neither satisfied nor dissatisfied
- Satisfied
- Very satisfied

**What aspects of your Soil to Society research experience are you most satisfied with up to this point? (Consider: which parts of the project are its**

strengths, from your perspective? What aspects did you like best?)

**What suggestions or ideas do you have for improving Soil to Society research experiences for student researchers? (Please be as specific as possible).** (Consider: What parts of your experience are you least satisfied with this year? What aspects did you like least or have challenges with this year? Avoid including details that would allow someone to identify you unless you feel comfortable doing so).

**Please indicate how interested you are to see or participate in the following types of involvement:**

	No interest	A little interested	Interested	Very Interested
Poster presentation at the annual meetings	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Round table sessions as the annual meetings	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Student presentation at the leadership meetings	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	No interest	A little interested	Interested	Very Interested
Bimonthly student presentations open to all team members	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bimonthly student discussion groups open to all team members	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Student meet and greets	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Student brown bag lunches	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Please identify any other types of student involvement or activities not listed in the previous question that you would like to participate in below:**

**Overall, I am motivated to contribute to the Soil to Society project.**

- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

### **Mentorship**

**Please select the response(s) that apply to your mentoring experience through Soil to Society up to this point. Mentoring may be formal (from**

**supervisors, committee members, etc.) or informal (from other students, unofficial mentors, etc.). (Select all that apply.)**

- I received mentoring from others during my experience so far.
- I provided mentoring to others during my experience so far.
- I was not involved in mentoring activities during my experience.
- I was not involved in mentoring activities during my experience but would like to be.

**Overall, how satisfied are you with your mentoring experience from the Soil to Society project up to this point?**

- Very dissatisfied
- Dissatisfied
- Neither satisfied nor dissatisfied
- Satisfied
- Very satisfied

**What aspects of your mentoring experience are you most satisfied with up to this point? (what are the strengths of the mentoring program, from your perspective?)**

**What suggestions or ideas do you have for improving the mentoring experience for students? (Please be as specific as possible). (Consider: What aspects of your experience are you least satisfied with this year? How could you be better supported as a mentor or mentee?)**



## Workforce Development and Career Preparedness

**What personal or professional benefits or outcomes have you gained from working on the Soil to Society project?** (What knowledge did you learn or improve? What skills did you develop? What opportunities did you receive?)

**Think about your research experiences with the Soil to Society project and rate your level of agreement for each statement.**

### Participating in Soil to Society increased my...

	Strongly disagree	Somewhat disagree	Neither disagree nor agree	Somewhat agree	Strongly agree	Too soon to tell	Not applicable
Ability to understand concepts and theories related to my work on the project.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Research skills (including skills in field and laboratory work).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Strongly disagree	Somewhat disagree	Neither disagree nor agree	Somewhat agree	Strongly agree	Too soon to tell	Not applicable
Scientific writing skills (broader scientific communication).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Critical thinking and decision-making skills.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Think about your experience working on the Soil to Society project in relation to professional development overall and rate your level of agreement for each statement.**

**Participating in Soil to Society...**

	Strongly disagree	Somewhat disagree	Neither disagree nor agree	Somewhat agree	Strongly agree	Too soon to tell
Increased my network of professional contacts.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Increased my interest in pursuing a career in agriscience.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Helped clarify which research field I want to study.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Helped clarify whether I want to pursue a career in agriscience.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Prepared me to work in agriscience.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please indicate how likely you were prior to your Soil to Society research experience and how likely you are now since participating in Soil to Society to pursue each of the educational/career options listed below.

	How likely were you <b>prior to participating in Soil to Society</b> to pursue...				How likely are you now <b>since participating in Soil to Society</b> to pursue...			
	Not likely	Somewhat likely	Very likely	Not applicable	Not likely	Somewhat likely	Very likely	Not applicable
Master's degree in agriscience	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Doctoral degree (PhD) in agriscience	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Career in an institution of higher education	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Career in a national or regional laboratory	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Career in business/industry	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

In what ways has working on Soil to Society influenced your education or career plans?

## Transdisciplinary Collaboration

**Think about your transdisciplinary collaboration experiences with the Soil to Society project this year and rate your level of agreement with each statement.**

**Soil to Society has improved my ability to...**

	Strongly disagree	Somewhat disagree	Neither agree or disagree	Somewhat agree	Strongly agree	Not applicable
Engage in transdisciplinary collaboration.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Work on interdisciplinary products and/or research.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Work on products and/or research with interdisciplinary team members.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Explain scientific concepts and theories related to my work on the project to people of interdisciplinary backgrounds.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to summarize scientific results/impacts for people of interdisciplinary backgrounds.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Learn about interdisciplinary research related to my field of study.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**How might Soil to Society improve collaborations amongst students/team members and with *interdisciplinary* collaborators?**

## Dissemination

Think about your experiences with Soil to Society overall and rate your level of agreement for each statement.

Due to participating in Soil to Society up to this point...

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
I understand the different research components of the project.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I understand how all the research components fit together to support Soil to Society goals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I understand how my work contributes to the overall goals of the project.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I increased my knowledge of project-related research topics.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel integrated/connected into the overall Soil to Society project.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Which of the following products have you been involved in developing as part of your role on the Soil to Society project up to this point? (Select all that apply).**

- Article for publication in a scientific or professional journal
- Book/book chapter
- Completed or contributed to a thesis/dissertation
- Conference presentation (oral or poster)
- Not applicable
- Other (Please specify)

**Please identify which of the following methods you have received information about the Soil to Society project from and then rank the effectiveness of the method in disseminating project information to students:**

	Did you hear about the Soil to Society project through these methods:		Please rank the following methods by order of which you find to be the most effective in disseminating project information to students:			
	Yes	No	Not effective	Somewhat effective	Effective	Not applicable
Project meetings	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Events (conferences, seminars, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mentor(s)/advisor(s)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emails	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Teams announcements	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Project website	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Project newsletter	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Social media	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (Please specify) <input style="width: 150px; height: 20px; border: 1px solid black;" type="text"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**What motivated you to join the Soil to Society project?**

**Final Questions**

**How well integrated into the Soil to Society project do you feel? Please share suggestions for how the project could improve connectedness of students with other team members.**

**Please provide any additional comments that you would like to share about your Soil to Society experience.**

# Optimizing Human Health and Nutrition: AFRI SAS From Soil to Society Year 2 Graduate Student Survey Report Appendix B - Compiled Results

**Table 1. Please indicate your consent to participate in this survey. By selecting "I agree to participate," you are providing your consent to participate in this survey. (n = 8)**

Response Option	Frequency	Percent
I agree to participate	8	100%
I prefer not to participate	-	-
Total	8	100%

Note. The survey originally had nine respondents; however, one respondent did not complete the survey and was therefore removed from analysis.

## **Implementation and Satisfaction:**

**Table 2. Please indicate your role on the project. (n = 8)**

Response Option	Frequency	Percent
Doctoral student	7	87.5%
Master's student	1	12.5%
Other (Please specify)	-	-
Total	8	100%

**Table 3. Please select the objective(s) with which you are primarily involved (please select all that apply): (n = 8)**

Response Option	Frequency	Percent
Plant Breeding & Genetics	5	62.5%
Soil, Management, & Cropping Systems	3	37.5%
Education	2	25.0%
Extension	2	25.0%
Community-Based Health & Nutrition	1	12.5%
Human Health & Nutrition	1	12.5%
Food Science & Product Development	-	-
Other (Please specify)	-	-

Note. Respondents could select multiple responses; thus, the sum of the frequency percentages will be greater than 100%. Percentages reflect the portion of the response option of the total number of respondents who answered the question (n = 8).



**Table 4. Overall, which of the following options best describes the progress being made toward the goals of the project? (n = 8)**

Response Option	Frequency	Percent
Significantly behind schedule	-	-
Slightly behind schedule	2	25.0%
On schedule	5	62.5%
Slightly ahead of schedule	-	-
Significantly ahead of schedule	1	12.5%

Note. Means are on a 5-point scale (1 =Significantly behind schedule to 5 = Significantly ahead of schedule).  $M = 3.0$ ,  $SD = 0.9$

**Table 5. How confident are you that the project can achieve its goal(s) outlined in the proposal by the end of the project? (n = 8)**

Response Option	Frequency	Percentage
Not at all confident	-	-
Somewhat not confident	-	-
Confident	5	62.5%
Very confident	3	37.5%

Note. Means are on a 4-point scale (1 =Not at all confident to 4 = Very confident).  $M = 3.4$ ,  $SD = 0.5$

**Table 6. Overall, how satisfied are you with your Soil to Society research experience up to this point? (n = 8)**

Response Option	Frequency	Percentage
Very dissatisfied	-	-
Dissatisfied	-	-
Neither satisfied nor dissatisfied	1	12.5%
Satisfied	6	75.0%
Very satisfied	1	12.5%

Note. Means are on a 5-point scale (1 = Very dissatisfied to 5 = Very satisfied).  $M = 4.0$ ,  $SD = 0.5$

**Table 7. What aspects of your Soil to Society research experience are you most satisfied with up to this point? (Consider: which parts of the project are its strengths, from your perspective? What aspect did you like best?) (n = 6)**

Theme	Frequency
Collaboration/networking across and within disciplines	3
Multidisciplinary nature of the project	3
Transdisciplinary teamwork helps address large research goals	3
Gains in knowledge/experience/skills (e.g., teamwork skills, internships)	2
Knowledgeable mentor	1

Note. Survey participant responses have been coded to multiple themes as applicable. Therefore, the sum of the frequencies may be greater than  $n$ .

**Table 8. What suggestions or ideas do you have for improving Soil to Society research experiences for student researchers? (Please be as specific as possible).** (Consider: What parts of your experience are you least satisfied with this year? What aspects did you like least or have challenges with this year? Avoid including details that would allow someone to identify you unless you feel comfortable doing so). (*n* = 6)

Theme	Frequency
Increase opportunities for collaboration (e.g., hold within-group meetings, have students work in labs from other disciplines, problem-solving to address challenges)	3
Project leadership continue to provide communication and resources for collaboration (e.g., quarterly meetings, grad student meetings, website)	2
Better communication (e.g., project updates, provide an outline of project work for next 3-6 months)	1

Note. Survey participant responses have been coded to multiple themes as applicable. Therefore, the sum of the frequencies may be greater than *n*.

**Table 9. Please indicate how interested you are to see or participate in the following types of involvement: (*n* = 8)**

Response Option	No interest	A little interested	Interested	Very interested	Mean ( <i>SD</i> )
Bimonthly student discussion groups open to all team members	-	1 (12.5%)	4 (50.0%)	3 (37.5%)	3.3 (0.7)
Round table sessions at the annual meeting	-	1 (12.5%)	4 (50.0%)	3 (37.5%)	3.3 (0.7)
Poster presentation at the annual meeting	1 (12.5%)	1 (12.5%)	2 (25.0%)	4 (50.0%)	3.1 (1.1)
Student brown bag lunches	-	2 (25.0%)	3 (37.5%)	3 (37.5%)	3.1 (0.8)
Student meet and greets	-	2 (25.0%)	3 (37.5%)	3 (37.5%)	3.1 (0.8)
Student presentation at the leadership meetings	-	2 (25.0%)	3 (37.5%)	3 (37.5%)	3.1 (0.8)
Bimonthly student presentations open to all team members	1 (12.5%)	2 (25.0%)	3 (37.5%)	2 (25.0%)	2.8 (1.0)

**Table 10. Please identify any other types of student involvement or activities not listed in the previous question that you would like to participate in below: (*n* = 4)**

Theme	Frequency
Dissemination activities (e.g., publications, podcasts, presenting at conferences)	2
Involvement in Extension activities	1
Touring project institutions	1
Writing groups (e.g., to receive feedback during the writing process)	1

Note. Survey participant responses have been coded to multiple themes as applicable. Therefore, the sum of the frequencies may be greater than *n*.

**Table 11. Overall, I am motivated to contribute to the Soil to Society project. (n = 8)**

Response Option	Frequency	Percentage
Strongly disagree	-	-
Disagree	-	-
Neither agree nor disagree	1	12.5%
Agree	2	25.0%
Strongly agree	5	62.5%

Note. Means are on a 5-point scale (1 = Strongly disagree to 5 = Strongly agree).  $M = 4.5$ ,  $SD = 0.8$

**Mentorship**

Note that only the responses from SAS-funded graduate students were included in the mentoring section of this report.

**Table 12. Please select the response(s) that apply to your mentoring experience through Soil to Society up to this point. Mentoring may be formal (form supervisors, committee members, etc.) or information (form other students, unofficial mentors, etc.). (Select all that apply). (n = 5)**

Response Option	Frequency	Percentage
I received mentoring from others during my experience so far.	5	100%
I provided mentoring to others during my experience so far.	-	-
I was not involved in mentoring activities during my experience.	-	-
I was not involved in mentoring activities during my experience but would like to be.	1	20.0%

Note. Respondents could select multiple responses; thus, the sum of the frequency percentages will be greater than 100%.

**Table 13. Overall, how satisfied are you with your mentoring experience from the Soil to Society project up to this point? (n = 5)**

Response Option	Frequency	Percentage
Very dissatisfied	-	-
Dissatisfied	-	-
Neither satisfied nor dissatisfied	-	-
Satisfied	4	80.0%
Very satisfied	1	20.0%

Note. Means are on a 5-point scale (1 = Very dissatisfied to 5 = Very satisfied).  $M = 4.1$ ,  $SD = 0.4$

**Table 14. What aspects of your mentoring experience are you most satisfied with up to this point? (What are the strengths of the mentoring program, from your perspective?) (n = 4)**

Theme	Frequency
Provides feedback, advice, and clarification	3
Ease of access/availability of mentor	1
Fosters scientific thinking	1
Provides different perspectives	1

Note. Survey participant responses have been coded to multiple themes as applicable. Therefore, the sum of the frequencies may be greater than  $n$ .

**Table 15. What suggestions or ideas do you have for improving the mentoring experience for students (Please be as specific as possible). (Consider: what aspects of your experience are you least satisfied with this year? How could you be better supported as a mentor or mentee?) (*n* = 2)**

Response	Frequency
As a mentee, I will very likely benefit from frequent feedback.	1
I think so far, I feel good about the mentorship I am receiving.	1
Note. No themes were found for this item.	

**Workforce Development and Career Preparedness:**

**Table 16. What personal or professional benefits or outcomes have you gained from working on the Soil to Society project? (What knowledge did you learn or improve? What skills did you develop? What opportunities did you receive?) (*n* = 5)**

Theme	Frequency
Improvements in soft skills (e.g., communication, leadership, completing applications)	3
Improvements in research knowledge and skills	2
Interdisciplinary collaborations (e.g., learning about large interdisciplinary grants and their development/organization, improving interdisciplinary communication skills)	2
Opportunities for networking/collaboration	1
Note. Survey participant responses have been coded to multiple themes as applicable. Therefore, the sum of the frequencies may be greater than <i>n</i> .	

**Table 17. Think about your research experiences with the Soil to Society project and rate your level of agreement for each statement. (n = 8)**  
**Participating in the Soil to Society increased my...**

Statement	Strongly disagree	Somewhat disagree	Neither disagree nor agree	Somewhat agree	Strongly Agree	Mean (SD)	Too soon to tell	N/A
Critical thinking and decision-making skills.	-	1 (12.5%)	-	2 (25.0%)	4 (50.0%)	4.3 (1.1)	1 (12.5%)	-
Scientific writing skills (broader scientific communication).	-	1 (12.5%)	-	2 (25.0%)	3 (37.5%)	4.2 (1.2)	2 (25.0%)	-
Ability to understand concepts and theories related to my work on the project.	-	1 (12.5%)	-	3 (37.5%)	2 (25.0%)	4.0 (1.1)	1 (12.5%)	1 (12.5%)
Research skills (including skills in field and laboratory work).	-	1 (12.5%)	-	4 (50.0%)	2 (25.0%)	4.0 (1.0)	1 (12.5%)	-

Note. Means are on a 5-point scale (1 = Strongly disagree to 5 = Strongly agree). “Too soon to tell” and “N/A” answers are not included in the calculations of the means.

**Table 18. Think about your experience working on the Soil to Society project in relation to professional development overall and rate your level of agreement for each statement. (n = 8)**

**Participating in Soil to Society...**

Statement	Strongly disagree	Somewhat disagree	Neither disagree nor agree	Somewhat agree	Strongly Agree	Mean (SD)	Too soon to tell
Prepared me to work in agriscience.	-	-	-	3 (37.5%)	5 (62.5%)	4.6 (0.5)	-
Increased my interest in pursuing a career in agriscience.	-	-	1 (12.5%)	2 (25.0%)	5 (62.5%)	4.5 (0.8)	-
Helped clarify which research field I want to study.	-	-	2 (25.0%)	2 (25.0%)	4 (50.0%)	4.3 (0.9)	-
Helped clarify whether I want to pursue a career in agriscience.	-	-	2 (25.0%)	3 (37.5%)	3 (37.5%)	4.1 (0.8)	-
Increased my network of professional contacts.	-	1 (12.5%)	1 (12.5%)	2 (25.0%)	4 (50.0%)	4.1 (1.1)	-

Note. Means are on a 5-point scale (1 = Strongly disagree to 5 = Strongly agree). “Too soon to tell” answers are not included in the calculations of the means.

**Table 19. Please indicate how likely you were prior to your Soil to Society research experience and how likely you are now since participating in Soil to Society to pursue each of the educational/career potions listed below.**

Statement	How likely were you <b>prior to participating in Soil to Society</b> to pursue...						How likely are you now <b>since participating in Soil to Society</b> to pursue...					
	Not likely	Somewhat Likely	Very Likely	Mean (SD)	N/A	Total	Not likely	Somewhat Likely	Very Likely	Mean (SD)	N/A	Total
Master's degree in agriscience	1 (14.3%)	-	-	1.0 (-)	6 (85.7%)	7	-	-	1 (14.3%)	3.0 (-)	6 (85.7%)	7
Doctoral degree (PhD) in agriscience	1 (12.5%)	1 (12.5%)	1 (12.5%)	2.0 (1.0)	5 (62.5%)	8	-	1 (12.5%)	1 (12.5%)	2.5 (0.7)	6 (75.0%)	8
Career in an institution of higher education	1 (14.3%)	5 (71.4%)	1 (14.3%)	2.0 (0.6)	-	7	-	4 (57.1%)	3 (42.9%)	2.4 (0.5)	-	7
Career in a national or regional laboratory	2 (28.6%)	4 (57.1%)	1 (14.3%)	1.9 (0.7)	-	7	2 (28.6%)	2 (28.6%)	3 (42.9%)	2.1 (0.9)	-	7
Career in business/industry	-	2 (28.6%)	5 (71.4%)	2.7 (0.5)	-	7	-	2 (28.6%)	5 (71.4%)	2.7 (0.5)	-	7

Note. Means are on a 3-point scale (1 = Not likely to 3 = Very likely). "N/A" answers are not included in the calculation of the means.

**Table 20. In what ways has working on Soil to Society influenced your education or career plans? (*n* = 5)**

Theme	Frequency
Promoted exploration of other career/educational options related to project scope (e.g., careers in policy impacting agriculture, courses in nutrition)	2
Provided examples of the benefits of transdisciplinary research	2
Increased network	1
Provided funding for degree	1

Note. Survey participant responses have been coded to multiple themes as applicable. Therefore, the sum of the frequencies may be greater than *n*.



**Transdisciplinary Collaboration:**

**Table 21. Think about your transdisciplinary collaboration experiences with the Soil to Society project this year and rate your level of agreement with each statement. (*n* = 8)**

**Soil to Society has improved my ability to...**

Statement	Strongly disagree	Somewhat disagree	Neither disagree nor agree	Somewhat agree	Strongly Agree	Mean (SD)	N/A
Engage in transdisciplinary collaboration	-	-	-	1 (12.5%)	7 (87.5%)	4.9 (0.4)	-
Learn about interdisciplinary research related to my field of study.	-	-	-	2 (25.0%)	6 (75.0%)	4.8 (0.5)	-
Work on interdisciplinary products and/or research.	-	-	1 (12.5%)	1 (12.5%)	5 (62.5%)	4.6 (0.8)	1 (12.5%)
Work on products and/or research with interdisciplinary team members.	-	-	-	3 (37.5%)	4 (50.0%)	4.6 (0.5)	1 (12.5%)
Ability to summarize scientific results/impacts for people of interdisciplinary backgrounds	-	-	1 (12.5%)	3 (37.5%)	4 (50.0%)	4.4 (0.7)	-
Explain scientific concepts and theories related to my work on the project to people of interdisciplinary backgrounds.	-	-	-	5 (62.5%)	3 (37.5%)	4.4 (0.5)	-

Note. Means are on a 5-point scale (1 = Strongly disagree to 5 = Strongly agree). "N/A" answers are not included in the calculation of the means.

**Table 22. How might Soil to Society improve collaborations amongst students/team members and with interdisciplinary collaborators? ( $n = 4$ )**

Theme	Frequency
Present a large-scale, transdisciplinary picture of project (e.g., ensure students perceive how their work fits into the larger picture, provide opportunities for project members to share research at larger scale)	2
Place graduate students in labs belonging to other disciplines	1
Soil to Society is already doing a good job in this area	1

Note. Survey participant responses have been coded to multiple themes as applicable. Therefore, the sum of the frequencies may be greater than  $n$ .

**Dissemination:**

**Table 23. Think about your experiences with Soil to Society overall and rate your level of agreement for each statement. (n = 8)**

**Due to participating in Social to Society up to this point...**

Statement	Strongly disagree	Somewhat disagree	Neither disagree nor agree	Somewhat agree	Strongly agree	Mean (SD)
I understand how my work contributes to the overall goals of the project.	-	-	-	1 (12.5%)	7 (87.5%)	4.9 (0.4)
I increased my knowledge of project-related research topics.	-	-	1 (12.5%)	3 (37.5%)	4 (50.0%)	4.4 (0.7)
I understand the different research components of the project.	-	-	1 (12.5%)	4 (50.0%)	3 (37.5%)	4.3 (0.7)
I feel integrated/ connected into the overall Soil to Society project.	-	1 (12.5%)	1 (12.5%)	3 (37.5%)	3 (37.5%)	4.0 (1.1)
I understand how all the research components fit together to support Soil to Society goals.	-	1 (12.5%)	1 (12.5%)	3 (37.5%)	3 (37.5%)	4.0 (1.1)

Note. Means are on a 5-point scale (1 = Strongly disagree to 5 = Strongly agree).

**Table 24. Which of the following products have you been involved in developing as part of your role on the Soil to Society project up to this point? (Select all that apply). (n = 8)**

Response Option	Frequency	Percent
Article for publication in a scientific or professional journal	4	50.0%
Conference presentation (oral or poster)	2	25.0%
Book/book chapter	-	-
Completed or contributed to a thesis/dissertation	-	-
Not applicable	3	37.5%
Other (Please specify)	1	12.5%

Note. Respondents could select multiple responses; thus, the sum of the frequency percentages will be greater than 100%. "Other" response was: "Grant proposal submission."

**Table 25. Please identify which of the following methods you have received information about the Soil to Society project from and then rank the effectiveness of the method in disseminating project information to students:**

Statement	Did you hear about the Soil to Society project through these methods:		Please rank the following methods by order of which you find to be the most effective in disseminating project information to students:					
	Yes	No	Not Effective	Somewhat effective	Effective	Mean <i>SD</i>	N/A	Total
Emails	4 (80.0%)	1 (20.0%)	-	-	7 (87.5%)	3.0 (0.0)	1 (12.5%)	8
Events (conferences, seminars, etc.)	2 (40.0%)	3 (60.0%)	-	-	5 (62.5%)	3.0 (0.0)	3 (37.5%)	8
Mentor(s)/ advisor(s)	7 (100.0%)	-	-	-	8 (100.0%)	3.0 (0.0)	-	8
Project newsletter	1 (20.0%)	4 (80.0%)	-	1 (14.3%)	5 (71.4%)	2.8 (0.4)	1 (14.3%)	7
Project meetings	1 (20.0%)	4 (80.0%)	1 (12.5%)	1 (12.5%)	5 (62.5%)	2.6 (0.8)	1 (12.5%)	8
Teams announcements	2 (40.0%)	3 (60.0%)	-	3 (37.5%)	3 (37.5%)	2.5 (0.5)	1 (12.5%)	7
Project Website	1 (20.0%)	4 (80.0%)	1 (14.3%)	2 (28.6%)	3 (42.9%)	2.3 (0.8)	1 (14.3%)	7
Social media	2 (33.3%)	4 (66.7%)	1 (14.3%)	2 (28.6%)	3 (42.9%)	2.3 (0.8)	1 (14.3%)	7
Other (Please specify)	-	2 (100%)	-	-	-	-	1 (100%)	1

Note. "Other" options not specified. Means are on a 3-point scale (1 = Not effective to 3 = Effective). "N/A" answers are not included in the calculation of the means.

**Table 26. What motivated you to join the Soil to Society project? (*n* = 4)**

Theme	Frequency
The project's interdisciplinary approach	3
The project is addressing timely/relevant research objectives	2
The project provided an opportunity to receive degree	1

Note. Survey participant responses have been coded to multiple themes as applicable. Therefore, the sum of the frequencies may be greater than *n*.

**Final Questions:**

**Table 27. How well integrated in the Soil to Society project do you feel? Please share suggestions for how the project could improve connectedness of students with other team members. ( $n = 5$ )**

Theme	Frequency
<i>Feeling of integration</i>	
Currently feel integrated	3
Feel connected to team but not integrated into overall project	1
Not integrated into project	1
<i>Suggestions</i>	
Have a networking event for students working on similar projects in different institutions	1

Note. Survey participant responses have been coded to multiple themes as applicable. Therefore, the sum of the frequencies may be greater than  $n$ .

**Table 28. Please provide any additional comments that you would like to share about your Soil to Society experience. ( $n = 2$ )**

Response	Frequency
It is a great setting to meet and collaborate with people from different disciplines	1
Overall, happy to be a part and learn from this group	1

Note. No themes were found for this item.

# Optimizing Human Health and Nutrition: AFRI SAS From Soil to Society Year 2 Graduate Student Survey Report Appendix C - Responses to Qualitative Items

*Please note that comments have been lightly edited to protect confidentiality and enhance readability. The question numbering corresponds to the table number in Appendix B.*

## **Progress and Satisfaction:**

**7. What aspects of your Soil to Society research experience are you most satisfied with up to this point?** (Consider: which parts of the project are its strengths, from your perspective? What aspects did you like best?). (n = 6)

- I am very satisfied with the collaboration within groups. It helps emphasize the need for teamwork to achieve national/global goals.
- I like the fact that my project is multidisciplinary and forces me to seek help from other people from different disciplines. It helped me improve my teamwork skills.
- I like the multidisciplinary aspect of the project. I believe there will be an increasing need for professionals that can work in such teams and be able to develop questions and solutions accordingly.
- I'm most satisfied with the opportunities for collaboration and networking with other research groups.
- My mentor has been knowledgeable about the project and that helps me find the information I need for this project. I like that the internship portion of education will allow secondary students the ability to participate and encourage new findings.
- The project's core strength is to foster the overcoming of discipline barriers, allowing for fundamental reassessment of research directions and priorities.

**8. What suggestions or ideas do you have for improving Soil to Society research experiences for student researchers? (Please be as specific as possible).** (Consider: What parts of your experience are you least satisfied with this year? What aspects did you like least or have challenges with this year? Avoid including details that would allow someone to identify you unless you feel comfortable doing so). (*n* = 6)

- Better communication to update what other groups are doing and a well outlined plan for the next 3 to 6 months.
- I think it is a challenge to work with such a large team and maintain contact to understand what others are working on. I think the SAS staff team is doing a great job at putting the quarterly meetings and grad student meetings together. This has allowed us to at least meet each other and hopefully in the yearly meeting we can get to know more of what each person is working on and increase collaboration.
- I think it would benefit graduate students to work in labs from other teams. For example, a plant breeding student can work with the soil team or the nutrition team.
- It would be great to have meetings within each group, excluding the general meetings, with all groups.
- The biggest challenge I am having is with method development because I am new to most of it. However, reaching out to other people helps in many ways.
- When I first got selected to work on the grant, I did not know a lot about what I was going to be working on. Going to the summer meeting helped. Now that the website is up, it will be easier to find the other researchers I need to talk to about my part in the grant.

**10. Please identify any other types of student involvement or activities not listed in the previous question that you would like to participate in below:** (*n* = 4)

- A tour of other institutions.
- Encourage students to work on a publication (extension report or journal article) together. Participant in a WSU podcast to share their research. Have research-focused students get involved in extension-related activities.
- Potentially provide writing groups where feedback could be given to people who are in the process of writing any kind of paper.
- Presenting results at various national and international conferences.

#### **Mentorship:**

**14. What aspects of your mentoring experience are you most satisfied with up to this point?** (What are the strengths of the mentoring program. From your perspective). (*n* = 4)

- I have continuously received clarification when I have questions regarding the project, including broad and specific questions on the objectives we are trying to achieve. This helped me understand the purpose of the project and how to better perform research.
- I have direct access to my mentor and can provide them with updates on my progress. I also get feedback and ideas for improvement from my mentor.
- My mentor is good at explaining things to me and helping me determine what is the highest priority for our internship and what part of the grant to work on.
- The mentoring from my advisor gives me different perspectives and fosters my scientific thinking.

**15. What suggestions or ideas do you have for improving the mentoring experience for students (Please be as specific as possible).** (Consider: what aspects of your experience are you least satisfied with this year? How could you be better supported as a mentor or mentee?) (*n* = 2)

- As a mentee, I will very likely benefit from frequent feedback.
- I think so far, I feel good about the mentorship I am receiving.

**Workforce Development and Career Preparedness:**

**16. What personal or professional benefits or outcomes have you gained from working on the Soil to Society project?** (What knowledge did you learn or improve? What skills did you develop? What opportunities did you receive?) (*n* = 5)

- I have learned a lot about planning an internship program and how to apply to different things at WSU for the internship. I have developed better emailing skills and have learned how to ask constructive questions.
- I have improved my knowledge in analytical chemistry, and I am developing good leadership skills.
- I just joined the project, however in my short time here, I have greatly improved my knowledge of the ways growers and researchers can collaborate. I have improved my interpersonal skills from communicating with people across other departments.
- It was beneficial to see how large grants like this are organized and developed; it was also beneficial to observe the interdisciplinary components and how different groups approach research.
- Professional benefits are being involved with faculty who are involved in extension and outreach.

**20. In what ways has working on Soil to Society influenced your education or career plans?** (*n* = 5)

- I don't think SAS has influenced my education or career plans except that it has increased my network.
- I have been selecting courses that not only prepare me to perform my research, but also understand the broad application of it. For example, I am taking soil and crop science courses but also taking a nutrition course to get familiar with the scope of SAS.
- I was able to receive my [degree] due to the funds through the grant. Now I will have more career options in the future.
- It helped me explore other career options that influence agricultural research such as policy.
- Soil to Society provided a valuable example of the benefits that can be derived from having people with different and complementary expertise working on one project. This influenced my sense of what should be prioritized when designing a research project.



### **Transdisciplinary Collaboration:**

#### **22. How might Soil to Society improve collaborations amongst students/team members and with interdisciplinary collaborators? (n = 4)**

- I think Soil to Society is already doing a good job in this area.
- Like chapters of a book, it would be important for the students to perceive how their individual work fits in the bigger, transdisciplinary picture.
- Potentially organize mini conferences gathering all parties to share their research at a larger scale.
- A student exchange across labs.

### **Dissemination:**

#### **26. What motivated you to join the Soil to Society project? (n = 4)**

- Being able to work with people with different academic backgrounds. Also, the research questions about the cropping systems involved on my part of the project were exactly what I was searching for as a research project.
- I found the objectives and approach to achieve the objectives very timely and essential to address public health issues. I also like the interdisciplinary approach and the recognition of the role of different sectors and stakeholders to achieve the goals.
- It provided an opportunity to receive my [degree].
- The multidisciplinary aspect of the project.

### **Final Thoughts:**

#### **27. How well integrated into Soil to Society project do you feel? Please share suggestions for how the project could improve connectedness of students with other team members. (n = 5)**

- I am not that integrated into the project.
- I feel included.
- I feel very connected to my team. I do not [feel so connected to] many people in the other teams. It will be helpful for students working on similar projects in different institutions to have a networking event.
- I feel well integrated in terms of being able to conduct my research almost independently.
- I think the SAS team is doing well at connecting people.

#### **28. Please provide any additional comments that you would like to share about your Soil to Society experience. (n = 2)**

- It is a great setting to meet and collaborate with people from different disciplines.
- Overall, [I am] happy to be a part and learn from this group.