

# AFRI SAS Soil to Society (S2S)

## Year 5 Co-PI Industry Partnership Survey Summary

**November  
2025**



# Background



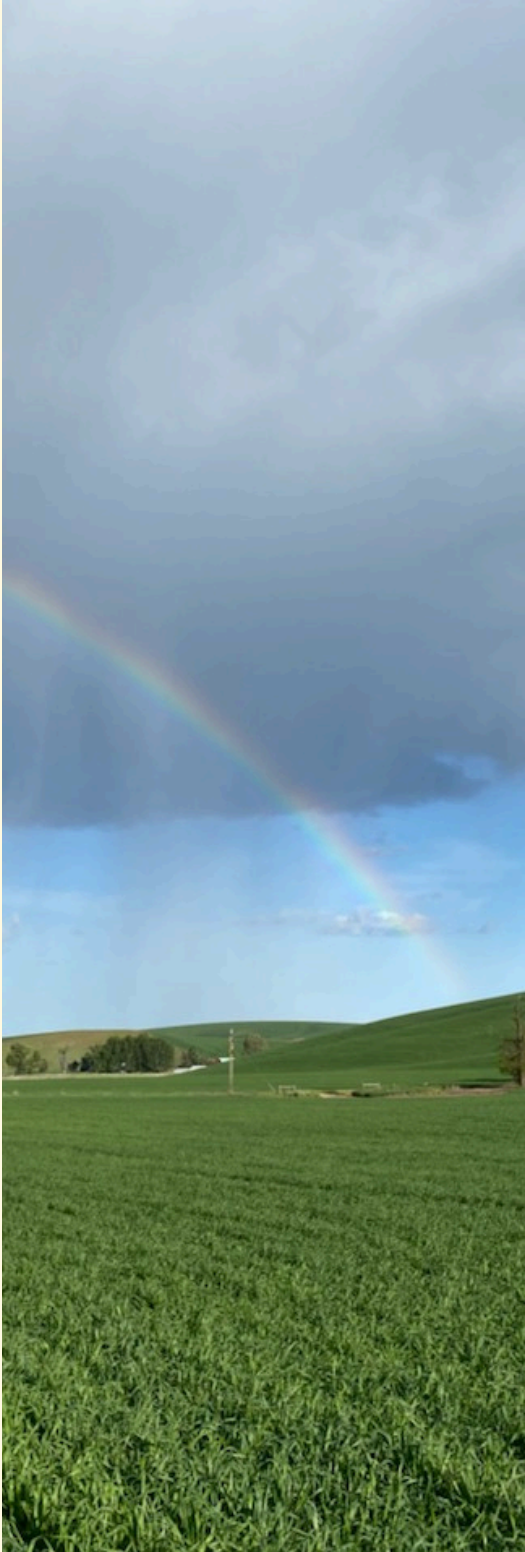
In 2021, Washington State University and its partners received funding from the United States Department of Agriculture (USDA) National Institute of Food and Agriculture for an Agriculture and Food Research Initiative (AFRI) Sustainable Agricultural Systems (SAS) project, Optimizing Human Health and Nutrition: From Soil to Society (“Soil to Society”). 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.

As part of the project’s evaluation, project leadership contracted with the Office of Educational Innovation and Evaluation (OEIE) to conduct evaluation activities that assess the project’s progress, implementation, and impacts. Project leadership collaborated with OEIE to develop and conduct a web-based survey with project Co-Principal Investigators (Co-PIs) to collect feedback about perspectives on industry partnerships related to Soil to Society and how these collaborations enhance the project’s impact. A copy of the survey appears in Appendix A.

On September 18, 2025, OEIE sent survey invitations to 18 Soil to Society Co-PIs identified by project leadership. The email invitation provided each contact with a personalized link for completing the survey. The survey closed on October 16 with 11 responses (61.1%). OEIE analyzed the survey data by calculating descriptive statistics on multiple choice and scaled items including frequency [n], percentage [%], mean [M], and standard deviation [SD], and coding qualitative responses for themes (individual responses were coded to single or multiple themes as applicable). Highlights of these analyses appear in this report. Full results are appended, including descriptive statistics for all survey items (Appendix B) and a list of responses to qualitative items (Appendix C).

Photograph courtesy of Soil to Society project

# Highlights



Eleven Co-PIs shared their perceptions regarding industry partnerships within the project. Of the 11 Co-PIs participating in the survey, seven (63.6%) have worked directly with industrial partners as part of the Soil to Society project. Industry partners include companies in food processing, farming and agribusiness, bulb and seed production, school food services, and the US Army.

Collaborations encompass a range of activities, including product development, modifying project work to improve outcomes, and discussing research findings ( $n = 2$  for each). One respondent noted that many industry partners are involved in advisory roles. Survey respondents noted that this feedback allows for an exchange of expertise and provides insights from an industry perspective ( $n = 2$ ). Industry partners are also involved in outreach efforts, developing educational connections in schools and organizing workshops ( $n = 1$  for both). Industry partnerships have also generated opportunities to share research resources, such as seeds ( $n = 1$ ). The frequency of collaborations varied from monthly to annually, while other partners met as needed.

OEIE sought feedback on industry collaborations from all Co-PIs regardless of whether they work directly with industry, to assess awareness of industry collaborations among project leadership and how integrated industry partnerships are within the overall project.

Four Co-PIs participating in the survey did not directly collaborate with industry (36.4%), but three of the four have observed industry collaborations occurring on project work. Four Co-PIs who do collaborate directly with industry have also observed other industry partnerships occurring on Soil to Society for a total of seven Co-PIs who have observed such collaborations (63.6%). Co-PIs who do not directly collaborate have observed partnerships with food product companies, such as Ardent Mills and others ( $n = 3$ ) and the Washington Grain Commission ( $n = 1$ ). None mentioned observing the industry collaborations in areas such as seed service, agribusiness, or schools.

Photograph courtesy of Soil to Society project



Photograph courtesy of Soil to Society project

## Effects of funding pause

Co-PIs ( $n = 9$ ) were asked whether the stop work order due to a USDA-initiated funding pause impacted project collaborations with industrial partners. The majority of participating Co-PIs were unsure ( $n = 5$ ; 55.6%). Three Co-PIs indicated that the pause did not impact these partnerships (33.3%), while the remaining respondent (11.1%) reported that the pause impacted these collaborations, elaborating that the funding pause slowed progress due to uncertainty about the path forward for the work and the funding.

## Communication

Co-PIs ( $n = 10$ ) shared mixed feedback regarding their satisfaction with how the project communicates industrial partner needs to the project team, with respondents most frequently neither satisfied nor dissatisfied ( $n = 5$ ; 50.0%). Four Co-PIs expressed satisfaction (40.0%) while one was dissatisfied (10.0%). When asked how to improve communications, respondents ( $n = 5$ ) most commonly suggested that leadership regularly facilitate collaborative opportunities, such as collaborations on product development and having industry partners give brief presentations to the team explaining their work and their needs from the project ( $n = 3$ ). One respondent also suggested increased communication to the team providing summaries of meetings with industry partners and explaining how partners are working with specific objective teams.

## Impacts and sustainability

Co-PIs ( $n = 6$ ) shared their perspectives on ways in which collaborations with industry can make Soil to Society project work more impactful. Respondents noted that partnerships:

Respondents noted that partnerships:

- Provide practical work opportunities ( $n = 2$ )
- Generate feedback that helps to align project outputs with industrial and target audience needs ( $n = 1$ )
- Help the project team to better understand industrial production, such as costs and processes that impact prices ( $n = 1$ )
- Are essential to the long-term sustainability of the project ( $n = 1$ ).

Two respondents shared that either that they do not know, or that impacts are yet to be determined

Co-PIs were then asked to share which efforts are currently underway to sustain Soil to Society's activities, outputs, and outcomes after the funding cycle ends (Figure 2) and how industrial partnerships contribute to sustaining these efforts.

Co-PIs ( $n = 10$ ) most frequently agreed that Soil to Society supports the sustainability of project efforts through the dissemination of findings and resources using a variety of avenues, including online, in-person workshops and presentations at meetings and conferences, and in print. Establishing and maintaining partnerships were the second most commonly reported sustainability efforts.



Photograph courtesy of Soil to Society project

## Student involvement

Co-PIs ( $n = 9$ ) were asked to share their perceptions of how Soil to Society has enabled students to work with industry partners. Two respondents do not work with students and have not observed students collaborating with industry ( $n = 22.2\%$ ), while another two Co-PIs shared that they work with students but have also not observed student-industry collaborations ( $n = 22.2\%$ ).

The Soil to Society project has enabled students to work with industry through:

- Invited speaking engagements with industrial partners, such as Q&As, brown bags, and panels at project conferences or events ( $n = 3$ )
- Collaborations on research ( $n = 3$ )
- Co-participation in project demonstrations or workshops ( $n = 3$ )

At this time, no respondents indicated that Soil to Society students are involved in internships at industrial partner organizations.

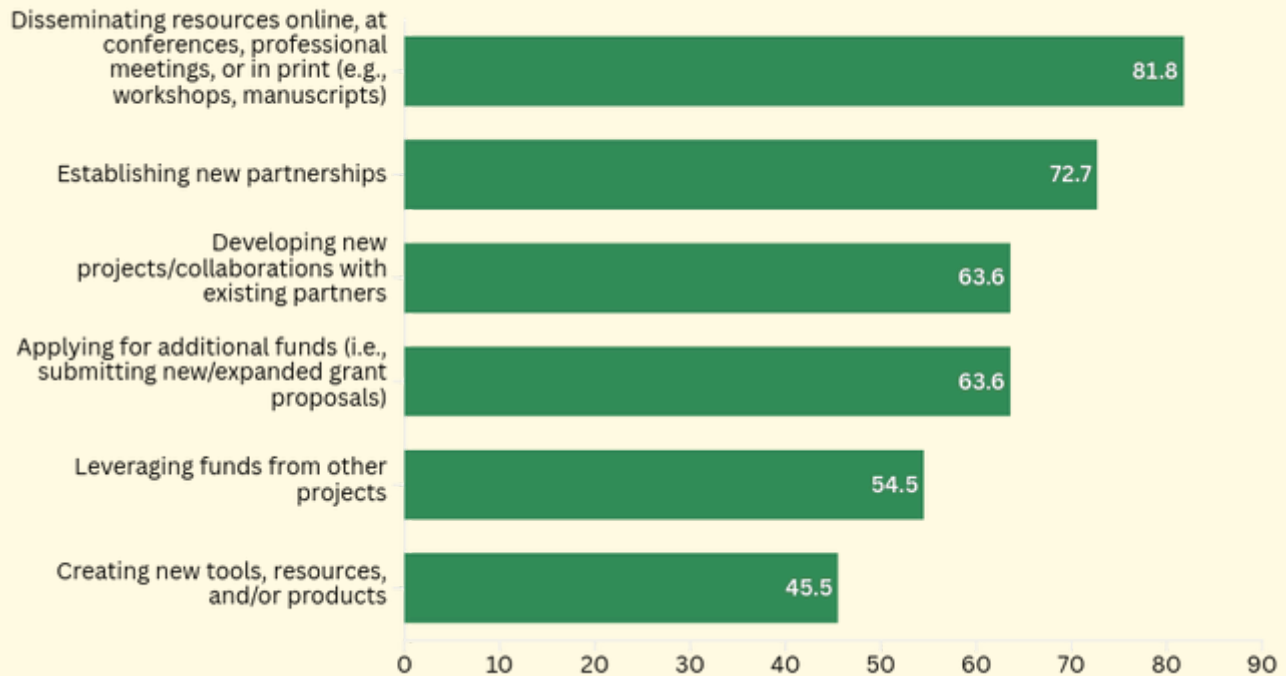
## Satisfaction with industrial partnership opportunities

Co-PIs were asked to rate their level of satisfaction with the opportunities to collaborate with industry on the Soil to Society project (Figure 1). Respondents ( $n = 10$ ) were most frequently satisfied with opportunities to collaborate with industrial partners across the broader project and their own objectives (40.0%) and most frequently reported that they were unable to evaluate collaboration opportunities for students (50.0%).

**Figure 1. Co-PI satisfaction with industrial collaboration opportunities by percentage**



**Figure 2. Top Soil to Society sustainability efforts by percentage**



When asked how industrial partnerships have contributed to sustainability, Co-PIs ( $n = 6$ ) reflected that industry input was helpful for increasing the impact of project work (for example, by helping researchers to understand practical needs and gaps in the industry;  $n = 3$ ). One respondent mentioned that work with industry has strengthened local networks with farmers, post-harvest handlers, and value-added producers, while another expressed hope that partnerships will be strengthened in the next iteration of the grant. Two Co-PIs shared that they either do not know or that it is too early to tell how industry partnerships have supported Soil to Society’s sustainability.

## Looking forward

Co-PIs were generally in agreement that industrial partnerships have benefited the Soil to Society project and maintaining existing and establishing new partnerships are important to the long-term sustainability of project work. Co-PIs were asked how these important industry connections can be maintained after the grant funding ends. Most frequently respondents suggested continuing communication among researchers and industry collaborators, such as holding annual events that include researchers and industry, continuing to report on research to industry, and connecting researchers and industry through CHEFF ( $n = 4$ ). Co-PIs also suggested developing industry-funded extensions ( $n = 1$ ) and obtaining a no-cost extension for Soil to Society to focus on product development with industry ( $n = 1$ ).

To improve industry partner integration in future grant funded research projects, Co-PIs ( $n = 8$ ) suggested more regular facilitation of communication and collaboration with partners, such as more presentations from industry or building time into meetings with industry partners for brainstorming and discussion;  $n = 3$ ). Other recommendations included initiating industry contact earlier and more frequently, connecting graduate students with industry through internships, and exploring artificial intelligence (AI) applications in whole grain food development ( $n = 1$  for each). Respondents ( $n = 2$ ) noted in their final comments that leadership did a good job of working with industry.

# Observations and Recommendations

As demonstrated by these evaluation findings, collaborations with industry partners occur across a number of industries and research projects within the Soil to Society project. More than half of the Co-PIs who participated in the survey are directly involved with industry partners, while several others are aware of these collaborations even if they do not participate themselves. Respondents spoke positively of leadership's work in recruiting industry partners, but outside of their own work with industry they are only familiar with project collaborations with food processing organizations. Some Co-PIs mentioned the BreadLab as an industry partner, rather than an organization internal to the project, indicating a lack of clarity about the BreadLab's role among team members. Additionally, several Co-PIs have not observed any industry partnerships occurring on the project outside of their own work, despite other respondents listing a variety of industry partners that have engaged with Soil to Society either directly or in an advisory capacity since the project's inception. Co-PIs were often unable to evaluate industry partnerships on the project and one respondent noted that because they are not directly involved in industry partnerships they were unable to provide feedback. This suggests that industry collaborations are not well integrated into the project network as a whole and that team members may be unaware of all the industry connections the project has formed or is forming, or how these partnerships enhance the impact and effectiveness of project work.

OEIE recommends that Soil to Society leadership consider dedicating time at an upcoming all-hands project team meeting to discuss:

- Industry connections have been formed to date
- Extent to which industry partners are involved in the project
- Specifics on what project work they have collaborated on
- How their participation has led to the modification/adjustment of objectives' work or otherwise impacted project efforts

Project leadership could also solicit stories from team members who collaborate with industry about how these partnerships have enhanced project work for inclusion in the project newsletter. Such activities should help raise awareness of industry partnerships among the project team and may promote greater interaction between team members and industry partners.

OEIE also suggests that project leadership seek to strengthen these existing partnerships by hosting an event that includes researchers and industry representatives. Intentionally creating space for team members and industry partners to meet and discuss potential areas for collaboration may strengthen existing relationships and build new connections among people who had not previously had the opportunity to meet, further supporting the project's sustainability efforts. Such an event could be particularly beneficial if graduate students were invited, as student collaboration with industry appears to be relatively limited and opportunities to form networks with relevant industry professionals could benefit both industry partners and students.

**USDA AFRI SAS Soil to Society  
Year 5 Co-PI Industry Partnership Survey  
Appendix A – Survey Questions**

The purpose of this survey is to gather perspectives on industrial relationships within the S2S project from co-PIs who collaborate with industrial partners (business or industry representatives who collaborate with the project) on project-related work. **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 **October 2, 2025**.

The survey should take approximately **15-20 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) or Laurel Schmidt (Irschmidt@ksu.edu). Questions about the project and the evaluation can also be directed to Kevin Murphy, AFRI SAS Soil to Society Project Director (kmurphy2@wsu.edu). You may also contact Lisa Rubin (rubin@ksu.edu) of the Research Compliance Office at Kansas State University with questions about the evaluation.

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

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. If you would like a copy of the consent form, please print this page for your own records.

- Yes
- No

2. Please indicate which AFRI SAS Soil to Society objective(s) you are part of (Select all that apply).

- Objective 1: Soil Management & Cropping Systems
- Objective 2: Plant Breeding & Genetics
- Objective 3: Human Health & Nutrition
- Objective 4: Food Science & Product Development
- Objective 5: Community-based Health & Nutrition
- Objective 6: Education
- Objective 7: Extension
- Other (Please specify) \_\_\_\_\_

3. Have you worked with industrial partners through the S2S project? (Definition: industrial partners refers to business or industry representative that collaborates with the project)

- Yes
- No

**Questions 4 - 6 were only asked of individuals who responded “yes” to question 3.**

4. Please list the partner(s) and their organization(s) in the space below.

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5. On average, how frequently do you collaborate with industrial partners on this project?

- Daily
- Weekly
- Monthly
- Quarterly
- Annually
- As needed
- Other (Please specify) \_\_\_\_\_

6. Please describe the nature of your collaborative work with each partner.

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7. Have you observed industrial partnerships occurring on this grant outside of your own work or objective(s)?

- Yes
- No

**Question 8 was only asked of individuals who responded “yes” to question 7.**

8. Please list the partner(s) and organization(s) you've observed and the extent to which the project has worked with them in the space below.

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**Question 9 was only asked of individuals who responded “yes” to question 3 or 7 (those who participate in or have observed industry partnerships).**

9. In what ways has the project enabled students to work with industrial partners? (Select all that apply.)

- Q&A, brown bags, industrial panels at project conferences/events, or other invited speaking engagements with industrial partners
- Collaborating on research
- Co-participating in project demonstrations or workshops
- Internships at industrial partner organizations
- Other (please specify) \_\_\_\_\_
- I do not work with students nor have observed them collaborating with industry

10. Please rate your level of satisfaction with the following industrial partnership aspects of the project

	Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very Satisfied	Unable to Evaluate
Opportunities to collaborate with industrial partners within your own objective	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Opportunities for students to collaborate with industrial partners	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Opportunities to collaborate with industrial partners across the broader project	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Question 11 was only asked of individuals who responded “yes” to question 3 or 7 (those who participate in or have observed industry partnerships).**

11. Did the pause in Soil to Society grant funding impact project partnerships with industrial partners?

- Yes
- No
- Unsure

**Question 12 was only asked of individuals who responded “yes” to question 11.**

12. Please elaborate as to what impacts the pause has had on industrial partnerships.

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13. How satisfied are you with the project communication of industrial partner needs to the S2S team?

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

14. How may leadership improve the communication of the needs of industrial partners to the team in future grants?

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**Question 15 was only asked of individuals who responded “yes” to question 3 or 7 (those who participate in or have observed industry partnerships).**

15. How have industrial partnerships/collaborations made the project work more impactful? Please provide one or two examples.

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16. What efforts are underway to sustain the project's activities, outputs, and outcomes beyond the funding cycle? (Select all that apply.)

- Establishing new partnerships
- Developing new projects/collaborations with existing partners
- Creating new tools, resources, and/or products
- Disseminating resources online, at conferences/professional meetings, or in print (e.g., presentations, workshops, manuscripts, book chapters)
- Leveraging funds from other projects
- Applying for additional funds (i.e. submitting new/expanded grant proposals)
- Other (please specify): \_\_\_\_\_

**Question 17 was only asked of individuals who responded “yes” to question 3 or 7 (those who participate in or have observed industry partnerships).**

17. Reflecting on the past four years of the project, how have these industrial partnerships/collaborations contributed to sustaining project efforts? (where sustaining means maintaining project-research-related efforts after the project formally ends).

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18. Now that the project is in its final year, what are one or two suggestions as to how the project can sustain industrial relationships after the project ends?

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19. Upon reflecting over the past four years of the project, what suggestions might you have for future grant work to better integrate industrial partners into the project?

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20. Do you have any final comments or suggestions for project leadership?

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**USDA AFRI SAS Soil to Society  
Year 5 Co-PI Industry Partnership Survey  
Appendix B - Compiled Results**

*Note. The sum of frequencies for certain tables may exceed 100% or the total n if they are for questions in which respondents could select multiple responses or are open-ended questions that may be coded for multiple themes.*

**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. If you would like a copy of the consent form, please print this page for your own records. (n = 11)**

Response Option	Frequency	Percent
I agree to participate	11	100%
I prefer not to participate	-	-
Total	11	100%

**Table 2. Please indicate which AFRI SAS Soil to Society objective(s) you are a part of (select all that apply). (n = 11)**

Response Option	Frequency	Percent
Objective 1: Soil Management and Cropping Systems	4	36.4%
Objective 2: Plant Breeding and Genetics	1	9.1%
Objective 3: Human Health and Nutrition	1	9.1%
Objective 4: Food Science and Product Development	2	18.2%
Objective 5: Community-based Health and Nutrition	1	9.1%
Objective 6: Education	3	27.3%
Objective 7: Extension	3	27.3%
Other (please specify)	-	-

**Table 3. Have you worked with industrial partners through the S2S project? (n = 11)**

Response Option	Frequency	Percent
Yes	7	63.6%
No	4	36.4%
Total	11	100%

**Questions 4 - 6 were only asked of individuals who responded "yes" to question 3.**

**Table 4. Please list the partner(s) and their organization(s) in the space below. (n = 7)**

Theme	Frequency
<i>Organizations</i>	
Cairnspring Mill	3
Bread Lab	2
Harmony Dairy	1

Hedlin Farms	1
King Arthur Flour	1
Morrison Farms	1
Pioneer Potatoes	1
School Food Service	1
Skagit Seed Services	1
US Army Soldier Center	1
Washington Bulb	1
Water Tank Bakery	1
Wilbur-Ellis	1
<i>Industry by Type</i>	
Food Processors (e.g., bakeries, mills)	7
Farms (Generic, potatoes, dairy, pulses)	5
Bulbs and Seeds	2
Agricultural Input Producer	1

*Note.* One individual left categories of producers instead of specific names, as such, their responses are not included in the organizational name list but are present in the organizational type list.

**Table 5. On average, how frequently do you collaborate with industrial partners on this project? (n = 7)**

Response Option	Frequency	Percent
Daily	-	-
Weekly	-	-
Monthly	2	28.6%
Quarterly	1	14.3%
Annually	2	28.6%
As Needed	2	28.6%
Other (Please specify):	-	-

**Table 6. Please describe the nature of your collaborative work with each partner. (n = 7)**

Theme	Frequency
Adjusting project work (e.g., modifying trials, adding metrics, modifying surveys)	2
Assisted with product development (discussed product, help test sterilization and shelf-stable methods for product)	2
Feedback/discussion of findings (e.g., on generated data from surveys, trials, etc.; receiving industry feedback)	2
Received or gave technical and field/discipline expertise (e.g., technical expertise on soil health practices to promote regenerative agriculture; on food sterilization processes to retain nutrients; provided education and literature on soil health management practices)	2
Education connections in schools	1

Organizing workshops	1
Receiving equipment/materials for research (e.g., seeds)	1

**Table 7. Have you observed industrial partnerships occurring on this grant outside of your own work or objective(s)? (n = 11)**

Response Option	Frequency	Percent
Yes	7	63.6%
No	4	36.4%
Total	11	100%

Question 8 was only asked of individuals who responded “yes” to question 7.

**Table 8. Please list the partner(s) and organization(s) you've observed and the extent to which the project has worked with them in the space below. (n = 5)**

Theme	Frequency
<i>List of Partners and Organizations</i>	
Other food product companies (not further specified)	2
Ardent Mills	1
Washington Grain Commission	1
<i>The extent to which project has worked</i>	
Annual meetings have been a fertile ground for discussion between science and industry	2
Contact engagement with Crop Breeding and Agronomy teams	1

Question 9 was only asked of individuals who responded “yes” to question 3 or 7 (those who participate in or have observed industry partnerships).

**Table 9. In what ways has the project enabled students to work with industrial partners? (Select all that apply.) (n = 9)**

Response Option	Frequency	Percent
Brown bags, Q&A, industrial panels at project conferences/events, or other invited speaking engagements with industrial partners	3	33.3%
Collaborating on research	3	33.3%
Co-participating in project demonstrations or workshops	3	33.3%
Internships at industrial partner organizations	-	-
I do not work with students nor have observed them collaborating with industry	2	22.2%
Others (please specify)	2	22.2%

*Note.* Other responses were from two individuals who work with students but have not observed them collaborating with industry.

**Table 10. Please rate your level of satisfaction with the following industrial partnership aspects of the project. (n = 10)**

Statement	Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied	Unable to evaluate	Total (n)	M (SD)
Opportunities to collaborate with industrial partners within your own objective	-	1 (10.0%)	3 (30.0%)	2 (20.0%)	2 (20.0%)	2 (20.0%)	10	3.6 (1.1)
Opportunities for students to collaborate with industrial partners	-	2 (20.0%)	-	1 (10.0%)	2 (20.0%)	5 (50.0%)	10	3.6 (1.5)
Opportunities to collaborate with industrial partners across the broader project	-	2 (20.0%)	1 (10.0%)	2 (20.0%)	2 (20.0%)	3 (30.0%)	10	3.6 (1.3)

*Note.* Means and standard deviations are calculated on a 5-point scale where 1= Very dissatisfied and 5 = Very satisfied. “Unable to evaluate” answers were not included in the calculation of the means and standard deviations.

Question 11 was only asked of individuals who responded “yes” to question 3 or 7 (those who participate in or have observed industry partnerships).

**Table 11. Did the pause in Soil to Society grant funding impact project partnerships with industrial partners? (n = 9)**

Response Option	Frequency	Percent
Yes	1	11.1%
No	3	33.3%
Unsure	5	55.6%
Total	9	100%

**Table 12. Please elaborate as to what impacts the pause has had on industrial partnerships. (n = 1)**

Response
<i>It slowed progress due to uncertainty of path forward and funds for the work.</i>
<i>Note.</i> No themes were collected for this question. The verbatim response(s) are listed instead.

**Table 13. How satisfied are you with the project communication of industrial partner needs to the S2S team (n = 10)**

Response Option	Frequency	Percent
Very satisfied	-	-
Satisfied	4	40.0%
Neither satisfied nor dissatisfied	5	50.0%
Dissatisfied	1	10.0%
Very dissatisfied	-	-

*Note.* Means are on a 5-point scale (1 = Very satisfied to 5 = Very dissatisfied).  $M = 2.7$ ,  $SD = 0.7$

**Table 14. How may leadership improve the communication of the needs of industrial partners to the team in future grants? (n = 5)**

Theme	Frequency
Regularly facilitate collaborative opportunities (e.g., to identify and progress on product development; have partners give short presentations to the team that explain what they do and identify their needs from the project)	3
Greater project communication to the team (e.g., summaries of info from meetings with industry partners; explaining how industry partners are working with specific objectives)	1
Project is doing the best they can	1

**Question 15 was only asked of individuals who responded “yes” to question 3 or 7 (those who participate in or have observed industry partnerships).**

**Table 15. How have industrial partnerships/collaborations made the project work more impactful? Please provide one or two examples. (n = 6)**

Theme	Frequency
Provides opportunity for practical work (e.g., generally, through workshops)	2
Feedback enabled greater alignment of outputs with industrial and target needs	1
Greater understanding of industrial production (e.g., costs and processes that feed into prices)	1
They are essential to long-term sustainability of the project	1
To be determined/Don't know	2

**Table 16. What efforts are underway to sustain the project's activities, outputs, and outcomes beyond the funding cycle? (Select all that apply.) (n = 10)**

Response Option	Frequency	Percent
Disseminating resources online, at conferences/professional meetings, or in print (e.g., presentations, workshops, manuscripts, book chapters)	9	81.8%
Establishing new partnerships	8	72.7%
Applying for additional funds (i.e. submitting new/expanded grant proposals)	7	63.6%
Developing new projects/collaborations with existing partners	7	63.6%
Leveraging funds from other projects	6	54.5%
Creating new tools, resources, and/or products	5	45.5%
Other (please specify)	-	-

**Question 17 was only asked of individuals who responded “yes” to question 3 or 7 (those who participate in or have observed industry partnerships).**

**Table 17. Reflecting on the past four years of the project, how have these industrial partnerships/collaborations contributed to sustaining project efforts? (where sustaining means maintaining project-research-related efforts after the project formally ends) (n = 6)**

Theme	Frequency
Industry input was helpful to make project work more impactful (e.g., understand practical needs and gaps in the industry, input at annual meetings)	3
Next grant will strengthen existing partnerships	1
Strengthening local networks (e.g., with farmers, post-harvest handlers, value added producers)	1
Too early to tell/Don't know	2

**Table 18. Now that the project is in its final year, what are one or two suggestions as to how the project can sustain industrial relationships after the project ends? (n = 5)**

Theme	Frequency
Continue communications (e.g., generally; connecting researchers with industry through CHEFF; conducting annual events that include research and industry; continue providing reports to industry)	4
Develop industry-funded extensions	1
Obtain a no-cost extension for the project (e.g., specifically for product development; focus on products for school food service products)	1

**Table 19. Upon reflecting over the past four years of the project, what suggestions might you have for future grant work to better integrate industrial partners into the project? (n = 8)**

Theme	Frequency
More regular facilitation of communication/collaborations with partners (e.g., to identify and collaborate on shared goals; sharing timelines and discussing project deliverables; more presentations from industry; allow time after meetings to discuss/brainstorm with industry)	3
Connecting graduate students with industrial partners (e.g., via internships)	1
Explore AI applications in whole grain food development	1
Start engagement with partners earlier and more frequently	1
N/A (generally; it's easier for some objectives than others)	3

**Table 20. Do you have any final comments or suggestions for project leadership? (n = 6)**

Theme	Frequency
Leadership did a good job (e.g., great leadership; leadership put a fair amount of effort to recruit partners)	2
Thank you	1
None	3

**USDA AFRI SAS Soil to Society  
Year 5 Co-PI Industry Partnership Survey  
Appendix C - Responses to Qualitative Items**

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

**Table 4. Please list the partner(s) and their organization(s) in the space below. (n = 7)**

- Bread Lab, Water Tank Bakery, School Food Service.
- Cairnspring Mill.
- Cairnspring Mills Hedlin Farms.
- King Arthur Flour.
- Pulse Industry, Food Processors.
- Some of the project activities are layered on existing research trials, one of which includes a robust stakeholder advisory committee. The committee has a dairy farmer (Harmony Dairy), a flower bulk producer (Washington Bulb), two potato producers (Pioneer Potatoes and Morrison Farms), a vegetable seed producer (Skagit Seed Services), and an agricultural input supplier (Wilbur-Ellis). We have also strengthened connections with WSU Bread Lab industrial partners through this project like Cairnspring Mill.
- US Army Soldier Center.

**Table 6. Please describe the nature of your collaborative work with each partner. (n = 7)**

- BreadLab - Education connections in schools. Product development conversations.
- I started working with Cairnspring Mill to discuss soil health management efforts in Skagit Valley grain systems. My student is writing a literature review for them.
- i) Discuss any new data generated, ii) Receiving seeds that are in commerce and that can be used as a control, iii) Feedback from the industry perspective.
- Organizing Workshops.
- Provide service to product developers to test how the microwave-assisted sterilization process helped retain nutritional attributes in plant-based shelf-stable meals intent for the military.  
School Food Service: Product development conversations, capacity to incorporate in menu.
- The stakeholders provide feedback on how we should modify our trials and additional measurements we should be collecting. Cairnspring has solicited technical expertise on soil health practices to promote regenerative agriculture.  
Water Tank Bakery: Product development conversations.
- We've had a couple of meetings with colleagues at King Arthur Flour to discuss the content of our survey work as well as the findings.

**Table 8. Please list the partner(s) and organization(s) you've observed and the extent to which the project has worked with them in the space below. (n = 5)**

- Ardent Mills, other food companies.
- Multiple contact engagement with the crop breeding and agronomy teams.
- Others would be better equipped to answer this question, but clearly the Washington Grain Commission, several food products companies, etc.

- Partners attended our annual meeting in Mt. Vernon and Spokane and shared experience and insight. I'm not specifically aware of how these partners are working with others on a team in a more involved way.
- The annual meetings have been a fertile ground for discussion between scientists on Soil to Society and industry partners. I've witnessed and been part of many conversations (speaking generally).

**Table 12. Please elaborate as to what impacts the pause has had on industrial partnerships. (n = 1)**

- It slowed progress due to uncertainty of path forward and funds for the work.

**Table 14. How may leadership improve the communication of the needs of industrial partners to the team in future grants? (n = 5)**

- Maybe have industrial partners give short presentations on what they do so we can better understand it? The updates at meetings are typically only from the project team.
- Providing summaries of info from the meetings with industry partners. Highlighting how industry partners are working with specific objectives - providing the opportunity to see overlap or opportunities in other objective areas.
- Regularly facilitate collaborative opportunities to identify and progress on product development.
- They are doing the best they can.
- Would be great to see those partners make more presentations about what types of science they feel would be beneficial.

**Table 15. How have industrial partnerships/collaborations made the project work more impactful? Please provide one or two examples. (n = 6)**

- Essential to increase the long-term sustainability of project activities.
- I don't know.
- More practical work.
- Speaking to colleagues from King Arthur Flour while developing our survey made us realize technical and financial reasons why whole grain flour is priced higher. We had nice exchanges that helped ground the questions we were asking and hopefully ultimately will help findings be more relevant to those partners.
- TBD.
- Yes -- hosting workshops with industrial partners provides real-world and applicable examples to farmers considering production of grains.

**Table 17. Reflecting on the past four years of the project, how have these industrial partnerships/collaborations contributed to sustaining project efforts? (where sustaining means maintaining project-research-related efforts after the project formally ends) (n = 6)**

- Helps understand the practical needs and gaps in the industry. This in turn helping to steer the work in the direction where its most impactful.
- I am not sure, but I think the next iteration of this grant will hopefully strengthen those partnerships.
- Strengthening local networks of all stakeholders in the grain economy -- farmers, post-harvest handlers, value added producers (mills), etc.
- Their input and insight at annual meetings was insightful.
- Too early to know.

- We better understand what industry partners are looking for and can hone our research to meet those needs.

**Table 18. Now that the project is in its final year, what are one or two suggestions as to how the project can sustain industrial relationships after the project ends? (n = 5)**

- Bringing people together more for conversations in person.
- Continue communication. Perhaps conducting an annual event where we exchange all wonderful work going on in research as well as panels with the industry partners.
- Develop industry-funded extensions. Report continuing outcomes from work.
- I think the CHEFF tiered membership model could be very impactful for this and we should think about how collaborating researchers can better connect with industry through CHEFF.
- No-cost extension. Specifically for product development, regular focus on products that are feasible for school food service partners. Products need to have ongoing financial viability for industry partners.

**Table 19. Upon reflecting over the past four years of the project, what suggestions might you have for future grant work to better integrate industrial partners into the project? (n = 8)**

- Begin earlier, engage more frequently, look for meaningful connections beyond the research aspects of the grant. After engagement during meetings, allow for time at meetings to work together to brainstorm new connections, opportunities etc.
- Explore AI applications in developing whole grains foods.
- I think this is just easier/more direct for some objectives vs others.
- More presentations from industrial partners, connecting graduate students with partners formally for mentorship opportunities.
- N/A.
- N/A.
- Regular facilitation to identify and collaborate on shared goals between project partners to meet desired goals. Shared timeline mapping and discussion of project deliverables.
- We need to continue the collaborative work.

**Table 20. Do you have any final comments or suggestions for project leadership? (n = 6)**

- From what I could observe, the leadership put a fair amount of effort to recruit industrial partners.
- Great leadership.
- I did not answer most questions as I did not personally, actively engage with industrial partners. It would have been a better survey if there was an exit option after asking if I engaged with industrial partners...
- None.
- Not currently!
- Thank you!