

Agricultural Producers' Motivations and Challenges With Improving Soil Health in Utah

Peggy Petrzelka, Jessica D. Ulrich-Schad, Matt Yost, Jenae Dean, Tony Richards, and Kristy Davis

01/21/2025



Introduction

Highlights

- Participants in the soil health demonstration project understand the importance of soil health to the environment and their operation's productivity.
- Participants see and feel the gap in research on soil health in the Intermountain West.
- Participants are aware of their unique land and that soil health practices used in other parts of the country do not always work, nor are they necessarily a good idea on their farm or ranch.
- Participants are motivated to attempt soil health practices for their own benefit so others can learn from them.
- A need exists for more soil health data collection in Utah, as well as additional resources and knowledge to assist Utah producers in improving soil health.

Soil health is defined by the United States Department of Agriculture (USDA) as "the continued capacity of soil to function as a vital living ecosystem that sustains plants, animals, and humans" (Natural Resources Conservation Service [NRCS], n.d.). The importance of soil health to agricultural production and conservation has been widely documented in certain U.S. areas, such as the Midwest and Great Plains, for the commodity crop and ranching industries (e.g., Karlen et al., 2019; Wilmer et al., 2019). Yet, soil health in other U.S. agricultural

regions remains largely understudied, including agricultural production systems in the Intermountain West (IMW). As Odom et al. (2017) note, "Despite the valuable resources that rangelands and pasturelands represent, and the ecosystem services they provide, they have not featured prominently in the national discussion and efforts to improve soil health."

With funding from the USDA/NRCS and the Utah State Legislature in 2021, the Utah Department of Agriculture and Food (UDAF) created the Utah Soil Health Program. Further, they developed the Utah Soil Health Partnership (USHP) to bring together various partners, agencies, and stakeholders to promote the adoption of soil health practices in Utah. The USHP developed a five-year project to increase understanding of how best to implement soil health practices into Utah's diverse farming systems. Fifteen producers were selected to participate in the USHP On-Farm Soil Health Demonstration Project (hereafter "trial") to represent the state's geographic and agricultural diversity.¹

During 2022, the trial's first year, the participating farmers and ranchers were interviewed. We begin by discussing participant demographics and operation characteristics. Next, we turn to challenges the producers faced with implementing soil health practices in the IMW, and then turn to motivations for the producers to enroll in the USHP trial. This will help (1) document what is currently known about soil health efforts in the IMW and (2) provide information to other producers interested in pursuing soil health on their agricultural land.

Participants' Characteristics

To select the participants, there was an open application period for all Utah producers. Questions were asked about their current management practices and access to soil health equipment, such as no-till drills. The applications were grouped into four working areas by region: Northwest, Northeast, Southeast, and Southwest. USHP members reviewed and ranked applications to select at least three sites in each of the four working areas.

Fourteen of the 15 participants agreed to be interviewed during the summer of 2022. All interviews were recorded and transcribed. Data was coded into dominant themes using the interview transcripts. The transcripts were read multiple times, and if changes in coding were made, all previous coding was reviewed to ensure it was coded consistently.²

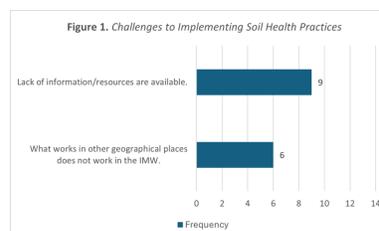
Participants' ages ranged from 32 to 70 years old (Table 1). The majority were men, and all identified their race as White. They tended to have high levels of education, with five either having some graduate work or a master's degree and four with a bachelor's degree. The farm/ranch size varied dramatically among the participants, ranging from 2 to 2,500 acres in their operation, and all either owned livestock (n = 12) or rented their land to those with livestock to graze (n = 2). Seven of the participants owned and leased land from another landowner to operate, five owned all their land, and two of the participants owned no land. The participants are spread throughout Utah, with most (n = 6) being from the northwest part of the state. The range of various characteristics reflects the diversity among those who sought to participate in the trial.

Table 1. Operator and Farm/Ranch Characteristics (N=14)

Characteristic	Average	Range
Age	47	32-70
	Frequency	
Identify as male	11	
Identify as white	14	
Education	3	
Highschool	2	
Some college	4	
Bachelor's degree	5	
Some graduate work		
Acres	474	2-2,500
Own livestock	12	
Land tenure	5	
Own all acres	7	
Own + rent acres	2	
Do not own any acres		
Region of Utah	3	
Northeast	6	
Northwest	3	
Southeast	2	
Southwest		

Challenges to Implementing Soil Health Conservation Practices

All 14 participants noted the challenges they faced with implementing soil health practices. Two dominant and interrelated challenges emerged in the interviews: (1) the lack of information/resources available and (2) the fact that the existing information/resources are not transferable to Utah (Figure 1).



Lacking Information and Resources

Nine of the participants indicated the lack of soil health information/resources available locally, ranging from one stating, "I wouldn't know where to go" to:

- *I really haven't found anyone local. We tried to talk to our local farmers and ranchers in town. And really, it's hard to find anyone local that does any practices like that. It's almost frowned upon. And they kind of look at us like we're a little bit crazy just talking about it. So, it's not something right now locally that there's many people that I can talk to about it.*
- *We are the only people operating with these practices at scale in our region, for sure...when we started; it was just a lot of laughs. They would come over and laugh right in your face.*
- *...nobody probably even knew about no-till in this valley until two or three years ago...*

Information and Resources Not Transferable to Utah

A second related issue with information and resources on soil health is the producers' views that what works in other geographical places in the U.S. may not or does not work in Utah. Six of the participants noted this, as illustrated below:

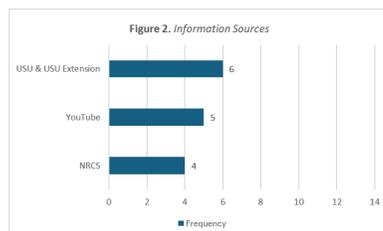
- *Soil is so subjective geographically that what a person in the [Midwest] has good success with, and the knowledge that they pass down, doesn't always apply, and almost always doesn't apply to people in*

our part of the world... it's just everything is totally different...

- *We bought just a terribly tired old ranch. One of the first things we did was enroll in an NRCS soil health program. And I'll be honest with you. I think it was a complete waste of funds and time. The practices they wanted us to implement were better suited for the Midwest. And that's why I'm here. I want to participate in this project so it goes according to the environment I'm in, which is not the Midwest.*
- *Soil health in [county name] they push a lot of stuff on us and most of it does not work. It's arid, it's dry. There's usually not enough moisture for one crop, let alone a cover crop.*
- *I don't feel the need to reinvent the wheel. But having said that, most of the information we get is not related to our specific environment... some of it translates, but not as much as I would like it to.*

Information Sources

Supporting these above findings, the top three sources used for soil health information by the participants included Utah State University (USU) and USU Extension (n = 6), YouTube (n = 5), and NRCS (n = 4) (Figure 2). Most notable here is the low use of any of these resources, despite them being the top ones named. When asked why they use these specific resources, a common participant response was, "Because that's all I can find."



We suspect that this lack of information motivated the participants to become involved in the trial project, to which we now turn.

Motivations for Enrolling in the Utah Soil Health Partnership Trial

We asked the participants what they hoped to gain from the USHP trial (Figure 3). The primary answer was to increase knowledge (n = 13), reflected in the following quotes.

Gaining Knowledge

- *Knowledge of how to help our soil... how to increase the amount of carbon in our soil and the water holding capacity. Knowledge of what works to improve our soils and what doesn't work. So, we don't have to waste our time on doing those other things [that do not work].*
- *More exposure, more ideas. We were kind of hitting a dead end on things that we can do to further our soil health. We're just looking for better practices.*
- *Knowledge, just some knowledge. If it works, if I can open some eyes and show my brother-in-law and father-in-law that hey, if we do this, here's the result. If I can figure out how to help build those soils because that's the building block. If you don't have good soil, you're not gonna grow anything.*

Increasing Productivity

The second dominant motivator for participants enrolling in the trial was to increase productivity on their farm or ranch (n = 12), illustrated in these comments:

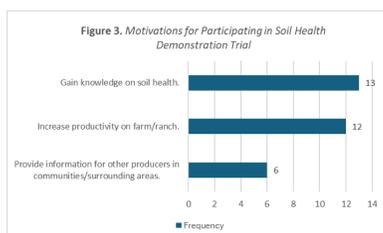
- *I'm hoping to be able to, especially in our water crisis we're in right now, to be able to optimize use of my land through good soil using the minimal amount of water possible for optimal production.*
- *I don't make decisions based on soil health. I make decisions based on quality of feed for my cattle and quantity. If you have a soil health practice that you can show me is going to increase the quality feed into my dairy cows, forage and grains, which decreases my input costs, I'm interested in learning more. You have to show me how it's going to positively impact my operation.*
- *I'm in it for the business. And what it amounts to is, I think soil health could be very valuable in knowing what's best for the long-term production.*

Sharing Information to Help Communities

A third motivator for six of the participants was to help provide information for other producers in their communities and beyond:



- *I'm hoping that the end results of this study is to help the agricultural community and not just research for a university...it'd be nice if other people could get access to the data when the project's done... I'm hoping this is the beginning of helping the community.*
- *We want very much to be able to share our successes with people. So, if publishing our results to this study and having people at the university be able to go to other producers and say, it's not as hard as it used to be, look at these results, then we get more people involved with soil health practice, then it feels like our work has more value in the long term.*
- *I think the problem is most of the data that is done, it's done on college farms or farms that actually don't need to make a living. It just seems like they're not super practical for people who are actually earning a living and having to make it work. So, more peer-based things [are needed/wanted]. Like a farm that's actually doing it, trying to survive, and making a living off of it... Soil scientists are awesome, and they can tell you really cool things. But when you go to the farmer who's doing it day-to-day, it's a totally different world than someone who's sitting in the lab.*



Summary

The findings indicate that the farmers and ranchers participating in the soil health trial understand the importance of soil health both to the environment and their operation's productivity. They see the gap in research on soil health in their geographical region—and they *feel* the gap. They are aware of the uniqueness of their land and that soil health practices used in other parts of the country

do not always work, nor are they necessarily a good idea on their farm or ranch. Yet, they are motivated to attempt soil health practices for their benefit and so that others can learn from them.

The trial's findings help document what is currently known about soil health efforts among Utah producers. The survey also highlights the need for more soil health research in the IMW and additional resources and knowledge to assist Utah farmers and ranching in improving soil health.

Acknowledgments

Photos were provided by the authors and USU Extension.

This fact sheet is largely derived from the following publication:

Petrzelka, P., Jessica Ulrich-Schad, J., & Yost, M. (2024). "We're very late to the party": Motivations and challenges with improving soil health in Utah. *Agriculture and Human Values*, 41, 381–386. <https://doi.org/10.1007/s10460-023-10467-x>

Endnotes

¹While 15 producers were participating at the time of the interviews, up to 17 were a part of the trial. Participating producers receive annual incentive payments and are expected to keep records, maintain test plots, and implement various practices on their farm/ranch. Each program participant has on-farm/ranch trials implemented (e.g., cover crops, no-till, and integrated grazing along with conventional strips) from which soil, crop, and water samples are drawn. Participants are also working with soil planners, USU Extension agents, and crop advisors to develop a soil health plan for the five-year project, with technical assistance provided throughout.

²For the full report, see the [Utah Soil Health Network On-Farm Trial Participant Report](#) (Petrzelka & Ulrich-Schad, 2022, November).

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January 2025
Utah State University Extension
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January 2025
Utah State University Extension
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Suggested citation: Petrzelka, P., Ulrich-Schad, J. D., Yost, M., Dean, J., Creech, E., Schott, L, Richards, T., & Davis, K. (2024). *Agricultural producers' motivations and challenges with improving soil health in Utah*. Utah State University Extension.

Authors

Peggy Petrzelka, Jessica D. Ulrich-Schad, Matt Yost, Jenae Dean, Tony Richards, and Kristy Davis