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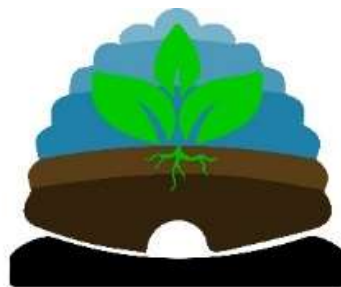
Extension
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UTAH SOIL HEALTH NETWORK PRODUCER SURVEY

Descriptive Report
July 2024

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**Utah Soil Health
Partnership**

Working Together to Improve Utah's Soils



Introduction

From February to April of 2024, as part of the Utah Soil Health Partnership (USHP) including Utah State University (USU) Extension and the Utah Department of Food and Agriculture (UDAF), Utah agricultural producers were surveyed to better understand their usage of soil management practices. Respondents were asked about a wide variety of questions, including:

- Operation characteristics
- Work with crop advisors
- Attitudes towards and usage of soil health management practices
- Personal background

Over 500 producers completed at least half of the survey. Below we provide a detailed overview of the methods used to collect the data, followed by a description of responses to all questions asked in the survey.



Methods

The questionnaire was developed through a combination of questions validated in other survey research and those created by participating faculty and graduate students. The questionnaire was reviewed by topic experts before usage. Using a list of producers purchased from DTN (N=2497; included producers with at least 25 operated acres, some with and without livestock) in combination with a list put together by USU Extension (N=503) with attendees from various workshops from around the state over multiple years, operations across the state were randomly selected to participate in proportion to the number of operations in the county. DTN and Extension did not have enough contacts to fulfill the quotas for every county, and in those cases additional respondents were selected at the state level. Duplicates were checked for and removed.

Those selected were contacted up to four times every two weeks to take the online or paper questionnaire. The first wave consisted of an advance letter printed in color and sent in a business size envelope with a USU logo and return address. Recipients were asked to go online and take the survey using a QR code or the shortened link provided. As recommended by Dillman et al. (2014), recipients were not notified that another chance to take the survey would be available. As a token pre-incentive, in the first wave the sample was randomly assigned to receive either a sticker (see Figure 1) or a \$2 bill in order to test which was more effective in increasing response rates. Wave 2 was sent to non-respondents in a 9x12 envelope and included a copy of the 12-page booklet questionnaire and an addressed and stamped return envelope.

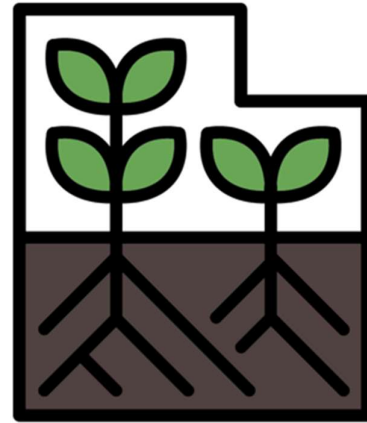


Figure 1. Incentive Sticker

A color postcard with an image of a farm in Cache Valley, Utah was sent to non-respondents in wave 3 (see Figure 2). Finally, non-respondents were mailed another copy of the survey and a business-reply addressed return envelope.



Figure 2. Front of Postcard for Wave 3

Surveys returned via mail were entered into Qualtrics. Once data collection was complete, the data was cleaned for incomplete responses (<50% of questions answered), non-logical responses, etc. After the four waves of contact and cleaning, 527 Utah agricultural producers took the survey. Of the 3,000 in the sample, we received notifications that 233 producers were no longer farming (197 from DTN sample and 36 from Extension sample), seven were bad addresses (all DTN sample), and that 12 were deceased (11 from DTN sample and 1 from Extension sample). Eight indicated that they would not take the survey. After subtracting non-current farmers, bad addresses, and those deceased from the sample denominator, our response rate was 19% (517/2748). Fifty-five percent took the survey on paper and 45% online. Forty-two percent of respondents took the survey during Wave 1, 30% during Wave 2, 24% during Wave 3, and 5% during Wave 4. We found that the response rate for those with the sticker incentive was 14%, while it was 21% for those who received the \$2 bill a significant ($p<.05$) difference.

The sample from DTN provided some operation characteristic data which allows us to conduct a few non-response bias tests. The average gross farm income for respondents from the DTN sample was \$365,856 (\$147,884 median, range from \$14,945-\$1,1125,671), while it was \$428,828 (\$116,501 median, range from \$5,552-\$210,578,356) for non-respondents. The average acres planted for respondents from the DTN sample was 226 (114 median, range from 25-3200), while it was 264 (87 median, range from 25-75,873) for non-respondents. Thus respondents tended to have lower average gross farm incomes (but a higher median) and fewer planted acres on average (but a higher median) than non-respondents from the DTN sample.



Findings

PART A. OPERATION CHARACTERISTICS

Question A1. In 2023, what was the total number of acres you operated (rented and owned)? (N=473)

931 average acres (range of 0.5-45,000 acres)

Question A2. In 2023, what was the total number of acres you operated that you rented from a landowner? (N=448)

263 average acres (range of 0-22,000 acres)

Question A3. Which crops did you grow in 2023? (N=517)

	Percentages
Alfalfa	82%
Other hay (not alfalfa)	55%
Corn	17%
Small grains (wheat, barley, etc.)	30%
Safflower	2%
Other oilseeds (not safflower)	0.4%
Tart cherry	2%
Other fruit (not tart cherry)	3%
Onions	2%
Other vegetables (not onions)	3%
Other	11%

Question A4. In 2023, was your operation based solely on crops, or a mixture of crops and livestock? (N=517)

My operation was solely crop-based	My operation was a mix of crops and livestock
34%	66%

Question A5. In 2023, how much of the acreage of your operation was used for livestock? (N=300)

1,452 average acres (range of 0-140,000)

PART B. WORK WITH CROP ADVISORS

Question B1. In 2023, did you work with a crop advisor (or crop advisors)? (N=516)

Yes	No
25%	75%

Question B2. What types of advice do the crop advisors you work with provide to you? (N=119)

	Percentages
Financial	6%
Marketing	3%
Soil health	64%
Agronomic (seed dealer, crop inputs, or other crop management services)	79%
Daily management (i.e. scouting for disease or insects)	19%
Equipment	11%
Full farm management	1%
Conservation practices	19%
Government programs/farm bill	21%
Other	3%

Question B3. How many minutes on average do you spend with your crop advisor on any topic each time you meet with them? (N=119)

Less than 30 minutes	31-60 minutes	61-90 minutes	91-120 minutes	More than 120 minutes
50%	42%	4%	3%	1%

Question B4. How many minutes on average do you spend with your crop advisor on soil health related topics each time you meet with them? (N=119)

Less than 30 minutes	31-60 minutes	61-90 minutes	91-120 minutes	More than 120 minutes
65%	28%	6%	0.84%	0%

Question B5. How many times per year do you meet with crop advisors on any topic, on average? (N=121)

Less than 2 times	3-5 times	6-8 times	9-10 times	More than 10 times
26%	52%	7%	6%	9%

Question B6. How many times per year do you meet with crop advisors on soil health related topics, on average? (N=125)

Less than 2 times	3-5 times	6-8 times	9-10 times	More than 10 times
46%	46%	4%	0%	4%

Question B7. Overall, how satisfied or unsatisfied are you with the overall advice that you receive from the crop advisors that you work with? (N=125)

Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
4%	2%	12%	56%	26%

Question B8. Overall, how satisfied or unsatisfied are you with the advice related to soil health that you receive from the crop advisors that you work with? (N=122)

Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
3%	2%	18%	53%	23%

PART C. SOIL HEALTH MANAGEMENT PRACTICES

Question C1. Please indicate how much you agree or disagree with the following statements.

	Strongly disagree	Disagree	Neither agree/disagree	Agree	Strongly agree
Soil health is important to me.(N=503)	5%	1%	4%	43%	47%
Overall, I am doing a good job managing soil health.(N=495)	1%	4%	23%	59%	13%
Proactive farmers can usually manage soil health on their own.(N=491)	2%	14%	36%	40%	8%
I worry about disapproval from my neighbors when implementing soil health practices.(N=497)	29%	37%	29%	4%	0.4%
I am tired of hearing about soil health practices.(N=497)	19%	39%	37%	3%	2%
I feel it is too difficult to implement soil health practices.(N=497)	14%	41%	37%	7%	1%
I find it easier to just do the same thing I've always done with regards to soil health.(N=495)	11%	27%	31%	28%	3%
I am more open to someone's suggestions regarding soil health when I'm able to have a face-to-face conversation with them.(N=500)	2%	5%	27%	55%	11%

Question C2. Please rate how useful you think (regardless of if you have used or not) each of the following practices are for improving soil health.

	Not at all useful	Slightly useful	Somewhat useful	Very Useful	Extremely useful	Don't Know
Cover crops (crops that are not mechanically harvested, but could be grazed) (N=495)	4%	6%	28%	41%	14%	7%
Alternative or double forage crops (crops mechanically harvested)(N=494)	4%	6%	27%	40%	11%	13%
Diversified crop rotation (planting three or more crops sequentially on the same plot of land)(N=490)	6%	9%	24%	34%	12%	15%
Crop diversification (growing more than one crop in an area at the same time, including interseeding crops)(N=492)	8%	10%	30%	23%	8%	22%
Conservation tillage (no-till, strip-till, vertical tillage, ridge tillage)(N=491)	5%	9%	30%	27%	13%	16%
Organic soil amendments (manure, compost, biosolids, biochar)(N=494)	1%	3%	13%	39%	38%	5%
Chemical soil amendments (wetting agents, surfactants, infiltration agents)(N=489)	5%	10%	28%	27%	11%	21%
Biological soil amendments (bacteria, fungi, etc.)(N=490)	7%	11%	22%	17%	11%	33%
Soil or water pH management(N=491)	4%	5%	23%	31%	18%	20%
Salinity management (N=484)	3%	4%	17%	35%	21%	19%

Question C3. Which of the following soil health practices did you use in 2023 on all or a portion of your land and, of those used, what percentage of acres had a cost share or financial assistance from a government program to implement the practice?

	I did not use this practice	I used with no financial assistance	I used with financial assistance on 1-50% of acres	I used it with financial assistance on 51-99% of acres	I used with financial assistance on 100% of acres
Cover crops (crops that are not mechanically harvested, but could be grazed)(N=484)	60%	34%	4%	1%	1%
Alternative or double forage crops (crops mechanically harvested)(N=484)	57%	39%	3%	0.2%	0.4%
Diversified crop rotation (planting three or more crops sequentially on the same plot of land)(N=484)	71%	27%	1%	0.4%	0.4%
Crop diversification (growing more than one crop in an area at the same time, including interseeding crops)(N=485)	70%	27%	3%	0.2%	0.4%
Conservation tillage (no-till, strip-till, vertical tillage, ridge tillage)(N=484)	59%	38%	3%	0.2%	0.2%
Organic soil amendments (manure, compost, biosolids, biochar)(N=487)	35%	61%	2%	1%	0.4%
Chemical soil amendments (wetting agents, surfactants, infiltration agents)(N=488)	58%	39%	2%	1%	1%
Biological soil amendments (bacteria, fungi, etc.)(N=485)	84%	15%	0.6%	0.2%	0.4%
Soil or water pH management(N=485)	71%	28%	1%	0.2%	0.2%
Salinity management(N=482)	68%	29%	2%	0.4%	0.8%

Question C4. Please indicate how likely you are to use each of the following soil health practices in the future.

	Extremely unlikely	Unlikely	Neither likely nor unlikely	Likely	Extremely likely
Cover crops (crops that are not mechanically harvested, but could be grazed)(N=487)	13%	21%	16%	37%	12%
Alternative or double forage crops (crops mechanically harvested)(N=485)	13%	20%	18%	37%	12%
Diversified crop rotation (planting three or more crops sequentially on the same plot of land)(N=485)	16%	31%	20%	23%	10%
Crop diversification (growing more than one crop in an area at the same time, including interseeding crops)(N=484)	17%	28%	22%	27%	6%
Conservation tillage (no-till, strip-till, vertical tillage, ridge tillage)(N=489)	14%	21%	20%	32%	13%
Organic soil amendments (manure, compost, biosolids, biochar)(N=488)	8%	9%	14%	40%	29%
Chemical soil amendments (wetting agents, surfactants, infiltration agents)(N=488)	12%	20%	26%	31%	10%
Biological soil amendments (bacteria, fungi, etc.)(N=486)	19%	335	30%	13%	5%
Soil or water pH management(N=486)	16%	22%	28%	26%	7%
Salinity management(N=479)	15%	21%	29%	27%	7%

Question C5. Regardless of whether you have already adopted these soil practices, please indicate the amount of cost share you would require in order to adopt them in the future.

	None	Less than 10% of cost	10-20% of cost	21-30% of cost	More than 30% of cost
Cover crops (crops that are not mechanically harvested, but could be grazed)(N=466)	46%	9%	11%	12%	23%
Alternative or double forage crops (crops mechanically harvested)(N=463)	50%	8%	10%	13%	19%
Diversified crop rotation (planting three or more crops sequentially on the same plot of land)(N=465)	51%	8%	10%	11%	21%
Crop diversification (growing more than one crop in an area at the same time, including interseeding crops)(N=464)	46%	9%	12%	11%	22%
Conservation tillage (no-till, strip-till, vertical tillage, ridge tillage)(N=460)	48%	9%	9%	12%	22%
Organic soil amendments (manure, compost, biosolids, biochar)(N=459)	53%	10%	10%	9%	18%
Chemical soil amendments (wetting agents, surfactants, infiltration agents)(N=456)	46%	8%	12%	10%	24%
Biological soil amendments (bacteria, fungi, etc.)(N=453)	43%	7%	11%	10%	28%
Soil or water pH management(N=456)	43%	9%	10%	12%	26%
Salinity management(N=452)	42%	9%	11%	11%	27%

Question C6. Please rate how important each of the following factors are to your soil health practice adoption decisions.

	Not important	Slightly important	Somewhat important	Very important
Improved soil health (N=482)	2%	4%	29%	66%
Increased crop yields (N=483)	1%	3%	19%	77%
Increased profitability (N=483)	1%	2%	17%	79%
Financial assistance from government programs (N=481)	23%	24%	29%	23%
Technical support (N=474)	10%	16%	41%	33%
Other (N=139)	59%	6%	11%	24%

Question C7. How much do the following influence your soil health management choices?

	Not at all	Somewhat	A lot
Already invested in current techniques (N=464)	16%	58%	26%
Expected decrease in productivity or yields(N=465)	26%	44%	31%
Expected increase in operation complexity(N=465)	14%	59%	27%
Lack of time(N=469)	22%	52%	26%
Lack of labor(N=468)	20%	52%	28%
Lack of interest(N=466)	51%	41%	8%
Do not think it will improve anything(N=458)	34%	47%	19%
Farm size(N=462)	32%	50%	19%
Cost(N=465)	7%	44%	49%
Lack of knowledge(N=469)	14%	58%	27%
Difficulty in managing(N=463)	23%	59%	18%
Lack of available technologies(N=460)	22%	57%	20%
Lack of equipment(N=466)	18%	44%	38%
Mixed messaging from various sources(N=255)	31%	54%	15%
Lack of farm input supplies(N=482)	25%	58%	17%
Lack of adequate information pertaining to soil health in Utah(N=456)	25%	52%	23%
Other (N=129)	60%	25%	16%

Question C8. How often do you use the following sources of information about soil health management?

	Never	Rarely	Sometimes	Often	Don't Know
Crop advisors (N=478)	32%	24%	31%	13%	1%
Other producers (N=477)	12%	12%	47%	28%	1%
Landlords(N=475)	79%	13%	4%	2%	1%
Lenders(N=474)	79%	12%	6%	1%	1%
Retailers(N=468)	50%	14%	29%	7%	0%
University extension (N=475)	25%	19%	40%	15%	1%
Commodity groups(N=468)	54%	17%	22%	5%	2%
Government entities (National Resources Conservation Services (NRCS), Farm service Agency (FSA) Utah Department of Agriculture and Food (UDAF)(N=470)	22%	18%	40%	19%	1%
Other (N=135)	63%	1%	18%	11%	7%

Question C9. Please rate the usefulness of each of the following indicators of soil health:

	Not at all useful	Slightly useful	Somewhat useful	Very useful	Extremely useful	Not sure
Organic carbon(N=459)	7%	8%	21%	24%	11%	31%
Soil pH(N=464)	5%	5%	22%	37%	18%	14%
Water-stable aggregation(N=461)	6%	5%	21%	30%	13%	26%
Crop yield(N=467)	1%	1%	12%	39%	40%	6%
Soil texture(N=468)	2%	5%	25%	38%	21%	10%
Penetration resistance(N=463)	4%	5%	22%	31%	19%	18%
Cation exchange capacity(N=459)	8%	5%	17%	15%	10%	44%
Electrical conductivity(N=457)	12%	9%	16%	9%	6%	47%
Nitrogen(N=471)	2%	2%	14%	37%	39%	6%
Phosphorus(N=473)	1%	2%	13%	37%	40%	6%
Potassium(N=471)	3%	3%	14%	36%	36%	8%
Carbon mineralization(N=458)	6%	6%	18%	19%	12%	38%
Nitrogen mineralization(N=459)	5%	5%	16%	25%	19%	31%
Erosion rating (N=461)	9%	9%	22%	24%	15%	21%
Base saturation(N=458)	6%	7%	18%	24%	12%	33%
Bulk density(N=455)	6%	7%	21%	14%	8%	43%
Available water holding capacity (N=467)	3%	3%	16%	39%	26%	13%
Infiltration rate(N=465)	4%	5%	18%	33%	20%	20%
Micronutrients (N=457)	4%	5%	15%	32%	23%	21%
Haney test (N=443)	8%	4%	14%	8%	5%	61%
Cornell assessment of soil health (CASH) (N=448)	8%	4%	13%	8%	5%	61%
Other soil health test package (N=443)	7%	6%	15%	13%	9%	49%
Other (N=140)	29%	3%	9%	4%	4%	52%

Question C10. Which of the following indicators of soil health do you currently use in your operation? Please check all that apply (N=517)

	Percentages
Organic carbon	14%
Soil pH	37%
Aggregate stability	5%
Crop yield	69%
Soil texture	37%
Penetration resistance	15%
Cation exchange capacity	6%
Electrical conductivity	3%
Nitrogen	68%
Phosphorus	68%
Potassium	56%
Carbon mineralization	4%
Nitrogen mineralization	12%
Erosion rating	10%
Base saturation	8%
Bulk density	2%
Available water holding capacity	22%
Infiltration rate	11%
Micronutrients	21%
Haney test	1%
Cornell assessment of soil health (CASH)	1%
Other soil health test package	6%
Other	5%

Question C11. In general, how often do you conduct soil nutrient testing?(N=482)

	Percentages
More than once a year	2%
Once a year	20%
Every two years	16%
Every three years	8%
Every four years	5%
Every five years	6%
Every six years or more	4%
I do not routinely conduct soil nutrient testing	39%

Question C12. In general, how often do you conduct soil health testing (not including soil nutrient testing)? (N=468)

Percentages	
More than once a year	3%
Once a year	10%
Every two years	8%
Every three years	5%
Every four years	3%
Every five years	2%
Every six years or more	4%
I do not routinely conduct soil nutrient testing	64%

PART D. PERSONAL BACKGROUND

Question D1. What year were you born? (N=470)

Average age=66 years, range of 23 - 98 years, median=68 years

Question D2. What is your gender?(N=483)

Man	Woman	Prefer not to specify
94%	6%	0%

Question D3. What is your highest level of formal education attained?(N=481)

Percentages	
Less than high school	1%
High school graduate (or equivalent)	18%
Some college, no degree	28%
Associate/Technical degree	13%
Bachelor's degree	25%
Graduate or professional degree	15%

Question D4. Approximately how many years have you been making farm management decisions?(N=487)

Percentages	
Less than 5 years	3%
5-10 years	6%
11-20 years	13%
21-30 years	18%
More than 30 years	60%

Question D5. Did you consider farming as your primary occupation in 2023?(N=484)

Yes	No
51%	49%

Question D6. What was your approximate annual net farm income before taxes (i.e. gross cash farm income) in 2023?(N=446)

	Percentages
Less than \$25,000	32%
\$25,000-\$74,999	30%
\$75,000-\$124,999	12%
\$125,000-\$174,999	5%
\$175,000-\$224,999	6%
\$225,000-\$349,999	5%
\$350,000-\$999,999	6%
\$ 1 million or more	4%