

# **RESOURCE ECONOMICS AND ENVIRONMENTAL SOCIOLOGY**

**The 2021 Environmentally Sustainable Agriculture  
Tracking Survey**

Sven Anders, Peter Boxall, Sarah Van Wyngaarden

Project Report #21-02

## **Project Report**



**UNIVERSITY OF ALBERTA**  
DEPARTMENT OF RESOURCE ECONOMICS  
AND ENVIRONMENTAL SOCIOLOGY

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Project Report #21-02

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# 2021 Environmentally Sustainable Agriculture Tracking Survey

## Final Report

### Submitted by:

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## Summary of Key Findings

Alberta Agriculture, Forestry and Rural Economic Development (AFRED) recognizes the benefit of protecting and ensuring a sustainable environment for future generations. This includes identifying the role AFRED can play in assisting producers to manage and mitigate environmental risks through adopting environmentally beneficial management practices.

The Environmentally Sustainable Agriculture Tracking Survey (ESATS) has been undertaken almost biannually since 1997. ESATS measures Alberta producers' awareness of, and adoption of environmentally sustainable agriculture (ESA) practices within a number of agri-environmental risk areas.

The agri-environmental risk areas covered in the 2021 ESATS survey included:

- Water Quality
- Soil Health
- Air Quality
- Biodiversity

Each risk area corresponds to a number of ESA practices, also commonly referred to as Best Management Practices (BMPs). The ESATS was fielded in 2021, which means it is based upon the 2020 production year.

## ESA Adoption Score Summary

Following prior surveys an ESA adoption score is developed and defined as “the average percentage of improved environmentally sustainable agriculture practices adopted by producers.” A total of 20 ESA practices were used to derive the results for this adoption index. **The 2021 ESA adoption score is 57%** with variations across individual agri-environmental adoption scores. Individual practice adoption varied further, with 7 practices presenting adoption scores higher than 80% and 8 practices holding scores lower than 50%.

### ESA Adoption Characteristics:

- ESA adoption scores were relatively similar across regions; however, the northwest region had the lowest scores, on average, with a mean adoption score of 50%.
- Respondents who had attended conservation training (in the past two years) held higher mean adoption scores (68%).
- Having an Environmental Farm Plan (EFP) was also an indicator of higher mean adoption scores (63%) compared to those without (51%).
- Having higher gross farm revenue (63%), as well as having a degree (63%), also resulted in higher mean adoption scores.
- Respondents aged 25 to 44 were more likely to adopt, on average, with respondents planning to expand their operation having the highest mean adoption scores at 63%.

### Soil Health Adoption Characteristics

- Respondents from the south held the highest soil health adoption scores (57%), with respondents from the northwest region having the lowest scores, on average (33%).
- Having a degree (58%), having an EFP (54%), attending conservation training (56%) and higher gross farm revenue (60%) were also indicators of higher adoption scores.
- Livestock producers had, on average, lower adoption scores (34%) compared to crop producers (50%).
- Respondents planning to sell their operation presented the lowest scores, on average (37%).

### Water Quality Adoption Characteristics:

- Adoption scores were similar across regions, but the northwest region did have the lowest scores, on average (72%).
- Having an EFP (81%) and higher gross farm revenue (81%) were indicators of higher water quality adoption scores. The most significant difference in adoption score was between respondents who attended conservation training (86%) compared to those who have not attended (74%).
- Primarily crop producers were slightly less likely to adopt water quality practices, on average, than livestock producers.

### Air Quality Adoption Characteristics:

- On average, respondents from the peace region had the lowest air quality adoption scores (26%), with the south region having the highest scores (45%).
- Attending conservation training presented higher adoption scores (61%), compared to not attending (32%). Having a degree was also an indicator for higher rates of adoption (52%) compared to those without a degree (30%).
- Have an EFP also presented higher scores (46%) compared to those without (28%).
- Younger producers were more likely to adopt.
- Respondents planning to expand (51%) or planning to sell (53%) their operation also held some of the highest adoption scores.

### Biodiversity Adoption Characteristics:

- The central region had the lowest adoption score, on average (61%), with respondents from the peace region having the highest scores (79%).
- Crop farmers were more likely to adopt compared to livestock farmers.
- Higher gross farm revenue, as well as having a degree, did not differ from the mean adoption score.
- Respondents with an EFP were slightly more likely to have higher scores (71%), with attending conservation training also improving mean scores (74%).

### *Additional Survey Insights:*

Beyond updated information on adoption scores for important agri-environmental BMP indicators, the survey explored the following issues relevant to the agri-environmental performance for farming in Alberta:

- Assessment of knowledge and adoption scores for the Canadian Environmental Farm Plan (EFP) among Alberta producers.
- Impacts of producers' economic, environmental conservation, and lifestyle attitudes on ESA adoption decisions.
- Usage patterns of specific decision support tools by agricultural producers.
- Assessment of producer attitudes towards sustainable sourcing practices in agribusiness. Evaluation of motivational factors and barriers.

Detailed findings for these survey components are discussed below.

## Background and Objectives

Alberta Agriculture, Forestry and Rural Economic Development (AFRED) is committed to ensuring producer competitiveness in global and domestic markets, improving efficiencies in production systems, and maintaining environmental stewardship in Alberta's air, water, and land for the well-being of current and future generations. AFRED provides technical assistance, expertise, and targeted programs to aid agricultural producers in addressing on-farm environmental risks. The main outcome in providing resources to address environmental issues is to encourage producers to adopt environmentally sustainable agriculture (ESA) practices.

Every two years the Environmentally Sustainable Agriculture Tracking Survey (ESATS) is administered to monitor farm-level awareness and adoption of environmentally sustainable agriculture (ESA) practices in Alberta. The results of the survey are used to aid the government in improving ESA programs and activities to further encourage producers to adopt ESA practices.

Over the years, AFRED has revised the survey to meet new objectives and to align with environmental conditions in Alberta. In 2014 and 2016, Ipsos worked in collaboration with AFRED to make a number of minor revisions to the questionnaire. This included adding a question about the usage and awareness of decision-making support resources and tools; questions about the use of commercial fertilizer; and the time of manure incorporation. The 2018 survey added the objective of measuring awareness and readiness of Alberta's producers to meet current and emerging sustainability schemes.

For the 2021 ESAT survey, AFRED collaborated with researchers at the University of Alberta to update the ESA practices and survey objectives, retaining questions and practices which were determined to be reflective of current environmental conditions. This survey kept many objectives shown in the 2012 to 2018 surveys, with an added objective to examine current and emerging initiatives in the agricultural industry. This led to the development of questions that elicited producer opinions on soil and water quality monitoring programs, the environmental farm plan, sustainable sourcing, as well as economic, conservation and lifestyle values.

This survey was fielding during the spring and summer of 2021 and asked respondents about their 2020 production year practices. It may be difficult to determine whether practice decisions were influenced by the Covid-19 pandemic. Producers may make practice decisions the year prior in preparation for the forthcoming production year; for example, a producer may be making fertilizer purchases in 2019 in preparation for 2020. However, early supply chain issues may have been emerging which may have influenced practice decision making. Investigating the influence of the Covid-19 pandemic was not an objective of this survey, but it is noteworthy that there may be some influence.



Amongst the largest change was the reduction of ESA practices. From 2012 to 2018, 40 ESA practices were included across the following risk areas:

- Soil conservation – 3 performance measures;
- Water quality and/or quantity – 12 performance measures;
- Wildlife habitat conservation – 3 performance measures;
- Grazing management – 2 performance measures;
- Manure management – 11 performance measures;
- Agricultural waste management – 1 performance measures;
- Energy and climate change – 3 performance measures;
- General practices – 5 performance measures.

The 2021 ESAT survey includes 20 ESA practices and narrowed agri-environmental risk areas to the following:

- Water Quality – 7 performance measures;
- Soil Health – 5 performance measures and 2 non-performance measures;
- Air Quality – 3 performance measures and 1 non-performance measure;
- Biodiversity – 5 performance measures.

### *ESA Practices*

ESA practices, also known as Best Management Practices (BMPs), have been actively promoted as a method to mitigate on-farm environmental risks, while reducing greenhouse gas (GHG) emissions. These practices are voluntary in nature and often require agricultural producers to alter their management practices, with some requiring the adoption of additional technology to support their operation.

Many practices provide observable and unobservable benefits for agricultural producers. As stewards of the land, adopting ESA practices can provide multiple environmental benefits on their land and for their communities. For example, certain practices can improve water quality by reducing water contamination from manure runoff, fertilizer runoff, among other sources. This aids the quality of water going back into the community, as well as ensuring sound quality for animal drinking water. Other practices provide economic benefits, such as increased profitability. For example, reduced tillage (or no till) reduces soil erosion, while improving soil organic matter, which can result in increased crop yields (Awada et al. 2014; Munkholm et al. 2013).

While practices provide multiple benefits to producers in direct and indirect ways, there are also a number of barriers producers face when trying to adopt. Some practices have high uptake costs or long-term maintenance costs, which produces a financial barrier and can result in perceived risks to profitability (Prokopy et al. 2019; Pannell et al. 2006; Rodriguez et al. 2009). Further, many producers lack access to quality information about ESA practices (Baird et al. 2016; Baumgart-Getz et al. 2012) resulting in many producers being unaware of eligible practices for their operation.

This survey enables AFRED to track practice adoption rates in order to tailor policy, programs, and resources to fit current economic and environmental conditions. This includes programs for financial assistance, technical assistance, or improved extension efforts to provide up-to-date information about current ESA practices.

## Methodology

The 2021 ESAT survey used both online and telephone methods, differing from prior survey years which only conducted telephone interviews. Researchers at the University of Alberta recruited 356 producers for an online survey, and Kynetec was commissioned to recruit the remaining 145 producers using a telephone survey. While the surveys were mostly similar for all respondents, the online survey differed in two ways:

1. Online respondents participated in a choice experiment eliciting Alberta agricultural producer's thoughts on soil and water quality monitoring programs; and,
2. Online respondents were able to pause the survey and complete it at their own pace. This was meant to reduce respondent fatigue.

In total, a random and representative sample of 501 Alberta agricultural producers responded to either the online or telephone survey between March 23<sup>rd</sup>, 2021, and August 9<sup>th</sup>, 2021. The target population was primary agricultural operators in Alberta who had gross farm sales of at least \$10,000 in 2020 and were the most involved in making decisions about the practices and operations used on their farm. The sample was drawn from Kynetec's proprietary provincially representative database of over 30,000 unique Alberta agricultural producers. The same sample source was used for the 2012, 2014, 2016, and 2018 surveys.

To develop a representative sample, interviews (both online and over the phone) were stratified by five Alberta regions, with a quota of 100 respondents per region to ensure a reliable sample size. The final data was weighted to ensure the overall sample's regional and gross farm sales composition reflects that of the actual distribution of farms in Alberta based on the 2016 Census of Agriculture. More information on the weighting used in this survey can be found in the appendix.

All survey results are presented for the overall *weighted* sample of Alberta primary agricultural operators with gross farm sales of at least \$10,000. Findings that are applicable are tracked against the 2012, 2014, 2016, and 2018 surveys. Throughout the report, graphs and tables are for all operators in Alberta who were asked the question. The exception is the ESA adoption scores which excludes 'don't know' and 'not applicable.'

## Respondent Characteristics

A total of 501 agricultural producers in Alberta responded to the 2021 ESAT survey, either by telephone or through an online format, to develop a random and representative sample. The target population was active agricultural producers in Alberta with gross farm sales of at least \$10,000 in 2020 and were involved in the decision-making process for their operation.

### Respondent Characteristics Across ESAT Surveys (2012-2020)

	2012	2014	2016	2018	2020
<b>Farmer Characteristics</b>					
Age 18-44	7%	7%	10%	10%	9%
Age 45-64	56%	59%	53%	53%	49%
Age 65+	34%	34%	30%	37%	42%
Has a Degree	24%	27%	28%	25%	29%
Attended Conservation Training	24%	24%	22%	18%	16%
Gross Farm Revenue > \$250,000	19%	24%	24%	32%	34%
Environmental Farm Plan	44%	42%	38%	42%	47%
<b>Farm Characteristics</b>					
Primarily Owns Land	51%	48%	49%	45%	41%
Primarily Rents Land	1%	2%	3%	1%	1%
Both Owns and Rents	48%	50%	48%	53%	58%
Primarily Crop Producer	39%	44%	45%	31%	61%
Primarily Livestock Producer	40%	38%	34%	50%	24%
Both Crop and Livestock	19%	17%	19%	18%	15%
Planning to Expand	14%	15%	13%	13%	16%
Planning to Reduce	34%	31%	33%	29%	28%
Planning to Sell	5%	6%	4%	8%	4%
Planning to Maintain	43%	43%	47%	47%	53%

Farmer characteristics for the 2021 ESAT survey were mostly comparable to prior survey years. Most respondents were between the ages of 45 to 64 (49%) or over the age of 65 (42%), with only a small portion of individuals being younger than 45 (9%). Only 16% of respondents had attended conservation training within the past two years, the lowest amount of training since the 2012 survey. On the other hand, respondents with an Environmental Farm Plan (EFP) present an upward trend, increasing 5% from the 2018 survey with 47% participation. Further, a third of respondents (34%) had gross farm revenue greater than \$250,000.

Farm characteristics also remained similar to prior survey years. Over half of all respondents owned and rented land (58%), and 41% primarily owned land. The most significant change was the shift in farm typology. More than half (61%) of respondents identified as primarily crop producers, which was based on gross farm receipts in 2020, with only 24% being primarily livestock producers.

### Farm Type Characteristics

Across farm types, respondent characteristics were relatively similar. The largest, and most significant difference was the mean percentage of respondents who had gross farm revenue greater than \$250,000. Compared to primarily crop or mixed producers, primarily livestock producers were the least likely to have higher gross farm revenue (15%).

	Crop	Livestock	Mixed
<b>Farmer Characteristics</b>			
Age 18-44	10%	6%	15%
Age 45-64	52%	47%	35%
Age 65+	38%	47%	50%
Has a Degree	32%	25%	27%
Attended Conservation Training	16%	14%	21%
Gross Farm Revenue > \$250,000	41%	15%	38%
Environmental Farm Plan	48%	48%	44%
<b>Farm Characteristics</b>			
Primarily Owns Land	41%	44%	38%
Primarily Rents Land	2%	0%	0%
Both Owns and Rents	57%	56%	62%
Planning to Expand	15%	19%	13%
Planning to Reduce	26%	33%	29%
Planning to Sell	4%	3%	4%
Planning to Maintain	55%	46%	53%

## Online vs. Phone Respondents

More than half of all phone respondents are over the age of 65 (59%), are more likely to primarily own land (49%) and are more likely to be planning to reduce their operation (32%). Online respondents had a larger percentage of younger participants (14%) compared to phone respondents. This likely reflects technology and information preferences. On average, almost half of all online respondents (45%) have higher gross farm revenue, roughly a third (31%) have an Environmental Farm Plan (EFP) and these respondents are more likely to equally own and rent land (63%). Further, online respondents were also, on average, more likely to be planning to expand their operation (22%).

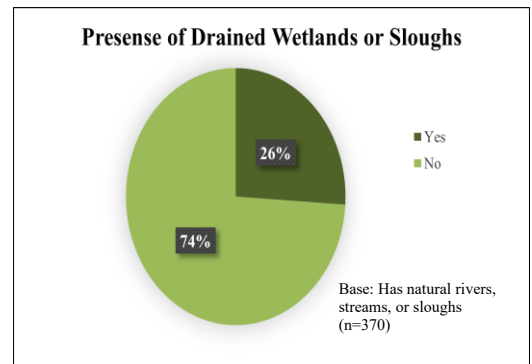
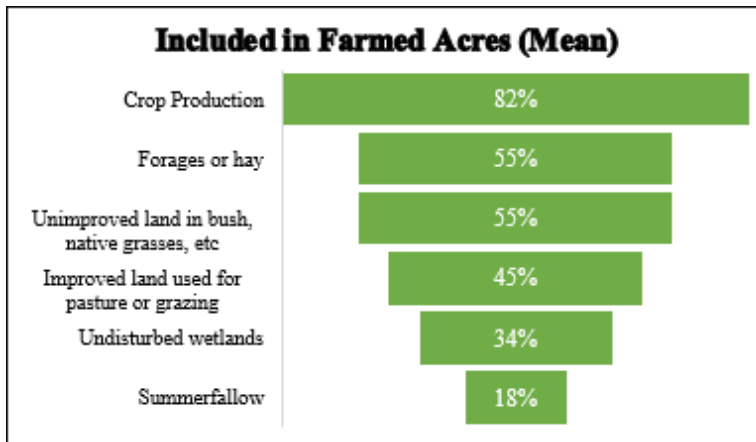
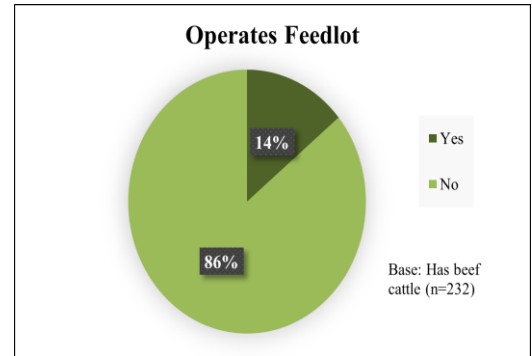
	Online	Phone
<b>Farmer Characteristics</b>		
Age 18-44	14%	3%
Age 45-64	56%	38%
Age 65+	31%	59%
Has a Degree	35%	21%
Attended Conservation Training	19%	11%
Gross Farm Revenue > \$250,000	45%	18%
Environmental Farm Plan	58%	31%
<b>Farm Characteristics</b>		
Primarily Owns Land	36%	49%
Primarily Rents Land	0%	2%
Both Owns and Rents	63%	49%
Primarily Crop Producer	64%	56%
Primarily Livestock Producer	22%	28%
Both Crop and Livestock	14%	16%
Planning to Expand	22%	6%
Planning to Reduce	25%	32%
Planning to Sell	3%	5%
Planning to Maintain	50%	57%

This section provides an overview of respondent characteristics that were used to determine eligible ESA practices.

### Livestock

Did you have any....?	Yes (%)
Beef Cattle	51%
Dairy Cattle	4%
Pigs	8%
Broilers	6%
Layers	11%
Turkeys	4%
Sheep/Lamb	6%
Horses	17%

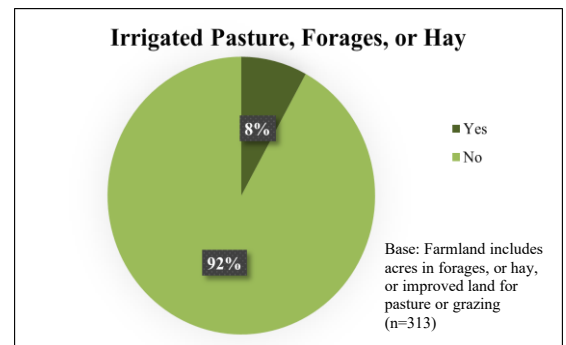
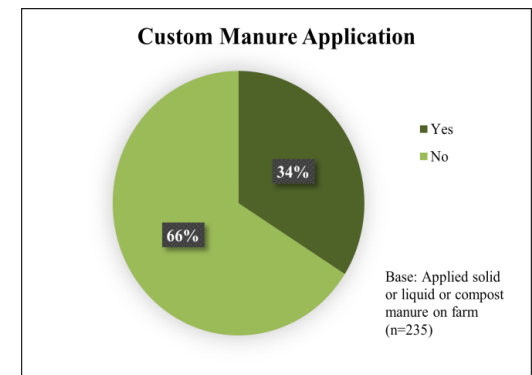
Base: All respondents (n=501)

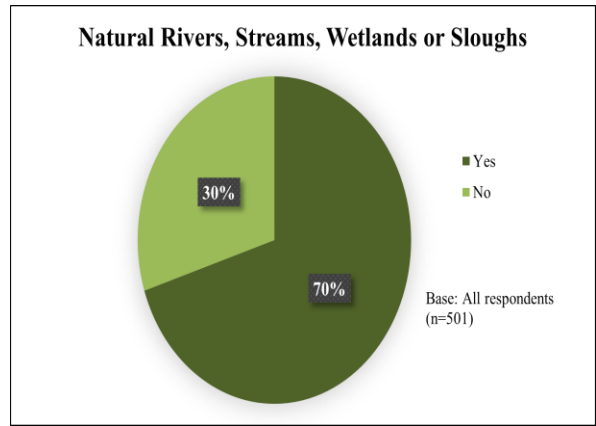
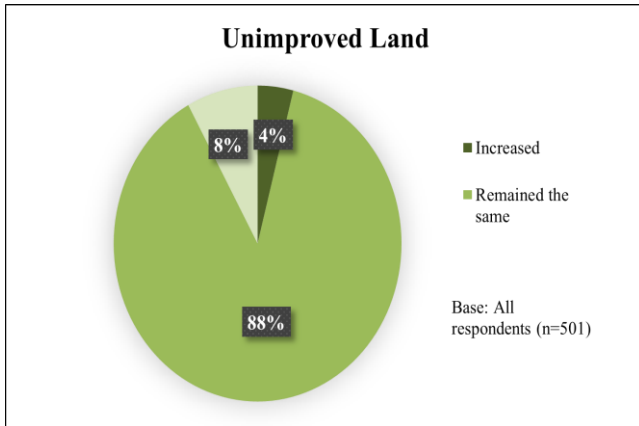
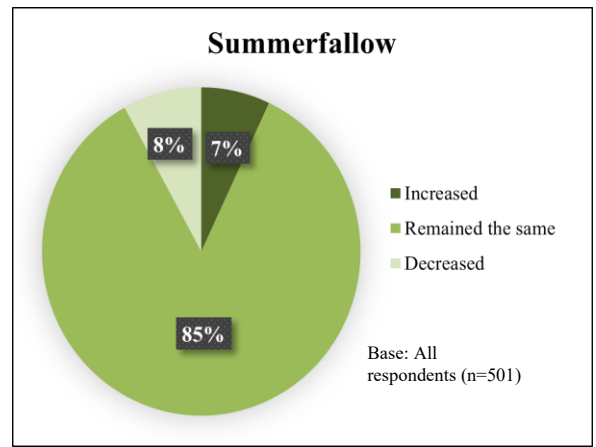
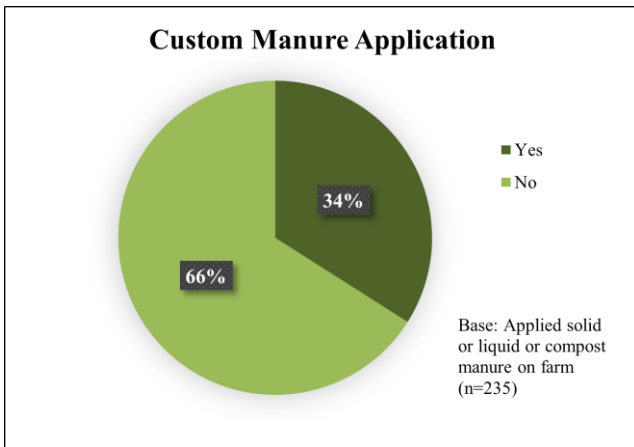
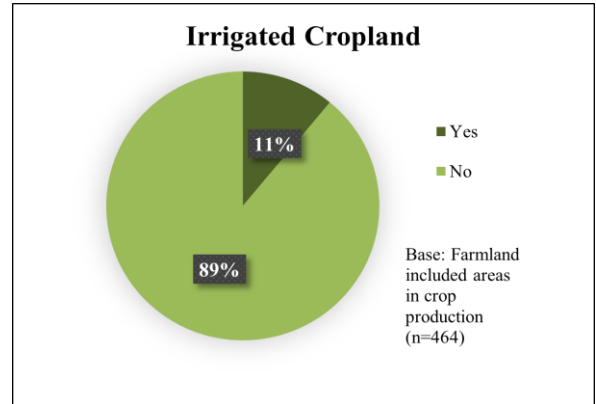
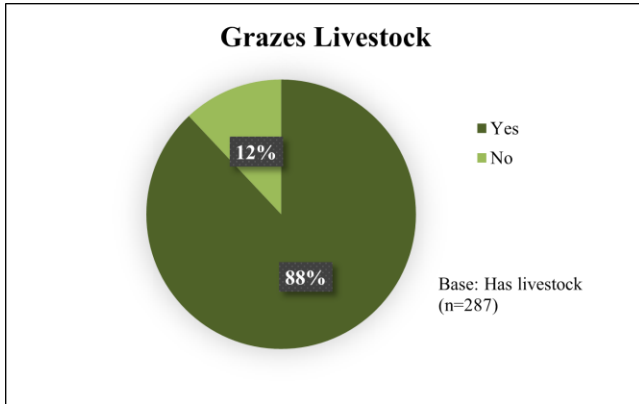


### Applied to Land

In 2020, did you apply...?	Yes (%)
Commercial Fertilizer	81%
Solid Manure	37%
Liquid Manure	6%
Compost Manure	12%
Crop Protection Products (i.e. Herbicides)	7%
None of the above	6%

Base: All respondents (n=501)





## Alberta-Land Use Regions Distribution (Weighted)

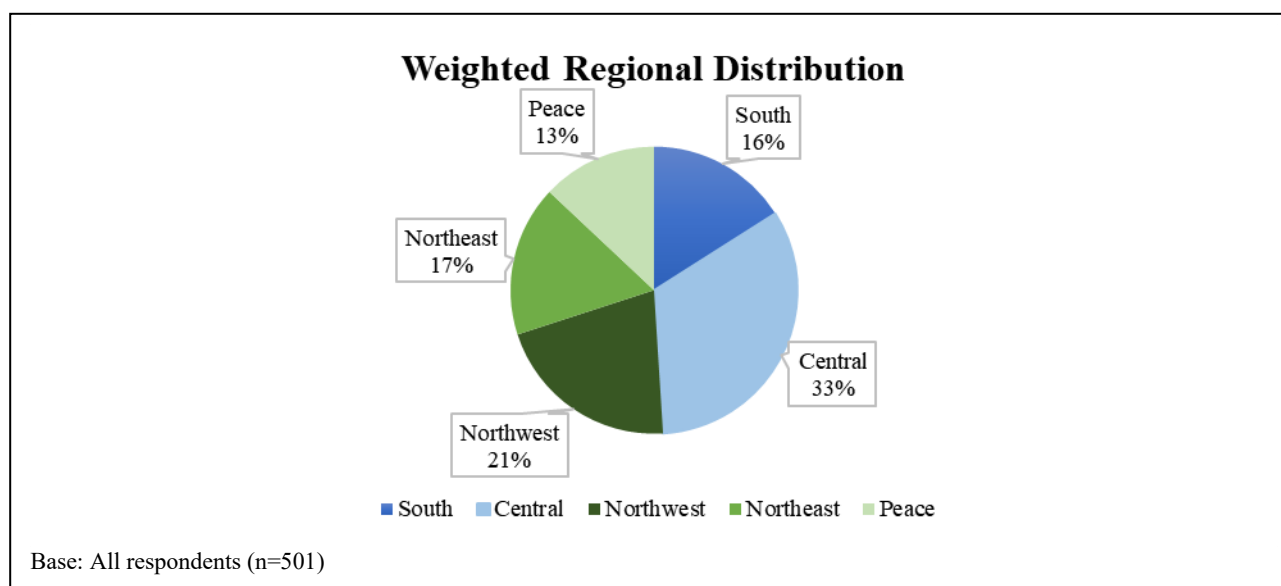
Below is the weighted distribution of survey respondents and their regional location. The table provides a summary of Alberta Land-Use Regions (as described in the 2016 Census of Agriculture for Alberta) and the percentage of respondents per county.

	Percent (%)	Obs. (N)		Percent (%)	Obs. (N)
<b><u>Lower Peace</u></b>	<b>1.4%</b>	<b>10</b>	<b><u>North Saskatchewan</u></b>	<b>38.3%</b>	<b>181</b>
Mackenzie	0.6%	3	Beaver	1.9%	12
Northern Lights	0.6%	5	Brazeau	0.9%	3
Northern Sunrise	0.2%	2	Camrose	3.9%	30
<b><u>Lower Athabasca</u></b>	<b>1.1%</b>	<b>6</b>	Clearwater	4.6%	5
Bonnyville	0.8%	4	Edmonton	0.1%	1
Lac La Biche	0.3%	2	Flagstaff	2.5%	10
Wood Buffalo	0	0	Lamont	3.5%	15
<b><u>Upper Peace</u></b>	<b>9.6%</b>	<b>58</b>	Leduc	1.2%	9
Birch Hills	0.4%	7	Minburn	2.3%	12
Clear Hills	0.9%	7	Parkland	0.5%	6
Fairview	0.2%	3	Provost	0.6%	12
Grande Prairie	2.9%	16	Smoky Lake	0.4%	2
Greenview	0.4%	1	St. Paul	2.3%	7
Peace	1.2%	7	Strathcona	1.9%	6
Saddle Hills	1.1%	5	Sturgeon	2%	10
Smoky River	1.1%	8	Thorhild	2.7%	8
Spirit River	1.4%	4	Two Hills	0.3%	4
<b><u>Upper Athabasca</u></b>	<b>11.8%</b>	<b>56</b>	Vermilion	1.3%	13
Athabasca	1.4%	9	Wainwright	3.1%	8
Barrhead	2.4%	14	Wetaskiwin	2.3%	8
Big Lakes	1.2%	6	<b><u>South Saskatchewan</u></b>	<b>23.4%</b>	<b>133</b>
Lac Ste. Anne	1.9%	3	Bighorn	0.5%	1
Lesser Slave River	0.6%	1	Calgary	0.1%	1
Westlock	2.3%	16	Cardston	0.5%	3
Woodlands	0.9%	3	Cypress	1.7%	11



Yellowhead	1.1%	4	Foothills	0.5%	2
<b>Red Deer</b>	<b>13.9%</b>	<b>65</b>	Forty Mile	1.5%	10
Kneehill	3.1%	13	Lethbridge	3.2%	18
Lacombe	1.5%	9	Newell	1.3%	10
Mountain View	1.9%	9	Pincher Creek	0.7%	5
Paintearth	1.2%	5	Ranchland	0	0
Ponoka	2.3%	8	Rocky View	1.9%	7
Red Deer	2.6%	12	Taber	1.5%	14
Special Area No. 2	0	0	Vulcan	1.8%	7
Special Area No.3	0	0	Warner	2.1%	12
Special Area No. 4	0	0	Wheatland	2.7%	15
Starland	0.8%	8	Willow Creek	3.4%	17
Stettler	0.5%	1			

Alberta land-use regions were developed by the Government of Alberta and are based on major watersheds, with boundaries aligned to fit with existing municipal boundaries and natural regions (Government of Alberta 2017). Over a third (38.3%) of respondent's operations are in the North Saskatchewan region, with roughly a quarter (23.4%) of respondents in the South Saskatchewan region. This is expected as these are the largest land-use regions with the largest population of agricultural producers. The pie chart below represent weighted Alberta market regions.



## ESA Adoption Score by Agri-Environmental Risk Areas

### Overall ESA Adoption Score

An ESA adoption score is developed to correspond with prior surveys and can be described as: ‘the average percentage of improved environmentally sustainable agriculture practices adopted by producers.’ The ESA adoption score can be shown as:

$$ESA\ Score_{jf} = \frac{\text{Number of Practices Adopted}_{jf}}{\text{Number of Practices Eligible}_{jf}}$$

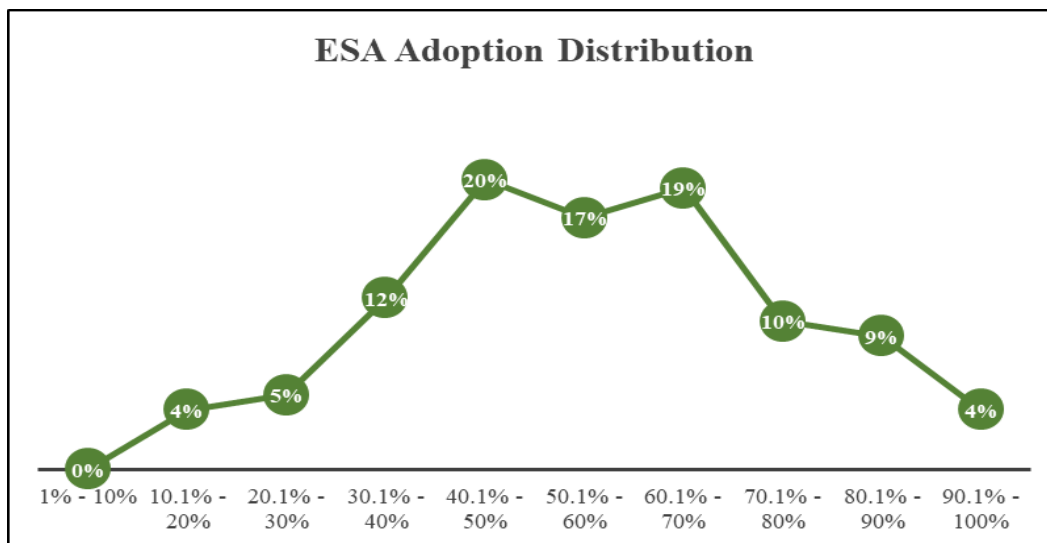
where  $j$  represents the risk area for farmer  $f$ . There are 21 ESA practices in total with the following breakdown:

- Water Quality – 7 performance measures
- Soil Health – 5 performance measures
- Air Quality – 3 performance measures
- Biodiversity – 5 performance measures

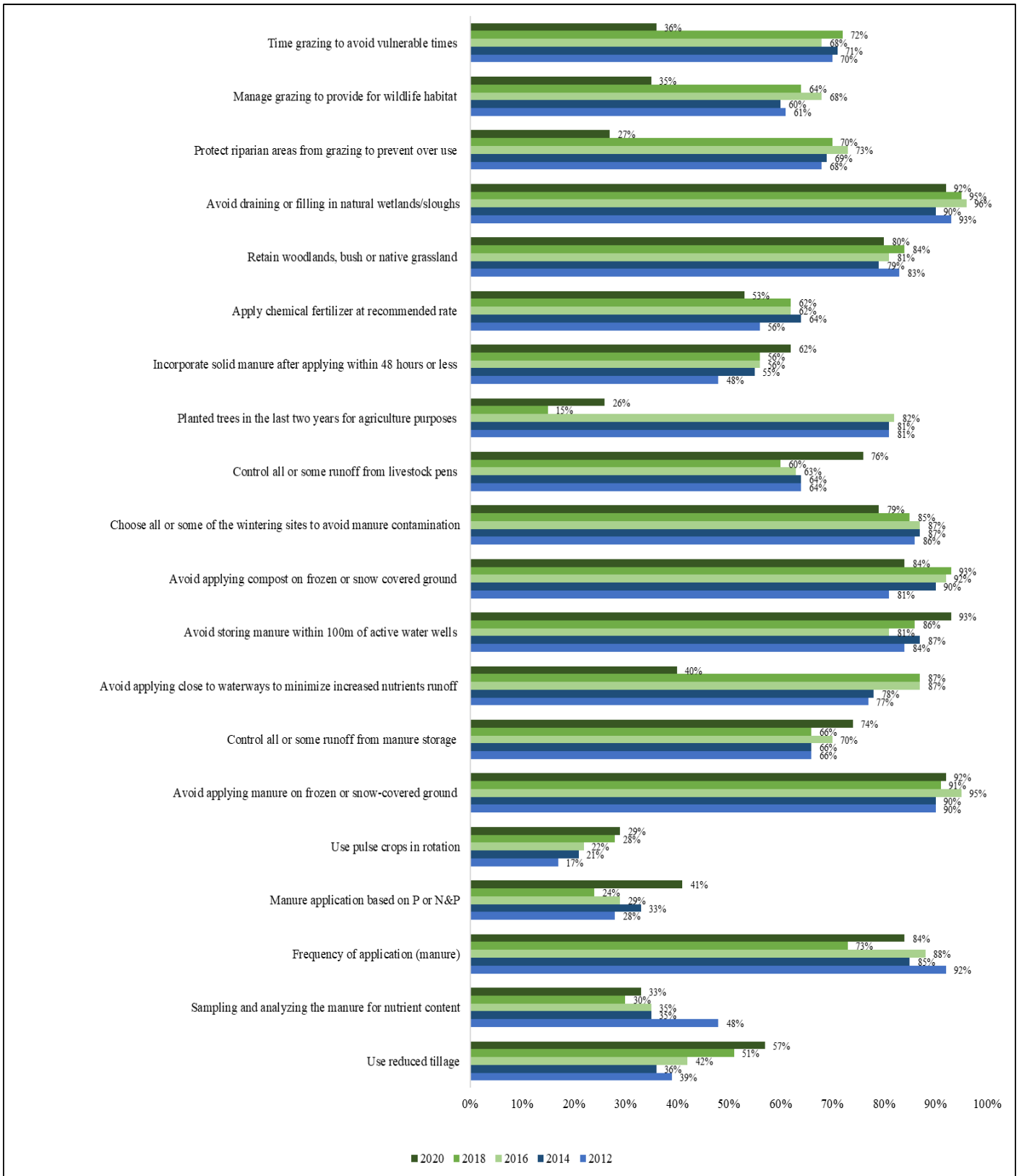
The 2020 adoption score is 57%, yet variations in adoption occurs across individual agri-environmental risk areas. Mean ESA adoption scores are highest under the Water Quality risk area (76%) and Biodiversity risk area (68%). Notably lower is the mean score for Air Quality (37%) and Soil Health (46%). The rest of this section will explore individual ESA adoption scores separately, including factors which are correlated to higher (> or = 50% ESA adoption score) and low adoption scores (<50%)

### ESA Adoption: Distribution

The bulk of overall ESA adoption scores range between 40 to 70%. This includes about a fifth of all respondents (19%) holding an adoption score between 60.1% to 70%. Less than 10% of all respondents held scores less than 30%, while 13% of the sample population had scores over 80%.



## ESA Adoption: By Practice from 2012 to 2020

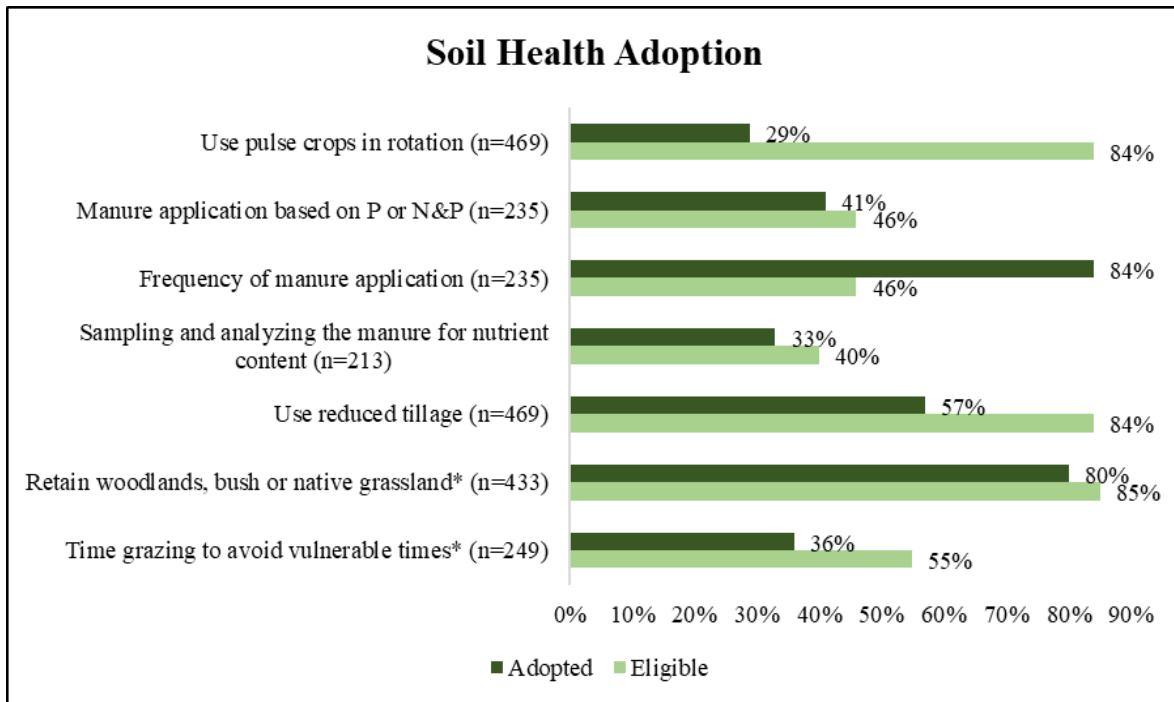


### ESA Adoption Characteristics:

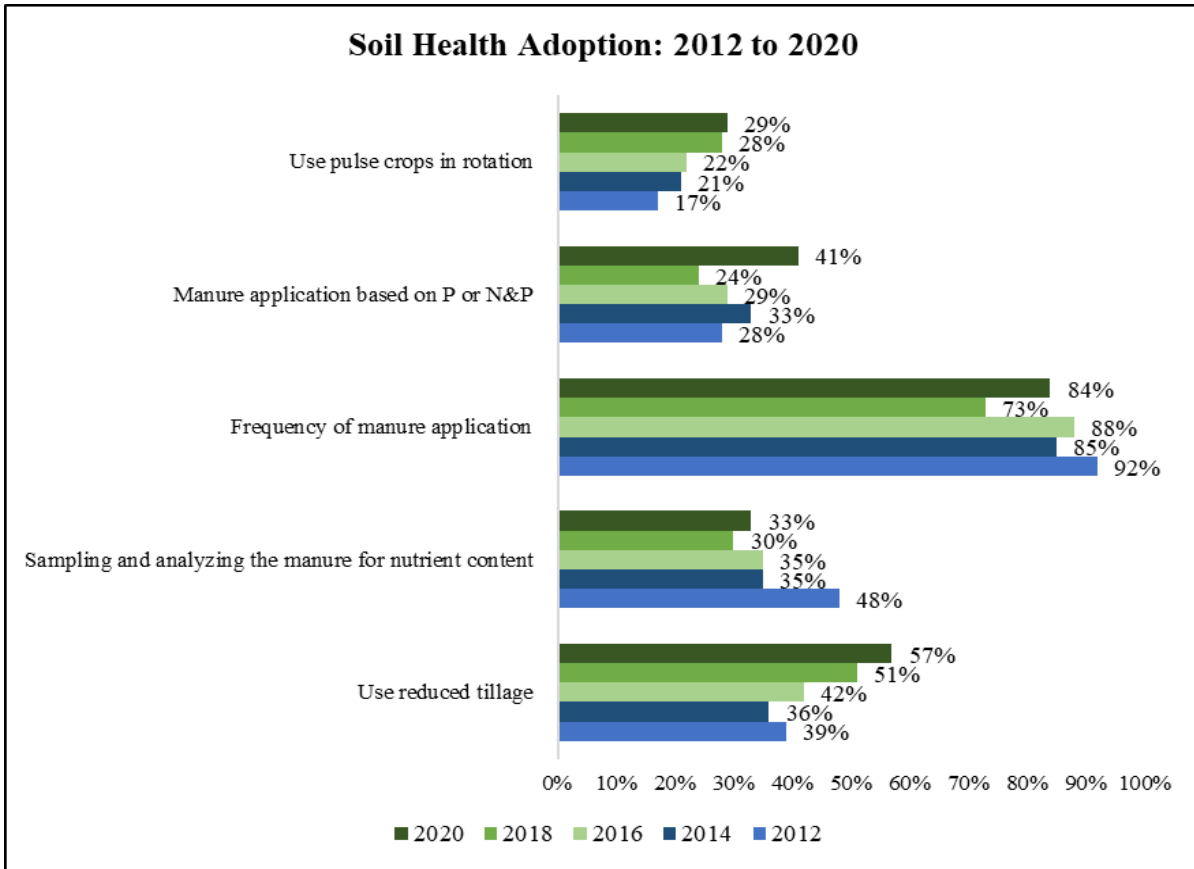
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- Respondents who had attended conservation training (in the past two years) held higher mean adoption scores (68%).
- Having an Environmental Farm Plan (EFP) was also an indicator of higher mean adoption scores (64%) compared to those without (51%).
- Having higher gross farm revenue (63%), as well as having a degree (63%), also resulted in higher mean adoption scores.
- Respondents aged 25 to 44 were more likely to adopt, on average, with respondents planning to expand their operation having the highest mean adoption scores at 64%.

### SOIL HEALTH

The mean soil health adoption score for 2020 was **46%**. The most adopted practice was the frequency of applying manure more than every two years (84%), with the least adopted practice being use pulse crops in rotation (29%). Most practices held similar adoption rates to prior surveys or increased adoption since the 2018 survey.



\*This was not included as a performance measure.



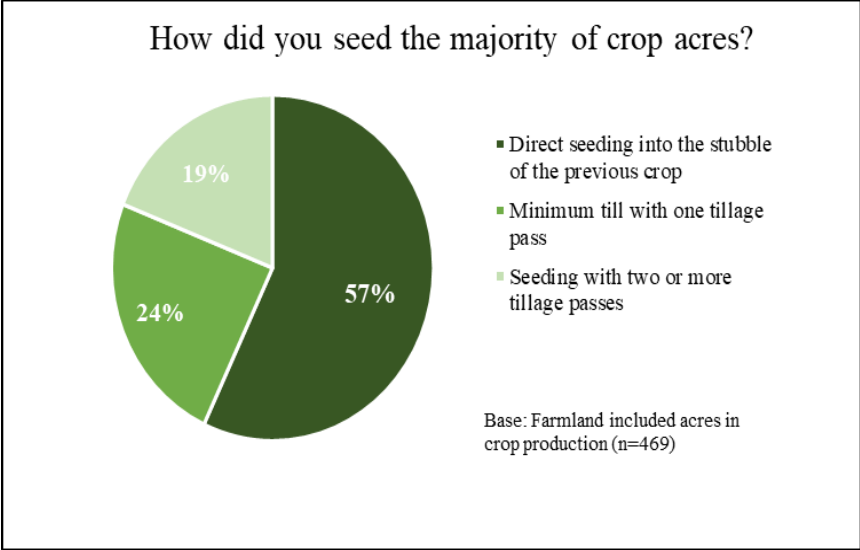
### Soil Health Adoption Characteristics

- Respondents from the south held the highest soil health adoption scores (57%), with respondents from the northwest region having the lowest scores, on average (33%).
- Having a degree (58%), having an EFP (54%), and higher gross farm revenue (60%) were also indicators of higher adoption scores.
- Livestock producers had, on average, lower adoption scores (34%) compared to crop producers (50%).
- Respondents planning to sell their operation presented the lowest scores, on average (37%).

### Soil Health Practices: Overview

#### Reduced Tillage

Over half (57%) of all respondents who had crop production on their farmland directly seeded into the stubble of the previous crop. This is up 12% from the 2018 ESAT survey where only 45% of respondents directly seeded. Roughly a quarter (24%) of respondents completed only one tillage pass, with 19% completing two or more tillage passes. This question was altered from prior survey years to make the responses clearer. This may have impacted the higher adoption scores.



### Reduced Tillage Adoption Rate

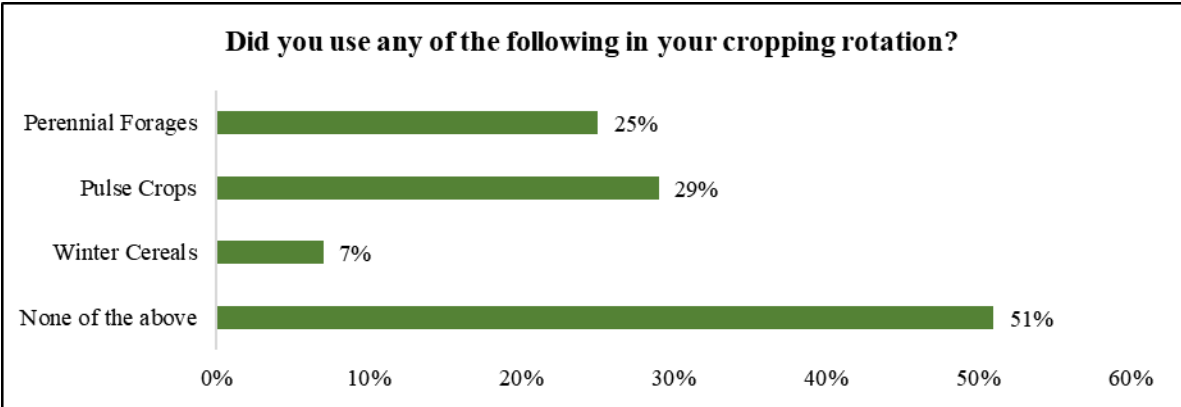
2012	2014	2016	2018	2020
39%	36%	42%	51%	57%†

### Adoption trends for reduced tillage:

- Tillage adoption is highest in the Northeast (68%) and Central (66%) regions compared to the Northwest region (34%).
- Higher gross farm revenue (greater than \$250,000) contributed to adoption (68%) compared to lower gross farm revenue (50%).
- Respondents with a degree (65%) and an EFP (64%) were more likely to adopt, with no difference in adoption for those who had or had not attended conservation training.

### Cropping Rotation: Pulse Crops

In 2020, 29% of respondents used pulse crops in their rotation, up 1% from 2018. Although it was not included as a performance measure, 25% of respondents included perennial forages in their cropping rotation, down 10% from 2018. Further, only 7% used winter cereals in their rotation, down 2% from 2018.



### Use of Pulse Crops Adoption

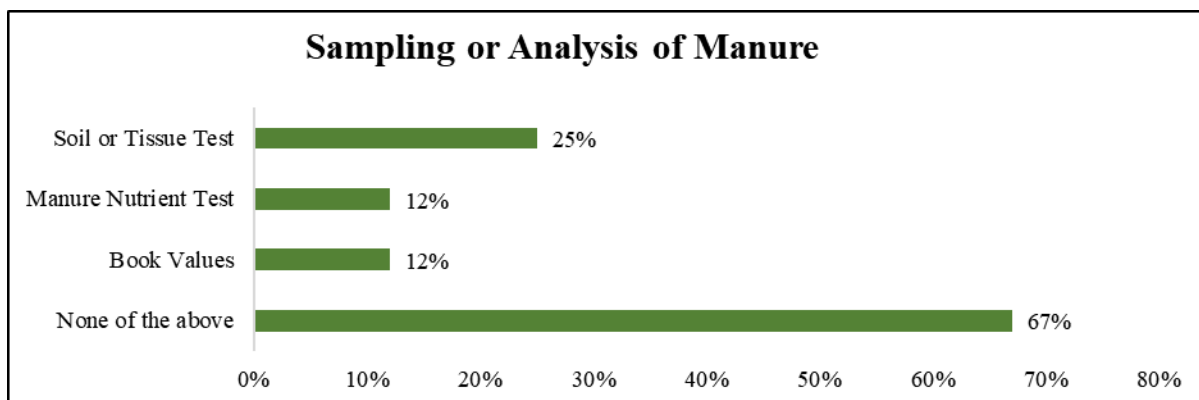
2012	2014	2016	2018	2020
16%	21%	22%	28%	29%†

Adoption trends for use of pulse crops:

- Significantly higher in the South region (50%), and lowest in the Northwest region (9%).
- Significantly higher for respondents with gross farm revenue > \$250,000 (47%) compared to those with lower gross farm revenue (17%).
- Higher adopter scores were seen for respondents with a degree (42%), an EFP (40%), and moderately higher for individuals who have attended conservation training (35%).
- Respondents who were expanding their operation were the most likely to use pulse crops (49%), with those selling being unlikely to use them in their cropping rotation (5%).

### Sampling and Analysing the Manure for Nutrient Content

A quarter of all eligible respondents used a soil or tissue test to analyse their manure nutrient content, up 10% from 2018. Both manure nutrient tests and book values were used only by a small (12%) portion of respondents, with most (67%) completing no sampling or analysis of their manure. These are comparable results to the 2018 survey.



### Manure Sample and/or Analysis Adoption

2012	2014	2016	2018	2020
48%	35%	35%	30%	33%†

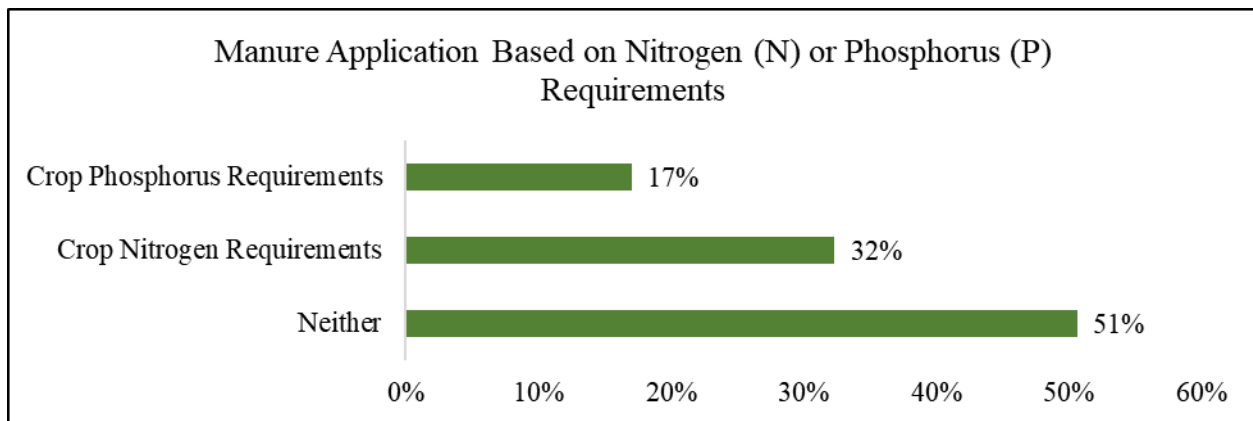
Adoption trends for manure sample and/or analysis:

- Both the South (52%) and Peace region (52%) were more likely to adopt, with the Northeast region (19%) being the least likely to sample their manure.
- Those who attended conservation training were more likely to adopt (60%) compared to those who had not attended (27%). Higher gross farm revenue (54%) was also an indicator towards adoption.

- Respondents with an EFP (46%) were also more likely to adopt than those without one (18%). Having a degree was also an indicator for adoption (46%) compared to those without (26%).
- Farmers planning to sell their operation were also more likely to adopt this practice (52%).

### Manure Application Based on P or N&P

Roughly a third (32%) of respondents who applied manure on their land applied based on crop nitrogen requirements, which is an increase compared to 16% in 2018. Applying based on crop phosphorus requirements also increased to 17% of eligible respondents, compared to 5% in 2018. In general, most producers who applied manure did not use either N or P requirements (51%), which is down from 2018 (69%).



### N or P Requirements Adoption

2012	2014	2016	2018	2020
28%	33%	29%	24%	41%†

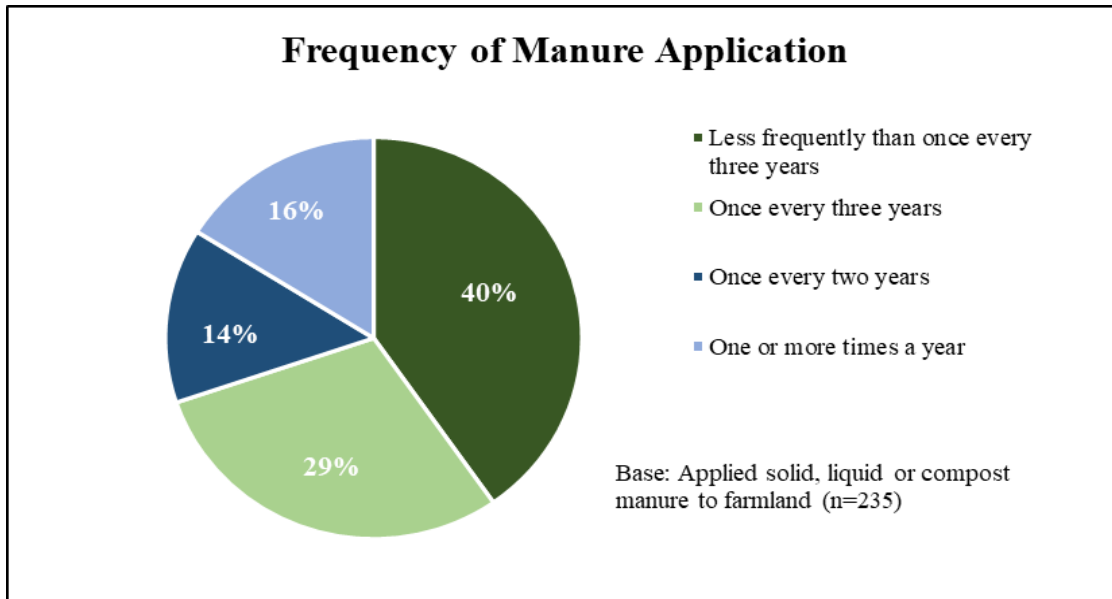
Adoption trends for manure application based on N or P:

- Highest adoption rates were seen in the South (57%) but were significantly lower in the Northeast region (20%).
- Lowest scores were seen for producers planning to sell their operation (16%). All other succession plans had relatively similar adoption rates.
- Significantly higher for respondents who have attended conservation training (68%) compared to those who have not (35%). Also higher for those who have an agriculturally related degree (53%).
- Younger farmers (under 45) were also more likely to adopt.



### Frequency of Manure Application

Just under half (46%) of respondents applied manure less frequently than once every three years. This is up from the 35% in 2018. 29% of respondents indicated they apply manure once every three years, which is similar to the 2018 survey. Only 16% of respondents apply manure one or more times a year which is significantly less than the 2018 responses where 26% applied manure this frequently.



### Frequency of Manure Application

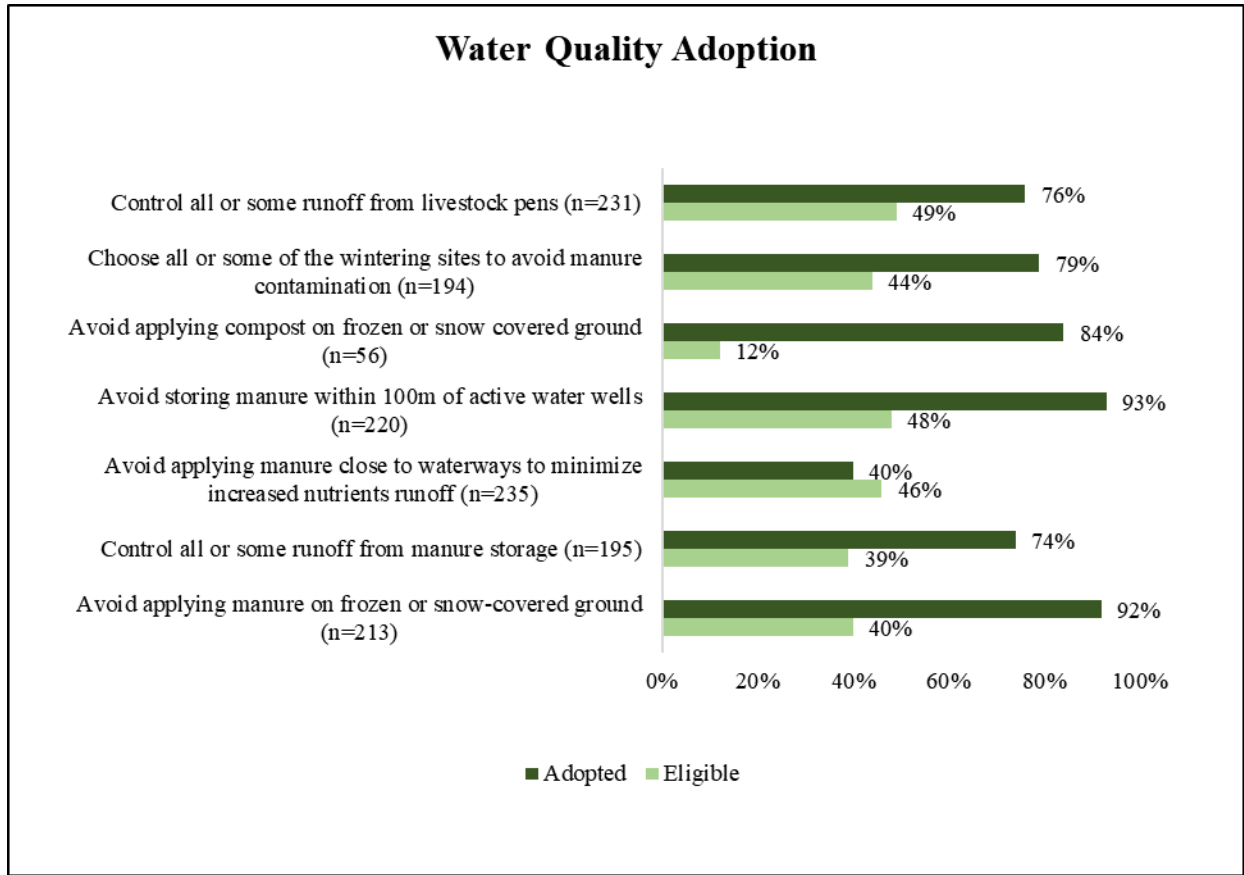
2012	2014	2016	2018	2020
92%	85%	88%	73%	84%†

Adoption trends for frequency of manure applications:

- Primarily crop farmers and producers with both crops and livestock, were more likely to adopt this practice compared to primarily livestock producers.
- Producers who had attended conservation training had higher adoption scores (92%), than those that did not attend. Higher gross farm revenue also posted higher adoption scores (92%).
- Planning to sell their operation reduced adoption scores (67%), on average.
- All other characteristics posted similar adoption scores.

## WATER QUALITY

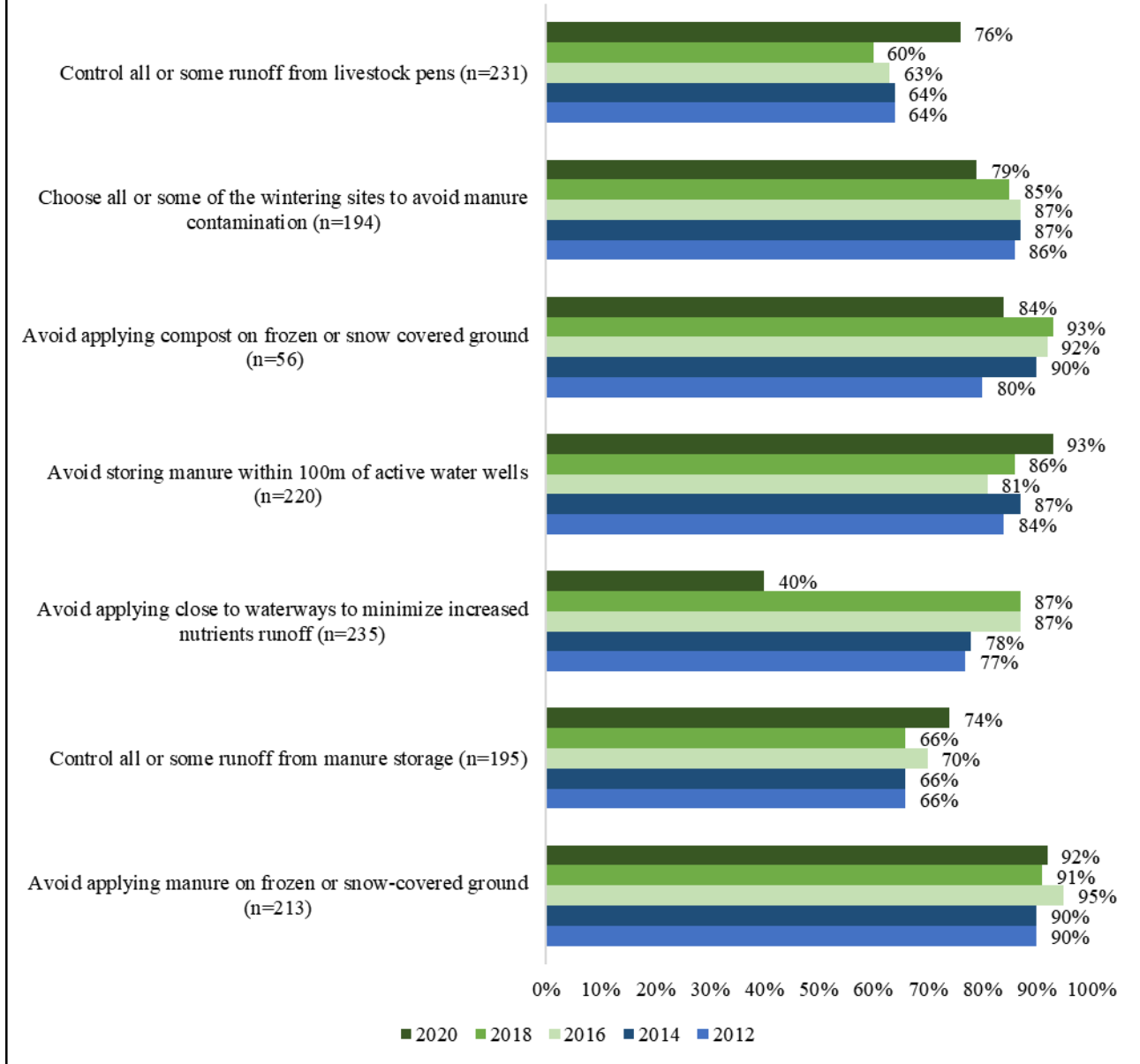
The mean Water Quality adoption score for 2020 was **76%**. Overall, almost all practices were highly adopted which is consistent with prior survey years. The only practice which significantly declined in its adoption rate was avoiding applying manure close to waterways to minimize increased nutrient runoff. As a whole, most practices held similar adoption rates in 2020 and are comparable to prior survey years with minimal exemptions.



### *Water Quality Adoption Characteristics:*

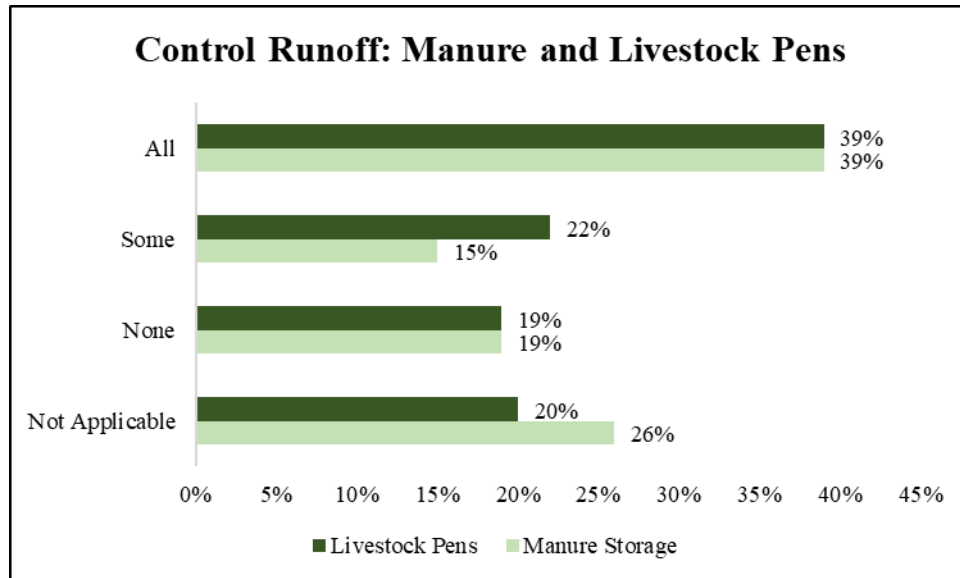
- Adoption scores were similar across regions.
- Having an EFP (81%) and higher gross farm revenue (81%) were indicators of higher water quality adoption scores. The most significant difference in adoption score was between respondents who attended conservation training (86%) compared to those who have not attended (74%).
- Primarily crop producers were slightly less likely to adopt water quality practices, on average, than livestock producers.

## Water Quality Adoption: 2012 to 2020



### *Control runoff from manure storage and/or livestock pens*

Roughly 39% of all eligible respondents controlled all runoff from manure storage, with 15% controlling some, and 19% controlling none of the runoff. 39% of respondents controlled all runoff from livestock pens, 22% controlled some, and 19% controlled none of the runoff. These results are similar to the responses from the 2018 survey.



#### Control Runoff from Manure Storage Site or Livestock Pens

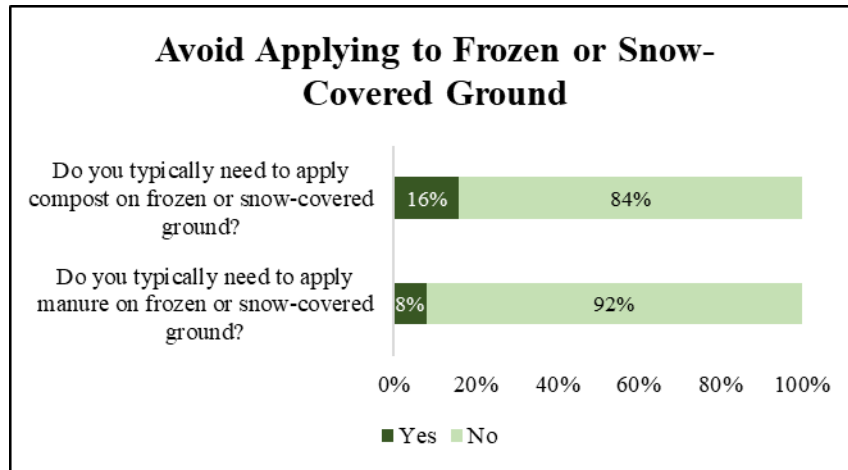
	2012	2014	2016	2018	2020
Manure Storage	66%	66%	70%	66%	74% <sup>‡</sup>
Livestock Pens	64%	64%	63%	60%	76% <sup>‡</sup>

Adoption was higher for controlling runoff from manure storage site or livestock pens practices:

- Respondents from the Central region were more likely to control runoff from manure storage (81%), whereas respondents from the South (85%) and Peace (81%) region were more likely to control runoff from livestock pens.
- Attending conservation training was a predictor of higher adoption rates for both.
- Individuals with an EFP were more likely to control runoff from manure storage sites (83%) compared to those without an EFP (64%).
- Livestock producers were more likely to control manure storage runoff (87%), but producers with both crop and livestock were more likely to control runoff from livestock pens (87%).
- Producers planning to expand their operation were more likely to control runoff from livestock pens (82%).

#### *Avoid applying manure and/or compost on frozen or snow-covered ground*

This practice posts high adoption scores, where 92% of producers did not apply manure to frozen or snow-covered ground. This is up from the 2018 survey, where 91% did not apply compost. However, 84% of producers said they did not apply compost to frozen or snow-covered ground, a lower adoption rate than the 2018 survey (93%).



#### Did you apply the following on snow-covered or frozen ground?

	2012	2014	2016	2018	2020
Compost	80%	90%	92%	93%	84%↓
Manure	90%	90%	95%	91%	92%↑

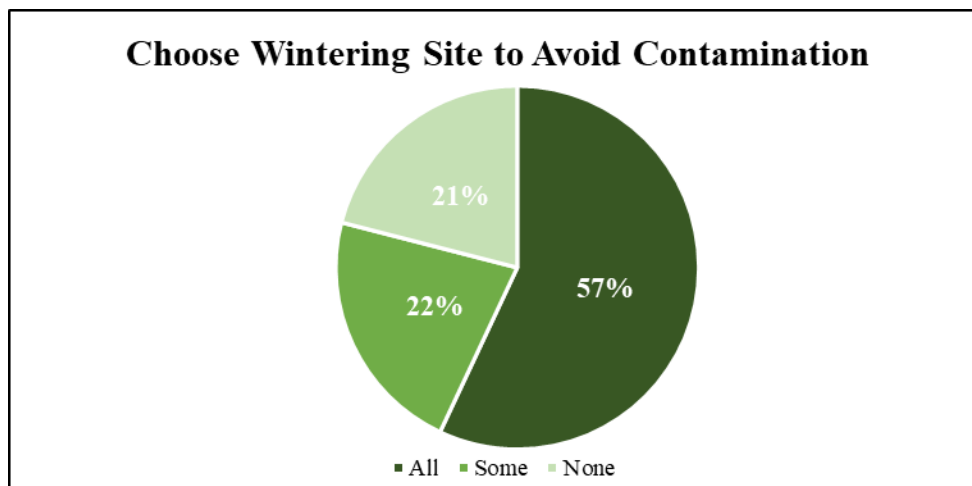
Adoption was higher (or lower) for avoiding applying manure and/or compost on frozen or snow-covered ground:

- Respondents in the peace region were less likely to avoid applying *manure* on frozen or snow-covered ground (74%), whereas individuals in the central region were significantly less likely to avoid applying *compost* (57%).
- Respondents *without* an EFP were more likely to adopt both practices but having a degree and higher gross farm revenue were both indicators for greater adoption scores under both manure and compost.
- Livestock producers were less likely to avoid applying compost on snow-covered or frozen ground (67%), but producers with an equal mix of crop and livestock were the most likely to adopt both practices.
- For both manure and compost, producers planning to expand their operation were the least likely to adopt.

#### *Choose all or some of the wintering sites to avoid manure contamination*

Respondents were asked: ‘*Did you select the location of all, some or none of your in-field winter feeding and bedding sites to prevent runoff from manure entering natural water bodies or leaching into shallow groundwater or aquifers?*’

Producers who graze livestock and have water bodies on their farm state they locate all (57%) or some (22%) of their winter feeding and bedding sites to prevent runoff from manure entering their water bodies. The overall adoption of the practice declined however, from the 2018 survey.



**Choose wintering sites to avoid manure contamination**

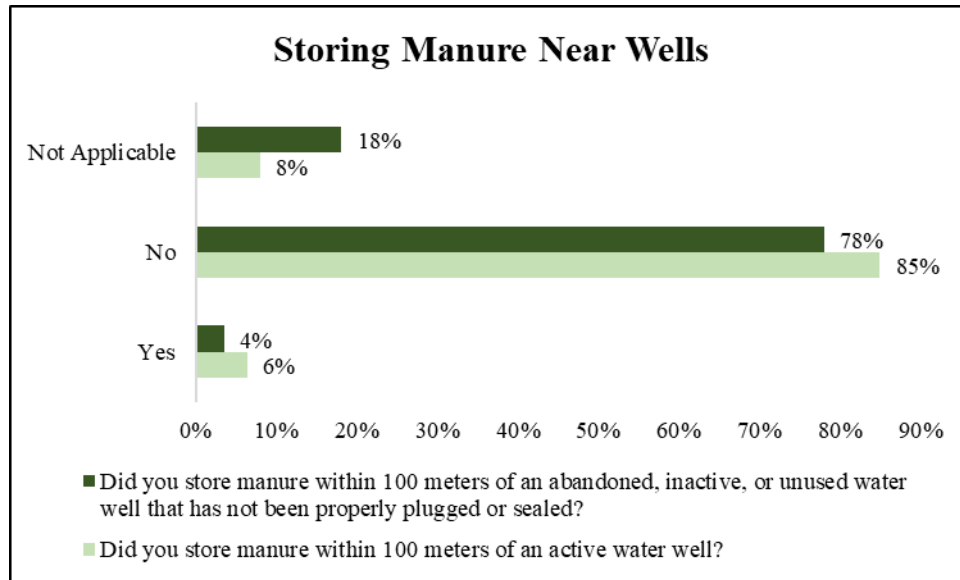
2012	2014	2016	2018	2020
86%	87%	87%	85%	79% <sup>‡</sup>

Adoption trends for choosing wintering sites to avoid manure contamination:

- Adoption was lowest in the northwest region (64%) and highest in the south (90%).
- Adoption was higher for producers with an EFP (89%) compared to those without (68%), a well as higher for those with conservation training (97%) as opposed to those without (76%).
- Older farmers were significantly less likely to adopt (36%).

#### *Avoid storing manure within 100m of active water wells*

For all producers who had active or abandoned wells on their operation, the majority of respondents indicated they did not store manure near them. The adoption of not storing manure near active wells has increased (93%) since the 2018 survey (86%).



#### Avoid storing manure within 100m of active water wells

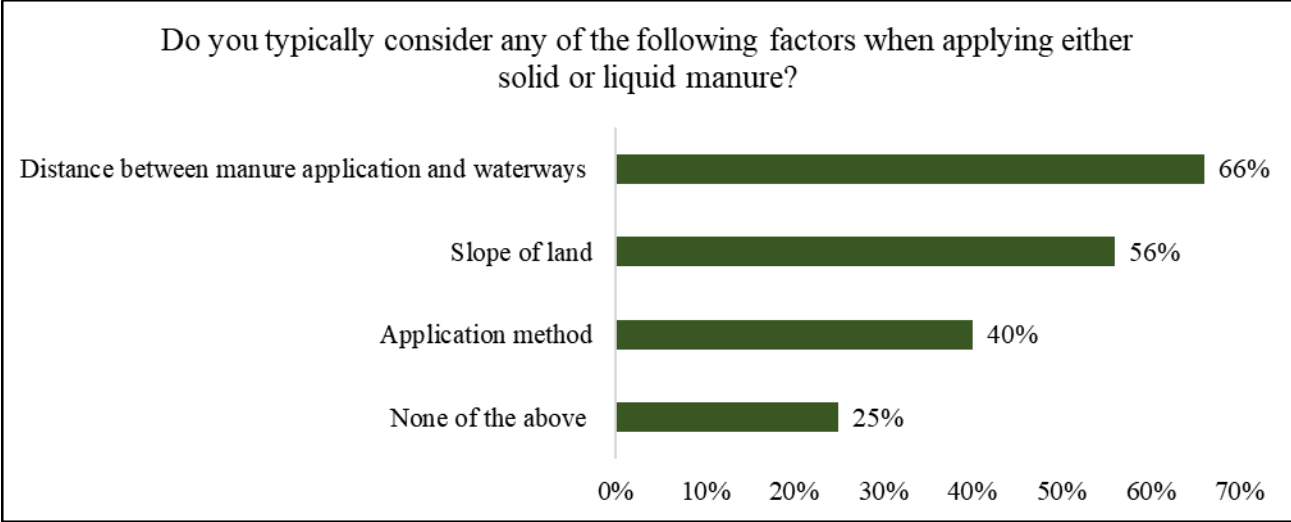
2012	2014	2016	2018	2020
84%	87%	81%	86%	93% <sup>†</sup>

Adoption trends for avoid storing manure within 100m of active water wells:

- All regions had similar adoption trends.
- Characteristics were not significantly different.

#### *Avoid applying manure close to waterways to minimize increased nutrients runoff*

Among producers who applied manure on their land, 66% indicated they consider the distance between manure application and waterways, 56% consider the slope of the land, and 40% consider the application method. Still, a quarter (25%) of these respondents identified they did not consider any of the options. **The 2020 survey shows that the adoption of this practice was significantly less than prior survey years at 40%.**



**Avoid applying manure close to waterways**

2012	2014	2016	2018	2020
77%	78%	87%	87%	40% <sup>‡</sup>

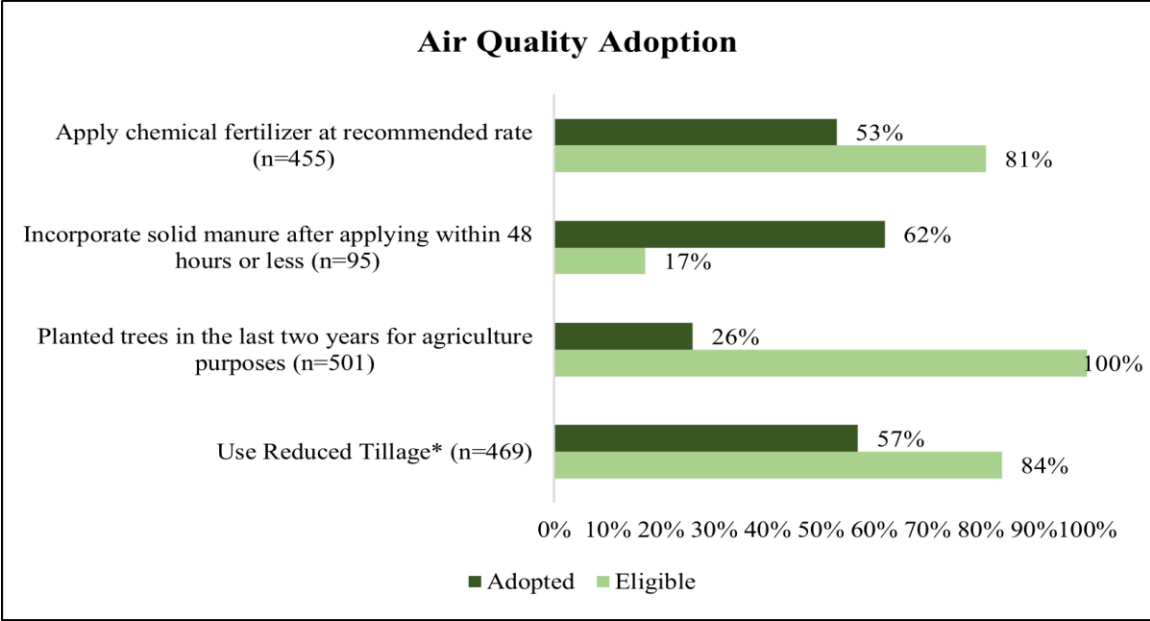
Adoption Trends for avoid applying manure close to waterways:

- The peace region had the highest likelihood of adoption (73%), with the northeast (28%) and northwest (32%) having the lowest adoption rates.
- Having a degree (51%), attending conservation training (56%), higher gross farm revenue (52%), and having an EFP (55%) were predictors of higher adoption.
- Older farmers were significantly less likely to adopt, especially those 65 to 74 (32%) and those over 75 (16%).
- Planning to expand their operation was also associated with higher adoption (65%).

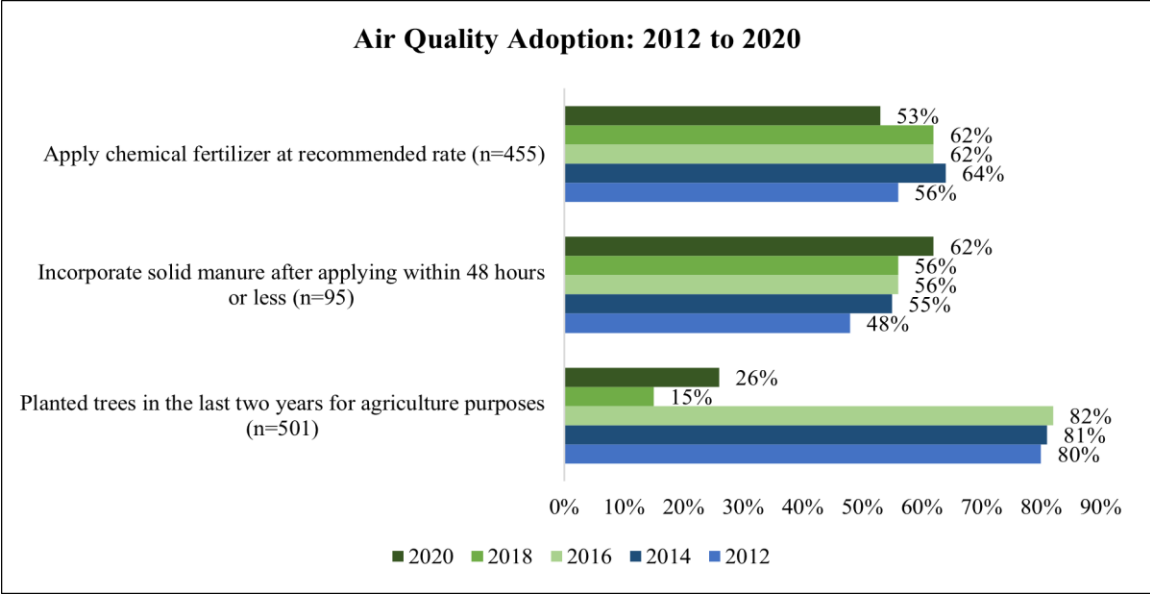
**AIR QUALITY**

The mean Air Quality adoption score for 2020 was **37%**. The most adopted practice was incorporating solid manure within 48 hours of applying (62%). The lowest adopted practice was planting trees for agriculture purposes. While this adoption rate increased from the 2018 survey, this remained substantially lower than the 2012-2016 adoption rates. This likely reflect the slight change to the question, where in previous years producers were simply asked “Have you planted trees on your farm in the past two years?” compared to the 2018 and 2020 survey which asked, “Have you planted trees on your farm in the past two years **for agricultural purposes?**” This subtle change is likely what resulted in a drop in adoption as farmers may not attribute planting trees as part of their operation.





\*This was not included as a performance measure.



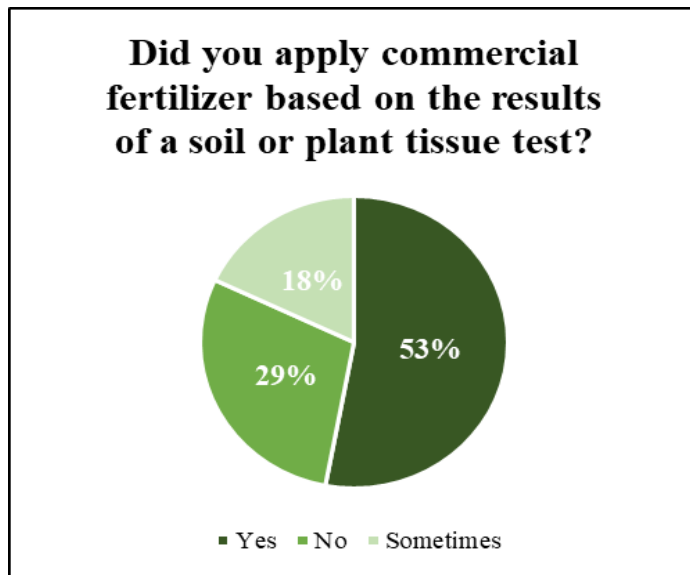
**Air Quality Adoption Characteristics:**

- On average, respondents from the peace region had the lowest air quality adoption scores (26%), with the south region having the highest scores (45%).
- Attending conservation training presented higher adoption scores (61%), compared to not attending (32%). Having a degree was also an indicator for higher rates of adoption (52%) compared to those without a degree (31%).
- Having an EFP (46%) and higher gross farm revenue (43%) were also predictors of higher adoption scores.
- Younger producers were more likely to adopt.

- Respondents planning to expand (51%) or planning to sell (53%) their operation also held some of the highest adoption scores.

### *Apply chemical fertilizer at recommended rate*

When broken down, roughly half (53%) of respondents indicated they applied commercial fertilizer (chemical fertilizer) based on soil or plant tissue tests. 29% responded they did not apply based on soil or plant tissue tests, and the remaining 18% applied it sometimes based on these tests. The overall adoption score of this practice is lower than the scores presented in the 2012 to 2018 surveys at 53%.



**Apply chemical fertilizer based on soil or plant tissue test**

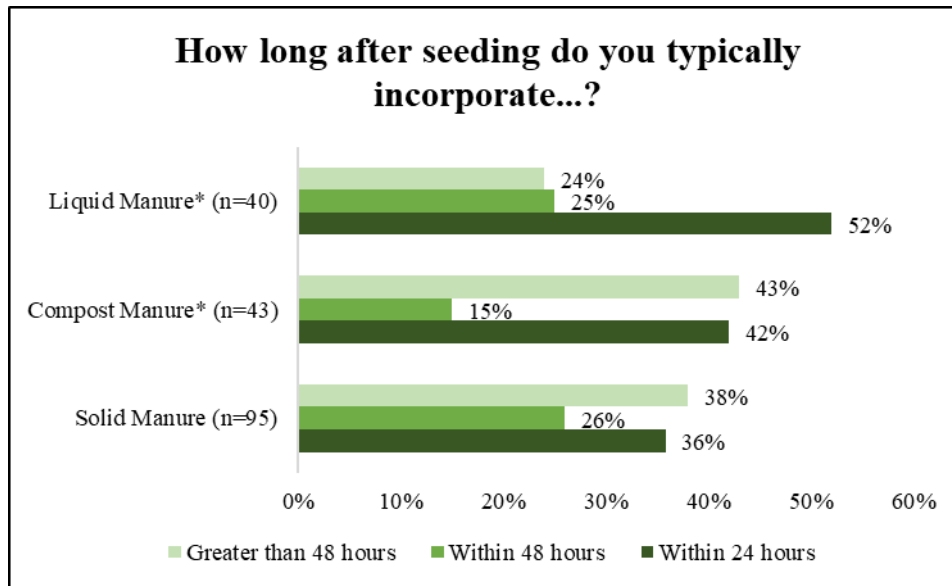
2012	2014	2016	2018	2020
56%	64%	62%	62%	53% <sup>‡</sup>

Adoption Trends for applying chemical fertilizer based on soil or plant tissue test:

- The south region had the highest adoption rate (71%), with the lowest adoptions scores occurring in the peace region (41%).
- Attending conservation training was a predictor of higher adoption (73%) compared to those without training (48%), as well as higher gross farm revenue (64%) compared to lower revenue (45%). Having an EFP was also significant (62%).
- Primarily owning land also improved adoption scores (58%).
- Younger farmers (under 45) and respondents planning to expand (70%) also more likely to adopt.

### *Incorporate solid manure after applying*

About 36% of producers who applied solid manure in 2020 stated they incorporated within 24 hours, with 26% incorporating within 48 hours. Adoption has increased to its highest adoption rate since 2012 with 62% of eligible producers incorporating solid manure within 48 hours of applying.



\*This was not included as a performance measure.

#### Incorporating Solid Manure Within 48 hours

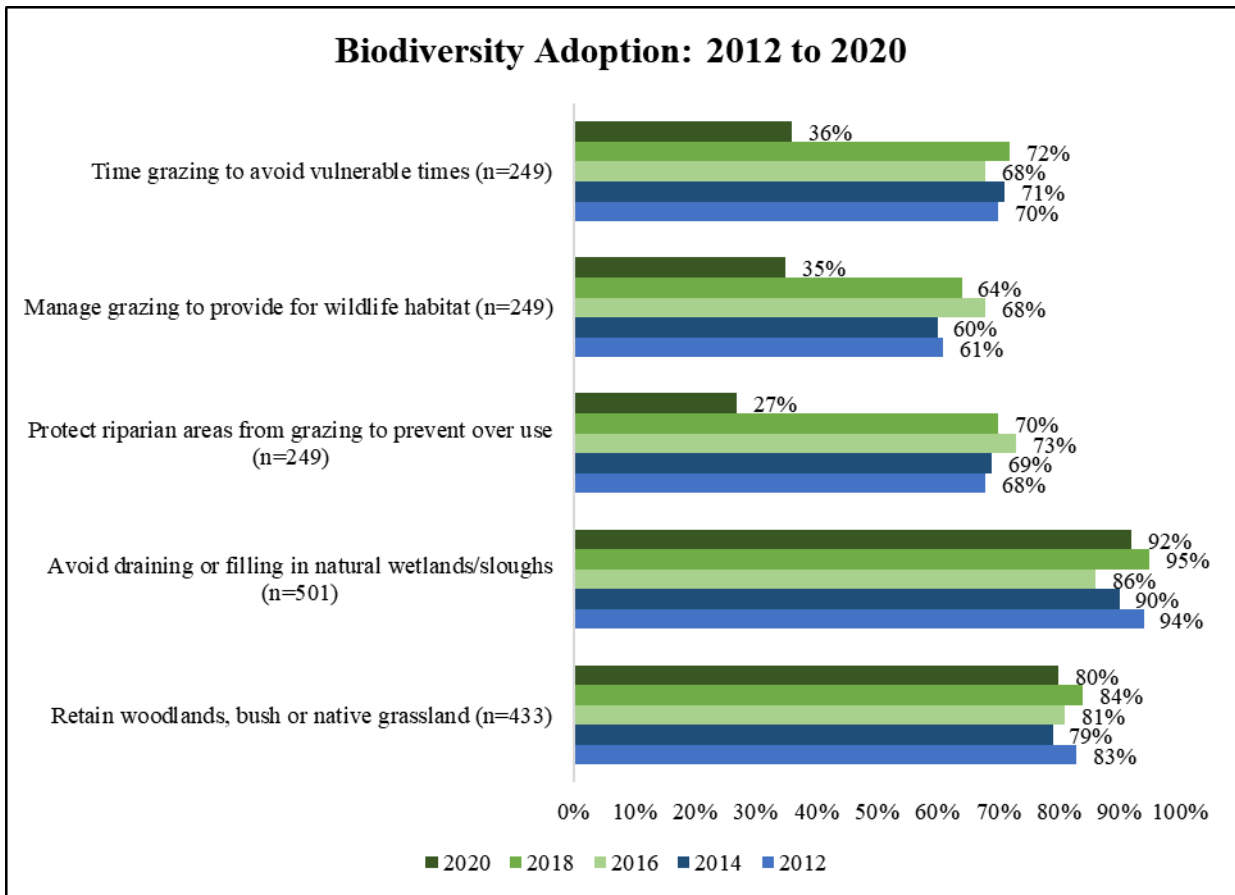
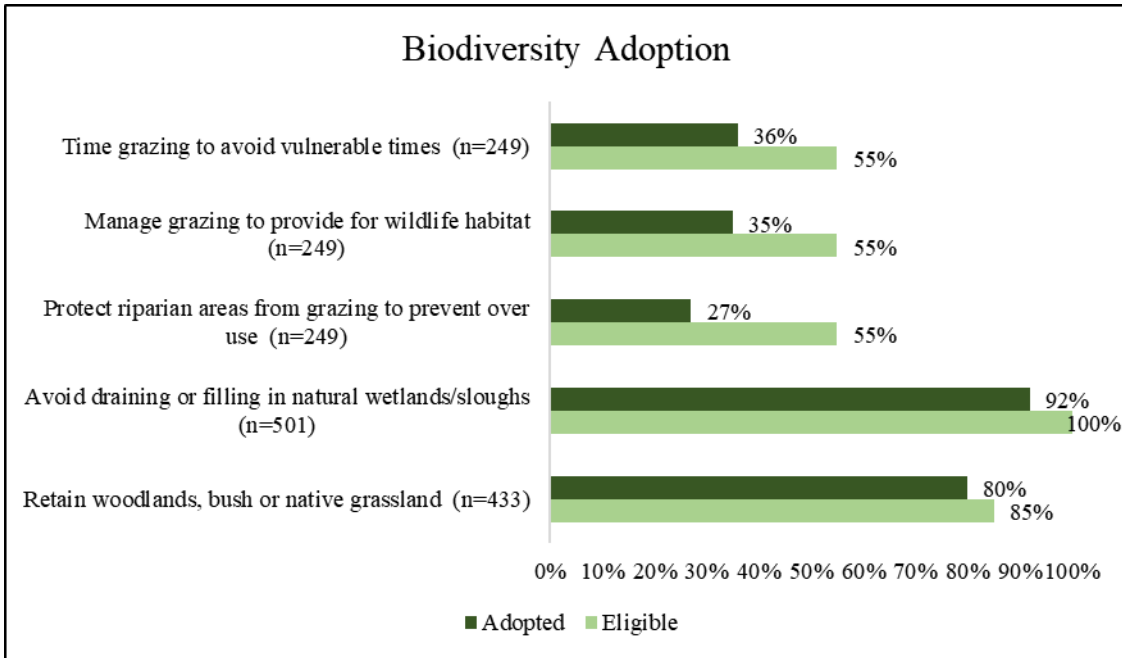
2012	2014	2016	2018	2020
48%	55%	56%	56%	62% <sup>‡</sup>

Adoption Trends for incorporating solid manure within 48 hours:

- The peace region had more producers who adopted this practice (81%), while the south (53%) and northwest (55%) regions had the lowest adoption scores.
- Planning to reduce their operation (67%), or currently maintaining (71%), were indicators of higher adoption.
- Those with a degree were more likely to adopt (84%) compared to those without (48%) and attending conservation training was also an indicator of higher adoption (77%). However, those *without* an EFP were more likely to adopt (75%), compared to those with an EFP (55%).

## BIODIVERSITY

The mean Biodiversity adoption score in 2020 was **68%**. The practice with the highest adoption rate was ‘avoid draining or filling in natural wetlands/sloughs’ (92%). The adoption rate was down 3% from the 2018 survey but is a highly adopted practice across producers. The least adopted practice was ‘protect riparian areas from grazing to prevent overuse’ (27%). The adoption of this practice significantly declined from 70% adoption rate in 2018, presenting the lowest adoption rate since 2012.

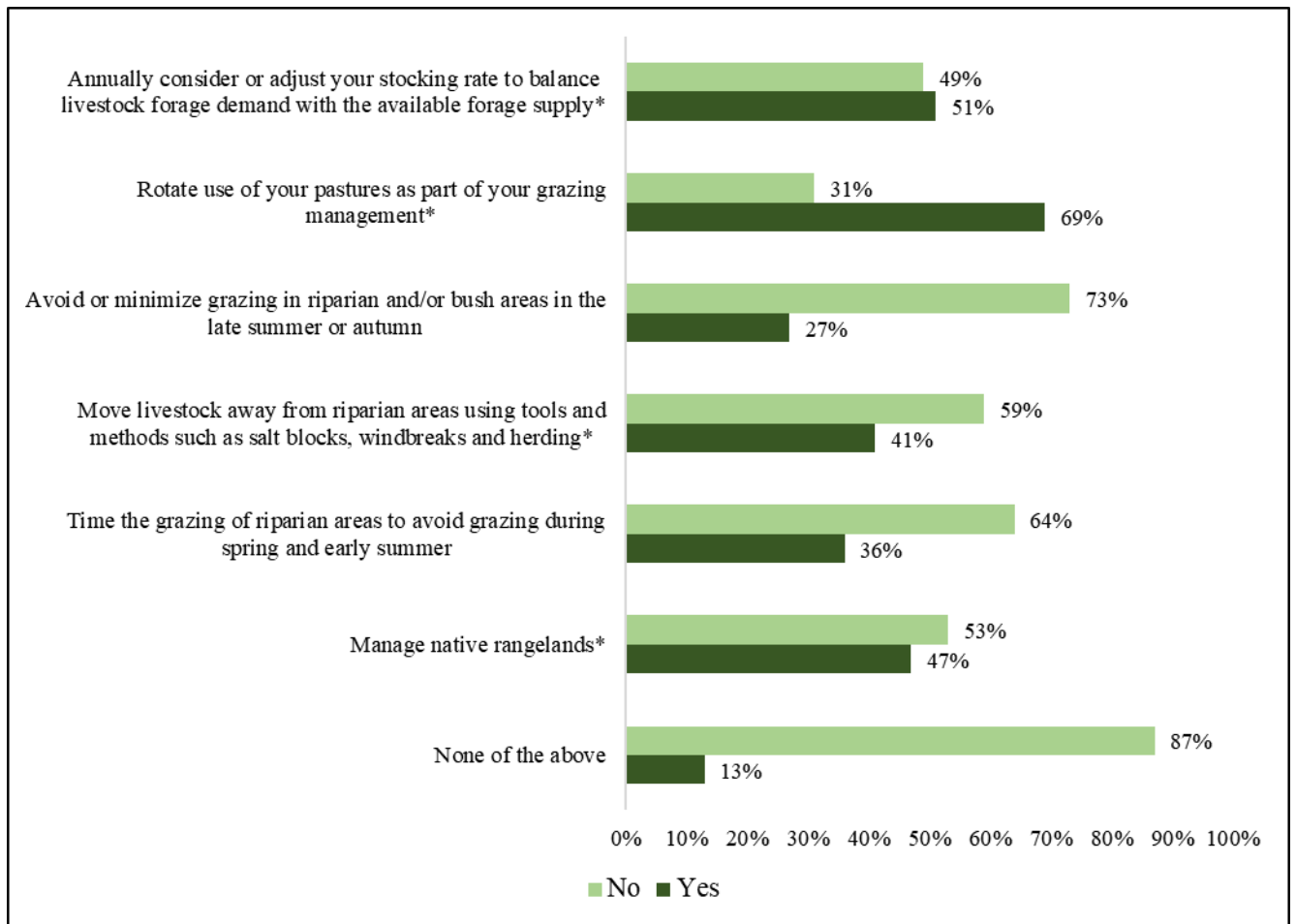


**Biodiversity Adoption Characteristics:**

- The central region had the lowest adoption score, on average (61%), with respondents from the peace region having the highest scores (79%).
- Higher gross farm revenue, as well as having a degree, did not differ from the mean adoption score.
- Respondents with an EFP were slightly more likely to have higher scores (71%), with attending conservation training also improving mean scores (74%).
- Crop producers were more likely to adopt practices than livestock producers.

**Protect Riparian Areas**

Compared to prior survey years, the two performance measures shown below declined significantly in their adoption rates. Out of producers who grazed livestock on their land, only 27% answered they avoid or minimize grazing in riparian areas in late summer or autumn. Further, 36% of producers stated they time grazing of riparian areas during spring or early summer to prevent overuse.



\*These were not included as performance measures.

**Protect riparian areas from grazing to prevent overuse**

2012	2014	2016	2018	2020
68%	69%	73%	70%	27%↓

**Time grazing to avoid vulnerable times**

2012	2014	2016	2018	2020
70%	71%	68%	72%	36%↓

Adoption trends for protecting riparian areas:

- The northeast and peace regions were more likely to time grazing to avoid vulnerable times (54% each), whereas the south and peace regions were more likely to protect riparian areas from overuse.
- Having an EFP was a significant indicator towards higher adoption rates for both practices. For example, 53% of respondents with an EFP were more likely to avoid grazing during vulnerable times, compared to 17% of individuals without an EFP.
- Having a degree and attending conservation training were also significant.

**ESA Adoption by Respondent Characteristics**

The following section will explore components that alter adoption scores. Note: indicators ↑ or ↓ are only included if a characteristic has a percentage difference of 5% or more from the mean adoption score.

*Farmer Characteristics and Adoption Scores*

Producers who indicated they have an agriculturally related degree or diploma were more likely to have higher soil health and air quality scores, with respondents without a degree having significantly lower air quality scores (30%). Attending environmental training was a significant indicator towards adoption across all ESA adoption scores, which is likely attributed to the increased awareness and knowledge of practices that can stem from training. Livestock producers, on average, held lower soil health and biodiversity adoption scores, whereas crop producers had higher soil health adoption scores, on average. This is not unexpected since crop producers are generally more aware, as well as more concerned, about soil quality compared to primarily livestock producers. Lastly, producers who indicated they had higher gross farm revenue (>\$250,000), as well as producers with an Environmental Farm Plan (EFP), were more likely to adopt water quality and soil health practices, as well as hold higher overall ESA adoption scores.

	Score	Degree or Diploma		Enviro. Training		Livestock Producer		Crop Producer		GFR > \$250K		Enviro. Farm Plan (EFP)	
		Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
2020 ESA Adoption	<b>57%</b>	63% <sup>†</sup>	54%	68% <sup>†</sup>	55%	56%	57%	56%	57%	62% <sup>†</sup>	54%	64% <sup>†</sup>	51%
Water Quality	<b>76%</b>	78%	75%	86% <sup>†</sup>	74%	76%	76%	73%	78%	81% <sup>†</sup>	74%	81% <sup>†</sup>	72%
Soil Health	<b>46%</b>	58% <sup>†</sup>	41%	56% <sup>†</sup>	44%	34% <sup>‡</sup>	49%	50% <sup>†</sup>	39% <sup>‡</sup>	60% <sup>†</sup>	38% <sup>‡</sup>	54% <sup>†</sup>	38% <sup>‡</sup>
Air Quality	<b>37%</b>	52% <sup>†</sup>	30% <sup>‡</sup>	61% <sup>†</sup>	32% <sup>‡</sup>	35%	37%	39%	33%	43%	34%	46%	28%
Biodiversity	<b>68%</b>	69%	67%	74% <sup>†</sup>	66%	60% <sup>‡</sup>	70%	72%	61% <sup>‡</sup>	70%	67%	71%	65%

### Regional Distribution and Adoption Scores

Respondents from the northwest region had the lowest overall ESA adoption scores (50% on average), including the lowest water quality score (72%) and the lowest soil health score (33%). The south region had producers with the highest overall ESA scores, the highest soil health scores, and the highest air quality scores. Respondents in the peace region were more likely to adopt water quality and biodiversity practices, but these producers were less likely to adopt air quality practices (26%). Finally, the central region posted the lowest rate of adoption for biodiversity (61%).

	Score	South	Central	Northeast	Northwest	Peace
2020 ESA Adoption	<b>57%</b>	<b>61%</b>	59%	59%	<b>50%<sup>‡</sup></b>	56%
Water Quality	<b>76%</b>	80%	76%	74%	<b>72%</b>	<b>81%<sup>†</sup></b>
Soil Health	<b>46%</b>	<b>57%<sup>†</sup></b>	49%	46%	<b>33%<sup>‡</sup></b>	48%
Air Quality	<b>37%</b>	<b>45%</b>	40%	38%	31%	<b>26%</b>
Biodiversity	<b>68%</b>	69%	<b>61%</b>	70%	68%	<b>79%</b>

<sup>†</sup>Red indicates the region with the lowest score; green is the region with the highest score.

### Farm Succession Plans and Adoption Scores

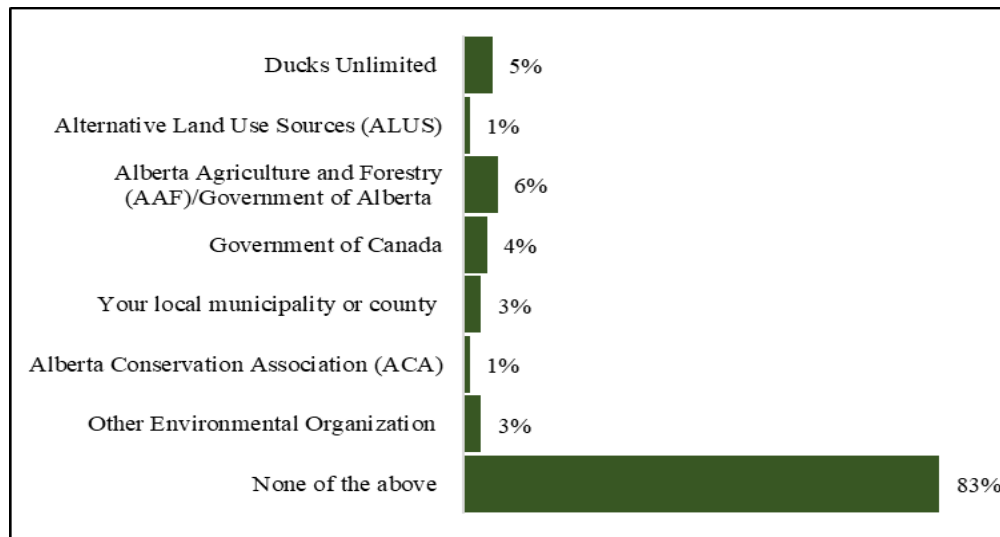
Farm succession plans posted mixed results across risk areas. Respondents who were planning to expand their operation had higher adoption scores overall, as well as higher soil health scores. Planning to reduce their operation resulted in lower adoption scores overall, as well as slightly lower water quality scores. Planning to sell one's operation was the most polarizing, as this succession plan resulted in significantly higher water quality scores, higher air quality scores, but lower soil health scores. Lastly, biodiversity scores were mostly unaffected by succession plans.

	Total	Beginning or Maintaining	Expanding	Reducing	Selling
ESA Adoption Score	57%	56%	64%↑	55%	58%
Water Quality	76%	76%	79%	73%	89%↑
Soil Health	46%	44%	53%↑	45%	37%↓
Air Quality	37%	33%	51%↑	34%	53%↑
Biodiversity	68%	69%	69%	65%	66%

<sup>1</sup>Red indicates the farm succession plan with the lowest score; green is the succession plan with the highest score.

### ESA Adoption Funding

The adoption and implementation of sustainable practices can be costly, with financial barriers to adoption amongst the most common reason for non-adoption. Many sources of funding are available for producers, and for the first time the 2021 ESAT survey asked respondents the following: ‘At any time, have you received funding or payments to introduce more sustainable practices on your land from any of the following sources?’ In general, the majority of respondents answered they had not received funding from any of the following sources (83%). This may indicate a need to inform producers about funding opportunities available to them to help with adopting sustainable practices. This includes training and promoting extension personnel.





## Environmental Farm Plan

This section was developed to better understand Alberta producers' opinions and knowledge about the Environmental Farm Plan (EFP). The EFP is a voluntary, whole-farm, self-assessment tool that helps producers identify environmental risks on their farm. The EFP forms an integral component of agri-environmental policy as it is a requirement for producers to participate in almost all cost-share programs under agricultural policy frameworks. Out of all respondents, approximately **47%** had completed an EFP, up 5% from the 2018 ESAT survey. **88%** of respondents found the EFP process to be valuable and by completing an EFP, they learned something about environmental risks on their operation. Out of respondents who did not have an EFP, only **21%** indicated they would consider completing one in the future, **46%** stated they did not know if they would consider completing one, and **33%** said they would not be willing to complete one.

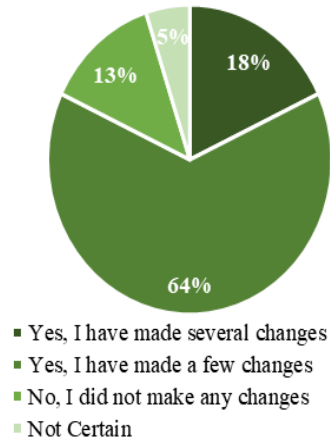
While the EFP is allotted high confidentiality, many producers have privacy concerns, fearing negative consequences for identifying certain on-farm environmental risks (Atari et al. 2009; Smithers & Furman 2003). This may explain some producer's hesitancy to obtain an EFP and indicates a need to address these concerns going forward. Further, there has been a push to utilize the EFP as a method to meet industry standards for sustainable sourcing (Alberta EFP 2021). This includes several commodity groups requiring, or promoting, the completion of an EFP to meet market demands, such as the shift towards agri-food businesses primarily purchasing from sustainably sourced operations. In short, obtaining an EFP may be beneficial to retain competitiveness in future markets.

The 2020 survey asked respondents to identify the statement they felt best described the EFP. This question was meant to examine whether producers understood or held knowledge about the EFP program. The response which would indicate a producer fully understood the program was *'The EFP helps farmers identify environmental risks and provides suggestions to mitigate them.'* Producers who also responded *'The EFP is a tool for identifying environmental risks on your farm'* were also deemed knowledgeable and informed regarding the EFP. Most producers properly described the EFP (83%), but no producers (0%) selected the best statement to describe the EFP. Only 6% of respondents believed the EFP gave farmers money to complete environmental projects on their land. While the EFP does not provide monetary funds, this response may be attributed to the EFP being a requirement to access financial support through environmental stewardship programs.

Statement	Responses (%)
The EFP is a tool for identifying environmental risks on your farm	83%
The EFP gives farmers money to complete environmental projects on their land	6%
The EFP is required by some commodity organizations	2%
The EFP is only for large commercial farms	8%
The EFP helps farmers identify environmental risks and provides suggestions to mitigate them	0%

Base: Has an Environmental Farm Plan (n=304)

### Did you make changes?



Base: Respondent has an EFP (n=304)

In 2020, respondents with an EFP were asked whether they had made changes to their operation based on their EFP workbook. Most respondents said they had made a *few* changes (64%), with 18% stating they had made several changes. Further, 13% of respondents indicated they did not make any changes based on their EFP. It should be noted these respondents may have only recently completed an EFP, which would provide a shorter time horizon to make changes.

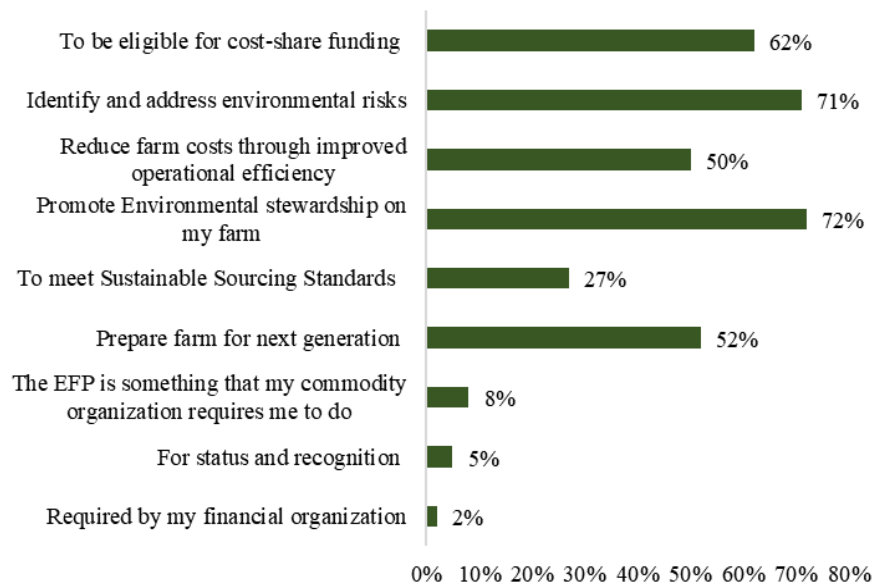
Respondents were also asked to identify reasons why they decided to complete an EFP. Out of the 304 producers who stated they had an EFP, most completed to be

eligible for cost-share funding (62%), to identify and address environmental risks on their farm (71%), and to promote environmental stewardship (72%). Only a small portion of producers stated they completed an EFP for status and recognition (5%) or that they were required by their financial organization (2%) or that their commodity group required them to complete one (8%).

Lastly, producers who did not have an EFP

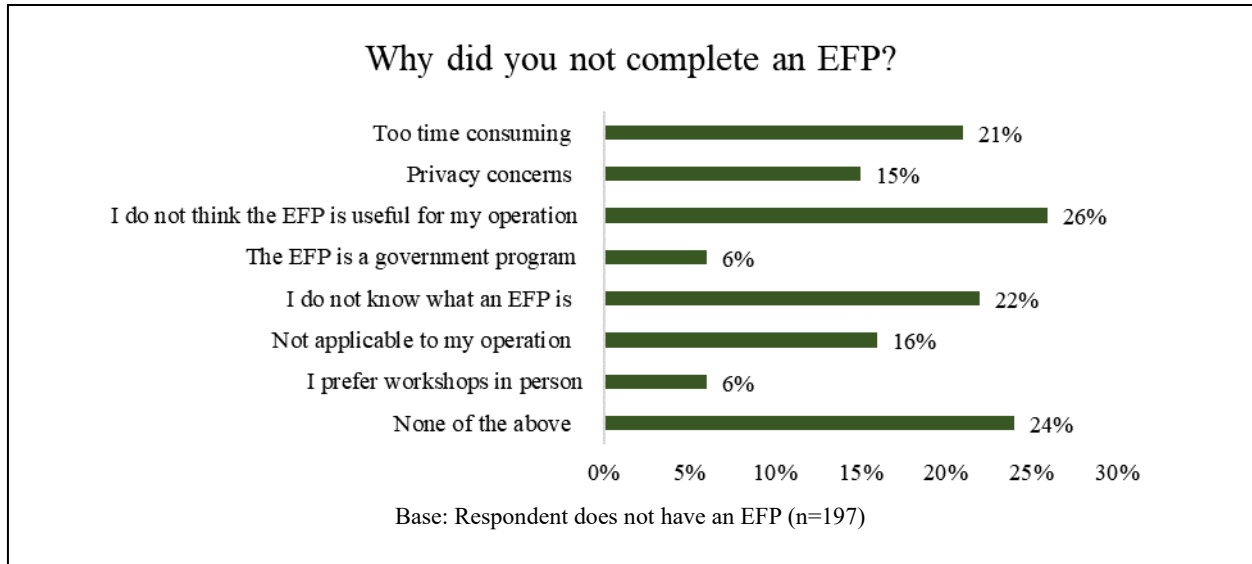
were asked to identify reasons which made them not complete one. Amongst the most common reasons producers stated for not completing an EFP was that it was too time consuming (21%), not useful for their operation (26%), they did not know what an EFP was (22%), and privacy concerns (15%). Privacy concerns, as previously stated, have been a consistent reason for producers choosing to not complete an EFP, even with the current confidentiality allotted towards the program (Atari et al. 2009; Smithers & Furman 2003). This may be related to 9% of

### Why did you complete an EFP?



Base: Respondent has an EFP (n=304)

producers who chose not to complete an EFP as they believe it is a government program, but in reality, it is run by a private organization.



### *Environmental Farm Plan Participation by Respondent Characteristics*

The remainder of this section will provide an overview of EFP participation and how participation is altered by respondent characteristics.

#### *Farmer Characteristics*

Having a degree (or diploma), attending an environmental agricultural training session, and having higher gross farm revenue are all associated with higher rates of EFP participation. Having a degree and attending conservation training can result in a higher level of awareness about environmental risks, which may correspond to an increased interest in completing an EFP. Being either a livestock or crop producer did not seem to increase or reduce the rate of completing an EFP. Instead, producers who primarily own land had lower rates of completion.

	Total	Degree or Diploma		Enviro. Training		Livestock Producer		Crop Producer		GFR>250K		Own Land	
		Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Environmental Farm Plan (%)	47%	61%↑	42%	67%↑	43%	48%	47%	48%	47%	69%↑	36%↓	42%↓	51%

↑ indicates participation increased by at least 5% for these characteristics.

↓ indicates participation decreased by at least 5% for these characteristics.

### *Farm Succession Plans and Environmental Farm Plan Participation*

Producers who are planning to expand their operation had the highest percentage of producers who completed an EFP (68%). Planning to sell their operation had the lowest participation rates on average at 33%. These producers are most likely older and have shorter planning horizons (Ervin & Ervin 1982; Baumgart-Getz et al. 2012), or they do not find value in completing an EFP if they are not going to continue to take care of the land.

	Total	Beginning or Maintaining	Expanding	Reducing	Selling
Environmental Farm Plan (%)	47%	44%	68%	44%	33%

<sup>1</sup>Red indicates the farm succession plan with the lowest EFP score; green represents the highest.

### *Regional Distribution of Environmental Farm Plan Participation*

Both the South and Central regions had the highest rates of EFP completion on average. This may reflect the higher ESA adoption scores for these regions as presented in the previous section. The Peace region holds the lowest participation rates on average (35%).

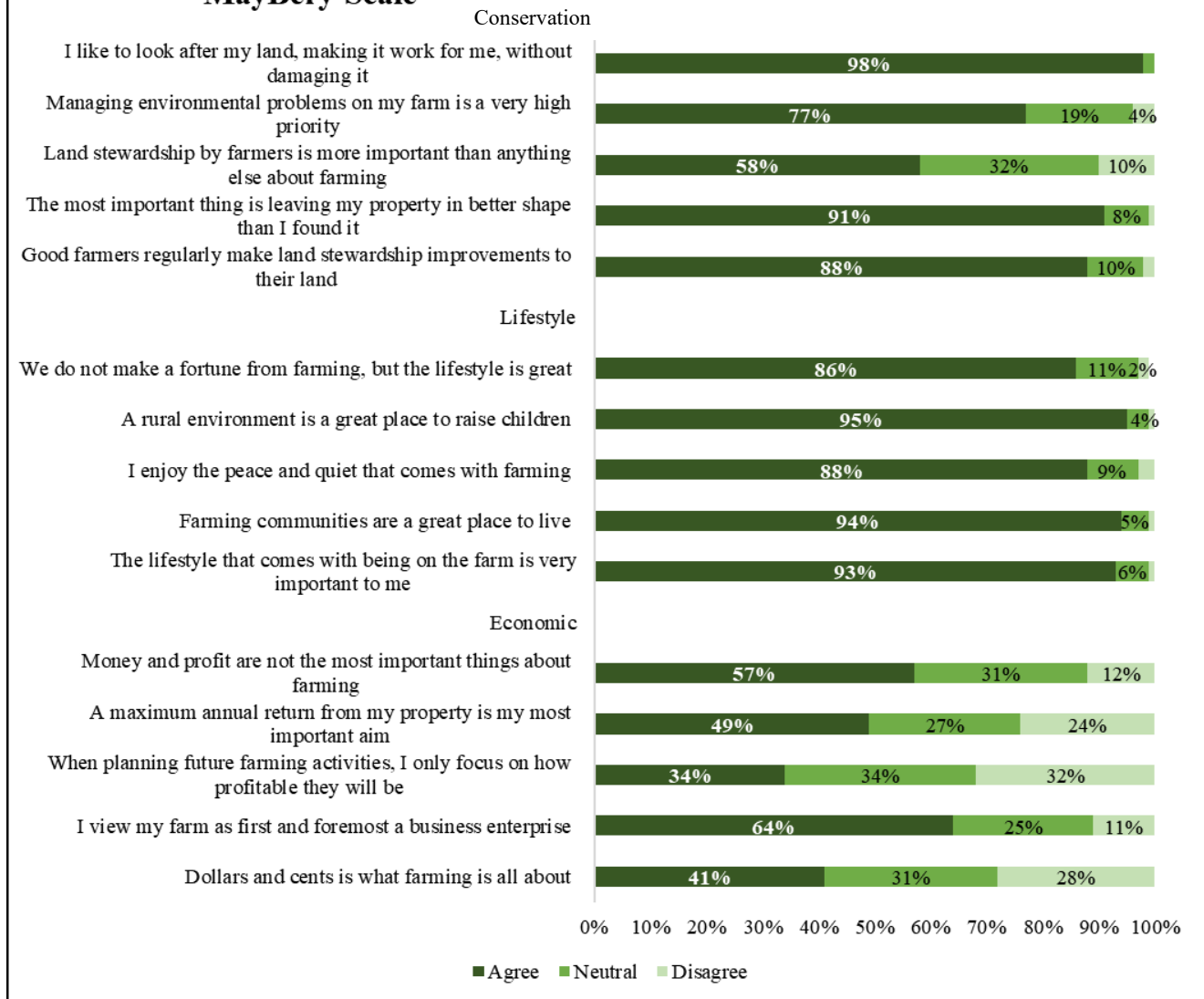
	Total	South	Central	Northeast	Northwest	Peace
Environmental Farm Plan (%)	47%	59%	53%	45%	38%	35%

<sup>1</sup>Red indicates the farm succession plan with the lowest EFP score; green represents the highest.

## **Economic, Conservation, and Lifestyle Measures**

In 2020, respondents were asked to rate their agreement to economic, conservation, and lifestyle measures on a scale from ‘strongly disagree’ to ‘strongly agree.’ The scale was developed by Maybery et al. (2005) to determine goals and objectives farmers have for their farm. According to Maybery et al. (2005), the end-use objective of this scale is to decipher land-use values to target policies in a more strategic manner. For example, understanding how to influence farmers with higher conservation values to alter their management practices, compared to policies or initiatives that would incentivize farmers with higher economic values. A total of 15 statements were used to better understand respondents economic, conservation and lifestyle values.

## MayBery Scale



Base: All respondents (n=501)

Most respondents held similar lifestyle values, where farmers homogeneously agreed or strongly agreed to the statements they were shown. Respondents also held similar conservation values, except for the statement ‘*Land stewardship by farmers is more important than anything else about farming.*’ Half (58%) agreed with this statement, with 32% holding neutral values and 10% disagreeing. Likely, farmers who did not agree with this statement may hold more economic values or lifestyle values, such as the social aspect. Farmers economic values were much more heterogeneous, with only a majority (64%) of respondents agreeing with the statement ‘*I view my farm as first and foremost a business enterprise*’. Respondents were also less likely to agree with the statement ‘*When planning for future farming activities, I only focus on how profitable they will be*’ (34%). These results suggest producers highly value the lifestyle that comes with farming and being good stewards of the land. Producers also value certain economic factors, but they are not driving values regarding their operation.

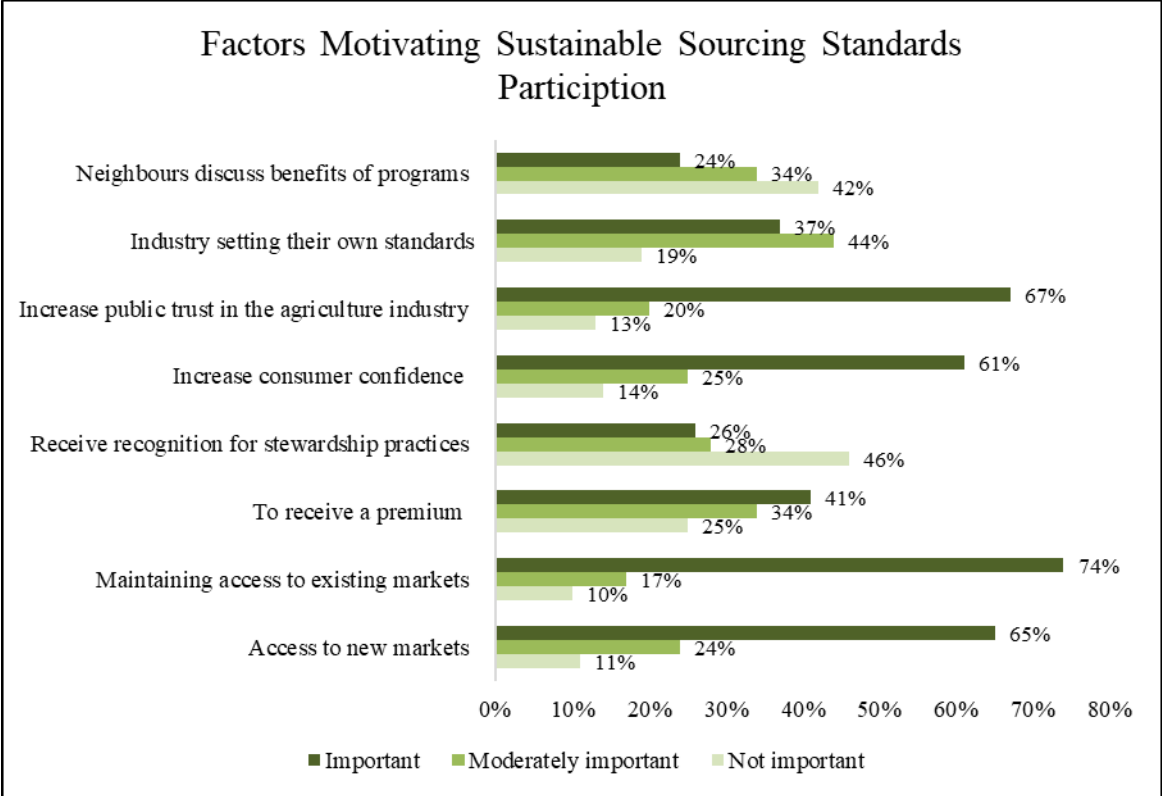
## Sustainable Sourcing

This section will explore the results for Alberta producers' opinions on sustainable sourcing; all results are based on the full sample size (n=501). Sustainable sourcing standards have become an important component to buying decisions across agri-supply food chains, which has influenced producers' management decisions. The preference for sustainable sourcing from agri-food businesses will likely influence competitiveness in national and global markets, as well as affect access to markets (see EFP section).

### *Motivating Factors*

The 2020 survey first asked the following: *'Sustainability standards are becoming more important to buyers across agri-food supply chains and increasingly influence production decisions of both livestock and crop producers. We would like to better understand your thoughts and opinions on sustainability standards for sourcing agriculture products. For each of the following please indicate how import it is as a factor that motivates participation.'* On a five-point scale, producers were asked to rank statements from 'not important at all' to 'extremely important'. The results were simplified into three categories: 'not important', 'moderately important', and 'very important'.

The most important motivating factors are maintaining access to existing markets (74%), increase public trust in the agriculture industry (67%), access to new markets (65%), and increase consumer confidence (61%). The least important factors are social impacts such as neighbours discuss benefits of programs (24%) and receive recognition for stewardship practices (26%). Namely, the most important factors are those that benefit the farm as a business (i.e., market access), rather than personal or intrinsic motivations (i.e., recognition).



*Motivating Factors by Farm Type*

Sections highlighted in green indicate the farm type with the highest percentage of respondents indicating a statement is a motivating factor towards participating in sustainable sourcing. The most significant difference was livestock producers ranking ‘increase public trust in the agriculture industry’ (80%) as a significantly important motivating factor. These producers also ranked ‘increase consumer confidence’ (71%) as an important factor for participating. Livestock producers are often faced with higher bouts of criticism regarding their management practices compared to crop producers. This has also led many livestock commodity groups to implement sustainable sourcing or environmental programs (i.e., proAction for dairy farmers) to increase consumer confidence.



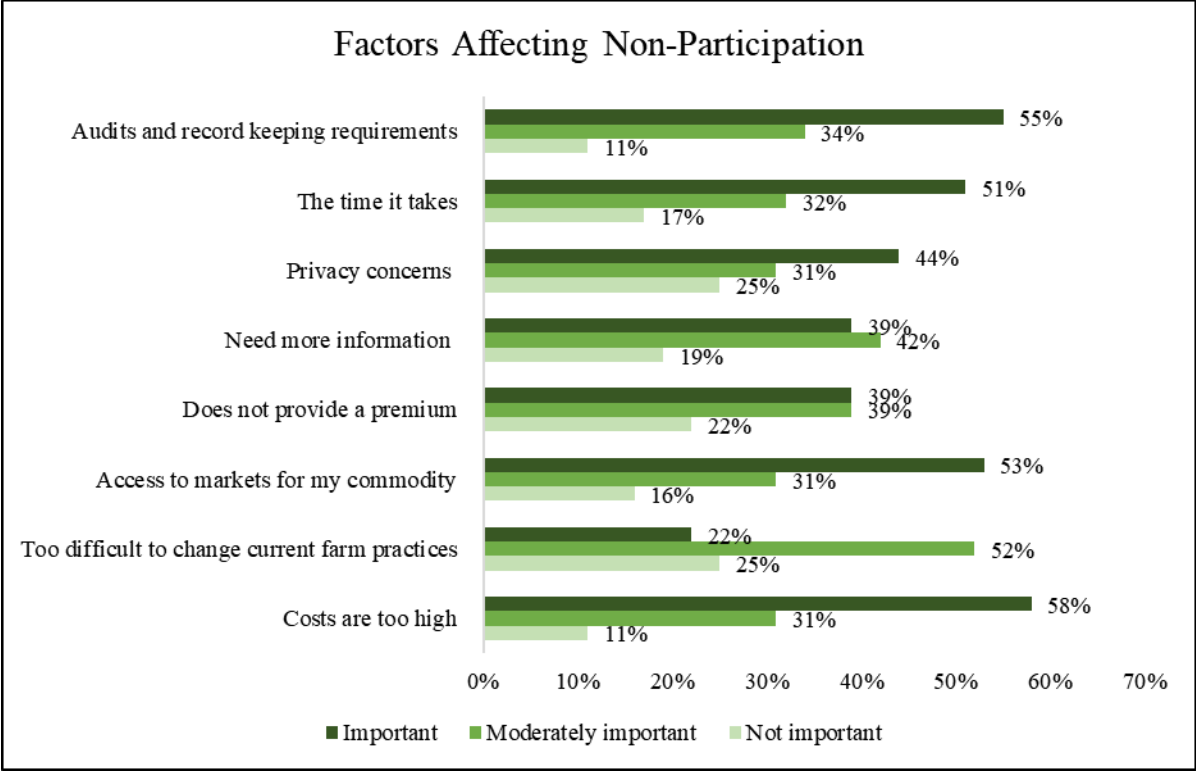
	Crop Producer			Livestock Producer			Mixed Producer		
	Not important	Moderately important	Important	Not important	Moderately important	Important	Not important	Moderately important	Important
Access to new markets	9%	26%	65%	18%	20%	62%	7%	26%	67%
Maintaining access to existing markets	10%	16%	74%	11%	17%	71%	7%	19%	74%
To receive a premium	23%	33%	44%	25%	38%	37%	35%	31%	34%
Receive recognition for stewardship practices	49%	29%	22%	43%	32%	25%	41%	16%	42%
Increase consumer confidence	15%	29%	56%	10%	19%	71%	14%	23%	63%
Increase public trust in the agriculture industry	13%	25%	62%	6%	13%	80%	20%	13%	67%
Industry setting their own standards	22%	40%	37%	13%	43%	44%	18%	58%	24%
Neighbours discuss benefits of programs	44%	34%	22%	45%	33%	22%	28%	33%	39%

### *Reasons for non-participation*

Respondents were also asked ‘Now, we would like to understand why someone may not participate in sustainable standards and sourcing programs. Please indicate how important the following barriers are in your opinion’. A five-point scale was used, again simplified to three categories: ‘not important’, ‘moderately important’, and ‘very important’.

Respondents highlighted the following as the most important reasons for non-participation: 1) costs are too high (58%); 2) audits and record keeping requirements (55%); 3) the time it takes (51%); and 4) access to markets for my commodity group (53%). Farmers are seemingly concerned with costs and additional time constraints that may stem from sustainable sourcing practices. Respondents were also torn regarding the importance of the difficulty they may face changing current farm practices to meet sustainability sourcing standards. 52% believe this was moderately important, yet 25% believed this was not important. The remaining statements received mixed opinions regarding their impacts on non-participation.





*Non-Participation Factors by Farm Type*

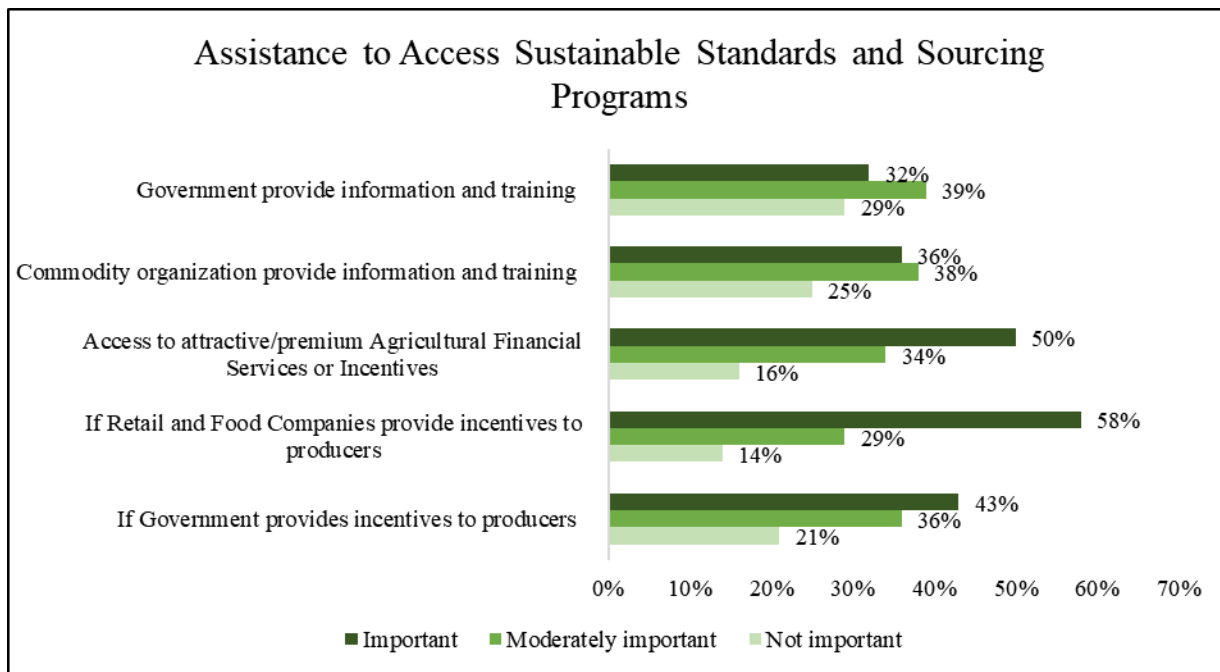
In general, there were no significant differences across livestock and crop producers. However, mixed producers were more likely to find an array of factors as more important towards non-participation. This may be reflective of mixed producers having to meet standards for both crop and livestock markets, adding an additional layer of difficulty transitioning towards sustainable sourcing management decisions.

	Crop Producer			Livestock Producer			Mixed Producer		
	Not important	Moderately important	Important	Not important	Moderately important	Important	Not important	Moderately important	Important
Costs are too high	9%	33%	58%	17%	22%	61%	7%	39%	54%
Too difficult to change current farm practices	24%	56%	20%	32%	46%	22%	20%	47%	33%
Access to markets for my commodity	13%	32%	55%	25%	30%	45%	11%	29%	60%
Does not provide a premium	20%	39%	42%	26%	42%	31%	27%	31%	42%
Need more information	17%	41%	43%	24%	45%	31%	19%	40%	41%
Privacy concerns	25%	31%	44%	29%	38%	32%	17%	19%	64%
The time it takes	12%	34%	54%	36%	23%	40%	4%	40%	56%
Audits and record keeping requirements	9%	38%	53%	22%	27%	51%	6%	30%	65%

### Factors that would assist producers in participating in sustainable sourcing

Lastly, producers were shown the following statement: ‘Which of the following factors would assist you in accessing sustainable standards and sourcing programs more readily. Please indicate how important the following facilitating factors are in your opinion.’ A five-point scale was used, again simplified to three categories: ‘not important’, ‘moderately important’, and ‘very important’.

Over half (58%) of producers find retail and food companies providing incentives as an important factor towards accessing sustainable sourcing programs. The second most important factor was access to premium agricultural financial services or incentives (50%), followed by the government providing incentives (43%). Many respondents likely attribute incentives as financial incentives, a commonly used economic tool to encourage the adoption of sustainable practices (Palm-Forster et al. 2017; Pannell 2008). Just over a third of respondents rated commodity organizations (36%) or the government (32%) providing information and training as important. Many researchers have argued financial incentives may not be the most efficient way to encourage adoption (Feather & Amacher 1994; Pannell 2008). Instead, improving producers’ information levels is more cost-effective. Finding producers value information and training is something to note going forward.



### Assistance for Sustainable Sourcing and Farm Type

Primarily crop producers were more likely to rank ‘access to attractive/premium agricultural financial services or incentives’ as an important factor for accessing sustainable sourcing. Meanwhile, mixed producers found ‘commodity organization provide information and training’ as an important component to accessing sustainable sourcing programs. Again, this likely reflects the nature of mixed producers’ operations, which requires knowledge across an array of farming practices.

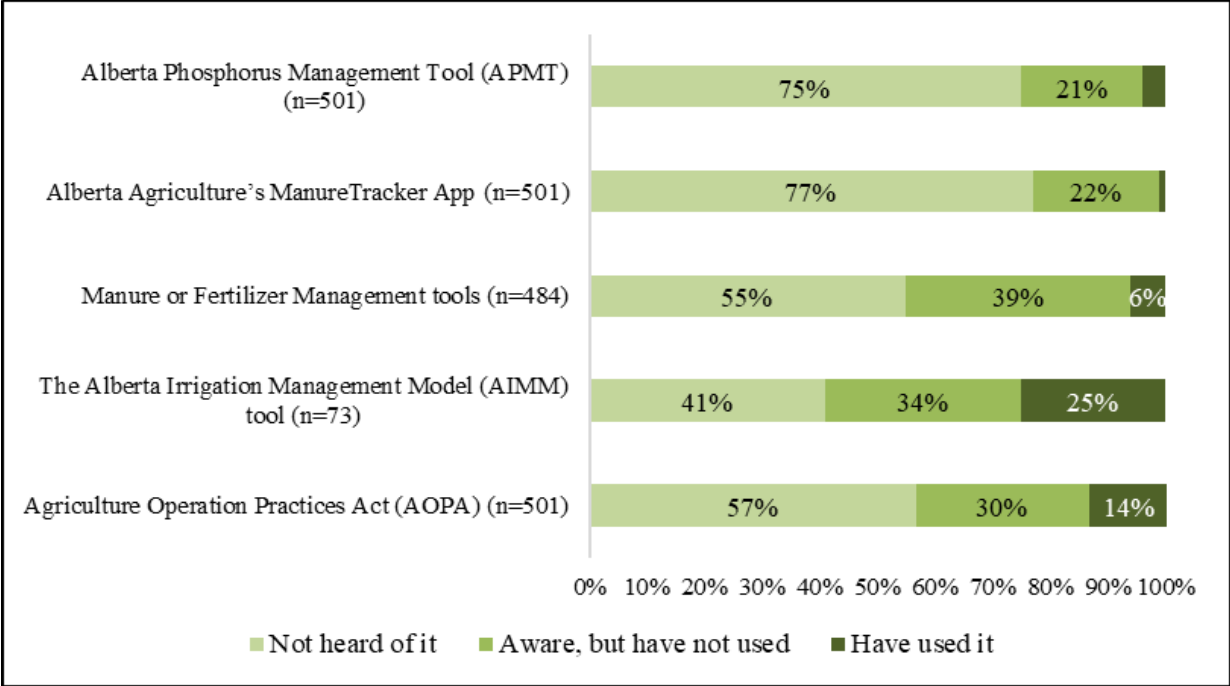
	Crop Producer			Livestock Producer			Mixed Producer		
	Not Important	Moderately Important	Important	Not Important	Moderately Important	Important	Not Important	Moderately Important	Important
If Government provides incentives to producers	18%	35%	47%	27%	39%	35%	21%	38%	41%
If Retail and Food Companies provide incentives to producers	11%	28%	61%	23%	33%	44%	10%	25%	65%
Access to attractive/premium Agricultural Financial Services or Incentives	15%	29%	56%	24%	40%	36%	6%	47%	47%
Commodity organization provide information and training	23%	41%	35%	32%	36%	32%	21%	32%	47%
Government provides information and training	28%	40%	32%	35%	31%	34%	23%	43%	34%

## Decisions Making Support Tools

Since 2016, respondents have been asked their awareness and usage of multiple decisions making support tools and resources. These tools and resources are specific to projects, programs and services delivered by the Natural Resource Management Branch (NRMB) at the Government of Alberta. These tools are presented under ESA risk areas, with many tools and resources being applicable to more than just one risk area. This is why the air quality risk area does not have its own section of decision-making support tools and/or resources. Prior surveys asked respondents if they had ‘used it,’ ‘considering using,’ ‘heard of but not considered,’ and ‘not heard of.’ The 2020 survey narrowed this to ‘have used it,’ ‘aware, but have not used,’ and ‘not heard of it.’ While most tools remained similar to the 2018 survey, the question was asked again in 2020 including some new resources and tools, including the removal of certain resources and tools. Tool and resource descriptions and access may be found in Appendix B.

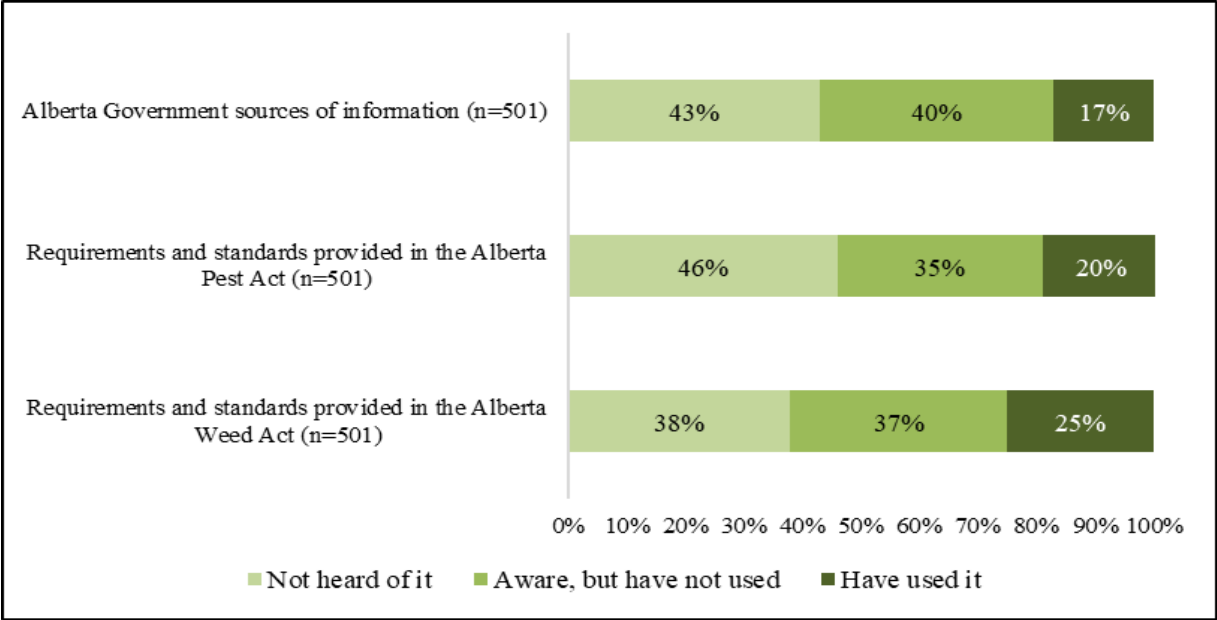
### *Water Quality Decision Support Tools*

The most used decision support tool under the water quality risk area is ‘The Alberta Irrigation Management Model (AIMM)’ with 25% of respondents indicating they have used this tool. It is important to note only a small sample (n=73) were asked this question, as only producers who irrigated their land were eligible to respond. The least used tool was Alberta Agriculture’s ManureTracker App, where 77% of respondents had not heard of it and only 1% of all respondents have used this tool.



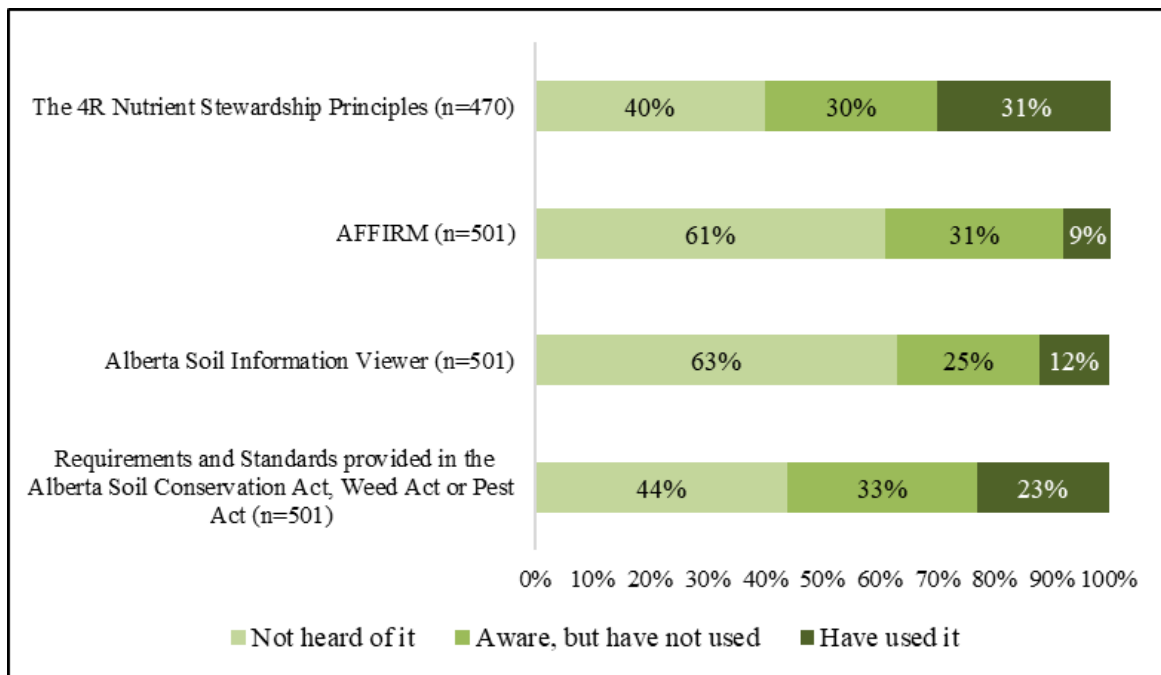
*Biodiversity Decision Support Tools*

For the three tools included under this risk area, responses were relatively similar. Roughly a third of respondents had heard of all three tools, meanwhile the most used was the ‘requirements and standards provided in Alberta Weed Act when making management decisions’ with a 25% use rate. Meanwhile, the use of Alberta government sources of information was the least used resource (17%). However, 40% were aware of this resource.



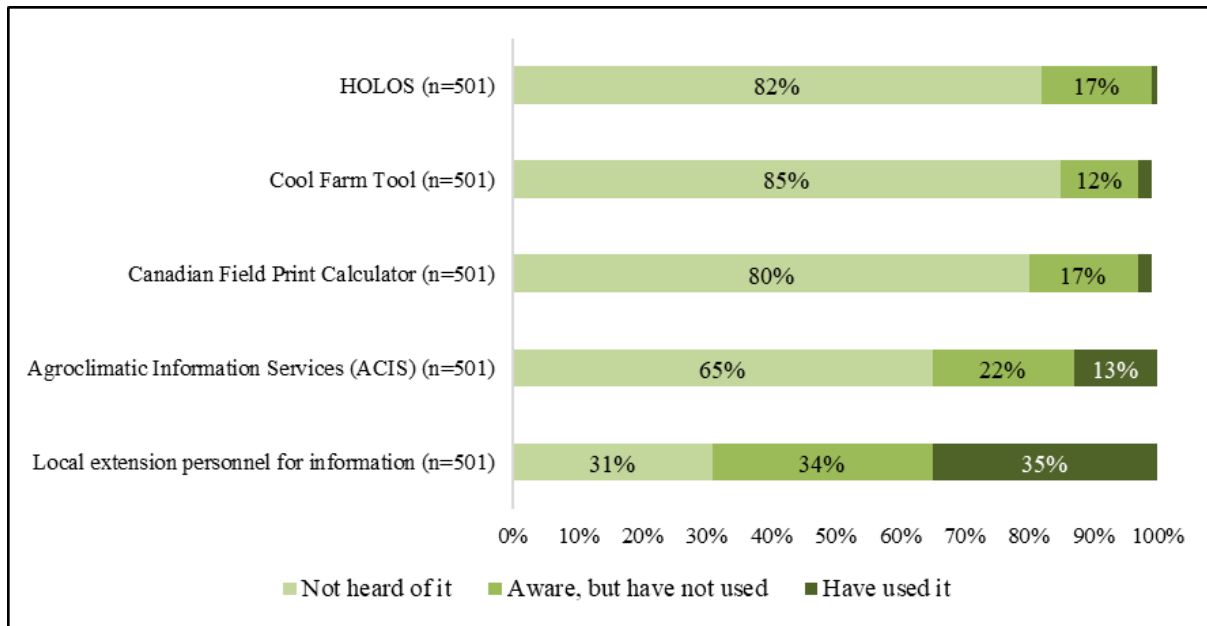
### Soil Health Decision Support Tools

The most used tool under the soil health risk area was the 4R Nutrient Stewardship Principles (31%), also known as ‘right source, right rate, right time, right place.’ The 4R principles are commonly promoted by commodity groups, extension personnel, and government sources, to ensure fertilizer efficiency while prompting increased yields. Both ‘The Alberta Farm Fertilizer Information and Recommendation Manager’ or AFFIRM, and the Alberta Soil Information Viewer were the least used tools, with over half of respondents not having heard of these resources. This may be related to their perceived complexity, as they are online mapping and calculation tools, or purely from a lack of awareness and information being provided to producers about their existence.



### General Decision Support Tools

General support tools and resources are applicable to all producers in Alberta. The most used resource is ‘local extension personnel for information,’ with 35% of respondents using this resource. Extension personnel are commonly used to relay scientific, government, or commodity group-specific information to farmers (Rollins et al. 2018; Boxall 2018). Dependent on the quality of information, extension personnel are a key source of information for programs and services that can aid producers in addressing on-farm environmental risks. The Canadian Field Print Calculator, Cool Farm Tool, and HOLOS (a whole farm greenhouse gas emissions calculator) were tools where the majority of respondents indicated they had not heard of it.



## Use of Decision Support Tools by Farm and Farmers Characteristics

### Decisions Support Tools Use by Region

The table below provides an overview of how varying tools and resources differ in use across regions. ↑ indicates an increase in use by at least 5%, whereas ↓ represents a decline in use by at least 5% from the mean.

	Mean Use	Central	Northeast	Northwest	Peace	South
Requirements and standards provided in the Alberta Soil Conservation Act, Weed Act or Pest Act	23%	26%	17%↓	16%↓	30%↑	27%
Alberta Soil Information Viewer	12%	15%	15%	5%↓	15%	13%
The Alberta Farm Fertilizer Information and Recommendation Manager (AFFIRM)	9%	6%	10%	7%	9%	15%↑
The 4R Nutrient Stewardship Principles	31%	31%	31%	29%	30%	33%
Requirements and standards provided in the Alberta Weed Act	25%	18%↓	32%↑	21%	35%↑	31%↑
Requirements and standards provided in the Alberta Pest Act	20%	17%	29%↑	14%↓	17%	25%↑
Alberta Government sources of information on current and new environmentally sustainable agricultural practices	17%	14%	18%	16%	18%	21%

Requirements and standards provided in the Agriculture Operation Practices Act (AOPA)	<b>14%</b>	17%	13%	10%	9%↓	15%
The Alberta Irrigation Management Model (AIMM)	<b>25%</b>	19%	0%	0%	0%	28%↑
Manure Management or Fertilizer Management decision support tools	<b>6%</b>	10%	5%	3%	2%	5%
Alberta Agriculture's ManureTracker App	<b>1%</b>	2%	0%	1%	0%	1%
Alberta Phosphorus Management Tool (APMT)	<b>4%</b>	5%	2%	1%	3%	8%
Local extension personnel for information or events	<b>35%</b>	40%	32%	24%↓	38%	38%
Agroclimatic Information Services (ACIS)	<b>13%</b>	17%	11%↓	7%↓	11%↓	18%
Canadian Field Print Calculator	<b>2%</b>	1%	1%	2%	7%	4%
Cool Farm Tool	<b>2%</b>	2%	2%	4%	3%	1%
HOLOS, the whole farm greenhouse gas emissions calculator	<b>1%</b>	1%	2%	2%	0%	1%

### Decision Support Tools Use by Characteristics

The table below provides an overview of how varying tools and resources differ in use across respondent characteristics. ↑ indicates an increase in use by at least 5%, whereas ↓ represents a decline in use by at least 5% from the mean.

	Mean Use	Degree		Conservation Training		EFP		GFR > \$250k		Land Ownership	
		Yes	No	Yes	No	Yes	No	Yes	No	Own Only	Rent & Own
Requirements and standards provided in the Alberta Soil Conservation Act, Weed Act or Pest Act	<b>23%</b>	37%↑	18%↓	51%↑	18%↓	30%↑	17%↓	25%	23%	21%	25%
Alberta Soil Information Viewer	<b>12%</b>	26%↑	7%↓	28%↑	9%	18%↑	8%	16%	11%	14%	11%
The Alberta Farm Fertilizer Information and Recommendation Manager (AFFIRM)	<b>9%</b>	20%↑	4%↓	21%↑	6%	13%	5%	12%	7%	9%	9%

The 4R Nutrient Stewardship Principles	<b>31%</b>	48%↑	23%↓	60%↑	25%↓	39%↑	22%↓	41%↑	25%↓	25%↓	35%
Requirements and standards provided in the Alberta Weed Act	<b>25%</b>	43%↑	18%↓	52%↑	20%↓	36%↑	16%↓	35%↑	20%↓	21%	28%
Requirements and standards provided in the Alberta Pest Act	<b>20%</b>	33%↑	14%↓	47%↑	14%↓	31%↑	10%↓	30%↑	14%↓	13%↓	24%
Alberta Government sources of information on current and new environmentally sustainable agricultural practices	<b>17%</b>	29%↑	12%↓	40%↑	13%	28%↑	7%↓	19%	16%	15%	18%
Requirements and standards provided in the Agriculture Operation Practices Act (AOPA)	<b>14%</b>	22%↑	10%	31%↑	10%	22%↑	6%↓	15%	13%	13%	14%
The Alberta Irrigation Management Model (AIMM)	<b>25%</b>	38%	11%	20%	27%	31%	17%	33%	12%	22%	28%
Manure Management or Fertilizer Management decision support tools	<b>6%</b>	9%	5%	14%↑	4%	8%	4%	11%↑	3%	5%	7%
Alberta Agriculture's ManureTracker App	<b>1%</b>	0%	1%	1%	1%	1%	1%	2%	0%	1%	1%
Alberta Phosphorus Management Tool (APMT)	<b>4%</b>	8%	2%	12%↑	2%	6%	2%	6%	3%	6%	2%
Local extension personnel for	<b>35%</b>	50%↑	28%↓	57%↑	30%↓	48%↑	23%↓	39%	32%↓	28%↓	39%



information or events											
Agroclimatic Information Services (ACIS)	<b>13%</b>	24%↑	8%↓	29%↑	10%↓	19%	7%↓	21%	9%↓	15%	12%↓
Canadian Field Print Calculator	<b>2%</b>	4%	2%	6%	2%	4%	1%	3%	2%	3%	2%
Cool Farm Tool	<b>2%</b>	3%	2%	5%	2%	3%	2%	3%	2%	1%	3%
HOLOS, the whole farm greenhouse gas emissions calculator	<b>1%</b>	1%	1%	5%	1%	2%	1%	2%	1%	1%	1%

## Appendix A: ESA Adoption Eligibility and Practice Adoption

An eligible practice for the base calculation was one where the respondent was asked the question, it was applicable to their operation, and was answered. Responses of “not applicable” or “don’t know” were excluded from the base calculation.

For example, the 2020 survey includes 7 practices for the Water Quality risk area which were included in the overall Water Quality ESA adoption score. One such practice is ‘Avoid applying close to waterways to minimize increased nutrient runoff.’

- All respondents (n=501) were asked: ‘In 2020, which of the following was applied to your land? (select all that apply)’
  - 81% applied commercial fertilizer, 37% applied solid manure, 6% applied liquid manure, 12% applied compost manure, 7% applied crop protection products, with 6% applying *none* of the above.
- Those who had applied solid manure, liquid manure or compost manure were then asked the following question: ‘Do you typically consider any of the following factors when applying either solid or liquid manure? (Select all that apply).’
  - 66% considered the distance between manure application and waterways, 56% considered the slope of the land, 40% considered application methods, and 25% considered *none of the above*.
  - Adoption was saying ‘yes’ (n=118) to any item, other than none of the above.
  - Eligible respondents were those who answered the question (n=235)
- Adoption of this practice is  $118/235=50\%$  as a raw score, once weighted, the score becomes 40% to reflect the true sample population.

Adoption of all 21 ESA practices were calculated for each risk area, as well as an overall ESA adoption score. In all cases (where applicable), the eligible base was defined as those respondents asked the question excluding "not applicable" and "don't know" responses. The table below provides a summary of all 20 ESA practices and the question(s) used to measure each practice, and how adoption was defined in the 2020 survey.

ESA Practice	Question	Adoption =
Water Quality (7 Practices)		
Control runoff from manure storage	Q40. Did you control runoff from all, some or none of your Manure Storage?	All or Some
Control runoff from livestock pens	Q40. Did you control runoff from all, some or none of your Livestock Pens?	All or Some
Choose wintering site to avoid manure contamination	Q41. Did you select the location of all, some or none of your in-field winter feeding and bedding sites to prevent runoff from manure entering natural water bodies or leaching into shallow groundwater or aquifers?	All or Some

Avoid applying manure or compost on frozen or snow-covered ground	Q42. Do you typically apply manure on frozen or snow-covered ground?	No
	Q42. Do you typically apply compost on frozen or snow-covered ground?	
Avoid storing manure near active water wells	Q43. Did you store manure within 100m of Active water wells?	No
Avoid applying close to waterways to minimize increased nutrient runoff	Q44. Do you typically take into account any of the following factors when applying either solid or liquid manure? Distance between manure applications and waterways – that is low lying paths where surface water collects and flows, slope of land, application method	Yes to any item
<b>Soil Health (5 Practices)</b>		
Used reduced tillage	Q18. Please indicate which of the following best describes how you seeded the majority of your crop acres in 2020.	The seeding operation into the stubble of the previous crop was the only tillage pass completed.
Use pulse crops in rotation	Q19. Did you use pulse crops in your cropping rotation in 2020?	Yes
Frequency of application	Q23. On the fields that you have manure applied, how frequently do these fields typically receive manure?	Once every two years, three years or less
Sampling and analyzing the manure for nutrient content	Q24. Do you typically apply manure – either solid or liquid, based on a soil or tissue test, manure nutrient test or book values?	Yes to soil or tissue test OR manure nutrient test OR book values
Manure application based on P or N&P	Q25. Are your manure application rates typically based on crop nitrogen requirements, crop phosphorus or neither?	Crop nitrogen or phosphorus requirements
<b>Biodiversity (5 Practices)</b>		
Protect riparian areas from grazing to prevent overuse	Q20. Which of the following do you typically do on your farm? Avoid or minimize grazing in riparian and/or bush areas in the late summer or autumn	Yes
Time grazing to avoid vulnerable times of the year for riparian areas	Q20. Which of the following do you typically do on your farm? Time the grazing of riparian areas to avoid grazing during spring and early summer	Yes
Retain bush or native grassland	Q22. Do you retain woodlands, bush or native grassland?	Yes
Avoid draining or filling in natural wetlands/sloughs	Q37. Did you drain or fill in natural wetlands or sloughs?	No
Manage grazing for wildlife habitat	Q38. In 2020, did you actively manage your livestock grazing land to create wildlife habitat, such as delaying	Yes

	grazing until after nesting, etc.?	
Air Quality (4 Practices)		
Apply chemical fertilizer at recommended rate	Q27. Did you apply commercial fertilizer based on the results of a soil or plant tissue test?	Yes
Incorporate manure after applying	Q33. Do you typically incorporate Solid manure with 24 hours, 48 hours or greater than 48 hours?	Within 24 or 48 hours
Trees for agricultural purposes	Q36. Have you planted trees on your farm in the past two years for agriculture purposes? (Examples; Shelterbelts/windbreaks, Wildlife habitat, soil conservation, odour control, etc.)	Yes

## Weighting

Region & Gross Farm Sales	# of 2016 Census Farms with \$10+ In Gross Farm Sales	2016 Census Distribution (Weights)	Survey Count Unweighted	Survey Distribution Unweighted	Weighting Factor	Survey Count Weighted
South \$10K to \$25k	557	0.016	2	0.004	4.0	8
South \$25k to <50K	591	0.017	2	0.004	4.0	8
South \$50K to <\$100K	718	0.021	5	0.010	2.0	10
South \$100K to <\$250K	1084	0.031	11	0.022	1.45	16
South \$250K to <\$500K	736	0.021	16	0.032	0.69	11
South \$500+	1481	0.042	64	0.128	0.33	21
<b>Total South</b>	<b>5167</b>	<b>0.148</b>	<b>100</b>	<b>0.20</b>	<b>0.74</b>	<b>74</b>
Central \$10K to \$25k	2119	0.061	0	0	30	30
Central \$25k to <50K	1829	0.052	3	0.006	8.67	26
Central \$50K to <\$100K	1998	0.057	6	0.012	4.83	29
Central \$100K to <\$250K	2644	0.076	15	0.030	2.53	38
Central \$250K to <\$500K	1754	0.076	21	0.042	1.19	25

Central \$500+	2554	0.073	80	0.160	0.46	37
<b>Total Central</b>	<b>12898</b>	<b>0.370</b>	<b>125</b>	<b>0.25</b>	<b>1.48</b>	<b>185</b>
Northeast \$10K to \$25k	954	0.027	4	0.008	3.5	14
Northeast \$25k to <50K	857	0.025	6	0.012	2	12
Northeast \$50K to <\$100K	911	0.026	9	0.018	1.44	13
Northeast \$100K to <\$250K	1141	0.033	15	0.030	1.07	16
Northeast \$250K to <\$500K	787	0.023	27	0.054	0.41	11
Northeast \$500+	991	0.023	40	0.080	0.35	14
<b>Total Northeast</b>	<b>5641</b>	<b>0.162</b>	<b>101</b>	<b>0.20</b>	<b>0.8</b>	<b>81</b>
Northwest \$10K to \$25k	1617	0.046	3	0.006	7.67	23
Northwest \$25k to <50K	1216	0.035	5	0.010	3.4	17
Northwest \$50K to <\$100K	1227	0.035	8	0.016	2.25	18
Northwest \$100K to <\$250K	1354	0.039	20	0.040	0.95	19
Northwest \$250K to <\$500K	688	0.020	25	0.050	0.4	10
Northwest \$500+	874	0.025	39	0.078	0.33	13
<b>Total Northwest</b>	<b>6976</b>	<b>0.200</b>	<b>100</b>	<b>0.20</b>	<b>1.0</b>	<b>100</b>

Peace \$10K to \$25k	761	0.022	4	0.008	2.75	11
Peace \$25k to <50K	669	0.019	6	0.012	1.67	10
Peace \$50K to <\$100K	661	0.019	10	0.020	0.90	9
Peace \$100K to <\$250K	661	0.024	7	0.014	1.71	12
Peace \$250K to <\$500K	538	0.015	14	0.028	0.57	8
Peace \$500+	701	0.020	34	0.068	0.29	10
<b>Total Peace</b>	<b>4171</b>	<b>0.120</b>	<b>75</b>	<b>0.15</b>	<b>0.8</b>	<b>60</b>
<b>Total</b>	<b>34,853</b>	<b>1.00</b>	<b>501</b>	<b>1.0</b>		<b>500</b>

## Appendix B: Decision Making Support Tools and Resources Description

Tool or Resource	Description	Access
Requirements and standards provided in the <i>Alberta Soil Conservation Act</i>	The Soil Conservation Act describes the requirement for landholders to prevent soil loss or deterioration from taking place or to stop loss or deterioration from continuing.	<a href="#">Soil Conservation Act</a>
Alberta Soil Information Viewer	The Soil Information Viewer assists land managers and producers in making general land management decisions. This resource tool allows users to query soil information from the Agricultural Region of Alberta Soil Inventory Database (AGRASID). AGRASID describes the distribution of soil types for the agricultural land base of Alberta.	<a href="#">Soil Information Viewer</a>
The Alberta Farm Fertilizer Information and Recommendation Manager (AFFIRM)	The Alberta Farm Fertilizer Information and Recommendation Manager (AFFIRM) Version 3.0 is a web-based decision support application. It helps land managers evaluate fertilizers and livestock manure management options and formulate a fertilizer program that fits within the farm budget.	<a href="#">Alberta Farm Fertilizer Information and Recommendation Manager</a>
The 4R Nutrient Stewardship Principles	Using the 4R Principles in fertilizer management includes considering the source, rate, time, and placement of fertilizer to improve agriculture productivity.	<a href="#">4R Nutrient Stewardship</a> (Information from Fertilizer Canada)
Requirements and standards provided in the <i>Alberta Weed Control Act</i>	The Weed Control Act enables the Minister's authority to declare noxious or prohibited noxious weeds that present significant economic, social, or ecological risks.	<a href="#">Alberta Weed Control Act</a>
Requirements and standards provided in the <i>Alberta Agricultural Pests Act</i>	The Agricultural Pests Act enables the Minister's authority to declare an animal, bird, insect, plant, or disease as a pest or nuisance if it is destroying, harming, or is likely to destroy or harm any land, livestock, or property in all or part of Alberta.	<a href="#">Agricultural Pests Act</a>
Alberta Government sources of information on current and new environmentally sustainable agricultural practices	A listing of programs and resources to help farmers, producers and operators practice sustainable agriculture. A listing of online calculators or download software or worksheets to help with decision-making.	<a href="#">Agriculture environmental stewardship</a> <a href="#">AFRED decision support tools</a>
Requirements and standards provided in the <i>Agriculture Operation Practices Act (AOPA)</i>	The <i>Agriculture Operation Practices Act (AOPA)</i> and its associated regulations apply to all agricultural operations in Alberta. The purpose of the Act is to ensure that the province's livestock industry can grow to meet the opportunities presented by local and world markets in an environmentally sustainable manner.	<a href="#">The Agricultural Operation Practices Act</a> <a href="#">Additional AOPA information</a>
The Alberta Irrigation	This software program helps irrigation producers with deciding their irrigation schedules as well as	<a href="#">The Alberta Irrigation Management Model</a>



Management Model (AIMM)	agronomic record keeping.	<a href="#">(AIMM)</a> <a href="#">Alberta Irrigation Management Manual</a>
Manure Management or Fertilizer Management decision support tools	Planning and management tools, calculators, and guides for operations in Alberta that produce, store or handle manure.	<a href="#">Various manure and fertilizer management tools and resources</a>
Alberta Agriculture's Manure Transportation Calculator/ ManureTracker App	The calculator can be used to determine the net cost of application and transportation for manure as a nutrient source. Users enter their information to generate an estimate of the net economic benefit gained from the manure application based on the nutrient requirements for each field and crop.	<a href="#">Manure Transportation Calculator</a> <a href="#">ManureTracker App</a>
Alberta Phosphorus Management Tool (APMT)	The APMT is a risk assessment tool designed to help producers make livestock and nutrient management decisions that will minimize environmental risk associated with the loss of phosphorus (P), and to maximize the benefits of manure and fertilizer nutrients.	<a href="#">Alberta Phosphorus Management Tool (APMT)</a>
Local extension personnel for information or events	Local boards work in their communities to manage weeds and pests, conserve soil and water, and support sustainable agricultural practices.	<a href="#">Agriculture Service Board Program</a>
Agroclimatic Information Services (ACIS)	An interactive tool that helps producers, farm consultants, and researchers to see Alberta weather forecasts, browse over 10000 maps of Alberta weather and Alberta climate related information, and access near real time station data from over 350 meteorological stations operating in the province of Alberta. The maps and weather data describe Alberta's weather, climate and related agriculture features to help with your long-term planning and decision-making throughout the growing season.	<a href="#">Alberta Climate Information Services</a>
Canadian Field Print Calculator	The Canadian Field Print Calculator lets individual growers document that their production practices are appropriate and sustainable.	<a href="#">Canadian Field Print Calculator</a>
Cool Farm Tool	An on-line greenhouse gas, water, and biodiversity calculator for farmers	<a href="#">Cool Farm Tool</a>
HOLOS, the whole farm greenhouse gas emissions calculator	Holos is a whole-farm model and software program that estimates greenhouse gas (GHG) emissions based on information entered for individual farms. The main purpose of Holos is to test possible ways of reducing GHG emissions from farms and is available at no cost to users.	<a href="#">HOLOS</a>

**Appendix C: 2021 ESATS On-Line Survey Questionnaire**

Below is a copy of the 2021 ESAT survey for online participants. Phone respondents answered all the same questions **except** section 2, the vignette experiment.

**2021 Environmentally Sustainable Agriculture Tracking Survey (on-line)**

S2. Do you currently own or rent your farmland or both?

- Own land only
- Rented land only
- Both own and rented land
- Don't know

S3. What was your gross farm revenue in 2020?

- Under \$10,000
- \$10,000 to under \$25,000
- \$25,000 to under \$50,000
- \$50,000 to under \$100,000
- \$100,000 to under \$250,000
- \$250,000 to under \$500,000
- \$500,000 to under \$1,000,000
- \$1,000,000 to under \$2,000,000
- \$2,000,000 or more
- Don't know

S4. In order to ensure we have representation from all regions of the province, could you please select in which [IF IN AB INSERT "County or Municipal District" the majority of your farm is located.

- |                     |                             |  |
|---------------------|-----------------------------|--|
| Acadia, M.D. of     | Lacombe County              | Starland County                          |
| Athabasca County    | Lamont County               | Stettler, County of                      |
| Barrhead, County of | Leduc County                | Strathcona County                        |
| Beaver County       | Lesser Slave River, M.D. of | Sturgeon County                          |
| Big Lakes, M.D. of  | Lethbridge, County of       | Taber, M.D. of                           |
| Bighorn, M.D. of    | MacKenzie, M.D. of          | Thorhild, County of Two Hills, County of |
| Birch Hills County  | Medicine Hat                | Vermilion River, County of               |
| Bonnyville, M.D. of | Minburn, County of          | Vulcan County                            |
| Brazeau County      | Mountain View County        | Wainwright , M.D. of                     |
| Camrose County      | Newell, County of           | Warner, County of                        |
| Calgary             | Northern Lights, County of  | Westlock County                          |
| Cardston County     | Northern Sunrise County     |  |



Clear Hills County	Opportunity, M.D. of	Wetaskiwin, County of
Clearwater County Consort	Paintearth, County of	Wheatland County
Cypress County	Parkland County	Willow Creek, M.D. of
Edmonton	Peace, M.D. of / Peace River	Wood Buffalo, Regional Municipality of
Fairview, M.D. of	Pincher Creek, M.D. of	Woodlands County
Flagstaff County	Ponoka County	Yellowhead County
Foothills, M.D. of	Provost, M.D. of	None of the above
Fort McMurray	Ranchland, M.D. of	Don't know
Forty Mile, County of	Red Deer County	
Grande Prairie, County of	Rocky View County	
Greenview, M.D. of	Saddle Hills County	
Hanna	Smoky Lake County	
Kneehill County	Smoky River, M.D. of	
Lac La Biche County	Spirit River, M.D. of	
Lac Ste. Anne County	St. Paul, County of	

In this first section, we will ask you questions about your farm operation and production system

1. In 2020, did the area you farmed include acres in any of the following? (Please select all that apply). **Note:** 'Area you farmed' includes both land that is owned, as well as land that was rented from someone else

- Crop production
- Summerfallow
- Forages or hay
- Improved land used for pasture or grazing
- Undisturbed wetlands
- Unimproved land in bush, native grasses, etc.
- Anything else (please specify)
- None of the above

*[ASK Q2 IF EITHER CROP PRODUCTION OR SUMMERFALLOW SELECTED IN Q1]*

2. Approximately how many acres of cropland seeded to annual crops did you have on your farm in 2020?

*[ASK Q3 IF “FORAGES OR HAY” OR “IMPROVED LAND” OR “UNDISTURBED WETLANDS” OR “UNIMPROVED LAND IN BUSH” SELECTED IN Q1]*

3. Approximately how many acres of perennial cover did you have on your farm in 2020?

*[ASK Q4 IF CROP PRODUCTION SELECTED IN Q1]*

4. Did you have any irrigated cropland last year?

Yes

No

*[ASK Q5 IF “FORAGES OR HAY” OR “IMPROVED LAND USED FOR PASTURE OR GRAZING” SELECTED IN Q1]*

5. Did you have any irrigated pasture, forages or hay last year?

Yes

No

6. Has the percentage of acres in summerfallow on your farm increased, decreased, or remained the same in the past two years?

Increased

Remained the same/ had none

Decreased

7. Thinking about your total farm area, has the percentage of acres in unimproved land increased, decreased or remained the same in the past two years? **Note:** By unimproved land, we mean land not under production, excluding summerfallow.

Increased

Remained the same/ had none

Decreased

8. In 2020, did you have any of the following?

Beef cattle

Dairy cattle

Pigs

Broiler chickens

Layer chickens

Turkeys

Sheep or lambs

Horses

Bison

Any other livestock

None of the above

*[IF NONE OF THE ABOVE IN Q8, SKIP TO INSTRUCTION BEFORE Q11]*

9. Do you graze any livestock on land you own or rent?

Yes

No

*[ASK Q10 IF YES TO BEEF CATTLE OR BISON IN Q8, OTHERWISE SKIP TO Q11.]*

10. Do you operate a feedlot?

Yes

No

*[ASK Q11 IF "CROP PRODUCTION" OR "FORAGES OR HAY" SELECTED IN Q1 AND YES TO ANY ITEM IN Q8.]*

11. Was the main source of your gross farm revenue in 2020...

Crops

Livestock

Equal mix of both

12. In 2020, which of the following was applied to your land? (select all that apply)

Commercial fertilizers

Solid manure

Liquid manure

Compost manure – that is, manure that is actively managed, not manure that has been piled and left

Crop protection products such as herbicides, insecticides and fungicides

None of the above

*[ASK Q13 IF YES TO SOLID MANURE OR LIQUID MANURE OR COMPOST IN Q12]*

13. Did you have any custom manure application in 2020?

Yes

No

14. Which of the following types of manure did you store on your farm last year?

Solid manure

Liquid manure

Compost manure

None of the above

15. Are there any natural rivers, streams, wetlands or sloughs on the property that you farm?

Yes

No

*[ASK Q16 IF YES TO Q15]*

16. Do you have any drained wetlands or sloughs on your land?

Yes

No

***[SECTION 2: VIGNETTE EXPERIMENT]***

***[SECTION 3 - SOIL QUALITY]***

In this section, we will ask you questions about your land use and soil management

*[IF CROP PRODUCTION OR SUMMERFALLOW SELECTED IN Q1 CONTINUE OTHERWISE SKIP TO Q20]*

18. Please indicate which of the following best describes how you seeded the majority of your crop acres in 2020.

Direct seeding into the stubble of the previous crop (this may include use of harrows)

Minimum till with one tillage pass, completed either in the spring or fall prior to seeding

Seeding with two or more tillage passes were completed either in the spring or fall prior to seeding

19. Did you use any of the following in your cropping rotation in 2020? (Select all that apply)

Perennial forages

Pulse crops

Winter cereals

None of the above

*[IF YES TO Q9 CONTINUE OTHERWISE SKIP TO Q22]*

20. Which, if any, of the following do you typically do on your farm?

Annually consider or adjust your stocking rate to balance livestock forage demand with the available forage supply

Rotate use of your pastures as part of your grazing management

Avoid or minimize grazing in riparian and/or bush areas in the late summer or autumn

Move livestock away from riparian areas using tools and methods such as salt blocks, windbreaks and herding

Time the grazing of riparian areas to avoid grazing during spring and early summer

Manage native rangelands – that is, those lands on which the vegetation is mostly native grasses in a way that improves rangeland health and/or biodiversity (e.g., allowing adequate rest throughout the growing season, timing grazing to avoid impacting species at risk, controlling invasive species, avoiding overutilization).

None of the above

*[IF SELECTED MANAGE NATIVE RANGELANDS IN Q20 CONTINUE OTHERWISE SKIP TO Q22]*

21. On your farm do you typically time the grazing of native rangelands  
Yes  
No

22. Do you retain woodlands, bush or native grassland?  
Yes  
No  
Not applicable – my farm does not have woodlands, bush or native grassland

*[IF ANY OF SOLID MANURE, LIQUID MANURE OR COMPOST MANURE  
SELECTED IN Q12 CONTINUE OTHERWISE SKIP TO Q24]*

23. On the fields that you have manure applied, how frequently do these fields typically receive manure?  
One or more times a year  
Once every two years  
Once every three years  
Less frequently than once every three years

*[ASK Q24 IF YES TO COMPOST, SOLID MANURE OR LIQUID MANURE IN Q12]*

24. Do you typically apply any of the following based on a soil or tissue test, manure nutrient test or book values? (select all that apply)  
Compost *[INSERT IF YES TO COMPOST IN Q12]*  
Manure – either, solid or liquid *[INSERT IF YES TO SOLID OR LIQUID MANURE IN Q12]*  
*[DOWN SIDE – DO NOT RANDOMIZE]*  
Soil or tissue test  
Manure nutrient test  
Book values  
None of the above

*[ASK Q25 IF YES TO COMPOST, SOLID MANURE OR LIQUID MANURE IN Q12]*

25. Are your manure application rates typically based on crop nitrogen requirements, crop phosphorus requirements or neither? (Please select one response – the best one that applies) *[ACCEPT ONE RESPONSE ONLY]*  
Crop nitrogen requirements  
Crop phosphorus requirements  
Neither

26. For each of the following, please indicate how familiar you are with these resources or if you've used any of them to help you make soil quality related management decisions.

*[ACROSS TOP]*

You have not heard of it

You are aware, but have not used it

You have used it

*[DOWN SIDE - RANDOMIZE ORDER]*

Requirements and standards provided in the Alberta Soil Conservation Act, Weed Act or Pest Act when making management decisions.

Alberta Soil Information Viewer for soil information and planning

The Alberta Farm Fertilizer Information and Recommendation Manager (AFFIRM)

The 4R Nutrient Stewardship Principles when applying manure or fertilizer on your farm (the 4R's are defined as: the right product, at the right rate, right time and right place)

#### ***[SECTION 4: AIR QUALITY]***

In this section, we will ask you questions about fertilizer and manure management.

*[IF COMMERCIAL FERTILIZER SELECTED IN Q12 CONTINUE OTHERWISE SKIP TO Q32]*

27. Did you apply commercial fertilizer based on the results of a soil or plant tissue test?

Yes

No

Sometimes

28. Thinking about the total amount of commercial fertilizer you applied or had applied in 2020,

about what percentage was applied in each of the following?

Spring

Fall

Other time of year

29. Which of the following application methods were used for the fertilizer you applied or had applied in 2020? (Select all that apply)

Banded

Broadcast and incorporated

Broadcast but not incorporated

In furrow with the seed

Fertigation (injection of fertilizer into an irrigation system)

Other (Please specify)

30. Did you use any Nitrogen Use Efficiency products in 2020, for example, products such as ESN, Super U, Urea with Agrotain, Anhydrous Ammonia with N-serve, etc. – that is, products that are nitrogen inhibitors or stabilizers that reduce nitrogen loss?

Yes

No



*[IF YES IN Q30 CONTINUE OTHERWISE SKIP TO Q32]*

31. Of all the acres that you could use Nitrogen Use Efficiency products on, on your operation, what percentage of your acres are you using them on currently?

*[IF ANY OF LIQUID MANURE, SOLID MANURE OR COMPOST MANURE SELECTED IN Q12 CONTINUE OTHERWISE SKIP TO Q34]*

32. On annually cropped fields that are not direct seeded, do you typically incorporate ...?

*[DOWN SIDE]*

Solid manure  
Compost manure  
Liquid manure

*[ACROSS TOP]*

Yes  
No

*[ASK Q33 IF YES TO ANY ITEM IN Q32]*

33. How long after seeding do you typically incorporate each of the following?

*[DOWN SIDE]*

Solid manure *[INSERT IF YES TO SOLID MANURE IN Q32]*  
Compost manure *[INSERT IF YES TO COMPOST MANURE IN Q32]*  
Liquid manure *[INSERT IF YES TO LIQUID MANURE IN Q32]*

*[ACROSS TOP]*

Within 24 hours  
Within 48 hours  
Greater than 48 hours

*[ASK Q34 IF YES TO LIQUID MANURE IN Q12, OTHERWISE SKIP TO Q35]*

34. Thinking about liquid manure, do you typically...? (Please select one response)

Inject – that is, shank or disc – the manure into the ground  
Broadcast the liquid manure with no incorporation – incorporation means cultivation, discing or harrowed after application  
Broadcast with incorporation within 24 hours after application  
Broadcast with incorporation within 48 hours after application, OR  
Broadcast with incorporation greater than 48 hours after application

*[IF RESPONDENT FROM SK ASK Q35 OTHERWISE SKIP TO Q36]*

35. Do you produce grid-connected electricity using any of the following sources of renewable energy (excluding electrical company leases)?

Solar panels, not counting for water pumping or electric fencing

Wind turbine generator on a tower  
Biogas generator using farm waste

Yes  
No

36. Have you planted trees on your farm in the past two years for agriculture purposes?  
(Examples; Shelterbelts/windbreaks, Wildlife habitat, soil conservation, odour control,  
etc.)

Yes  
No

### ***[SECTION 5: BIODIVERSITY]***

In this section, we will ask you questions about natural habitat and biodiversity management on the land you farm.

37. Did you drain or fill in any natural wetlands or sloughs since 2018?

Yes  
No

*[ASK Q38 IF YES TO Q9]*

38. In 2020, did you actively manage your livestock grazing land to create wildlife habitat, such as delaying grazing until after nesting, etc.?

Yes  
No

39. For each of the following, please indicate which statement best describes how familiar you are with these resources or if you've used any of them to help you make biodiversity related management decisions.

Requirements and standards provided in the Alberta Weed Act when making management decisions.

Requirements and standards provided in the Alberta Pest Act when making management decisions.

Alberta Government sources of information on current and new environmentally sustainable agricultural practices

*[ACROSS TOP]*

You have not heard of it

You are aware, but have not used it

You have used it

### ***[SECTION 6: WATER QUALITY]***

In this section, we will ask you questions about your manure management

*[ASK Q40 IF ANY ITEM OTHER THAN NONE OF THE ABOVE SELECTED IN Q8 OR ANY ITEM OTHER THAN NONE OF THE ABOVE SELECTED IN Q14, OTHERWISE SKIP TO Q41]*

40. Did you control runoff from all, some or none of if each of the following on your farm

*[DOWN SIDE]*

Manure storage

Livestock pens

Silage piles, pits or bunkers

*[ACROSS TOP]*

All

Some

None

Not applicable – do not have this

*[ASK Q41 IF YES TO Q9 AND YES TO Q15]*

41. Did you select the location of all, some or none of your in-field winter feeding and bedding sites to prevent runoff from manure entering natural water bodies or leaching into shallow groundwater or aquifers?

All

Some

None

*[ASK Q42 IF SELECTED ANY OF LIQUID, SOLID OR COMPOST MANURE IN Q12]*

42. Do you typically need to apply any of the following on frozen or snow-covered ground?

Manure *[SHOW IF YES TO LIQUID OR SOLID MANURE IN Q12]*

Compost *[SHOW IF YES TO COMPOST IN Q12]*

Yes

No

*[ASK Q43 IF YES TO LIQUID, SOLID OR COMPOST MANURE IN Q14]*

43. Did you store manure within 100 meters of each of the following?

Active water wells

Abandoned, inactive or unused water wells that have not been properly plugged, or sealed

Yes

No

Not applicable – do not have this type of well.

*[ASK Q44 IF YES TO COMPOST MANURE SOLID MANURE OR LIQUID MANURE IN Q12]*

44. Do you typically consider any of the following factors when applying either solid or liquid manure? (Select all that apply)

Distance between manure application and waterways – that is, low lying paths where surface water collects and flows

Slope of land

Application method

None of the above

45. For each of the following, please indicate which statement best describes how familiar you are with these resources or if you've used any of them to help you make water quality related management decisions.

Requirements and standards provided in the Agriculture Operation Practices Act – AOPA when making management decisions.

The Alberta Irrigation Management Model (AIMM) tool when irrigating your crops  
Manure Management or Fertilizer Management decision support tools – for example, manure management planner, manure transportation calculator or ammonia loss calculator

Alberta Agriculture's ManureTracker App

Alberta Phosphorus Management Tool (APMT)

*[ACROSS TOP]*

You have not heard of it

You are aware, but have not used it

You have used it

46. For each of the following, please indicate which statement best describes how familiar you are with these resources or if you've used any of them to help you make general farm management decisions.

Local extension personnel for information or events – for example, local newsletters, workshops or tours

Agroclimatic Information Services – ACIS – website for weather information

Cool Farm Tool (both crop and livestock)

HOLOS, the whole farm greenhouse gas emissions calculator (both crop and livestock)

*[ACROSS TOP]*

You have not heard of it

You are aware, but have not used it

You have used it

### ***[SECTION 7: ENVIRONMENTAL FARM PLAN]***

This section is to better understand your opinions on the Environmental Farm Plan (EFP) process.

47: Please tell me which statement you think best describes the Environmental Farm Plan.

The EFP is a tool for identifying environmental risks on your farm  
The EFP gives farmers money to complete environmental projects on their land  
The EFP is required by some commodity organizations  
The EFP is only for large commercial farms  
The EFP helps farmers identify environmental risks and provides suggestions to mitigate them

48: Do you have an Environmental Farm Plan?

Yes

No

*[IF NO IN Q48 CONTINUE OTHERWISE SKIP TO Q51]*

49: What reason(s) made you not complete an EFP? Select all that apply.

Too time consuming

Privacy concerns

I do not think the EFP is useful for my operation

The EFP is a government program

I do not know what an EFP is

Not applicable to my operation

I prefer workshops, in person, or an EFP binders instead of online

None of the above

50. Would you consider completing an EFP in the future?

Yes

No

Don't Know

*[IF YES IN Q48 CONTINUE OTHERWISE SKIP TO NEXT SECTION Q55]*

51. Select all reasons for why you completed an Environmental Farm Plan.

To be eligible for government cost-share funding

Identify and address environmental risks on my farm

Reduce farm costs through improved operational efficiency

Promote Environmental stewardship on my farm

To meet Sustainable Sourcing Standards

Prepare farm for next generation

The EFP is something that my commodity organization requires me to do

For status and recognition (ex. Adding to business cards, product packaging)

Required by my financial organization and/or insurer

Other (please specify)

52: How did you learn about the Environmental Farm Plan? (Please select all that apply)

Government of Alberta / Alberta Agriculture, Forestry and Rural Economic Development website

Environmental Farm Plan technician

Neighbours and friends  
In person workshop  
Local municipal website or event  
Newspaper  
Social Media  
Market requirements  
From commodity organization(s)  
Local agriculture/producer organization  
None of the above

53: Have you made changes to your operation based on what you learned through completing an EFP?

Yes, I have made several changes  
Yes, I have made a few changes  
No, I did not make any changes  
Not Certain

54: Was the process valuable and did you learn something about environmental risks on your farm?

Yes  
No  
Prefer not to answer

## [SECTION 8 – SUSTAINABLE SOURCING]

In this section, we will ask for your opinion about Sustainable Sourcing Standards and about your approach to farming in general.

55. Sustainability standards are becoming more important to buyers across agri-food supply chains and increasingly influence production decisions of both livestock and crop producers.

We would like to better understand your thoughts and opinions on sustainability standards for sourcing agriculture products. For each of the following, please indicate how important each factor is towards motivating your participation.

*[ACROSS TOP]*

Not important at all  
Slightly important  
Moderately important  
Very important  
Extremely important

*[DOWNSIDE – RANDOMIZE]*

Access to new markets  
Maintaining access to existing markets  
To receive a premium  
Receive recognition for stewardship practices  
Increase consumer confidence

Increase public trust in the agriculture industry  
Industry setting their own standards  
Neighbours discuss benefits of programs  
Other (Specify)

56 Now, we would like to understand why someone may not participate in sustainable standards and sourcing programs. Please indicate how important the following barriers are in your opinion.

*[ACROSS TOP]*

Not important at all  
Slightly important  
Moderately important  
Very important  
Extremely important

*[DOWNSIDE – RANDOMIZE]*

Costs are too high  
Too difficult to change current farm practices  
Access to markets for my commodity  
Does not provide a premium  
Need more information  
Privacy concerns  
The time it takes  
Audits and record keeping requirements  
Other (Specify)

57. Which of the following factors would assist you in accessing sustainable standards and sourcing programs more readily. Please indicate how important the following facilitating factors are in your opinion.

*[ACROSS TOP]*

Not important at all  
Slightly important  
Moderately important  
Very important  
Extremely important

*[DOWNSIDE – RANDOMIZE]*

If Government provides incentives to producers  
If Retail and Food Companies provide incentives to producers  
Access to attractive/premium Agricultural Financial Services or Incentives  
Commodity organization provide information and training  
Government provide information and training  
Other (Specify)

***[SECTION 9 – ECONOMIC, CONSERVATION AND LIFESTYLE MEASURE]***

58. Please indicate your level of agreement with each of the following statements:

*[ACROSS TOP]*



Strongly disagree

Disagree

Neutral

Agree

Strongly Agree

[DOWNSIDE – RANDOMIZE]

Dollars and cents is what farming is all about

I view my farm as first and foremost a business enterprise

When planning future farming activities, I only focus on how profitable they will be

A maximum annual return from my property is my most important aim

Money and profit are not the most important things about farming

The lifestyle that comes with being on the farm is very important to me

Farming communities are a great place to live

I enjoy the peace and quiet that comes with farming

A rural environment is a great place to raise children

We do not make a fortune from farming, but the lifestyle is great

Good farmers regularly make land stewardship improvements to their land

The most important thing is leaving my property in better shape than I found it

Land stewardship by farmers is more important than anything else about farming

Managing environmental problems on my farm is a very high priority

I like to look after my land, making it work for me, without damaging it

### ***[SECTION 10 - RESPONDENT PROFILE]***

I just have a few final questions about you and your farm. Your responses will be used for classification purposes only and only aggregate results will be used for reporting purposes.

59. Have you attended a degree or diploma program, specifically in an agriculturally related area?

Yes

No

60. Have you attended any environmental agriculture training sessions in the past two years?

Yes

No

61. Which of the following best describes the current state of your farm operation?

I am just getting my farming operation established

I am maintaining my farming operation at a steady level

I am expanding my farming operation

I have started to reduce or scale down my farming operation

I plan to sell my farming operation

62. What is your age?



18 to 24  
25 to 34  
35 to 44  
45 to 54  
55 to 64  
65 to 74  
75 or older  
Decline to respond

63. At any time, have you received funding or payments to introduce more sustainable practices on your land (for example, introducing wetlands on your land, riparian fencing) from any of the following sources? (Select all that apply)

Ducks Unlimited

Alternative Land Use Sources (ALUS)

Alberta Agriculture, Forestry and Rural Economic Development (AFRED)/Government of Alberta

Your local municipality or county

Alberta Conservation Association (ACA)

Other Environmental Organization

None of the above

“That is all of the questions we have for you today. Thank you very much for your time.”]

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