U.S. FARMERS' VALUES ASSOCIATED WITH POTENTIAL TO ADOPT BEST MANAGEMENT PRACTICES AND IMPACT OF SOCIO-PSYCHOLOGICAL DEVELOPMENT ON DECISION-MAKING PROCESSES

A Dissertation

by

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ABSTRACT

United States (U.S.) farmers are working to increase agricultural yield production to meet commodity demands, while considering the environmental impacts of their management practices. To reduce agricultural environmental impacts, farmers can implement agricultural best management practices (BMPs). While governmental programs can offer incentives, they often do not provide sufficient financial security for implementing and managing the practices. Therefore, farmers might be motivated to adopt best management practices because of personal benefits. One source of motivation could be internal, such as values and beliefs an individual has about the environment. This study identified U.S. farmers' personal values associated with their potential to adopt best management practices and explored their socio-psychological development associated with farm life on their decision-making process. Using a convergent mixed-methods design, quantitative survey data was collected from 67 farmers, and qualitative interview data was collected from eight farmers in the Pacific Northwest.

Quantitative results showed that the values *universalism* and *security* had positive influence on farmers' potential to adopt best management practices, where the value of *power* had a negative influence. The *universalism* value was present in the qualitative interviews in that participants felt pride in taking care of the environment by implementing minimal to no tillage practices. Overarching themes revealed in the qualitative data included diversity in farming, proving oneself, family experiences on the farm, finances impacting decision-making, and the importance of conveying land to someone who will take care of the environment.

Findings from this study can serve as a foundation for future research related to the impact that values can have on farmers' decision-making processes. Based on the results of this

study, it is recommended that additional research be conducted to examine the dynamics of spousal contribution to farm decisions. It is also recommended that children be introduced to the positive impacts BMPs can have on the environment to establish values associated with positive environmental behavior and that Cooperative Extension agencies educate farmers on the financial and familial dynamics of adopting BMPs. By understanding values we can instill positive environmental stewardship in the next generation of landowners, ultimately impacting agricultural commodity production and the environment.

DEDICATION

I dedicate this document to my family. To my parents, Rob and Susan, who have supported me, even when they did not understand what I was learning about or working towards. They knew it was important and meant a great deal to me, and that is all they needed to be proud of me. To my brothers, Travis and Jake, who secretly think I'm super cool. Whom by the way, have to call me Dr. Dewald. To my nephew, Russell, who always asked why I was still in school and if he had to go to school for just as long as me, and who always reminded me that Sandy from Sponge Bob was also from Texas.

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My family has taught me to keep working hard and never settle for anything less. Being content and happy with average should never make a person happy. Striving to do something better or more efficiently should always be the goal. I have cursed my Dewald genes often during graduate school, as my hard-headedness made me more frustrated than accomplished. However, those genes also got me to where I am today, and therefore, I greatly appreciate my determination and perseverance.

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TABLE OF CONTENTS

Page

LIST OF FIGURES

Page

LIST OF TABLES

Page

CHAPTER I

INTRODUCTION

Background

The demand for food and fiber products from the agriculture industry is continuing to grow. In fact, agricultural commodity crop yields across the world, need to double by 2050 to meet the demands of the human population (Deepak, Mueller, West, & Foley, 2013). A more recent analysis has projected a deficit in food commodity availability by 2027. Menker predicted that the demand for food commodities would surpass the world's ability to produce food, creating a 214-trillion calorie shortage (as cited in Henderson, 2018). In addition, the 2019 political tariff war on U.S goods has greatly impacted U.S. farmers who wish to purchase steel and aluminum products (e.g., farm equipment, grain bins) affected by tariff burdens (Paschal, 2019). This makes it difficult for farmers to repair or purchase new equipment to increase farm efficiency and meet commodity production demands. In addition, Chinese tariffs on U.S. agricultural commodities lead to economic loss for many U.S. farmers (National Association of Wheat Growers, 2019). With that, the market price of agricultural commodities fluctuates with the increase in tariffs (Good, 2018), leaving farmers to sell grain at less than ideal market prices, ultimately affecting their earned income.

Not only are farmers being pressured to meet production demands and work through tariffs, but they are trying to produce commodities on smaller land parcels. In particular, the amount of agriculture land has decreased over time—"from 63 percent in 1949 to 51 percent in 2007" (Nickerson & Borchers, 2012, para. 3). Specifically, "in 2007, 408 million acres of agricultural land were in cropland (down 17 percent from 1949), 614 million acres were in

pasture and range (down 3 percent), 127 million acres were in grazed forestland (down 52 percent), and 12 million acres were in farmsteads and farm roads (down 19 percent)" (Nickerson & Borchers, 2012, para. 4). This change in land use and landscape (e.g., growth in suburban developments) has also had economic and environmental impacts on agricultural land (Bigelow & Borchers, 2017). Paradoxically, agricultural land use had steadily declined over the years, despite the demand for greater commodity production to feed the growing human population.

Not only are farmland resources declining in quantity, but also in quality. It is hypothesized that agricultural production land will fail to meet the demands of commodity needs due to the decline in healthy energy, land, water, and climate resources (Crosson, 2016). These unhealthy environmental land and water resources can be caused by nonpoint source pollution. Pollution of this type can include mismanaged animal feeding operations, overgrazing, pesticide and fertilizer application, and extensive plowing (Centers for Disease Control and Prevention, 2016). The U.S. Environmental Protection Agency ([EPA] 2017) stated:

> The National Water Quality Assessment shows that agricultural nonpoint source (NPS) pollution is the leading source of water quality impacts on surveyed rivers and streams, the third largest source for lakes, the second largest source of impairments to wetlands, and a major contributor to contamination of surveyed estuaries and ground water. (para. 2)

The potentially negative impact agricultural production has on polluting waterways is noteworthy. However, the Environmental Protection Agency also explained the reason for agriculture having a negative impact on waterways is because of an absence of conservation plans and efforts to reduce nonpoint source pollution runoff (EPA, 2017).

One way that farmers can reduce their nonpoint source pollution is through the implementation of conservation plans, that allow them to meet commodity production demands (Beddington et al., 2012). Conservation plans are also known as Best Management Practices (BMPs). BMPs are defined as profitable methods of managing land to reduce negative environmental impacts and can be considered a program, operating system, device, etc. that can prevent or reduce nonpoint source pollution, and is backed by scientific data (United States Department of Agriculture-Natural Resources Conservation Service, [USDA-NRCS] n.d.a). BMPs can include buffer/filter strips, soil testing, proper manure fertilization, prescribed grazing, critical area plantings, precision agricultural practices, and no-till management (USDA-NRCS, n.d.b; Pennington, n.d.). BMPs should be implemented to reduce long-term negative impacts on the environment (Sharpley et al., 2006).

Although BMPs can be effective in providing a positive impact on the environment, such technologies and practices are implemented only if the farmer chooses to do so. One way to encourage BMP adoption is through incentive programs. Incentive or cost-share programs compensate farmers for implementing BMPs, such as Natural Resources Conservation Service's (NRCS) Environmental Quality Incentives Program (EQIP) (USDA-NRCS-Environmental Quality Incentives Program, 2018). This program can offer a personalized land management plan and limited financial compensation to cover the cost of implementing BMPs (e.g., cover crops, grazing management plans, precision agriculture technology). Researchers from the U.S. Department of Agriculture's Economic Research Service (USDA-ERS) stated:

> The EQIP awards cost-share funding to farmers who voluntarily adopt soil conservation practices. The top five conservation practices awarded funding through EQIP since 1998 have been: cover crops, conservation tillage/residue management, conservation crop

> rotation, terraces, and nutrient management. (Marshall, Maguire, Hellerstein, & Schimmelpfennig, 2019, para. 3)

In fact, farmers who participated in the EQIP program have dramatically decreased soil erosion. "Between 1982 and 2012, soil erosion declined on cultivated cropland by 45 percent, in part due to expanded adoption of soil conservation practices" (Marshall et al., 2019, para. 3).

While these programs provide some compensation for implementing the practice, often, these programs do not provide enough economic security for purchasing equipment and maintaining the BMPs. Similarly, farmers may not see an instant positive economic return within the first two of years of implementing, all of which can be barriers to adopting BMPs (Baumgart-Getz, Prokopy, & Floress, 2012; Rodriguez, Molnar, Fazio, Sydnor, & Lowe, 2009). The amount of payment to the landowner is determined by the current costs of material and labor and marketplace compensation for each state (USDA-NRCS, n.d.c). Therefore, although there is an opportunity for payment when implementing BMPs through incentive programs, there are also regulations and limited funding that may limit enrollment. This idea of weighing the benefits, financial compensation, and complexity of implementing BMPs has also been studied in Belgium (Van Herzele et al., 2013). The complexity of the practice, the environmental effects, and how it can impact their production, in relation to the monetary costs and pay, were shown to have a heavy influence on the farmers' reasoning to adopt (Van Herzele et al., 2013).

Farmers often make the decision to adopt BMPs, despite limited financial incentives. Their decision to adopt has been shown to be driven by various factors, other than a monetary gain. In fact, researchers at USDA-ERS noted:

> For any given conservation practice, some farmers and ranchers do not need incentives because adopting the practice provides enough on-farm, private benefits to justify its

> costs. In contrast, other farmers and ranchers are willing to adopt the practice only with financial assistance. In general, a mix of both types participate in conservation programs. (Wallander & Claassen, 2019, para. 2)

Personal or private benefits and financial gains can both be influential in encouraging adoption of BMPs. More specifically, USDA-ERS (Wallander & Claassen, 2019) identified that specific BMPs, such as conservation tillage, have higher contract completion rates, but also have low "additionality" (i.e., the adoption of practices because of financial incentives). This means that landowners who fully adopt conservation tillage practices are willing to do so because of personal benefits rather than because of receiving financial assistance.

USDA-ERS has attempted to identify why landowners might drop their incentive contract to implement BMPs. They found that BMPs that provide "low farm benefits are more likely to be dropped from EQIP contracts than practices with likely high benefits" (Wallander, Claassen, Hill, & Fooks, 2019, p. 2). They classify these reasons as either *unrevealed private benefits* or those benefits that are not directly observed by the NRCS staff, and *adaptive management* or a reaction to the need to change management because of circumstances beyond the control of the landowner (Wallander, Claassen, Hill, & Fooks, 2019). This implies that farmers might drop their contracts because the BMP provides them low farm benefits, that are private or unknown to the researchers, or the farmers have reasons that are outside of their control.

One way that farmers might identify whether they want to adopt a new idea is how relatable the new idea is to their current management. This is considered compatibility, which Rogers (2003) defined as, "the degree to which an innovation is perceived as consistent with existing values, past experiences, and needs of potential adopters" (p. 240). A farmer must

evaluate how he or she can implement the new idea compared to their current practices. In fact, the less landowners are able to connect with an idea, the less likely they are to adopt a practice (Reimer, Weinkauf, & Prokopy, 2012). The individual must weigh the benefits and drawbacks to implementing the new idea. They might evaluate the economical profitability, upkeep and management, and long-term impacts of the practice. Compatibility is an important concept for individuals to acknowledge when adopting new ideas; however, identifying how relatable the innovation is can elicit uncertainty.

Some farmers might identify and understand this state of uncertainty, which is known as cognitive dissonance (Festinger, 1957). This term refers to the uncomfortable tension of simultaneously debating conflicting thoughts. Individuals create this tension when they strongly believe in something; however, they cannot implement or behave in ways that align with their beliefs because of outside factors (e.g., financial, contextual, or regulatory factors). Being in a state of cognitive dissonance can be difficult for individuals, particularly farmers who want to implement change, yet, might not have the economic means to make a change.

Despite the barriers (e.g., how relatable the innovation is, cognitive uncertainties, and limited economic incentives or payback), adopting BMPs is voluntary, and therefore, the decision to seek more information is intentional. So, what motivates farmers to seek information and voluntarily adopt BMPs, despite the potential barriers? Why are some farmers willing to implement conservation practices regardless of the risk (e.g., loss of income)? How do they manage the decision-making process of adopting a management practice they believe is right, yet could bring financial uncertainty?

One source of motivation could be internal, such as planned behavior or values and beliefs an individual possesses. For example, when an individual finds an activity (e.g.,

implementing BMPs) that aligns with their personal values or goals, they might be more motivated to adopt the practice. In fact, Feather (1995) identified values as influential in the decision-making process. This suggests that values can play a specific role throughout the decision-making process, such as when farmers determine whether they should implement BMPs. More specifically, researchers in Western Australia (Price & Leviston, 2014), found farmers' context and socio-psychological factors are predictive of their behavior to adopt pro-environmental agricultural management practices, suggesting that an individual's contextual situation and their cognitive motivations are strongly influential in their decision to implement changes on their farm. This idea of socio-psychological factors being predictive in implementing practices is important to consider when studying why farmers adopt BMPs.

Statement of the Problem

There is a large body of literature documenting the examination of the adoption of agricultural practices (Baumgart-Getz et al., 2012); however, adoption is predominately viewed through the Theory of Planned Behavior (Ajzen, 1991) and Rogers' Diffusion of Innovations theory (2003). Limited research has been conducted through a socio-psychological lens to understand the cognitive influences on adopting BMPs. There is a gap in the literature related to understanding how values influence the adoption of BMPs and how the socio-psychological developmental factors contribute to decision-making among U.S. farmers. My study is unique in that it focused on the socio-psychological dimensions of decision-making among farmers. Although economic and financial factors are important when making decisions, this study specifically focused on the human emotional and psychological factors. In fact, values and motivations across multi-generation and first-generation farmers have been absent in the

literature (Inwood, Clark, & Bean, 2013). Additionally, "there is insufficient understanding of the factors that influence decision-making on small, diversified family farms, especially within specific regional contexts" (Grover & Gruver, 2017, p. 512). Furthermore, a holistic view of quantifying values and qualitatively exploring how management decisions are made among U.S. farmers has been absent, resulting in the need to explore and document this topic.

Purpose of Study

The purpose of my study was to identify the values associated with the potential for farmers to adopt BMPs and explore their socio-psychological development of farm life on their decision-making process. I conducted this study using a convergent mixed-methods design addressing quantitative and qualitative research questions.

Research Questions

Due to the nature of mixed-method study design, I approached answering quantitative and qualitative research questions separately, then converged the quantitative and qualitative data to further build upon the purpose of the study. I accomplished the purpose by answering the following quantitative research questions:

RQ1) What are the participants education level, age, gender, and zip code of residence?

RQ2) What are the participants' ownership categories based upon commodities produced, approximate number of acres they operate, years of farming, household net income from commodities produced on land, and years of implementing no-till/direct seed practices?

RQ3) Are there relationships among identified statements that best describe the *potential to adopt* construct?

Ho: No significant relationships exist between the identified statements.

Ha: Significant relationships exist between the identified statements.

RQ4) Which of values are associated with participants' *potential to adopt* BMPs?

Ho: No significant associations exist between the values and the *potential to adopt* construct.

Ha: Significant associations exist between the values and the *potential to adopt* construct.

Because I explored the problem through a mixed methods design, I also answered the following qualitative research questions:

RQ5) What are participants' background related to agriculture?

RQ6) How do the participants' learned farm management influence how they make management decisions?

RQ7) What are participants' future goals for their farm and their concerns for the future of agriculture?

RQ8) What do participants value and/or appreciate about their farm, and what do they admire about other farmers?

RQ9) How do participants envision the future of agriculture?

RQ10) What are participants' experiences with land succession?

RQ11) In what ways do participants self-identify themselves as farmers?

Significance of Study

I chose to use a mixed-method study design to explore the adoption of BMPs because this enabled a holistic view of values and the decision-making process. By viewing adoption of BMPs through a psychological and sociological lens, we can better understand the cognitive dissonance farmers experience between morally doing what they believe is right, and weighing the economic benefits and drawbacks to implementing BMPs. This study explored how values most associated with adopting BMPs might be developed based upon childhood experiences. Furthermore, this study examined how farm families are passing down traditions, experiences during the land succession process, and how those experiences might affect the way future generations care for the land. Additionally, this study provides insight into how the pressure to meet agricultural commodity production demands affect farmers' decisions.

CHAPTER II

LITERATURE REVIEW

Socio-psychological factors, such as values, can affect an individual's decision-making process. In fact, values are considered influential in encouraging individuals to behave in specific ways (Rokeach, 1973, 1979). When an individual finds an activity that aligns with their personal values or goals, they could be more motivated to adopt the practice. Feather (1995) identified values as influential in the decision-making process, specifically impacting an individual's motivation to behave in a specific way (e.g., adopt BMPs) (Rokeach, 1973, 1979). Values can be understood as core principles that an individual lives by or as judgement to what is important in life (Values, 2018).

This definition is surface-level; therefore, a more detailed description of how values influence behavior is needed. Rokeach (1973, 1979), a pioneer in research on values, described values as a method of helping an individual make a decision. "All values have cognitive, affective, and directional aspects. Values serve as criteria for selection in action. When most explicit and fully conceptualized, values become criteria for judgment, preference, and choice" (Rokeach, 1979, p. 16). Similarly, Schwartz (1992) defines values as a, "transsituational goal varying in importance, which serves as a guiding principle in the life of a person or other social entity" (p. 21). Values are ultimately the ways in which individuals choose to behave in certain ways in different situations.

Many times, when individuals decide to act on their values, they seek confirmation in their decisions. Rogers (2003) identifies this confirmation as the final stage in his innovation-decision process. Once a behavior has been performed, individuals question their decision and

look for reassurance or confirmation for their behavior (Rogers, 2003). Individuals seek confirmation either from the opinions of others or internally evaluating their values and judgement on the decision made. In fact, values are not a concrete set of rules by which an individual lives (Williams, 1960); instead, values are criteria for evaluating and deciding to act (Rokeach, 1973, 1979).

Theoretical Framework

Specific theories have been used to examine the motivation to adopt BMPs and conservation practices, such as The Theory of Planned Behavior (Ajzen, 1991) and Rogers' Diffusion of Innovations (2003). However, these theories lack the understanding of *why* individuals partake in the innovation-decision process (Rogers, 2003), *what* the deeper psychological constructs are (Ajzen, 1991), and the *influence* values have on the adopter of an innovation (Daghfous, Petrof & Pons, 1999).

The Theory of Planned Behavior (Ajzen, 1991) suggests behavior is stimulated by psychological constructs: attitude, subjective norm, and perceived behavioral control (Ajzen, 1991). Individuals behave in ways, stemming from psychological constructs, to help them seek reward and deter punishment (Ajzen, 1991). This theory has been widely used to understand an individual's intent to adopt new innovations or behave in specific ways such as improvement of natural grasslands (Borges & Lanskink, 2016), soil conservation practices (Wauters, Bielders, Poesen, Govers, & Mathijs, 2010), and conservation-type behavior (Beedell & Rehman, 2000). However, values are the precursor to the psychological constructs described in the Theory of Planned Behavior, and a more direct influencer in behavior (Rokeach, 1973, 1979).

In addition to the Theory of Planned Behavior (Ajzen, 1991), Rogers' (2003) Diffusion of Innovations theory has been extensively explored in adoption literature. The Diffusion of Innovations incorporates many explanations of adopting new innovations, including adopter categories, diffusion networks, the innovation-decision process, and change agents (Rogers, 2003). It is important to view these various contributions to adoption; however, the innovation-decision process considers only the process that individuals go through and not the psychological factors in adoption. Ultimately, the Diffusion of Innovations theory, lacks the depth and understanding of an individual's psychological process when adopting new ideas.

Although these theories have widely been used to examine the motivation to adopt new ideas, these theories lack the deeper understanding of values and how values influence the adopter of an innovation (Daghfous et al., 1999). In fact, "values are more powerful in predicting pro-environmental preferences and intentions than are motivational types" (De Groot & Steg, 2010, p. 377). Therefore, in this study I suggested viewing adoption of agricultural management practices through a psychological and sociological lens, using Schwartz's (2012) Values Theory, Bronfenbrenner's (1979) Ecological Systems Theory, Scannell and Gifford's (2009) Tripartite Model of Place Attachment, and Burton's (2004) Good Farmer Theory.

The Values Theory

The Values Theory (Schwartz, 2012) emphasizes the idea that human values are an important motivator to behavior. Individuals possess multiple values that are prominent motivators, encouraging them to behave in ways that align with those values. Schwartz (2012) identifies six elements compiled from multiple theorists that define values (Allport, 1961; Feather, 1995; Kluckhohn, 1951; Morris, 1956; Rokeach, 1973, 1979). These six elements are

(1) values are beliefs, (2) values refer to desirable goals, (3) values transcend specific actions and situations, (4) values serve as standards or criteria, (5) values are ordered by importance, and (6) the relative importance of multiple values guide action. Ultimately, Schwartz (1992) believed that through common experiences in shared locations, individuals develop values through social interaction, which ultimately guide their behavior.

Along with the six elements of values, Schwartz (2012) proposed ten values that an individual might possess. These values are *self-direction, stimulation, hedonism, achievement, power, security, conformity, tradition, benevolence,* and *universalism*. Each of these values is described in the following paragraphs, in their respective higher order value constructs. Table 1 shows the model of values and their relation to each one.

Table 1

Schwartz's (2012) Values Theory, Depicting Higher Order Values in Relation to the Lower Order Values

Higher Order Values	Lower Order Values
Openness to Change	Self-direction, Stimulation, Hedonism
Self-enhancement	Power, Achievement, Hedonism
Conservation	Security, Conformity, Tradition
Self-transcendence	Universalism, Benevolence

Research has been conducted to understand values associated with environmental behavior, such as the adoption of pro-environmental behavior. Specifically, Schwartz's (2012) self-transcendence construct has been associated with pro-environmental behavior (Hansla, Gamble, Juliusson, & Gärling, 2008). Additionally, literature revealed four values most associated with environmental behavior: hedonic, egoistic, altruistic, and biospheric (De Groot &

Steg, 2008; Steg, 2016; Stern & Dietz, 1994), which correspond with Schwartz's (2012) values. Each higher order construct and the values associated with them is described below.

Openness to Change: Self-direction, Stimulation, and Hedonism

The openness to change construct includes three values: self-direction, stimulation, and hedonism. Self-direction is the idea that an individual is independent and requires independence and autonomy. Stimulation is defined as the need for excitement and variety. Hedonistic values suggest the individual enjoys pleasure or being happy with oneself by doing something themselves (Schwartz, 2012). Hedonism is suggested to be a strong motivator to influence change and obtain pleasure in consuming something (Daghfous et al., 1999). It has been specifically associated with pro-environmental behavior, focusing on how the behavior makes them feel good or provides them pleasure (De Groot & Steg, 2008; Steg, 2016; Stern & Dietz, 1994). The hedonistic value is more closely related to adopting something for an individual's pleasure, not for a greater good beyond the individual. Therefore, in the case of BMPs, an individual might adopt a practice to benefit themselves, and not particularly to benefit the community, environment, and future generations.

Self-enhancement: Hedonism, Achievement, and Power

The self-enhancement construct also includes the hedonism value. In fact, "people with strong hedonic and egoistic values are most likely to engage in pro-environmental behavior when such behavior is pleasurable, convenient, or financially beneficial, or when it enhances their status" (Steg, 2016, p. 280). For example, an individual might implement precision agricultural technology because it can reduce the amount of fertilizer or pesticide application they put on

their field; therefore, saving them money in the long run and ultimately reducing the amount of chemical applied. Parminter and Perkins (1997) found that hedonistic values are associated with farmers' "off-farm" goals also suggesting their goals were self-centered in the context of non-farm goals.

Additionally, the achievement value focuses on an individual's personal successes associated with obtaining social approval in which an individual's personal success promotes social approval among a community or society (Schwartz, 2012). Similar to achievement, the power value is defined as an individual having control or dominance over people and resources. Power and achievement values are focused on social esteem (Schwartz, 2012). In fact, achievement and power values were most prevalent within farmers' business, production, and farm capital management goals (Parminter & Perkins, 1997).

Individuals who possess this value might identify adopting innovations as an achievement or find that by adopting the innovation, it increases their status and adds to the identification of who they are, also known as an egoistic value (Noppers, Keizer, Bolderdijk & Steg, 2015; Noppers, Keizer, Bolderdijk & Steg, 2014; Schuitema, Anable, Skippon, Kinnear, 2013; Steg, 2016). While achievement and power have been negatively related to pro-environmental attitudes and behavior (Hansla, et al., 2008), other literature suggests the egoistic-type value can be associated with pro-environmental behavior (De Groot & Steg, 2008; Steg, 2016; Stern & Dietz, 1994).

Conservation: Security, Conformity, and Tradition

The conservation construct comprises the values of security, conformity, and tradition. The security value is defined as being safe and stable of oneself in society (Schwartz, 1992).

Individuals who possess this value typically display conservative behavior (Daghfous et al., 1999). The idea of implementing something new could feel unstable for an individual who values security. This suggests that they might not be open for change or adopting new innovations. This value is also considered the least likely value for exerting a behavior of wanting to implement change (Daghfous et al., 1999).

The conformity value is defined as restraint of actions and impulses likely to violate social expectations (Schwartz, 2012). Conformity could be a motivator to adopt pro-environmental innovations. For example, social pressures can be a motivator on behavior (Rogers, 2003), as well as if an individual believes others consider the innovation or behavior to be a good thing (Harland, Staats, Wilke, 1999; Schultz, Nolan, Cialdini, Goldstein, Griskevicius, 2007; Steg, 2016). Similarly, tradition refers to the respect and commitment to the customs of an individual's religion and culture. Schwartz (2012) notes that tradition and conformity share similar motivation in that they have a goal to subordinate themselves to social expectations.

Self-transcendence: Benevolence and Universalism

Self-transcendence encompasses two values: benevolence and universalism. Benevolence is defined as enhancing the welfare of a group, and emphasizes traits such as honesty, responsibility, friendship, forgiveness, and responsibility (Hansla et al., 2008; Schwartz, 2012). Whereas, universalism is the understanding and appreciation of all people and for nature and encompasses human kindness, social justice, and peace on earth (Hansla et al., 2008; Schwartz, 2012). Parminter and Perkins (1997) identified universalism and benevolence values most associated in farming goals of environmental and community realms. Furthermore, self-transcendence values of benevolence and universalism, also known as altruistic and biospheric

values (De Groot & Stern, 2008; Stern, Dietz, Abel, Guagnano, & Kalof 1999), focus on behavior that reflects positive on a community or group. In the case of adopting BMPs, an individual with these values would adopt BMPs because they know it can benefit society, the greater good, and potentially, future generations.

Although Schwartz's (2012) Values theory does not specifically identify values in an environmental context, Stern et al.'s (1999) Value-Belief-Norm theory does. The Value-Belief-Norm theory (Stern et al., 1999) views values and personal norms to be the antecedents to behavior. This theory is specifically used to understand human behavior on the environment. Kaiser, Hübner, and Bogner wrote:

> In this [Value-Belief-Norm] model, a person's awareness of the behavioral consequence depends on his or her ecological worldview and, at the same time, determines a person's self-ascribed responsibility to act, which then leads to a person's sense of obligation to act (i.e., his or her personal norms). (2005, p. 2153)

The Value-Belief-Norm theory focuses on how an individual's awareness and consequences influence pro-environmental behavior (Stern et al., 1999). The Value-Belief-Norm theory has been used in previous research to guide understanding of how people's values influence their concern and behavior toward pro-environmental topics such as adopting agricultural conservation practices in Australia (Price & Leviston, 2014), vehicle travel choices (Jakovcevic & Steg, 2013; Lind, Nordfjærn, Jørgensen, & Rundmo, 2015), and behavioral engagement in national parks (Van Riper & Kyle, 2014).

Ecological Systems Theory

As noted, values are cognitively developed and translated into reasoning for decisions, depending on the situation and circumstances (Rokeach, 1973, 1979). Over a lifetime, individuals develop values depending on their situations (State of New South Wales, 2009). Values are established in many circumstances, and potentially during childhood. Bronfenbrenner developed the Ecological Systems Theory (1979) in which he believed that a child's biological makeup and environmental surroundings influenced how they developed over time (Bronfenbrenner, 1979). He identified five levels of influence (i.e., *microsystem, mesosystem, exosystem, macrosystem,* and *chronosystem*). He shared that a child developed based on their surroundings and this included their microsystem (i.e., the primary setting in which activities directly affect the individual), mesosystem (i.e., interactions and interrelationships surrounding the primary setting), exosystem (i.e., impinging social structures that are not direct, but affect the individual), macrosystem (i.e., societal impact and expectations), and chronosystem (i.e., historic changes over time). Examples of these systems can include family, community, religion, workplace, school, life events, and family heritage.

Although Bronfenbrenner (1979) did not specifically research values with his model, each of these systems provide an opportunity for an individual to develop and change their values. For example, if an individual was raised in a family where they did not value and care for the environment, as they grow older, gain knowledge, and a possible life event happens, they might seek and find value in caring for the environment. Therefore, it is a possibility to develop a value that was not present during childhood, and rather developed over time through experiences. Furthermore, "values steer attention and affect how people evaluate different consequences of choices, which in turn influences their preferences and choices" (Steg, 2016, p.

280). Values can determine an individual's goals, outcomes, and perspectives (Decision Making, n.d.).

When growing up on a farm, an individual might identify the occupation of a farmer as more than just a job—and also as a way of life that extends beyond the career itself. For example, a California family reported agricultural operations as a "lifestyle, for themselves and their family, an important reason to continue ranching" (Liffmann, Huntsinger, & Forero, 2000, p. 368). This suggests that the lifestyle that ranching provides is important in itself to continue the occupation. Agricultural lifestyle can be described as way of life that, in itself, is unique. In one study, Maybery, Crase, and Gullifer (2005) interviewed 25 farmers in Australia to identify their economic, lifestyle, and conservation values related to farming. Key statements from the interviews were gathered, developed into a survey, and quantified on a 5-point Likert scale among 552 farmers. Most notably, the lifestyle construct included statements such as *farming communities are a great place to live, a rural environment is a great place to raise children, I enjoy the peace and quiet that comes with farming, the lifestyle that comes with being on the farm is very important to me,* and *we do not make a fortune from farming but the lifestyle is great*. This study found significant differences between economic and conservation constructs, and a significantly stronger connection between conservation and lifestyle constructs (Maybery et al., 2005). That is, farmers with strong conservation goals are more likely to hold strong lifestyle beliefs as well.

Place Attachment Theory

Landowners who have a strong attachment to their land typically want to employ positive stewardship on their land (Sheeder & Lynne, 2011), suggesting it is their duty to care for the

environment (Greiner, Patterson, & Miller, 2009). This type of motivation to care for the land can be traced back to Scannell and Gifford's (2009) Tripartite Model of Place Attachment. Scannell and Gifford (2009) suggested three factors contribute to the attachment an individual has to a physical location. First, *the person*: what are the individual properties of the person attached to the land? Second, *the psychological process*: how is their cognition and behavior manifested in their attachment to the land? Third, *the object of attachment*: what are the characteristics of the place? Generally, people are motivated to engage in environmental change based on their psychological attachment to a place (Scannell & Gifford, 2009). Specifically, this theory relates to psychological dimensions, including affective, cognitive, and behavioral components with physical characteristics including place, location, spatial level, specificity, and social or physical elements.

The Place Attachment theory (Scannell & Gifford, 2009) has been used in many areas of civic (Anton & Lawrence, 2014) and natural land-based research (Raymond, Brown, & Robinson, 2011). Interestingly, Scannell and Gifford (2010) found significant differences when assessing pro-environmental behaviors between civic and natural populations. This implies that there are distinct differences between understanding place attachment with individuals in city and rural landscape areas. Using Scannell and Gifford's (2010) model, one South Australia study found place identity, dependence, nature bonding, family bonding, and friend bonding areas as reliable measures of landowners' attachment to natural resource management (Raymond, Brown, & Weber, 2010). Raymond et al. (2010) suggested an individual's connection with a place is not solely their experience with nature or social interaction, but how they "construct their own identity through their residential and farming histories" (p. 433). History of an individual and their land can influence the behavior to implement conservation practices. Although in a study of

Australian farmers, place attachment was not related to management behavior, instead, their level of connectedness to nature increased their vegetation protection behavior (Gosling & Williams, 2010). This means that the amount of connectedness they have to their land can influence their behavior to protect the vegetation on their land. The emotional connection and place attachment can have an impact on farmers' care for their land. This theory provides an accurate connection between the human dimensions and physical environmental factors that can potentially influence behavior.

Good Farmer Theory

Individuals, farmers in particular, can self-identify themselves based on their role, behavior, and habits. Burton (2004) explored the idea of the 'good farmer' or a farmer who is productive and, in nature, good stewards to their land. In fact, the farmer can self-identify themselves as well as other farmers based on their productivity (Burton 2004; Stryker, 1980). Burton noted:

> The farm is not simply an object, it is consubstantial with the farmer and, importantly, it is the very part of the farmer that is used to express his/her and his/her family's identities, both to other members of the farming community and to the world in general. (2004, p. 208)

A farmer's actions are seen by others and are a direct reflection of their operation, and are based on judgements by the farmer and by others. In particular, Burton (2004) identified a few of the differences that farmers use as criteria for judgement between types of farmers:

> From the interviews it emerged that the main difference between a farmer who was perceived by the community as a 'good farmer' and a 'bad farmer' was the quality of

> the crops and livestock produced as judged by two principal criteria—the physical appearance or attractiveness of the crop (or animal) and crop yield per acre/hectare (or weight/quality per animal). (2004, p. 201)

Influence for judgement on others was also identified by values researcher, Rokeach (1979). For example, an individual who values trees and participates in conservation activities that save forest trees might view an individual who logs trees as a bad person or a person who does not care for the environment. In this example, the individual who protects trees, passing judgement on the individual who logs the trees, is an example where an individual bases their complete opinion on the idea that they value protecting the trees.

In addition to the physical appearance and crop yield, good farmers are identified as good farmers over a period of time. In fact, Burton (2004) found farm identity can extend through the generations, noting that it can take many years for the next generation of farmer to change the identity of the farm. This idea of a good farmer and identifying other farmers, has been explored in the literature related to crop diversification (Roesch-McNally, Arbuckle, & Tyndall, 2018) and implementation of practices to reduce animal disease (Shortall, Sutherland, Ruston, & Kaler, 2018).

In relation to good farmers, the idea of farming styles has been explored and is referred to as the cultural and normative ideas about how individuals believe farming should be done (Vanclay, Mesiti, & Howden, 1998). This idea brings to light the idea that farmers have their style of farming, and with that, brings their unique approach on how to manage the land. For example, Petrzelka, Korsching, and Malia (1996) identified that farmers might categorize themselves as sustainable or conventional in nature, and therefore, perform behaviors according to their perceived classifications. In particular, Hyland, Jones, Parkhill, Barnes, and Williams

(2016) explored how self-identification influences beef and sheep farmers' willingness to implement practices to reduce greenhouse gas emissions on their operations. The authors found four types of farmers emerged, 'the productivist,' 'the countryside steward,' 'the environmentalist,' and 'the dejected', in which 'the environmentalist' showed most connection between the emission sources and their ability to do something about it (Hyland et al., 2016). This suggests that the farmers who self-identify with being an environmentalist are more conscious of the issue and might take behavioral action to implement practices to reduce the issue.

Although an environmentalist-type identity might be more effective in implementing change, Burton and Wilson (2006) found that farmers who strongly self-identify themselves as productivists can also implement change. This productivist self-concept comprises the farmer identifying more as a producer and agribusiness person, and less as a diversifier or conservationist (Burton & Wilson, 2006).

Additional Factors Impacting Adoption

Although the guiding theories of this study are largely based on socio-psychological factors, previous literature has identified other factors influential in the adoption of BMPs. These factors include acres owned, net-income, ownership and management of land, and years of experience.

The number of acres a farmer possesses can positively impact the opportunities they have to try new practices. In a review of literature, Prokopy, Floress, Klotthor-Weinkauf, and Baumgart-Getz (2008) reported that a higher number of studies documented that the amount of acreage was positively correlated with the adoption of BMPs, more so than the number of studies

that found increase in acreage negatively correlated with the adoption of BMPs. That is, the number of acres a farmer owns could increase the chances of adoption. This might be related to the idea that with more acres the farmer has more freedom in trying new practices and is more likely to use new practices, like conservation tillage (Bossange, Knudson, Shrestha, Harben, & Mitchell, 2016). Trialability is an important characteristic in the adoption of innovations (Rogers, 2003); therefore, with more acres the farmer is able to comfortably try a new practice on a small acreage of land. In addition to trying a new practice, the number of acres owned can be more forgiving because of higher potential for income, specifically in situations where precision agriculture technologies are implemented (Daberkow & McBride, 2003). For example, farmers with more acreage could diversify their crops and implement new ideas in one area of land, yet have cash crops (i.e., crops that yield a profitable income) that ensure profit at the end of the season.

In addition to acres, the economic profitability as a repercussion of implementing a specific BMP can also impact whether farmers adopt BMPs. Implementing BMPs such as conservation tillage practices can negatively impact farmers' profitability. In fact, it can possibly reduce yields and delay profitability from commodity production (Rodriguez et al., 2009); therefore, limiting farmers' potential to adopt the BMP. However, when adopting BMPs with the assistance of incentive programs (e.g., NRCS programs), the financial compensation is not enough (Berthold, 2014; Rodriguez et al. 2009). Farmers can have a difficult time affording full implementation of new technologies, especially when the practice does not result in economic profitability. Furthermore, fluctuating commodity market prices for farmers has continued to affect the income from their operations, ultimately affecting their potential to implement conservation practices (Lesch & Wachenheim, 2014). Similarly, Grover and Gruver (2017) noted

from interviews with farmers that, “markets were by far the most prominent topic farmers discussed regarding challenges in maintaining long-term farm viability” (p. 515). Although the commodity market is often how farmers earn their income, Prokopy et al. (2008) found income was not a statistically significant factor (i.e., positively or negatively) in the adoption of BMPs. This suggests that although income is widely evaluated across adoption studies, it is typically not found to be significant; therefore, other factors might be more influential in the potential to adopt BMPs.

A farmer’s position in ownership and management in an operation can also influence their potential to adopt BMPs. Some operations are owned by a single family and others may be operated by multiple families. The size and number of partnerships within an operation increases the complexity of making decisions (Nuthall & Old, 2017). Additionally, “managers themselves make most of the decisions no matter what the ownership system” (Nuthall & Old, 2017, p. 105). That is, that the individual who is running the everyday management of the operation is the one who makes the decisions, and, therefore, has more authority in what decisions are made.

In the context of implementing BMPs, the manager or farmer might be leasing the land from a landowner. In this case, the farmer then has to have a conversation with the landowner to describe and explain the benefits of implementing the BMP. However, this can be difficult. From interviews on implementing cover crops, Roesch-McNally, Basche, et al. (2018) stated:

> Farmers [the study participants] also articulated that commonly held beliefs, or regional norms that emphasize maximizing output of key commodity crops (measured in yields per production area), can also negatively impact farmers’ acceptance and adoption of conservation practices such as cover crops. Farmers noted that this influences landlords and custom operators and might serve to discourage, or at times, inspire, the use of cover

> crops, and that there are distinctly different incentives for landowners and lessees. (p. 328)

Ultimately, the participants of the Roesch-McNally, Basche, et al. (2018) study expressed that the price of implementing the practice and the output yield of the practice might not always be a convincing argument to implement BMPs that are beneficial for the environment. In fact, one participant noted, "we need landowners out there [who] are demanding cover crops and are willing to help fund it" (Roesch-McNally, Basche, et al., 2018, p. 328). Interestingly, in a survey among corn farmers in the Midwest, Varble, Secchi, and Druschke (2016) found that, "land renters practice conservation tillage at a higher rate than owners" (p. 326), suggesting that farmers who lease farmland, are implementing conservation tillage practices more so than farmers who own their land.

Years on a farm or ranch can provide an individual with experience and knowledge of how to manage an operation effectively. The level of dedication strongly influences the decision-making approaches on farms (Solano, Leon, Pérez, & Herrero, 2001). In their review of adoption research, Prokopy et al. (2008) found a farmer's experience was not robust enough, to predict adoption decisions, and suggested more research be conducted focusing on experience or years on operation.

Related to years on operation, age has been associated with the adoption of BMPs in many articles, as noted in reviews of adoption literature (Knowler & Bradshaw, 2007; Prokopy et al., 2008). In fact, Prokopy et al. (2008) hypothesized "that age will have a negative relationship with adoption as older farmers are less likely to change practices due to a shorter planning horizon (p. 302)" as stated in previous literature (Featherstone & Goodwin, 1993; Soule, Tegene, & Wiebe, 2000). This was found to be true in their analysis across 26 studies; age had a negative

relationship with adoption of BMPs (Prokopy et al., 2008), suggesting farmers who are older in age are less likely to implement new ideas because they might not find justification in the long-term planning and involvement in farming.

In conclusion, although previous theories have examined the adoption of BMPs in the U.S., few studies have examined values as the motivator to adoption. Therefore, I explored BMP adoption in the U.S. using Schwartz's (2012) Values Theory, Bronfenbrenner's (1979) Ecological Systems Theory, Scannell and Gifford's (2009) Tripartite Model of Place Attachment, and Burton's (2004) Good Farmer Theory. Additionally, other factors (i.e., acres owned, net-income, ownership and management of land, and years of experience) have been explored and have presented mixed results in explaining the motivations to adopting BMPs. Consequently, I focused on the psychological and sociological factor of personal values that contribute to the adoption of BMPs.

CHAPTER III

METHODS

Study Design

In this study, I used a mixed method approach to understand farmers' values associated with their potential to adopt BMPs (quantitative) and how their upbringing had influenced their decision-making process (qualitative). To execute the two research methods, I used a convergent design in which I separately collected and analyzed the data, then compared results from each method (Creswell & Plano Clark, 2018). This allowed me to complement the data gathered from each method and balance the strengths and weaknesses of both methods (Creswell & Plano Clark, 2018). Both quantitative and qualitative research study designs are described in this chapter.

Population

The focus of this mixed method study was farmers in the Unites States, predominately in the Pacific Northwest. In 2012, the average age of a principal operator of a farm or ranch in the U.S. was 58.3 (USDA-Economic Research Service [USDA-ERS], 2017). More than half of principal farm operators in 2012 were over the age of 55 (USDA-ERS, 2017). The advanced age of principal operators suggests a near-term shift to a younger generation of operators. Between 2014 and 2019, 91.5 million acres of agricultural farmland was expected to transfer ownership (United States Census of Agriculture, 2015a). As land transfers occur it could potentially be to younger farmers. Young farmers are defined as individuals between 18 and 35 years of age (Farm Bureau, n.d.); a beginning farmer is defined as an individual who has owned or operated a

farm or ranch for less than 10 years (USDA-NRCS, n.d.d). Interestingly, the young farmer generation has been reported as having more connection to technology, being open-minded, and possessing higher education levels (Pew Research Center, 2010).

In 2012, the U.S. had 522,058 beginning farmers who had been in operation 10 or less years, and "operated one fourth of the 2.1 million U.S. farms" (U.S. Census of Agriculture, 2012, para. 1). However, the number of young farmers has dropped 20% since the 2007 U.S. Census of Agriculture, and "only 14% of millennials live in rural areas" (Pew Research Center, 2010, p. 12). This decrease in young farmers entering agricultural production could be due to limited access to affordable land, student loan debt, shortfall in labor, and/or limited health insurance options (National Young Farmers Coalition, 2017). Additionally, the 2012 U.S. Census of Agriculture (2015b) reported 97% of farms are family owned with 88% of those being small family farms (i.e., less than $350,000 in gross cash farm income). However, "though there are fewer farms now, most are still family owned" (USDA-National Agricultural Statistics Service, 2018, para. 2). Furthermore, those small family farms only contributed to 20% of the agricultural sales (U.S. Census of Agriculture, 2015b).

More specifically, the Pacific Northwest (i.e., Idaho, Oregon, and Washington) is a large producer of agricultural grain crops. In fact, Idaho produced 1,191,000 acres of wheat in 2018 (U.S. Census of Agriculture, 2018a). Oregon produced 800,000 acres of wheat (U.S. Census of Agriculture, 2018b), and Washington produced 2,220,000 acres (U.S. Census of Agriculture, 2018c). Furthermore, to look at the land use practices for the Pacific Northwest, in Washington, Oregon, and Idaho, there are 10,962 farms and 4,133,727 acres of conventionally tilled farm land (U.S. Census of Agriculture, 2017a). In contrast, there are 6,121 farms using no-till management

on 2,684,596 acres (U.S. Census of Agriculture, 2017a). Additionally, there are only 1,805 farms and 387,472 acres in conservation easement programs (U.S. Census of Agriculture, 2017a).

Quantitative Method

To understand what factors contribute to the adoption of BMPs, I employed a quantitative study design. This method is best to estimate the participant's values and potential to adopt BMPs because it provides the ability to generalize results and statistically describe the population (Bryman, 2016). For data collection, I used a modified version of Dillman, Smyth, and Christian's (2014) survey design and delivery method using Social Exchange theory. I attempted to decrease costs of participating by choosing a shorter version of Schwartz's Portrait Values Questionnaire-21 (Schwartz, 2012), minimizing requesting personal information, and allowing responding to be convenient (Dillman et al., 2014). Additionally, I increased the benefits of participating by explaining how the results can be used and asking questions that relate to participants' life and knowledge (Dillman et al., 2014). Furthermore, I attempted to establish trust by showing the relationship I had with the potential participants and displaying authenticity within the survey (Dillman et al., 2014). The quantitative sample, instrument development, validity and reliability of the instrument, and data collection and analysis are described below.

Sample

I obtained the original sample for the quantitative phase of this study from the population of farmers in the U.S. Pacific Northwest. The same frame was a list of farmers who were on the email list for the Pacific Northwest Direct Seed Association (PNDSA). This group is an

association in which farmers, scientists, and agricultural industry personnel can gain knowledge regarding the adoption and implementation of no-till or direct seed farming practices. No-till and direct seed are described as farming practices that reduce soil erosion, improve air and water quality, and benefit wildlife (PNDSA, n.d.). Access to this sample was provided by PNDSA Executive Director after board approval. Approval to use the sample likely related to the fact that this study complemented the organization's overall goals. The sample consisted of approximately 700 contacts and contained all individuals who might be interested in no-till or direct seed from Washington, Oregon, Idaho, and other surrounding states (e.g., farmers, industry chemical and equipment dealers, Extension agents, university scientists). To gain as many participants as possible, I did not use a sampling method; instead I attempted a census (Bryman, 2016). This census was of purposeful convenience because I knew the PNDSA Executive Director and allowed for access to this specific population (Bryman, 2016). In attempt to gain as many participants as possible, I also used Facebook to invite individuals to participate in the survey.

Instrument Development

I developed the instrument based on a questionnaire by Schwartz (1992) and previous literature (Baumgart-Getz et al., 2012), following Dillman's Tailored Design Method (Dillman et al., 2014) (See Appendix A). To understand the participants, I asked general farm management questions (i.e., acres managed, land ownership, years of operation, years in no-till or direct seed, and net-income from commodities produced on their land). I also asked participants to rate their agreement on 10 statements related to their potential to adopt BMPs. Then, I asked the participants to respond to the values questions. Additionally, I asked demographic questions:

age, gender, zip code, and level of education. The development of potential to adopt questions (dependent variable) and values questions (independent variables) are described below.

Independent Variables

Survey questions related to independent variables were developed by Schwartz (2001), who suggested, "values can provide predictive and explanatory power in the analysis of attitudes, opinions and actions. Moreover, values can reflect major social change in societies and across nations" (p. 261). To identify an individual's values, Schwartz (2001) created multiple versions of a questionnaire (i.e., the Schwartz Value Survey (SVS-57), Portrait Values Questionnaire (PVQ-21); and Portrait Values Questionnaire (PVQ-40)). The most widely used evaluation instruments used to evaluate values are Schwartz's (2001) PVQ-21 and PVQ-40. Both versions of the PVQ have been used to conduct studies cross-culturally (Simón et al., 2017). The most current review of the SVS and PVQ noted 58 published articles ranging from 2007 to 2017, with 30 out of the 57 articles using the PVQ-40 (Simón et al., 2017). Additionally, the reliabilities of the PVQ-21 and PVQ-40 have been compared, proving the PVQ-40 containing more questions per variable construct, produces a stronger reliability (Cieciuch & Davidov, 2012). However, the PVQ-21 does have acceptable reliability with fewer questions, and is shorter and quicker for participants to complete (Schwartz, 2012).

As a result of feedback received during pilot testing, I used the PVQ-21 to identify participants' values. The PVQ-21 contained 21 questions, each using a male or female voice for statements of importance related to various values. The PVQ-21 comes in two separate versions: male and female. The differences between the gender versions lie in pronouns; male (i.e., 'he', 'his', 'him'), female (i.e., 'she', hers', 'her'). Participants were asked to read each statement and

rate how each statement is or is not like themselves. Statements include, "*He believes that people should do what they are told; He thinks people should follow rules at all times, even when no-one is watching."* Schwartz used a portrait-type description to allow the participant to compare themselves to the person described in the statement. Schwartz (2001) explained that by, "comparing others to self, the format I propose [in the questionnaire], is a much more common activity in everyday life. People constantly assess others and compare them to themselves" (p. 299). Therefore, the participants are asked to rate their personal likeness of themselves to the portrait description, using a six-point scale of, v*ery much like me, like me, somewhat like me, a little like me, not like me,* and *not like me at all*.

Each questionnaire statement is associated with a specific value, as determined by Schwartz (2012). There are 10 values (i.e., c*onformity, tradition, benevolence, universalism, self-direction, stimulation, hedonism, achievement, power,* and *security*), which are associated with four higher order values (i.e., *self-transcendence, self-enhancement, openness to change,* and *conservation*). It is important to note that the value, *hedonism*, is used in both higher order values, *self-enhancement* and *openness to change*. The statements, values, and higher order values are displayed in Table 2.

Table 2

Schwartz's (1992) Values Theory: Higher Order Values, the Individual Values, and the Survey Statements Associated with the Values

Higher order value	Individual value	Survey Statements/Items
Self-transcendence	*Universalism*	He/she thinks it is important that every person in the world be treated equally. He/she wants justice for everybody, even for people he/she doesn't know. It is important to him/her to listen to people who are different from him/her. Even when he/she disagrees with them, he/she still wants to understand them. He/she strongly believes that people should care for nature. Looking after the environment is important to him/her.
	Benevolence	It is very important to him/her to help the people around him/her. He/she wants to care for other people. It is important to him/her to be loyal to his/her friends. He/she wants to devote himself to people close to him/her.
Self-enhancement	*Power*	It is important to him/her to be rich. He/she wants to have a lot of money and expensive things. It is important to him/her to be in charge and tell others what to do. He/she wants people to do what he/she says.
	Achievement	It is very important to him/her to show his/her abilities. He/she wants people to admire what he/she does. Being very successful is important to him/her. He/she likes to impress other people.
	Hedonism	Having a good time is important to him/her. He/she likes to "go out" often. He/she seeks every chance he/she can to have fun. It is important to him/her to do things that give him/her pleasure.
Openness to Change	*Self-direction*	Thinking up new ideas and being creative is important to him/her. He/she likes to do things in his/her own original way. It is important to him/her to make his/her own decisions about what he/she does. He/she likes to be free to plan and to choose his/her activities for himself/herself.
	Stimulation	He/she likes surprises and is always looking for new things to do. He/she thinks it is important to do lots of different things in life. He/she looks for adventures and likes to take risks. He/she wants to have an exciting life.
	Hedonism	Having a good time is important to him/her. He/she likes to "go out" often. He/she seeks every chance he/she can to have fun. It is important to him/her to do things that give him/her pleasure.
Conservation	*Security*	It is important to him/her to live in secure surroundings. He/she avoids anything that might endanger his/her safety. It is very important to him/her that his/her country be safe from threats from within and without. He/she is concerned that social order be protected.
	Conformity	He/she believes that people should do what they're told. He/she thinks people should follow rules at all times, even when no-one is watching. It is important to him/her always to behave properly. He/she wants to avoid doing anything people would say is wrong.
	Tradition	He/she thinks it's important not to ask for more than what you have. He/she believes that people should be satisfied with what they have. Religious belief is important to him/her. He/she tries hard to do what his/her religion requires.

Note. The *Hedonism* value is associated with the higher order values of *Self-enhancement* and *Openness to change*; the actual survey statements did not include "he/she" instead the participant noted whether they were male or female and were provided the appropriate gendered surveys.

Dependent Variable

To identify participants' *potential to adopt* BMPs, I identified 10 statements from previous literature. In the survey, I asked participants to rate their agreement towards each of the 10 statements, on a 6-point Likert-type scale (i.e., strongly agree, agree, somewhat agree, somewhat disagree, disagree, and strongly disagree). The reliability of this construct was determined using Cronbach's Alpha during analysis. The items that had the highest interrater reliability were identified as the construct for the dependent variable, *potential to adopt*. Identification of the 10 statements is described below.

To assess the potential to adopt BMPs, I identified statements from previous literature. Farmers might be more willing to adopt BMPs if they identify with specific factors (e.g., participation in incentive programs, their assessment of how profitable the practice is, their knowledge of practices, and how practices can positively impact the environment). The amount of *farm experience* a farmer had, has been found particularly influential in the number of water conservation practices adopted (Boyer, Tong, & Sanders, 2018). That is, if a farmer has more experience on their farm, they are more willing to adopt more water conservation practices. Along with a farmer's experience, they might have more knowledge about their land and the potential their operation has to implement BMPs. In fact, farmers who were older in age were more likely than younger farmers to implement conservation practices, potentially because they have a greater understanding of their land (Gould, Saupe, & Klemme, 1989). In particular, the landscape of the land is a factor that influences an individual's ability to adopt BMPs. Farm structure was reported as a good predictor of adoption, more so than the farmers' or ranchers' personal characteristics (Camboni & Napier, 1993). Farm structure can include soil type, slope,

and ability to establish and maintain new plantings. In fact, in a review of literature by Carlisle (2016), agronomic factors were highly cited as barriers to adopting soil health practices.

In addition to an operator's experience or farm characteristics, how financially profitable the practice is can greatly impact their potential to adopt. Many times, farm management decisions are often ultimately based on profitability. For example, northwest Ohio farmers who were 52 years of age or older were more motivated to make decisions based on land profits (Wilson, Howard, & Burnett, 2014). This suggests that farmers might base their decisions on the profitability of the new idea or practice. Similarly, Boyer, Tong, and Sanders (2018) stated, "Farmers who value land stewardship for profitability of production rather than off-farm effects were more likely to adopt soil and water conservation practices" (p. 1829). In this study, off-farm effects were considered the external factors (e.g., reducing bacteria in the water, increase in wildlife) that are influenced by the effects of BMPs. This implies that farmers who prioritized stewardship on their own land were more likely to adopt practices over other reasons that might positively benefit off-farm locations, such as other landowners or the public.

Additionally, off-farm income can potentially create a buffer of financial uncertainty to allow farmers to implement BMPs. In fact, diversity of income can provide ease to the uncertain yields and agricultural markets (Udagawa, Hodge, & Reader, 2014). Small-scale farmers, in particular, aim to diversify their income through resale, to have a backup source of income, and ensure stability of income (Grover & Gruver, 2017). Contrary, farmers often make decisions based on non-economic motives (Carlisle, 2016). In fact, some individuals implement BMPs even if they do not expect an increase in profits, such as riparian buffer strips (Gedikoglu & McCann, 2012). A farmers' or ranchers' attitude toward BMPs can play a major role in their potential to adopt them (Prokopy et al., 2008). In fact, farmers' attitudes toward conservation

practices have been associated with an increase in the number of practices adopted (Boyer et al., 2018; Prokopy et al., 2008).

Access to and quality of information is influential in the decision to adopt BMPs (Arbuckle & Ferrell, 2012; Carlisle, 2016; Dewald, Leggette, Murphrey, Berthold, & Wagner, 2018; Rosenberg & Margerum, 2008). Specifically, "farmers who were more knowledgeable about the environmental and agronomic benefits of these practices, and who had confidence in their ability to properly implement them, were significantly more likely to adopt them" (Carlisle, 2016, p. 599). Information about BMPs can come from many sources, such as interpersonal communication or the ability to witness others' implementation of the practices (Rogers, 2003). In a study conducted with Texas landowners, 34.6% of landowners received information from friends and neighbors, and 34.3% received information from the Texas A&M AgriLife Extension Service (Dewald et al., 2018). Additionally, receiving information about incentive programs is important in the decision to adopt BMPs; however, some Texas landowners were unaware of incentive programs, such as cost-share programs like the Conservation Stewardship Program and EQIP through USDA-NRCS (Dewald et al., 2018). Dewald et al. (2018) also found Texans to be less trustworthy of government agencies, whereas, Mase, Babin, Prokopy, and Genskow (2015) found a government agency (i.e., Natural Resources Conservation Service) to be a trustworthy source of information among individuals in 19 watersheds in the Midwest states of the U.S. This suggests there are differences in the trustworthiness and familiarity with sources of information about BMPs, based on geographic location.

Validity and Reliability

I established reliability of the survey, first by conducting a pilot test, using intercept data collection at The South Texas Farm and Ranch show in Victoria, Texas. Although this show provided access to the farmer and rancher population, the demographics and overall set-up of the show was not conducive to my data collection method. This pilot test elicited 16 participants; I gained important information to improve the instrument and data collection procedure. I made changes to the instrument including choosing to implement the PVQ-21 instead of the PVQ-40 due to participant's length of time spent on the survey. I also made grammatical corrections and altered the invitation verbiage.

Additionally, I established content validity by asking three no-till farmers and the PNDSA Executive Director to review the survey before collecting data. Survey reliability was assessed through post-hoc Cronbach's alpha on the dependent variable on all 10 statements related to the potential to adopt ($\alpha = .797$). Furthermore, to test for non-response error, I followed one of the methods suggested by Lindner, Murphy, and Briers (2001) for handling non-response in social science research. Specifically, I followed method two in which I used "Days to Respond" as an independent variable in a regression analysis. I found no significant relationship between participants' response dates and potential to adopt ($R^2 = .02$, $F(1, 65) = 1.27$), $p < .26$), suggesting non-respondents would not differ from respondents (Lindner, Murphy, & Briers, 2001).

Data Collection

I collected data using email and social media (i.e., Facebook) distribution methods. The email was sent to the potential participants through the PNDSA membership email list by the

PNSDA Executive Director. The potential participants received the email with a short description of the study and why they were being asked to participate (See Appendix B). A link to the Qualtrics survey was also included in the body of the email. To distribute the survey via Facebook, I followed procedures outlined by the Texas A&M Institutional Review Board (IRB) and utilized an approved recruitment script (See Appendix C). This script followed Dillman et al.'s (2014) social exchange theory, in which I attempted to build trust by showing authenticity and connection through acquaintances of family members in the farming community. Participants were able to complete the survey on a mobile device or on a laptop/desktop computer. After clicking on the link, the participants were asked to read the IRB-approved information sheet (See Appendix D). The information sheet contained the general information about the study. Potential participants' agreement to participate in the study was confirmed when they read the information sheet at the beginning of the survey and submitted the survey, once completed.

The first email was sent to the list of 700 contacts by the PNDSA Executive Director. This email was sent May 28, 2019, and included a link to the survey. A second reminder email was sent June 25, 2019 (See Appendix E). The survey was available to participants for 71 days, which provided sufficient time to participate in the survey. I also posted the survey on Facebook at 5:00 pm on Monday, July 8, 2019, and it was shared by nine people.

Data Analysis

After the data was collected, I exported the survey data as a .csv Excel file from Qualtrics. I used STATA 15 statistical software to analyze the data. I used descriptive statistics (i.e., frequencies, means, and standard deviations) for demographic and general farm

characteristic questions. After completing descriptive statistics, I generated a new variable for each of the 10 values (i.e., *benevolence, universalism, self-direction, stimulation, hedonism, achievement, power, security, conformity,* and *tradition*). To do this, I averaged the two or three statements associated with each value as determined by Schwartz (2003). The value *benevolence* had three statements; each of the other values were comprised of two statements. Then, I calculated the reliability of each value variable using Cronbach's alpha; these measures of internal consistency are identified in the results section of this document.

To identify the statements associated with the potential to adopt, I calculated Kaiser-Meyer-Olkin Measure to determine sampling adequacy, then calculated Bartlett's Test of Sphericity to determine the overall significance of the correlation matrix (Field, 2013). I conducted Exploratory Factor Analysis (EFA), specifically using Principal Component Analysis (PCA), to determine how the statements load onto factors (Field, 2013). I used PCA (Field, 2013) because it allowed me to "understand the structure of a set of variables" (p. 666), and because PCA "aim[s] to reduce a set of variables into a smaller set of dimensions" (p. 667). Ultimately, PCA determined the adequacy of variables in the construct and identified statements to be removed that did not contribute to high reliability for the construct. After factors were determined, I rotated the factors to better interpret the results (Field, 2013). After determining the eigenvalues, I calculated Cronbach's Alpha on the resulting factors to determine reliability. After determining which factor had the highest reliability and best represented the *potential to adopt* construct, I generated a new variable, *potential to adopt*. This variable consisted of an average of the seven statements identified in the factor. To identify which of the 10 values (i.e., independent variables) predicted the *potential to adopt* (i.e., dependent variable), I regressed potential to adopt on the 10 values via Multiple Regression.

Qualitative Method

To understand farmers' lifestyles and farm experiences related to their values and decision-making process, I conducted interviews. Following my post-positivist and constructivist approach to interviewing, I extracted farmers' feelings, beliefs, and experiences when making decisions. A post-positivist and constructivist view means that I believe in reality (e.g., black and white, right and wrong); however, I also believe that humans form an understanding of reality through constructivism (e.g., knowledge is created by the learner through their experiences). Because this phase of the research is guided by understanding how farmers' construct their reality and learn from their social encounters, exploratory interviews to converge with the quantitative data was best suited (Creswell & Plano Clark, 2018; Merriam & Tisdell, 2015). In order to accurately interpret the findings, I bracketed my personal experiences, expressed in my philosophical positionality, prior to data analysis.

Bracketing of Philosophical Positionality

Qualitative results are developed through gathering and interpreting data from the stance of the researcher; therefore, it is important to identify the positionality of the researcher (Birks & Mills, 2015). Positionality identifies my orientation toward the research project and determines the methodological framework and analysis lens that guided the study. Therefore, it is important to acknowledge my epistemological lens through which data for this study was gathered and interpreted. I interpreted the data collection and analysis of the qualitative data through a social constructivism view, which assumes that reality is understood by the collection of knowledge through learning with others (Bruner, 1990; Dewey, 1933; Piaget, 1972; Vygotsky, 1980).

Specifically, I believe individuals learn by constructing their knowledge base and skills through assimilation, accommodation, and equilibration (Piaget, 1972). I believe that people learn through the experiences around them, assimilating and accommodating to other individuals, attempting to create a place of common ground. Because I hold a post-positivist stance and I form my understanding of reality through constructivism, and therefore, I have applied my post-positivism stance through the early works of Glaser and Strauss (1967).

Personal Experience

I became interested in this research topic because I have experienced adopting BMPs on my family's farmland. I grew up on a farm in central eastern Washington where my family has implemented direct seed farming practices for almost 20 years. I have seen first-hand the experiences and struggles of being motivated to implement new practices that could not only impact my family economically, but also emotionally. Because of this, I wanted to understand the drive and motivation for farmers to want to do something that is not always economically beneficial, but morally motivating. Additionally, my family is in the process of transitioning the farm from my father to the next generation. I have found the experience of land succession, decision-making, and adopting BMPs to be different for all family farms. Considering the limited knowledge and understanding of how values and socio-psychological factors contribute to decision-making for Pacific Northwest farmers, I explored this notion through this study. Because I bracketed my personal assumptions, I avoided promoting the personal views I held about this phenomenon and used my experiences only to effectively analyze the data gathered in this study (Birks & Mills, 2015; Strubing, 2007).

Participants

To obtain participants, I used a purposeful sampling method, specifically a maximal variation sampling method in which, "diverse individuals are chosen who are expected to hold different perspective on the central phenomenon" (Creswell & Plano Clark, 2018, p. 176). I used this method because I wanted to intentionally select participants who had experience in making farm management decisions and obtain variation (i.e., age, experience, geographic region) in perspectives on the main idea of the study. To recruit potential participants who met these requirements, I used my social network to identify the sample. I contacted 13 farmers who met the criteria. Of those 13 invited to participate, one denied participating, two did not answer my initial invitation, and two agreed to participate but schedules did not align to conduct the interview. Therefore, eight individuals agreed to and participated in the interview. I listed the participants in the order that they were interviewed and summarized the general characteristics of each participant in Table 3. All eight participants were white and male; this is representative of Pacific Northwest farmers (U.S. Census of Agriculture, 2017b, 2017c, 2017d).

Table 3

Interview Participants' Demographics and General Characteristics, Pacific Northwest, U.S., Summer 2019

Participant's Pseudonym	Age	Farming Practice	Avg. Acres Farmed	Avg. Rainfall Inch/year[a]
Perry	< 35	Conventional	2,000	8"
Cory	> 35	Direct seed, cattle	-	12"
Rocky	> 35	Direct seed	Owns 80, leases more	13"
Tony	> 35	Conventional	4,500	10"
Mikey	> 35	Direct seed	2,800	13"
Jeffrey	< 35	Conventional	2,000	12"
Johnny	< 35	Direct seed	6,000	12"
Ray	> 35	Direct seed	8,500	12"

Note. Age was a dichotomy based on whether they were considered a young farmer (i.e., < 35 years of age) as determined by Farm Bureau, n.d.
[a]Average rainfall was obtained from U.S. Climate Data.

Interview Participants' Characteristics

Interview participants were located in the Pacific Northwest; they varied in their farming experience, location, and background as noted in Table 3. The first participant interviewed, Perry, was considered a young farmer and graduated from college five years ago with a degree in agricultural business management. He is not married and has no family of his own. He currently works fulltime for a chemical company, with clients that range from large corporate farms to small family-owned farms. Perry grew up in the local town, and would visit their family farm when his dad would go out to work. His mom worked for a local business and his sister was not interested in agriculture. Perry works with his dad on their farm in central Washington, growing predominately wheat on both dry and irrigated land of less than 2,000 acres. In this region, it is a very dry climate with an average of 8 inches of rainfall per year (U.S. Climate Data, n.d.a). They are conventional farmers; however, they have experimented on small acres with no-till, and planting dry peas and canola.

Cory is a middle-aged farmer from eastern Idaho, receiving an average rainfall of 12 inches per year (U.S. Climate Data, n.d.b). He is a dryland no-till farmer, growing wheat, barley, peas, barley, garbanzos, alfalfa, and cover crops that are grazed with livestock from his cattle operation. He is unique in that he has diversity on his farm with crops and livestock. Specifically, he grazes livestock on his row crops, which provides a holistic livestock and crop management system. He grew up farming with his dad and grandfather, who also did minimum tillage crops at the time. He worked on their family farm doing odd jobs and driving a truck and tractor. When he gained full management of the farm in 2011, he started diversifying his crops. He currently lives on his farm with his wife and children.

Rocky is a farmer in the North central area of Washington. He grows many crops including wheat, canola, and peas, using a no-till system that he started in 2001. He grew up on a farm in the same area; however, his father sold their farm when he was 19 years old, and his family moved to Oregon. Rocky lived there for three and a half years, then moved back to the central Washington area to finish high school. Every summer for harvest he would work on his brother in-law's farm. After high school, he went to the local community college to study agriculture and worked for a local chemical dealer after graduating from college. Rocky began working as a farm manager for a farmer in a neighboring town, and eventually the farmer gifted the farm and the land to him in 1981. Currently, he owns 80 acres and has leases to farm neighboring owners' land. Additionally, he runs a custom seeding and spraying business. Rocky is in the beginning years of transitioning his farm to his son, who he purposefully involves in management decisions. In this region of Washington, he averages 13 inches of rain per year (U.S. Climate Data, n.d.c).

Tony is a fourth-generation farmer on his land. He owns 4,500 acres. Of this, 4,200 acres are dryland, with a two-year rotation, and 300 acres are irrigated cropland. He grows Soft White and Dark Northern Spring wheat, and testing peas, and winter and spring canola on his irrigated ground. He grew up on his father's farm with 750 acres of cropland. Tony was much younger in age than his brother and sister, so his father didn't need his labor help on the farm. However, Tony always tried to be involved in harvest. Tony did not feel like he learned a lot about farming from his father, as his father did not talk about farming or decision making in front of him. His father originally wanted to sell the farm because he did not think his sons were interested in farming. However, after Tony worked for a couple of years after college as a forestry engineer, he and his wife decided they wanted to return to the farm. Currently, Tony lives with his family on the same farm where he grew up, and works with his eldest son who is actively involved in decision-making and day-to-day labor. His two younger sons do not currently seem interested in farming. Along with his eldest son, Tony also makes decisions with his wife, who takes care of the finances of the farm. His wife also grew up on a farm in the same community, so he feels that she understands how farms work. Tony farms in a region of Washington that gets an average rainfall of only 10 inches per year (U.S. Climate Data, n.d.d).

Mikey owns 2,800 acres of no-till cropland. His operation is about 50% wheat and 50% peas, in a region that receives an average of 13 inches of rain per year (U.S. Climate Data, n.d.c). He is a fourth-generation farmer, and third generation living in the same house on his farm. Before Mikey was born, his father and his father's brothers split the family operation. His father's brother received the land south, and his father received the land that he grew up on. Currently, Mikey's cousin runs the farm to the south. These two farms are completely separate in the way they till the ground and run finances. Mikey admitted that he and his cousin get along,

but they do not look to each other for advice on farming topics. During his upbringing on the farm, Mikey worked with his brother during harvest in the summer months, and his sister had no interest in farming. He explained that his father was very traditional in that his sister played no part in the farm. Mikey explained that when they got older, his brother, "had no interest in farming and got away as quick as he could and he became a writer" (Mikey). Later, Mikey inherited the farm after attending college and majoring in economics. Mikey shared that he first developed an interest in the mechanical side of farming first, and his passion for conservation and agronomy developed later in life. Mikey has two sons who did not show any interest in farming as a career, one is a wildlife conservationist and the other is a writer. Currently, Mikey is planning to retire in the next five years and has a succession plan to offer his farm to his nephew who is in his 20s and has been farming for a couple of years now.

Jeffrey is a young farmer who owns a dryland wheat farm of 2,000 acres, with a yearly cropping schedule of 1,000 acres summer fallow and winter crop rotations. Jeffrey did not grow up on a farm; however, he grew up in a small community surrounded by farmland. During the summer months, he worked harvest for farmers in the area. Jeffrey learned the skill of working hard when he was young having to do chores for his family. He started farming a few years ago, after working as a lineman for an electricity company for 10 years. He always wanted to be a farmer, so when he and his wife were presented the opportunity to buy a farm from his wife's grandfather, they took the chance. Jeffrey consults with his wife when making farm management decisions and seeks advice from his wife's father and his close friends who are also farmers in the area. Jeffrey farms in a region of Washington that has an average rainfall of 12 inches (U.S. Climate Data, n.d.e).

Johnny is a young farmer who grew up on a farm using a direct seed operation to grow wheat, barely, canola, peas; and, he is experimenting with grass seed and other cover crops. His region of Washington averages 12 inches of rain (U.S. Climate, n.d.e). Because he grew up on the farm, he felt like that was all he knew how to do. At the age of 12, Johnny started working on the farm driving a tractor with a wagon during harvest. He had a serious interest in trucks and understanding how mechanics work. He shared that when he was younger it was just his dad and grandfather who made the farm decisions together. It wasn't until he got into high school that he started paying attention to their conversations, and after graduating from the university is when he started working full time on the farm and began contributing his opinions to his father and brother. Currently, Johnny, his brother, and his father talk about farming almost all day, make farm management decisions together, and do all of the labor work themselves.

Ray is an older farmer who has been farming since 1989, and been direct seeding since 1995. He grows wheat, canola, and other cover crops across an average of 8,500 acres, in which some acres are leased. Ray's farm averages rainfall of 12 inches annually (U.S. Climate Data, n.d.e). Ray grew up on his farm, and started shoveling wheat out of grain bins around five years old and was driving trucks and tractors by nine years old. He was always around the decision-making process, as it was something that his father would discuss with his mother at the dinner table. Ray remembers talking about farming with his father when he was around 16 years old, asking questions and trying to understand how farming worked. After Ray went to community college, he worked for a couple of years as a semi-truck driver then decided to return to the farm. Currently, Ray works with his two sons who contribute their ideas and work together. When making farm management decisions, Ray appreciates his son's ideas and considers their future of

owning the farm. However, he has the final say on what decision is made. Ray also makes decisions with his wife who is in control of the financial side of the farm.

Data Collection

I contacted the participants via email, phone call, or text message, asking them if they would like to participate in an interview about their farm and how they make decisions on their farm (See Appendix F). After agreeing to participate, I scheduled a day and time to meet or call to conduct the interview. Participants were able to choose how the interview was conducted (i.e., in-person or over the phone) to accommodate their schedule. Data collection began on July 8, 2019 and commenced on July 12, 2019. I began each interview by describing the study and either handing them a copy or emailed a copy of the IRB Information Sheet (See Appendix G). Participants were given as much time as they needed to review, understand, and ask questions about the study. Due to the nature of qualitative data, I served as the instrument to gather data (Merriam & Tisdell, 2015). I interviewed, observed, and sought to understand the reality of the participants as they conversed with me. Each interview lasted approximately 30-40 minutes.

Interview Process

The interview protocol (See Appendix H) I used in this study was based on the ideas of Bronfenbrenner's Ecological Systems Theory (Bronfenbrenner, 1979) and a previous research project (Dewald, 2018). I designed the questions in a semi-structured, general to specific format, allowing myself to set the stage of context and prepare participants for future questions. Participants were able to expand on their answers, and when needed, I asked participants to elaborate or further describe their answer to elicit more clarity in the data.

Data Analysis

I analyzed the data through a post-positivism epistemology (Glaser & Strauss, 1967) and through an inductive and comparative method (Glaser & Strauss, 1967; Merriam & Tisdell, 2015). During and after conducting each interview, I wrote down my general thoughts and the personal characteristics of each participant. I also noted the ideas and common subjects that the interviewee would refer to, which helped me when identifying the overall categories during the constant comparative analysis process. Next, because I used an automatic transcription application, I downloaded and saved all audio recordings and transcription notes. I listened to each recording and further clarified and transcribed the words that the transcription application missed, and added emphasis and quotes to the notes taken during the interview. Finally, I began the analysis process by working inductively and comparatively when reviewing each interview transcription. As I went through each transcription in the Word document, I fractured the data by using unit-by-unit open coding to identify thoughts and ideas of the participants (Merriam & Tisdell, 2015). This method of open coding provided the opportunity for categories to develop from the data (Glaser & Strauss, 1967). From there, I opened a separate document to record the coded data, create summary, and process the data into the categories. Next to each data, I wrote the timestamp to refer back to if needed. As I open coded throughout the data, I highlighted quotes that were meaningful and could be used to best describe the categories. I continuously compared the data and categories against one another, created new categories as needed, and ultimately allowed the categories to emerge from the data (Birks & Mills, 2015). After all of the data was transcribed and results were written, I gave each participant a pseudonym (i.e., a name) to ensure confidentiality of results (Merriam & Tisdell, 2015).

Trustworthiness

To establish trustworthiness of the findings, I ensured credibility, dependability, transferability and confirmability were met (Lincoln & Guba, 1985; Shenton, 2004). I established credibility by providing personal stories that created a bond and elicited openness with the interviewee. To achieve credibility, I triangulated measurements obtained during data collection. To triangulate data, I used audio recordings, notes taken during the interviews, my audit trail notes taken after the interviews, and guiding theories associated with this study (Merriam & Tisdell, 2015).

I established dependability by identifying how the results were consistent with the data collected (Lincoln & Guba, 1985). Specifically, I asked a graduate student qualitative researcher to help me in the debriefing process. The researcher did not participate in the data collection process; therefore, they provided a non-biased perspective to identify whether or not the data were classified into the appropriate categories. If there was discrepancy, we discussed and agreed where the data fit best.

Transferability was addressed by acknowledging the applicability of these findings to similar farming locations. Although the participants in this study were regionally specific, similar populations of farmers are represented in other geographical locations. Across the U.S., many farmers make decisions on their farm with others, are in the process of land succession, or are implementing new management ideas. Therefore, similar results might be represented in other similar geographic locations; however, replication cannot be guaranteed. I suggest that the reader of these results apply reader generalizability, in which the reader identifies whether or not the results of this study can be applied to their particular situation (Merriam & Tisdell, 2015).

I established confirmability throughout the data collection and analysis period by using an audit trail and reflexive journal (Merriam & Tisdell, 2015). After each interview, I wrote down the unique topics and categories that came from the conversation. I also kept a reflective journal where I used paper and pencil to reflect upon the data collection and analysis process. These methods helped me confirm and ensure the categories and results were from the participants and not myself.

CHAPTER IV

RESULTS

The quantitative and qualitative results of the study are presented separately. First, the quantitative data is organized by research question. Second, the qualitative data is organized by research question and the emergent themes associated with each question.

Quantitative Results

Response Information

I received a 10.45% (n = 67) response rate of completed surveys. There was a total of 105 people who clicked on the link, with 67 completing the survey, and 38 who clicked on the link and either partially filled it out (f = 9) or did not fill out the survey at all (f = 29). The participants responded using the email link (f = 58, 86.57%) and the Facebook post (f = 9, 13.43%). Of the total people who participated (n = 67), 32 participants filled out the survey sent in the first email. On or after the reminder (sent on June 25), 35 participants filled out the survey. Participants spent an average of 31 minutes filling out the survey.

Research Question 1:

Demographics

Demographic characteristics of the 67 participants are reported in Table 4. The average age of participants was 51.7 years of age (SD = 12.7). A majority of participants were male (f =

61, 91.04%) and almost two-thirds of the participants had a 4-year degree or higher (*f* = 44, 65.67%).

Table 4

Demographic Characteristics of U.S. Survey Participants, Summer 2019 (n = 67)

Characteristics	*f*	%
Age		
<35	9	13.43
36-44	12	17.91
45-54	11	16.42
55-64	25	37.31
65 or older	10	14.93
Gender		
Male	61	91.04
Female	6	8.96
Highest level of education completed		
Less than high school	-	-
High school graduate	1	1.49
Some college	8	11.94
2-year degree	14	20.90
4-year degree	37	55.22
Professional/Master's/Doctorate Degree	7	10.45

I created a map of the U.S., highlighting the participants' reported zip codes, using Geographic Information System (See Figure 2). There were 44 participants from Washington, 10 participants from Oregon, six participants from Idaho, four participants from Texas, one participant from Utah, one participant from Ohio, and one participant from an unidentifiable zip code.

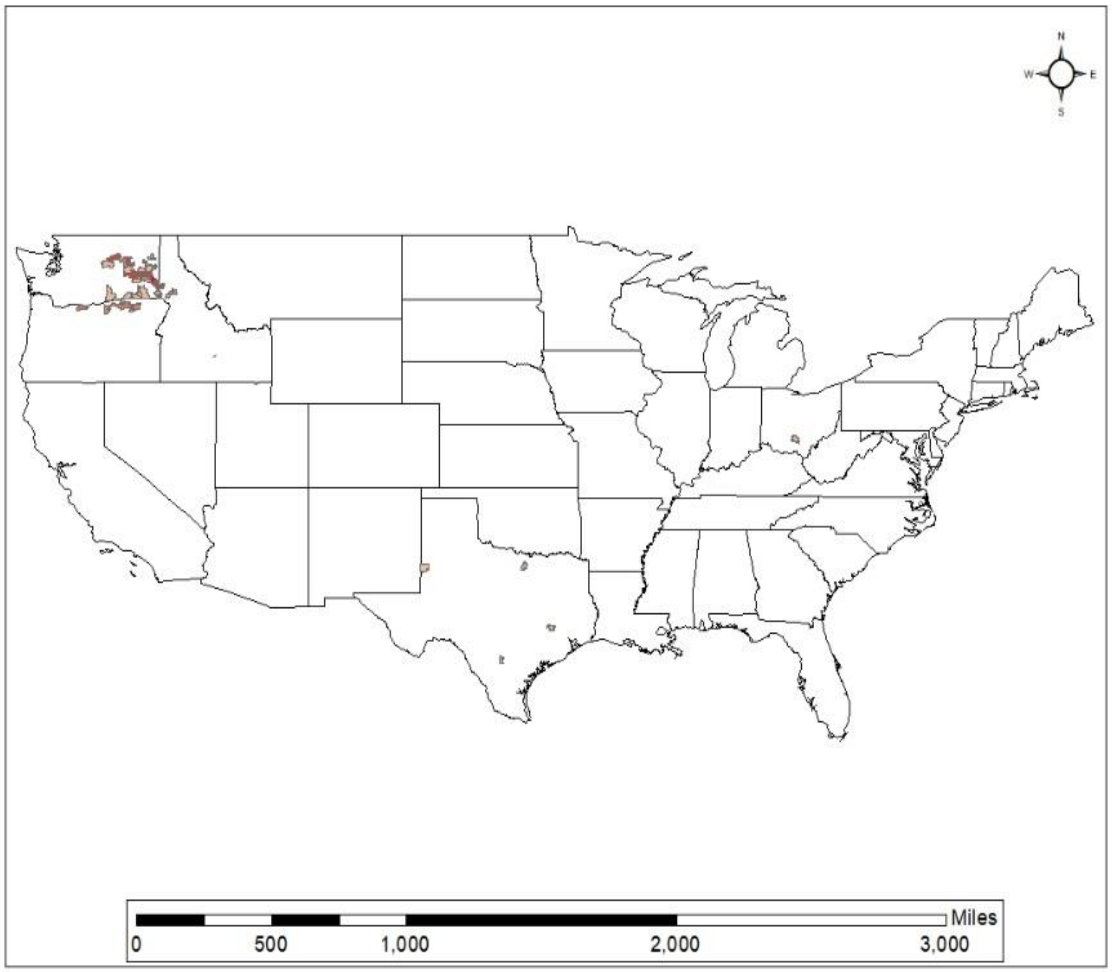

Figure 1. U.S. map of survey participants' zip codes, Summer 2019.

Figure 2 displays a map of the Pacific Northwest in which a majority of participants were located. There were some participants who were from the same zip codes, however, they are not indicated in these maps. This map is indicative of the area in which the PNDSA predominately targets their outreach and educational programming.

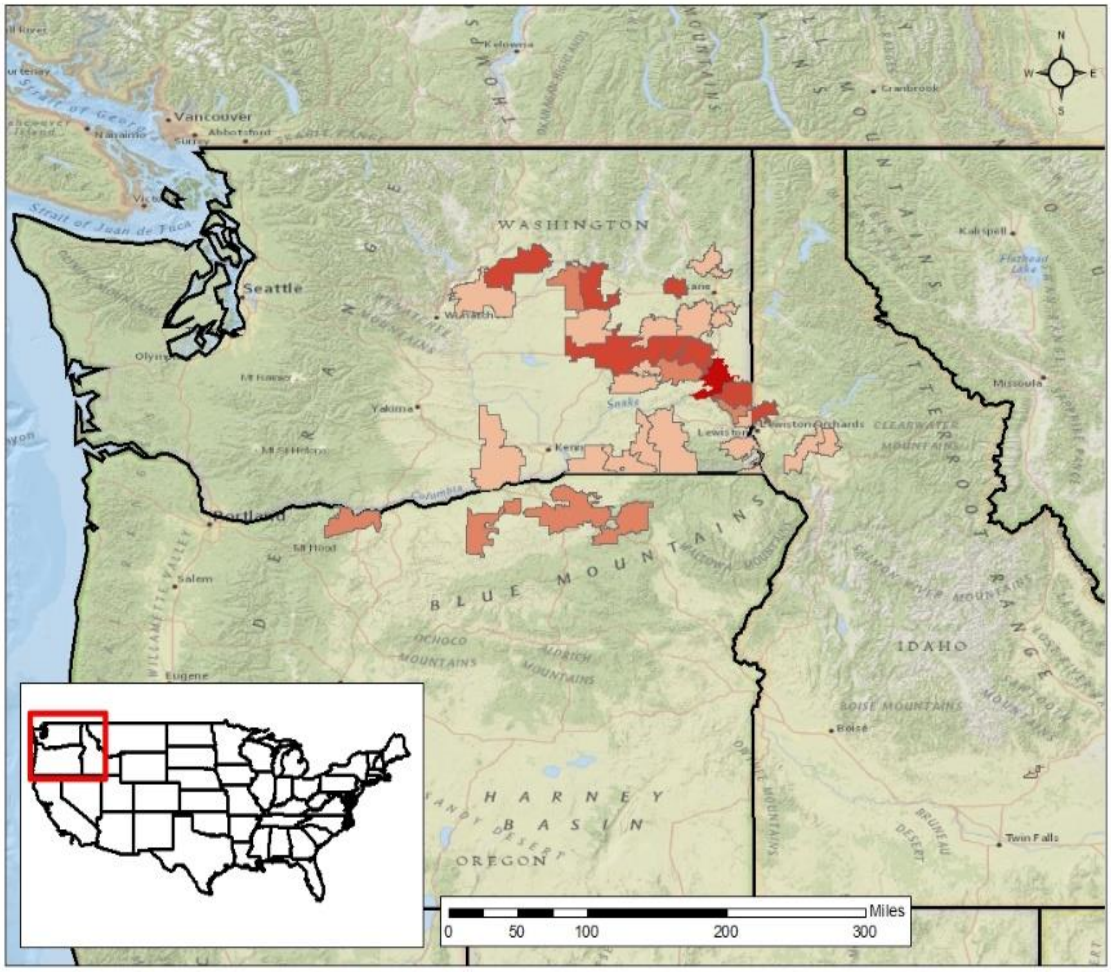

Figure 2. Pacific Northwest map of survey participants' zip codes, Summer 2019. The darker the color, the more responses there were in the respective zip code.

Research Question 2:

General Farm Characteristics

Participants reported the category of land ownership that reflected their situation (See Figure 3). Of the 67 participants, 42 reported to produce commodities on land *leased by me from a landlord*, 34 reported *land owned by their family*, 34 reported *owned by me*, 27 reported *leased by me from family*, and 1 participant reported *other*.

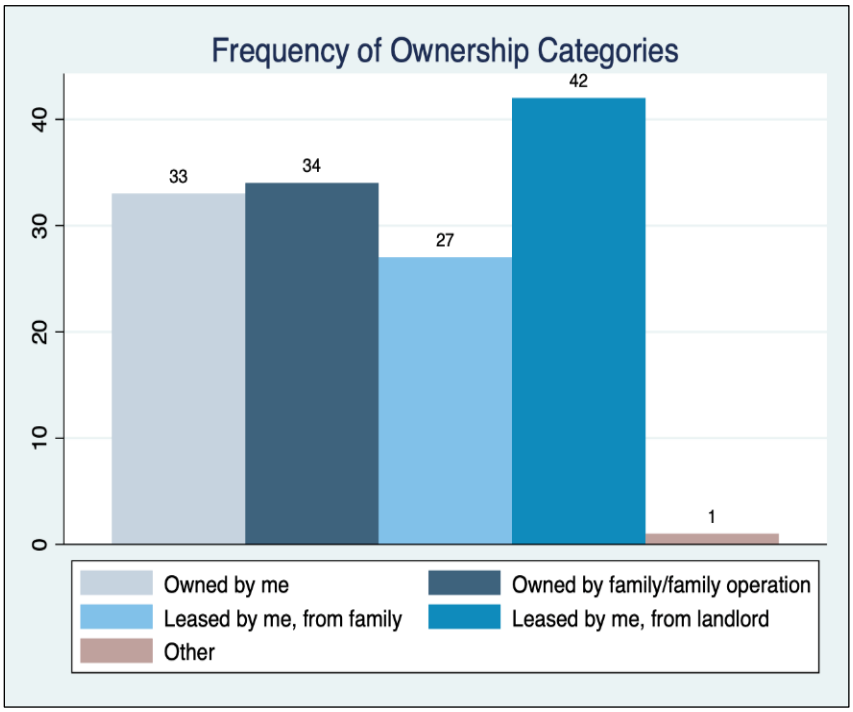

Figure 3. Bar graph displaying U.S. participants' reported frequency of land ownership categories, Summer 2019.

Participants also reported the approximate acreage of land on which they produce commodities. Overall, there was an average of 3,488.16 (*SD* = 3011.48) (See Table 5). As noted in the boxplot below, the minimum reported acreage was 10 acres and the maximum reported acreage was 15,000 (See Figure 4).

Table 5

U.S. Survey Participant's Reported Approximate Acreage of Land on which they Produce Commodities, Summer 2019 (n = 67)

Acres	*f*	%
< 1000	12	17.91
1001-3000	26	38.81
3001-5000	17	25.37
5001-7000	7	10.45
7001-9000	2	2.99
> 9001	3	4.48

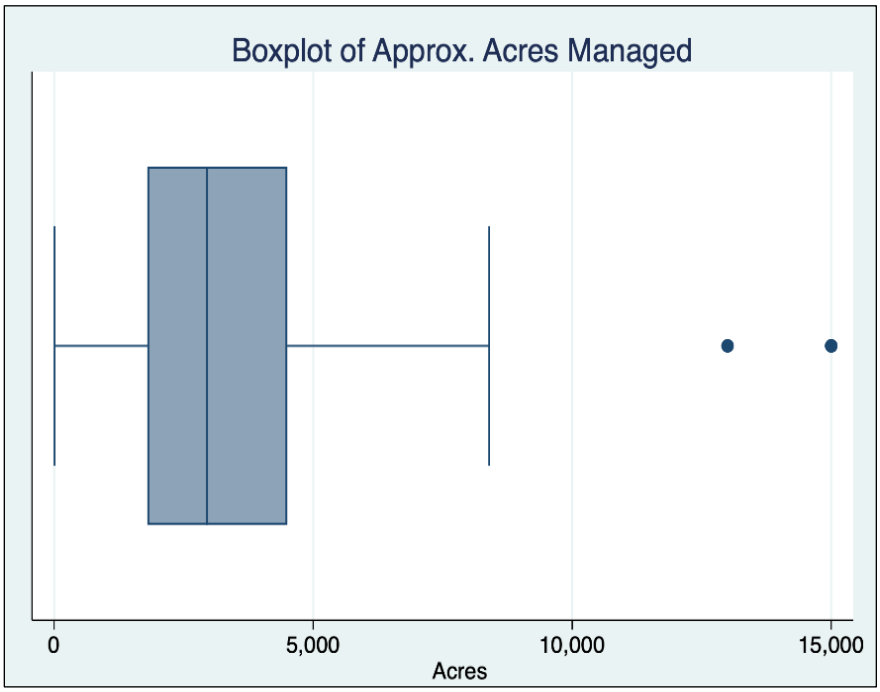

Figure 4. Boxplot depicting participants' reported acreage on which they produce commodities, Summer 2019.

To better understand the participants, I analyzed the number of acres managed by the age of participants (See Figure 5). Interestingly, the participant who managed 10 acres was 35 years old. Two participants managed 15,000 acres; these individuals were ages 42 and 50. The USDA-

ERS (2017) reported the average age of a principal operator of a farm or ranch in the U.S. to be 58.3 years of age. For those who completed the survey, 26 participants were 58 years of age or older, and reported an average amount of acres of 2,948.34.

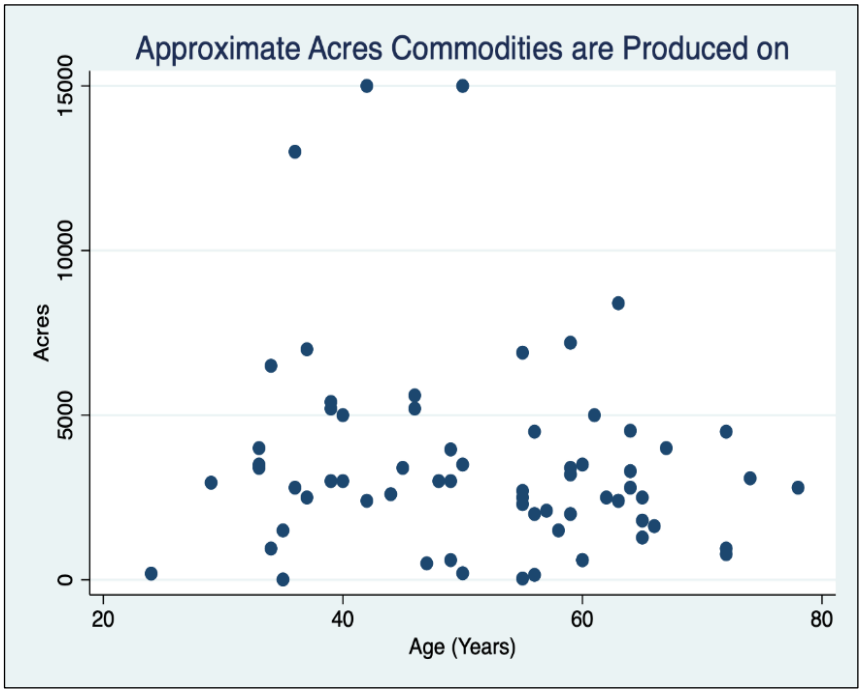

Figure 5. Scatter plot depicting U.S. participants' reported approximate number of acres managed by age, Summer 2019.

Participants' approximate years of experience managing a farm was reported in Table 6. Thirty-one years or more of experience was most frequently reported (41.80%, $f = 28$). Participants who had managed a farm for 21 or more years, managed an average of 2,906.34 acres. Additionally, participants who managed a farm for 20 years or less, managed an average of 4,124.52 acres.

Table 6

Frequencies and Percentages of U.S. Participants' Reported Years of Experience Managing a Farm, Summer 2019 (n= 67)

Years of Experience	*f*	*%*
5 years or less	7	10.44
6-15 years	14	20.90
16-20 years	11	16.42
21-25 years	5	07.46
26-30 years	2	02.30
31 years or more	28	41.80

Participants reported their approximate percentage of household net income from commodities produced on their land (See Table 7). A plurality of participants reported obtaining 81-100% of their household net income from commodities produced on their land (41.80%, *f* = 28).

Table 7

Frequencies and Percentages of U.S. Participants' Reported Approximate Percentage of Household Net Income from Commodities Produced on their Land, Summer 2019 (n= 67)

Percentage of Household Net Income	*f*	*%*
0%	-	-
1-20%	9	13.43
21-40%	3	04.48
41-60%	15	22.39
61-80%	12	17.91
81-100%	28	41.79

Participants also reported implementation of no-till or direct seed farming practices (See Table 8). Of the participants who reported implementation of no-till or direct seed (*f* = 63, 94%),

33.33% (*f* = 21) reported implementation of no-till or direct seed for 6-10 years, but with a median of approximately 13 years, and 57% reported implementation of the practice for 11 years or more.

Table 8

Frequencies and Percentages of U.S. Participants' Reported Approximate Years of Implementing No-till or Direct Seed, Summer 2019 (n= 67)

Years of Implementing No-till	*f*	%
5 years or less	6	9.52
6-10 years	21	33.33
11-15 years	9	14.29
16-20 years	12	19.05
21-35 years	12	19.05
36 years or more	3	4.76

Research Question 3:

Potential to Adopt Construct

To construct the *potential to adopt* variable, I first conducted the Kaiser-Meyer-Olkin Measure to determine sampling adequacy (*KMO* = 0.767). This calculation indicated a medium amount of shared variance between variables, yet did not show to be hindering the uniqueness of each individual variable (Field, 2013). Secondly, I constructed a correlation matrix to determine the degree to which the statements were correlated. I conducted Bartlett's Test of Sphericity to determine the overall significance of the correlation matrix (Field, 2013). This was reported as significant (X^2 (45) = 302.069, p<0.001), suggesting there was sufficient intercorrelation to conduct the factor analysis. I rejected the null hypothesis (i.e., Ho: No significant relationships exist between the identified statements), and accepted the alternative hypothesis (i.e., Ha:

Significant relationships exist between the identified statements). In this case, the statements were correlated but not strongly correlated enough to ensure each statement provided a unique contribution to the *potential to adopt* factor. The means, standard deviations, and correlation numbers are displayed in Table 9.

Table 9

Means, Standard Deviations, and Correlations for Potential to Adopt Statements, U.S., Summer 2019 (n = 67)

Statements	*M*	*SD*	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. I have participated in NRCS EQIP, CREP, state level, or similar conservation programs	5.28	.14	-									
2. I have an overall positive attitude toward agricultural BMPs	5.28	.11	0.31	-								
3. I am knowledgeable about BMPs	5.22	.09	0.35	0.49	-							
4. I believe my operation has/already has the potential to adopt BMPs	5.33	.09	0.55	0.62	0.55	-						
5. I have previously implemented BMPs	5.21	.11	0.50	0.38	0.68	0.70	-					
6. I would like to start/continue implementing BMPs in the future	5.13	.13	0.57	0.52	0.43	0.56	0.44	-				
7. I view financial profitability as an important concern when implementing BMPs	5.51	.11	0.25	0.14	-0.01*	0.13	0.11	0.36	-			
8. I believe the effect BMPs have on the environment is influential in my decision to implement BMPs	5.12	.12	0.65	0.48	0.37	0.61	0.37	0.76	0.25	-		
9. I believe having off-farm income increases my potential to implement BMPs	4.07	.16	0.11	0.02*	-0.00*	0.11	-0.01*	0.15	0.26	0.19	-	
10. I believe seeing other farmers/ranchers in my area implement BMPs has an impact on my decision to implement BMPs	4.27	.17	0.12	0.05	-0.02*	0.02*	-0.04*	0.19	0.41	0.18	0.48	-

Note. ≤1.50 = strongly disagree; 1.51–2.49 = disagree; 2.50–3.49 = somewhat agree; 3.50–4.49 = somewhat agree; 4.50–5.49 = agree; 5.50 ≥ = strongly agree.

*$p < .05$

I conducted an EFA using the PCA approach. A total of 10 factors were produced, in which I retained 2 components with eigenvalues greater than 1 (Field, 2013; Kaiser, 1960). The first component had an eigenvalue of 4.25, which accounted for 42.60% of the variance. The second component had an eigenvalue of 1.83, which accounted for 18.36% of the variance.

To enable the component interpretation, I rotated the components using an oblique–oblimin rotation. I conducted an oblique rotation because the two components were expected to be correlated (Field, 2013). I then sorted the component loadings from high to low. Based on Stevens (2002), I identified the variables with a loading of .40 or greater, which explained about 16% of the variance in the variable (Field, 2013).

STATA 15 automatically identified the variables with the higher component loadings of .40 or higher and were put into the respective component (Field, 2013). The matrix presented in Table 10 shows Component 1 which consisted of seven items and yielded a high Cronbach's alpha of .88. Component 2 loaded 3 items and reported a low Cronbach's alpha of .64. Due to a higher Cronbach's alpha and the statement items best describing Component 1, I chose Component 1 as the *potential to adopt* factor.

Table 10

Factor Loadings from Principal Component Analysis: Loadings, Eigenvalues, Percentages of Variance, and Cronbach's alpha for Potential to Adopt Statements, U.S., Summer 2019 (n = 67)

Statements	*Component 1*	*Component 2*
4. I believe my operation has/already has the potential to adopt BMPs	.87	
5. I have previously implemented BMPs	.80	
3. I am knowledgeable about BMPs	.76	
6. I would like to start/continue implement BMPs in the future	.75	
8. I believe the effect BMPs has on the environment is influential in my decision to implement BMPs	.74	
2. I have an overall positive attitude toward agricultural BMPs	.71	
1. I have participated in NRCS EQIP, CREP, state level, or similar conservation programs	.70	
10. I believe seeing other farmers/ranchers in my area implement BMPs has an impact on my decision to implement BMPs		.81
9. I believe having off-farm income increases my potential to implement BMPs		.71
7. I view financial profitability as an important concern when implementing BMPs		.68
Eigenvalue	4.20	2.05
Percentage of Variance	41.90	20.50
Cronbach's Alpha (α)	.88	.64

Research Question 4:

Values Associated with Potential to Adopt

I conducted multiple regression analysis to identify which of the values predict the *potential to adopt* BMPs. The means, standard deviations, reliability coefficients, and correlations are presented in Table 11. The overall model was significant (R^2 = .41, $F(10, 56)$ = 3.94), $p < .001$), suggesting there are statistically significant predictors of the dependent variable

(i.e., values; Table 12). I rejected the null hypothesis (i.e., Ho: No statistically significant associations exist between the values and the *potential to adopt* BMPs), and accepted the alternative hypothesis (i.e., Ha: Statistically significant associations exist between the values and the *potential to adopt* BMPs).

I identified three values (i.e., *universalism*, *power*, and *security*) to be significant ($p < .05$) in predicting *potential to adopt*. For every one unit increase in *universalism*, there was a predicted increase of .35 units on *potential to adopt*. For every one unit increase in *power*, there was a predicted decrease of -.35 units on *potential to adopt*. For every one unit increase in *security* there was a predicted increase of .16 units on *potential to adopt*. The potential for participants to adopt BMPs can be predicted by their ratings of the values of *universalism* and *security* (as positive influencers on adoption) and by their rating of *power*, which had a negative influence on the *potential to adopt*.

Table 11

Means, Standard Deviations, Reliability Coefficients, and Correlations for Potential to Adopt Variable and Value Variables, U.S., Summer 2019 (n = 67)

Variable	*M*	*SD*	α	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
Potential to Adopt	5.23	.09		0.19	0.44	0.02*	0.13	-0.09	0.11	-0.26	0.21	0.08	0.03*
1. Benevolence	5.00	.09	.39	-									
2. Universalism[a]	4.61	.12	.77	0.52	-								
3. Self-direction	5.00	.09	.28	0.19	0.38	-							
4. Stimulation	3.74	.13	.59	0.34	0.18	0.11	-						
5. Hedonism	3.42	.15	.78	0.15	-0.12	0.01	0.64	-					
6. Achievement	3.60	.14	.68	0.08	0.09	0.04*	0.19	0.37	-				
7. Power	3.07	.11	.44	0.06	0.13	0.33	0.08	0.23	0.43	-			
8. Security	3.60	.14	.32	0.18	0.06	0.09	0.04*	0.30	0.27	0.18	-		
9. Conformity	3.65	.15	.73	0.20	0.28	0.20	-0.09	0.04*	0.19	0.58	0.40	-	
10. Tradition	4.57	.10	.13	0.55	0.18	-0.01	0.10	0.26	0.18	0.24	0.35	0.41	-

Note. ≤1.50 = not like me at all; 1.51–2.49 = not like me; 2.50–3.49 = a little like me; 3.50–4.49 = somewhat like me; 4.50–5.49 = like me; 5.50 ≥ = very much like me

[a]Three statements

* $p < .05$

Table 12

Multiple Regression Analysis Summary for the Value Variables Predicting Potential to Adopt, U.S., Summer 2019 (n = 67)

Variable	*B*	95% CI	ß	*t*	*p*
Benevolence	-0.15	[-0.45, 0.44]	-0.16	-1.02	0.31
Universalism	0.35	[0.14, 0.60]	0.50	3.33	0.01*
Self-direction	-0.07	[-0.29, 0.16]	-0.07	-0.58	0.57
Stimulation	0.16	[-0.04, 0.37]	0.26	1.62	0.11
Hedonism	-0.11	[-0.30, 0.08]	-0.20	-1.19	0.24
Achievement	0.06	[-0.09, 0.21]	0.10	0.83	0.41
Power	-0.35	[-0.59, -0.12]	-0.45	-3.00	0.01*
Security	0.16	[0.01, 0.31]	0.26	2.08	0.04*
Conformity	0.10	[-0.07, 0.27]	0.17	1.16	0.25
Tradition	-0.02	[-0.28, 0.25]	-0.02	-0.12	0.90

Note. CI = Confidence Interval for *B.*
R^2 = .41 (n = 67, $p < .05$)
*$p < .05$

Qualitative Results

Qualitative Results Overview

The purpose of the qualitative data collection was to understand how farmers' backgrounds had influenced the way they make decisions. I presented the findings organized by research question, the associated major themes, and subthemes identified from the data (See Table 13).

Table 13

Qualitative Research Questions, Themes, and Subthemes that Emerged from the Data, Pacific Northwest, U.S., Summer 2019

RQ5) Background Related to Agriculture
Theme 1: Upbringing around agriculture
Theme 2: Knowing they wanted to farm
RQ6) Decision Making
Theme 3: Management Decisions
Subtheme: Back in the day involvement
Theme 4: Current Decision Processes
Subtheme: Current structure of management
Subtheme: Weighing the factors
Theme 5: Building Knowledge
RQ7) Goals and Concerns
Theme 6: Farm Goals
Theme 7: Concerns for the Future of Agriculture
Subtheme: Uncertainties
Subtheme: Regulations
Subtheme: Corporate Agriculture
Subtheme: Failure
RQ8) Appreciation and Admire
Theme 8: Characteristics of Farmers they Admire
Subtheme: Progressive/innovative/diverse
Subtheme: Timely
Subtheme: Passionate about the land
Subtheme: Honesty
Subtheme: Farming style
Subtheme: Efficiency

Table 13 Continued

Theme 9: Valuing the Farm
Subtheme: Land and mother nature
Subtheme: Control of time and duties
Subtheme: Family heritage
Subtheme: Spending time with family
Subtheme: Farming as a lifestyle
RQ9) The Future of Agriculture
Theme 10: The Next Generation of Farmers
Subtheme: Change
RQ10) Succession
Theme 11: Succession from Previous Owner to Participant
Theme 12: Succession from Participant to Future Owner
Subtheme: Succession stipulations
RQ11) Self-identify
Theme 13: Farmers persevere
Theme 14: Farmers prove self
Theme 15: Farmers compare themselves to other farmers

Research Question 5:

Background Related to Agriculture

The first qualitative research question I asked the interview participants focused on understanding their upbringing. Bronfenbrenner (1979) found that the surroundings of a child, particularly the microsystem (i.e., the primary setting in which activities directly affect the individual) and mesosystem (i.e., interactions and interrelationships surrounding the primary setting), can greatly impact (positively and negatively) the growth and development of an individual. Therefore, I posed this question to understand participants' backgrounds related to agriculture and how it might shape the way they make decisions on their farm. I found two major themes that emerged from the data regarding the participants' upbringing. The first theme, *upbringing around agriculture,* described how participants matured around agriculture and how it might have helped them develop mentally. Of the eight participants, one participant did not

grow up on or have any familial ties to a farm before becoming a farmer. One participant's family owned a farm, but did not live on the farm. Six participants grew up on a family-owned farm.

Theme 1: Upbringing Around Agriculture

All participants described physically being around agriculture during their upbringing; however, they varied in the degree of familiarity and activities engaged in on the farm. Six of the participants described living on and actively being engaged on the farm from a young age. Tony described his upbringing on the farm and how he loved to play in the dirt and mentioned that he is currently living in his childhood house. Similarly, Cory grew up on the family farm, and described that on his farm they never plowed or tilled their fields. To him, his family farm was always on the cutting edge and he was raised to try new things on the farm. This influenced Cory to believe that diversification on the farm was important.

Some participants described not being raised directly on a farm; however, they still sought to participant in harvest each year. In particular, Rocky grew up on the farm until he was 19 years old when his dad sold the farm, and they moved to another state. However, Rocky would travel back to his hometown to help neighbors harvest in the summer. Although Rocky moved away from the farm, he continued to reconnect with the farm by helping with harvest. Similarly, Jeffrey did not grow up on a farm, nor did his family own any land; however, he did grow up in a small community that was surrounded by farms. He described helping local farmers with harvest each year. Although he did not grow up on a farm, Jeffrey believed his parents instilled the hard work mentality that a lot of farmers have by assigning chores. Perry also did not grow up directly on the farm. Although his family owned a farm, he lived in the local town

and visited the farm only when his dad took him there. He described that he was able to run around and do all of the 'normal' kid things that would happen if he lived on the farm.

Despite some participants not being raised on a farm, all participants described working harvest during the summer. Johnny described working harvest around 12 years old driving a tractor with a wagon, and Ray started driving wheat trucks around nine years old. Mikey also worked harvest for his dad during the summer months with his brother and dad. Tony did not actively participate in harvest until he was 16 because his dad would not let him, mostly because his dad had hired workers to assist.

Theme 2: Knowing They Wanted to Farm

A second major theme that I identified, which closely related to upbringing around agriculture, was the participants knowing they wanted to be farmers. Cory described knowing right away by telling a story of him mowing the lawn for his grandpa. He said, "I was working so hard mowing the lawn just right, so grandpa was impressed with my tractor driving abilities, so that I could drive a bigger one" (Cory). Cory knew that if his grandpa could see that he was doing a good job that he would be able to drive a bigger tractor someday. Contrary, for Perry, knowing that he wanted to farm was a gradual process between spending time on the farm, driving a tractor, and talking with friends:

> I mean, it was all I ever did, was go to the farm. I mean the first time I got to drive equipment by myself, I always remember that. Like there was no one else in the cab … But I don't know if there was a real standalone moment. I have a really hard time remembering a time that I didn't want to farm, or said that I was going to go do something else. (Perry)

Additionally, Perry described farming was ‘playground talk’ with friends, meaning they would talk about how exciting and *cool* it would be to have ownership of land. Rocky knew that he wanted to be a farmer in junior high and always wanted to be involved in agriculture. Despite seeing his dad struggle with and eventually sell the farm, Rocky knew he still wanted to farm some day and prove to his father that farming could be a successful career.

For Mikey, knowing he wanted to be a farmer was a gradual process. He said, “I think that it was a fairly easy decision and it was more of an evolution than any ‘aha’ moment” (Mikey). He realized that he wanted to be a farmer not because he was lazy in looking for a different career but because he genuinely wanted to. Mikey said, “it was a pride of me wanting to be a farmer, and not because I couldn’t do anything else” (Mikey). Johnny also had a similar experience; he did not feel there was a specific moment of knowing he wanted to be a farmer, but that it was a gradual process and he knew he actually liked farming. Additionally, Ray did not recall a specific memory of wanting to farm, but explained that as a kid he always wanted to drive trucks and go out and play in the dirt and to him farming was just part of life.

Research Question 6:

Decision Making

In regards to decision-making, I sought to identify how farm management decisions were discussed during participant’s upbringing and how those experiences might be influential in making management decisions today. I asked participants if their family openly talked about farm management decisions and how they feel their family upbringing had influenced the way they make decisions on their farm today. Four major themes emerged (i.e., *management decisions, currently how they make decisions*, *morals and making decisions*, and *building*

knowledge), with an additional three subthemes (i.e., *back in the day involvement*, *current structure of management*, and *decision-making examples*).

Theme 3: Management Decisions

Back in the Day Involvement

Participants shared how they were involved in making decisions as a child. It is important to note that when I asked these questions it was difficult for almost all participants to recall how the farm management decisions were made. Ray explained, "you know, I don't remember when I was really young. But as I got older Dad would always include Mom and I in discussions at the dinner table" (Ray). However, Ray believes that he does make decisions much differently than his father did. For example, he focuses on marketing and forward grain contracts and his father did not.

Mikey shared that he was exposed to some of the management decisions made by his father and his uncle. He explained that his father handled the business side and his uncle handled the agronomy side of the farm and they would make decisions together:

> I think Dad probably made a lot of decisions without consulting his brother. But then they would sit down and make a lot of decisions together. But I know him and [uncle] had a great partnership that way. So, they've never really battled each other, and it was an unusually harmonious partnership of farming with two brothers. (Mikey)

Although he felt he gained his passion for conservation from his uncle, Mikey does not make decisions the same way his father and uncle did. He believes he is independent and it is easy for him to make decisions on his own.

Vividly, Cory shared about talking openly about farm management decisions as a family and how it might have influenced the way he operates his farm today:

> We had discussion about it [management decisions], mainly, our biggest motivation is profitability, making money. If I'm not making a profit, I won't be able to farm. My dad, grandfather, and [uncle] kind of had the same advice, stay diverse, and have a good reputation, and take care of the land, and you're a good farmer if you keep your fields clean, and borders clean, and road edges clean, then it will translate into more opportunity, good farming practices, different markets. It has kind of all worked out that way. (Cory)

Johnny also remembered his grandfather and father making decisions together; however, it was not until high school that he started to pay attention to what they were saying. Johnny explained how being around farming his whole life has influenced the way he makes decisions:

> Basically, all I've known is farming. That, I mean, I've been around a farm my whole life. So, it's like, I know how everything works really well. So, that makes decision-making a little easier than if I were to just start farming after college. (Johnny)

For Perry, he asked his dad general questions regarding what the tasks were going to do on the farm, but it was not until he got older that he started asking why they were doing it that specific way, and his dad would answer honestly to him. However, Perry mentioned, "I wouldn't say the farm decisions were a huge part of home life, though. It wasn't like at dinner we sat around it and talked about the farm" (Perry). Similarly, for Tony, farm management decisions were not talked about openly. He described that his father did all of the management decisions on his own:

> I didn't really learn about… how do I say this without discrediting my father… I didn't really learn a lot about farming from my dad, until I actually went back to the farm, you know, like everything I learned was just from other people. (Tony)

Theme 4: Current Decision Processes

Current Structure of Management

Each participant described who they make decisions with today. I found that many of them included their wife and sons in the decision-making process. For example, Jeffrey, reported involving his wife with making decisions because she grew up around it and understands; however, she is not involved in the hands-on day-to-day work. Additionally, Tony reported involving his wife and explained that his wife has a good "say" in the farm decisions:

> So, we, you know, we're a partnership. She's the brain. I'm always telling everyone she's the brain, and I'm the brawn. But we don't have any structured business meetings, or we don't look into QuickBooks and see where we're at or anything. But if our finances are getting a little tight. She'll tell me, you know, and I'll kind of ratchet back on some things. And I always love at the end of the year when she says, 'well now you gotta spend some money!' (Tony)

Tony has three sons; however, only the eldest son contributes to the decision-making process. Tony stated, "I've already turned a lot of management over to [his son], whether he noticed it or not … we're always talking about it [farming]. Then, you know, we're bouncing ideas off each other all the time" (Tony). This is a similar situation to Ray, in that Ray involves his wife and sons when making decisions:

> So, a lot of the decisions are kind of made on their [his sons'] basis to have what they want, where they want to end up down the road someday, too. I mean, you know, if we're making a purchase of something, you know, they got to give their input if they think it's worth buying or not … Just because they [his sons] think it's a good decision, doesn't mean that we're going to follow through with it. I mean, you got to weight it all out, you know. But somewhere, I'd say I still have the final say, I guess, if you want to call it that. (Ray)

Similarly, Rocky was the only one making decisions on his farm until his son was made a partner in the corporation. Now Rocky and his son share equally in the farm decisions. Rocky explained that he is getting older, and is now allowing his son to make a lot of the decisions on his own.

As a younger farmer, Johnny explained that he started contributing to farm decisions when he was in college. He felt that from his education he finally had the knowledge and understanding to contribute decent advice. Although Johnny is not the sole decision-maker on the farm, he feels that he can always provide his input and advice to the situation. For Perry, however, it was difficult at first contributing his opinions and learning lessons when making decisions with his father:

> At times. Yeah. It [decision-making with his father] was pretty rough. Rough for a year or so. Mostly because I was really hammered down [on making changes to the farm] … So yeah, I had to step back a little bit. Dad has been very much more willing to let go and to realize things. Yeah, I have some dumb ideas, but most of them are not. Not that they're smart, but they're not too financially risky. We've tried some new ideas for our area. But we're doing it on small acreage, keeping our financial risk down. Farming is a marathon not a sprint. (Perry)

Mikey is the sole decision maker on his farm; his sons are not involved on the farm, and his cousin and he do not ask each other for advice. However, he explained, “I don’t feel challenged when somebody else exercises my decision-making ability, I actually want to see my employees doing that” (Mikey).

Weighing the Factors

The participants described situations where they needed to make decisions on their farms, and how they think through weighing many factors when making those decisions. In particular, I found they mentioned weighing buying new equipment or land, weather, and environmental situations, and the moral dilemmas they feel when making those decisions. Almost all participants mentioned finances and how although they like the idea of something, they might not act on it because of finances. Tony described that when making decisions:

> It's easy for me, as far as what, when, where, how. Other than marketing, I’m greedy. Sometimes I’ll pass up a good price, and take a bad one … but we do good enough to keep the banker away, so that’s the main thing. (Tony)

Tony wants to ensure that he will get paid each year; and therefore, is willing to take the initial jump to sell his grain at a safe price that eventually changed to a better price. However, he believed he does a good enough job of selling his grain, enough to disregard the need for an operating loan.

For Rocky, he is willing to take more risks. Rocky explained, “I’ve always been the person that believes, it’s always easier to keep up rather than catch up” (Rocky). However, those decisions can also be very difficult to manage and survive. Rocky also explained:

> I've had a few different drills, and it's difficult right now with the price of grain, and because we have froze-out three years in a row. Before that, we froze, and we lost a lot of our crop to winter kill. It's been difficult for four years in a row. So, with the equipment we bought, it's been difficult to make it [finances] go. And the only way to make it go is through custom work. If we didn't have our custom work, we probably wouldn't have made it…Because of the financial situation, with the price of wheat, it's hard. So, we take that into consideration more than anything I think. At this point, we're just trying to survive. (Rocky)

Rocky described that a farmer needs to keep progressing forward, so they will not have to catch up in the future, even when it is currently a financial uncertainty. Some participants described weighing decisions in long-term and short-term decisions and what the pay-off will be. Ray explained:

> We are trying to be more sustainable. So, I mean, you got to really look at things in a long-term perspective on certain decisions and other decisions can be a lot shorter term… short term stuff is a lot easier to management than long term stuff. (Ray)

Similarly, Mikey's thought process to purchase new equipment was a simple one. He explained that he bought a sprayer for $300,000, he knew it would be a quick payback investment. It was an easy decision for him to spend the money when he knew he would get his money out of it quickly.

Unlike Ray and Mikey, Jeffrey is a young and beginning farmer and assesses decisions differently. Jeffrey described that when making decisions, he thinks about the problem, assesses what he has available to him and what it might cost, then determines whether or not it is feasible.

Although he does not find it difficult to make decisions, he explained that he is always questioning himself. Jeffrey described how he uses a spreadsheet to help him:

> I built a pretty sweet spreadsheet that I keep everything on … sometimes it [updating the spreadsheet] goes in phases for me. Sometimes it's really easy to sit there [and fill it out] and sometimes it's harder. You just have to keep on top of it, and it will slip my mind and I have to try to remember. (Jeffrey)

Similarly, Cory described using a spreadsheet:

> I put it into my cost of production spreadsheet to make sure it's economical, and then I typically bounce the idea off of my dad, and then I follow that up with a brief conversation with my banker, just to make sure he's on board as well. (Cory)

Perry confirmed how important it is to keep track of what a farmer does, to learn from and understand what worked and what did not:

> But I think a huge part that a lot of people miss, you gotta write down. And I'm guilty of it too. I mean I get to spraying or whatever, and one glug, two glugs, little more or less, but I mean, if you don't document it. And yes, yield mapping has come so far, but if you don't, write it down, then people say, 'oh wow that [field] looks good', and if you didn't write it down, then you wonder what all actually helped. You know? (Perry)

Although the participants make decisions based on finances, they expressed that they also wrestle with them. Cory described an example of how he balances his feelings when making decisions:

> It's hard because I wrestle with that concept a lot [making risky decisions to improve his farm]. It's crazy because it's really hard to make the economics of cover crops work. The only benefit I have right now financially is the livestock value on capturing from the

> livestock. Because I own the livestock and they're not someone else's … But then I wrestle with the you know, thinking long term and biological improvements, because of the diversity of the livestock with their urine, and their hair, and their poop, and saliva. It's hard to quantify that benefit per acre. So, it's kind of that feel good, economic benefit of knowing that I'm, I'm trying to do the best I can for the soil, and relying on my other cash crops. (Cory)

Ray has a similar thought process in that making decisions can, "sometimes be by the seat of your pants" (Ray). He explains that he is trying to implement cover crops with his cash crops and getting to grow sometimes on his land year-round. "We might go broke doing it, but we're going to keep going" (Ray). Ray described attempting to rebuild soil health in his fields:

> Can it [poor soil health] be fixed? Yes. Can it be fixed short-term? Maybe. But it's extremely costly to do that, and I don't want to have to do that. I want to try to do it with seeds, you know, growing different crops that are going to benefit the microbial life and change things in the soil, instead of having to buy 'bugs in a jug' to fix in … It's going to be a slow process, but it's taken 130 years to get it in this state. You know, hopefully before I'm dead we will have things turned around, but I can't guarantee it. (Ray)

When making decisions Perry evaluates it. He described thinking about all the aspects of the topic, then calculates how much it will cost. In some cases, he's willing to make personal sacrifices:

> Yeah, risk is the biggest deal, what can you risk and still be willing to take a hit? I always try and look like, 'okay, if this right here [what he implemented] goes to an absolute zero? Am I still going to be able to make an tractor payment at the end of the month?' … If I tried something drastic, zero would be my number. Like, 'okay, if this goes to an

> absolute disaster on this, I'm still fine after all.' Yeah, I won't be buying sushi, and I'll have Top Ramen instead, but I'll still be able to make a tractor payment. (Perry)

Perry also explained, "it's just so easy to see that somebody else is doing something or either succeeding for a reason that you're not able to, or doing something for a reason that you're not able to do" (Perry).

Although farmers go through dilemmas on making decisions, Johnny explained:

> You got to have a balance for sure. You can't just be one sided, or else you're either go broke, or you can't [pause]… I feel like as farmers, you almost have kind of an obligation to try something new and to keep advancing. But, you know, there's a lot of farmers that don't, and I guess that's fine, too. It's just, they're kind of going to be behind the eight ball when it catches up to them. (Johnny)

Mikey and Ray describing having similar views when making decisions related to purchasing land. Mikey explained his thought process of purchasing land that was physically close to land that he already owns. Although it would have been a good location, he didn't see value in it because the top soil had been depleted. To him, the land it was beyond repair to get good yields off of. He stated, "just for the pride of saying I have acres… that doesn't really get you very far (Mikey). Ray described a similar decision-making process of purchasing land:

> You really got to look at the soil quality or soil health. What kind of chemistry is in the ground? How bad has it been eroded? What's it going to take to get it into a direct seed system? There're all kinds of factors that can go into land purchases, just because it's for sale doesn't mean it's worth buying. (Ray)

For Jeffrey, His transition into being a farmer has led to decisions he has to make. For example, he described that it can be hard to see other people heading to the lake every weekend, and his

family has to stay to work on the farm. Although this dilemma can elicit negative emotions for Jeffrey, he knows that staying home to do farm work is something that he has to do and wants to do.

Theme 5: Building Knowledge

When understanding how the participants gain knowledge, I found they described using sources of information to gain more understanding and knowledge of new farming ideas. Rocky explained, "we look to education, we look at Extension, and we look to see what [the local agriculture extension agent] is doing. And then, it comes down to dollars and cents after that" (Rocky). Similarly, Ray described listening to advice from crop consultants that help him make decisions. Additionally, Ray explained, "there's a lot that goes on between other direct seeded farmers" (Ray). Ray suggested that there is a lot of sharing of knowledge between farmers who implement similar farming practices. Mikey explained his experiences of asking questions and providing others advice:

> If someone is doing something I'm interested in, I am more than happy to see what I can learn from them. But that does not happen very often, because guys, like your dad and I are pretty much out-front doing things first. So, it pretty much works the other way around, I have a lot of guys calling me asking me questions … I think of it like I know something they don't know. Not that I know more than they know. Because that's the reason for asking questions. Like when I call your dad, it's not that he knows more than me, but that he has just done something that I haven't. So, I'm never paranoid or insecure about showing my cards. (Mikey)

Johnny explained that it is helpful for the farmer when he is open about what they are doing. Johnny described:

> it will hurt them in the end, because like, if they don't want to share what they're doing, or if they got something else going on, and they don't want to share that, then other farmers aren't going to want to share stuff with them. (Johnny)

Perry shares a similar view. He explained:

> If you think you know everything, then you're a [expletive] idiot … If you're not listening, like there's always somebody who knows more about whatever you think you're the best. So, if you're not listening to other people and other areas, and I mean, you're just, that's crazy. (Perry)

Perry expressed his perception on how beneficial it can be for farmers to listen and learn from other farmers. Similarly, Jeffrey explained how other farmers are open with him, "they all know that we're just starting out. So, they're a little more open than they might be to other people" (Jeffrey). Tony, a farmer with more experience, described that he enjoys talking about farming with other farmers:

> Oh, I love to talk to other guys, and get different ideas … and, you know, typical farmer, you're always looking at the neighbor and seeing what they're doing … I'm always questioning others, when I see something different going on, or a different piece of equipment. You know I've asked your dad several times, 'well what the hell are you doing?' because they kind of push the envelope. Or at least, as far as a local envelope goes. (Tony)

Tony has also encouraged his son to be social and attend grower meetings and conferences to bounce ideas off other people. Johnny also believes it's important to continue learning, "you

can't stop learning. Like you gotta just keep reading and going to meetings and stuff like that" (Johnny).

Research Question 7:

Goals and Concerns

To further understand participants' methods of making decisions, I focused a research question on identifying participants' future goals for their farms and sought to document their concerns for the future of agriculture. Two themes (i.e., *farm goals* and *concerns of the future*) and three subthemes (i.e., *uncertainties, regulations, corporate agriculture* and *failure*) emerged from the data.

Theme 6: Farm Goals

Many of the participants described goals to implement new ideas on their farm. Cory, Ray, Johnny, and Jeffrey all noted they wanted to implement diversity. Cory explained he wanted to, "make sure I'm taking care of the soil so it's better for the next generation, better than what it was when I got it" (Cory). Ray and Johnny both mentioned they wanted to reduce their inputs of chemicals. Johnny explained why he wanted to reduce chemical inputs:

> Because I think that's what the public wants. I think that there are benefits to it, not just because of political things. So, I think that there are benefits, to the farmer, the environment, the land, and everything. (Johnny)

As a beginning farmer, Jeffrey described wanting to implement more technology on his farm and pay off bank loans:

> Long term it would be really nice to just be out from underneath the bank. That would be ideal if we can run a cash operation. I would consider that successful. That's a career goal though because it's going to take that long for that to happen. (Jeffrey)

Theme 7: Concerns for the Future of Agriculture

Uncertainties

Although not explicitly stated, I found many of the farmers discussed their feelings of uncertainty. The uncertainties were based on factors that were beyond their control, but directly affected them. Rocky explained his concerns succinctly:

> Weather and price. Those are my two biggest fears. We [farmers] don't seem to have any control over either of those things. Sometimes I think I can deal better with the weather than with the market. And a lot of times, the market doesn't make much sense anymore. (Rocky)

Johnny and Mikey expressed a similar concern to Rocky. Johnny was worried about being profitable, he said, "the wheat and commodity prices, you can't really change it, you just have to adapt" (Johnny). Mikey also shared his concerns regarind factors beyond his control:

> My biggest fears are continued prices where they are. We've [his farm] had some amazing production. I've had 100-bushel wheat in the last three years in a row but yeah, no one [farmers] is really racking up any money. Because prices are very, very low. So, things that are totally beyond our control are, what should be, most concerning to farmers. (Mikey)

Regulations

The participants described concerns of being regulated. Specifically, Cory and Johnny shared concerns of regulations related to chemical usage on the farm. Cory explained that he is worried about, "losing markets because of tariffs and politics" and "losing chemicals, that maybe get abused in other areas [farming regions], like glyphosate" (Cory). Johnny explained how regulations can alter the future of agriculture:

> I think in the future, the regulations. Like not releasing too much carbon or, you know, restricting our pesticides. That's a big one. You know, if we lose some of our pesticides, farming is going to change. (Johnny)

Corporate Agriculture

Similar to regulations, participants also concerned corporate agriculture becoming the standard for farming. Perry and Tony described their concerns of corporate agriculture becoming more prominent over smaller family farms. Perry described his concern in detail:

> Corporate agriculture. Our tax system, the way it's set up, it's scary … some of the larger farms are all running the table, they are creating levels of competition, and it's not just little peasant farms like us, I mean, it's like fairly large farms right here that cannot compete with them, and that's scary. (Perry)

Similarly, Tony also expresses concern related to larger farms taking over:

> Getting squeezed out … If you got a fifth generation coming back [to the farm], you gotta make sure they got a land-based farm to come back to. And I fear that I might not be able to compete with the deeper pockets. I've already missed out on a couple of prime opportunities … But yeah, we were just unable to compete with the deep pockets. (Tony)

Failure

Although not openly described by many of the other participants, the concern of failure emerged from the data. Specifically, Jeffrey expressed concerns of failure whether it is his fault or not. He explained that he does not have enough capital to support a huge loss on his farm, and he worries about not being able to make ends meet. This was a theme that emerged because of Jeffrey explicitly describing it. However, failure was exponentially prominent in all interviews with the participants.

Research Question 8:

Appreciation and Admire

As part of my study, I identified what the participants value and appreciate about their farm and what they admire about other farmers. The findings related to this question provide a perspective as to what potentially motivated the decisions made by participants. The theme, *characteristics of farmers they admire* had four subthemes: *progressive/innovative/diverse, timely, passionate about their land,* and *honesty*. The second theme that emerged, *value about their farm* had five subthemes: *land and Mother Nature, control of time and duties, family heritage, spending time with family,* and *farming as a lifestyle*.

Theme 8: Characteristics of Farmers they Admire

Progressive/Innovative/Diverse

Seven out of the eight participants expressed that they admired farmers who were progressive, innovative, and/or implement diverse ideas on their land. Their answers were similar in how they described those types of farmers. In particular, the participants who were older and had more experience (Ray, Mikey, and Rocky) shared similar views. Ray explained that he looked up to, "the ones [farmers] that are really involved in soil health. I mean, some of these guys are really going for it" (Ray). Similarly, Mikey explained he admired, "those that are willing to try new things, innovate, to embrace conservation and realize that they can't practice a non-sustainable form of agriculture. So, your old guys, who have been there and done that with direct seed" (Mikey). Furthermore, Rocky shared his feelings on farmers who is admires and those he does not:

> Anyone who is progressive. And always look at new things. My pet peeve are people who don't. Who are just doing the same old thing. I understand it's what works for them, but they really aren't looking down the road. (Rocky)

Younger participants, Jeffrey and Johnny, also admired farmers who are trying new ideas on their farm. Jeffrey described those farmers as, "willing to try different thing and new stuff in different ways" (Jeffrey). Additionally, Johnny stated that he admired, "people that are innovative. Who are, you know, you can tell they're making money, and making advances out there in farming. How they farm, they're not just doing the same things" (Johnny).

Timely

Three participants (Cory, Perry, and Tony) also admired farmers who were timely in accomplishing their work. Perry provided a the following explanation:

> I think one of the biggest ways to be successful in farming, and this is what drives me crazy, is being on time. And coming in, year in and year out. When you look at the best farmers they are always on time. You know, it's not the spring's fault that it was wet or dry, not Mother Nature's fault that whatever happens, but being on time is so critical in farming. Especially in our area here, nature is just so non-forgiving here. So, if you're not on time, there's no making it up. So, I have a lot of respect for the farmers that are continually on time and continually have consistent results. (Perry)

Tony described a specific farmer who he admires:

> So, you know, the whole thing about farming is timing. And those are the only ones who are successful. And the ones that fart around, and don't take care of their [expletive] and they're always broke down, those guys are the failures. So anyone who is timely, is on my plus side. (Tony)

In addition to being timely, Cory expressed not having much appreciation for the guys who are not as active in working and getting things done on their farm. He expressed appreciating farmers who love to work, he stated, "you can usually pick up on a good cowboy operation from a mile away" (Cory). Similarly, Rocky described admiring a farmer who loves to work and be a farmer. He described an 80-year-old man who isn't exactly progressive, but is still out in the field and loves farming. Rocky said, "alright, my hero, is [farmer name]. That guy… Amazing. Yeah, I don't know how old he is, but he's a good guy. Up until just a couple of years ago, he outworked the [expletive] out of me" (Rocky).

Passionate about the land

Two of the participants (Jeffrey and Cory) mentioned they admire farmers who are passionate about the land. Jeffrey explained characteristics of farmers that he admires, “their fields are clean all the time, their crops always look good, they're consistent” (Jeffrey). Similarly, Cory stated be admires farmers who produced diverse agricultural commodities, but still had good clean fields. He said:

> And the thing I liked about the guys that had cows and farmed, was they seem to have a passion for the land and the animals … And there's very few of them that have livestock and farms that did a good job and had good clean fields. (Cory)

Honesty

Although not described by other participants, honesty was mentioned by Tony and provided a sincere comment about who he admires:

> You know, the honest ones. The ones that I can ask how much rain they got and they’re honest about it. Or I ask what their yield was, and I *know* [emphasis added], it wasn't the number you gave me because I know it wasn't that good … honesty, integrity, timeliness. Those are the main things. (Tony)

Farming Style

As a young farmer, Jeffrey described appreciating farmers who have a specific style of farming:

> They got a certain way of doing it. But then it's nice to see him change up their crops, but at the same time, not change up their style. By style, I don't mean their farming practice, necessarily, but just like there, more like their core values. (Jeffrey)

Efficiency

Johnny described admiring farmers who are efficient, in that they can run the business side of a farm to make money, but are also willing to try new approaches. Johnny said:

> They're efficient. They know how to run a farm very efficiently ... You know, they're more business focused and not as much agronomics side of things pushing the envelope, because they want to make their money. (Johnny)

Theme 9: Valuing the Farm

Land and Mother Nature

The participants expressed what they appreciate and value most about their farm. Five participants mentioned they value the land. In particular, Perry explained:

> I think it goes back to the sense of ownership and sense of pride. So, owning something that is bigger than just a one-acre lot and a house. Owning land is always something that I've wanted. So, having ownership and doing a good job at it. Like being somebody that you would hope other people would look to. (Perry)

Similarly, Tony expressed his pride in the land:

> I guess I would have to say, probably just being on the land. Knowing that it either works or doesn't work, because of me… Being able to produce something, see something grow. Watching the fields turn green in the spring, and watching the canola bloom. You know,

> just see something grow that you put in the ground, and pray to God that it grows. And nurture it, and try to do the best job you can. (Tony)

Johnny also described his appreciation for his land and the changing of work each year, “I think like that we're in an area that is very challenging. Like every year is different. It's very low rainfall, and it's tough. But like, the challenge of making it work” (Johnny).

Control of Time and Duties

A few participants mentioned they appreciate having control of their own time and job duties. For example, Tony stated that he liked, “being my own boss” (Tony). Similarly, Ray stated he liked having, “the freedom to kind of do what you want, I think it's a great way of life” (Ray). Although farmers can be their own boss and control their own time, there are more duties required. Johnny explained, “it would be really nice to have more time off when you’re a farmer. Like there really isn’t any time off” (Johnny).

Family Heritage

Many of the participants described valuing the history of their farm. Cory said he appreciates the, “family history and heritage of my family farm” (Cory). Ray explained that he values, “that it's [his farm] still all family run, I mean, you know it's all with immediate family” (Ray). Jeffrey expressed a different perspective on valuing his family farm, “if we do it we do it [farming] right, then [my kids] would have a shot at it [being successful with the farm] too” (Jeffrey). Tony also mentioned that he values his family farm:

> Heritage. Just knowing that there were three generations before me on here, on this ground … you know, one of the things, [his grandfather] on his deathbed said, ‘Whatever

> you do, don't lose this farm'. So, you know, that was a big push for us. You know, if the farm goes away, it goes away forever, and we [Tony and his wife] didn't want that to happen. (Tony)

Mark explained that he appreciates his family for setting the stage for him to be successful in implementing new management practices:

> Well I give my father and his brother, mostly brother, credit for setting the standard … they left a good asset for me to pick up with. And that's what I am proud of … not because I am better, but because I had better tools to implement direct seed … so you know, they were happy as a clam when I did this [adopt direct seed]. So that's what I'm most proud of is getting a 20-year head start. (Mikey)

Furthermore, Johnny described how hard his family worked before him, "I don't think that I ever realized how hard my parents and grandparents worked then" (Johnny). Tony, an older participant hopes that he is helping instill family history and heritage of the farm to his sons:

> I don't know that he [his eldest son] actually really has a handle on the historic aspect of the farm. Because we've never really dove into the old pictures. I don't think he's read anything of the [last name] family history or anything like that. He just basically gotten it from grandma and he might remember some from grandpa … So, I think he has a sense of the heritage. Like I said, I hope we're just instilling that in him. (Tony)

Spending Time with Family

In the context of discussing what they appreciate about their farm and their job, a few of the participants mention the aspect of being able to spend time with their family. Cory shared:

> Just to spend time with the family on the combine and tractor. Yeah, those are some of the funniest moments we've had as a family are here [on the farm]. They're [moments] always in the field or in a feedlot or at the calf table castrating calves … yeah and you do everything together, you know, you might vacation just once a year [laughing]. (Cory)

Similarly, Jeffrey described an example, "like today, [his wife] said [his son] was crying all morning, so I came in and sat with him for a while. I couldn't do that working a regular job" (Jeffrey).

Farming as a Lifestyle

Farming was specifically referred to as a lifestyle by multiple participants. Johnny described that he appreciated how the farm and the family blend together, creating farming into a lifestyle. Johnny stated, "I mean, farming is a lifestyle. It's not really a job. So, your family kind of has to be involved" (Johnny). Ray had a similar statement in that, "[farming] is a great way of life" (Ray). Furthermore, Rocky said, "I would say the lifestyle. I always say that, but with all the work and having a work ethic, there is a good lifestyle" (Rocky).

Research Question 9:

The Future of Agriculture

As part of the study, I sought to understand how participants viewed the future of agriculture. I asked participants to describe their thoughts on the future of agriculture and the next generation of farmers. One theme emerged from the data, the *next of generation* which had a subtheme of *change*.

Theme 10: The Next Generation of Farmers

Participants expressed worry, concern, and hope when they shared their thoughts about the next generation of farmers. Cory described feeling worried about the younger generation because they do not have very strong worth ethic and social skills; however, he also expressed hope for humanity when he sees a kid who is polite and can hold a conversation. More specifically, Tony described that he anticipates a lot of obstacles for future farmers, yet is still hopeful. Whereas Mikey explained that he hopes they have a heart for conservation agriculture. Overall, participants expressed that they expect much change in the future for the next generation of farmers.

Change

Change was a prominent theme among participants when describing the future of agriculture. Tony and Jeffrey believed the next generation will be more apt to using technology on the farm. Tony explained, “I'm optimistic that they will be able to use technology to the fullest” (Tony). Additionally, Jeffrey stated, “guys, like my age, I think we're kind of in a weird spot, because there's a lot of new technology coming out right now. We're pretty good with technology, so that won’t be a problem for us” (Jeffrey). Similar to Jeffrey, Johnny (a younger participant) explained, “you know, there's a lot of kids, my age kids that are coming back and want to change” (Johnny). Johnny described how agriculture will change:

> It's [agriculture] going to change a lot, especially in this area … I think they're [young farmers] going to see that there are other ways of getting the same or better results, that are better for the ground and better for other things. (Johnny)

Interestingly, Rocky, Ray, and Mikey see the change in agriculture more vividly than the younger participants. In particular, Rocky explained that change in adopting new farming practices will start with the next generation:

> I think they're going to have to change. I remember saying this to the board members for the [association], when I was on the board. If they want people to change right now, and convert to direct seed, I have always said it's going to happen with the next generation. People aren't just going to do it, to do it. (Rocky)

Rocky also described how the change process for the next generations of farmers might be forced and provided an example of how that might happen:

> They [young farmers] see it [the use of new practices]. They get it. But getting it past their dad, is another thing … [for example] it's the split packer drill. Which is the biggest cause of erosion there is. But it is still successful and it still works for them. But, they are not going to be able to use that forever. The next generation probably is not going to be able to get parts for it. So, they're going to have to change and do something different. I have some neighbors right next to me. Very good, conventional farmers. But the next generation that will come in, aren't going to do it the same [as their fathers]. (Rocky)

Ray, an older participant like Rocky, explained:

> I think the younger generations are getting more and more advantageous to taking more risks. Whether it be cropping, or you know, getting rid of tillage or whatever … I think the younger and next generation, they're going to see the writing on the wall and they're going to have to change. (Ray)

Similar to Rocky and Ray, Mikey explained:

> They [young farmers] would appreciate the efficiency, technology of direct seed. So, I think very few new farmers would be interested in doing things the old way. And if they think they should be done the old way, you probably shouldn't let them come back [to the farm]. (Mikey)

Mikey also explained his view of the future of agriculture:

> I see it as nothing but positive. For one, they [the next generation of farmers] didn't really grow up thinking you were supposed to work 15 hours a day, seven days a week, which means you're not that interested in working in your fields 28 times just to get a crop planted. (Mikey)

Mikey's comment reveals that he believes that the next generation will adopt new practices that allow them reduce the amount of time they spend in the field. Jefferey, a younger participant, acknowledges that things will change but farmers will still have to work hard. Jeffrey stated, "but the way things are going, I think you're still gonna have to work hard and you still gonna have to grind it out every day, but it's [farming] gonna be a lot different than it used to be" (Jeffrey).

Research Question 10:

Succession

Understanding participants' perspectives of land succession was important. Participants described their experiences when entering their career as a farmer and their thoughts about retiring and land succession. Two themes emerged from the data, *succession from previous owner to participant* and *succession from participant to next owner*. The theme, *succession from one participant to next owner*, elicited a specific subtheme related to *succession stipulations*.

Theme 11: Succession from Previous Owner to Participant

Succession in farming was expressed as a very individual process, indicating that each situation was unique. All participants described entering into their career as a farmer at different ages and under different circumstances. Some participants reported more difficultly becoming a farmer, than others. Tony described his unique experience with land succession and becoming a farmer:

> We came really close to not being able to come back to the farm. Part of it was because of not being included [in farming conversations], I guess, or not being involved in the day-to-day farming. You know, I didn't have any intentions of coming back to the farm number one, because Dad didn't want me to … because he thought it [farming] was too much work for too little return … the discussion never came up about succession. So, I went off to do something else, because I just figured it [farming] wasn't going to happen … then one day I just asked Dad. I said, 'Oh, what are you going to do?' And he said, 'what do you mean?', and I said, 'well what are you going to do with the farm?', and he said, 'well I'll just have [neighbor] take it over'. And I said, 'is that what you want to do?' And he goes, 'well no, not really, but I don't know who else would want it.', and I said, 'what if I wanted it?' and he said, 'you wouldn't want it.' I said, 'I'd like to at least try it.' Because once it's gone, it's gone forever. And he just said, 'well ok I guess if you want it, we can work something out.' And literally, six months later we moved back [to the farm]. Yeah, it was a quick turnaround. (Tony)

For Tony, his father did not want him to farm in the first place, and assumed that Tony wouldn't want to go back and farm anyway. However, Tony knew that this was his opportunity to farm,

and if he did not take the opportunity, it would be gone forever. Tony further described an example as to why his father thought Tony shouldn't come back to the farm:

> When I finally cleaned out my dad's office downstairs … I found a notebook stuffed in on a shelf. It was a pro and con list of having me come back to the farm. He had a whole bunch of cons and only a few pros … I'll never forget this. The number one item against me coming back to the farm was, 'what would [Tony] do if diesel went over $1 a gallon?' [laughing]. That was his number one fear, that diesel was going to go over $1 gallon, he didn't know how anyone would make it if that happened. (Tony)

For Perry, he described feeling like he had to prove himself to his father that he wanted to farm:

> He [Perry's father] just didn't want me to come back unless that was what I really, really wanted … I don't think he really knew that until later … I think he really wanted me to prove to him that this is what I really wanted to do. Not that I was just gonna come back just because he had to, or that was just what I needed to do … dad knew I loved it, but he was all for me doing anything else in the entire world. So, he was not pushy at all [for Perry to come back to the farm] … so, I feel like I almost had to convince him… you know, dad had a very rough deck of cards delt to him when he came back to the farm, unfortunately, and so I think it was really hard on him. He just didn't want me to come back unless that was what I really, really wanted. (Perry)

Johnny had similar experiences of not feeling pressured to come back to the farm. In particular, Johnny stated, "I don't feel like it [coming back to the farm] was an expectation. It was just like, I always liked farming, and I always thought I was going to come back and farm" (Johnny). Because Jeffrey's family didn't own farm land, he had a different experience with becoming a farmer:

> We were meeting with our accountant one day, and she's like, 'Whoa, I guess the plan is for you guys to start farming next year'. And we [Jeffrey and his wife] were like 'Ahh, it is?!' … So, after we heard that, and we talked for a few weeks and decided that if we didn't do it [take over his wife's grandfather's farm] now, we didn't know when the next chance would be … I don't think it really felt forced. We were both good with it. We talked about it. It was something that we both wanted. (Jeffrey)

Interestingly, younger participants Jeffrey, Johnny, and Perry expressed statements about land succession by putting themselves in the shoes of older farmers who are in the process of transitioning land. Jeffrey explained:

> I get it. So, for somebody that built something and you're thinking about taking it, it's hard for them to let it go … yeah, they've worked really hard to make it what it is. But at the same time, if you don't help somebody else, then it's going to be even worse. (Jeffrey)

Jeffrey experienced taking over someone else's land, in which it was hard for the previous owner to let go of what they had built. Perry believes that succession planning is more common today than it used to be:

> In today's industry so much of this [talking about succession planning] has come more into light, and it's from a lot of stuff like this [the interview], I guess, that make it so that people realize that they're not alone, that they're not the only one going through the process. That there are steps and processes for people, and how to handle those things like coming back to the farm. (Perry)

For Johnny, he described feeling sad that older farmers might not have someone to give their land to. He stated:

> But you know, there's a lot of older people that don't have anybody to come back and run their farm. So, they're just going to lease it out or sell it. But I think it's kind of sad that. [pause] I think once they sell they're like, you know, they feel bad, because everything that they've worked for, is kind of gone. Yeah, it's not gone. It's just in somebody else's name. (Johnny)

Theme 12: Succession from the Participant to the Next Owner

The older participants talked about transitioning their land from them to the next owner. Mostly because it was applicable to them because they were thinking of retiring in the near future. However, Jeffrey and Perry (younger farmers) described what they might do in the future. Jeffrey explained that he hopes that his kids would want to farm but he is not going to push that on them. Additionally, Perry said:

> I'd rather build a farm and give it to a kid that wasn't my family and whose heart was in it, rather than give it to my kid who heart wasn't in it. So yeah, I think you have those conversations" (Perry).

Rocky, Tony, and Mikey (older participants) expressed they had been thinking about retirement and what they will do with their farm. When Rocky described a fellow farmer, who is still farming at 80 years old, I asked him if he wanted to farm until he was 80 years old too. He replied, "I hope not. Gosh I hope not" (Rocky). Rocky also explained:

> I think [his son] gets ready every day for me to retire. Except for the fact that he wouldn't be able to do it [farm the land] himself … and I really don't want to quit. People ask me about retiring, and I say, 'Oh farmers don't retire, they just die.' (Rocky)

Additionally, Rocky explained that when he fully transitions the land to his son, "he [his son] has to buy us out. It would be nice to just give it [the farm] to him, but obviously no one gave it to me" (Rocky). In Rocky's case, he expressed that, financially, he cannot afford to retire because he is still dealing with debt. Thus, to retire, his son would have to buy the land and equipment from him.

Similarly, Tony is thinking about providing an opportunity for his sons to come back and farm. However, based on his own experience with coming back to the farm, he understands that two of his sons, who aren't very interested right now, might show interest in the farm later in life. Tony explained:

> But I never really expressed an interest in farming until six months before I came back. So yeah … I don't know what the future holds for both of them [his two youngest sons] … my whole goal in life was to, you know, keep the [last name] Farm solvent and in one piece long enough for my kids to have a chance. Well, I want to make sure all three kids have that chance and if they want to come back I wanna be able to make it possible that they can." (Tony)

Tony expressed a desire to expand the farm in a way to allow all of his sons the opportunity to farm. Although most of the participants described family farm transitions, Mikey expressed a different idea about keeping land within the family:

> I think for business purposes, yes [keeping the land in the family]. I think farmland is good for passing down and emotionally, as far as history and tradition, but I'm not much for history and tradition. So, I don't think the world's losing anything if the [last] name isn't on the land. Which is the same reason I'm very happy my boys had the integrity to

> go off and do what they wanted, and not feel like they were defaulting to the farm. (Mikey)

Succession Stipulations

The participants (Mikey and Ray) who apply specific farming practices of no-till, expressed that when transitioning the land from one person to the next, they will be specific about what practices are allowed on the land. When I asked Mikey if he had any concerns about transition his land, he shared:

> This is a game stopper for me, they have to [direct seed] or else they are not going to lease the land … if you own land you should be the *most* [emphasis added] interested in preserving the assets, not the *least* [emphases added] interested. So that is beyond me why landlords can't figure out that they should at least hope that their operators are direct seeders, and not demand that they are direct seeders … I want to be a good hands-off landlord. I don't want to dictate terms or anything. But that's the one thing that I will dictate, is that it has to be a direct seed farm. (Mikey)

Ray expressed a similar perspective about leasing the land to a specific type of farmer if his sons did not come back to the farm. He explained:

> I'd still retire and lease it out … they would have to be direct seeders and would have to try to carry on the cover crop-type scenario … I guess if I was to lease it out I'd have stiff stipulations on how it needs to be farmed because I hate to see it [long pause] just all the years that we've put in to try to get the soil to the condition that it is, I would hate to see it go backwards just because they started conventionally farming it again. (Ray)

Research Question 11:

Self-identify

I was interested in understanding how farmers self-identify themselves. Many of the participants described themselves as having specific characteristics that identified them as a specific type of farmer. Three themes emerged from the data: *farmers persevere*, *farmers prove themselves,* and *farmers compare themselves to other farmers*.

Theme 13: Farmers Persevere

In reflecting on their own identify, many of the participants described how tough farming is and that farmers need to be tough too. Tony described how he persevered in the early years of farming to obtain more land and become a farmer. Tony said:

> There was, you know, 3, 4, 5 years, there I was actively knocking on doors, trying to lease land. It was like, 'Man…' … then all of a sudden, you know, I tripled my farm size in two years, and that was kind of hard too, but we [his family] made it. We made it through a couple of tough, really busy years … leaving the farm never was a real thought. It was just kind of a question, 'Can we make it?' So, no, we were never going to leave unless we were forced to. (Tony)

Rocky also described that he wanted to prove his father wrong, "that [proving his father wrong] was pretty much my motivation" (Rocky). Similarly, when describing the new management practices that he wanted to implement, Ray stated, "we might go broke doing it, but we're going to keep going" (Ray). Furthermore, Mikey describing watching another farmer struggle and quit being a farmer when implementing new farming practices. Mikey said:

> He [farmer] just could never push himself to go beyond what his father had done … So, he was always pretty nervous about the risk of being a farmer. He was stressed about being a farmer. Moving to another level was just not working out for him. So, I don't know if it was the fact of doing direct seed, or economics, or just the stress of being a farmer. (Mikey)

This example of Mikey noticing that farmers need to be tough and persevere was also described by Johnny, and solidified by Perry. Johnny stated:

> It [farming] teaches you to work hard and especially when it's like me, my dad, and [brother]. There's not like you got 30 employees, it's only between us three to get it done. It's not like you can just push it on to the next guy. If you don't go pick up the wrench, or do what needs to be done, it's just not going to get done. (Johnny)

For Johnny, farming teaches you to persevere and work hard because no one else is going to do it for you. Similarly, Perry described that if you do not care about the work and effort that goes into farming, then you might not be good at farming. Perry stated, "if you don't absolutely love ag, and absolutely love farming, and love growing crops, and the steps and what's involved, then I don't think you'd be successful at this game [farming]" (Perry).

Theme 14: Farmers Prove Themselves

Throughout the interviews with the participants, I found they would discuss their ability to prove themselves. The participants were reflecting on themselves and how they self-identify. Rocky discussed the concept of being progressive and proving himself, specifically, he described his decision to start direct seeding, and how other farmers in his area ostracized him. Rocky stated:

> Well, I guess it [being ostracized] was because I was tired of tillage and what was going on with the soil. I was tired. By the time it was ready to seed, it was powdered up and eroded and I was tired of that, and so I was looking for a different way. I'd like to say I've always been progressive. Mainly, probably to prove myself. You know, I've been doing this since 1996, and they [other farmers] still act like I've only been doing it for 2 years, like I don't know what I'm doing. (Rocky)

Additionally, Rocky stated, "I'm probably like your dad, I'm a pioneer" (Rocky). Rocky also explained, "you know, when we [his farm] proved that we could get a stand on dry land, then we pretty much showed everyone that we could do it, and that's where we impressed people" (Rocky). Mikey described himself, "I'm not a timid guy" (Mikey). Similarly, Ray described himself, "I guess I've always been on the bleeding edge" (Ray). Furthermore, Ray further described how he pushes himself and progresses to try new things. Ray said:

> I don't think I'd ever be happy with anything I want. You always want to try to build a bigger, better mousetrap. You want to try to be more efficient. I mean, that's just, I guess it's the nature of the beast, being competitive, trying to get more for better quality. (Ray)

Interestingly, Perry self-identified himself in another way. When explaining how he grew up, he understood that his situation was different than other farm kids his age, "we do not live on a farm, I guess. So that's different for a lot of people … but yeah, it was not the stereotypical living on farm" (Perry). Perry realized that his upbringing was different than his friends who did live on a farm.

Theme 15: Farmers Compare Themselves to Other Farmers

As participants shared information about themselves, they consistently compared their specific management practices to other farmers. Particularly, some of the participants talked about why other farmers are not willing to change or be progressive. Ray explained:

> Most of them [other farmers] are just kind of stuck in a rut. They're doing the same thing because that's what their dad did or their grandpa did. They do it by a calendar and not by what Mother Nature gives you. Especially here, most everybody does the same thing over and over and over, and their soil quality is going downhill … I think that they would like to see things change or be different, but they don't want to take the risks or the time to get there so they just kind of fall back on the security that they know it works. (Ray)

When trying to understand why farmers are not willing to implement new ideas, Johnny discussed that age might be a factor as to why. He stated:

> They [farmers who are not willing to implement change] are 60 years old, and are about to retire. They don't, [long pause] I do think that some of them care. I really do. It's just, why start now when they're at the end of their time? You know, there's a lot of kids, my age who are coming back, that want to change, and if they got parents or somebody above them that wants to change, they're going to be more willing to. But if it's just them, you know, in the next 10 years, they're going to lease out their farm, why even bother changing? (Johnny)

Mikey (an older participant) is one of those farmers who is about to retire and is experiencing these thoughts. He explained:

> You know, I’m suffering from the things all old guys suffer from and that they really don't want to make major investments when they know that they’re toward the tail-end of their career. They've invested so much in what they already have … In agriculture, the biggest problem holding back the adoption of direct seed, would be the demographic age of farmers. We're an old demographic, and no one really wants to go up and spend hundreds of thousands of dollars making ends meet when they will be retired in the next couple years … that's very understandable, and a real concern. I joke that the best thing you can do it get rid of us old buzzards, and get some young people that can do it a new way. (Mikey)

Johnny (a younger participant) reflected on how farmers have to make decisions on their own:

> If you're just one person, farming by yourself, makes things a lot tougher, because all you have is your own mind, and your own creativity to come up with something. Whereas if you got a few guys around, that know what's going on, it's a lot easier to bounce ideas off each other. (Johnny)

CHAPTER V

CONCLUSIONS

The purpose of this study was to identify the values associated with the potential for farmers to adopt BMPs and explore their socio-psychological development of farm life on their decision-making process. I found the convergent mix-methods design addressed both quantitative and qualitative research questions and expanded the understanding of the topic. Particularly, the qualitative results described how farmers make decisions to adopt BMPs. This expanded my understanding of the quantitative values associated with adopting BMPs. The findings in this study do not allow for the wide generalization of adopting BMPs across the U.S.; however, they do provide insight into how farmers in the Pacific Northwest, and possibly across the U.S., might make decisions on their farms.

Discussion of Findings

I studied farmers to understand what values are associated with the adoption of BMPs and how their upbringing might have influenced the development of their values. Overall, participants in this study were males with an average age of 51.7. The age of participants in this study was slightly younger than the U.S. average of 57.5 years of age (U.S. Census of Agriculture, 2019). Although participants were younger than the average, almost half of the participants reported having 31 years or more experience managing a farm, which is higher than the Unites States average of 21.3 years of experience (U.S. Census of Agriculture, 2019). In fact, previous research indicates that farming experience is not robust enough to accurately influence adoption decisions (Prokopy et al., 2008). Although, level of dedication to farming can have

strong influence on decision-making (Solano et al., 2001). Although I did not quantify the level of dedication in the survey, the interview participants expressed passion and motivation toward caring for their land.

Survey results revealed that 41.8% of the participants reported to receive 81% or more of their household net income from commodities produced on their land, and 40.3% reported to receive 41-80%. This suggests that a little less than half of the participants are gathering some of their net income from other sources. Participants also reported to "somewhat agree" with the statement, *I believe having off-farm income increases my potential to implement BMPs*. This suggests participants might not need the financial assistance of outside income to help supplement their decision to implement BMPs. Furthermore, none of the participants reported to receive 0% of their household net income from commodities produced on their land, suggesting they use their land to make a profit and not solely as a hobby or for personal consumption.

Participants reported current implementation of BMPs. Almost 95% of participants in the quantitative study reported to implement no-till or direct seed farming practices. This is not surprising, considering the survey was emailed to participants on the list for the Pacific Northwest Direct Seed Association, which are farmers who are already or are interested in no-till management practices. Furthermore, 38.1% of survey participants had been implementing no-till or direct seed for 16-35 years. Similarly, survey participants reported owning an average of 3,488.16 acres, and interview participants varied in acres owned from owning 80 acres to 8,500 acres. This suggests participants could have sufficient acres to try new practices on their land. Previous research has found the number of acres a landowner owns is associated with the potential to adopt BMPs (Prokopy et al.,2008), potentially because they have more acres to try

new practices (Bossange et al., 2016), and there is higher potential for variability in commodity income (Daberkow & McBride, 2003).

After conducting the principal component analysis, I identified seven statements that were best suited to describe the *potential to adopt* BMPs construct. Four of the statements in the component (i.e., *I believe my operation has/already has the potential to adopt BMPs.; I have previously implemented BMPs.; I am knowledgeable about BMPs,* and *I would like to start/continue implement BMPs in the future.*) make sense because 94% of the survey participants were already implementing BMPs (i.e., no-till/direct seed). Additionally, the statement, *I have participated in NRCS EQIP, CREP, state level, or similar conservation programs,* is applicable because a majority of participants were already implementing BMPs (e.g., no-till or direct seed), which could have been implemented through incentive programs.

Given that the interview participants also expressed caring about the environment, it was not surprising that the statement, *I believe the effect BMPs has on the environment is influential in my decision to implement BMPs* was included in the potential to adopt component. In particular, I found that the interview participants' expressed appreciation for the land and "Mother Nature" (Johnny). Similarly, because most interview participants grew up on the farm and were around the farm at a young age, participants expressed a sense of pride and responsibility in taking care of the land. This lends well to the concept of Scannell and Gifford's (2009) Place Attachment, in that people show cognitive and behavioral actions based on their attachment and appreciation for a specific place. This supports previous literature, people who have a strong attachment to their land want to employ positive stewardship on their land (Sheeder & Lynne, 2011) and feel as though it is their duty to care for the environment (Greiner

et al., 2009). Ultimately, I found that both the survey and interview participants in this study showed feelings of environmental care for their land.

Universalism Traits

The goal of this study was to identify values associated with predicting farmers' potential to adopt BMPs. After I identified the potential to adopt construct, it was revealed that the value of universalism had significantly positive impact on potential to adopt. Universalism is made up of three statements (i.e., *He thinks it is important that every person in the world be treated equally. He wants justice for everybody, even for people he doesn't know*.; *It is important to him to listen to people who are different from him. Even when he disagrees with them, he still wants to understand them*.; and *He strongly believes that people should care for nature. Looking after the environment is important to him.).* Schwartz (2012) identified the universalism value as having qualities of appreciation of everyone and nature. Such people with this value promote kindness, social justice, and peace on earth (Schwartz, 2012; Hansla et al., 2008).

To further explain universalism associated with the potential to adopt, I found that the interview participants expressed having value and appreciation for the land and environment. Perry explained having a "sense of ownership and sense of pride … and doing a good job at it [taking care of the land]" (Perry). Similarly, Tony explained he had pride in "being able to produce something, see something grow" (Tony). Johnny also expressed appreciating the challenges that "Mother Nature" provides him (e.g., little rainfall). Additionally, when talking about goals for his farm, Johnny expressed wanting to reduce chemical inputs because he believes that is what the public wants and that it could benefit farmers too. Here, he is showcasing feelings of consideration for other people, in that he is willing to implement new

ideas not only for the benefit of himself, but for others as well. This supports the finding from USDA-ERS in that farmers are willing to adopt practices like conservation tillage more so for personal benefits than for monetary incentives (Wallander & Claassen, 2019).

Furthermore, I found that interview participants described building knowledge and showing respect when learning from other farmers. Rocky described basing his management decisions on education from the local Extension service. Here, Rocky was using Extension to identify how no-till could be tried in his area and sought ways that no-till could be compatible with his current farm management system (Rogers, 2003). Similarly, Ray listened to crop consultants and other farmers who has a similar mindset. Particularly, Mikey expressed statements of treating everyone equally and listening to others who are different from him. Mikey said, "If someone is doing something I'm interested in, I am more than happy to see what I can learn from them" (Mikey). Importantly, he also expressed feelings of appreciation and acceptance of other farmers who are doing new things, and indicated no fear of telling others about what he is doing on his farm. Conversely, Perry explicitly suggested that if a farmer believes he is the best at farming and acts like they know more than other farmers, then they are actually not smart at all. This suggests that no one truly knows everything about farming and that farmers need to learn from others. Similarly, Johnny expressed his thoughts on farmers who are not open with their practices. He suggested that by not sharing their knowledge with others, these farmers are only hurting themselves in the end because other farmers will not want to share their ideas with them either. Ultimately, non-sharing farmers would be missing out from learning from others.

In contrast to the interview participants, I found that the survey participants only reported "somewhat agree" to the statement, *I believe seeing other farmers/ranchers in my area*

implement BMPs has an impact on my decision to implement BMPs. This suggests that although the interview participants wanted to learn from other farmers, it might not be influential in their decision-making process to adopt BMPs. In fact, many of the interview participants were already leaders and innovators in the adoption of direct seed, and therefore, might not need the motivation or assurance of seeing others implement practices to feel the need to adopt BMPs.

Although not statistically significant in predicting the potential to adopt BMPs, the benevolence value was reported as the highest overall mean among the quantitative participants. In fact, universalism and benevolence are the two values associated with Schwartz's (2001) higher-order value of self-transcendence. As noted in the review of literature, previous research by Parminter and Perkins (1997) identified universalism and benevolence values most associated in farming goals of environmental and community realms.

Benevolence is comprised of two statements (i.e., *It's very important to him to help the people around him. He wants to care for other people.;* and *It is important to him to be loyal to his friends. He wants to devote himself to people close to him*.). As I mentioned in the theoretical framework, people who possess this value show traits of caring for the welfare of others. They also express honesty, responsibility, and friendship (Hansla et al., 2008; Schwartz, 2012). Again, I did not find this value to be statistically associated with the potential to adopt BMPs in this study; however, I did find it to be the highest overall mean. Furthermore, many of the interview participants revealed examples of possessing benevolence.

During the interviews, participants revealed that they admire other farmers who are honest and passionate about the land, which are traits of benevolence. In particular, Tony described admiring the farmers who are honest about the amount of rain they received or the yields of their crops, and Cory expressed that he appreciated farmers who care for both the land

and the animals. Similarly, Johnny expressed sadness for older farmers who do not have family to succeed the land to. Johnny said:

> There's a lot of older people that don't have anybody to come back and run their farm… I think once they sell they're like, you know, they feel bad, because everything that they've worked for is kind of gone … it's just in somebody else's name. (Johnny)

Tony, Cory, and Johnny all expressed feelings of appreciation and caring for others, which are traits of benevolence.

While exploring the interview participants' backgrounds, I found that all participants lived on or were physically close to a farm during their upbringing. Many of the participants were helping care for the land (e.g., drive tractor, clean grain bins, or help with harvest) at a young age, some as young as five years old. Therefore, at a young age, participants were taught to care for the land and be a part of familial efforts. This represents Bronfenbrenner's (1979) microsystem and mesosystem and Scannell and Gifford's (2009) Place Attachment theory. Bronfenbrenner (1979) described the microsystem as the primary setting in which activities directly affect the individual, and the mesosystem as the interactions and interrelationships surrounding the primary setting. Specifically, interview participants shared memories of working with their father, grandfather, uncle, and/or siblings on the farm. These family innerworkings and working on the land instilled the concept of caring for the land.

During the interviews, I found that many of the participants could not pinpoint a specific time when they knew they wanted to be a farmer; instead, participants described it as a "gradual process" (Mikey), or "playground talk" (Perry), or always wanting to play in the dirt (Ray). This idea of not being able to identify a specific time revealed the perception of farming as a way of life rather than an event. Additionally, interview participants, Mikey and Cory, revealed that

conservation and taking care of the land was already part of their microsystem. Mikey's father and uncle were already implementing heavy mulch tillage practices, and Cory proudly stated that he has never pulled a plow or tilled his land because of his father. This is an example of Burton's (2004) Good Farmer Theory, in that farm identity can extend through the generations. Cory and Mikey have extended their methods of farming from previous generations and were proud that they implemented direct seed. These findings support previous research in that farmers with strong conservation goals are more likely to hold strong lifestyle beliefs (Maybery et al., 2005).

Furthermore, Bronfenbrenner's Ecological Systems Theory (1972), was revealed in the way that Johnny and Ray both described talking about farming decisions at the dinner table as a family. The physical proximity of being on the farm and the casual conversations about farming suggests this impacted their development and appreciation for farming. The absence of farming conversations in the home revealed how impactful the microsystem and mesosystem are to the development of an individual. When making decisions, Perry described that at the dinner table, his family did not talk about the farm, potentially because his family did not physically live on the farm. He also expressed that he wouldn't change anything about his upbringing; however, he believed it could have impacted the way he makes decisions today.

The concept of instilling values, such as benevolence and universalism, in the microsystem and mesosystem of an individual, might not be knowingly intentional among parents. The career path of a farmer allows the individual to be close to family members. However, interview participants expressed appreciating the fact that farming allows them to spend time with their family. Cory described that some of his best memories were experiences on the farm. Similarly, Jeffrey expressed the importance of being able to step off of the tractor and care of his infant child, and Johnny summed it up well when he stated, "farming is a lifestyle. It's

not really a job. So, your family kind of has to be involved" (Johnny). This idea of living and working on a farm as being a lifestyle has been observed in previous research. Liffman, Hustsinger and Forero (2000) found that a Califorina farm family believed that farming as a lifestyle was a great reason for their family to continue living and working on the farm. Similarly, Maybery, Crase, and Fullifer (2005) identified lifestyle constructs are strongly connected to conservation constructs. This idea of lifestyle and conservation, and memories built on the farm, could be linked back to the cognitive and behavioral aspects that Scannell and Gifford (2009) describe in their Place Attachment Theory. The interview participants unknowingly describe the cognitive and behavioral connection their family has with each other and their land. When describing these concepts, the participants expressed that it was just part of life and thus did not see it differently.

Although instilling values might not always be knowingly, sometimes a family member wants to intentionally pass family history and values to the next generation. Tony specifically stated that he hoped to instill the history and heritage of his family's land to the next generation. In this situation, Tony wanted to ensure the family lifestyle, traditions, and understanding of their farm be instilled in the next generation.

The interview participants expressed feelings of family heritage and history as a quality they appreciate about their farm. This suggests qualities of responsibility, enhancing the welfare of a group or family, and caring for the land. Cory, Ray, and Jeffrey expressed thoughts related to the farm owners before them and the next generation of owner that would come after them. Cory said he wanted to "make sure I'm taking care of the soils so it's better for the next generation, better than it was when I got it" (Cory). He expressed care for doing things better not only for himself and the environment now, but also for future generations. Mark also specifically

expressed appreciation of his father and uncle caring for the land before him. Both Cory and Mikey provided evidence for showcasing the value of universalism. As revealed in previous literature, individuals build their connection with a place, not only based on social interaction, but also on how they create their own experiences and identity through farming history (Raymond et al., 2010). Again, the interview participants expressed attachment (Scannell & Gifford, 2009) to the land and wanted to be a good farmer (Burton, 2004) to the land.

Interestingly, interview participants expressed succession of passing land from one farmer to the next is not so much about the family legacy, but about the characteristics of those people. For example, Perry said he would rather give his farm to a person who is not family but who has their heart in caring for the land, than to give it to a family member who did not have their heart in farming. This was also expressed by Mikey, when he suggested that he is proud that his sons are in careers that make them happy, rather than in farming that doesn't make them happy. Furthermore, Mikey and Ray expressed that they are more concerned about giving their land to someone who implements specific land management practices. It is apparent that these participants have stipulations about how their land is handled (e.g., direct seed or other BMPs) after they succeed it to the next owner. Research by Roesch-McNally, Basche, et al. (2018) noted specific practices (e.g., cover crops) have been demanded by the landlords. Stipulations related to implementing BMPs revealed care for the environment. Ultimately, farmers (e.g., Mikey and Ray) do not want all of their hard work building healthy soil to then be revered by a new owner's practices. This is an example of the Good Farmer Theory (Burton, 2004), in that they have normative ideas about how they believe farming should be done (Vanclay et al., 1998). Mikey and Ray also show concepts of Place Attachment (Scannell & Gifford, 2009), in that that they cognitively think about the land and how others will treat the land.

Ultimately, interview participants showcase the trait of universalism, in that they care more about the successors' care for the land, rather than the familial blood tied to the land. In fact, this represents more universalism traits than benevolence. Considering the participants believe more in that people should care and look after the environment, more so than being loyal and devoting themselves to those closest to them (Schwartz, 2001).

Security Traits

The value of security was found to have a positive effect on potential to adopt BMPs. The security value is made up of two statements (i.e., *It is important to him to live in secure surroundings. He avoids anything that might endanger his safety*.; and *It is important to him that his country be safe from threats from within and without. He is concerned that social order be protected*.). I found it interesting that this value had a positive association on potentially adopting BPMs, considering individuals who possess this value may not want to take risks or implement new ideas.

The idea of financial security was revealed in the survey data. The statement with the highest mean regarding the potential to adopt BMPs was, *I view financial profitability as an important concern when implementing BMPs*. The interview participants also regarded financial security as an important concept when trying new ideas. Participants expressed crunching numbers through spreadsheets (Cory and Jeffrey), bankers (Cory) or running expenses through their wives who manage the finances (Tony) were important. The delay of profitability from commodities (Rodriguez et al., 2009) and the financial compensation of implementing BMPs through incentive programs (Berthold, 2014; Rodriguez et al. 2009) might provide too much financial risk for some farmers.

The concept of the market was also shared by interview participants. Tony described not being well versed with the market of selling his grain, saying that he is greedy in that he will sell his wheat at a lower price just to make sure that he keeps the banker away. In this situation, Tony is worried about his finances and is not willing to gamble with the market. This idea is supported in the literature. Fluctuating commodity prices can affect the income farmers obtain from their operation, ultimately affecting their potential to implement conservation practices (Lesch & Wachenheim, 2014). Perry also described being cautious, preferring to try new ideas on small acreages to avoid a financial risk. This is a great example of Rogers's (2003) innovation characteristic of trialiability. Perry is able to try out new ideas on small areas of his land to see if it is worth investing in more. Perry summed it up by saying, "farming is a marathon not a sprint" (Perry). As a young farmer, Perry understands that to implement change on his farm, he must be patient to remain financially secure. Ray, an older interview participant, described this same concept of how implementing change on the farm can take a long time, as a large change can be costly.

Despite the financial risks and showcasing qualities of the security value, some interview participants expressed willingness to take risks when adopting new management practices. Rocky described himself as a person "that believes it's always easier to keep up rather than catch up" (Rocky). He told a story about purchasing new equipment because he needed to upgrade. Low grain prices and freezing weather required him to diversify his income to avoid financial problems. make ends meet. Rocky also described financially 'surviving' in that he was willing to running the financial risk to upgrade equipment, and take on custom field work with his equipment to get his equipment paid off.

Furthermore, the idea of *security* within the context of politics was also briefly explored by Cory. Cory expressed concerns of tariffs and regulations regarding the way he farms his land. Being secure in their ability to make decisions or being directly impacted by laws and agreements could potentially impact the way the participants are willing to take risks and implement BMPs.

Power Traits

Interview participants reported that power had a significantly negative association with the potential to adopt BMPs. The value of power, is made up of two statements (i.e., *It is important to him to be rich. He wants to have a lot of money and expensive things*.; *It is important to him to be in charge and tell others what to do. He wants people to do what he says*.), focusing on the individual having control or dominance over people and resources (Schwartz, 2001). Similar to this result, Hansla et al. (2008) found power to be negatively associated with pro-environmental attitudes and behavior. Furthermore, Parminter and Perkins (1997) identified achievement and power values in farmers who showed management goals specific to business, production, and gaining farm capital. I found that some of the interview participants (Tony, Ray, and Johnny) expressed admiration in their ability to exercise their control over their time and duties associated with their job. Suggesting they appreciated having the power to be their own boss.

However, I did not directly observe feelings of power or goals of gaining farm capital in the qualitative data. In fact, I found that the interview participants supported the idea of power negatively impacting their potential to adopt BMPs. Participants expressed statements completely opposite to being in power. Instead they expressed not wanting to being in charge

and telling people what to do. Many of the older participants explained that they have other individuals helping make decisions or discuss management ideas together (i.e., sons, fathers, or wives). Specifically, Mikey explained that he wanted to be challenged by his workers by wanting them to question new ideas and encourage him to learn more. Additionally, Ray and Tony described discussing new ideas with their sons and wives. Johnny described bouncing ideas off of his brother and father. Literature revealed that the size and number of partnerships within an operation increases complexity of making decisions (Nuthall & Old, 2017); however, I did not identify this concept in the qualitative data. In fact, Johnny described appreciating the fact that he could engage with others when making decisions.

Additionally, three of the participants (Ray, Tony, and Jeffrey) described discussing farming and financial decisions with their wives. This finding aligns with the data presented from the U.S. Census of Agriculture (2019), in that 75% of females and 74% of males are involved in the record keeping and/or financial management. Females are a predominate part of the financial management of the farm, suggesting they are willing to share the duties of managing the farm.

The concept of not having power or control over resources is a natural part of farming. Although the interview participants expressed concerns of not making money or not having control over the grain market or climate, they understand that those are things they do not have control over. Most importantly, they accept that they do not have control. They have mentally accepted the fact that they cannot have total control of the things that provide them income.

Perseverance and Self-identification

In addition to finding universalism and security positively influential in potentially adopting BMPs, the interview participants described how they persevere through hardships and uncertainty. In particular, Cory expressed running risks or failing when he morally feels like it is the right thing to do. Cory described attempting to quantify the biological soil improvements of having livestock. He suggested the "feel good economic benefits" are those that biologically benefit the environment, yet are hard to economically quantify. However, in Cory's case, he relies on his cash crops to support him financially. He recognizes situations where he believes the biological and environmental improvements are needed, but would not provide much economic benefit. Thus, he diversifies by planting with crops that he can financially depend on to allow him to implement new ideas. In this situation, Cory is weighing the environmental effects, how it impacts his production, and the economic gains of implementing cover crops and livestock on his row crops. This is similar to Van Herzele et al.'s (2013) finding that the environmental effects have an influence on their decisions to implement practices. Similarly, Cory potentially feels enough "unrevealed private benefit" (Wallander, Claassen, Hill, & Fooks, 2019) from implementing these practices, and does not need financial assistance to implement the practices (Wallander & Claassen, 2019).

Ray also described attempting to implement changes that might not have instant payback. He described that when rebuilding soil heath, he might not see the changes in his lifetime. Yet, importantly, Ray is willing to implement the changes because he believes it is the right thing to do. Perry also expressed willing to make personal sacrifices to make changes, by purchasing less expensive foods just to make sure that he can make new tractor payments each month. However,

Perry also expressed how it can be hard to see other farmers be successful in implementing new ideas on their farm, while Perry is not as successful in implementing the idea.

The idea of wanting to make changes and implement practices is complicated for farmers and could be described as a moral dilemma. I identify this moral dilemma as a red flag in their decision-making process. At this point, farmers must decide if they want to continue with the process to implement the practice and persevere in confirming adoption, or cease implementation the practice because of other factors (e.g., financial factors). As I identified in the interviews, the participants were willing to persevere through hardships and complicated decisions because of the desire to do good.

Ray and Mikey described examples of these moral dilemmas. They described how they were financially able to purchase land, which would benefit them; however, did not choose to buy due to the biological make-up of the soil. They decided it was not worth purchasing due to the length of time required to build the biological heath of the soil. They were willing to disregard purchasing the land because they believed it was not worth it. Contrary, participants Perry and Tony, described worrying about purchasing land and not being bought out by the larger more corporate farms. Perry and Tony are searching for more land and are worried that they won't be able to survive long-term.

Some interview participants expressed thoughts of why other farmers might not want to impellent new management practices. Ray suggested that other farmers might not be willing to change because they wanted to feel secure, operate the way their father or grandfather did, and not by what mother nature was providing them. Johnny, a younger farmer, explained that farmers might not want to change because they are older and it's not worth it for them to implement new ideas because of impending retirement. As Mikey shared, he is "suffering from the things all old

guys suffer from and that they really don't want to make major investment when they know that they're toward the tail-end of their career" (Mikey).

When discussing the idea of change in agriculture, the interview participants thought change would happen in the future with the next generation. Most of the participants were certain that the next generation will have to change the way most farmers are currently managing their farms because of laws, regulations, and climate. Ray, Mikey, and Rocky expressed similar feelings on the next generation changing. Rocky explained that changing farming practices will start with the next generation, that "people aren't just going to do it [change], to do it [change]" (Rocky). He believed that the majority of current farmers are not going to implement change or adopt major BMPs, and that it will have to happen with the next generation. This finding aligns with the idea that age has a negative impact on the adoption of BMPs in that, "older farmers are less likely to change practices due to a shorter planning horizon" (Prokopy et al., 2008, p. 302) as stated in previous literature (Featherstone & Goodwin, 1993; Soule et al., 2000). Therefore, change will most likely happen with the next generation of farmers and not the current generation.

In addition to perseverance, interview participants self-identified themselves (Burton, 2004) in the context of being strong and proud. Many of the participants expressed this concept in the context of change. Tony described striving to obtain more land and moving through phases of transition and growth. However, through it all, he said, "but leaving the farm never, never was a real thought. It was just kind of a question, 'can we make it?'" (Tony). He was persevering. Similarly, Ray expressed that when adopting new practices, he might go broke, yet he is willing to push through it and make it work somehow. He described when implementing something new "sometimes it might be by the seat of your pants" (Ray). Ray and Mikey both self-identified in

regards to change and being at the forefront of new innovations. In particular, Ray suggested he has always been on the "bleeding edge" (Ray) and Mikey described himself as "not a timid guy" (Mikey). Rocky also discussed how he felt ostracized by neighboring farmers when he first started implementing direct seed practices. However, he worked hard to build and care for the land, feeling like he was proving to everyone that he could make it work. According to Rogers (2003), these participants could be classified as early adopters or innovators. In fact, Rogers (2003) stated, "earlier adopters have greater exposure to interpersonal communication channels than do later adopters" (p. 291). I found this when the interview participants, Mikey and Rocky, described talking with other farmers in various geographic locations who conduct a specific type of farming practices like no-till. In fact, Rogers (2003) described this specific network of communication:

> We argued that the heart of the diffusion process is the modeling an imitation by potential adopters of their near peers' experiences with the new idea. In decision whether or not to adopt an innovation, individuals depend mainly on the communicated experience of others much like themselves who have already adopted a new idea. (Rogers, 2003 p. 330)

Mikey, Ray, and Rocky all self-identified as trying to do something different, and expressed building connections with other farmers who implement similar BMPs as well. This self-identification of being a different type of farmer is seen in literature by Petrzelka et al. (1996) in that farmers had their own style of farming and categorized themselves as sustainable farmers. Similarly, these participants could fall into the "the environmentalist" type of farmer in that they had strong connections with the impact they are having on the environment and are willing to do something about it and implement BMPs like direct seed.

Leasing land and land succession was an important topic the interview participants in the context of how land succession to the next generation of farmers will be different. Tony, Mikey and Rocky (older farmers) expressed having difficult experiences with succeeding land from their fathers or pervious owners. Specifically, Tony shared the story of his father making a pros and cons list of why Tony should not come back to farm. The list had more cons than pros, yet, Tony still wanted to come back to the farm. Many of the participants expressed the need to convince or prove to their father or previous owner that they should farm (Perry, Tony, and Rocky). These participants who expressed a more difficult experience entering into farming, also expressed more excitement about farming than their fathers and plan to succeed their land to the next generation differently than they had experienced. This willingness to be open to succeeding land to the next generation could be because it is more openly talked about than in previous generations. Perry suggested that succession planning has "come more into light … mak[ing] it so that people realize they're not alone, that they're not the only one going through the process" (Perry).

Similar to the idea of land succession, leasing land from someone can also pose complexity in implementing BMPs. Mikey described:

> If you own land you should be the *most* [emphasis expressed] interested in preserving the assets, not the *least* [emphases expressed] interested. So that is beyond me why landlords can't figure out that they should at least hope that their operators are direct seeders, and not demand that they are direct seeders. (Mikey)

Mikey was expressing his reasoning as to why taking care of the land, in a landowner's position, is important to preserving the resources of the land. Research from Roesch-McNally, Basche, et al. (2018), described how implementing cover crops can particularly be difficult when trying to

do so on land that someone else owns. They identified a participant who described that "there are distinctly different incentives for landowners and lessees" and that "we need landowners out there [who] are demanding cover crops and are willing to help fund it" (Roesch-McNally, Basche, et al., 2018, p. 328). In these situations, the landowner might not understand the complexity, finances, and reasoning to implement BMPs that might not be financially beneficial at first. These conversations between landowner and lessees could be difficult, yet are an important step in implementing BMPs, particularly when agricultural land is continuing to be broken up into smaller parcels (Nickerson & Borchers, 2012).

Overarching Themes

In summary, there were overarching themes represented across the quantitative and qualitative data. In particular, the concepts of diversity in farming, proving themselves, family experiences on the farm, decision-making, uncertainties, and land succession. Additionally, despite wanting to feel financially secure, participants were willing to adopt new ideas and obligations to care for the environment (i.e., universalism and benevolence values). Participants were willing to endure financial hardships if they believe it was the right thing to do. Interestingly, the theme of progressive/innovative/diverse continued to show up in the qualitative results. However, values that represent Schwartz's (2001) the higher order value openness to change (i.e., self-direction, stimulation, and hedonism), were not identified as a predictor to adopting BMPs. This might be because adopting BPMs comes with a stronger sense of doing what is right for nature, rather than feeling the need to change, in order to do something. It is possible that participants already possess the qualities related to benevolence and universalism.

Interview participants self-identified as stewards of the land and many expressed the desire to stipulate that stewardship for the next generation of farmer who owns their land.

Recommendations

Recommendations for Research

Findings from this study can serve as a foundation for future research on the impact values have on farmers' decision-making processes. In particular, there is very little research on values of farmers in the U.S.; this research is needed. I attempted to determine the intrinsic and socio-psychological motivations that farmers go through when adopting new ideas. As revealed in this study, some farmers are willing to persevere through financial uncertainty to do what they believe is right for the environment. Research to investigate motivations is needed in order to develop programs to encourage the adoption of BMPs.

Future research in the U.S. regarding values and the adoption of BMPs should utilize an adjusted version of the values questionnaire be developed. This study identified three significant values related to adopting BMPs (i.e., universalism, power, and security). Therefore, it is recommended that a questionnaire with the statements related to these values, could elicit a stronger and more precise questionnaire. In particular, the statements from Schwartz's (2001) PVQ-40 could be used to encourage a higher reliability of those significant value constructs. However, it should be noted that the adjusted version be administered to a similar sample and population as used in this study.

I found that many of the interview participants in this study expressed finances as a concern when evaluating whether or not to adopt a new management practice. I recommend that

research be conducted regarding the economics and financial process of adopting farm equipment or practices. Additionally, participants described including their spouse when making decisions. I recommend that additional research be conducted to dive deeper into the dynamics of spouses contributing to farm decisions. Given that slightly less than half of the participants reported some of their household net income, this should be studied further. Understanding this additional income might relate to the implementing BMPs.

Research regarding farmers' cognitive dissonance (Festinger, 1957) and the uncomfortable tensions of conflicting thoughts when making decisions to adopt BMPs is worth studying. In particular, the moral dilemmas they face in the decision-making process. Such research could be conducted in the area of agricultural economics. In particular, I believe it would be valuable to quantify the 'feel good' benefits and the economic benefits and how those benefits impact the decision-making process. This study revealed that some farmers make decisions based on moral beliefs related to economics. By quantifying the 'feel good' benefits of implementing BMPs, educators and communicators could better target messages that amplify the internal moral desire to implement positive practices for the environment.

Participants expressed uncertainties, concerns of regulations, corporate agriculture, and failure; such concerns and uncertainties provide important insight. I recommend that future research be conducted to deeply understand farmers' concerns of agriculture. In fact, the Center for Disease Control and Prevention (2018) found that in 2012, males in the suicide rate for "*Farmers, Ranchers, and Other Occupational Managers* category was 44.9 per 100,000 civilian noninstitutionalized working persons and the 2015 suicide rate was 32.2" (para. 9). This statistic could stem from the farmers' expressions of concerns and uncertainties documented in this study. Research is needed to confirm and address this.

When conducting the interviews for this study, it was difficult for the participants to think back to their childhood and reflect on how they grew up. Therefore, I recommend that a longitudinal study be conducted among children in farming communities to document environmental influences on their development. Following Bronfenbrenner's Ecological Systems Theory (1972), studies should be conducted to observe children over time, and document their growth and development around agriculture influences their decision-making processes as adults.

Survey data collection is a challenge in relation to conducting research on farmers and their interest in conservation practices. I recommend utilizing *crowdsourcing* as a tool. This term encompasses the idea of leveraging the Internet or mass media methods of communication to gain for information from targeted audiences. In a study to understand crowdsourcing, Behrend, Sharek, Meade, and Wiebe operationally define it as "the paid recruitment of an online, independent global workforce for the objective of working on a specifically defined task or set of tasks" (2011, para. 8). In fact, crowdsourcing can provide more generalizability in demographic makeup of a sample (Behrend, Sharek, Meade, & Wiebe, 2011). Because my study focused on a political and personal topic, the use of crowdsourcing could be a viable option to recruit participants of a particular topic and include more variability in the sample.

Recommendations for Practice

After analyzing the data, I found universalism associated with adopting BMPs. Values are developed over time; however, they could be more strongly developed at a young age through their microsystem and mesosystem (Bronfenbrenner, 1972) and also instilled in an individual's attachment to a place (Scannell & Gifford, 2009). Therefore, I recommend that children develop the value of universalism, and be introduced to the positive impacts BMPs can

have on the environment, through experiences within their microsystem and mesosystem. In particular, parents can instill the values of universalism and benevolence, such as teaching children to care for others and the environment. In fact, parents can read to their children about environmental impacts. Research has explored how children's books can be a resource for education about sustainability and the environment (Baratz & Hazeira, 2012). Additionally, school teachers can introduce students to farmers who conduct sustainable farming practices by taking children on field trips to farms.

Finances, uncertainties, and land succession were found to be specific keywords related to stress for the interview participants. Therefore, I recommend that educational programs associated with these topics be provided to farmers. Educational programs could be provided by local Cooperative Extension agencies and financial advisors regarding the financial factors related to the adoption of BMPs and land succession. It is important that educational programs not only focus on the soil science and biological management of BMPs, but also the financial and familial dynamics of adopting BMPs. Furthermore, discrepancies in trustworthiness of government agencies among this demographic (Dewald et al., 2018; Mase et al., 2015) should be studied. The question, "Why are government agencies that assist farmers in implementing BMPs, like NRCS, seen as a trustworthy or untrustworthy source of information?" should be addressed.

Similarly, government agencies (e.g., NRCS) should promote their financial assistance programs with emotional messages, instead of merely financial compensation. This study revealed universalism as a motivator to adopt BMPs; therefore, communication and outreach for these programs should lead with ideas of 'caring for the land, for others, and social peace'. Individuals who find these messages motivating could be more willing to adopt BMPs. NRCS

has a soil health campaign, *Unlock the secrets in the soil* (USDA-NRCS, n.d.e.), which can be a platform to encourage messages with universalism traits.

Uncertainties and relationships related to the occupation of farming can elicit unpleasant mental feelings associated with loss of control. Therefore, I also recommend providing educational events to help ease those concerns and determine how to provide comfort or education in those areas. These educational events could be provided by Cooperative Extension, potentially paired with educational material on financial security when adopting BMPs.

Limitations

Although this study provided a representation of the values associated with adopting BMPs in the U.S., there are limitations. For the quantitative section of this study, the survey development and delivery were subject to error (Bryman, 2016). In particular, I attempted to improve cultural context and familiarity of the statements for the participants in which I altered one statement. Schwartz (2001) originally wrote the statement number 10 to read "*Having a good time is important to him/her. He/she likes to 'soil' himself*". To better adhere to cultural context, I changed it to read, "*Having a good time is important to him/her. He/she likes to 'go out' often*." I did this to fit the cultural norm and context of this study, but kept the same meaning. Although I made this change, I did not gain approval or attest to cultural correctness and this could be a limiting factor in the accuracy of the instrument.

Additionally, the survey was sent only on specific days of the week; therefore, slightly minimizing randomization of the sample. The survey was sent only via Internet, with no mail option. Considering the demographic age of farmers in the U.S., a mail option could have elicited a higher response; however, was not be economically feasible. The survey was sent once

with only one reminder email; therefore, not adhering to Dillman et al.'s (2014) suggestion of five points of contact. Furthermore, the survey was posted on Facebook, and when people "shared" the post, the link and verbiage did not post together. Readers could see only the link and not the verbiage, which could be considered a limitation of the study.

The qualitative portion of this mixed-method study also had limitations. I did not interview females, but females represented 8.96% of the survey participants. Furthermore, because I conducted some of the interviews via phone, I was unable to record observations for those interviews, which could have been helpful in better interpreting the participant's emotions in the conversations (Bryman, 2016). Finally, my personal connection to the interview participants could be perceived as a limitation. This factor could be both positive and/or negative, as it enables me critical insight while at the same time introducing potential bias.

Implications

This study provided an understanding of U.S. farmers' values associated with their potential to adopt BMPs, and identified factors that contribute to their decision-making processes. These findings contribute to the literature related to values and motivations among U.S. farmers. In fact, Maybery et al. (2005) found that by, "identifying core land stewardship-related values may have important implications for future land conservation attitude and behavior change" (p. 68). Findings revealed key concepts that aid in our understanding of farmers' values as we strive to instill positive environmental stewardship in the next generation of landowners. By implementing the recommendations for research and practice, we can increase the knowledge and awareness of adopting BMPs, ultimately impacting commodity production and the environment.

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APPENDIX A

QUESTIONNAIRE

Dewald_Dissertation_PVQ-21 - PNDSA - 4/15/19

Start of Block: General Questions

Q1 Thank you for choosing to participate in this survey. Please answer all questions. If you would like to remove yourself from participating, you can exit this survey at any time.

Q2
To ensure we do not receive duplicate surveys, please enter your **initials** and **last four digits** of your primary phone number.

Example: Stacey Dewald 555-555-1234 would be SD1234

_____

Q3 Of the land you manage/assist in managing, what ownership category does your land fall into... (choose all that apply)

- ☐ Owned by me (1)
- ☐ Owned by my family/part of a family operation (2)
- ☐ Leased by me, from my family (3)
- ☐ Leased by me, from landlord (4)
- ☐ Other (please describe) (5) _____

Q4 How many acres do you produce commodities on? (Please enter a number)

_____

IRB NUMBER: IRB2018-1022M
IRB APPROVAL DATE: 05/08/2019

Page 1 of 20

Q5 Approximately how many years have you managed a farm?

- 5 years or less (1)
- 6-15 years (2)
- 16-20 years (3)
- 21-25 years (4)
- 26-30 years (5)
- 31 years or more (6)

Q6 Approximately what percentage of your household net income, comes from commodities produced on your farm?

- 0% (1)
- 1-20% (2)
- 21-40% (3)
- 41-60% (4)
- 61-80% (5)
- 81-100% (6)

Q7 Do you currently implement no-till or direct seed?

- Yes (1)
- No (2)

Display This Question:

If Do you currently implement no-till or direct seed? = Yes

Q8 Approximately how many years have you implemented no-till or direct seed?

- ○ 5 years or less (1)
- ○ 6-10 years (3)
- ○ 11-15 years (4)
- ○ 16-20 years (5)
- ○ 21-35 years (6)
- ○ 36 or more years (9)

Page Break

Q9 Please rate your agreement regarding the following questions about Best Management Practices (BMPs), such as buffer strips, reduced tillage, no-till, etc.

	Strongly Agree (1)	Agree (2)	Somewhat Agree (3)	Somewhat Disagree (4)	Disagree (5)	Strongly Disagree (6)
I have participated in NRCS EQIP, CREP, state level, or similar conservation programs (1)	○	○	○	○	○	○
I have an overall positive attitude toward agricultural BMPs (2)	○	○	○	○	○	○
I am knowledgeable about BMPs (11)	○	○	○	○	○	○
I believe my operation has/already has the potential to adopt BMPs (3)	○	○	○	○	○	○
I have previously implemented BMPs (4)	○	○	○	○	○	○
I would like to start/continue implementing BMPs in the future (5)	○	○	○	○	○	○
I view financial profitability as an important concern when implementing BMPs (6)	○	○	○	○	○	○
I believe the effect BMPs have on the environment is influential in my decision to implement BMPs (7)	○	○	○	○	○	○

I believe having off-farm income increases my potential to implement BMPs (8)	○	○	○	○	○	○
I believe seeing other farmers/ranchers in my area implement BMPs has an impact on my decision to implement BMPs (9)	○	○	○	○	○	○

Page Break

Q10 Please enter the zip code that you live in.

_____

Q11 What is your education level?

- Less than high school (1)
- High school graduate (2)
- Some college (3)
- 2 year degree (4)
- 4 year degree (5)
- Professional/Master's/Doctorate (6)

Q12 What is your current age?

▼ 18 (4) ... 100+ (87)

Q13 What is you gender

- Male (1)
- Female (2)

End of Block: General Questions

Start of Block: MalePVQ-21

Q14
Here we briefly describe some people in 21 statements. Please read each statement description and think about how much each person **is or is not like you**. Choose the answer that shows

how much the person in the description is like you. Please answer every statement.

	Very much like me (1)	Like me (2)	Somewhat like me (3)	A little like me (4)	Not like me (5)	Not like me at all (6)
Thinking up new ideas and being creative is important to him. He likes to do things in his own original way. (1)	○	○	○	○	○	○
It is important to him to be rich. He wants to have a lot of money and expensive things. (2)	○	○	○	○	○	○
He thinks it is important that every person in the world should be treated equally. He believes everyone should have equal opportunities in life. (3)	○	○	○	○	○	○
It's important to him to show his abilities. He wants people to admire what he does. (4)	○	○	○	○	○	○

It is important to him to live in secure surroundings. He avoids anything that might endanger his safety. (5)	○	○	○	○	○	○
He likes surprises and is always looking for new things to do. He thinks it is important to do lots of different things in life. (6)	○	○	○	○	○	○
He believes that people should do what they are told. He thinks people should follow rules at all times, even when no one is watching. (7)	○	○	○	○	○	○
It is important to him to listen to people who are different from him. Even when he disagrees with them, he still wants to understand them. (8)	○	○	○	○	○	○

It is important to him to be humble and modest. He tries not to draw attention to himself. (9)	○	○	○	○	○	○
Having a good time is important to him. He likes to "go out" often. (10)	○	○	○	○	○	○
It is important to him to make his own decisions about what he does. He likes to be free and not depend on others. (11)	○	○	○	○	○	○
It's very important to him to help the people around him. He wants to care for their well-being. (12)	○	○	○	○	○	○
Being very successful is important to him. He hopes people will recognize his achievements. (13)	○	○	○	○	○	○

It is important to him that the government ensures his safety against all threats. He wants the state to be strong so it can defend its citizens. (14)	○	○	○	○	○	○
He looks for adventures and likes to take risks. He wants to have an exciting life. (15)	○	○	○	○	○	○
It is important to him always to behave properly. He wants to avoid doing anything people would say is wrong. (16)	○	○	○	○	○	○
It is important to him to get respect from others. He wants people to do what he says. (17)	○	○	○	○	○	○
It is important to him to be loyal to his friends. He wants to devote himself to people close to him. (18)	○	○	○	○	○	○

He strongly believes that people should care for nature. Looking after the environment is important to him. (19)	○	○	○	○	○	○
Tradition is important to him. He tries to follow the customs handed down by his religion or his family. (20)	○	○	○	○	○	○
He seeks every chance he can to have fun. It is important o him to do things that give him pleasure. (21)	○	○	○	○	○	○

End of Block: MalePVQ-21

Start of Block: FemalePVQ-21

Q15 Here we briefly describe some people in 21 statements. Please read each statement description and think about how much each person **is or is not like you**. Choose the answer that shows how much the person in the description is like you. Please answer every statement.

	Very much like me (1)	Like me (2)	Somewhat like me (3)	A little like me (4)	Not like me (5)	Not like me at all (6)
Thinking up new ideas and being creative is important to her. She likes to do thinks in her own original way. (1)	○	○	○	○	○	○
It is important to her to be rich. She wants to have a lot of money and expensive things. (2)	○	○	○	○	○	○
She thinks it is important that every person in the world should be treated equally. She believes everyone should have equal opportunities in life. (3)	○	○	○	○	○	○
It's important to her to show his abilities. She wants people to admire what she does. (4)	○	○	○	○	○	○

It is important to her to live in secure surroundings. She avoids anything that might endanger her safety. (5)	○	○	○	○	○	○
She likes surprises and is always looking for new things to do. She think it is important to do lots of different things in life. (6)	○	○	○	○	○	○
She believes that people should do what they are told. She thinks people should follow rules at all times, even when no one is watching. (7)	○	○	○	○	○	○
It is important to her to listen to people who are different from her. Even when she disagrees with them, she still wants to understand them. (8)	○	○	○	○	○	○

It is important to her to be humble and modest. She tries not to draw attention to herself. (9)	○	○	○	○	○	○
Having a good time is important to her. She likes to "go out" often. (10)	○	○	○	○	○	○
It is important to her to make her own decisions about what she does. She likes to be free and not depend on others. (11)	○	○	○	○	○	○
It's very important to her to help the people around her. She wants to care for their well-being. (12)	○	○	○	○	○	○
Being very successful is important to her. She hopes people will recognize her achievements. (13)	○	○	○	○	○	○

It is important to her that the government ensures her safety against all threats. She wants the state to be strong so it can defend its citizens. (14)	○	○	○	○	○	○
She looks for adventures and likes to take risks. She wants to have an exciting life. (15)	○	○	○	○	○	○
It is important to her to always behave properly. She wants to avoid doing anything people would say is wrong. (16)	○	○	○	○	○	○
It is important to her to get respect from others. She wants people to do what she says. (17)	○	○	○	○	○	○
It is important to her to be loyal to her friends. She wants to devote herself to people close to her. (18)	○	○	○	○	○	○

She strongly believes that people should care for nature. Looking after the environment is important to her. (19)	○	○	○	○	○	○
Tradition is important to her. She tries to follow the customs handed down by her religion or her family. (20)	○	○	○	○	○	○
She seeks every chance she can to have fun. it is important to her to do things that give her pleasure. (21)	○	○	○	○	○	○

End of Block: FemalePVQ-21

APPENDIX B

RECRUITMENT EMAIL

[*IRB-RECRUITMENT EMAIL*]

Hello,

My name is Stacey Dewald, a graduate of Washington State University. I grew up outside of Ritzville, WA on a farm with my father, Rob; mother, Susan; and brothers, Travis and Jake.

I am writing to you because I am working on a research project with the Pacific Northwest Direct Seed Association about farmers' values and characteristics related to implementing agricultural management practices. This research project will help inform the PNDSA about farmers and help fulfill my graduation requirements at Texas A&M University.

We are asking you to participate in this research project because you are on the PNSDA email list. To participate, you will be asked to click on the link below and fill out a survey. The survey will take approximately 10 minutes to complete, and is compatible with any computer or mobile device. The survey will ask you general questions, such as, how many years you have been farming, your likeliness to implement new management practices, age, education, and your values.

Please click here to access the survey.

Your participation in this research project is important and will help provide insight into farmers' potential to implement new agricultural management practices in the northwest. You will receive two reminder/thank you emails about participating in this research project in the coming weeks.

If you have any questions about the research project, please contact me at sdewald@tamu.edu or at 509-660-1601.

Thank you,

Stacey Dewald
Graduate Research Assistant
Agricultural Leadership, Education, and Communications
Texas A&M University

IRB NUMBER: IRB2018-1022M
IRB APPROVAL DATE: 05/08/2019

APPENDIX C

RECRUITMENT POST

[IRB-RECRUITMENT FACEBOOK POST]

Farmer Friends! I need your help with a project for graduate school!

This project focuses on farmers' values and characteristics related to implementing agricultural management practices. I'm asking for your participation in a short survey.

The survey will take approximately 10 minutes to complete, and is compatible with any computer or mobile device. The survey will ask you general questions, such as, how many years you have been farming, your likeliness to implement new management practices, age, education, and your values.

[link to survey]

Your participation in this research project is important. You will provide insight into farmers' potential to implement new agricultural management practices and help fulfill my graduation requirements. If you have already participated in this survey, please do not participate again.

If you have any questions, please contact me at sdewald@tamu.edu

THANK YOU!

IRB NUMBER: IRB2018-1022M
IRB APPROVAL DATE: 06/27/2019

APPENDIX D

QUESTIONNAIRE INFORMATION SHEET

TEXAS A&M UNIVERSITY HUMAN SUBJECTS PROTECTION PROGRAM

INFORMATION SHEET

Project Title: **Farmers' Values and Operation Characteristics Associated with the Adoption of Best Management Practices**

You are invited to take part in a research study being conducted by Stacey Dewald, M.S., a researcher from Texas A&M University. The information in this form is provided to help you decide whether or not to take part. If you decide you do not want to participate, there will be no penalty to you, and you will not lose any benefits you normally would have.

Why Is This Study Being Done?
The purpose of this study is to identify farmers' values associated with adopting agricultural best management practices.

Why Am I Being Asked To Be In This Study?
You are being asked to be in this study because you are a farmer in the Pacific Northwest. You qualify for this study because you are on the contact list of the Pacific Northwest Direct Seed Association. Participants must be 18 years or older to participate.

How Many People Will Be Asked To Be In This Study?
Up to 700 people will be invited to participate in this study.

What Are the Alternatives to being in this study?
No, the alternative to being in the study is not to participate.

What Will I Be Asked To Do In This Study?
You will be asked to fill out a survey. This survey will include questions about values. You will be asked to rate your likeness to a list of values. Additionally, you will be asked to rate how likely you are to adopt agricultural management practices. The time you spend on this study will last 10 minutes.

Are There Any Risks To Me?
The things that you will be doing are no more risks than you would come across in everyday life.

Are There Any Benefits To Me?
There may be no direct benefit to you by participating in this study, however, there may be a benefit to society as the responses will help contribute to the research of farmers' potential to adopt management practices.

Will There Be Any Costs To Me?
Aside from your time, there are no costs for taking part in the study.

Will I Be Paid To Be In This Study?
You will not be paid for being in this study.

Will Information from This Study Be Kept Private?

IRB NUMBER: IRB2018-1022M
IRB APPROVAL DATE: 05/08/2019

Version Date: April 2019 Page 1 of 2

The records of this study will be kept private. Any identifiable information that we collect will not be linked back to your individual responses in any publications or presentations about the research or be included in any sort of report. Research records will be stored securely and only Stacey Dewald, and Dr. Theresa Pesl Murphrey, will have access to the records. Information about you will be stored in a locked file cabinet and computer files protected with a password. This information sheet will be filed securely in an official area.

People who have access to your information include the Principal Investigator and research study personnel. Representatives of regulatory agencies such as the Office of Human Research Protections (OHRP) and entities such as the Texas A&M University Human Subjects Protection Program may access your records to make sure the study is being run correctly and that information is collected properly. Information about you and related to this study will be kept confidential to the extent permitted or required by law.

Who may I Contact for More Information?
You may contact the Principal Investigator, Stacey Dewald, M.S., to tell her about a concern or complaint about this research at 979-845-2700 or sdewald@tamu.edu .

For questions about your rights as a research participant, to provide input regarding research, or if you have questions, complaints, or concerns about the research, you may call the Texas A&M University Human Subjects Protection Program office by phone at 1-979-458-4067, toll free at 1-855-795-8636, or by email at irb@tamu.edu.

What if I Change My Mind About Participating?
This research is voluntary and you have the choice whether or not to be in this research study. You may decide to not begin or to stop participating at any time. If you choose not to be in this study or stop being in the study, there will be no effect on your relationship with Texas A&M University.

By participating in the questionnaire you are giving permission for the investigator to use your information for research purposes.

Thank you,

Stacey Dewald, M.S.
Graduate Research Assistant
Texas A&M University
Agricultural Leadership, Education, and Communications

IRB NUMBER: IRB2018-1022M
IRB APPROVAL DATE: 05/08/2019

APPENDIX E

REMINDER EMAIL

[*IRB-REMINDER EMAIL*]

Hello,

Last week I emailed you asking for your help on a research project with the Pacific Northwest Direct Seed Association about farmers' values and characteristics related to implementing agricultural management practices.

If you have already filled out the survey, I sincerely appreciate your contribution. Your participation will help provide insight into farmers' potential to implement agricultural management practices in the northwest.

If you have not filled out the survey, I ask that you please take a moment to participate. To participate, you will be asked to click on the link below and fill out a survey.

The survey will take approximately 10 minutes to complete and is compatible with any computer or mobile device. The survey will ask you general questions, such as, how many years you have been farming, your likeliness to implement new management practices, age, education, and your values.

Please click here to access the survey.

Your participation in this research project is important and will help provide insight into farmers' potential to implement new agricultural management practices in the northwest. You will receive two reminder/thank you emails about participating in this research project in the coming weeks.

If you have any questions about the research project, please contact me at sdewald@tamu.edu or at 509-660-1601.

Thank you,

Stacey Dewald
Graduate Research Assistant
Agricultural Leadership, Education, and Communications
Texas A&M University

IRB NUMBER: IRB2018-1022M
IRB APPROVAL DATE: 05/08/2019

APPENDIX F

INTERVIEW RECRUITMENT

[*IRB- QUALITATIVE RECRUITMENT SCRIPT*]

Email Recruitment Script

Hello [name],

My name is Stacey Dewald, Rob Dewald's daughter, and fellow agriculturalist in the Northwest. I am conducting a research project for school, and you are invited to participate. The project is about farmers' values and characteristics related to implementing agricultural management practices. I thought that you would be a great contribution to this study, and I am extending an invitation for you to participate.

If you agree to participate, I would ask you to answer some questions about you experiences on the farm and how you make management decisions on the farm. The interview would last approximately 90 minutes, and will take place at the most convenient location for you or via phone call. There is no penalty for choosing not to participate.

Your participation in this interview is voluntary. However, this project will provide insight into the research around the adoption of agricultural management practices and help fulfill my graduation requirements at Texas A&M University.

Your identity as a participant will remain confidential and your identity will not be disclosed in any publications or presentations related to the research.

If you would be willing to help me out and participate in this project, please call or text me at 509-660-1601 or email me at sdewald@tamu.edu

Thank you for your consideration and look forward to hearing from you.

Stacey Dewald
Graduate Research Assistant
Agricultural Leadership, Education, and Communications
Texas A&M University

Phone /In-Person Recruitment Script

Hello, My name is Stacey Dewald, Rob Dewald's daughter. Could I please speak to [name]?

Thank you. I am conducting a research project for school and would like to invite you to participate. The project is about farmers' values and characteristics related to implementing agricultural management practices. Participation would involve an interview lasting approximately 90 minutes. Your participation is confidential and your name or other identifying information will not be used in any publication or presentations related to the research. Would you be willing to participate? <<If Yes, proceed with scheduling a time and provide the consent form at the time of the meeting>>

IRB NUMBER: IRB2019-0755
IRB APPROVAL DATE: 07/02/2019

APPENDIX G

INTERVIEW INFORMATION SHEET

TEXAS A&M UNIVERSITY HUMAN RESEARCH PROTECTION PROGRAM

INFORMATION SHEET

Exploring How Farmers' Values are Developed

You are invited to participate in a research study conducted by Stacey Dewald, M.S. a researcher from Texas A&M University. The information in this form is provided to help you decide whether or not to take part. If you decide you do not want to participate, there will be no penalty to you, and you will not lose any benefits you normally would have. You may choose to withdraw from the study at any time without penalty.

Why Is This Study Being Done?
The purpose of this study is to understand farmers' values associated with adopting agricultural best management practices.

Why Am I Being Asked To Be In This Study?
You are being asked to be in this study because you are a farmer in the Northwest and make decisions on your farm.

How Many People Will Be Asked To Be In This Study?
Thirty people will be invited to participate in this study.

What Are the Alternatives to being in this study?
The alternative to being in the study is not to participate.

What Will I Be Asked To Do In This Study?
You will be asked to answer questions regarding your farm, being raised on this farm, and how your make decisions on your farm. The interview should take no more than 90 minutes to complete.

Will Photos, Video or Audio Recordings Be Made Of Me during the Study?
The researcher will take audio recording during the study to ensure correctness of questions and answers. Recordings will be only used during data analysis, and will be deleted when analysis is completed. If you do not wish to be recorded you will be asked to not participate in this study.

Are There Any Risks To Me?
There is potential risk for loss of confidentiality. Researchers will do their best to limit potential loss of confidentiality.

Will There Be Any Costs To Me?
Aside from your time, there are no costs for taking part in the study.

Will I Be Paid To Be In This Study?
You will not be paid for participating in this study.

Will Information From This Study Be Kept Private?
The records of this study will be kept private. Any identifiable information that we collect will not be linked back to your individual responses in any publications or presentations about the research

IRB NUMBER: IRB2019-0755
IRB APPROVAL DATE: 07/02/2019

or be included in any sort of report. Research records will be stored securely and only Stacey Dewald and Dr. Theresa Pesl Murphrey will have access to the records. Information about you will be stored in a locked file cabinet and computer files protected with a password. This information sheet will be filed securely in an official area.

People who have access to your information include the Principal Investigator and research study personnel. Representatives of regulatory agencies such as the Texas A&M University Human Subjects Protection Program may access your records to make sure the study is being run correctly and that information is collected properly. Information about you and related to this study will be kept confidential to the extent permitted or required by law.

Who may I Contact for More Information?
You may contact the Principal Investigator, Stacey Dewald, M.S., to tell her about a concern or complaint about this research at 979-845-2700 or sdewald@tamu.edu.

For questions about your rights as a research participant, to provide input regarding research, or if you have questions, complaints, or concerns about the research, you may call the Texas A&M University Human Subjects Protection Program office by phone at 1-979-458-4067, toll free at 1-855-795-8636, or by email at irb@tamu.edu.

What if I Change My Mind About Participating?
This research is voluntary and you have the choice whether or not to be in this research study. You may decide to not begin or to stop participating at any time. If you choose not to be in this study or stop being in the study, there will be no effect on your relationship with Texas A&M University. By participating in the interview, you are giving permission for the investigator to use your information for research purposes.

APPENDIX H

INTERVIEW QUESTIONS

Farmer interview questions

Farmers' Values and Operation Characteristics Associated with the Adoption of Best Management Practices

Interview Protocol: *The protocol includes open-ended questions and a number of areas to keep in mind. The purpose of these guiding questions is to enable individuals to be as informative as possible in their responses. The questions are neutral and encourage additional information, but do not suggest specific answers. Encouraging questions such as 'Why?, "Why not?", "How is that?" or "In what ways?" will be used to support conversation. Follow-up questions will be employed to obtain further information and should touch on whatever the participant has already shared, thus these are only suggestions.*

Guide

Introduction:

Hello, my name is Stacey Dewald with Texas A&M University. This study is being conducted to understand values and how they were developed by growing up on a farm. I am conducting interviews with farmers in the northwest region. Thank you for taking the time to visit with me today. This interview should take no more than 90 minutes. As a reminder, all information shared will remain confidential. Your name will not be associated with any comments you make. Information shared will be reported in aggregate and your name will not be associated with the study.

Guiding Questions: (It is possible that not all questions will be needed – only relevant questions will be asked based on the individual's experiences)

1. Tell me about your farm. (What type of crops do you grow? What is your typical planting methods? Do you make decisions alongside a family member?)
2. What was your upbringing around the farm like?
3. Were discussions of farm management openly shared as a family?
4. How do you feel your upbringing has influenced the way you make decisions on your land today?
5. Do you find it easy to make management decisions on your farm?
6. Do you involve your family (father, wife, other operators) when making decisions?
7. If you had a theme or mission statement for your operation, what would it be?
8. What was your first memory of knowing that being a farmer was what you wanted to do with your life?
9. Do you consider other farmers' thoughts when implementing new management ideas?
10. Describe any farmers that you admire or look up to? What are come qualities that you like about them?
11. What are your biggest fears or challenges regarding your operation?
12. What are some of the current and future goals you have for your farm?
13. What do you value most about your farm?

Thank you for your time.

IRB NUMBER: IRB2019-0755
IRB APPROVAL DATE: 07/02/2019