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The Motivation for Organic Grain Farming in the United States: Profits, Lifestyle, or the Environment?

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The objective of this research is to identify and quantify the motivations for organic grain farming in the United States. Survey data of US organic grain producers were used in regression models to find the statistical determinants of three motivations for organic grain production, including profit maximization, environmental stewardship, and an organic lifestyle. Results provide evidence that many organic grain producers had more than a single motivation and that younger farmers are more likely to be motivated by environmental and lifestyle goals than older farmers. Organic grain producers exhibited a diversity of motivations, including profit and stewardship.

Key Words: bootstrapping, logistic regression, organic farming, profit maximization, environmental stewardship

JEL Classifications: Q01, Q12, Q15

Organic farming in the United States has grown rapidly since the 1990s. The overall certified organic acreage increased more than fourfold from 1992–2008 to represent 0.57% of total farm acreage in 2008 (U.S. Department of Agriculture, Economic Research Service [USDA/ERS], 2010). Although the organic acreage for vegetables exceeded 8.6% of total acreage in 2008, the percentage of the top US field crops grown under certified organic farming systems remained minimal: 0.21% for corn and 0.20% for soybeans in 2008, yet the growth in retail sales of organic meat and dairy products led the growth in sales of other organic foods in 2005 and 2006 (Organic Trade Commission [OTA], 2007), fueling the growth in the number of certified organic livestock for milk cows to reach 2.7% of all milk cows in 2008 (USDA/ERS, 2010). In 2008, the retail sales of organic bread and grains recorded the strongest growth among all organic food categories (OTA, 2009). Given these trends, organic grain production is likely to continue.

Organic grain farming entails production and marketing practices that are distinct from conventional grain farming and from organic fruit and vegetable farming. In addition to the list of allowed and prohibited substances maintained by the National Organic Program (NOP), the

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organic supply chain differs from the conventional grain infrastructure. For example, conventional farmers can deposit the entire harvest at a local grain elevator, whereas an organic crop must have its identity preserved throughout production and distribution channels. Most often, organic grain sales are handled through individual contracts directly with the buyer or through a trader. In addition to default risk associated with individual contracts, organic grain farmers are exposed to the risk of the commodity not meeting organic certification as a result of genetically modified crop contamination or spray drift from neighboring conventional farms.

These differences in practices imply cost differences, whereas the organic characteristic is mostly associated with premium in the marketplace. Although the prices received by producers of organic products are not as thoroughly documented as conventional products at the retail level, organic grains have received considerable premia over conventional grains (Heiman and Peterson, 2008). Whether the premium guarantees profit is uncertain. Several studies based on long-term experimental trials have reported that organic cropping systems are at least as profitable as conventional cropping systems (Mahoney et al., 2004; see Greene and Kremen, 2003, for reviews of other studies), yet experimental trials fail to compare the practices and yields experienced by producers in the field, including not accounting for the difficulty of marketing minor crops used in the cropping rotations (McBride and Greene, 2009b). Despite growth in organic farming, the impact of organic farm adoption on farm income and profitability is not clear. Previous literature on the economics of conservation practices and organic farming has assumed profit maximizing behavior of organic producers (Cary and Wilkinson, 1997; Honlonkou, 2004; Lichtenberg, 2004). Inaccurate understanding of organic producer motivations could undermine the effectiveness of policies and business strategies aimed at the organic sector.

The main objective of this research is to further our understanding of organic grain producer characteristics and their motivations for producing organic grains in the United States. Specifically, we quantify the degree to which organic grain farming is the result of: 1) profit maximization; 2) environmental stewardship; 3) an organic lifestyle; or 4) a combination of these three motivations. The survey was administered to organic grain producers nationwide in November and December of 2005. The results provide some evidence that organic farmers are simultaneously motivated by profits and environmental stewardship goals. In the next section, the literature of the economics of organic farming is reviewed. The following section details the administration of the survey. Then, the characteristics of the respondents are summarized by demographics, farm characteristics and management practices, and primary risk concerns. The regression results using ordered logit models are presented and discussed. The findings identify segments of farmers who raise grains organically for its profitability and those who do for environmental and lifestyle reasons.

Literature Review

The principles of sustainable agriculture that underlie organic farming call for economic viability of farms along with social justice and environmental stewardship (Gold, 1999). Thus, the assumption of profit maximization alone may be inapplicable to producers who are genuinely guided by these principles (Cary and Wilkinson, 1997; Honlonkou, 2004; Lichtenberg, 2004). Chouinard et al. (2008) integrated profit and stewardship motives into a decision model and provided evidence that there are farmers who are willing to forego some profit to engage in stewardship. Their conceptual framework allows for agricultural producers to have preference for profits (self-interest) and/or environmental effects following the multiutility framework of Lynne (1999, 2002). Lynne's modification of the standard profit-maximizing assumption of economic theory provides a foundation for the interpretation of the results of this study (Lynne and Rola, 1988; Lynne, 1995; summarized in Glimcher et al. 2009).

Lynne and Casey (1998) referred to two primary motivations as self-interest and other-interest, and Hayes and Lynne (2004) used the terms ego and empathy in their conceptual model. Lynne's framework becomes more complete in

Lynne (2006a, 2006b) in which the conceptual model is built on the idea that egoism–hedonism motivates the pursuit of "self-interest," and empathy–altruism motivates the pursuit of "other interest." This literature leads to the conclusion that farmers may temper their profit motive with a small amount of self-sacrifice to meet social and/or environmental goals.

Recent literature suggests a limitation of the ability of economic factors to explain producer adoption of sustainable practices (Lynne, Shonkwiler, and Rola, 1988; Lynne et al. 1995; Artikov et al. 2006; Hu et al., 2006; Sautter et al. 2011) along with a wealth of literature generated by other social scientists emphasizing the importance of noneconomic factors (e.g., see the literature reviewed by Kallas, Serra, and Gil, 2010). Van Kooten, Weisensel, and Chinthammit (1990), Klonsky et al. (2004), and Maybery, Crase, and Gullifer (2005) included stewardship in the profit-maximizing framework, showing that some producers can maximize profit and still follow stewardship practices. Bishop, Shumway, and Wandschneider (2010) examined attitudes toward the adoption of conservation technology of dairy farms by expanding the conventional profit-maximizing framework to include utility-maximization to allow for multiple motives or maximization of a metautility function as proposed by Lynne (2006b). The authors provide an excellent review of literature of recent advances in behavioral economics and conservation adoption.

Sheeder and Lynne (2011) used a dual-interests theoretical framework to examine self-interest and other interest in the conservation tillage adoption decision. Sheeder and Lynne (2011) concluded that, "...while it is undeniable that profits do play a role, the assumption that they play the only role in economic decision making is highly contentious" (p. 433). Nowak and Korsching (1998) demonstrated that a lack of knowledge about farmers' "human dimension" can lead to policy inadequacies. Sen (1977) concluded that individuals are likely to make choices based on commitment to others, even when the outcomes do not maximize self-interest.

Fairweather (1999), Burton, Rigby, and Young (2003), and Stofferahn (2009) studied survey samples of both conventional and organic producers. Darnhofer, Schneeberger, and Freyer (2005) distinguished "committed conventional" producers from "environment-conscious but not organic" and "pragmatic conventional" farmers. Constance and Choi (2010) categorized a sample of Texas producers into conventional, pragmatic conventional, and organic producers. Of the studies reviewed in Kallas, Serra, and Gil (2010), 18 of 25 were European applications. Although Butler (2002) estimated that organic production costs were approximately 10% higher than conventional costs in California, Dalton et al. (2005, 2008) found the cost structures of organic and conventional dairies in Maine and Vermont to be similar. McBride and Greene (2009b), using the 2005 Agricultural Resource Management Survey (ARMS) data, found that returns above operating and capital costs on small organic dairy farms compared favorably to conventional dairy farms (p. 35). All studies, including Rotz et al. (2007), agreed that higher prices have helped maintain higher net returns for the organics. Barham, Brock, and Foltz (2006) found few differences between organic and other dairies in terms of farm operator characteristics in Wisconsin, but organic operators expressed greater satisfaction and are more optimistic about their future in the dairy business. Thus, there is some evidence that organic and conventional farms have common financial circumstances, but organic producers also consider other motivations, a finding confirmed subsequently.

Anderson (1994) and Dobbs (1995) concluded that, across the United States, organic grain agriculture yielded less, but this is not necessarily offset by lower production costs. Therefore, organic farming is slightly less profitable than conventional systems. Dobbs (1995) noted that alternative cropping systems appeared to be competitive with conventional systems in areas that were dominantly small grains or in transition areas.

Hanson, Lichtenberg, and Peters (1997) found that profitability of the conventional and organic farming systems depended on whether the analysis includes the initial investment in building up the soil and the value of family labor. Pimentel et al. (2005) reported the 1991–2001 economic comparisons based on the same farming systems trial, concluding that net returns from the organic and conventional systems were similar without the organic price premium. Delate et al. (2003) found that based on organic and conventional farmers in Iowa, corn returns were not significantly different between the two organic rotations. Organic soybean returns were significantly greater than conventional soybean crop returns. Mahoney et al. (2004) using experimental data in Minnesota from 1990–1999 compared the profitability of organic vs. conventional strategies and concluded that the 4-year organic strategy was not less profitable nor its net return more variable than the conventional strategies. Smith, Clapperton, and Blackshaw (2004) also found that certain organic cropping systems were more profitable than conventional counterparts based on 1997–2000 experimental field data in Alberta, Canada. McBride and Greene (2009a) reported that a nationwide survey of soybean producers for 2006 suggested significant returns to organic systems resulting from similar yields and lower costs than conventional systems.

Nordquist et al. (2010) provided detailed data on the financial performance of 47 organic farms in Minnesota, reporting two major conclusions that are emphasized throughout the previous literature: 1) "As is always the case, the averages mask the variability of returns across the wide range of producers" (p. 6); and 2) "As with groups of conventional farms, there is tremendous variability in the production and financial performance of this group of organic producers" (p. 7). The results of this study provide some evidence for both of these important conclusions. Hanson et al. (2004), Stofferahn (2009), and Khaledi et al. (2010) studied the characteristics of organic grain farmers in North America and found that organic producers were motivated by both profit and environmental goals, a result that is also found in what follows.

The Survey Instrument and the Mailing List

The target population of the survey was all organic grain producers and soybean farmers in the United States. To garner information about organic grain farming, six listening sessions were conducted in Minnesota, Montana, Ohio, Wisconsin, and two locations in Kansas during spring 2004 with 53 participants (Peterson and Kastens, 2006). The survey instrument was developed by using the findings from the listening sessions to identify the characteristics of organic grain farmers in the United States, their risk issues, and risk management needs. The NOP has made the mailing directory of all organic certified operations in the United States publicly available for research purposes. Fifty-eight USDA-accredited certifying agents listed on the NOP web page of the Agricultural Marketing Service were contacted by e-mail and phone with a request to identify their members from the NOP directory who raised grains, soybeans, and forage. After repeated contacts, 48 certifying agents responded and identified organic grain producers from the NOP directory.

Of the 3,413 surveys mailed, 11 were returned as a result of invalid addresses. One month later, a second copy of the same survey was mailed to 1,784 nonrespondents. The question, "Have you ever raised any grains (including soybeans) in certified organic acreage?" at the beginning of the survey was used to screen respondents so that organic grain farmers were included in the analysis. Accordingly, 1,134 of the responses responded affirmatively to the question: 779 from the first mailing and 355 from the second mailing. Of these, 748 (21.9%) were usable, complete surveys. The others were excluded as a result of missing values. The survey questionnaire is lengthy, extensive, and includes a large number of questions concerning profitability and personal opinion. The length and proprietary nature of the survey may have led to a lower response rate than previous surveys.

Survey Responses

Farmer Objectives

Table 1 summarizes the variables that comprise the major source of study for analysis: responses to the approaches to farming, i.e., objectives, or value statements. Note that the survey question does not specify if profitability is relative to organic or conventional

Table 1. Organic Farming Objective Variable Definitions and Survey Responses (n = 748)

	Strongly Disagree 1	2	3	4	Strongly Agree 5	
	(percent responses)					Average
MAXP	2.0	6.1	22.3	25.9	43.6	4.03
ENVIRON	0.8	0.7	7.1	32.4	59.1	4.48
OLIFE	3.5	9.9	21.7	24.2	40.8	3.89

Note: Variables represent survey responses to the statement: What is your approach to farming?
MAXP, "The objective is to maximize profitability"; *ENVIRON,* "Environmental stewardship is important"; *OLIFE,* "Organic is our lifestyle."

enterprises. The respondents were asked to rank their degree of accordance on a 5-point scale, ranging from 1 equaling strongly disagree to 5 equaling strongly agree. Over two-thirds of the respondents (69.5%) agreed or strongly agreed that their objectives included maximizing profitability (*MAXP*). Less than 10% (8.1%) disagreed or strongly disagreed with this statement. Profits appear to be an important motivation for organic grain producers. Additionally, an overwhelming majority (91.5%) regarded environmental stewardship (*ENVIRON*) as an important aspect of their farming practices. Only 1.5% of the respondents disagreed or strongly disagreed with the statement. Lastly, 65.0% of the respondents agreed or strongly agreed with the statement that organic was their lifestyle (*OLIFE*), whereas 13.4% disagreed or strongly disagreed. A simple correlation between the responses to this lifestyle statement and those to the profit-maximizing statement ($OLIFE \times MAXP$) was –0.111, suggesting that at least some of those motivated by economic incentives differed from those motivated by noneconomic factors, although a majority appear to be motivated by more than one goal, as described by Lynne (2006a, 2006b). Correlations between the lifestyle and environment statements ($OLIFE \times ENVIRON$) and profit-maximizing and environment statements ($MAXP \times ENVIRON$) were 0.338 and 0.137, respectively. Interestingly, Table 1 shows some evidence for simultaneity, or a dual motive, for most survey respondents between profit-maximization and stewardship.

Similar to previous research (e.g. Hanson et al. 2004), the survey results provide some evidence that organic grain production is more profitable than conventional grain production, at least once the certification process has been completed. The conclusion is limited, however, by respondent bias: only 320 of 729 respondents answered a question about profitability of organic grain production relative to conventional grain farming. Of the subsample of 320 respondents, 7.8% reported that organic was less profitable than conventional, 9.4% reported equal profitability, and 82.5% reported that organic grain production was more profitable than conventional grain production. This is likely to be the result of lower production costs and price premiums for organic grain. The low response rate to this question may reflect a concern for providing too much information about organic profitability to others, as reflected in the conclusion of Hanson et al. (2004), "...while the market for organic products is increasing rapidly, it is also immature, and some markets may be sensitive to oversupply and prices may be highly variable" (p. 226).

Farmer Characteristics and Regions

A list of variable definitions is provided in alphabetical order in Table 2. The survey requested that "the primary operator of the farm" answer the questions. Table 3 summarizes the variable means for the demographic variables GENDER, AGE, EDUC, and INC for both the survey sample (n = 729) and the survey responses that could not be used as a result of missing values (n = 405) together with the ARMS data (Hoppe et al., 2007), providing information about the possibility of sample selection bias. The regression results presented here must be conditioned by the possibility of sample selection bias of a smaller percentage of

Table 2. Variable Definitions

Variable	Description
ACRES	Number of Acres Farmed (10,000 acres)
AGE	Years (23.5 = "18-29", 34.5 = "30–39", 44.5 = "40–49", 54.5 = "50–59", 64.5 = "60–69", 74.5 = "70+")
CBELT	Corn Belt region (Iowa, Illinois, Indiana, Ohio, and Missouri); 0 otherwise
CONVP	1 = used conventional prices, including futures prices, as a source of pricing information; 0 otherwise
COOP	1 = used cooperatives to market crops; 0 otherwise
COSTPROD	1 = used cost of production as a source of pricing information; 0 otherwise
DEFRISK	1 = "large farms entering and swamping the organic market", "USDA organic standards are too lax", and/or "organic standards are not enforced consistently across certified and other organic enterprises"; 0 otherwise
EDUC	Education (1 = college degree or higher, 0 otherwise)
EXPERTS	1 = used marketing representatives, buyers, and/or brokers as a source of pricing information; 0 otherwise
GENDER	1 = female; 0 = male
INC	Household income (–1 = "net loss," 1 = "$0–19,999," 3 = "$20,000–39,999," 5 = "$40,000–59,999," 7 = "$60,000–79,999," 10 = "$80,000–119,999," 15 = "$120,000+"
IND	1 = used individual contracts to market crops; 0 otherwise
INS	1 = if the respondent carried federal crop insurance; 0 otherwise
IPRISK	1 = "crops not meeting organic standards as a result of contamination"; 0 otherwise
LAKE	Lake region (Michigan, Minnesota, and Wisconsin); 0 otherwise
MKTRISK	1 = "low prices," "contracts not honored," and/or "few buyers"; 0 otherwise
MTN	Mountain region (Arizona, Colorado, Idaho, Montana, New Mexico, Nevada, Utah, and Wyoming); 0 otherwise
NEAST	Northeast region (Connecticut, Delaware, Massachusetts, Maryland, Maine, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont); 0 otherwise
NGRAIN	Number of grain crops raised
NPLAINS	Northern Plains region (Kansas, Nebraska, North Dakota, and South Dakota); 0 otherwise
NPRODENT	Number of production enterprises
NLIVSTCK	Number of livestock enterprises
OCPLAN	Future plans for acreage allocation (1 = "100% organic," 2 = "more than half organic," 3 = "more than half conventional," 4 = "100% conventional")
ONFARM	1 = on-farm use of crops; 0 otherwise
OTHFMR	1 = considered information from other farmers; 0 otherwise
PACIFIC	Pacific region (California, Oregon, and Washington); 0 otherwise
PCTCERT	Percentage of acreage certified as organic
PCTOINC	Percentage of household income earned from organic farming

Table 2. Continued

Variable	Description
PCTTIME	Percentage of work time devoted to farm or ranch work
PRODRISK	1 = yield loss as a result of weather and/or weeds and/or insects"; 0 otherwise
PUB	1 = considered information from Internet and industry publications; 0 otherwise
YRSFMG	Years of farming
YRSOFMG	Years of farming organically

women, younger age, and higher incomes than organic grain producers not included in the sample. It is important to point out that the ARMS survey data are for all farmers in the United States and are thus not directly comparable to our sample of organic grain producers. The ARMS data are provided for comparison purposes only.

The majority of the survey respondents (96.3%) were male (*GENDER*); only 4% were female. The average percentage of female operators from the 2004 ARMS survey was 9% (Hoppe et al., 2007). The average age of the respondents was 50 years old (*AGE*), consistent with the 2004 ARMS average of 56 years. One-third of the respondents had completed at least a 4-year college degree (*EDUC*), which was between the 2004 ARMS average of 23.8% and 40% in Khaledi et al.'s (2010) sample of organic farmers in Saskatchewan. The ARMS data report 24% college-educated (Table 3). The respondents were asked to choose from a list of ranges that best described their "average annual household income (net farm income plus off-farm wages, before taxes) over the last 3 years." In defining the variable *INC*, their responses were assigned the midpoints of the ranges in $10,000. For example, a response of "$40,000–59,999" was assigned the value of 5. Less than 1% of the sample indicated net loss, whereas 28.3% indicated earning over $80,000. The 2004 ARMS average household income was $81,596.

Table 4 reports summary statistics of each variable in variable categories. The average respondent had farmed 25.8 years (*YRSFMG*) since turning 18 years old with a standard deviation of 11.8 years. The experience among respondents varied widely ranging from a veteran of 69 years to a novice of just starting out (1 year). The number of years the respondents had farmed organically (*YRSOFMG*) varied widely as well with a mean of 9.7 years and standard deviation of 7.2 years. The minimum was 1 year, as expected, whereas the most experienced person had farmed organically for 63 years, clearly predating the establishment of the NOP. The percentage of their work time allocated to farm or ranch work (*PCTIME*) ranged from 1–100% with an average of 80.0%. The person who responded 1% explained that he worked on his farm operation during weekday evenings and weekends only. The percentage of annual household income attributed to organic farming (*PCTOINC*) had a mean of 43.9% and a standard deviation of 36.5%.

Table 3. Demographic Variable Means for Survey Sample, Nonsample, and ARMS Data[a]

	Sample (n = 729)	Out of Sample (n = 405)	ARMS[b]
GENDER (female)	0.04	0.05	0.09
AGE	50	54	56
EDUC (college educated)	0.34	0.33	0.24
INC (income)	6.35	5.65	N/A[c]

[a] See Table 2 for variable definitions.
[b] Hoppe et al. (2007). The ARMS data include farms of all types and structures and are not directly comparable to our sample and are included for comparison purposes only.
[c] The ARMS data define income in different categories and are thus not comparable to the sample data.
ARMS, Agricultural Resource Management Survey; N/A, not available.

Table 4. Summary Statistics of Regression Variables

Variable	Mean	Standard Deviation	Minimum	Maximum
Farmer characteristics				
GENDER	0.037	0.189	0	1
AGE	49.912	11.446	23.5	74.5
EDUC	0.340	0.474	0	1
INC	6.353	4.390	–1	15
YRSFMG	25.750	11.776	1	69
YRSOFMG	9.705	7.203	1	63
PCTTIME	0.800	0.271	0.01	1
PCTOINC	0.439	0.365	0	1
Farm characteristics and management practices				
ACRES	0.077	0.155	0.0012	2.5
PCTCERT	0.828	0.298	0	1
NGRAIN	3.056	1.391	0	10
NLIVSTCK	0.948	0.921	0	5
NPRODENT	4.660	2.010	1	14
OCPLAN	1.283	0.667	1	4
INS	0.503	0.500	0	1
Regions				
NEAST	0.108	0.311	0	1
LAKE	0.354	0.479	0	1
CBELT	0.277	0.449	0	1
NPLAINS	0.137	0.344	0	1
MTN	0.062	0.241	0	1
PACIFIC	0.047	0.211	0	1
Marketing and pricing methods				
COOP	0.241	0.428	0	1
IND	0.782	0.413	0	1
ONFARM	0.145	0.353	0	1
CONVP	0.184	0.386	0	1
COSTPROD	0.258	0.438	0	1
OTHFMR	0.584	0.493	0	1
PUB	0.240	0.427	0	
EXPERTS	0.713	0.453	0	1
Primary risk concerns				1
PRODRISK	0.599	0.490	0	1
MKTRISK	0.163	0.370	0	1
IPRISK	0.151	0.358	0	1
DEFRISK	0.547	0.498	0	1

Note: n = 729

Farm Characteristics and Management Practices

The total acreage farmed (*ACRES*) varied from 12–25,000 acres. The average was 770 acres with a standard deviation of 1,550 acres. For reference, the number of acres operated per farm averaged 470 for all farms in the 2004 ARMS survey (Hoppe et al., 2007). Our sample average lies between the average acreages of family farms with less than $10,000 in sales (413 acres) and between $10,000 and $250,000 (1,170 acres). The distribution is skewed with two-thirds (66.4%) of the respondents having farms smaller than 500 acres. The median respondent farmed 300 acres. The percentage of total acreage that is certified organic (*PCTCERT*) ranged from 0 (likely undergoing transition) and 100. Approximately 75% of the respondents had more than

90% of their acreage certified as organic, and the remaining 25% of the sample appeared to be more or less uniformly distributed across the percentages less than 90. The mean of 82.8% is comparable to Khaledi et al.'s (2010) 77%.

The average number of grains raised by a respondent (*NGRAIN*) was 3.1 with a standard deviation of 1.4 and the maximum of 10. The variable NPRODENT is defined as the "number of production enterprises including grain crops, livestock, other crops, and miscellaneous enterprises."[1] This variable averaged 4.7 with a standard deviation of 2.01 and a maximum of 14. These numbers of production enterprises can more or less be compared with the average number of commodities reported from the 2004 ARMS of 1.8 for all farms (Hoppe et al., 2007).[2] Of the various farm types distinguished in the ARMS report, the most diversified group consists of family farms with $10,000–250,000 in sales, averaging 3.5 commodities. Surveyed organic grain producers revealed that their future plans included maintaining or expanding organic acreage, in most cases 100% (*OCPLAN*). Approximately half of the surveyed producers had purchased federal crop insurance at the time of the survey (*INS*). The surveys were returned from 35 states as summarized by USDA production regions in Table 2.

Marketing and Pricing Methods

From a list, the respondents were asked to choose all methods that they used to market and price their crops in addition to the opportunity to explain other methods, following the work of Hanson et al. (2004). The most popular method to market organic grains was individually negotiated transactions in some form of contracts or spot sales after harvest used by 78.2% of the respondents (*IND*). The next most popular marketing method was through cooperatives or marketing groups (*COOP*, 24%). Of those who indicated that they used their grains on their farms (*ONFARM*), most of them indicated that they feed all of their crops to their livestock, thus having no need for alternative outlets. Other marketing methods mentioned by a few involved direct marketing through farmers' markets and self-serve stands and marketing through individual agents or brokers. In addition, there were six respondents who explicitly mentioned the use of forward contracts.

In terms of pricing methods, the majority (71.3%) of the respondents referred to the quotes from their marketing representatives, including cooperatives, or from their buyers and brokers (*EXPERTS*). More than half (58.4%) of the respondents compared notes with fellow farmers to gauge the price level (*OTHFMR*). Approximately one in four respondents (25.8%) took into account their costs of production (*COSTPROD*) as defined in Table 2. The next most common source of price information, used by 24.0% of the respondents, was the quotes available from industry publications or over the Internet (*PUB*).

There were 18.4% of the respondents who indicated that they took into account the conventional prices including futures prices at the Chicago Board of Trade when pricing their organic grains (*CONVP*). These responses suggest that at least a fraction of organic grain farmers perceive that the conventional and organic markets are linked in some fashion.

Primary Risk Concerns

The respondents were asked to identify their two greatest concerns from a list of potential sources of risk following Hanson et al. (2004). Concerns regarding yield losses from various sources were classified as production risks. Specifically, 59.9% of the respondents identified yield losses as a result of weather and to weeds, insects, or deer as strong concerns (*PRODRISK*). Concerns regarding low prices, contracts not being honored, and few buyers can be classified as market risks (*MKTRISK*), and the responses showed that many respondents were not overly concerned with these market risks. Approximately 16.3% of the respondents

[1] The "other crops" include cotton, sunflower, safflower, peanut, rape, lentils, alfalfa, other hay, vegetables, fruits, and syrup; "miscellaneous enterprises" include seed, turf, wood, or composting.

[2] The ARMS numbers are based on 26 commodities or commodity groups: barley, oats, wheat, corn for grain, corn silage, soybeans, sorghum for grain, sorghum silage, canola, fruit, vegetables, nursery products, peanuts, sugar cane, sugar beets, rice potatoes, cotton, tobacco, hay, other crops, cattle, hogs, dairy, poultry, and other livestock.

identified at least one of the market risks as a major concern. Concerns regarding contamination and commingling (*IPRISK*) were also low in many respondents' priorities. Only 15.1% of the respondents identified concern of on-farm contamination as a result of prohibited substances, on-farm contamination as a result of genetic contamination, or the risk of their crops being mishandled after leaving their farms. The last group of concerns pertained to a risk of the definition of organic being diluted in the marketplace *DEFRISK*.[3] Collectively, these risks were of importance to 54.7% of our respondents (*DEFRISK*) and included the concern of large farms entering and swamping the organic market, which alone was identified as one of the major concerns for 28.1% of the respondents along with concerns regarding the USDA standards being too lax or that the organic standards are not being enforced consistently across various industry participants.

Ordered Logit Model

Given the ordered nature of our measure of farmers' objectives, the ordered logit (latent) regression (Greene, 2007) is given by:

$$y^* = \mathbf{x}'\boldsymbol{\beta} + \varepsilon \quad (1)$$

where y^* is the unobserved "intensity of feelings" of each respondent toward the particular objective statement; $\mathbf{x}$ is a set of explanatory variables, $\boldsymbol{\beta}$ is a vector of parameters to be estimated, and ε is a stochastic error. Because y^* is unobserved and what we know is a response in a scale chosen by each respondent, the underlying model structure can be represented as:

$$\begin{aligned} &y = 1 \quad \text{if} \quad y \leq \mu_1; \\ &y = 2 \quad \text{if} \quad \mu_1 \leq y \leq \mu_2; \quad \text{and} \\ &y = J \quad \text{if} \quad \mu_{J-1} \geq y \end{aligned} \quad (2)$$

where y represents each of the response levels presented to the respondent and μ_i are parameters to be estimated. This model structure implied the following set of probabilities:

$$\begin{aligned} &\text{Prob}(y = 1|\mathbf{x}) = \Phi(\mu_1 - \mathbf{x}'\boldsymbol{\beta}) \\ &\text{Prob}(y = 2|\mathbf{x}) = \Phi(\mu_2 - \mathbf{x}'\boldsymbol{\beta}) - \Phi(\mu_1 - \mathbf{x}'\boldsymbol{\beta}) \\ &\vdots \\ &\text{Prob}(y = J|\mathbf{x}) = 1 - \sum_{i=1}^{J-1} \text{Prob}(y = i) \end{aligned} \quad (3)$$

where $\Phi(\cdot)$ is the cumulative distribution function of the logistic distribution.

Equation (3) shows that each probability is a function of all parameters μ_j and $\boldsymbol{\beta}$. Therefore, the marginal effects of the regressors are different from the estimated coefficients. In the case of dummy variables, the marginal effects are calculated as the difference in the probability of each response level j when the specific variable takes the value of one and zero using the mean values of all other variables. The regional dummy variables are mutually exclusive, so the values of the other dummy variables within the group were set to zero.

Tests performed on the preliminary estimates showed that the estimated errors were heteroskedastic. This violation of the constant-variance standard errors assumption implied that the estimated parameters were not efficient and statistical inference on the parameters would be invalid, yet when the model was estimated with multiplicative heteroskedastic errors, the model's goodness of fit decreased, suggesting misspecification. Therefore, 2,000 bootstrap samples of 729 observations were drawn from the original data set with replacement to generate distributions for each parameter in each of the five models analyzed. Based on these distributions, parameter means, standard errors, and 85%, 90%, and 95% confidence intervals were calculated. The marginal effects for each variable were computed using the simulated parameter values. The averages of 2,000 simulated observations are reported along with statistical inference based on 90% and 95% confidence intervals.

Results

Three ordered logit models were estimated to analyze the determinants of organic grain producers' approach to farming. The definitions of

[3] The variable DEFRISK is a group of three concerns about the definition of organic markets, including, "large farms entering and swamping the organic market", "USDA organic standards are too lax", and/or "organic standards are not enforced consistently across certified and other organic enterprises."

dependent and independent variables are provided in Tables 1 and 2; and respective summary statistics are in Tables 1 and 4. Table 5 presents the parameter estimates and marginal effects for each of the three models are presented in Tables 6–8. When using multinomial logistic regression, one category of the dependent variable is chosen as the reference category, and separate odds ratios are determined for all independent variables for each category of the dependent variable with the exception of the reference category, which is omitted from the analysis. Each regression includes an intercept for each category of the dependent variable with the reference category omitted.

Maximize Profitability

Each constant term represents the intercept for the group of respondents in each response category. The smallest three constant terms were statistically significant at the 5% level, suggesting that the model could distinguish those who chose the lower three scores on a 5-point scale indicating strong disagreement to indifference to the statement from respondents in the other two categories (Table 5). Four factors were statistically significant at the 10% level or higher: 1) household income (*INC*); 2) number of years farming organically (*YRSOFMG*); 3) risks related to the definition of organics (*DEFRISK*); and 4) *GENDER*. Additionally, education (EDUC) and OCPLAN were statistically significant at the 15% level.

Marginal effects for MAXP are reported in Table 6.[4] The marginal effects of the statistically significant characteristics were small in magnitude. In terms of farmer characteristics, higher household income (*INC*) decreased the probability of the respondent strongly agreeing to the statement about profit maximization and increased the probability of the respondent selecting lower levels of accord, holding all else constant. This finding is consistent with Lynne's (2006a, 2006b) notion of a farmer tempering profit-maximization with a small amount of "other interest," or stewardship. This finding is an important contribution to the dual-motive literature and provides evidence for the metautility hypothesis. In contrast, an additional year of farming organically (*YRSOFMG*) lowered the probability of the respondent disagreeing that profits are an important motive and agreeing that profits are an important motivation. Organic grain producers with more experience are motivated by profits, which could reflect those producers who have completed a costly certification program (Hanson et al., 2004). Grain producers who are new to organic production are less likely to be motivated by profit, perhaps indicating a greater willingness to enter the certification process, which requires the elimination of chemicals on acres to be certified.

One of the largest impacts on the motivation to maximize profit was risk perception. If the respondent identified risks of the organic standards being challenged by the industry or large corporations as primary concern (*DEFRISK*), the probability of their strongly agreeing to maximizing profitability increased by 0.199, holding all else equal. This is consistent with profit-maximizing farmers concerned about losing their market niche with the organic sector becoming more like the conventional sector.

Environmental Stewardship

Similar to the model for profit maximization (*MAXP*) as the primary approach to farming, three smallest constant terms were statistically significant at the 5% level (Table 5). There were six factors that were statistically significant, including *AGE* and number of livestock (*NLIVSTK*) at the 10% level and years of farming (*YRSFMG*) using the cost of production as a pricing method (*COSTPROD*) and identifying yield and marketing related risks as primary concerns (*PRODRISK*, *MKTRISK*) at the 5% level. Marginal effects for this model are reported in Table 7.

The marginal effects for *AGE* suggest that younger respondents were more likely to agree with the importance of environmental stewardship

[4] The marginal effects measure changes in predicted probabilities of the dependent variable assuming certain values, given an incremental change in the independent variable. A nonzero coefficient shifts the probability distribution of y to the right or to the left. The marginal effects measure how Prob(y = 0|X), Prob(y = 1|X), ... Prob(y = 5|X) change given this shift. By definition, the marginal effects sum to zero (Greene, 2007).

Table 5. Parameter Estimates for Ordered Logit Models

Dependent Variable	*MAXP*	*ENVIRON*	*OLIFE*
Constant terms			
μ0	–4.811***	–4.688***	–3.018***
μ1	–3.294***	–4.150***	–1.232
μ2	–1.599***	–2.210***	0.422
μ3	–0.385	0.007	1.705**
Farm characteristics			
GENDER	–0.622**	–0.316	–0.442
AGE	0.008	–0.016**	–0.034***
EDUC	0.211*	0.148	0.334***
INC	–0.056***	0.011	0.020
YRSFMG	0.000	0.017***	0.010
YRSOFMG	0.035***	–0.014	–0.052***
PCTTIME	–0.395	–0.145	0.011
PCTOINC	–0.118	–0.175	–0.136
Farm characteristics and management practices			
ACRES	–0.343	–0.308	0.548**
PCTCERT	–0.102	0.014	–0.933***
NGRAINS	–0.010	–0.121	–0.210***
NLIVSTCK	0.014	–0.209**	–0.286***
NPRODENT	0.082	0.018	0.096
OCPLAN	–0.200*	0.016	0.780***
INS	0.180	–0.187	–0.187
Regions (base = Southern Plains)			
NEAST	0.464	0.487	1.213***
LAKE	–0.053	0.162	0.503
CBELT	–0.075	0.502	0.602
NPLAINS	0.138	0.421	0.853
MTN	0.378	1.145	0.797
PACIFIC	–0.143	–0.207	0.099
Marketing and pricing methods			
COOP	0.077	–0.146	–0.168
IND	0.199	–0.045	–0.035
ONFARM	0.307	0.285	–0.142
CONVP	–0.071	0.213	0.052
COSTPROD	0.173	–0.430***	–0.046
OTHFMR	0.087	–0.063	0.108
PUB	0.027	0.011	0.181
EXPERTS	–0.168	–0.094	0.073
Primary risk concerns			
PRODRISK	0.111	0.685***	0.400***
MKTGRISK	–0.170	0.589***	0.266
IPRISK	–0.170	0.042	–0.146
DEFRISK	0.516***	0.102	–0.141

Note: Triple, double, and single asterisks are significance at the 5%, 10%, and 15% levels, respectively.

relative to older survey respondents, Yet an additional year of farming in general (*YRSFMG*) increased the probability that the respondents agreed with the importance of environmental stewardship. The measure of operational diversity in terms of the numbers of livestock (*NLIVSTK*) indicates that the farmers with more diversified animal operations were less likely to strongly agree with the importance of environmental stewardship. This suggests that more diversified

Table 6. Marginal Effects for Dependent Variable = *MAXP*

Dependent Variable	Strongly Disagree 1	2	3	4	Strongly Agree 5
Farmer characteristics					
GENDER	0.019	0.051	0.100	0.115	–0.285
AGE	0.000	0.000	–0.001	0.000	0.001
EDUC	–0.004**	–0.013**	–0.029**	–0.038**	0.084**
INC	0.002***	0.004***	0.007*	0.003	–0.016***
YRSFMG	0.000	0.000	0.000	0.000	0.000
YRSOFMG	–0.001***	–0.001***	–0.003*	–0.001	0.006***
PCTTIME	0.010	0.018	0.031	0.012	–0.070
PCTOINC	0.012**	0.022*	0.041	0.016	–0.091**
Farm characteristics and management practices					
ACRES	0.009	0.016	0.028	0.011	–0.063
PCTCERT	0.006	0.008	0.008	–0.001	–0.020
NGRAINS	0.000	0.000	0.001	0.000	0.001
NLIVSTCK	0.000	–0.001	–0.001	0.000	0.002
NPRODENT	–0.002	–0.003	–0.006	–0.003	0.014
OCPLAN	0.005	0.009	0.014	0.005	–0.033
INS	–0.003	–0.009	–0.023	–0.030	0.065
Regions (base = Southern Plains)					
NEAST	–0.001	–0.006	–0.026	–0.035	0.067
LAKE	0.009	0.014	0.025	0.008	–0.056
CBELT	0.010	0.016	0.028	0.009	–0.063
NPLAINS	0.005	0.007	0.008	–0.006	–0.015
MTN	0.001	–0.001	–0.012	–0.022	0.034
PACIFIC	0.012	0.019	0.035	0.013	–0.080
Marketing and pricing methods					
COOP	–0.001	–0.005	–0.010	–0.013	0.030
IND	–0.004	–0.011	–0.024	–0.031	0.070
ONFARM	–0.005	–0.015	–0.038	–0.052	0.111
CONVP	0.002	0.005	0.009	0.011	–0.027
COSTPROD	–0.003	–0.010	–0.024	–0.031	0.069
OTHFMR	–0.002	–0.007	–0.014	–0.017	0.040
PUB	0.000	–0.001	–0.002	–0.003	0.005
EXPERTS	0.003	0.010	0.021	0.026	–0.060
Primary risk concerns					
PRODRISK	–0.002	–0.007	–0.017	–0.022	0.049
MKTGRISK	0.005	0.013	0.026	0.029	–0.073
IPRISK	0.004	0.011	0.024	0.028	–0.067
DEFRISK	–0.011***	–0.031***	–0.070***	–0.088***	0.199***

Note: Triple, double, and single asterisks are significance at the 5%, 10%, and 15% levels, respectively.

operators are more likely to be driven by profit motives than less diversified producers.

The factors that had larger impacts on the importance of environmental stewardship among organic grain farmers pertained to management practices and risk concerns. The farmers, who referred to cost of production (*COSTPROD*) in pricing their crops, were less likely to agree with the importance of environmental stewardship with all else constant. Although our argument is speculative, we suggest that farmers who use cost of production to price their crops may be good farm managers. They likely got into organic as business ventures and are less motivated by

Table 7. Marginal Effects for Dependent Variable = *ENVIRON*

	Strongly Disagree				Strongly Agree
Dependent Variable	1	2	3	4	5
Farmer characteristics					
GENDER	0.018	0.024	0.048	–0.132	–0.127
AGE	0.001**	0.000**	0.001	–0.002**	–0.026**
EDUC	–0.006	–0.009	–0.020	0.057	0.052
INC	0.000	0.000	–0.001	0.002	0.003
YRSFMG	–0.001***	0.000**	–0.001	0.003***	–0.051
YRSOFMG	0.001	0.000	0.001	–0.002	0.004
PCTTIME	0.009	0.003	0.011	–0.020	–0.028
PCTOINC	0.008	0.003	0.013	–0.026	–0.034**
Farm characteristics and management practices					
ACRES	0.018	0.006	0.025	–0.044	0.002
PCTCERT	0.004	0.000	–0.002	0.006	–0.020
NGRAINS	0.006	0.002	0.010	–0.018	0.003***
NLIVSTCK	0.010**	0.004*	0.016	–0.031**	–0.002
NPRODENT	–0.001	0.000	–0.002	0.003	–0.021
OCPLAN	0.001	0.000	–0.001	0.004	0.175
INS	0.009	0.012	0.027	–0.075	–0.101
Regions (base = Southern Plains)					
NEAST	0.009	0.001	–0.010	0.047	0.003
LAKE	0.024	0.006	0.030	–0.022	–0.067
CBELT	0.008	0.000	–0.013	0.050	0.044
NPLAINS	0.011	0.002	–0.002	0.033	–0.023
MTN	–0.016	–0.009	–0.085	0.185	0.049
PACIFIC	0.046	0.014	0.079	–0.101	0.033
Marketing and pricing methods					
COOP	0.008	0.010	0.021	–0.060	–0.054
IND	0.003	0.004	0.008	–0.020	–0.022
ONFARM	–0.010	–0.014	–0.036	0.106	0.094
CONVP	–0.009	–0.013	–0.029	0.084	0.075
COSTPROD	0.022***	0.029***	0.062***	–0.175***	–0.158***
OTHFMR	0.003	0.004	0.009	–0.026	–0.023
PUB	0.000	–0.001	–0.002	0.005	0.004
EXPERTS	0.005	0.007	0.015	–0.040	–0.037
Primary risk concerns					
PRODRISK	–0.032***	–0.044***	–0.098***	0.276***	0.252***
MKTGRISK	–0.022***	–0.031***	–0.076***	0.221***	0.198***
IPRISK	–0.001	–0.002	–0.005	0.015	0.017
DEFRISK	–0.004	–0.005	–0.014	0.039	0.034

Note: Triple, double, and single asterisks are significance at the 5%, 10%, and 15% levels, respectively.

environment or lifestyle reasons, although their characteristics may not have shown up as statistically significant in the MAXP and OLIFE models. These producers may be motivated less by environmental goals as a result of the need to meet financial obligations first. Further research is necessary to investigate the characteristics of producers who use the cost of production as a pricing method.

In contrast, farmers who identified yield or market related risks as primary concerns (*PRODRISK*, *MKTRISK*) were more likely to agree to being motivated by environmental goals. A farmer characterized by concern about

Table 8. Marginal Effects for Dependent Variable = *OLIFE*

Dependent Variable	Strongly Disagree 1	2	3	4	Strongly Agree 5
Farmer characteristics					
GENDER	0.058	0.073	0.054	0.031	–0.217
AGE	0.004***	0.001	–0.001	–0.002	–0.002***
EDUC	–0.039***	–0.054***	–0.044***	–0.028***	0.165***
INC	–0.002	–0.001	0.001	0.001	0.002
YRSFMG	–0.001	0.000	0.000	0.001	0.001
YRSOFMG	0.006***	0.002	–0.002	–0.003	–0.004***
PCTTIME	0.005	–0.006	–0.005	0.000	0.007
PCTOINC	0.016	0.006	–0.004	–0.007	–0.011
ACRES	–0.065**	–0.023	0.017	0.027	0.044**
PCTCERT	0.125***	0.029	–0.044	–0.048	–0.063***
NGRAINS	0.027***	0.008	–0.008	–0.011	–0.015***
NLIVSTCK	0.036***	0.011	–0.011	–0.014	–0.022***
NPRODENT	–0.012	–0.004	0.004	0.005	0.007
OCPLAN	–0.092***	–0.036	0.024	0.039	0.065***
INS	0.024	0.030	0.022	0.013	–0.090
NEAST	–0.128***	–0.071	–0.100**	–0.008	0.308***
LAKE	–0.046	–0.038	–0.039	–0.010	0.133
CBELT	–0.059	–0.040	–0.048	–0.008	0.154
NPLAINS	–0.090	–0.051	–0.069	–0.006	0.216
MTN	–0.084	–0.048	–0.065	–0.006	0.202
PACIFIC	0.009	–0.029	–0.003	–0.020	0.042
COOP	0.022	0.027	0.020	0.012	–0.081
IND	0.007	0.006	0.002	0.001	–0.016
ONFARM	0.022	0.023	0.013	0.007	–0.065
CONVP	–0.007	–0.009	–0.006	–0.003	0.026
COSTPROD	0.007	0.007	0.005	0.002	–0.021
OTHFMR	–0.014	–0.018	–0.013	–0.008	0.053
PUB	–0.023	–0.031	–0.023	–0.014	0.090
EXPERTS	–0.007	–0.011	–0.010	–0.007	0.036
PRODRISK	–0.049***	–0.065***	–0.051***	–0.031***	0.197***
MKTGRISK	–0.031	–0.043	–0.036	–0.023	0.132
IPRISK	0.019	0.024	0.018	0.010	–0.071
DEFRISK	0.018	0.024	0.018	0.010	–0.070

Note: Triple, double, and single asterisks are significance at the 5%, 10%, and 15% levels, respectively.

the environment was found to also be concerned with generating sufficient revenue from yield loss or low prices.

Organic Farming as Lifestyle

Eight of the statistically significant factors in the organic lifestyle regression were farm or farmer characteristics (Table 5). The marginal effects in Table 8 show that education had one of the large impacts (*EDUC*). Those respondents with college degrees were distinctively more likely to strongly agree that organic was their lifestyle than those without with all else equal. At the same time, it was less likely for younger farmers (*AGE*) to strongly agree, and more likely to strongly disagree, to the statement that organic farming was the respondent's lifestyle holding all other things constant (Table 8). Similarly, an additional year of organic farming (*YRSOFMG*) decreased the probability of the two extreme responses of strongly agree and strongly disagree with OLIFE. This result is also true for an additional percentage of acreage that is certified organic (*PCTCERT*). This could reflect the idea that the "early adopters" of organic grain production were motivated by high prices as a result of small supplies, as suggested by Hanson et al. (2004).

The results also suggest that those with larger farms in terms of acres farmed (*ACRES*) tended to agree that they were motivated by an "organic lifestyle." Additionally, less diversified farming operations, measured in terms of the number of grain crops (*NGRAIN*) or livestock enterprises (*NLIVSTCK*), tended to embrace organic farming as their lifestyles. This finding differs from that of Cutforth et al. (2001), who found that farmers characterized by greater levels of crop diversity were more likely to adopt conservation practices relative to those with less crop diversity. More diverse organic grain producers, as measured by number of crop and livestock enterprises, were less likely to embrace organic as a lifestyle, reflecting a different attitude than the conventional producers surveyed in Cutforth et al. (2001). This result could reflect the specialization of organic grain producers in grains that fit local production conditions or perhaps a limited number of organic grain products available relative to conventional agricultural products.

In terms of management practices, individuals who planned to allocate a higher percentage of their acreage to conventional farming (*OCPLAN*) had a higher tendency of strongly agreeing to the lifestyle statement. All else equal, farmers in the northeastern region of the country relative to those in the southern region were more likely to embrace organic farming as their lifestyles. Risk perceptions had a large impact on the lifestyle scale similar to the other approach. The farmers who were primarily concerned about production risks (*PRODRISK*) were more likely to regard organic farming as their lifestyle, a result that suggests correlation but not causation.

Conclusions and Implications

This research investigates the motivations of organic grain producers. The results from this study identified different motivations of organic grain farmers. A majority of organic grain producers who responded to the survey were motivated by profit and environmental stewardship and regarded organic as lifestyle. Many producers are motivated by both profits and stewardship behavior, a finding consistent with previous research (Lynne, 2006a, 2006b). We find that younger farmers, or those with shorter experience with organic farming, were drawn to organic farming for environmental or lifestyle reasons, relative to profitability, when compared with older or more experienced organic grain producers. Those with college education were more likely to embrace organic farming as a lifestyle. Our finding that farmers with additional household income were less likely to be motivated by profit suggests that the assumption of profit motive alone may be inadequate in the understanding of organic grain producer behavior. Rather, when sufficient economic means are available, organic farmers may be finding value in other aspects of life on the farm. This result is consistent with the argument of Lynne (2006a, 2006b) that producers temper profit-maximization with a small amount of self-sacrifice for objectives other than financial motivations. Our study found minimal regional differences. Interestingly, our results suggest that those with higher degrees of engagement with organic farming, either in terms of years that they have farmed organically or percentage of acreage allocated to organics, were more likely to be motivated by profit relative to environmental or lifestyle objectives. However, it is important to emphasize that these are marginal effects; most producers were found to be motivated by multiple objectives.

Similarly, individuals with more diversified operations tended to be associated with pursuit of profit relative to environmental or lifestyle objectives. Collectively, our results illuminate a profile of experienced organic grain farmers who are motivated by profit as well as environmental and organic lifestyle goals. However, the results also suggest that the profit motive is attenuated by environmental goals, a result that is intuitive and consistent with previous literature. These producers could be diversifying their operations of relatively small scale, which could reduce their cost by enhancing nutrient cycling and by reducing revenue risk.

Consistent with previous studies such as Stofferahn (2009) and Kallas et al. (2010), primary risk concerns could be more explanatory than demographics in identifying the farmers' motivations. Those pursuing profit in organic farming could be concerned about their value-added market becoming diluted or swamped as a result of entries of large players in the supply chain or lack of enforcement of the NOP standards. Those who valued environmental stewardship or lifestyle aspects of organic farming were worried about revenue losses, which could jeopardize their economic viability.

The implications for policymakers are that organic grain producers exhibit a diversity of motivations, including a large majority of organic grain farmers motivated by a strong desire for profits. As Nowak and Korsching (1998) emphasized, a lack of knowledge about organic grain producers' "human dimension" is likely to lead to policy inadequacies. Currently, federal programs subsidize organic farm certification and organic production research through the Environmental Quality Incentive Program and the NOP. To the extent that these public policies and programs intend to influence the number of organic grain farmers, or their level of income, they could have greater impact if the policies take into account the divergent motivations for organic grain production. A large majority of organic grain producers are motivated by profit, an unexpected result, that could be used to accelerate organic production through careful consideration of public policy proposals.

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