Barriers to Transitions to Organic Production:

Data Analysis

Prepared for:

Curt Stofferahn
Associate Professor, Department of Sociology
University of North Dakota

April 18, 2006

Linda Tinderholt

Table of Contents

List of Figures

List of Tables

Barriers to Transitioning to Organic Production: Data Analysis

OVERVIEW

North Dakota farm families and rural communities must find new options to sustain their rural way of life. It is essential that new and existing producers find ways to be profitable and sustainable. Organic markets provide one such opportunity for local producers. Building a sustainable agriculture and food system will help stabilize family farm communities and will create new opportunities for growth in rural communities. However, the first step in this process is to identify the needs of organic farmers and conventional farmers who might consider transitioning to organic production.

This study is designed to identify the obstacles prohibiting conventional farmers from transitioning to organic production and to try to identify the characteristics that predispose farmers to adopt organic farming techniques. The information gleaned from this research will be used to develop the appropriate educational programming and research to support North Dakota farmers in organic and sustainable production and marketing.

Methodology

The results of this study are based on telephone interviews of two populations: conventional and organic farmers. The sampling frame of conventional farmers consists of the subscribers of *Farm and Ranch Guide*, which track very closely with the characteristics of North Dakota farmers and ranchers as described in the Censuses of Agriculture. The sampling frame for organic farmers was compiled from lists of producer members provided by the Northern Plains Sustainable Agriculture Society and the Organic Crop Improvement Association, together with the North Dakota Department of Agriculture list of organic growers. The survey document is included in Appendix A.

Interviews of 113 organic producers and 378 conventional producers were conducted from February 20 through March 24, 2006. The overall response rate was 69%. The sample design and response rate information are included in Appendix B.

Report Format

The first section of the analysis describes the farm characteristics and demographic characteristics of the population sample. The second section identifies the barriers to transitioning to organic production. Section 3 looks specifically at the farm characteristics, demographic information and attitudes and values that describe the three producer groups (organic, conventional and those that have considered changing to organic production). Appendix A contains the survey instrument and Appendix B provides additional information on sample design and response rates.

SECTION 1. FARM CHARACTERISTICS AND DEMOGRAPHIC INFORMATION

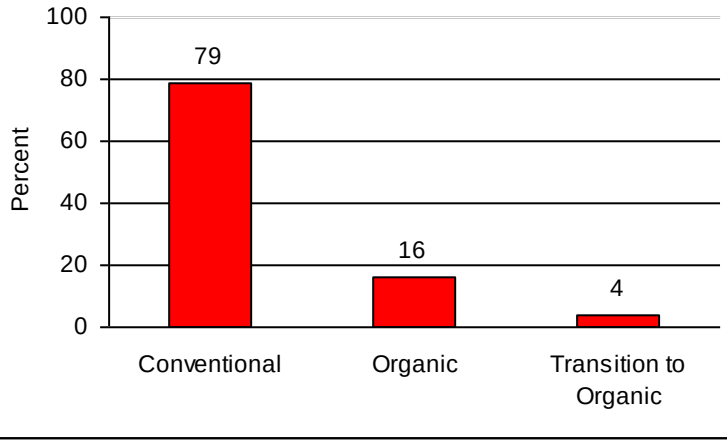
CLASSIFICATION OF FARM OPERATION

The farmers interviewed were asked to describe their farm operation in accordance with the following definitions:

- A conventional farming production system refers to a production system which employs a full range of pre- and post-plant tillage options (e.g., plow, disk, plant, cultivate), synthetic fertilizers, herbicides and pesticides.
- An organic agriculture production system refers to particular farming practices that have been followed and certified by a third party inspector. Organic guidelines require that crop rotation and soil-building practices be used; that pest control rely primarily on cultural, mechanical and biological controls; and that pesticides are from plants, are short-lived in the environment, and are used only as a last resort. Soil amendments should come from renewable resources as much as possible and only non-refined mined products, when manure, composts or other sources of nutrients are not available.

Based on these definitions, 79% of farmers contacted classified their operations as conventional, 16% as organic and 4% as transitioning to organic (Figure 1).

Figure 1. Farm Classification



This self-classification of farm operations does not always correspond with the sampling lists from which they were selected. Twenty-four conventional farmers were selected from the organic sample and 6 organic farmers and 7 farmers transitioning to organic were selected from the conventional sample (Table 1).

Table 1. Farm Operation by Sampling Frame

Operation	Conventional Sample	Organic Sample	Total
Conventional	365	24	389
Organic	6	75	81

Transitioning to organic	7	14	21
Total	378	113	491

For purposes of this analysis, the classification identified by the farmers themselves will be used and the 21 farmers transitioning to organic will be included with the organic producers (Table 2).

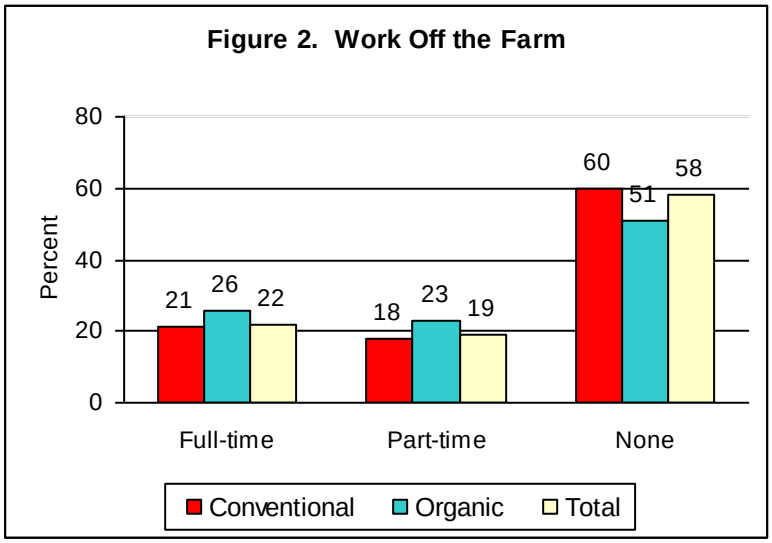
Table 2. Type of Operation

Operation	Number	Percent
Conventional	389	79
Organic	102	21

FARM CHARACTERISTICS

Work Off the Farm

Twenty-two percent of the farmers interviewed worked off the farm full-time in 2005; 19% worked off the farm part-time (Figure 2).



Sixty percent of conventional producers did not work off the farm in 2005, compared to 51% of organic producers. These differences, however, are not statistically significant.

Those who did work off the farm in 2005 (204 individuals) were asked why they did so. These reasons are summarized in Table 3.

Table 3. Reasons for Working Off the Farm

Percent

Reason	Conventional	Organic	Total
For personal interest	77	60	73
As a secondary income source	51	60	53
For health insurance or other benefits	29	44	33
To subsidize farm and capital investments	26	26	26
As a primary income source	26	6	21
As a primary career	21	10	19
Don't work off farm but farm part-time	5	10	6

Overall, the reasons mentioned most often for working off the farm are for personal interest, as a secondary income source and for health insurance or other benefits. The difference by type of operation for two of the reasons listed in Table 3 are statistically significant:

- conventional producers are more likely to work as a primary source of income
- conventional growers are more likely to work for personal interest

Chi-square values indicate that these variables are dependent, with a strength of association of .003 for working as a primary source of income and .022 for working for personal interest (Table 4).

Table 4. Chi-square and Cramer's V Values: Reasons for Working Off the Farm

Reason	Chi-square	Cramer's V
For personal interest	.003	.003
As a primary income source	.022	.022

Employees

Table 5. Employees (Mean)

Operation	Full-time, Year Round	Full-time, Seasonal	Part-time Year Round	Part-time, Seasonal
Conventional	2.07	2.97	2.46	2.53
Organic	2.89	2.30	1.89	2.50
Total	2.16	2.88	2.35	2.50

The number of persons employed on a full-time or part-time basis ranges from 1 to 30. Table 5 presents the average number of persons employed by the farmers interviewed by the type of farm operation. Organic farmers employ more full-time, year round employees. Conventional farms employ more full-time, seasonal and part-time employees, both year round and seasonal.

Farm Size

The largest acreage farmed is 10,000 acres, the largest acreage leased is 6,000 acres, the largest acreage owned is 10,000 acres and the largest acreage farmed organically is 5,000 acres.

In terms of acres farmed, acres leased and acres owned, the conventional farms tend to be larger (Table 6). Organic farms, on the average, are smaller, although they farm larger acreages organically.

Table 6. Average Size of Farms

Operation	Acres Farmed	Acres Farmed Organically	Acres Leased	Acres Owned
Conventional	2,021	579	1,248	1,351
Organic	1,300	1,034	725	1,033
Total	1,872	965	1,152	1,284

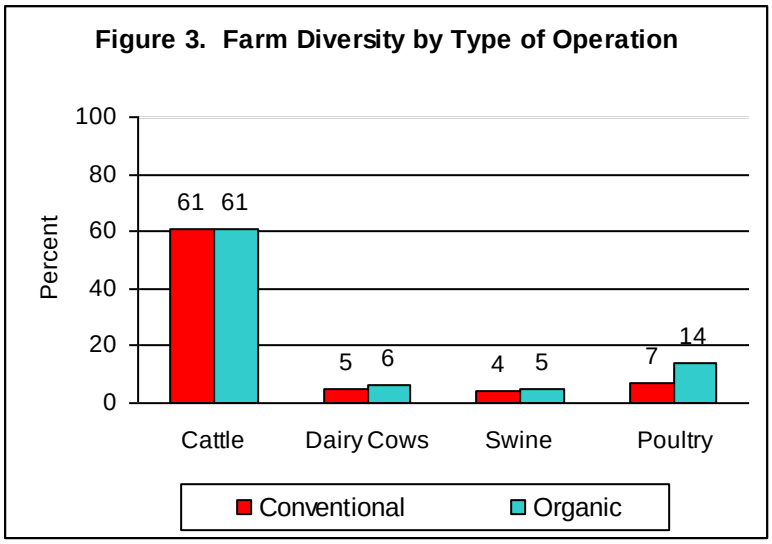
Analysis of variance in the differences between sample means indicate that there are statistically significant differences in the average acres farmed and acres leased by type of operation (Table 7), with Welch and Brown-Forsythe values of .000 for each of these variables.

Table 7. Chi-square and Cramer's V Values: Average Size of Farms

Acreage	Anova	Welch/ Brown-Forsythe
Acres farmed	.000	.000
Acres leased	.002	.000

Farm Diversification

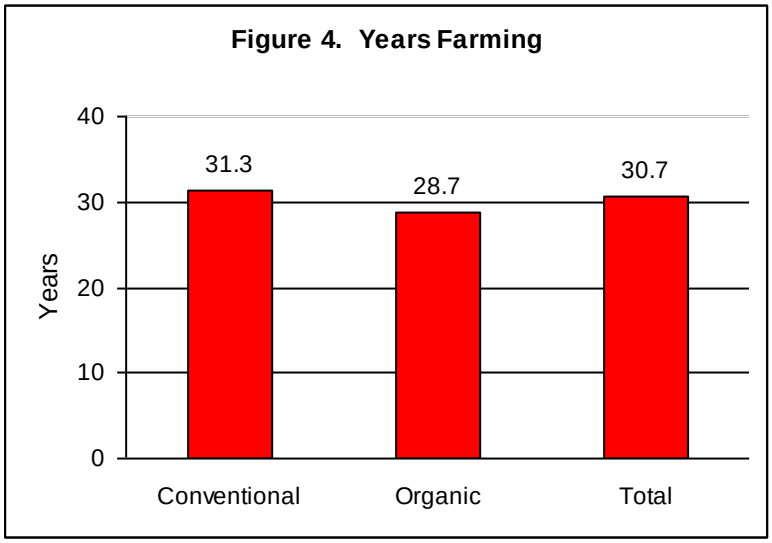
Sixty-one percent of farmers interviewed raise cattle, 5% have dairy cows, 4% raise swine and 8% raise poultry. Larger percentages of organic farmers raise cattle, dairy cows and swine; lower percentages of conventional farmers raise poultry (Figure 3).



These differences are significant only for the percentage of farmers raising poultry. Organic producers are significantly more likely to have poultry. A chi-square value of .018 indicates that raising poultry and type of operation are dependent, with a Cramer's V strength of association value of .018.

Number of Years Spent Farming

The average farmer has spent 30.7 years in the business. Conventional farmers have farmed an average of 31.3 years, compared to 28.7 years for organic farmers (Figure 4).



Gross Farm Income

Two hundred eighty-one of the individuals interviewed (58%) provided information on gross farm income in 2005. The incomes reported ranged from no income or loss to $500,000 or more (Table 8).

Table 8. Gross Farm Income, 2005

Percent

Income	Conventional	Organic	Total
No income, or loss	4		3
Less than $5,000	3	8	4
$5,000 - $9,999	4	7	4
$10,000 - $19,999	6	7	6
$20,000 - $24,999	4	2	4
$25,000 - $39,999	7	8	7
$40,000 - $49,999	4	7	5
$50,000 - $99,999	13	17	14
$100,000 - $249,999	27	32	28
$250,000 - $499,999	16	8	14
$500,000 or more	13	3	11

Twenty-eight percent reported gross farm incomes of $100,000 to $249,999; 14% reported incomes of $50,000 to $99,999 and $250,000 to $499,999. Eleven percent reported gross farm incomes of $500,000 or more.

Of those farmers reporting gross farm income, 21% of conventional farmers reported gross farm incomes less than $25,000, as did 24% of organic farmers. Fifty-six percent of conventional farmers reported incomes of $100,000 or more, compared to 43% of organic farmers.

DEMOGRAPHIC INFORMATION

Total Household Income

Two hundred fifty-four of the farmers interviewed (52%) provided information on total household income from all sources in 2005. Total income reported ranged from less than $10,000 to $200,000 or more (Table 9).

Table 9. Total Household Income

Percent

Income	Conventional	Organic	Total
Less than $10,000	5		4
$10,000 - $14,999	4	6	5
$15,000 - $24,999	9	15	10
$25,000 - $34,999	11	8	11
$35,000 - $49,999	16	9	15
$50,000 - $74,999	19	17	19
$75,000 - $99,999	10	13	11
$100,000 - $149,999	9	26	13
$150,000 - $199,999	5	2	4
$200,000 or more	11	4	9

Of those reporting total household income, 21% of organic farmers reported incomes under $25,000 compared to 18% of conventional farmers. Twenty-seven percent of conventional farmers reported total household income of $25,000 to $49,999, compared to 17% of organic farmers. Thirty-two percent of organic growers have total household incomes of $100,000 or more, compared to 25% of conventional farmers. These differences are statistically significant, with a chi-square value of .017 indicating that these measures are dependent on each other, with Cramer's V strength of association value of .017.

Education

Sixty-four percent of the farmers interviewed have completed high school; 21% have completed junior college or obtained a trade school degree (Table 10).

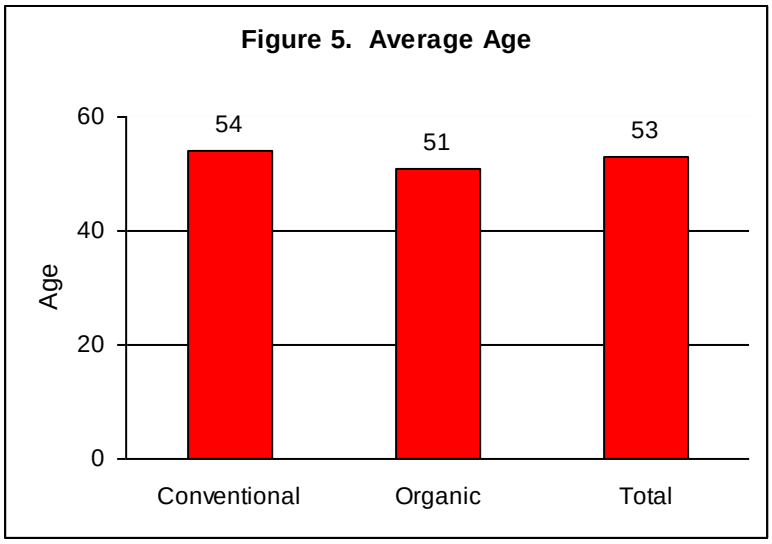
Table 10. Education

Percent

Educational Level	Conventional	Organic	Total
No formal education	6		6
Some high school	33	6	30
Completed high school	21	15	23
Some college	10	8	12
Completed junior college/ trade school degree	21	9	21
Completed bachelor's degree	2	26	2
Some graduate work	7	2	6
Graduate degree		4	

Ten percent have completed their bachelor's degree and 6% have completed some graduate work. Almost 40% of conventional farmers do not have a high school education, compared to 24% of organic farmers. One conventional farmer has his graduate degree, but the percentage is too small to be reflected in the table. The percentage differences by type of operation are statistically significant. A chi-square value of .031 indicates that these measures are dependent on each other, with a Cramer's V strength of association value of .031.

Age



The average age of the farm producers interviewed is 53 (Figure 5). The average age of conventional farmers is 54, compared to 51 for organic farmers. The largest age group is age 45 to 54 (34%), and most (63%) are between the ages of 44 and 65 (Table 11).

Table 11. Age Groups

	Percent		
Age	**Conventional**	**Organic**	**Total**
18 – 24	1	1	1
25 – 34	5	3	4
35 – 44	15	14	14
45 – 54	30	48	34
55 – 64	30	25	29
65 and older	20	8	17

The differences in age group by type of operation are statistically significant. A chi-square value of .009 indicates that these measures are dependent on each other, with a Cramer's V strength of association value of .009. Forty-eight percent of organic farmers

are age 45 to 54, compared to 30% of conventional farmers; 20% of conventional farmers are age 65 or older, compared to 8% of organic farmers.

Relationship to Farm

Ninety-four percent of the farmers interviewed are owners or co-owners, 3% are hired managers and 3% hold other positions. These percentages are similar for all types of farm operations.

SECTION 2. BARRIERS TO TRANSITIONING TO ORGANIC PRODUCTION

TRANSITION TO ORGANIC PRODUCTION

Three hundred eighty-nine of the farmers interviewed classified their operation as conventional. Eighty-two percent of these farmers (318 individuals) have never considered transitioning to organic production. Eighteen percent (68 individuals) have considered making the transition to organic production.

ACTIVITIES, BARRIERS AND PROBLEMS IN TRANSITION TO ORGANIC

Activities Pursued

The sixty-eight farm producers who have considered transitioning to organic production were asked to identify the activities they have pursued in considering transitioning to organic production.

Table 12. Activities Pursued

Activity	Number	Percent
Discussed it with organic farmers	38	56
Sought information from other organic farmers	33	49
Attended seminars or workshops on organic agriculture	17	25
Looked for information on internet	16	24
Attended organic agriculture demonstration field days	12	18
Sought information from government agencies	8	12

Organic farmers were the most common source of information both in supplying information to farmers considering a transition to organic production and in discussing organic production with them (Table 12). Farmers also attended seminars or workshops and searched the internet for information on organic production. Fewer farmers sought this information from government agencies.

Greatest barrier to Realizing the Transition to Organic Production

Concerns about marketing, production yields, income and expenses involved in changing to organic production, management difficulties and compliance procedures were some of the barriers to transitioning to organic production mentioned by those interviewed. These barriers are listed in Table 13.

Table 13. Greatest Barrier to Realizing the Transition to Organic Production

Barrier	Number
Marketing	6
Market availability	4
Finding markets	2
Distribution of products	1
Production yield uncertainty	4
Price difference vs. sacrifice and years to be certified	1
Loss of income during transition	2
Income reduction	3
Getting decent price for products	1
Cost of change	4
Rent	1
Too much debt to change	1
Weed control	15
Pest control	1
Chemical usage	1
Wheat hard to grow organically	1
Management difficulty	1
Too many acres, too far away	1
Size of operation	1
Amount of labor required	1
Lack of information	2
Compliance with certification requirements	1
Amount of paperwork	2
Organic inspectors	1
Organizations	1
Lack of time	2
Weather	1
Not able to make physical change	1
Change	1
Not worthwhile	1
Never got serious about it	1
Most farm conventionally	1

Weed control was mentioned most often, with 15 farmers expressing concerns about controlling weeds under organic production. Other barriers mentioned most often include marketing issues, market availability, production yield uncertainty and the cost of the transition to organic production.

Circumstances That Are a Constraint or Problem Specific to the Transition to Organic Production

The 81 farmers who are currently farming organically, the 21 who are in the process of transitioning to organic production and the 68 conventional farmers who are considering a change to organic production (a total of 170 farmers) were asked to what degree a series of circumstances serve as a constraint or problem specific to their transitioning to organic production. A scale of responses was provided, with responses ranging from 1 (not a constraint or problem) to 5 (serious constraint or problem). The responses given for these circumstances are summarized in Table 14. The column "serious constraint percentage" indicates the percentage of farmers who feel that that particular circumstance is a serious constraint.

Table 14. Degree of Constraint or Problem in Transition to Organic Production

Circumstance	Mean Response	Serious Constraint Percentage
Finding organic markets	3.21	25
Distance or transport of organically allowable inputs	3.17	23
Lack of organic marketing networks	3.13	15
Obtaining access to existing organic markets	2.99	19
Lack of consumer understanding about organic food	2.85	15
Achieving desired production levels or yields organically	2.79	15
Sourcing or finding organically allowable inputs	2.68	11
Cost of organically allowable inputs	2.68	10
Effectiveness of organically allowable inputs and methods	2.63	6
Information on organic practices unavailable or hard to find	2.51	10
Uncooperative or uninformed extension agents	2.50	16
Personal lack of knowledge about organic practices	2.41	11
Social pressure from other farmers or community to farm conventionally	2.34	12
Pressure from lenders to farm conventionally	1.83	6

Finding organic markets is the most serious constraint or problem in the transition to organic production, followed by distance or transport of organically allowable inputs, lack of organic marketing networks, obtaining access to existing organic markets and lack of consumer understanding about organic food. Pressure from lenders to farm conventionally, social pressures from other farmers or community to farm conventionally, personal lack of knowledge about organic practices, uncooperative or uninformed extension agents and information on organic practices unavailable or hard to find were felt to be the least serious constraints or problems.

The percentage of farmers feeling that a specific circumstance was a serious constraint or problem was highest for finding organic markets (25%), distance or transport of organically allowable inputs (23%), obtaining access to existing organic markets (19%) and uncooperative or uninformed extension agents (16%).

REASONS TO CHOOSE TO FARM ORGANICALLY

All of the farm producers interviewed were asked whether or not a series of reasons to choose to farm organically was important for them in choosing to farm organically. A range of responses was provided, ranging from 1 (not important) to 3 (moderately important) to 5 (very important). Table 15 summarizes these responses. The column "very important percentage" indicates the percentage of farmers who feel that each specific reason is very important.

Table 15. Importance of Reasons to Farm Organically

Reason	Mean Response	Very Important Percentage
Maintained economic sustainability of farm	3.96	55
Chemical avoidance for family/farmworker health	3.84	51
Land stewardship/ecological sustainability	3.68	42
Chemical avoidance for environmental health	3.66	44
Organic represents good farming practices	3.55	38
Quality of organically grown products	3.52	38
Community values, tradition, quality of life	3.51	36
Reduced input costs	3.49	35
Provide economic support on fewer acres of land	3.48	35
Ecological principles – view farm as ecological system	3.44	31
Organic price premiums	3.35	36
Growing consumer demand for organic	3.25	28
Changing practices in response to farm chemical regulation	3.24	28
Required by customer or buyer	3.12	26
Challenging, interesting, intellectually appealing	2.94	17
Required by owner of land	2.80	26
Philosophical, spiritual or ethical reasons	2.67	19

Maintaining economic sustainability of farm is felt to be the most important reason to farm organically, followed by chemical avoidance for health of family and farmworkers, land stewardship/ecological sustainability and chemical avoidance for environmental health. Reasons felt to be least important include philosophical, spiritual or ethical

reasons, required by owner of land, challenging, interesting, intellectually appealing and required by customer or buyer.

The percentage of farmers feeling that a specific reason was very important was highest for maintaining economic sustainability of farm (55%), chemical avoidance for health of family and farmworkers (51%), chemical avoidance for environmental health (44%), land stewardship/ecological sustainability (42%), quality of organically grown products (38%) and organic represents good farming practices (38%).

Differences in percentages by type of operation were statistically significant for thirteen of the seventeen reasons to farm organically. These reasons are summarized in Table 16.

Table 16. Importance of Reasons to Farm Organically (Means)

Reason	Mean - Conventional	Mean - Organic	Difference
Chemical avoidance for environmental health	3.39	4.51	1.12
Organic represents good farming practices	3.27	4.37	1.10
Philosophical, spiritual or ethical reasons	2.42	3.43	1.01
Land stewardship/ecological sustainability	3.44	4.44	1.00
Chemical avoidance for family/farmworker health	3.60	4.60	1.00
Quality of organically grown products	3.28	4.25	.97
Ecological principles – view farm as ecological system	3.25	4.04	.79
Community values, tradition, quality of life	3.32	4.10	.78
Challenging, interesting, intellectually appealing	2.74	3.52	.78
Provide economic support on fewer acres of land	3.34	3.90	.56
Growing consumer demand for organic	3.12	3.66	.54
Required by owner of land	2.92	2.43	.49
Maintained economic sustainability of farm	3.85	4.31	.46

The only reason felt to be more important by conventional growers was required by owner of land. For all other reasons listed, organic farmers rated these reasons as more important than did conventional farmers.

The largest difference in means was for chemical avoidance for environmental health (1.12), followed by organic represents good farming practices (1.10), philosophical, spiritual or ethical reasons (1.01), land stewardship/ecological sustainability (1.00) and chemical avoidance for family/farmworkers health (1.00). Conventional and organic growers were most in agreement with maintained economic sustainability of farm (.46),

required by owner of land (.49), growing consumer demand for organic (.54) and provide economic support on fewer acres than conventionally (.52).

Other reasons mentioned to farm organically are summarized in Table 17.

Table 17. Other Reasons to Farm Organically

Reason	Number
Environmental health – better for land and water	12
Health and safety issues	19
Problems with chemical use	9
Weed control problems	2
Use of non-GMO products	3
Safer food supply	3
Sustainability	2
Economic issues	12
Utilization of livestock	1
Smaller acreages	1
Regulatory enforcement	1
Land for rent requiring organic production	1
Rent land to organic farmers	1
Curiosity	2
Challenge	2
Spiritual/religious reasons	2

Health and safety issues, economic issues, environmental health issues and chemical use were mentioned most often by the farmers interviewed.

CONTRASTING VIEWS ABOUT AGRICULTURE IN THE UNITED STATES

Survey respondents were given a series of sets of contrasting views regarding agriculture in the United States and were asked to indicate which view in each pair they most agreed with and the strength of that agreement.[1] Possible responses included:

1 – strongly agree with Statement 1
2 – mildly agree with Statement 1
3 – undecided
4 – mildly agree with Statement 2
5 – strongly agree with Statement 2

Each pair of contrasting statements will be discussed below. For purposes of this analysis, the responses for each set of statements will be compared by the type of farm operation, conventional or organic. Organic includes both organic farmers and those

[1] This scale was taken from Curtis Beus and Riley Dunlop, Fall 1991, Vol. 56 No. 3, *Rural Sociology*.

transitioning to organic. All differences are statistically significant, except for the statements regarding crop diversification.

Statement 1: Meeting US food needs with fewer and fewer farmers is a positive outcome of technological progress.
Statement 2: Meeting US food needs with fewer and fewer farmers is a negative outcome of our free market system.

Thirty percent of those interviewed agree that meeting US food needs with fewer and fewer farmers is a positive outcome of technological progress and 63% agree that meeting US food needs with fewer and fewer farmers is a negative outcome of our free market system, with almost half agreeing strongly that meeting US food needs with fewer and fewer farmers is a negative outcome of our free market system (Table 18).

Table 18. Outcome of Technological Progress is Positive/Negative

	Percent		
	Conventional	**Organic**	**Total**
Statement 1 – strongly	17	4	14
Statement 1 – mildly	17	11	16
Undecided	8	7	8
Statement 2 – mildly	15	11	15
Statement 2 – strongly	43	66	48

Although both conventional and organic producers prefer Statement 2, larger percentages of conventional growers prefer Statement 1 (34%) and larger percentages of organic growers prefer Statement 2 (77%), with a chi-square value of .000 indicating dependence among measures and a Cramer's V strength of association value of .000.

Statement 1: High energy use makes US agriculture vulnerable and should be greatly reduced.
Statement 2: Large inputs of energy into agriculture should be continued as long as it is profitable to do so.

Approximately half (51%) of those interviewed agree that high energy use makes US agriculture vulnerable and should be greatly reduced and 39% agree that large inputs of energy into agriculture should be continued as long as it is profitable to do so, with a third agreeing strongly that high energy use makes US agriculture vulnerable and should be greatly reduced (Table 19).

Table 19. Amount of Energy Use Should Be Reduced/Continued

	Percent		
	Conventional	**Organic**	**Total**
Statement 1 – strongly	27	58	33
Statement 1 – mildly	19	13	18
Undecided	9	11	9
Statement 2 – mildly	22	8	19
Statement 2 – strongly	23	10	20

Conventional producers are slightly more in agreement with Statement 2 (55%) rather than Statement 1 (46%), while organic producers definitely prefer Statement 1 (71%). Fifty-eight percent of organic growers feel strongly that high energy use makes US agriculture vulnerable and should be greatly reduced, compared to 27% of conventional producers. A chi-square value of .000 indicates dependence among these measures, with a Cramer's V strength of association value of .000.

Statement 1: The amount of farmland owned by an individual or corporation should NOT be limited, even if the ownership of land becomes much more concentrated that at present.

Statement 2: The amount of farmland owned by an individual or corporation should be limited in order to encourage land ownership by as many people as possible.

Sixty-three percent of those interviewed agree that the amount of farmland owned by an individual or corporation should be limited in order to encourage land ownership by as many people as possible; 30% agree that the amount of farmland owned by an individual or corporation should not be limited, even if the ownership of land becomes much more concentrated that at present, with almost half (48%) agreeing strongly that the amount of farmland owned by an individual or corporation should be limited in order to encourage land ownership by as many people as possible (Table 20).

Table 20. Amount of Farmland Owned Should/Should Not Be Limited

	Percent		
	Conventional	**Organic**	**Total**
Statement 1 – strongly	17	6	15
Statement 1 – mildly	14	17	15
Undecided	6	16	8
Statement 2 – mildly	16	8	15
Statement 2 – strongly	46	53	48

Although both conventional and organic producers prefer Statement 2, larger percentages of conventional growers prefer Statement 1 (31%) and larger percentages of organic growers are undecided (16%). These differences are statistically significant,

with a chi-square value of .001 indicating dependence among measures and a Cramer's V strength of association value of .001.

Statement 1: Farming is first and foremost a business like any other.
Statement 2: Farming is first of all a way of life and second a business.

Half of those interviewed agree that farming is first and foremost a business like any other and 46% agree that farming is first of all a way of life and second a business, with 32% agreeing strongly with both statements (Table 21).

Table 21. Farming is a Business/ Way of Life

	Percent		
	Conventional	**Organic**	**Total**
Statement 1 – strongly	35	19	32
Statement 1 – mildly	20	10	18
Undecided	4	9	5
Statement 2 – mildly	13	18	14
Statement 2 – strongly	28	44	32

Conventional producers tend to agree with Statement 1 (55%) and organic producers tend to agree with Statement 2 (62%). These differences are significant, with a chi-square value of .000 indicating dependence among measures and a Cramer's V strength of association value of .000.

Statement 1: Farmers should use primarily natural fertilizers and production methods such as manure, crop rotations, compost and biological pest control.
Statement 2: Farmers should use primarily synthetic fertilizers and pesticides in order to maintain adequate levels of production.

Over half (56%) of those interviewed agree that farmers should use primarily natural fertilizers and production methods such as manure, crop rotations, compost and biological pest control and 32% agree that farmers should use primarily synthetic fertilizers and pesticides in order to maintain adequate levels of production, with 12% undecided. Thirty-nine percent agree strongly that farmers should use primarily natural fertilizers and production methods such as manure, crop rotations, compost and biological pest control (Table 22).

Table 22. Natural Fertilizers and Production Methods/Synthetic Fertilizers and Pesticides

	Percent		
	Conventional	**Organic**	**Total**
Statement 1 – strongly	28	80	39
Statement 1 – mildly	19	10	17
Undecided	14	4	12
Statement 2 – mildly	22	3	18
Statement 2 – strongly	17	3	14

Although both conventional and organic producers prefer Statement 1, far larger percentages of organic growers agree with this statement (90%) and larger percentages of conventional growers prefer Statement 2 (39%). Eighty percent of organic growers agree strongly that farmers should use primarily natural fertilizers and production methods, compared to 28% of conventional growers. A chi-square value of .000 indicates dependence among these measures, with a Cramer's V strength of association value of .000.

Statement 1: Farmers should farm only as much land as they can personally take care of.
Statement 2: Farmers should farm as much land as they profitably can.

Two-thirds of those interviewed agree that farmers should farm only as much land as they can personally take care of and 30% agree that farmers should farm as much land as they profitably can, with over half (51%) agreeing strongly that farmers should farm only as much land as they can personally take care of (Table 23).

Table 23. Farm as Much Land as They Can Personally Take Care Of/As They Profitably Can

	Percent		
	Conventional	**Organic**	**Total**
Statement 1 – strongly	48	62	51
Statement 1 – mildly	15	17	15
Undecided	5	2	4
Statement 2 – mildly	16	11	15
Statement 2 – strongly	17	8	15

Although both conventional and organic producers prefer Statement 1, larger percentages of organic growers prefer Statement 1 (79%) and larger percentages of conventional growers prefer Statement 2 (33%). Sixty-two percent of organic producers strongly agree that farmers should farm only as much land as they can personally take care of, compared to 48% of conventional producers. A chi-square value of .036 indicates dependence among these measures, with a Cramer's V strength of association value of .036.

Statement 1: Farms should be specialized in one or at most a few crops.
Statement 2: Farms should be diversified and include a large variety of crops.

Eighty percent of those interviewed agree with Statement 2 and 15% with Statement 1, with over half (51%) agreeing strongly that farms should be diversified and include a large variety of crops (Table 24).

Table 24. Crops Specialized/Diversified

	Percent		
	Conventional	**Organic**	**Total**
Statement 1 – strongly	6	4	6
Statement 1 – mildly	9	7	9
Undecided	5	7	6
Statement 2 – mildly	28	20	27
Statement 2 – strongly	51	62	53

These differences by type of operation are not statistically significant.

Statement 1: Soil and water are the sources of all life and should therefore be strictly conserved.
Statement 2: Soil and water are the basic factors of production and should be used so as to maximize production.

Sixty-eight percent of those interviewed agree that soil and water are the sources of all life and should therefore be strictly conserved and 23% agree that soil and water are the basic factors of production and should be used so as to maximize production, with almost half (48%) agreeing strongly that soil and water are the sources of all life and should therefore be strictly conserved (Table 25).

Table 25. Soil and Water Should be Strictly Conserved/Used so as to Maximize Production

	Percent		
	Conventional	**Organic**	**Total**
Statement 1 – strongly	44	62	48
Statement 1 – mildly	21	19	20
Undecided	9	7	9
Statement 2 – mildly	14	5	12
Statement 2 – strongly	12	7	11

Although both conventional and organic producers prefer Statement 1, larger percentages of organic producers prefer Statement 1 (81%) and larger percentages of conventional producers prefer Statement 2 (26%), with a chi-square value of .012 indicating dependence among measures and a Cramer's V strength of association value of .012.

Statement 1: Farmers should purchase most of their goods and services just as other consumers do.

Statement 2: Farmers should produce as many of their own goods and services as possible.

Sixty-two percent of those interviewed agree that farmers should produce as many of their own goods and services as possible and 26% agree that farmers should purchase most of their goods and services just as other consumers do, with 30% agreeing strongly that farmers should produce as many of their own goods and services as possible (Table 26).

Table 26. Purchase/Produce Goods and Services

	Percent		
	Conventional	**Organic**	**Total**
Statement 1 – strongly	9	7	9
Statement 1 – mildly	20	7	17
Undecided	11	14	12
Statement 2 – mildly	30	40	32
Statement 2 – strongly	30	32	30

Although both conventional and organic producers prefer Statement 2, larger percentages of conventional growers prefer Statement 1 (29%) and larger percentages of organic growers prefer Statement 2 (72%). A chi-square value of .026 indicates dependence among these measures, with a Cramer's V strength of association value of .026. However, the percent of growers, both conventional and organic, that agree strongly with Statement 2 (farmers should produce as many of their own goods and services as possible) are very similar.

Statement 1: The key to agriculture's future success lies in learning to imitate natural ecosystems and farm in harmony with nature.

Statement 2: The key to agriculture's future success lies in the continued development of advanced technologies that will overcome nature's limits.

Fifty-eight percent of those interviewed agree that the key to agriculture's future success lies in learning to imitate natural ecosystems and farm in harmony with nature and 30% agree that the key to agriculture's future success lies in the continued development of advanced technologies that will overcome nature's limits, with 37% agreeing strongly that the key to agriculture's future success lies in learning to imitate natural ecosystems and farm in harmony with nature (Table 27).

Table 27. Key to Future Success Lies in Harmony with Nature/Development of Advanced Technologies

	Percent		
	Conventional	**Organic**	**Total**
Statement 1 – strongly	30	64	37
Statement 1 – mildly	22	18	21
Undecided	12	9	11
Statement 2 – mildly	22	5	19
Statement 2 – strongly	13	4	11

Although both conventional and organic producers prefer Statement 1, larger percentages of conventional growers prefer Statement 2 (45%) and larger percentages of organic growers prefer Statement 1 (82%). A chi-square value of .000 indicates dependence among these measures, with a Cramer's V strength of association value of .000.

Statement 1: Most farms should specialize in either crops or livestock.
Statement 2: Most farms should include both crops and livestock.

Seventy percent of those interviewed agree that most farms should include both crops and livestock and 17% agree that most farms should specialize in either crops or livestock, with 39% agreeing strongly that most farms should include both crops and livestock (Table 28).

Table 28. Farms Should Specialize in Either Crops or Livestock/Include Both Crops and Livestock

	Percent		
	Conventional	**Organic**	**Total**
Statement 1 – strongly	6	5	5
Statement 1 – mildly	13	7	12
Undecided	15	6	13
Statement 2 – mildly	31	28	31
Statement 2 – strongly	35	54	39

Although both conventional and organic producers prefer Statement 2, larger percentages of conventional growers prefer Statement 1 (19%) and larger percentages of organic growers prefer Statement 2 (82%). Fifty-four percent of organic producers strongly agree that most farms should include both crops and livestock, compared to 35% of conventional producers. A chi-square value of .003 indicates dependence among these measures, with a Cramer's V strength of association value of .003.

Statement 1: The abundance and relatively low prices of food in the US are evidence that American agriculture is the most successful in the world.

Statement 2: High energy use, soil erosion, water pollution, etc. are evidence that US agriculture is not nearly as successful as many believe it to be.

Over half (56%) of those interviewed agree with that the abundance and relatively low prices of food in the US are evidence that American agriculture is the most successful in the world; 32% agree that high energy use, soil erosion, water pollution, etc. are evidence that US agriculture is not nearly as successful as many believe it to be, with 36% agreeing strongly that the abundance and relatively low prices of food in the US are evidence that American agriculture is the most successful in the world (Table 29).

Table 29. American Agriculture is the Most Successful in the World/Not Nearly as Successful as Many Believe

	Percent		
	Conventional	**Organic**	**Total**
Statement 1 – strongly	43	10	36
Statement 1 – mildly	22	14	20
Undecided	12	10	11
Statement 2 – mildly	12	21	14
Statement 2 – strongly	11	45	18

Conventional producers are more likely to agree with Statement 1 (65%) and organic producers are more likely to agree with Statement 2 (66%). Forty-three percent of conventional producers strongly agree that the abundance and relatively low prices of food in the US are evidence that American agriculture is the most successful in the world; 45% of organic growers strongly agree that high energy use, soil erosion, water pollution, etc. are evidence that US agriculture is not nearly as successful as many believe it to be. A chi-square value of .000 indicates dependence among these measures, with a Cramer's V strength of association value of .000.

SECTION 3. FARM CHARACTERISTICS, DEMOGRAPHIC INFORMATION AND ATTITUDES AND VALUES BY PRODUCTION GROUP

This section of the analysis looks specifically at the farm characteristics, demographic data and attitudes and beliefs about farming that describe those farmers who are already organic or transitioning to organic, those conventional farmers who have considered a change to organic production and those conventional farmers who have not considered such a transition to organic production. Table 30 lists the numbers and percentages of farmers in each of these production groups.

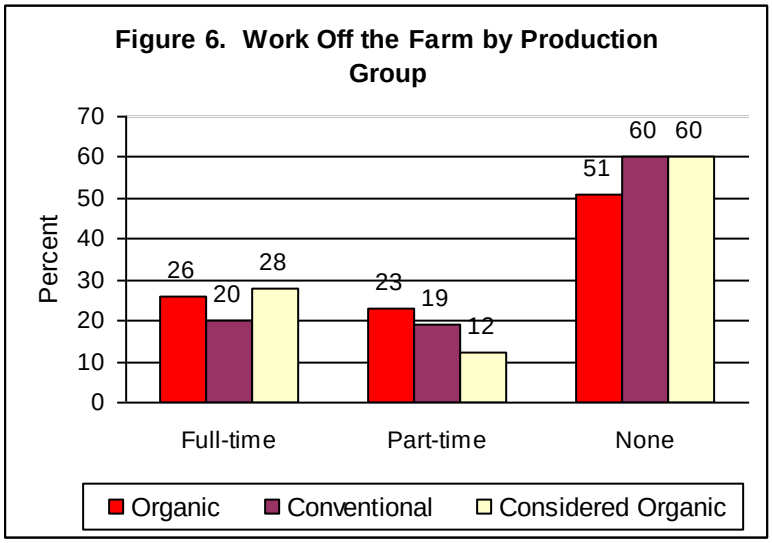
Table 30. Farm Production Groups

Production Group	Number	Percent
Organic	102	21
Conventional	318	65
Considered Organic	68	14
n	488*	

* Information on whether or not they had considered a change to organic is missing for three of the farmers interviewed.

FARM CHARACTERISTICS

Work Off the Farm



Overall, 58% of the farmers interviewed did not work off the farm in 2005, 23% worked off the farm full-time and 19% worked off the farm part-time. Organic farmers were more likely to work off the farm; those who have considered organic were more likely to work off the farm full-time.

Two hundred and two individuals did work off the farm in 2005 for various reasons (Table 31). The most important reasons for working off the farm for all production groups were for personal interest, as a secondary income source and for health insurance or other benefits.

Table 31. Reasons for Working Off the Farm by Producer Group

Percent

Reason	Organic	Conven-tional	Considered Organic	Chi-square	Cramer's V
For personal interest	60	73	93	.009	.009
As a secondary income source	60	54	37	.150	-
For health insurance or other benefits	44	26	44	.031	.031
To subsidize farm and capital investments	26	25	30	.902	-
As a primary income source	6	25	33	.006	.006
As a primary career	10	22	19	.172	-
Don't work off farm but farm part-time	3	10	15	.040	.040

Differences by production group are significant for four of these reasons: for personal interest, for health insurance or other benefits, as a primary income source and don't work off the farm but farm part-time. The chi-square values and the associated strength of association values are listed in Table 31. These differences in reasons for working off the farm by production group include:

- farmers who have considered a change to organic production are far more likely to work off the farm for personal interest
- organic farmers and those considering a change to organic are more likely to work for health insurance or other benefits
- organic farmers are least likely to work as a primary income source
- those considering a change to organic are more likely to farm part-time but not work off the farm

Employees

Organic farmers and those considering organic tend to employ more full-time year round workers; conventional farmers tend to have more full-time seasonal and part-time year round employees (Table 32). None of these differences, however, are significant.

Table 32. Employees (Means) by Production Group

Production Group	Full-time, Year Round	Full-time, Seasonal	Part-time Year Round	Part-time, Seasonal
Organic	2.89	2.30	1.89	2.36
Conventional	1.85	3.27	2.67	2.52
Considered Organic	3.08	1.93	1.33	2.54
All	2.16	2.88	2.35	2.49

Farm Size

The average acreage farmed was 1,875 acres, with an average of 1,152 acres leased, 1,281 acres owned and 965 acres farmed organically. Analysis of variance between sample means indicates that there are statistically significant differences in the average acres farmed, leased and owned by production group. The associated Anova, Welch and Brown-Forsythe values for each of these variables are shown in Table 33.

Table 33. Acreages Farmed by Production Group

Production Group	Acres Farmed	Acres Farmed Organically	Acres Leased	Acres Owned
Organic	1,300	1,034	725	1,033
Conventional	2,099	814	1,300	1,406
Considered Organic	1,732	344	1,044	1,117
Anova	.001	.153	.003	.048
Welch	.000	-	.001	.021
Brown-Forsythe	.000	-	.002	.022

These differences include:

- conventional farmers farm more acres (.000), lease more land (.001) and own more land (.026) than do those who farm organically

The values shows in the parentheses above are values from a least significant difference (LSD) test, which was run to determine which of the differences in sample means among the different groups were significant.

Farm Diversity

Sixty-one percent of the farmers interviewed raise cattle, 5% have dairy cows, 4% raise swine and 8% raise poultry. The percentages by production group are shown in Table 34. The differences by production group are significant only for the percentage of

farmers raising poultry. A chi-square value of .037 indicates that organic farmers are more likely to raise poultry, with a Cramer's V strength of association value of .037.

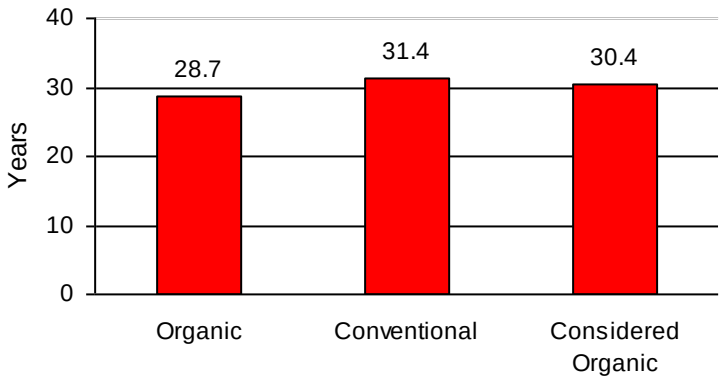
Table 34. Farm Diversity by Production Group

	Percent			
Production Group	**Cattle**	**Dairy Cows**	**Swine**	**Poultry**
Organic	61	6	5	14
Conventional	60	5	3	6
Considered Organic	66	3	7	9

Number of Years Spent Farming

The average farmer has spent 30.7 years farming. Although organic farmers have farmed for fewer years, on the average, the difference in years is not significant (Figure 7).

Figure 7. Years Spent Farming by Production Group



Gross Farm Income

Two-hundred eighty of the 491 farmers interviewed provided information on gross farm income in 2005 (Table 35). Conventional farmers had higher gross farm income in 2005, with 16% reporting incomes of $500,000 or more and 58% reporting incomes of $100,000 or more. Fifty-four percent of those who have considered organic production reported incomes of $100,000 or more, compared to 43% of organic farmers. These differences are not statistically significant.

Table 35. Gross Farm Income by Production Group

Percent

Income	Organic	Conventional	Considered Organic
No income, or loss	0	4	2
Less than $5,000	8	2	6
$5,000 - $9,999	7	3	4
$10,000 - $19,999	7	6	6
$20,000 - $24,999	2	5	2
$25,000 - $39,999	8	8	4
$40,000 - $49,999	7	4	4
$50,000 - $99,999	17	11	20
$100,000 - $249,999	32	25	35
$250,000 - $499,999	8	17	13
$500,000 or more	3	16	6

DEMOGRAPHIC INFORMATION

Total Household Income

Two hundred and fifty-two of the farm producers interviewed provided information on total household income in 2005. The levels of household income by producer group are listed in Table 36. These differences are not significant.

Table 36. Total Household Income by Producer Group

Percent

Income	Organic	Conventional	Considered Organic
Less than $10,000	0	5	4
$10,000 - $14,999	6	5	4
$15,000 - $24,999	15	8	12
$25,000 - $34,999	8	11	14
$35,000 - $49,999	9	19	10
$50,000 - $74,999	17	19	20
$75,000 - $99,999	13	9	10
$100,000 - $149,999	26	10	6
$150,000 - $199,999	2	6	2
$200,000 or more	4	9	16

Organic farmers reported higher levels of household income in 2005, with 32% of these farmers reporting incomes of $100,000 or more, compared to 25% of conventional farmers and 24% of those farmers who have considered a change to organic production.

Education

There are statistically significant differences by producer group in levels of education (Table 37). A chi-square value of .021 indicates that these measures are dependent, with a Cramer's V strength of association value of .021. Forty-two percent of conventional farmers have not graduated from high school, compared to 28% of those considering organic and 24% of organic farmers.

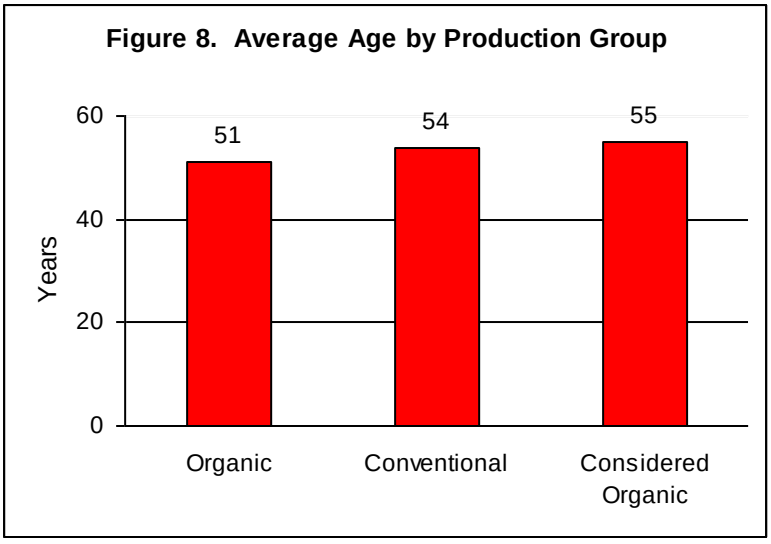
Table 37. Educational Level by Production Group

Percent

Educational Level	Organic	Conventional	Considered Organic
No formal education	5	7	3
Some high school	19	35	25
Completed high school	28	20	27
Some college	19	10	12
Completed junior college/ trade school degree	24	21	21
Completed bachelor's degree	2	1	6
Some graduate work	2	7	6

One-third of those farmers considering organic have completed junior college or trade school, completed their bachelor's degree or have some graduate work, compared to 29% of conventional farmers and 28% of organic farmers. Forty-seven percent of organic farmers have completed high school or taken some college courses, compared to 39% of those considering organic and 30% of conventional farmers.

Age



The average age of the farmers interviewed is 54. Although organic farmers tend to be younger (Figure 8), these differences are not significant.

Differences are, however, significant by age group, with a chi-square value of .038 indicating dependence and a Cramer's V strength of association value of .038 (Table 38). Farmers considering organic tend to be older, with only 13% under the age of 45 compared to 18% of organic farmers and 23% of conventional farmers. Organic farmers tend to be younger, with 67% below the age of 55 compared to 52% of conventional farmers and 44% of those considering organic.

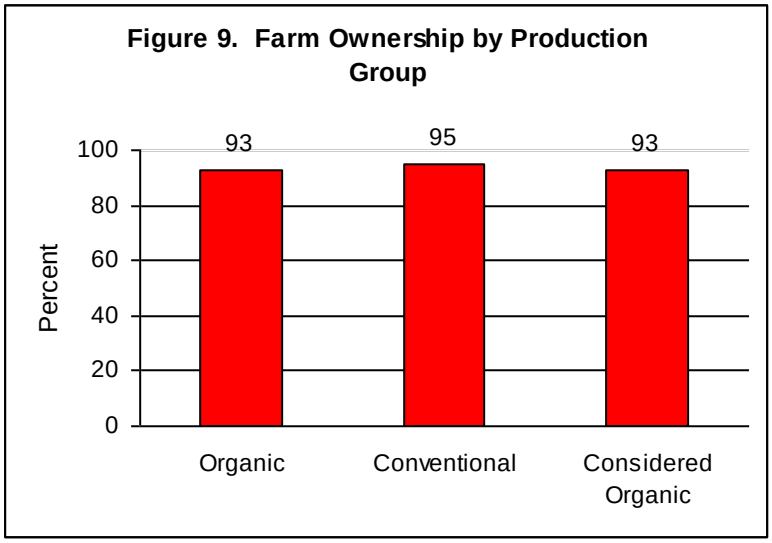
Table 38. Age Groups by Production Group

Percent

Age Group	Organic	Conventional	Considered Organic
18 – 24	1	2	0
25 – 34	3	5	2
35 – 44	14	16	11
45 – 54	48	30	32
55 – 64	25	29	33
65 and older	8	19	23

Relationship to Farm

There is very little difference in farm ownership by production group, with ownership levels of 95% for conventional farmers and 93% for organic farmers and those who have considered a transition to organic production (Figure 9).



Importance of Reasons to Change to Farm Organically

All of the farmers interviewed were asked whether or not a series of reasons to choose to farm organically was important to them in choosing to change their production to organic. A range of responses was provided, from 1 (not important) to 3 (moderately important) to 5 (very important). These responses by producer group and the significance levels of each are summarized in Table 39.

Table 39. Importance of Reasons to Farm Organically (Means) by Production Group

Reason	Organic	Conven-tional	Cons. Org.	Anova	Welch	Brown-Forsythe
Maintained economic sustainability of farm	4.31	3.71	4.29	.000	.000	.000
Chemical avoidance for family/ farmworker health	4.60	3.52	3.88	.000	.000	.000
Land stewardship/ecological sustainability	4.44	3.31	3.82	.000	.000	.000
Chemical avoidance for environ-mental health	4.51	3.25	3.91	.000	.000	.000
Organic represents good farming practices	4.37	3.11	3.81	.000	.000	.000
Quality of organically grown products	4.25	3.09	3.92	.000	.000	.000
Community values, tradition, quality of life	4.10	3.29	3.39	.000	.000	.000
Reduced input costs	3.59	3.37	3.73	.145	-	-
Provide economic support on fewer acres of land	3.90	3.23	3.72	.000	.000	.000
Ecological principles – view farm as ecological system	4.04	3.19	3.42	.000	.000	.000
Organic price premiums	3.47	3.09	4.08	.000	.000	.000
Growing consumer demand for organic	3.66	2.90	3.91	.000	.000	.000
Changing practices in response to farm chemical regulation	3.31	3.16	3.41	.409	-	-
Required by customer or buyer	3.27	3.01	3.26	.255	-	-
Challenging, interesting, intellectually appealing	3.52	2.56	3.33	.000	.000	.000
Required by owner of land	2.43	2.95	2.76	.031	.042	.038
Philosophical, spiritual or ethical reasons	3.43	2.30	2.83	.000	.000	.000

Analysis of variance in the difference between sample means indicates that there are statistically significant differences for all reasons listed except for reduced input costs, changing practices in response to farm chemical regulation and required by customer or

buyer. The Anova values for each reason and the Welch and Brown-Forsythe values, if significant, are listed in Table 39.

To determine which of the differences are significant among the three producer groups, a LSD (least significant difference) value was obtained for each comparison between groups (organic-conventional, organic-considered organic, conventional-considered organic). These LSD values are listed in parentheses in the following summary of statistically significant differences.

Organic farmers view the following reasons as more important than do conventional farmers:

- maintained economic sustainability of farm (.000)
- chemical avoidance for family/farmworker health (.000)
- land stewardship/ecological sustainability (.000)
- chemical avoidance for environmental health (.000)
- organic represents good farming practices (.000)
- quality of organically grown products (.000)
- community values, tradition, quality of life (.000)
- provide economic support on fewer acres of land (.000)
- ecological principles – view farm as ecological system (.000)
- organic price premiums (.035)
- growing consumer demand for organic (.000)
- challenging, interesting, intellectually appealing (.000)
- philosophical, spiritual or ethical reasons (.000)

Conventional farmers view the following reason as more important than do organic farmers:

- required by owner of land (.009)

Organic farmers view the following reasons as more important than do those considering organic production:

- chemical avoidance for family/farmworker health (.001)
- land stewardship/ecological sustainability (.004)
- chemical avoidance for environmental health (.006)
- organic represents good farming practices (.012)
- community values, tradition, quality of life (.000)
- ecological principles – view farm as ecological system (.005)
- organic price premiums (.012)
- philosophical, spiritual or ethical reasons (.009)

Those considering organic view the following reasons as more important than do conventional farmers:

- maintained economic sustainability of farm (.003)
- land stewardship/ecological sustainability (.009)
- chemical avoidance for environmental health (.001)

- organic represents good farming practices (.000)
- quality of organically grown products (.000)
- provide economic support on fewer acres of land (.011)
- organic price premiums (.000)
- growing consumer demand for organic (.000)
- challenging, interesting, intellectually appealing (.000)
- philosophical, spiritual or ethical reasons (.009)

Overall, for the following reasons to farm organically, organic farmers felt these reasons to be most important, followed by those considering organic and then by conventional farmers:

- maintained economic sustainability of farm
- chemical avoidance for family/farmworker health
- land stewardship/ecological sustainability
- chemical avoidance for environmental health
- organic represents good farming practices
- quality of organically grown products
- community values, tradition, quality of life
- provide economic support on fewer acres of land
- ecological principles – view farm as ecological system
- challenging, interesting, intellectually appealing
- philosophical, spiritual or ethical reasons

For the following reasons, farmers considering organic feel these reasons to be most important, followed by organic farmers and then by conventional farmers:

- organic price premiums
- growing consumer demand for organic

For the following reason, conventional farmers feel this reason to be most important, followed by those considering organic and then by organic growers:

- required by owner of land

CONTRASTING VIEWS ABOUT AGRICULTURE IN THE UNITED STATES

Survey respondents were given a series of sets of contrasting views regarding agriculture in the United States and were asked to indicate which view in each pair they most agreed with and the strength of that agreement. Possible responses included:

1 – strongly agree with Statement 1
2 – mildly agree with Statement 1
3 – undecided
4 – mildly agree with Statement 2
5 – strongly agree with Statement 2

Each pair of contrasting statements compared by production group (organic, conventional and considered organic) will be discussed below.

Statement 1: Meeting US food needs with fewer and fewer farmers is a positive outcome of technological progress.
Statement 2: Meeting US food needs with fewer and fewer farmers is a negative outcome of our free market system.

All the producer groups favored Statement 2, agreeing that meeting US food needs with fewer and fewer farmers is a negative outcome of our free market system (Table 40). A chi-square value of .001 indicates that these measures are dependent on each other, with a Cramer's V strength of association value of .001. Organic farmers are more likely to agree with Statement 2.

Table 40. Outcome of Technological Progress is Positive/Negative by Production Group

Percent

	Organic	Conventional	Considered Organic
Statement 1 – strongly	4	19	1
Statement 1 – mildly	11	17	16
Undecided	7	7	13
Statement 2 – mildly	11	16	12
Statement 2 – strongly	66	42	49

Statement 1: High energy use makes US agriculture vulnerable and should be greatly reduced.
Statement 2: Large inputs of energy into agriculture should be continued as long as it is profitable to do so.

Almost half (48%) of the conventional farmers agree that large inputs of energy into agriculture should be continued as long as it is profitable to do so (Table 41).

Table 41. Amount of Energy Use Should Be Reduced/Continued by Production Group

Percent

	Organic	Conventional	Considered Organic
Statement 1 – strongly	58	25	34
Statement 1 – mildly	13	19	22
Undecided	11	8	13
Statement 2 – mildly	8	24	15
Statement 2 – strongly	10	24	16

Organic farmers are more likely to agree that high energy use makes US agriculture vulnerable and should be greatly reduced (71%), followed by those who have considered organic production (56%). These differences are statistically significant, with a chi-square value of .000 indicating dependence and a Cramer's V strength of association value of .000.

Statement 1: The amount of farmland owned by an individual or corporation should NOT be limited, even if the ownership of land becomes much more concentrated that at present.
Statement 2: The amount of farmland owned by an individual or corporation should be limited in order to encourage land ownership by as many people as possible.

All producers agree that the amount of farmland owned by an individual or corporation should be limited in order to encourage land ownership by as many people as possible (Table 42).

Table 42. Amount of Farmland Owned Should/Should Not Be Limited by Production Group

	Percent		
	Organic	**Conventional**	**Considered Organic**
Statement 1 – strongly	6	19	12
Statement 1 – mildly	17	14	15
Undecided	16	6	4
Statement 2 – mildly	8	16	18
Statement 2 – strongly	53	45	51

A chi-square value of .005 indicates that these measures are dependent, with a Cramer's V strength of association value of .005. Higher percentages of organic growers are undecided, and higher percentages of conventional growers and those who have considered organic feel more strongly than organic growers that the amount of farmland owned by an individual or corporation should not be limited.

Statement 1: Farming is first and foremost a business like any other.
Statement 2: Farming is first of all a way of life and second a business.

A chi-square value of .000 indicates that these measures by producer group are dependent on each other, with a Cramer's V strength of association value of .000. Conventional farmers are more likely to agree that farming is first and foremost a business like any other (57%), while organic farmers (62%) and those considering

organic (50%) are more likely to agree that farming is first of all a way of life and second a business (Table 43).

Table 43. Farming is a Business/ Way of Life by Producer Group

Percent

	Organic	Conventional	Considered Organic
Statement 1 – strongly	19	38	24
Statement 1 – mildly	10	19	22
Undecided	9	4	3
Statement 2 – mildly	18	11	19
Statement 2 – strongly	44	28	31

Statement 1: Farmers should use primarily natural fertilizers and production methods such as manure, crop rotations, compost and biological pest control.

Statement 2: Farmers should use primarily synthetic fertilizers and pesticides in order to maintain adequate levels of production.

Organic farmers are far more likely to agree that farmers should use primarily natural fertilizers and production methods (90%), as are those considering organic (69%) (Table 44). Conventional farmers are split, with 42% favoring Statement 1 and 44% favoring Statement 2. These differences are statistically significant, with a chi-square value of .000 indicating dependence and a Cramer's V strength of association value of .000.

Table 44. Natural Fertilizers and Production Methods/Synthetic Fertilizers and Pesticides by Production Group

Percent

	Organic	Conventional	Considered Organic
Statement 1 – strongly	80	25	41
Statement 1 – mildly	10	17	28
Undecided	4	14	12
Statement 2 – mildly	3	25	13
Statement 2 – strongly	3	19	6

Statement 1: Farmers should farm only as much land as they can personally take care of.

Statement 2: Farmers should farm as much land as they profitably can.

All producer groups agree that farmers should farm only as much land as they can personally take care of (Table 45). Although higher percentages of organic producers agree with this statement than do other producer groups, this difference is not statistically significant.

Table 45. Farm as Much Land as They Can Personally Take Care Of/As They Profitably Can by Producer Group

Percent

	Organic	Conventional	Considered Organic
Statement 1 – strongly	62	49	42
Statement 1 – mildly	17	14	21
Undecided	2	4	6
Statement 2 – mildly	11	15	18
Statement 2 – strongly	8	18	13

Statement 1: Farms should be specialized in one or at most a few crops.
Statement 2: Farms should be diversified and include a large variety of crops.

Levels of agreement are similar for all producer groups. All agree that farms should be diversified and include a large variety of crops (Table 46). Organic farmers tend to agree more strongly than conventional farmers or those considering organic, but these differences are not statistically significant.

Table 46. Crops Specialized/Diversified by Producer Group

Percent

	Organic	Conventional	Considered Organic
Statement 1 – strongly	4	7	3
Statement 1 – mildly	7	9	9
Undecided	7	6	4
Statement 2 – mildly	20	27	34
Statement 2 – strongly	62	51	50

Statement 1: Soil and water are the sources of all life and should therefore be strictly conserved.
Statement 2: Soil and water are the basic factors of production and should be used so as to maximize production.

All producer groups agree that soil and water are the sources of all life and should therefore be strictly conserved (Table 47). Although higher percentages of organic producers agree with this statement, this difference is not statistically significant.

Table 47. Soil and Water Should be Strictly Conserved/Used so as to Maximize Production by Producer Group

Percent

	Organic	Conventional	Considered Organic
Statement 1 – strongly	62	44	47
Statement 1 – mildly	19	21	21
Undecided	7	9	7
Statement 2 – mildly	5	15	13
Statement 2 – strongly	7	12	12

Statement 1: Farmers should purchase most of their goods and services just as other consumers do.
Statement 2: Farmers should produce as many of their own goods and services as possible.

All producer groups agree that farmers should produce as many of their own goods and services as possible (Table 48). Higher percentages of organic producers agree with this statement, but the difference is not statistically significant.

Table 48. Purchase/Produce Goods and Services by Producer Group

Percent

	Organic	Conventional	Considered Organic
Statement 1 – strongly	7	9	11
Statement 1 – mildly	7	20	18
Undecided	14	12	9
Statement 2 – mildly	40	29	33
Statement 2 – strongly	32	30	29

Statement 1: The key to agriculture's future success lies in learning to imitate natural ecosystems and farm in harmony with nature.

Statement 2: The key to agriculture's future success lies in the continued development of advanced technologies that will overcome nature's limits.

All producer groups agree that the key to agriculture's future success lies is learning to imitate natural ecosystems and farm in harmony with nature (Table 49). Organic farmers are more likely to agree with this statement. A chi-square value of .000 indicates independence, with a Cramer's V strength of association value of .000.

Table 49. Key to Future Success Lies in Harmony with Nature/Development of Advanced Technologies by Producer Group

Percent

	Organic	Conventional	Considered Organic
Statement 1 – strongly	64	26	45
Statement 1 – mildly	18	23	19
Undecided	9	11	15
Statement 2 – mildly	5	25	12
Statement 2 – strongly	4	15	9

Statement 1: Most farms should specialize in either crops or livestock.
Statement 2: Most farms should include both crops and livestock.

All farmers interviewed agree that most farms should include both crops and livestock (Table 50). A chi-square value of .011 indicates that these measures are dependent, with a Cramer's V strength of association value of .011. Organic farmers are more likely to agree with this statement, followed by those considering organic and conventional farmers.

Table 50. Farms Should Specialize in Either Crops or Livestock/Include Both Crops and Livestock by Producer Group

Percent

	Organic	Conventional	Considered Organic
Statement 1 – strongly	5	6	4
Statement 1 – mildly	7	15	7
Undecided	6	15	13
Statement 2 – mildly	28	30	35
Statement 2 – strongly	54	34	40

Statement 1: The abundance and relatively low prices of food in the US are evidence that American agriculture is the most successful in the world.

Statement 2: High energy use, soil erosion, water pollution, etc. are evidence that US agriculture is not nearly as successful as many believe it to be.

A chi-square value of .000 indicates that these measures are dependent, with a Cramer's V strength of association value of .000. Organic farmers are more likely to agree that high energy use, soil erosion, water pollution, etc. are evidence that US agriculture is not nearly as successful as many believe it to be (Table 51). Conventional growers and those considering organic, however, are more likely to agree that the abundance and relatively low prices of food in the US are evidence that American agriculture is the most successful in the world.

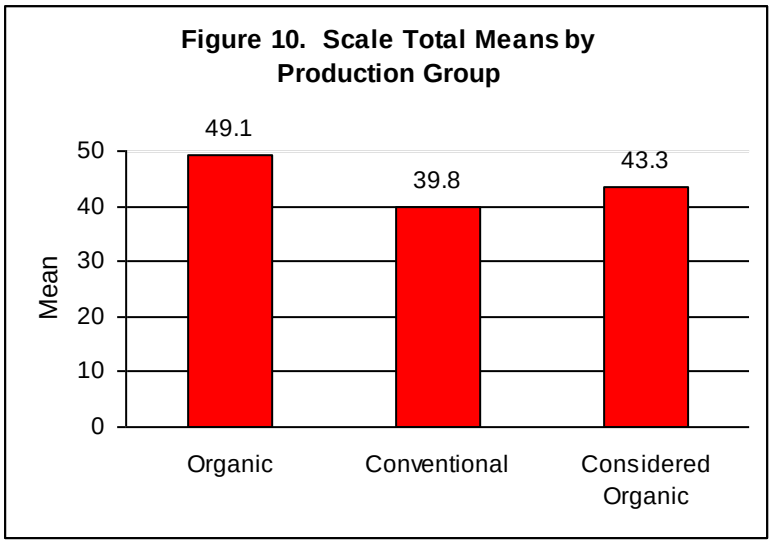
Table 51. American Agriculture is the Most Successful in the World/Not Nearly as Successful as Many Believe by Producer Group

	Percent		
	Organic	**Conventional**	**Considered Organic**
Statement 1 – strongly	10	46	30
Statement 1 – mildly	14	21	30
Undecided	10	12	13
Statement 2 – mildly	21	12	12
Statement 2 – strongly	45	10	15

Scale Total

A scale total variable was created out of the summed, recoded responses to these pairs of contrasting views regarding agriculture in the United States. The scale was designed so that conventional farming views are represented by lower values and organic farming views are represented by higher values. Appendix B contains more detailed information on scale construction.

Means were calculated for each production group (organic, conventional, considered organic) and are shown in Figure 10. Organic farmers have the highest scale total average (49.1), followed by those who have considered organic (43.3) and conventional farmers (39.8).



Analysis of variance in the difference between sample means indicates that there are statistically significant differences in these means, with an Anova value of .000 and a Welch/Brown-Forsythe value of .000. To determine which differences among the three groups were significant, least significant difference (LSD) values were calculated. This value was .000 for the comparison between organic and conventional growers, between organic growers and those who have considered organic and between conventional growers and those who have considered organic. Organic farmers have the highest scale total average, followed by those who have considered organic production and then by conventional farmers.

SUMMARY

Organic producers

Farm Characteristics

- more likely than conventional producers to work off the farm for health insurance or other benefits
- least likely to work off the farm as a primary income source
- most likely to raise poultry

Demographic Information

- highest educational levels
- younger than other producers

Attitudes and Values

- View the following reasons to change to organic production as more important than do conventional producers:
    - maintained economic sustainability of farm

    - chemical avoidance for family/farmworker health
    - land stewardship/ecological sustainability
    - chemical avoidance for environmental health
    - organic represents good farming practices
    - quality of organically grown products
    - community values, tradition, quality of life
    - provide economic support on fewer acres of land
    - ecological principles – view farm as ecological system
    - organic price premiums
    - growing consumer demand for organic
    - challenging, interesting, intellectually appealing
    - philosophical, spiritual or ethical reasons

- View the following reasons to change to organic production as more important than do those who have considered changing to organic production:
    - chemical avoidance for family/farmworker health
    - land stewardship/ecological sustainability
    - chemical avoidance for environmental health
    - organic represents good farming practices
    - community values, tradition, quality of life
    - ecological principles – view farm as ecological system
    - organic price premiums
    - philosophical, spiritual or ethical reasons

- Views about American agriculture
    - most likely to agree that meeting US food needs with fewer and fewer farmers is a negative outcome of our free market system
    - most likely to agree that high energy use makes US agriculture vulnerable and should be greatly reduced
    - more likely than conventional producers to agree that farming is first of all a way of life and second a business
    - most likely to agree that farmers should use primarily natural fertilizers and production methods
    - most likely to agree that the key to agriculture's future success lies in learning to imitate natural ecosystem and farm in harmony with nature
    - most likely to agree that most farms should include both crops and livestock
    - most likely to agree that high energy cost, soil erosion, water pollution, etc. are evidence that US agriculture is not nearly as successful as many believe it to be
    - highest scale average

Conventional producers

Farm Characteristics

- farm more acres, lease more land and own more land than organic producers

Demographic Information
- lowest educational levels

Attitudes and Values
- View the following reason to change to organic production as more important than do organic producers:
    - required by owner of land

- Views about American agriculture
    - more likely than organic producers to agree that the amount of farmland owned by an individual or corporation should not be limited
    - most likely to agree that farming is first and foremost a business like any other
    - most likely to agree that the abundance and relatively low prices of food in the US are evidence that American agriculture is the most successful in the world
    - lowest scale average

Conventional producers who have considered a change to organic

Farm Characteristics
- most likely to work off the farm for personal interest
- more likely than conventional producers to work off the farm for health insurance or other benefits
- most likely to farm part-time but not work off the farm

Demographic Information
- older than other producers

Attitudes and Values
- View the following reasons to change to organic production as more important than do conventional producers:
    - maintained economic sustainability of farm
    - land stewardship/ecological sustainability
    - chemical avoidance for environmental health
    - organic represents good farming practices
    - quality of organically grown products
    - provide economic support on fewer acres of l and
    - organic price premiums
    - growing consumer demand for organic
    - challenging, interesting, intellectually appealing
    - philosophical, spiritual or ethical reasons

- Views about American agriculture
    - more likely than conventional producers to agree that high energy use makes US agriculture vulnerable and should be greatly reduced
    - more likely than organic producers to agree that the amount of farmland owned by an individual or corporation should not be limited
    - more likely than conventional producers to agree that farming is first of all a way of life and second a business
    - more likely than conventional producers to agree that farms should include both crops and livestock
    - more likely than organic producers to agree that the abundance and relatively low prices of food in the US are evidence that American agriculture is the most successful in the world

Appendix A

Survey Instrument

North Dakota Rural Life Poll on Barriers to Transitioning to Organic Production

Barriers to Transitioning to Organic Production Systems

Q – 1 Alter reading the following definitions of various kinds of agriculture, please indicate which one of the definitions more closely describes your farm operation.

A ***conventional farming*** production system refers to a production system which employs a full range of pre- and post-plant tillage options (e.g., plow, disk, plant, cultivate), synthetic fertilizers, herbicides and pesticides.

An ***organic agriculture*** production system refers to particular farming practices that have been followed and certified by a third party inspector. Organic guidelines require that a crop rotation and soil-building practices be used; that pest control rely primarily on cultural, mechanical, and biological controls; and that pesticides are from plants, are short-lived in the environment, and are used only as a last resort. Soil amendments should come from renewable resources as much as possible and only non-refined mined products, when manure, composts, or other sources of nutrients are not available.

Based upon these definitions, I would classify my farm operation as: (*Please fill in a circle)*

O CONVENTIONAL *(go to question 14)*
O ORGANIC *(go to question 19)*
O TRANSITIONING TO ORGANIC *(go to question 19)*

Q -- 2 If you farm conventionally, have you ever considered transitioning to organic production?

O NO, NEVER HAVE CONSIDERED IT *(go to question 18)*
O YES, HAVE CONSIDERED IT *(go to question 15)*

Q – 3 If you have considered transitioning to organic farming, which of the following activities have you pursued in considering transitioning to organic production?
(Fill in all that apply)

O SOUGHT INFORMATION ABOUT IT FROM GOVERNMENT AGENCIES
O LOOKED FOR INFORMATION ABOUT IT ON THE INTERNET
O SOUGHT INFORMATION FROM OTHER ORGANIC FARMERS
O DISCUSSED IT WITH ORGANIC FARMERS
O ATTENDED ORGANIC AGRICULTURE DEMONSTRATION FIELD DAYS
O ATTENDED SEMINARS OR WORKSHOPS ON ORGANIC AGRICULTURE
O OTHER (Please list)_____

Q -- 4 If you have ever or are now considering transitioning *from conventional farming to organic farming*, what is *your greatest barrier* to realizing this transition? *(Please fill-in.)*

_____

Q -- 5 **In your experience, to what degree would any of the following circumstances serve as a *constraint or problem* specific to your transitioning to organic production*?***
(Please fill in a circle for each category.)

Not a constraint or problem				Serious constraint or problem	
1	2	3	4	5	Category
O	O	O	O	O	PERSONAL LACK OF KNOWLEDGE ABOUT ORGANIC PRACTICES
O	O	O	O	O	INFORMATION ON ORGANIC PRACTIUNAVAILABLE/ HARD TO FIND
O	O	O	O	O	UNCOOPERATIVE OR UNINFORMED EXTENSION AGENTS
O	O	O	O	O	SOCIAL PRESSURE FROM OTHER FARMERS or COMMUNITY TO FARM CONVENTIALLY
O	O	O	O	O	PRESSURE FROM LENDERS TO FARM CONVENTIONALLY
O	O	O	O	O	ACHIEVING DESIRED PRODUCTION LEVELS or YIELDS ORGANICALLY
O	O	O	O	O	SOURCING or FINDING ORGANICALLY ALLOWABLE INPUTS
O	O	O	O	O	COST OF ORGANICALLY ALLOWABLE INPUTS
O	O	O	O	O	DISTANCE or TRANSPORT OF ORGANICALLY ALLOWABLE INPUTS
O	O	O	O	O	EFFECTIVENESS OF ORGANICALLY ALLOWABLE INPUTS and METHODS
O	O	O	O	O	FINDING ORGANIC MARKETS
O	O	O	O	O	OBTAINING ACCESS TO EXISTING ORGANIC MARKETS
O	O	O	O	O	LACK OF ORGANIC MARKETING NETWORKS
O	O	O	O	O	LACK OF CONSUMER UNDERSTANDING ABOUT ORGANIC FOOD

Q -- 6 **Using a scale of 1 (not important) to 5 (*very important*) please indicate how important the following possible reasons might be for you, personally, *to choose to farm organically*?** *(Please fill in a circle for each category.)*

Not Important		Moderately Important		Very Important	
1	2	3	4	5	Reasons for farming organically
O	O	O	O	O	ORGANIC PRICE PREMIUMS--MORE MONEY FOR PRODUCT
O	O	O	O	O	GROWING CONSUMER DEMAND FOR ORGANIC--TO TAP INTO MARKET
O	O	O	O	O	TO REDUCE INPUT COSTS
O	O	O	O	O	TO MAINTAIN ECONOMIC SUSTAINABILITY OF FARM
O	O	O	O	O	QUALITY OF ORGANICALLY GROWN PRODUCTS
O	O	O	O	O	ORGANIC REPRESENTS GOOD FARMING PRACTICES--LIKE THE RESULTS
O	O	O	O	O	LAND STEWARDSHIP, ECOLOGICAL SUSTAINABILITY
O	O	O	O	O	CHEMICAL AVOIDANCE FOR ENVIRONMENTAL HEALTH
O	O	O	O	O	CHEMICAL AVOIDANCE FOR FAMILY/FARMWORKER HEALTH
O	O	O	O	O	CHANGE PRACTICES IN RESPONSE TO FARM CHEMICAL REGULATION
O	O	O	O	O	PHILOSOPHICAL, SPIRITUAL OR ETHICAL REASONS
O	O	O	O	O	ECOLOGICAL PRINCIPLES--VIEW FARM AS ECOLOGICAL SYSTEM
O	O	O	O	O	COMMUNITY VALUES, TRADITION, QUALITY OF LIFE
O	O	O	O	O	OWNER OF LAND REQUIRED IT
O	O	O	O	O	CUSTOMER OR BUYER REQUIRED IT
O	O	O	O	O	PROVIDE ECONOMIC SUPPORT ON FEWER ACRES THAN CONVENTIONAL
O	O	O	O	O	CHALLENGING, INTERESTING, INTELLECTUALLY APPEALING
O	O	O	O	O	OTHER: _____

Q – 7 Listed below are several pairs of contrasting views regarding agriculture in the United States. For each pair, *please indicate which one of the two views you most agree with* – the one in the left-hand column or the one in the right-hand column – by circling the appropriate number on the line between them.

1 = STRONGLY AGREE WITH THE VIEW IN THE LEFT-HAND COLUMN
2 = MILDLY AGREE WITH THE VIEW IN THE LEFT HAND COLUMN
3 = UNDECIDED
4 = MILDLY AGREE WITH THE VIEW IN THE RIGHT-HAND COLUMN
5 = STRONGLY AGREE WITH THE VIEW IN THE RIGHT HAND COLUMN

Please fill in a circle corresponding to one number for each pair)

	1	**2**	**3**	**4**	**5**	
Meeting U.S. food needs with fewer and fewer farmers is a positive outcome of technological progress.	1	2	3	4	5	Meeting U.S. food needs with fewer and fewer farmers is a negative outcome of our free market system.
High energy use makes U.S. agriculture vulner-able and should be greatly reduced.	1	2	3	4	5	Large inputs of energy into agriculture should be continued as long as it is profitable to do so.
The amount of farmland owned by an individual or corporation should NOT be limited, even if the ownership of land becomes much more concentrated than at present.	1	2	3	4	5	The amount of farmland owned by an individual or corporation should be limited in order to encourage land ownership by as many people as possible.
Farming is first and foremost a business like any other	1	2	3	4	5	Farming is first of all a way of life and second a business.
Farmers should use primarily natural fertilizers and production methods such as manure, crop rotations, compost and biological pest control	1	2	3	4	5	Farmers should use primarily synthetic fertilizers and pesticides in order to maintain adequate levels of production
Farmers should farm only as much land as they can personally care for.	1	2	3	4	5	Farmers should farm as much land as they profitably can
Farms should be specialized in one or at most a few crops.	1	2	3	4	5	Farms should be diversified and include a large variety of crops.
Soil and water are the sources of all life and should therefore be strictly conserved.	1	2	3	4	5	Soil and water are the basic factors of production and should be used so as to maximize production.
Farmers should purchase most of their goods and services just as other consumers do.	1	2	3	4	5	Farmers should produce as many of their own goods and services as possible.
The key to agriculture's future success lies in learning to imitate natural ecosystems and farm farm in harmony with nature.	1	2	3	4	5	The key to agriculture's future success lies in the continued development of advanced technologies that will overcome nature's limits.
Most farms should specialize in either crops or livestock	1	2	3	4	5	Most farms should include both crops and livestock
The abundance and relatively low prices of food in the U.S. are evidence that American agriculture is the most successful in the world.	1	2	3	4	5	High energy use, soil erosion, water pollution, etc. are evidence that U.S agriculture is not nearly as successful as many believe it to be.

FARM CHARACTERISTICS

Q – 8 In 2005 did you work off the farm full-time or part time? *(Fill in appropriate response.)*

O FULL TIME– (More than 20 hours a week of off–farm employment)
O PART TIME – (Less than 20 hours a week of off-farm employment)
O NO OFF-FARM WORK

Q -- 9 If you worked off-farm, what are some reasons for doing so? *(Select all that apply.)*

O I DON'T WORK OFF-FARM BUT I STILL ONLY FARM PART-TIME
O TO SUBSIDIZE FARM AND CAPITAL INVESTMENTS
O FOR HEALTH INSURANCE OR OTHER BENEFITS
O AS A PRIMARY INCOME SOURCE
O AS A SECONDARY INCOME SOURCE
O AS A PRIMARY CAREER
O FOR PERSONAL INTEREST
O OTHER

Q -- 10 How many full-time, part-time and/or seasonal paid employees worked on your farm in 2004?

(Fill-in #)		(Fill-in #)	
_____	FULL-TIME, YEAR-ROUND	_____	PART-TIME, YEAR-ROUND
_____	FULL-TIME, SEASONAL	_____	PART-TIME, SEASONAL

Q -- 11 Do you also raise livestock or poultry? (*Please fill in the appropriate circle).*

	Yes	**No**
Swine	O	O
Cattle	O	O
Dairy	O	O
Poultry	O	O

Q -- 12 In the spaces provided, please indicate the acreage you currently farm that applies to the following categories. **(***Fill-in number of acres.)*

HOW MANY ACRES DO YOU FARM? _____
HOW MANY ACRES DO YOU FARM ORGANICALLY? _____
HOW MANY ACRES DO YOU LEASE? _____
HOW MANY ACRES DO YOU OWN? _____

Q – 13 What was your farm's total gross farming income in 2004? Estimates are OK if your sales are not yet final. All survey responses, including financial figures, are strictly confidential! *(Select circle corresponding to the appropriate income category.)*

O	NO INCOME OR LOSS	O	$100,000 to $249,999
O	LESS THAN $5,000	O	$250,000 to $499,999
O	$ 5,000 TO $14,999	O	$500,000 TO $999,999
O	$15,000 TO $29,999	O	$1 MILLION TO $4.9 MILLION
O	$30,000 TO $49,999	O	$5 MILLION TO $19.9 MILLION
O	$50,000 TO $99,999	O	OVER $20 MILLION

Q -- 14 What is the total number of years you have been farming? _____

PERSONAL INFORMATION

Q -- 15 What is your highest level of formal education? *(Select one response.)*

- O NO FORMAL EDUCATION
- O SOME HIGH SCHOOL
- O COMPLETED HIGH SCHOOL (INCLUDES GED)
- O SOME COLLEGE
- O COMPLETED JUNIOR COLLEGE/TRADE SCHOOL DEGREE
- O COMPLETED BACHELOR'S DEGREE
- O SOME GRADUATE WORK (POST BACCALAUREATE)
- O GRADUATE DEGREE

Q -- 16 What was your age on your last birthday? __ __ years

Q -- 17 What was your total household income from all sources in 2005?

O	Less than $10,000	O	$ 50,000 to $74,999
O	$10,000 to $14,999	O	$ 75,000 to $ 99,999
O	$15,000 to $24,999	O	$100,000 to $149,999
O	$25,000 to $34,999	O	$150,000 to $199,999
O	$35,000 to $49,999	O	$200,000 or more

Q -- 18 What best describes your relationship to your farm? *(Select one response.)*

- O I am the owner or co-owner of this farm business
- O I am a hired manager or caretaker
- O Other

Q – 19 Your gender.

- O Female
- O Male

Q – 20 County

Q – 21 Area

Appendix B

Sample Design and Response Rates

SAMPLE DESIGN

Interviewing and Data Collection Procedures

All interviews were conducted at SSRI facilities by trained interviewers with supervision and random monitoring for technique and adherence to established procedures. Multiple attempts were made at different days and different times to determine whether the sampled phone number was a working residential number in contrast to a commercial or business line, a cell phone, data or fax line, or a non-primary household in order to be sure that hard-to-reach individuals would not be under-represented.

Computerized Assisted Telephone Interviewing (CATI)

To ease telephone interviewing, all telephone interviews were conducted with a computer assisted interview (CATI) system. The SSRI version of CATI is implemented with microcomputers, which display survey questions on interview terminals and collect telephone interview data as the interview is being conducted. For CATI telephone interviews, all coding of numeric and categorical responses is done by microcomputer software, with error checking to catch out-of-range values at the time of the interview.

The use of CATI increases both the speed of data collection and the accuracy of data collected. All CATI questionnaires are tested prior to conducting telephone interviews to ensure accurate encoding of survey responses and accurate branching and skip patterns in the questionnaire. The system prompts interviewers for a valid response to every question in the survey. For numeric questions, legitimate ranges of responses are entered into the computer so that the computer can detect out-of-range values. When these are detected during the interview, the computer warns the interviewer that the entered value is out of range an prompts the interviewer that the entered value is out of range and prompts the interviewer for a legitimate response.

Data validation at the data management step consists of accounting for all cases in the survey, and ensuring that data records exist for every completed interview in the sample. Data records will be passed through a SPSS program to ensure that all data fields are readable, and that all fields are reading the format specified for that variable. A separate data-cleaning step will also be reviewed and spell-checked for readability. The final validation step consists of checking the consistency of respondents' answers to objective and verifiable survey questions. All survey data will be backed up and stored for immediate access and corrections, should data corrections be needed.

RESPONSE RATES

Overall, 840 phone numbers were classified as working numbers with residents eligible for interview and 491 of these were successfully interviewed.[2] Table 52 presents the disposition of the sampled telephone numbers.

Table 52. Sample Dispositions

	Overall	Organic	Conventional
Completed interviews	491	113	378
Refusals	195	77	118
Terminated interviews	28	12	16
Subtotal	714	202	512
Contacted, not interviewed	126	65	61
Total	840	267	573

The overall response rate, based on the 714 residents available for interview, was 69% (*Upper Bound*). The response rate, based on the 840 numbers available for this study, was 58% (*CASRO*).

The response rate for organic growers, based on the 202 farmers available for interview, was 56% (*Upper Bound*). The response rate, based on the 267 numbers available for this study, was 42% (*CASRO*). The response rate for conventional growers, based on the 512 farmers available for interview, was 74% (*Upper Bound*). The response rate, based on the 573 numbers available for this study, was 66% (*CASRO*).

Survey professionals in general have found that response rates for telephone surveys have declined in recent years. The consequence has been that response rates for telephone surveys are now calculated in several different ways although all of these approaches involve dividing the number of respondents by the number of contacts believed to be eligible. Differences in response rates result from different ways of calculating the denominator, i.e. the number of individuals eligible to respond. The most liberal approach is called the *Upper Bound* method and takes into account only those individuals who refuse to participate or who terminate an interview. This approach is used by the federal government because of controversies about the eligibility of numbers that could not be reached. The most conservative approach is the method adopted by the Council of American Survey Research Organizations (CASRO). The *CASRO* method uses the known status of portions of the sample that are contacted to impute characteristics of portions of the sample that were not reached. Over-quota eligibles are assumed to qualify as *good numbers*.

[2] This sample size will yield a margin of error of +/-5.05%, with a confidence level of 95%. This means that one can be 95 percent confident that the mean response for any question in the survey will not vary more than 5.0% in either direction from the actual mean for that response if all farmers in the sample population were surveyed.

VIEWS ABOUT AMERICAN AGRICULTURE SCALE

SCALE TOTAL VARIABLE

To create the scale total variable, the responses to the series of contrasting views regarding agriculture in the United States (question 7) were recoded to reflect conventional views with lower category values and organic views with higher category values. Specifically, the responses for statement set 1, 3, 4, 7, 9, 11 and 12 remained the same (5=5, 4=4, 3=3, 2=2, 1=1). The responses for statement set 2, 5, 6, 8 and 10 were recoded as follows: 1=5, 2=4, 3=3, 4=2. 5=1. Missing data was replaced by the mean of the responses for that set of views, either the mean of the views of conventional farmers or the mean of the views of organic farmers. These individual scores were summed as a "scale total" variable.

The lowest scale value possible was 12; the highest, 60, a range of 48. The actual values ranged from 20 to 60. Organic producer values ranged from 30 to 60 with a mean of 49.12. Scale values for conventional farmers ranged from 20 to 59, with a mean of 39.77. Scale values for conventional farmers considering organic production ranged from 29 to 59, with a mean of 43.32.