

Understanding the Nature and Extent of Farm and Ranch Diversification in North America*

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ABSTRACT Pressure to adopt enhanced production technologies, changing government support policies, increasing and more diverse competition, and changing markets have posed economic challenges to North American farmers over the past two decades. As a response, farmers are adjusting their production model by incorporating agricultural related enterprises. Although there is evidence that farm diversification is occurring throughout North America, there is a dearth of scientific information regarding the types of enterprises being developed and used in this context. This study aims to fill this void by exploring the extent of farm diversification by identifying and describing eight types of enterprises that farmers and ranchers are using. It was found that levels of diversification are often dependent on operating and management attributes and owner characteristics, such as the number of family members working on the farm and the number of days that the farmer's spouse works off the farm.

North American Agriculture has undergone and continues to undergo major restructuring. Technological developments, changing government support policies (e.g., subsidies on selected crops), increasing and more diverse competition, and changing markets and customer expectations are all pressuring farmers to intensify and specialize agriculture production. Simultaneously, during the last twenty years, farmers have suffered from a reduction in the *prices received index*

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relative to the *prices paid index*¹, meaning that some have experienced a significant reduction in farm and ranch revenues. For example, from 1995 to 2000, the *agricultural prices received index* in the United States decreased from 102 to 96, while the *prices paid index* increased from 109 to 120, impacting farmers' profits (USDA: NASS 2004). Similarly, operating expenses for every dollar received in Canadian gross farm receipts increased from 83 cents to 87 cents in the same period (Statistics Canada 2002a).

The constant pressure to adopt enhanced production technologies in addition to the erosion of farm net income creates conditions favoring increased farm size. As a case in point, the United States has lost more than eighty-six thousand farms between 1997 and 2002, while the average farm size has increased from 431 to 441 acres (USDA: NASS 2005). Statistics Canada (2002a) reports similar trends between the last two census (1996 and 2001), where the the number of farms declined by at least 10 percent and the average farm size increased by 10 percent. This speaks to the increasing control of large corporate agricultural firms, posing a challenge to non-corporate farms and ranches, especially those that are either small or medium sized.

Farmers—especially family owned operations—are making structural adjustments and finding new paths of enterprise development to cope with these challenges (Barlas et al. 2001). Farm/ranch diversification is one type of farm adjustment strategies that is being adopted (Barlas et al. 2001; Ilbery 1991; McNally 2001). A variety of evidence indicates that farms and ranches throughout North America are adding new agricultural related enterprises and diversifying existing enterprises as a means of achieving both financial and non-financial objectives.

In addition, various agricultural policies are encouraging diversification as a way to strengthening rural communities, cultural diversity, and a traditional way of life. For example, the U.S. Small Farms Policy (September 1999) mandates the development and support of research, regulations and outreach programs and initiatives that focus on the special needs of small farms for developing alternative enterprises, value added products, and collaborative marketing efforts. Similarly the ruling US Farm Bill (Farm Security and Rural Investment Act of 2002, Public Law 107-171, May 2002) mandates high-priority research on Agritourism and agricultural marketing and creates a series of economic incentives (e.g., payments, grants, loans) to encourage

¹ The *prices received index* is the measure of prices that ranchers and growers receive for their products while the *prices paid index* is the measure of the costs of the inputs necessary to produce/grow commercial commodities (USDA: NASS n.d.).

various types of farm and ranch diversified enterprises. These incentives encourage the development of conservation easements, the production of healthier products, the restoration of historic barns, and marketing opportunities for the value-added agricultural product. Similarly, Canada has implemented the Agricultural Policy Framework to become a leader in food safety and push for innovation and environmentally responsible agricultural production through five strategies. One of these strategies, *Renewal*, focuses on assisting farmers to enhance their profitability and networks to develop new economic opportunities, including value-added enterprises.

This study seeks to better understand farm diversification in North America, as recent studies in this area have focused on Europe or Oceania. It is not surprising to find that much of the literature in this area encourages a more comprehensive understanding of farm diversification (e.g., Anosike and Coughenour 1990; Ilbery et al. 1998; Ilbery 1991), leading this study to concentrate on two areas. First, it describes, categorizes, and measures the extent of diversification enterprises that North American farmers and ranchers are incorporating into their firms. Second, it identifies internal farm factors, including characteristics of the farm and the farmer/farm household that influence greater diversification.

Review of Literature

Existing literature on the topic of farm/ranch diversification has been grouped into two categories. The first group relates to the definition and classification of diversification in an attempt to understand the scope of this farm adjustment strategy. The second group focuses on the identification of internal farm factors (i.e., farm and farmer attributes) that are associated and influence the adoption of diversification on farms and ranches. Both groups of research are discussed below.

Farm and Ranch Diversification—Concept and Typology

Despite the recent academic attention received, farm diversification is not yet precisely defined (Daskalopoulou and Petrou 2002). Common elements in many definitions include the reallocation and recombination of farm resources (i.e., land, labor, or capital) into new unconventional crops/animals or into non-agricultural enterprises developed on the farm or ranch (Ilbery 1991). Much of the uncertainty regarding the scope of diversification is related to farm labor and capital, and whether these are defined as resources of the farm business

or the farm household. To clarify, this study adopted an [on] farm-centered approach, excluding off-farm employment from the definition of diversification (in the same sense as Evans and Ilbery [1992]) and off-farm investments. This study understands farm diversification as any activity developed on a working farm or ranch by any member of the farm household that generates additional income or adds to the farm/ranch value (Mahoney and Barbieri 2004). In this sense, farm diversification is an expression of the *multi-faceted* nature of rural development since it incorporates several different practices towards the conservation of new environmental values, quality enhancement of agricultural products, region-specific production, cost-savings, and direct marketing (Ploeg et al. 2000).

A number of different ways of classifying farm diversification are described in the literature, of which six have been identified. The first involves the introduction of non-traditional crops/livestock or the adoption of unusual agricultural practices (e.g., organic agriculture, free-range pastures) into the farm (Barlas et al. 2001; Damianos and Skuras 1996). A second, and frequently documented diversification, includes the integration of recreation, tourism, and hospitality enterprises offered on farms and ranches. For example, Bowler et al. (1996) concluded that tourism was the most predominant diversification enterprise (31%) offered by farmers in England, and McGehee and Kim (2004) identified 987 farms in Virginia that were offering at least one type of tourism or lodging service. Barbieri and Mshenga (2008) analyzed 449 agritourism farms in the United States to investigate the role of firm and owner characteristics on their business performance.

Value-added is a third type of diversification commonly discussed and widely promoted, although not consistently defined. While some studies include the direct marketing of agriculture products within this diversification category (Ilbery 1991; McNally 2001), others recognize their distinct nature (Mahoney and Barbieri 2003). In this study, value-added includes the processing (e.g., yarns, wines) as well as the packaging (e.g., gift baskets) of the agriculture product. New marketing and distribution—a fourth diversification type—encompasses a variety of direct sale and merchandising activities, and the use of a mix of communication and promotional media that make farm products and services more readily accessible to different markets (e.g., direct mail promotions and on-farm retailing). Ilbery (1991) reported that direct marketing was the most frequent diversification related activities in farms located in an urban fringe (West Midlands) of the United Kingdom.

Several authors typify the lease or rental of the farm and its resources (e.g., land, buildings, equipment) as the fifth type of diversification (Ilbery 1991; McNally 2001). Also known as passive diversification, this includes renting a farm on an hourly basis to host especial events (e.g., private parties, weddings) or the lease of ranches for hunting. McNally (2001) reported that 30 percent of the farms studied in England were renting farm buildings. The last type depicted in the literature is related to contracting and services offered to others (Bowler et al. 1996; Mahoney and Barbieri 2003; McNally 2001). Examples of contracting include the boarding and training services of horses, veterinary services for farm animals, and the harvesting and processing services to other farmers. Contracting appears very frequently in England and Wales according Bowler et al. (1996) and McNally (2001).

While these six strategies are readily available in the literature, there was evidence suggesting that it might not cover the range of practices available. During early stages of this project, popular literature and advertising and marketing information pointed to the fact that North American farmers and ranchers were also developing enterprises related to cultural and historic preservation and to education, increasing the number of strategies to eight.

Internal Farm Factors Associated with Farm and Ranch Diversification

Various farm and farmer attributes (i.e., internal farm factors) have been associated with the propensity to diversify. Most studies conclude that larger farms are more likely to diversify because of their access to financial and non-financial resources, such as capital for investments, natural resources and infrastructure for re-use (Anosike and Coughenour 1990; Ilbery 1991; McNally 2001). However, Damianos and Skuras (1996) found that total arable land available negatively influences farmers' decision to adopt an alternative farm enterprise, concluding that the probability of adopting an alternative enterprise on farm falls by 28.6 percent as the mean size of arable land increases by 49.4 acres (20 hectares in original). This shows that the size of the farm might not be as important as its profitability, both in the sense of the willingness to diversify, but also the ability to do so. The maintenance of a large farm (in size) may hinder efforts to diversify activities.

An association between diversification and the mode of agriculture production has also been found. Obviously, diversification is more likely observed on less specialized farms (Ilbery 1991; McNally 2001). Similarly, Damianos and Skuras (1996) found that farms that depend extensively on hired labor are more likely to diversify. Ventura and

Milone (2000) report that diversification more likely occurs on farms with seasonal production because labor/time is available in the off-season to develop and manage diversified enterprises. Also, there is greater need to generate non-agriculture related revenues during the off-season. Regarding farm structure, Anosike and Coughenour (1990) found that those who rent land are less likely to diversify, which may not be too surprising given that the leasing of land will cut down on available space.

Studies regarding the relationship between the characteristics of the farmer/farm household and diversification show that diversified farmers are more likely to be people with considerable farming experience and traditional family farming backgrounds (Ilbery 1991), fitting in with the idea that those with the strongest traditions may be most likely to seek ways to maintain their livelihoods. Furthermore, a relatively large proportion of diversifiers describe their farms as being their only occupation (Carter 2001). Overall, the farmer's age and education do not appear to be correlated to the development of diversified enterprises (Anosike and Coughenour 1990; Damianos and Skuras 1996; McNally 2001).

Farm household structure seems to have an effect on diversification. Some studies conclude that the number of family members (excluding spouses) working on the farm has a positive relationship to diversification, except passive diversification (i.e., rental and leasing), suggesting that diversification is a strategy that either utilizes or provides employment for family members, and may tap into their own knowledge resources and human capital (Damianos and Skuras 1996; McNally 2001). Damianos and Skuras (1996) found a higher number of children living on diversified farms, suggesting that diversification is a strategy that either utilizes or provides employment for family members. The authors concluded that the probability of adopting any diversification enterprise was about 10 percent higher for each additional child living on the farm. Family life cycle also appears to be associated with diversification. On-farm enterprise diversification is more likely to be adopted when children are old enough to become an extra source of farm labor. As a case in point, Ilbery et al. (1998) found that alternative enterprises do not tend to be adopted by couples with children younger than six years of age.

Gender and the role of the farmer's wife as it relates to diversification have received considerable attention in the literature, consistent with the role that female spouses and significant others play in the establishment and operation of diversified enterprises (Ilbery et al. 1992). For example, McNally (2001) showed that the probability of

observing tourism activities increased by twelve percent (12%) when the spouse was present, also finding positive associations with retailing and recreation.

Methodology

Hypothesis

Based on existing literature and information gleaned from other sources, this study examines eight types of diversification that could be incorporated within a farm/ranch operation. Earlier findings regarding the association of several internal farm attributes with the propensity to diversify were used to hypothesize that farms and ranches having different levels of diversification differ on their farmer and farm characteristics. The number of diversification enterprises developed on the farm was used as a basis for this segmentation under the assumption that farms choose different business models (e.g., very or little diversified) depending on their available resources (land size, entrepreneurial experience, or human capital). Hence, it was hypothesized that farmer's age, gender, education, farming experience, primary occupation, and off-farm work were different between lightly, moderately, and highly diversified farms (defined below). Furthermore, it was hypothesized that farm size (measured in terms of farm acreage, gross sales and number of full time employees), environmental sensitivity (measured in terms of number of stewardship and environmental friendly practices employed), sales channels, and firm management sophistication (in terms of availability of written business and marketing plans) also vary among the three farm classes.

Although studies have documented an association of various farm/farmer attributes with diversification, little is known regarding the influence on the extent of diversification. Ilbery (1991) is the exception to this, finding that the number of diversified activities tends to increase with farm size. However, his study was carried out in an urban fringe setting of England. We hypothesized that besides farm size (in terms of acres owned), other internal farm factors were stimulating greater diversification. Independent variables tested as positive influencers on the extent of diversification were farm specialization (in terms of number of crops/livestock grown), education and farming experience of the operator, and number of family members working on the farm. The number of off-farm work days of the farmer was hypothesized to have a negative influence on greater diversification. Although education of the farmer has been consistently found not to be associated with diversification, the rationality to include it in this study

is that higher levels of education provide the farmer with more resources to develop enterprises not directly related to farming practices, such as the education of tourists and value added processes.

Sampling Frame

The data for this study were collected from North American farms and ranches. The initial sample frame for the survey was the member list of the North American Farmers' Direct Market Association (NAFDMA) including farms, farmers markets and extension agents. This list served as a purposive or judgmental sampling, defined as a sample that researchers draw because it best serves the purposes of the study (Monette, Sullivan, and DeJong 1994). Since the population of diversified farms/ranches in North America is not known or available in any listing or directory, probability sampling (i.e., random selection) could not be accomplished. Similarly, Getz and Carlsen (2000) reported using a non-random sample to study family rural businesses in tourism and hospitality in Western Australia due to the lack of adequate databases or sampling frames.

This sample frame prevents the study from being representative of all North American farms and ranching, though using the NAFDMA list provided three advantages. First, the list is not restricted to a specific agricultural sector. For example, it includes members growing crops, fruits, nursery and greenhouse, Christmas trees, and livestock, as well as those involved in value-added processes, agritourism, on-farm retail, farmers' markets, consumer-supported agriculture, and direct delivery among others. Second, the list includes, farmers' market managers, extension agents, industry suppliers, and government officials who were potential sources for referrals. Third, this association includes members from the United States, Canada, and Mexico. In short, while the list is not representative and is highly skewed toward those ranches and farms that are diversified, it provides an inroad into the types of operations we were interested in studying. It should be noted that there were numerous respondents who had not diversified, so the sampling did capture some farms and ranches that could be used to compare to those who fit the description of being diversified.

Survey Instrument and Data Collection

Farmers were surveyed using a web-based instrument. An on-line method was employed in this study due to its appropriateness to collect descriptive information in such a large geographic area in a short period of time. Also this method facilitates referrals that were used to

supplement the initial wave of surveys for this project. The on-line instrument included eight different topic/subject sections and collected information about the characteristics of the farm or ranch and the operator; the products, services and enterprises that generate farm/ranch revenues; farm/ranch sales and different revenues, including the total gross value of sales, the percent of revenues coming from different product categories and enterprises; and the assessment of the profitability of the diversified operations. It also gathered information regarding the management, financial, and marketing practices, including whether or not they had on-farm markets and/or participated in farmers markets.

The Survey was launched in July, 2005. An e-mail announcement was sent to 853 NAFDMA members, including 423 farmers. These invitees were encouraged to forward the e-mail to other diversified farms and to recruit them to participate. One hundred fifty-six emails were determined to be undeliverable, mostly because of non-existent or suspended accounts, reducing the number of valid e-mail addresses to 697. NAFDMA offered an economic incentive to encourage participation². One mail postcard and four reminder e-mails were sent to non-respondents. In addition, respondents who submitted partially completed surveys were sent up to three e-mails reminding them of survey sections still needing to be completed. The survey was closed in September, 2005 after having been opened for forty-two days.

The survey produced 1,241 completed answers. One hundred six cases were excluded because either the respondent quit after registering for the survey or because they were not a farm or ranch (e.g., government agents reviewing the survey). The analysis included 1,135 diversified farms and ranches; 192 from the original NAFDMA list and 943 resulted from the snowball sampling technique. Forty-five percent (45.4%) of the farms and ranches originally invited completed the survey. Over three-quarters of the respondents (76.6%) were not NAFDMA members, suggesting that the snowball sampling technique employed was able to obtain respondents from outside this association, increasing the external validity for this study. The majority of the diversified farms/ranches that responded to the survey were located throughout the United States (77.5%), followed by Canada (22.4%) and Mexico (0.1%)³. Respondents from the United States represent the

² The economic incentive was the chance to win the choice either to attend their 2005 Convention (\$1,900+ value) or \$1,000 in cash among the first 777 completed surveys and three annual memberships.

³ It was decided to include the sole Mexican case since several descriptive runs showed that it was not an outlier.

four agricultural regions: Northeast (21.5%); Midwest (17.5%); South (28.2%); and West (32.8%).

Analysis

The analysis for this study was organized in three stages. First, the characteristics of the diversified farms and operators, as well as the types and extent of their production enterprises, were examined. Development of typologies is a crucial element of rural sociology (Whatmore et al. 1987) especially to identify differences across groups. Classifications or typologies can be developed using an *a-priori* method based on pre-known variables (e.g., demographics) or *a-posteriori* based on the data (Kim et al. 2007).

This study used an *a-posteriori* method to classify farms/ranches into three levels of diversification—lightly, moderately, and highly diversified—based on the distribution of the number of diversification enterprises developed on the farm. Twenty (19.5%; $n = 221$) percent were *lightly* diversified farms and ranches, meaning they were engaged in one or two types of diversification; about half (47.4%; $n = 538$) were *moderately* diversified (involved in three or four types of diversification enterprises); and a third (33.1%; $n = 376$) were engaged in five or more enterprise categories (*highly* diversified farms and ranches). It is pertinent to state that this segmentation does not infer any association between the extent of diversification and their economic significance to the farm or any indicator of performance. This segmentation will be used in the second research stage where chi-square and ANOVA tests are used to identify farm and farmer differences among respondents with different levels of diversification.

Finally, a multiple linear regression was performed to analyze whether some farm and farm household characteristics were associated with different levels of diversification. Independent variables included in this analysis were farm specialization (in terms of number of crops/livestock grown), level of education and farming experience of the operator, number of family members working on the farm, and number of off-farm work days of the farmer's spouse. The dependent variable—extent of diversification—was measured by the number of diversification types that the farm/ranch was involved with ranging from 1 to 8. Tests performed revealed no collinearity among the independent variables used in the model.

It is important to recognize that relationships found in the second and third research stages of this study do not imply cause or effect. Farmers and ranchers who diversify may have resources, inherent

Table 1. Characteristics of the Diversified Farms and Ranches that Responded to the Survey

Farm/Ranch Characteristics	Percent of Respondents
Farm Acreage ^a (n = 1096)	
Less than 10 acres	16.7
10–49 acres	27.1
50–99 acres	15.1
100–249 acres	19.8
250–499 acres	10.2
500 acres or more	11.1
Mean (in acres)	304.3
Median (in acres)	64.5
Total Gross Value of Sales ^b (n = 1061)	
Less than \$10,000	28.3
\$10,000–\$49,999	23.6
\$50,000–\$99,999	11.9
\$100,000–\$249,999	13.6
\$250,000 or more	22.6
Number of Full-Time Year Round Employees (n = 1026)	
No employees	46.7
1–2 employees	29.9
3–5 employees	14.3
6–10 employees	4.7
11 or more employees	4.4
Mean (in number of employees)	2.7
Median (in number of employees)	1.0

^a Farm acreage includes the total acres owned plus the acres rented from others minus the acres rented to others.

^b This includes all 2004 gross farm/ranch sales derived from all existing diversified enterprises reported by participants.

characteristics, and tendencies that would make them more successful whether or not they were diversified.

Results

Participating farmers and ranchers owned an average of 304 acres (median = 64.5) (Table 1). Almost half (48.1%) reported a total gross value of sales of at least \$50,000 in 2004 and over a third (36.2%) of at least \$100,000. Over half (53.3%) had at least one full-time, year-round employee (mean = 2.7, median = 1).

Diversified farmers preponderantly are young, highly-educated, female and have strong involvement in agriculture. About a quarter (23.6%) of the respondents were younger than 45 years old and only 11.4 percent are 65 years old or older, which is younger than the national average (Table 2). Only 12 percent of the U.S. respondents are over 64, compared to 25 percent of all American farmers (USDA: NASS 2005). Similarly, less than a tenth (8.2%) of the diversified Canadian

Table 2. Characteristics of the Operators of Diversified Farms and Ranches

Farmer Characteristics	Percent of Respondents
Age (n = 998)	
Less than 35 years	5.8
35–44 years	17.8
45–54 years	36.3
55–64 years	28.7
65 years or more	11.4
Gender (n = 969)	
Male	67.2
Female	32.8
Level of Education (n = 990)	
At least some school	2.4
Completed high school	11.5
Attended college	20.1
Completed college	37.6
Attended graduate school	6.0
Completed graduate school	22.4
Number of Generations in Farming (n = 1098)	
First generation of farmers	55.7
More than one generation in farming	44.3
Farm will be Passed to Next Generation (n = 1090)	
Expecting to pass to next generation	65.1
Not expecting to pass to next generation	34.9
Primary Occupation (n = 999)	
Farming/ranching	67.7
Non farming/ranching	32.3
Percentage of Operators that Work Off-Farm (n = 997)	
Worked at least one day off-farm	44.6
Did not work off-farm	55.4
Employment Status of Farmer's Spouse (n = 903)	
Non-working spouses	7.9
Working spouses	92.1
Working only on-farm	(44.2) ^a
Working only off-farm	(10.2)
Working on and off-farm	(45.6)

^a This only includes the farmers' working spouses (92.1%).

farmers and ranchers who participated in the survey were 55 years old or older compared to over a third (35.9%) of Canadian farmers in the same age group (Statistics Canada 2002b). Two-thirds of the respondents (66.0%) had at least one college degree, and the majority (86.1%) had at least some college education.

Results confirm previous studies concerning the active role of women in farm diversification (Bock 2004; Ilbery et al. 1992; McNally 2001). Almost a third (32.8%) of the diversified farms and ranches had female principal operators. Moreover, the percentage of female principal operators of diversified farms was higher than farms overall. About a

third of the principal operators of American (33.2%) and Canadian (31.3%) diversified farms and ranches are women compared to 11.2 percent and 26.3 percent of all farms in the United States and Canada (USDA: NASS 2005; Statistics Canada 2002b).

We also found a strong connection and involvement of the diversified farmers' families in agriculture in terms of number of generations in farming, main occupation, and exclusive on-farm employment. Almost half of participants (44.3%) were second or more generation farmers and almost a third (65.1%) were expecting to pass on their operations to the next generation. The majority (67.7%) of participants reported that farming or ranching was their primary occupation and over half (55.4%) worked exclusively on-farm in 2004. Furthermore, only 10.2 percent of the farmers' spouses worked exclusively off-farm in 2004.

Farm/Ranch Diversification Typology

This study classified the diversification strategies on North American farmers in the following ways: 1) Non traditional crops, livestock, and practices; 2) New marketing and distribution; 3) Recreation, tourism, and hospitality; 4) Historic preservation and adaptive re-use; 5) Leases, easements, and time-shares; 6) Contracts and services; 7) Expertise, consulting, and education; and 8) Value added. These results confirm the typology of farm diversification that Mahoney and Barbieri (2003) previously proposed based on a comprehensive review of the popular literature, informal interviews with more than one hundred diversified farmers and ranchers, and a review of web pages, advertisements and brochures of more than 1500 diversified farms and ranches throughout the United States and Canada. Figure 1 illustrates the farm/ranch diversification typology that resulted from this study.

Almost three quarters (71.5%) of these farmers and ranchers generate revenues through *Non-Traditional Crops, Livestock, and Practices*. This was somewhat expected since the combination of non-traditional crops or animals with alternative farming practices allows the development of an entirely new product-line to meet emerging markets concerned about food health and the environment. A large proportion of these farmers were engaged in organic or natural farming (48.1%) and no-additive farming (39.9%). This strategy was also the most closely aligned to "normal" farming practices, so it was not surprising that this was a popular way to diversify.

As expected, all the respondents were involved with at least one type of *New Marketing and Distribution* practice. Although this includes creative or niche wholesaling, most were engaged in various types of

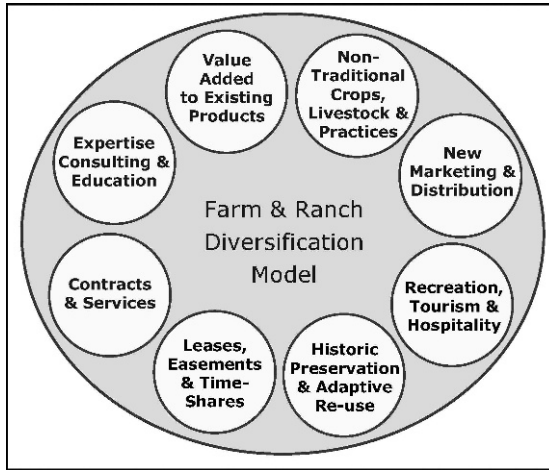


Figure 1. Farm and Ranch Diversification Typology Source: Mahoney et al. (2003)

direct marketing. These findings were expected because high quality and specialized products, including recreation and tourism experiences, cannot effectively be wholesale marketed or distributed. In addition, given the initial sampling frame, the majority of participants reported having an on-farm market and stores, including gift shops (53.0%)⁴; almost half of the diversified farms reported having ads in specialized directories (47.8%) and were using the Internet for marketing (46.8%). Half (50.9%) reported having diversified through *Recreation, Tourism, and Hospitality* (Type 3). The majority involved in Agritourism were offering farm/ranch tours (81%), outdoor activities (58.7%) or special events (56.4%), such as weddings and festivals.

Historic Preservation and Adaptive Re-use is a type of diversification identified as occurring in North America to add value, reduce costs, or generate revenues. Almost half (47.8%) of the farmers surveyed have preserved, restored and/or adaptively re-used historic buildings, equipment, artifacts, and other heritage and cultural resources on their farms. This type of diversification includes, for example, the restoration of old barns and conversion into dance or events theaters, the display of family and community heritage, the use of antique tractors for hayrides, and adaptation of historic buildings for lodging. While we do not have data to support the idea that this is a

⁴ To check for bias produced by the sample frame, this statistic was re-run excluding NAFDMA members. The availability of on-farm markets was even higher (53.9%) when members of NAFDMA were excluded from the analysis.

diversification strategy that many farmers would enjoy, we do see it as more than just an economic necessity.

A smaller proportion (11.5%) of respondents was generating revenues through *Leases, Easements, and Time-shares*. The number of respondents engaged in *Contracting and Services* was also smaller than other strategies (7.9%). However, it is pertinent to report that data showed a wide range of sophisticated and innovative services that these diversified farmers were offering, including holistic health counseling services, plant breeding services, composting, management and maintenance of orchards and gardens, and customized harvesting or processing.

About a third (30.2%) of the farmers and ranchers were generating revenues through *Expertise, Consulting, and Education*. Often, but not always, the consulting and education were directly related to other diversification enterprises including non-traditional crops and livestock and value-added processing. Common products offered within this diversification category include educational tours (88.7%) and classes, workshops, and seminars (41.5%). About two thirds (64.8%) of farmers and ranchers who were involved in *Value-added*, including the processing of products such as food and beverages, arts and crafts, and cosmetics and health products and their packaging, such as the delivery of gift boxes of farm products. The processing of jams, jellies, and preserves (34.2%), and bread and other baked products (31.2%) were the most frequent products in this type of diversification.

Table 3 displays the percent of respondents that are engaged in the eight diversification categories as well as the percentage of occurrence of the most frequent product/service reported in each category.

Attributes Associated with Different Extents of Farm/ Ranch Diversification

Simultaneous development of different diversification enterprises already reported in Europe (Ploeg et.al. 2000) appears also applicable to North America. On average, respondents had developed 3.8 diversification categories on their farms/ranches (median = 4.0). A relative small proportion of respondents were engaged in one (5.1%) or two (14.4%) diversification categories; more than half were engaged in four or more diversification categories (56.2%); and more than three quarters (80.4%) were involved in three or more categories.

Analysis to identify whether differences occur in farm characteristics among the *extent of diversification* segments—lightly, moderately, and highly—showed that farm size, in terms of gross sales and number of

Table 3. The Number of Different Enterprises that Farmers and Ranchers are Engaged in across the Eight Categories of Diversification and the Most Commonly Engaged in Enterprises within the Eight Categories

Diversification Categories and Most Frequent Products/Services (n = 1135)	Percent of Farms/Ranches		
	Diversification Category ^a	Within Category Products/Services ^b	Overall Products/Services ^c
Non-Traditional Crops, Livestock & Practices (n = 812)	71.5		
Organic/natural growing/raising		67.2	48.1
No additives farming		55.8	39.9
Biological control		36.2	25.9
New Marketing and Distribution (n = 969)	100.0		
On-farm/ranch markets		62.0	53.0
Listings in specialized directories		56.0	47.8
Webpage		54.8	46.8
Recreation, Tourism and Hospitality (n = 557)	50.9		
Tours		81.0	39.8
Outdoor activities		58.7	28.8
Special Events		56.4	27.7
Historic Preservation and Adaptive Re-use (n = 498)	47.8		
Preservation of buildings		68.9	30.2
Preservation of equipment		59.6	26.2
Preservation of artifacts		16.5	7.2
Leases, Easements and Timeshares (n = 118)	11.5		
Leasing of land		61.9	6.4
Conservation easements		24.6	2.6
Leasing of buildings		19.5	2.0
Contracts and Services (n = 90)	7.9	n/a ^d	n/a ^d
Education, Expertise and Consulting (n = 328)	30.2		
Educational tours		88.7	25.7
Classes, workshops and seminars		41.5	12.0
Apprenticeships		10.1	2.9
Value-Added to Existing Products (n = 669)	64.8		
Processing of jams, jellies and preserves		34.2	20.2
Bread and other baked goods		31.2	18.4
Woodlot related products		20.9	12.3

^a This is the percent of responding farmers engaged in different diversification categories.

^b The percentage of farms/ranches engaged in this category of diversification that offer these enterprises. For example, 34.2% of the farms and ranches engaged in Value-Added to Existing Products Diversification are processing jams, jellies and preserves.

^c The percentage of all farms/ranches that responded to the survey that are engaged in this enterprise. For example, 20.2% of all survey respondents are processing jams, jellies and preserves.

^d No specific product-lines within this diversified enterprise were identified.

employees, is related to different levels of farm diversification. As expected, on average, highly diversified farms and ranches have significantly higher incomes ($\chi^2 = 73.5, p < .001$) and employ more full time year round employees ($\chi^2 = 27.0, p = .001$) as shown in Table 4. However, tests did not reveal any statistically significant relationship between diversification and farm size in terms of acreage.

Farms with different diversification extent also differ significantly regarding their management sophistication, stewardship efforts, and marketing strategies. More diversified farms are more likely to have a business plan ($\chi^2 = 23.6, p < .001$) or a marketing plan ($\chi^2 = 15.5, p < .001$)⁵, suggesting greater management sophistication. The more diversified a farm or ranch, the more likely they were to be engaged in various types of environmental stewardship including soil and water conservation, protection or propagation of native plants, and improvement of wildlife and fisheries habitats ($F = 71.2, p < .001$). Tukey Post-hoc tests show significant differences across the three *extent of diversification* segments regarding their involvement in thirteen types of stewardship and environmentally friendly agriculture practices. Highly diversified farms were engaged in an average of six environmentally friendly practices (6.5), while moderately and lightly diversified farms employ on average five (5.6) and four (3.8) practices respectively. The percentage of farm/ranch wholesale and direct market sales was significantly associated with the extent of diversification ($F = 20.5, p < .001$), with less diversified farms having a greater percentage of wholesale business than moderately and highly diversified farms ($p < .001$). This result was expected because, as previously mentioned, one of the purposes of farm diversification is the broadening of farms' markets. The more diversified a farm the more likely it is to sell products to a broader range of specialized markets (e.g., agritourists, organic consumers), which would require more creative marketing methods and media usage. More diversified farmers were also more likely to be engaged in more types of marketing because Agritourism and others services require a different approach than agricultural products. Tapping into these various markets makes it less likely that highly diversified farmers will have much left over for wholesale.

Farmers' attributes, such as age and main occupation, appear to be associated with the extent to which they diversified their sources of

⁵ Comparisons performed between groups show, however, that there are no significant differences in the number of employees and the availability of written marketing plans between the lightly and the moderately diversified segments.

Table 4. A Comparison of Operating Characteristics of Light, Moderately, and Highly Diversified Farmers and Ranchers

	Lightly Diversified (19.5%)	Moderately Diversified (47.4%)	Highly Diversified (33.1%)	Sig.
Total Gross Value of Sales^a (n = 1061)				
Less than \$25,000	55.9%	46.4%	26.9%	$\chi^2 = 73.5, p < .001$
\$25,000–\$99,999	19.9%	22.3%	23.7%	
\$100,000–\$499,999	11.8%	23.1%	27.9%	
\$500,000 or more	12.4%	8.2%	21.5%	
Number of Full Time Year Round Employees (n = 1026)				
No employees	50.9%	50.0%	39.8%	$\chi^2 = 27.0, p = .001^*$
1–2 employees	30.2%	30.4%	29.2%	
3–5 employees	11.2%	13.8%	16.6%	
6–10 employees	3.6%	3.6%	6.5%	
11 or more employees	4.1%	2.2%	7.9%	
Firm Management Sophistication (n = 1027)				
Availability of a written business plan	24.0%	32.3%	44.2%	$\chi^2 = 23.6, p < .001$
Availability of a written marketing plan	39.4%	46.0%	56.4%	
Environment-Friendly and Stewardship Practices Index (n = 1135)^b				
Index (mean)	3.8	5.6	6.5	$F = 71.1, p < .001$
Sales Channels (n = 983)^c				
Percent of wholesale sales (mean)	37.3%	20.7%	18.1%	$F = 20.5, p < .001^{***}$
Percent of direct market sales (mean)	62.7%	79.3%	81.9%	

^a This includes all 2004 gross farm/ranch sales derived from all existing enterprises.

^b This index represents the sum/composite of thirteen stewardship and environmentally friendly agriculture practices that farms and ranches are performing.

^c This indicates the percent of revenues derived from wholesale and direct sales.

* Pairwise comparisons show that the highly diversified segment is different from the lightly diversified ($\chi^2 = 9.6, p = .049$) and from the moderately diversified segments ($\chi^2 = 24.0, p < .001$).

** Chi-squares tests performed between groups show that significant differences occur between the highly and lightly diversified segments ($\chi^2 = 13.0, p < .001$) and the highly and moderately diversified segments ($\chi^2 = 8.9, p < .001$).

*** Tukey Post-Hoc tests showed that the lightly diversified segment is significantly different from the moderately and the highly diversified segments ($p < .001$).

revenues. Table 5 indicates that moderately diversified farmers were younger than the highly diversified ones. Only 8.6 percent of the moderately diversified farmers were at least 65 years compared to 14.3 percent of the highly diversified farmers ($\chi^2 = 9.8, p < .001$). This may be due to the fact that established middle aged farmers are often the ones most interested in diversification as means of enhancing their incomes in order to allow them to remain in farming and possibly to

Table 5. A Comparison of the Characteristics of Light, Moderately, and Highly Diversified Farmers and Ranchers

	Lightly Diversified (n = 224)	Moderately Diversified (n = 538)	Highly Diversified (n = 376)	Sig.
Farmer/Rancher's Age (n = 998)				
Less than 45 years	25.8%	21.8%	25.3%	$\chi^2 = 11.2, p = .02^*$
45–64 years	60.7%	69.6%	60.4%	
65 years or more	13.5%	8.6%	14.3%	
Number of Generations in Farming (n = 1098)				
First generation of farmers	66.0%	57.8%	47.3%	$\chi^2 = 20.0, p < .001$
More than one generation in farming	34.0%	42.2%	52.7%	
Operator's Primary Occupation (n = 999)				
Farming/ranching	59.6%	65.4%	74.5%	$\chi^2 = 13.3, p = .02^{**}$
Non farming/ranching	40.4%	34.6%	25.5%	
Gender (n = 969)				
Male	70.9%	62.3%	72.3%	$\chi^2 = 10.1, p = .01^{***}$
Female	29.1%	37.7%	27.7%	
Employment Location of Farmer's Wife (n = 470)^a				
Working exclusively on-farm	33.3%	52.5%	57.0%	$\chi^2 = 13.1, p = .01^{****}$
Working exclusively off-farm	16.7%	10.6%	6.2%	
Working on and off-farm	50.0%	36.9%	36.8%	

^a This only includes farmers' /ranchers' working wives. Female operators were excluded from this analysis. The percentages of working wives were 83.3%, 92.9%, and 92.6% for the lightly, moderately and highly diversified segments respectively.

* Pairwise comparisons show significant differences between the highly and moderately diversified segments ($\chi^2 = 9.8, p < .001$).

** Chi-squares tests performed between groups show that the highly diversified farmers are more dedicated to agriculture (as main occupation) than the lightly diversified ones ($\chi^2 = 11.6, p < .001$) and the moderately diversified segments ($\chi^2 = 8.9, p < .001$).

*** There are significantly more female operators in the moderately diversified segment compared to the lightly ($\chi^2 = 3.8, p = .05$) and the highly ($\chi^2 = 8.2, p < .001$) diversified segments.

**** The farmer's wife of lightly diversified—male—operators work significantly more off-farm than their moderately and highly diversified counterparts ($\chi^2 = 7.1, p = .03$; and $\chi^2 = 12.7, p < .001$ respectively).

employ adult children. Diversified farmers were more likely to report farming as their primary occupation ($\chi^2 = 13.3, p = .02$). Two-way chi-square analysis showed that the proportion of highly diversified farmers having farming or ranching as their main occupation (74.5%) is significantly higher than the lightly and moderately diversified segments ($p < .001$). However, there were no significant differences

in the number of days that operators work off-farm across the *extent of diversification segments*. Although a high proportion of new entrants to farming and ranching were diversified, they were statistically less diversified ($\chi^2 = 20.6, p < .001$) than farmers and ranchers with longer involvement (2+ generations) in farming. This is likely due to both experience and available resources. There was no association between extent of diversification and the education level of the principal operators or whether the respondents had formal education in agriculture, business, or other disciplines.

This study also confirms that gender is associated with farm diversification. A significantly higher number of women were involved in the operations of moderately diversified farms and ranches (37.3%) than those classified as lightly diversified (29.1%; $\chi^2 = 3.8, p = .05$). However, women were less likely to be active in highly than moderately diversified farms. (27.7%; $\chi^2 = 8.2, p < .001$). This may be partially explained by thinking of high diversification as more full time employees. More of the wives of the less diversified farmers work exclusively off-farm compared to moderately and highly diversified farmers ($p \leq .03$). Farm/ranch diversification appears to provide these women an on-farm income earning potential, and the enterprises benefit from their involvement. Many diversified enterprises succeed in large part because there is family involvement that provides access to divergent skills and perspectives.

Attributes Associated with Higher Farm/Ranch Diversification

A multiple linear regression performed on six internal farm attributes on the number of on-farm diversification enterprises (dependent variable) resulted in a statistically significant model ($R^2 = .166, p < .001$). This model shows that agriculture specialization, number of days that the farmer's spouse work off-farm, and the number of family members working on the farm were statistically related to greater diversification (see table 6). The variety of crops and livestock grown/raised was also related to a greater level of diversification ($\beta = .313, p < .001$). This is not surprising because the greater the variety of crops and livestock grown the more opportunities to develop different types of diversification enterprises.

As might be expected, the number of days that the farmer's spouse worked off-farm was negatively related to the extent of diversification ($\beta = -.132, p < .001$). The greater the number of diversified enterprises the increased likelihood that spouses were engaged in diversification. This result is consistent with previous findings in the literature that

Table 6. Multiple Linear Regression of Farm Internal Characteristics on the Number of Enterprises Developed at the Farm

Independent Variables (n = 735)	Unstandardized B	Standardized β
Farm size	.000	.026
Agriculture specialization	.128	.313*
Farmer's level of education	-.009	-.009
Farmer's experience in farming	.003	.037
Number of off-farm workdays of farmers' spouse	-.084	-.132*
Number of family employees	.074	.143*
DV: Number of on-farm enterprises developed (1-8)		
F Value	25.33	
Adjusted R^2	.166*	

* $p < 0.001$.

suggest that diversified enterprises are often managed by the farmer's spouse while the farmer focuses primarily on more traditional farming and ranching activities. Similarly, the number of family members employed on the farm was positively related to the extent of diversification ($\beta = .143$, $p < .001$). This result confirms findings that diversification enterprises provide employment opportunities for family members.

Contrary to results previously reported (Ilbery 1991), this study indicates that size of the farm was not significantly related to the level of diversification. This could be explained by looking at the respondents of this study, as many operated small businesses where diversifying would be a way of maximizing the revenue potential from limited acreage. Also, there are many types of diversification enterprises that are very compatible and work well on small farms, especially those located near urban areas, such as the development of agritourism (e.g., self recreational harvest), value added processing (e.g., preserves), and offering classes and workshops. The level of education achieved by farmers and the level of farming experience is not related to the level of diversification. In part this is due to many diversified farmers being new to farming and may start a diversified farm rather than diversifying a traditional farm.

Conclusions and Insights for Further Research

While limited in the types of respondents taking part in this study, it is expected that there is now a better understanding of the extent to which farms and ranches are diversifying throughout North America, providing an extension to the literature on this topic. First, the study expands the traditional six diversification categories to include historic

preservation and education). Next, it suggests that diversified farmers are simultaneously engaged in several types of diversification as has been reported in Europe (Ilbery 1991; Ploeg 2000). The majority of farmers in this study were engaged in two or more diversification categories (an average of 3.8 categories). Extent of diversification was related to various farmer (age, whether s/he is a first generation farmer) and farm (annual gross sales, management sophistication) characteristics. Interestingly, the more diversified the farm or ranch the greater the operator and their family's attachment and involvement to farming, leading to the conclusion that diversification entails more than just economic considerations. This leads to asking a question about the reasons and rationality behind diversification, as economics does not seem to explain every instance of diversification, whether between or within farms and ranches. Almost three quarters of the highly diversified operators reported farming and ranching to be their main occupation and over half of the farmers' spouses reported working exclusively on-farm. These results suggest that farm diversification might be an appropriate strategy to retain farm household members in full-time farming, which becomes very relevant when considering the emphasis placed on this strategy in several North America agricultural policies as previously stated. In this sense, additional research is needed to assess the effects of diversification on farm income, employment, recruitment, retention, and quality of life.

Diversification is also associated with the propensity to be engaged in environmental and cultural resource stewardship. This finding is consistent with the increase of environmentally friendly land management practices used in agriculture. For example, the use of environmentally friendly land management practices has doubled in Canada in the period 1991–2001, surpassing the conventional tillage methods traditionally used. This, in turn, is enabling the reduction of fuel costs and carbon dioxide emissions (Statistics Canada 2002). The high engagement of diversified farmers in environmental practices is due in part to the nature of diversified farming operations and the fact that consumers of diversification products and experiences are more aware and concerned about environmental issues than the average consumer, in part because they often visit the farms and ranches to purchase products or engage in programs, activities or events.

Agriculture specialization, number of days of off-farm work of the farmer's spouse, and the number of family members working on the farm influence greater diversification. The more variety of crops and livestock grown/raised on the farm encourage greater number of diversified enterprises. Farm size does not bring about greater

diversification challenges as found in previous studies (Ilbery 1991). The influence of farm size on activities that require different amounts of farm space and other farm resources, (e.g., recreational harvest compared to farm tours or cattle drives), is an emerging hypothesis that will require further research.

In summary, diversified farmers and ranchers who participated in this research were very entrepreneurial in terms of the breadth of enterprises that they have developed, echoing studies which have taken place in Europe (Ploeg et al. 2000). They also appear to be very market-aware and responsive, especially when it comes to opportunities to add new revenue producing enterprises. While the typology presented verified the breath of diversification enterprises currently occurring in North America, it will have to be regularly adjusted to reflect new diversification trends (e.g., biomass, on-farm manufacturing). It would not be surprising to see farmers and ranchers continuing to add new diversification enterprises to take advantage of expertise they have acquired, their investment in facilities and equipment, and the tendency of various markets to purchase complementary products and services.

This study was intended to provide an overview of farm diversification in North America based on the assumption that existing typologies—mostly European and Australian—may not reflect the North American reality. Development of different typologies is important, since they serve multiple purposes. One of these purposes is to provide a broad panorama of a social phenomenon, which this study does. However, as it is broad, it opens many research opportunities to be addressed in the future. For example, a closer examination of the combined occurrence of the enterprises can be the foundation to cluster diversified farmers and provide evidence of the direction of diversification development. This study also raises the question whether the types of diversification enterprises (e.g., agritourism, value-added processes) vary across different farm and farmer classes, especially taking into consideration that different enterprises require different levels of investment. Studies are also needed regarding the changes of diversification over time as well as the impact of these enterprises in the sustainability of the farm business. Further, a deeper qualitative inquiry of farmers' motivations to diversify through several enterprises is needed to understand some of the statistical associations and inferences found in this study.

Finally, it is imperative to reiterate that this study is not representative of all farms and ranches in North America. The original first list utilized, as well as the final respondents, may be misrepresenting a certain sector (e.g., over-representing farms more involved in direct

marketing). In addition, the study does not account for the geographic representation of farms in North America. However, these research tools were adopted because they provided a way to explore and describe farm diversification in such a large geographic area. They were also appropriate to provide evidence of the extent of diversification—in terms of number of enterprises developed—across the sub-continent. The additional use of snowball sampling may have exacerbated these tendencies, yet it was an expedient way to enlarge the number of respondents in a relatively short-time frame. Given the economic situation facing many farmers and ranchers in North America, it is time to extend this study to include more types of rural operations, and approach these with new theoretical and methodological tools.

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