# UNIVERSITY OF MINNESOTA

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GRADUATE SCHOOL

# LOCAL SPENDING PATTERNS OF FARM BUSINESSES IN SOUTHWEST MINNESOTA

# A THESIS SUBMITTED TO THE FACULTY OF THE GRADUATE SCHOOL OF THE UNIVERSITY OF MINNESOTA BY

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## ABSTRACT

Thirty Southwest Minnesota farmers were interviewed to determine where they made their 1992 farming expenditures. Four hypotheses were forwarded regarding how various groupings of these operators would differ with respect to where they purchased their needed farming inputs: smaller farmers would tend to spend more locally than larger farmers, livestock farmers were more apt to spend locally than crop farmers (with a caveat that this hypothesis applies only to smaller farmers), more sustainable farmers would have a greater propensity to spend locally than would more conventional farmers, and that older farmers were more likely to spend locally than younger farmers.

Anecdotal, graphical, and numerical data were all used to test these propositions. The size hypothesis received the most support, followed by the livestock hypothesis and its caveat. The age hypothesis had only minor support, while the sustainability/conventionality hypothesis was basically refuted by the data presented.

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## CHAPTER 1

# INTRODUCTION

The twentieth century has brought tremendous structural change to the U.S. agriculture industry. Farm numbers declined from six million in 1900 to barely two million by 1990. Farm size also increased dramatically. Cochrane and Runge noted that in 1989 seventy-five percent of the total U.S. farm product was produced by only 300,000 of the nation's largest farmers. On the other end of the spectrum, one and one-half million part-time farmers accounted for only ten percent of the total output.

Looking to the future, Robert Delano writes, "Although often larger, more highly capitalized and automated, or different in other ways, the farm of the future will mostly reflect past developments or extensions of trends we see now. This includes the adoption of high technology" (Rosenblum, p. 187). Such trends probably include an increasing number of part-time farmers, continued farm population reduction, individual farm enlargement for fulltime farmers, and possibly even more specialization.

Because of the changes in U.S. agriculture, more and more people are concluding that rural communities must look to other industries, in addition to production agriculture, for their sustenance. Most of these people claim that farming is not as important to rural America today as it was

in the past. Browne et al. agrees with this concept:

"Today only a minority of rural people rely on farming. But a great proportion of farm people rely on off-farm income, and most of these jobs are not in agriculture" (p. 17).

Yet farmers still farm the land surrounding rural communities, and while production agriculture may not be the only viable industry for the rural communities of today and tomorrow, it still provides essential support to these towns' economies. This thesis will therefore analyze how different kinds of farms in Southwestern Minnesota tend to support nearby communities with their patronage.

Four hypotheses will be investigated:

1. That smaller farmers are more likely than larger farmers to make farm business expenditures in a local area.

2. That farmers who are more crop intensive are less likely than livestock farmers to spend locally.

3. That farmers using practices commonly associated with sustainable agriculture are more likely to make their farm purchases in a local area than are those identified as using more conventional practices.

4. That older farmers are more likely to make local farming expenditures than are their younger counterparts.

There is a growing body of literature which supports the general hypothesis that different types of farmers have different propensities to support their local communities. Perhaps the most effort has been focused on the first

hypothesis noted above. Goldschmidt, in the mid-1940's, conducted a study on two communities located in the San Joaquin Valley of California to learn about how farm size may affect rural towns.

The communities of Arvin and Dinuba were similar in many ways, including surrounding agricultural enterprises employed and various community dynamics. However, Arvin was the hub for bigger, more commercialized farmers, while Dinuba had more family-oriented, smaller farmers surrounding it. Goldschmidt found that the two communities differed greatly in quality of life offered, the number of businesses operating in town, poverty levels, public goods and services available, and public participation in community activities, with Dinuba being better off across all of these categories.

These findings prompted Goldschmidt to theorize that rural communities are greatly affected by the agricultural setting and structure that surrounds them:

"...industrialized farming creates an urban pattern of social organization. Urban social orders, unlike rural ones, are characterized by social heterogeneity, social class, depersonalized social relationships which are dominated by pecuniary considerations rather than sentimental ties, and increased differentials of power leading to alienation and apathy in the mass population" (Barnes, p. 172).

As recently as 1990, a new sociology text reported that Goldschmidt's general thesis continues to be theoretically accepted today. In fact, it remains a major motivation for

many research projects dealing with farm structure and rural communities (Buttel, Larson, and Gillespie). For example, Michaels and Marousek studied small towns in Idaho during the mid-1970's and concluded that smaller farmers tended to spend more of their farming-related expenses locally.

The second hypothesis of this study is that differences in the enterprise mix chosen by various farmers will affect the degree to which they make local business purchases. More specifically, it is hypothesized that livestock producers are more likely to make their farming expenditures locally due to the lack of time and managerial resources they have available to use in procuring their needs from distant vendors. This time restraint may hold these kinds of farmers on, or near, their farms more than other types of farmers in Southwest Minnesota, thus decreasing their ability to go greater distances for needed farm inputs as compared to their more crop intensive peers.

There is a caveat for this hypothesis, however. As the size of livestock operations increase the owners may employ more labor, begin utilizing contracting agreements, or in some other manner free themselves up to do more shopping around for needed farm goods and services -- looking for large volume price discounts and thus leaving their local trade areas more often. These are some of the reasons why there may be little discernable difference between large crop and large livestock farmers in terms of local spending

for farm needs.

The interaction of enterprise mix and farm size is well documented in a 1991 U.S. Department of Agriculture study:

"The recent modernization of the broiler, fed cattle, and processing vegetable subsectors was analyzed to determine why and how structural changes take place in agriculture...Within twenty years, most production of these commodities had shifted to a relatively small number of large, highly specialized and highly capitalized operations, using the latest technology and concentrated in a few regions. These farms are closely integrated with input suppliers and processors, who often share with producers both the control over production decisions and the risks. Products are now sold in closed markets with little access for outsiders and both entry of farmers into, and exit from, the subsectors are difficult" (Reimund, Martin, and Moore, p. iv).

Similar movements may be occurring in the swine industry, as well as in feed grains and dairy. Many factors mentioned in the above quote would tend to take the larger livestock producer, and the larger crop producer, away from local markets: direct factory buying, having less decision making power regarding local purchases due to contractual agreements, and greater specialization allowing for more intensive management (including closer price scrutiny).

Just such results appear to be occurring based on preliminary findings from a study now underway in Iowa. In that state roughly 1,000 swine producers were randomly surveyed to identify current production, marketing, and management practices used by Iowa pork producers. The survey also delves into the purchasing patterns of this

group. Early results show that larger swine producers tend to bypass local retailers by seeking out wholesalers and factory direct outlets more than smaller hog farmers do. This is the case for a majority of major swine input needs: feed, supplements, veterinarian supplies, and hog equipment (Lawrence, Otto, and Folkerts).

The third hypothesis, that sustainable farmers have greater impacts on rural communities than do conventional farmers because they tend to make more local purchases, in part arises from the way sustainable agriculture is defined. Granted, there are many interpretations of the term "sustainable agriculture," and many of these go beyond the farming practices used:

"sustainable agriculture offers alternative practices and values intended to promote environmental stewardship, conserve resources, preserve farm traditions, and support rural communities" (Lasley, Hoiberg, and Bultena, p. 1).

There is also some empirical basis for advancing the hypothesis concerning sustainable agriculture. A recent study of forty-one farmers in Minnesota concluded that the more sustainable farmers held less agricultural land, had greater labor demands, realized lower incomes, and were more likely to purchase their farming needs in the nearest town than were their more conventional counterparts (Menanteau, Juffer, and Maxwell).

The reasons why farmers who tend to be more sustainable

are spending more locally may be both psychologically and economically rooted. This paper will explore both of these factors. On the psychological side, the adopters of more sustainable practices and values may be the members of society who are more concerned about the environment and local communities than are their more conventional peers. This greater concern may predispose them to spend more closer to home in support of their local towns. On the economic side, greater labor and service needs, fewer expensive machinery needs, and generally lower commercial input volume needs may also make it more plausible to buy locally and simply save the time and hassle of leaving a local area to purchase needed farm inputs.

The fourth and final hypothesis deals with how a farmer's age will affect local spending decisions. Much less work has been done in this realm. Goldschmidt recounted that in his study one alternative community quality of life indicator was that an age differential may have been an important distinguishing variable for the two towns studied. Goldschmidt noted that Arvin's population was roughly twenty to twenty-five years younger than was Dinuba's at the time he was doing his research (Barnes).

While to Goldschmidt this community age variation may have appeared to be a potential flaw in his study, this author believes that farmer age differential, as it relates to local purchasing, makes for an interesting variable to

explore. The <u>1987 Census of Agriculture</u> shows that in Minnesota nearly sixty percent of the farmers in 1987 were age forty-five or older. If this group of farmers is more apt to support their local merchants, for whatever reason, the small town farm suppliers need to start planning ways to somehow lure the younger farmers into their stores more frequently, lest the generational turnover spell disaster.

In the next chapter of this thesis, information regarding the manner in which the data were collected and how the data were analyzed will be outlined. A results chapter will then present the findings of the various analyses carried out on the data. The fourth and final chapter will be presented in a discussion and conclusions format. It shall allude to future research needs in this area of study and it will contain a brief review of the main findings of this project.

# CHAPTER 2 METHODOLOGY

In order to test the four hypotheses forwarded in the first chapter, primary data were needed in the form of farmer perceptions regarding local spending patterns and actual farm records concerning farming expenditures in local areas. An ongoing University of Minnesota Extension Service effort, the Southwest Minnesota Farm Business Management Association, provided an excellent pool of farmers with both high quality records and willingness to participate in survey-based research.

The Association had over 200 farmer members in 1992. Resources did not allow for in-depth analysis of records and interviews with each of them, so a two-stage sampling procedure was employed. In the first stage, two communities with relatively heavy concentrations of members nearby were selected. Worthington, a Nobles County regional trade center with over 10,000 residents, had thirty-two farmer members operating around its borders. Mountain Lake, a community of 2,000 in Cottonwood County, had twenty-four farmer members surrounding it.

In the second stage of the sampling procedure, two Association field men were consulted in the farmer selection process. Operators were chosen from each town's group of Association members so that enough range in farm size,

enterprise mix, farming practices utilized, and operator age would be present in the sample to allow for a sufficient investigation of the hypotheses of this study. It was the wish of this author to study a segment of the Southwest Minnesota farming population that is now (and most likely will continue to be) a very viable portion of the production agriculture industry in the region: full-time, larger farmers. With that desire in mind, the two field men helped the author select eighteen (fifty-six percent) of the farmers from the Worthington group and twelve (fifty percent) from the Mountain Lake group.

The thirty farmers selected could all be well categorized as progressive, management conscious, and, for the most part, full-time, larger farmers: most farmed over 300 acres and had over \$100,000 in gross farm revenue in 1992. Besides the fact that the sample utilized for this study was not a random sample, there is an additional potential sample bias due to the fact that all farms surveyed belonged to a management association. Nordquist et al. noted such a concern in a recent publication:

"In two separate studies the farmers who belong to a management association were found to be larger than the average farm reported by the agricultural census and were more likely to have livestock" (p. 1).

According to one of those studies,

"The common assumption about members of farm

management associations is that they will be larger in size and better managed than their counterpoints in the general farm population. This perception is due to two views: (1) better managers will seek out better information -- and associations are one source for that information, and (2) better managers will operate larger farms" (Tvedt and Olson, p. 2).

Some of the potential bias which occurs when sampling Association farmers was eliminated by carefully selecting only a fraction of the Association's membership. These farmers were chosen to provide information for all of the categories covered by the four hypotheses of this study. If the sample is biased toward superior managers, one could easily contend that superior managers have a better chance of surviving and thus affecting their communities into the future than do their peers who possess weaker management skills. Therefore, this researcher's sample may be providing a better picture of how tomorrow's farmers will affect their local economies with their farming expenditure patterns.

As a final justification of the validity of the farmer sample used for this study, two tables have been prepared which compare the sampled Mountain Lake and Worthington area farmers' characteristics with appropriate, available county Census data. In both Table 1 and Table 2 three Census population segments were used in the various comparisons listed so that the best sample verifications could be made. Some inconsistencies between the sample data and the Census

TABLE 1.

# COMPARING THE TWELVE SAMPLED MOUNTAIN LAKE AREA FARMERS' CHARACTERISTICS TO COTTONWOOD COUNTY CENSUS DATA

Characteristic	Sample Data	Cottonwo Co. Data	od *
Average Acres Per Farm	626	649	A
Average Gross Farm Income	\$295,200	\$257,372	в
Average Age	43	47	с
Proportion of Farms Having:			
Crop Income	100%	94%	С
Livestock Income	58%	60%	С
Swine Enterprise Income	33%	34%	С
Cattle Enterprise Income	8%	34%	С
Dairy Enterprise Income	8%	88	С
Poultry Enterprise Income	17%	48	С

A: County Average Acreage for Farms With Over 250 Acres
B: County Average Market Value of Agricultural Products Sold for Farms With Over \$100,000 in Sales
C: County Data for Farms With Sales of \$10,000 or More

\* Source: 1987 Census of Agriculture

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# TABLE 2.

# COMPARING THE EIGHTEEN SAMPLED WORTHINGTON AREA FARMERS' CHARACTERISTICS TO NOBLES COUNTY CENSUS DATA

Characteristic	Sample Data	Nobles Co. Data	*
Average Acres Per Farm	668	584	A
Average Gross Farm Income	\$341,700	\$240,462	в
Average Age	45	46	с
Proportion of Farms Having:			
Crop Income	100%	93%	С
Livestock Income	78%	62%	С
Swine Enterprise Income	44%	40%	С
Cattle Enterprise Income	33%	38%	С
Dairy Enterprise Income	17%	10%	С
Poultry Enterprise Income	68	<b>4</b> 8	С

A: County Average Acreage for Farms With Over 250 Acres

- B: County Average Market Value of Agricultural Products Sold for Farms With Over \$100,000 in Sales
- C: County Data for Farms With Sales of \$10,000 or More

\* Source: 1987 Census of Agriculture

data still persist in both tables, however. For example, in the two tables the sample data listing for "average gross farm income" includes more income categories (agricultural sales, other farm income, custom farming revenue, government payments, and insurance receipts) than does the county Census figure to which it is compared (only market value of agricultural products sold were included in the Census data).

Table 1 compares the Mountain Lake farmer sample with Cottonwood County data from the <u>1987 Census of Agriculture</u>. It indicates that the sample utilized had fewer acres farmed but greater gross farm income on average than did the county-wide farmer population segments reported in the Census. Table 1 shows that the average age of the Mountain Lake area farmers sampled was lower than the average age reported in the Census.

The final six comparisons in Table 1 show how the sampled farmers compared to Cottonwood County farmers in terms of the mix of farm revenues the two groups' depended upon in 1992 and 1987, respectively. Table 1 indicates a very nice match-up between the sample data and the Census data over most of these revenue comparisons, with the sample perhaps being slightly deficient in the number of cattle farmers it included and a bit over-loaded with poultry farmers.

Table 2 compares the Worthington area farmers who were

sampled with 1987 Census data for Nobles County. It indicates that the sampled farmers were a bit larger on average, in both acreage and gross revenue terms, than were their Nobles County counterparts. Table 2 shows that agewise the two groups were almost the same and it indicates that the sample data and the Census data matched up nicely with regards to how farmers generated revenue in 1992 and 1987, respectively.

Upon agreeing to participate, each farmer provided a complete 1992 farm expense ledger for analysis. This process involved sorting through each expenditure made during the 1992 fiscal year and tabulating it as either an expense made within a twenty-mile radius of an individual's farm or as an expense made outside of that radius. Each expense was placed in either of those two categories based solely on where the business person that the farmer directly dealt with lived or worked. For example, if an insurance agency had its headquarters in Minneapolis but its branch office in Worthington was responsible for dealing with the farmer, an insurance expenditure paid to a Worthington agent would be recorded as having been made in Worthington.

The definition of a "local expense" or a "local area" as a twenty-mile radius surrounding a farmer's home was chosen primarily on the basis of feedback received from all thirty farmers during the interview portion of the data collection process. Several of the farmers mentioned that

they felt most comfortable with the twenty-mile definition because it would allow many of the towns in which they shop to be considered "local" communities.

In addition to analyzing each farmer's 1992 expense ledger to determine local spending, 1992 financial and production analysis reports and several survey questions were used to place each farmer within the various hypothesis categories. The survey was utilized in conjunction with a one-to-two hour interview as the final data collection mechanism. It solicited the farmers' opinions regarding the hypotheses of this research. The interviews offered an opportunity for the author to collect the survey information directly and to clear up any questions regarding whether or not a particular expenditure was made locally.

Not all farming expenditures were tabulated for this project. The only expenditure classes scrutinized were the ones in which farmers generally had the opportunity to freely choose where they purchased the items within that class. For example, there is generally only one available public utility cooperative and one private phone company per geographical region in Southwest Minnesota. Therefore, the farm-related utility and phone bills that the farmers paid during 1992 were not incorporated into the expenditure classes studied. The same held true for taxes: farmers had no decision to make about where to spend local, state, or federal tax dollars. Lastly, land purchases were not

included in the expenditures analyzed because, for the most part, full-time farmers look to purchase land close to their other farm holdings so that it is more convenient for them to farm the purchased parcel. Thus land purchases often lack the above-mentioned "freedom of choice" factor regarding where the asset is purchased, leading this researcher to disqualify them from this study's analysis.

These were the only three significant farming expenditures that were not studied and they only made up a tiny fraction of the total farming outlays that this group of thirty farmers made over the course of one year. The expenses that were analyzed have been placed into fourteen categories: (1) Breeding and Feeder Livestock Purchases, (2) Capital Adjustments, (3) Crop Chemicals, (4) Crop Fertilizers, (5) Feed, (6) Gas, Fuel, and Oil, (7) Insurance, (8) Interest, (9) Labor, (10) Miscellaneous, (11) Repairs and Operation, (12) Rent, (13) Seed, and (14) Veterinarian.

The capital adjustments category is the only expense group that involves more than one year's worth of purchases. Because of the sporadic nature of depreciable capital investments such as machinery and buildings, a four-year average of capital expenditures was calculated to yield the best picture of each farmer's average acquisition of these kinds of inputs. Every item that had been entered into each farmer's depreciation schedule in 1989, 1990, 1991, or 1992

was analyzed and tabulated as a local or non-local expense. These total capital expenditures were then divided by four to arrive at a four-year average, or the "capital adjustment" category mentioned above.

The insurance category consists of both crop insurance and any other farm-related insurance a farmer might carry. The labor classification contains both regular labor and miscellaneous labor expense groupings. The miscellaneous category is a hodgepodge of minor expense classes: various dairy farm-related expenditures, bank service charges, breeding fees, crop marketing and storage costs, custom hog finishing charges, grazing fees, livestock supply expenses, livestock trucking and marketing expenses, miscellaneous crop expenses, miscellaneous dues, miscellaneous farming expenses, miscellaneous livestock expenses, and office supply expenses.

The repair and operations category encompasses building repair expenses and machinery repairs and operation costs. The rent category includes land rent, machinery and building lease expenses, and machinery hire fees. All the abovementioned expense categories were analyzed and each individual expense therein was tabulated as either a local or non-local expenditure based on the definition of "local" presented above. These numbers were then compiled on a computer spreadsheet and prepared for presentation.

There are many possible ways to measure local farming

expenditure patterns. In this study, two methods will be utilized to determine how the various hypothesis categories influence local spending. The first method is to calculate the percentage of total farm expenditures that were made within a twenty-mile radius of a farmer's home. Within each hypothesized farmer grouping a weighted average percentage will then be calculated to determine local spending influence of the particular variable of interest. The second method is to calculate the dollars spent locally per acre of land farmed by each operator. Once again, within each hypothesis group a weighted average measure of local spending per acre will be calculated to offer an alternative indication of how a particular hypothesis category affects local farming expenditures. Because all four hypothesis factors are continuous in nature, graphs will be used to show how both measures of local spending vary with each particular hypothesis characteristic.

Two measures of farm size will be utilized to test the first hypothesis of this research paper. The first measure is gross farm revenue and the second is acres farmed. The second hypothesis variable, that of cropping intensity, will be quantified as the percentage of gross farm revenue that was generated by a farm's cropping enterprises in 1992. Cropping enterprise revenues include dollars earned from the sale of various crop commodities, government farm program receipts, and insurance payments received in lieu of crop

damage incurred in 1992.

The third hypothesis to discuss is that of cultural practices the farmers utilized in 1992. More specifically, each farmer was asked to place himself or herself on a "tending to be sustainable/tending to be conventional" continuum. This continuum ranged from one to ten, one being totally sustainable and ten being totally conventional. In addition to this current ranking, the farmers were asked where they would have placed themselves on the same scale in 1988. They were then asked to explain the change in position, if any had occurred, so that the author could get a feeling for what factors the farmers were using in their personal definitions of sustainable or conventional farming.

To study the affects of age on the propensity to make farming expenditures locally, the thirty farmers' ages will be plotted against the two local spending indicators mentioned above. In cases where the farm chosen was a partnership or a corporation with more than one member, an average of the principal operators' ages was used to determine that farm's age classification.

# CHAPTER 3 RESULTS

In this chapter results will be presented regarding the four hypotheses outlined in chapter one. Interview responses, graphical illustrations, and numerical crosstabulations of appropriate farmer groupings will be put forward as tests of this paper's propositions. The graphs have been produced using version 4.0 of the "Statistix" software package (Siegel). Regression trend lines will be superimposed on each figure to highlight the general results of each graph.

To test the first hypothesis, all thirty farmers were asked in the interviews if they thought farm size affected local spending for farming needs. Twenty-five farmers (eighty-three percent) felt that as farm size increased the tendency to spend locally would decrease. Two operators (seven percent) felt that farm size had no affect on the propensity to spend locally, while three farmers (ten percent) were not sure if size would affect local spending or not. These anecdotal data tend to support the size hypothesis.

Figure 1 and Figure 2 illustrate how farm size, when measured in terms of gross farm revenue, is related to local spending. In Figure 1, each farmer's percentage of total expenditures made locally has been plotted against his or

FIGURE 1.

# PERCENT OF TOTAL FARMING EXPENDITURES MADE LOCALLY VS. GROSS FARM REVENUE





FIGURE 2.

# DOLLARS OF LOCAL SPENDING PER ACRE OF LAND FARMED VS. GROSS FARM REVENUE





her gross farm revenue. This plot shows a fairly strong downward sloping trend line which indicates that as gross farm revenue rises, the percent of total expenditures that farmers make locally falls. Figure 2 again has gross farm revenue as one of its variables of interest, but now it is plotted against a different index of local spending: dollars of local spending per acre of land farmed. This graph seems to be telling an opposite story when compared to Figure 1. In Figure 2 a slightly upward sloping trend line indicates that local spending on a per acre basis increases as gross farm income rises. The trend line in Figure 2 is not as pronounced as it was in Figure 1, and an explanation for the seemingly contradictory results from these two graphs will be forwarded below.

Figure 3 and Figure 4 illustrate how farm size, when measured on an acreage basis, interacts with the two local spending measures. In Figure 3 each farmer's percentage of total expenditures made locally is plotted against the number of acres farmed. Only a very slight upwardly sloping line is revealed, showing that as farmers operate more land their propensity to spend locally rises negligibly. In Figure 4 dollars of local spending per acre of land farmed was plotted against each farmer's acreage level. The trend line here is opposite in slope and steeper than it was in Figure 3, indicating that there is a negative relationship between farm size and local spending when these two indices

FIGURE 3.

# PERCENT OF TOTAL FARMING EXPENDITURES MADE LOCALLY VS. ACRES FARMED



Acres Farmed

Percent of Total Farming Expenditures Made Locally

FIGURE 4.

# DOLLARS OF LOCAL SPENDING PER ACRE OF LAND FARMED VS. ACRES FARMED



Dollars of Local Spending Per Acre of Land Farmed

are incorporated.

Both Figure 1 and Figure 4 support the first hypothesis, while Figure 2 (and, to a lesser extent, Figure 3) tends to refute the size hypothesis. It is possible to divide the thirty farmers into two distinct size groupings based on farm revenue. By studying Figure 1, a person can conclude that for this study's farmer sample a plausible boundary between small and large farmers could be roughly drawn at the \$400,000 mark. With this cut-off made, six farms would be considered large and twenty-four could be called small. Based on these definitions, two crosstabulations of small and large farms were produced from the overall spending database to provide an additional test of how farm size affects local spending.

As a point of reference, the weighted average percentage of total farming expenditures made locally for all thirty farmers was sixty-five and one-half percent. The weighted average for dollars spent locally per acre of land farmed was \$251.91 per acre. The weighted average of local spending on the percentage basis for the small farmers was seventy-five and one-half percent, while for the large farms it was fifty-one percent. This information is in support of the first hypothesis.

But when one analyzes the size cross-tabulations on the per acre basis a contradiction arises, just as it did in Figure 2. The small farmers' weighted average of local

spending on the per acre index was \$230.22 per acre, while the large farmers' average value was \$315.08 per acre. The primary reason for this seeming contradiction is that five of the six large farmers are quite livestock intensive (less than thirty percent of their gross farm incomes were derived from cropping enterprises). Even though four of the six large farmers (two-thirds) spent less than half of their farming expenditures locally, the large magnitude of the total expenses they generated as a group, when coupled with the fact that they generally had fewer acres to spread those greater expenses over relative to all other farms, makes the larger farmers appear more likely to support their local regions on the per acre basis. This important fact helps to explain the potential contradictions mentioned above and adds support to the first hypothesis.

To explore the cropping intensity hypothesis all thirty farmers were asked in the interviews if they believed enterprise selection affected local spending for farm needs. This paper's second hypothesis was supported by a majority of the farmers sampled: sixteen farmers (fifty-three and one-half percent) felt that more livestock intensive operators would be more likely to buy locally. Two people (six and one-half percent) thought that more crop intensive operators would be more likely to spend locally. Six operators (twenty percent) felt that cropping intensity would have no affect on a farmer's propensity to buy needed

inputs in a local area. The final six farmers (twenty percent) were not sure if cropping intensity would affect local spending or not.

Figure 5 and Figure 6 show how enterprise selection, when measured as the percent of gross farm revenue generated by cropping enterprises, varies with the two alternative indicators of local spending. Figure 5 seems to contradict the second hypothesis. Its slightly positive sloping trend line indicates that local spending on the percentage basis rises somewhat with cropping intensity. However, it is important to again note that the farmer sample utilized for this study had most of its largest farmers being very livestock intensive. Therefore the size and enterprise selection interaction is definitely coming into play in Figure 5. The large, livestock intensive farmers who had low local spending on the percentage basis are pulling the trend line down in the left-hand side of the graph.

In Figure 6 a very different story is told with respect to local spending and its relationship with cropping intensity. Here local spending on the per acre basis for each farmer is plotted against his or her cropping intensity. The trend line in Figure 6 is sloped in the opposite direction and steeper than the trend line in Figure 5, indicating that local spending on the acreage basis is negatively related to increased cropping intensity. In Figure 6 the size and enterprise selection interaction

FIGURE 5.

# VS. PERCENT OF TOTAL FARMING EXPENDITURES MADE LOCALLY VS. PERCENT OF GROSS FARM REVENUE GENERATED BY CROPPING ENTERPRISES



FIGURE 6.

# DOLLARS OF LOCAL SPENDING PER ACRE OF LAND FARMED VS. PERCENT OF GROSS FARM REVENUE GENERATED BY CROPPING ENTERPRISES



Dollars of Local Spending Per Acre of Land Farmed

inherent with this study's sample is working in favor of the second hypothesis by propping up the left-hand side of the trend line. However, one can easily decipher from the picture that, as a group, the most crop intensive farmers have some of the lowest per acre local spending values. Figure 6 therefore offers strong support to the second hypothesis.

Two farmer groupings can be formed on the enterprise selection basis. By defining a crop farmer as an operator with over fifty percent of gross farm revenue coming from cropping enterprises and a livestock farmer as a manager with over fifty percent of gross farm revenue flowing in from livestock enterprises, two groups of fifteen farmers are identified. Carrying out two cross-tabulations on the farming expenditure database yields local spending information for these farmer categories. The weighted average of local spending on the percentage basis for the crop farmers was seventy-five percent. For the livestock farmers the weighted average percentage spent locally was sixty and one-half percent. Just as in Figure 5, this particular comparison contradicts the second hypothesis. By comparing the weighted averages of local spending on the acreage basis, however, the second hypothesis seems very sound. The crop farmers weighted average of local spending per acre of land farmed was \$187.63 per acre. The livestock farmers weighted average of local spending on the acreage

basis was \$334.79 per acre. Both the graphical and tabular approaches yield mixed results, but the strongest relationships presented definitely are in support of the cropping intensity hypothesis, as were the anecdotal data.

To explore the caveat to the second hypothesis, that only small livestock farmers will be more likely to spend locally when compared to all other types of farmers, two more cross-tabulations were performed on the livestock farmer database defined above. Using the size definitions incorporated earlier, that \$400,000 of gross farm revenue is the boundary between small and large farms for this study's sample, ten of the fifteen livestock farmers can be considered small and five could be called large.

With those two groups identified, new cross-tabulations revealed that the small livestock farmers' weighted average of local spending on the percentage basis was seventy-nine percent. The large livestock farmers' weighted average of local spending on the percentage basis was only forty-seven and one-half percent. This stark contrast is definitely in support of the small livestock farmer caveat, and it also lends support to the general size hypothesis.

On the acreage basis, both groups of livestock farmers surpassed the overall weighted average of local spending, \$251.91 per acre. The small livestock farmers' weighted average of local spending on the acreage basis was \$310.51 per acre, while the large livestock farmers had a weighted

average of \$367.58 per acre. While this may seem to contradict the notion that only smaller livestock farmers are more apt to spend locally for their farming needs, it is important to recall that the larger farmers had much greater spending volume to spread over relatively fewer acres of land.

Whether or not tending to be more sustainable or tending to be more conventional affects local spending was not specifically asked of each farmer interviewed. In conversations with several of the farmers, however, reactions to the above proposition were mixed. Most farmers who mentioned sustainability or conventionality during their interviews felt unsure of how this particular classification would impact local spending. Anecdotal evidence in support of the third hypothesis was lacking, and the general feeling was that the propensity to spend locally for farming inputs is not strongly related to whether or not a farmer tends to be more sustainable or more conventional.

Figure 7 tends to back up that indifference. In this graph each farmer's percent of total farming expenditures made locally was plotted against his or her personal sustainability/conventionality ranking. The virtually horizontal trend line indicates that tending to be more sustainable or tending to be more conventional has no relationship with how likely a farmer is to spend locally, when using the percentage basis.

FIGURE 7.

# PERCENT OF TOTAL FARMING EXPENDITURES MADE LOCALLY VS. SUSTAINABILITY/CONVENTIONALITY RANKING



Percent of Total Farming Expenditures Made Locally

FIGURE 8.

# DOLLARS OF LOCAL SPENDING PER ACRE OF LAND FARMED VS. SUSTAINABILITY/CONVENTIONALITY RANKING





Figure 8 contradicts the hypothesis about sustainability and its positive relationship with local spending. In Figure 8 local spending on the per acre basis is plotted against the same sustainability/conventionality index used in Figure 7. Figure 8 has a positively sloped trend line which indicates that as farmers become more conventional they tend to spend more locally per acre of land farmed.

Splitting the thirty farmers into two groups in order to perform another set of cross-tabulations allows one to test the sustainability/conventionality hypothesis in one additional manner. By defining more sustainable farmers as those who ranked themselves at five or below on the survey continuum and defining more conventional farmers as those who ranked themselves at six or greater on the continuum, two groups of fifteen farmers can be identified for tabular analysis.

The more sustainable farmers' weighted average of local spending on the percentage basis was seventy-five percent. The more conventional farmers' weighted average was fiftynine and one-half percent. These numbers are in support of the third hypothesis. However, the more sustainable farmers' weighted average of local spending per acre was \$216.64 per acre, while the more conventional farmers' weighted average of local spending on the acreage basis was \$290.50 per acre. Considering all of the contradictory results presented in the discussion of the sustain-

ability/conventionality relationship with local spending, it would appear that the sustainability proposition is the weakest of all the hypotheses discussed thus far.

The final hypothesis had more anecdotal support than did the third hypothesis. Out of all thirty farmers questioned, nineteen farmers (sixty-three and one-half percent) felt that older farmers are more likely to make farming expenditures locally. Two operators (six and onehalf percent) felt that younger farmers were more likely to make their farm purchases locally. Three people (ten percent) did not think age was related to the propensity to spend locally for needed farm items, while six farmers (twenty percent) were not sure if age is related to local spending or not. The anecdotal data were therefore in support of the age hypothesis, with a majority believing that older farmers are more likely to spend locally for needed farming inputs.

The graphical results are not as convincing. In Figure 9 local spending on the percentage basis has been plotted against each farmer's age. The slightly positive sloping trend line does coincide with the age hypothesis, but it is not a particularly strong validator. The same can be said of Figure 10. In this graph local spending on the acreage basis has been plotted against each farmer's age. Once again a slightly upward sloping trend line is apparent. Neither graph contradicts the fourth hypothesis of this

FIGURE 9.

# PERCENT OF TOTAL FARMING EXPENDITURES MADE LOCALLY VS. FARMER AGE



Percent of Total Farming Expenditures Made Locally

FIGURE 10.

# DOLLARS OF LOCAL SPENDING PER ACRE OF LAND FARMED VS. FARMER AGE





research, but neither offers strong support for it either. If the sampled farmers are split at the age of fifty, with farmers age fifty and over being called older farmers and operators age forty-nine and younger being defined as younger farmers, eight farmers from the sample of thirty would fall into the older farmer group and twenty-two would be classified as younger farmers. Two final crosstabulations were carried out on the database of local spending to yield an alternative test of the age hypothesis.

The younger farmers' weighted average of local spending on the percentage basis was sixty-six percent. The older farmers' weighted average on the percentage basis was sixtyfive and one-half percent. These numbers, much like the graphs, indicate that age is not related to the propensity to spend locally for needed farm inputs. The alternative indicator of local spending tends to refute the age hypothesis, however. The younger farmers' weighted average of local spending per acre of land farmed was \$274.35 per The older farmers' weighted average on the acreage acre. basis was \$191.54 per acre. One reason for this large difference in acreage-based local spending is that a majority of the older farmers were primarily crop farmers who tended to own more land than their younger peers. Thus the older farmers appear to be generating fewer expenditures and spreading them over more acres of land when compared to their younger counterparts.

### CHAPTER 4

# DISCUSSION AND CONCLUSIONS

Based on the results presented in this study, farm size seems to be the most important indicator of how likely a farmer is to spend locally for needed farm goods and services. This conclusion is based on the data that were presented in support of both the size and enterprise selection hypotheses. Additionally, the farmer interviews yielded many comments in support of the idea that size is the key indicator of the propensity to spending locally.

For instance, several people in the study noted that many larger crop farmers are beginning to group together to purchase seeds and chemicals from factory or wholesale outlets, thus bypassing local salespeople and receiving lower prices for these key inputs. Just as the data indicated in the previous chapter, however, large crop farmers are not the only people shopping around more in the interest of saving money. Some of the large livestock farmers noted that they are beginning to buy more of their needed feed ingredients, antibiotics, and livestock from distant suppliers who can offer better prices, higher quality service, or a more consistent supply of top quality animals.

Many respondents also noted that as farmers' businesses grow the primary managers will either tend to acquire more

labor, more management, or in some instances enter into contracting arrangements that allow them to devote more time to procuring needed farm inputs from distant sources to save money, get better service, or garner a superior product. These kinds of developments can affect both crop and livestock farmers and thus the size hypothesis seems to over-ride the enterprise selection hypothesis as farms grow larger.

The caveat to the cropping intensity hypothesis seemed to hold up in chapter three, though, and in fact it may be true that smaller livestock farmers are more likely than smaller crop farmers to spend locally for their farming For example, many of those interviewed noted that needs. crop farmers tend to have more time to shop around for their farming inputs because they might not have daily chores to perform. This freedom, when coupled with larger purchase planning horizons due to the seasonality of crop production, prompted a majority of the farmers surveyed to conclude that crop farmers may be more likely to shop non-locally than livestock farmers. Some participants mentioned that as crop farmers begin operating land far from their homes they may also start shopping for some needed items (such as tire repairs) in non-local communities to save time.

A few of those interviewed noted that livestock farmers tend to need their vital farming inputs (feed, veterinarian services, repairs, and supplies) more often throughout the

year than do their crop farming peers. These people felt that livestock farmers' lack of time and their greater need for consistent service may work together to forge stronger local loyalty ties between livestock farmers and the merchants they rely on. As mentioned above, however, all of these factors pointing to livestock farmers being more locally loyal probably only apply to smaller-sized farms.

There is an important final note to make regarding the second hypothesis of this thesis. Recently in Southwest Minnesota several rural communities have been attempting to use various methods (zoning and nuisance laws, etc.) to hinder the ability of animal agriculture to thrive and grow outside of a particular town's borders. These communities are therefore attempting to force some livestock farmers to alter their operating plans.

However, the fact remains that only a finite amount of land surrounds any particular rural community. Figure 6 in chapter three shows that in this study's sample the more livestock intensive farmers tended to generate more local spending on the per acre basis than did the more crop intensive farmers. By creating a hostile climate for livestock farmers, some small, rural communities may be putting greater negative economic pressure on many of their agricultural merchants by unwittingly lowering the total business volume available from the surrounding countryside.

While the first two hypotheses were fairly well

supported by chapter three's results, the sustainability/conventionality hypothesis turned out to be the weakest hypothesis forwarded in this paper. Lacking anecdotal and graphical support, and only receiving mixed tabular confirmation, the idea that more sustainable farmers will support their local communities more than will more conventional farmers simply was not upheld by the data.

It was mentioned in the introductory chapter that the sustainability/conventionality hypothesis has both a psychological and economic bent. This sentiment was shared by many of the farmers interviewed. Several believed that the people who have adopted more sustainable practices are the same people who are more concerned about keeping their local towns viable and that they work to that end by shopping locally more often for farming inputs. Many also felt that because the more sustainable farmers tend to rely on fewer inputs, they would simply do more local shopping because searching around for large volume price discounts would be less of a concern for them.

Nonetheless, the inherent sustainability-related drive to utilize fewer inputs apparently causes the more sustainable farmers to simply not generate as much economic activity in their local communities as do their more conventional counterparts. Thus, as was the case for the crop farmers' results, even though the more sustainable farmers might spend a greater percentage of their total

farming purchases locally, the fact that their total purchase volume is small compared to their more conventional peers makes them appear to be less locally loyal on the per acre spending basis.

Many of the farmers surveyed noted that one of the key reasons for calling themselves more sustainable was that they were making a conscious effort to use lower volumes of inputs like chemicals, fertilizers, and fuel in their operations. Other important characteristics of sustainable farming that were often cited by those surveyed included using alternative tillage practices, substituting animal manure for commercial fertilizer, and increasing overall farm profitability.

There is an interesting final note related to this topic. Twenty-six of the thirty farmers surveyed (eightyseven percent) said that they were more sustainable in 1992 than they were in 1988. Only four farmers (thirteen percent) said that over the last five years they had not changed positions on the sustainability/conventionality continuum used in this study. None of the farmers said that they had become more conventional in the last five years. It would therefore appear that more and more farmers are probably taking notice of various aspects of the sustainable agriculture movement. How this growing awareness of sustainability continues to affect local spending and a variety of other farm-related activities should make for

very interesting research endeavors in the months and years to come.

The age hypothesis had stronger support in the results chapter than did the sustainability/conventionality hypothesis, but it too seemed to not hold up as well as did the first two hypotheses of this thesis. Anecdotal and minor graphical support existed for this hypothesis, but as with the other three hypotheses, there were mixed tabular results. Many of those interviewed forwarded concepts that add logical support to the idea that older farmers may be more apt to make their farming expenditures locally, however. One of the most common points made was that older farmers tend to have more ties to local businesses because the people who are operating those entities are in many cases older and often have been associates and friends of the older farmers for many, many years.

Several people noted that older farmers, when compared to younger farmers, have lived through more stressful periods of time (war years, depressions, etc.) which in turn strengthened their loyalty to local communities and made them more prone to support those towns with their farming expenditures. A few respondents felt that the large changes in communication, computer, and transportation technologies have been more readily adopted by younger farmers as a means of procuring more of their farming needs non-locally and that these new tools have enabled younger farmers to shop

around more efficiently when compared to many older farmers. These anecdotal notes seem to offer stronger support to the age hypothesis than did the results presented in chapter three. Perhaps the age hypothesis is plausible in the general farm population, but this study's sample did not seem to offer a great deal of support for it.

In addition to the four hypothesized variables studied in this research project, a host of other farm and non-farm factors inevitably affect a particular farmer's propensity to spend locally for needed farm goods and services. Some of the non-farm attributes that were mentioned most in the interviews included the following: (1) church, school and bank location, (2) the level of community involvement a farmer takes on, (3) the location of off-farm jobs available for either spouse, (4) the increasing power of the media and advertising in farm families' lives, (5) the improvement of rural transportation systems, (6) local purchasing patterns that parents had established while the next generation's farmers were growing up, and (7) the greater degree of free time many types of Southwestern Minnesota farmers have today and the introduction of the concept of "recreational shopping" that may take more farmers out of their local areas for both family and farming needs.

On the more farm-related side, many of those interviewed noted that the advent of contracting may have increasingly important impacts on local spending. Simply

put, the contracting agreements many farmers are entering into often allow them to assume less financial risk, but these contracts can also take away point of purchase decisions regarding such basic inputs as feed, buildings, repairs and supplies, genetics, and livestock. Several of the smaller, younger farmers noted that it is becoming increasingly difficult for operations like theirs to acquire credit from small town banks. They stated that as more people are forced to get loans non-locally they may also begin purchasing more of their other farming needs from non-local sources as well.

All of these important variables regarding local spending for farming inputs point to several areas where additional study may be warranted. The scope of this paper, due to resource constraints, was limited to researching four potential characteristics that could affect local spending. Obviously many more exist and should be explored: profitability, tenancy, off-farm income, and business type are but only a few of the possible characteristics that could be reviewed.

Another area which this paper did not delve into is how different kinds of farmers spend locally for their personal needs. Are their differences between some of the types of farmers mentioned above in terms of where and why they make their family-related purchases? Is the tendency to make family expenditures locally related to only farming

characteristics like profitability and size, or rather to things like educational levels, a spouse's occupation, or the location of the children's school? Finally, do farmers differ from any other societal group regarding the propensity to spend locally for needed personal goods and services? These kinds of questions could be the basis for additional beneficial research.

Another potential research project could study how different community characteristics influence farmers' buying habits. Does community size and the number and type of businesses that are available in a particular town affect a farmer's ability to meet his or her farming needs in that community? Do different kinds of farmers produce significantly different economic multiplier affects within their communities and do these economic multiplier affects vary with the a community's characteristics such as size and current business climate?

Lastly, it would be a good follow-up to this paper's findings if a sample of the study area's merchants, who are selling the farmers their needed goods and services, could be interviewed. These agricultural business people could offer another perspective to the issue of how different kinds of farmers spend locally for their needs and their input could also go a long way in helping to make some predictions about how tomorrow's farmers will interact with local business people.

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