A COMPARISON
OF KANSAS FARM MANAGEMENT FARMS TO
ALL KANSAS FARMS

by

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# Table of Contents

<table>
<thead>
<tr>
<th>Title Page</th>
<th>i</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acknowledgements</td>
<td>ii</td>
</tr>
<tr>
<td>Table of Contents</td>
<td>iii-viii</td>
</tr>
<tr>
<td>Introduction</td>
<td>1-5</td>
</tr>
<tr>
<td>Focus</td>
<td>1</td>
</tr>
<tr>
<td>Hypothesis</td>
<td>3</td>
</tr>
<tr>
<td>Objectives</td>
<td>4-5</td>
</tr>
<tr>
<td>Historical Review of Data Sources</td>
<td>6-17</td>
</tr>
<tr>
<td>Sources of historical review</td>
<td>6</td>
</tr>
<tr>
<td>Association History</td>
<td>6-9</td>
</tr>
<tr>
<td>Farm Facts History</td>
<td>9-13</td>
</tr>
<tr>
<td>Census History</td>
<td>14-17</td>
</tr>
<tr>
<td>Methodology</td>
<td>18-25</td>
</tr>
<tr>
<td>Sources of Data</td>
<td>18</td>
</tr>
<tr>
<td>Variables and Statistical Tests</td>
<td>18-24</td>
</tr>
<tr>
<td>Definition of Variables</td>
<td>19-22</td>
</tr>
<tr>
<td>Explanation of Statistical Tools</td>
<td>22-24</td>
</tr>
<tr>
<td>Summary of Methodology</td>
<td>24-25</td>
</tr>
<tr>
<td>Results</td>
<td>26-56</td>
</tr>
<tr>
<td>Association versus Census</td>
<td>26-43</td>
</tr>
<tr>
<td>Size of Farm</td>
<td>28</td>
</tr>
<tr>
<td>Crop Acres</td>
<td>28</td>
</tr>
<tr>
<td>Harvested Acres</td>
<td>31</td>
</tr>
<tr>
<td>Gross Sales</td>
<td>31</td>
</tr>
<tr>
<td>Age of Operator</td>
<td>34</td>
</tr>
</tbody>
</table>
Farm Size Distribution............................................. 34
Operator Distribution............................................. 39
Association versus Farm Facts.................................. 44-56
Size of Farm....................................................... 44
Gross Sales......................................................... 44
Gross Farm Income................................................ 44
Net Farm Income.................................................. 49
Total Farm Expenses............................................. 49
Inventory Adjustment............................................. 49
Net Cash Income................................................... 53
Summary of results............................................... 53-56
Discussion and Conclusion....................................... 57-62
    Discussion..................................................... 57-61
    Conclusion.................................................... 62
Bibliography...................................................... 63
Appendix 1....................................................... 64-69
Appendix 2....................................................... 70-75
Appendix 3....................................................... 76-141
Abstract
## List of Tables

<table>
<thead>
<tr>
<th>Table</th>
<th>Summary of data for Association and Census comparison</th>
<th>Page #</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Association 1</td>
<td>64</td>
</tr>
<tr>
<td>2.1</td>
<td>Association 2</td>
<td>65</td>
</tr>
<tr>
<td>3.1</td>
<td>Association 3</td>
<td>66</td>
</tr>
<tr>
<td>4.1</td>
<td>Association 4</td>
<td>67</td>
</tr>
<tr>
<td>5.1</td>
<td>Association 5</td>
<td>68</td>
</tr>
<tr>
<td>6.1</td>
<td>Association 6</td>
<td>69</td>
</tr>
<tr>
<td>7.1</td>
<td>State</td>
<td>27</td>
</tr>
<tr>
<td>8.1</td>
<td>State</td>
<td>45</td>
</tr>
<tr>
<td>1.2</td>
<td>Association 1</td>
<td>70</td>
</tr>
<tr>
<td>2.2</td>
<td>Association 2</td>
<td>71</td>
</tr>
<tr>
<td>3.2</td>
<td>Association 3</td>
<td>72</td>
</tr>
<tr>
<td>4.2</td>
<td>Association 4</td>
<td>73</td>
</tr>
<tr>
<td>5.2</td>
<td>Association 5</td>
<td>74</td>
</tr>
<tr>
<td>6.2</td>
<td>Association 6</td>
<td>75</td>
</tr>
<tr>
<td>7.2</td>
<td>State</td>
<td>43</td>
</tr>
<tr>
<td>8.2</td>
<td>State</td>
<td>55</td>
</tr>
<tr>
<td>Table</td>
<td>Page #</td>
<td></td>
</tr>
<tr>
<td>-------</td>
<td>--------</td>
<td></td>
</tr>
<tr>
<td>9.0</td>
<td>Summary of variables from Census and Farm Facts data as a percent of Association data</td>
<td>56</td>
</tr>
<tr>
<td>10.0</td>
<td>Percent Crop Farms of Association Farms for 1985</td>
<td>58</td>
</tr>
<tr>
<td>Figure</td>
<td>Description</td>
<td>Page</td>
</tr>
<tr>
<td>--------</td>
<td>-----------------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>1</td>
<td>State map of Association areas as delineated by the Kansas Farm Management Association</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>Graph of mean Association and Census farm size, for All Farms data and farms with sales of $10,000 or more, State</td>
<td>29</td>
</tr>
<tr>
<td>3</td>
<td>Graph of mean Association and Census Crop Acres, for All Farms data and farms with sales of $10,000 or more, State</td>
<td>30</td>
</tr>
<tr>
<td>4</td>
<td>Graph of mean Association and Census Harvested Acres, for All Farms data and farms with sales of $10,000 or more, State</td>
<td>32</td>
</tr>
<tr>
<td>5</td>
<td>Graph of mean Association and Census Gross Sales, for All Farms data and farms with sales of $10,000 or more, State</td>
<td>33</td>
</tr>
<tr>
<td>6</td>
<td>Graph of mean Association and Census Age of Operator, for All Farms data and farms with sales of $10,000 or more, State</td>
<td>35</td>
</tr>
<tr>
<td>7-9</td>
<td>Graphs showing Association and Census Farm Size Distributions, for state data</td>
<td>36-38</td>
</tr>
<tr>
<td>10-12</td>
<td>Graphs showing Association and Census Operator Distributions, for state data</td>
<td>40-42</td>
</tr>
<tr>
<td>13</td>
<td>Graph of Association and Farm Facts mean Farm Size</td>
<td>46</td>
</tr>
<tr>
<td>14</td>
<td>Graph of Association and Farm Facts mean Gross Sales</td>
<td>47</td>
</tr>
<tr>
<td>15</td>
<td>Graph of Association and Farm Facts, mean Gross Farm Income</td>
<td>48</td>
</tr>
<tr>
<td>16</td>
<td>Graph of Association and Farm Facts, mean Net Farm Farm Income</td>
<td>50</td>
</tr>
<tr>
<td>17</td>
<td>Graph of Association and Farm Facts, mean Total Farm Expense</td>
<td>51</td>
</tr>
<tr>
<td>18</td>
<td>Graph of Association and Farm Facts, mean Inventory Adjustment</td>
<td>52</td>
</tr>
<tr>
<td>19</td>
<td>Graph of Association and Farm Facts, mean Net Cash Income</td>
<td>54</td>
</tr>
</tbody>
</table>

vii
## Appendices

<table>
<thead>
<tr>
<th>Appendix</th>
<th>Tables</th>
<th>Page #</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.1 through 6.1, see list of Tables</td>
<td>64-69</td>
</tr>
<tr>
<td>2</td>
<td>2.1 through 6.2, see list of Tables</td>
<td>70-75</td>
</tr>
<tr>
<td>3</td>
<td>Individual Association Graphs of each characteristic of the Association and Census comparison, by Association, in numerical order. Graphs are included in the following order:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Size of Farm</td>
<td>76-81</td>
</tr>
<tr>
<td></td>
<td>2. Crop acres per Farm</td>
<td>82-87</td>
</tr>
<tr>
<td></td>
<td>3. Harvested acres per Farm</td>
<td>88-93</td>
</tr>
<tr>
<td></td>
<td>4. Sales per Farm</td>
<td>94-99</td>
</tr>
<tr>
<td></td>
<td>5. Age of Farmer (All Farms data)</td>
<td>100-105</td>
</tr>
<tr>
<td></td>
<td>6. Number of Farms per size (distribution)</td>
<td>106-123</td>
</tr>
<tr>
<td></td>
<td>7. Tenure of Ownership (Operator Distribution)</td>
<td>124-141</td>
</tr>
</tbody>
</table>
Chapter 1

INTRODUCTION

The focus of this paper is to compare those farms enrolled in the Kansas Farm Management Association with the general population of farms in Kansas by analyzing specific characteristics from Association Farms and all Kansas Farms through the use of a "representative" farm. Association Data was taken from the Farm Management Data Bank located on the main frame computer at Kansas State University. The "representative" data was drawn from the Kansas Census of Agriculture\(^1\), and "Kansas Farm Facts," a publication of the Kansas State Board of Agriculture, Statistical Division\(^2\). The mean value of all farms included in these two data sources is what is implied when the term "representative or average Kansas Farm" is used.

The study will first compare the Association Farm Characteristics with the same characteristics taken from the Kansas Census of Agriculture. These variables will be examined by Association, as grouped by the Farm Management Associations (figure 1), as well as on a statewide basis. Subsequently, the second analysis will compare like


\(^2\) Kansas Agricultural Statistics, Kansas Farm Facts (Topeka, Kansas: Kansas State Board of Agriculture, Statistics Division, 1987).
Figure 1

KSU Farm Management Associations

☆ Association Headquarters
○ Satellite Office
variables between Association Farms with farms reported in the Farm Facts publication. Due to the nature of the Farm Facts data, this will only be a statewide comparison.

Since a similar study of this specific nature was not found, the final decision of which characteristics to be used in the study, were based on the criteria just discussed, and the advice of Dr. Larry Langemeier, who works closely with farm data relative to the Farm Management Association. The prevailing opinions about the relationship between these two farm sets are that Association Farms on average, larger and more prosperous than the average Kansas Farm. However, this study will determine if these opinions are in fact true, as well as whether, "Association Farms are larger" than all farms. Because opinions have been long in forming about the relationship between Association Farms and that of the average Kansas Farm, this study should clarify many uncertainties about this relationship.

The theoretical use of this study is somewhat limited, because no new principals are being examined or challenged. However, from a practical standpoint, the purpose of this paper is to present a clearer picture of the relationship, which will be the primary contribution of this study.

The basic hypothesis is that the mean of specific farm characteristics of the Association Farms is statistically equal to that of the average Kansas Farm. The statistical design of the study was developed to prove or disprove this fact. First, a simple t-test was used to compare each characteristics mean value for an Association Farm with the corresponding mean value of a Census or Farm Facts farm
operation. However, in two instances, where the characteristic is in the form of a distribution, a Chi-square goodness of fit test was used. The use of the hypothesis here is that of a point of inception from which the research design can be used to begin the clarification of the relationship discussed above.

The hypothesis and the research design were used collectively as the primary step in clarifying the relationship between Association Farms and the average Kansas Farm. In addition to determining the validity of the hypothesis stated above, an index (percent) was calculated comparing the average Kansas Farm and the mean Association Farm for each characteristic in both portions of the study. This step was included in order to provide a quantifiable relationship between the two groups in the study. The final step will be to draw practical conclusions from the study.

In the overall context of this study, a number of additional points need to be considered. First, the variables chosen were selected for their compatibility and availability, in addition to being valuable for a comparative insight. In other words, the characteristics needed to be similarly calculated in order for the comparison of mean values to be relevant. Second, these variables needed to be readily available in a workable format in order for the study to be feasible.

Statement of Objective

1) To clarify the relationship between Kansas Farm Management Farms and the farms in the general population of farms in Kansas.

2) Adequately describe this relationship.

3) Determine what the index (percent), of the Census or Farm Facts
data is of the Association Farms for each nondistribution characteristic.

4) Discuss the source and accuracy of data used in the study.

5) Determine value of conclusions for practical purposes.
Chapter 2

Historical Review of Data Sources

2.1 Sources for historical review

The history and review of the data came primarily from three sources. These sources will be referenced once for the entire chapter. The Association review came from an extension publication outlining '50 Years of Progress'. The history of the Farm Facts came from "The Rise of the Wheat State", and the Census review material came from a special historical addition of the 1982 Census of Agriculture.

Association History

The origins of the Kansas Farm Management Association dates back to the first specialist in Farm Management in 1909. By 1913 "there were five 'District Demonstration Agents.', working under a cooperative agreement with the office of Farm Management of the U.S.D.A., the Rock Island and Santa Fe Railways, and Kansas State College." Area bankers and business people provided lodging for these agents. Interest grew and a year later the first "Farm Management Demonstrators" were appointed. It was through the appointment of such an agent, and his work with farmers that the first Farm Account Book was developed in 1915.

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3 Leonard C. Parker, Extension Farm Management—A Model for Kansas Agriculture (Manhattan, Kansas: Cooperative Extension Service, Kansas State University, [1985]).


5 1982 Census of Agriculture, History.
These account books were distributed to farmers who were then encouraged to return them to the College for summary and analysis. The first Farm Account Clubs were formed in 1919 when over 14,000 Farm Account books were distributed. Educational concerns continued through the twenties to a point where professors in Agricultural Economics realized the need for farmers to learn more about farm organization, management, and the use of credit in their farm operation.

By 1922, a state Farm Management Demonstrator was appointed who revised the Kansas Farm Account Book and began helping farmers take inventories and keep a record of their financial transactions. During the twenties, funds became available to use such farmer information for teaching and research.

In 1930, partly on the initiative of similar programs in other states, the first "Farm and Home Management Associations" were established. Area bankers, with the support of the Kansas Bankers Association acted as treasurers for these Associations. Farm Management member farms are not chosen randomly. Associations solicit farmers for membership that are recommended by county agents. The individual Associations set their own membership fees. This could be limiting for some farmers.

The popularity of the program has continued to increase over the years as many adjustments have been made to keep pace with changes in agriculture. Today the Kansas Farm Management Association is comprised of six Associations covering every county in the state. The number of member farmers has fluctuated over the years. In 1980, there were 4382 member families while at the time of the 1986 annual report member
families numbered 3437. Each Association is serviced by two to five fieldmen, and operates under its owned budget and governed by a Board of Directors elected from its own members. The fieldman has the following responsibilities:

1. The fieldman visits each member on his farm to discuss individual problems and to help work out future plans.

2. He furnishes account books to record all farm business transactions and family living expenses and offers help on keeping records.

3. A computerized record system Financial Plus is available for operators desiring a computerized system, instead of an account book. With Financial Plus, a computer processes information from checks, deposit tickets and/or journal forms. Financial Plus is a basic computerized income and expense program. Additional options are available including a credit option, a payroll option, and an enterprise option.

4. On each farm visit, the fieldman checks the account book or K-MAR-105 reports and offers advice on any record keeping problems.

5. In November and December, the Farm Management Association office receives the account books and calculates 10- or 11-month totals for income to date to plan year-end tax
management strategies. At the end of the year, the year's business is totaled for preparing income tax returns and for analysis of the business operation.

6. Analysis figures for each farm and for averages of similar farms in an area are returned to each member.

7. All figures of individual farms are kept confidential and the account books are returned to each member.

8. Each spring the fieldman holds a "summary meeting" to review and discuss the previous year's records and management problems.

9. The fieldman of each Association send out newsletters that feature timely tips on farm management, reports of experiments and profitable practices used on other farms in the area.

10. An Association fieldman is available on a year-round basis to assist with record or business planning problems.  

From the work done with the individual farm records, the fieldman is also responsible for assembling this data for use in an annual report of Association Farms. This data is used in teaching and research, and the source of Association data used in this study.

Farm Facts History

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The Kansas State Board of Agriculture was founded in 1872, as an out-growth of the Kansas State Agricultural Society formed prior to Kansas becoming a state. According to I.D. Graham, the June following the admission of Kansas into the Union in 1861 the executive committee of the Society "prepared and sent out what is believed to be the first questionnaire relating to agriculture in the country, and from the information thus gained, they made a report to the legislature."

At the second annual meeting of the new State Board of Agriculture, the "statewide farmers' convention and the first state cooperative Association were organized." In addition, the Board established "a law to allow for the collection and publication of Kansas farm Statistics."

Under the first Secretary of the State Board of Agriculture, a policy was adopted in 1874 to "work through the interests of the state through statistical collection and dissemination, and the encouragement of immigration into the sparsely settled state." The Board's activities were broadened in 1875 with the inclusion of "an industrial and statistical bureau, a census commission..." in addition to relinquishing administration of the state fair.

One of the first ancestors of the Annual Report and Farm Facts was a series of periodical reports that were "published containing information for the settler and prospective immigrant". Under Major William Sims, Secretary from 1882 until 1887, the Board "established the system of crop reports, inaugurated cooperative agricultural experiments with the State Agricultural College...", and published reports in other languages to encourage immigration. It was not until the term of the
fifth Secretary's term, Mr. F. D. Coburn, that the Board reports became "agricultural, rather than immigration documents." In the late eighteen hundreds, the Board decided to make their reports more educational "in the area of agricultural techniques and information." However, in the early nineteen hundreds, the role of the Board became more regulatory, with the "extension education duties" being delegated to what is now Kansas State University. As a result of this evolvement, the reports became "statistical and informational pieces for farms and agribusinesses." This report became the Annual Report and Farm Facts that is still being published, although in 1986 the Agricultural Statistical Board published the Kansas Farm Facts publication separate from the annual report.

"The State Board of Agriculture members are elected by delegates from farm organizations across the state, rather than appointed by the Governor; the Secretary of the Board is appointed by Board Members, rather than the Governor."

The Board of Agriculture has worked closely with agriculture as the industry has developed in Kansas. The statistical division of the board is one of seven divisions that make up the Kansas State Board of Agriculture. This division of the Board, through primarily mail surveys, compiles Kansas farm statistics in its "Kansas Farm Facts" publication. Addresses used for these surveys are obtained from "the annual compilation of agricultural statistics which is made by county appraisers." Further information is drawn from printed articles that

reference farm units, as well as county agents and ASCS employees. Below is the organizational structure of the Kansas State Board of Agriculture.
Kansas State Board Of Agriculture

Secretary

Asst. Secretary

Laboratory

Entomology

Weed & Pesticide

Marketing

Statistics

Inspection

Water Resources

Egg

Control

Weights & Measures

Meat & Poultry
2.4 Census History

The Census of Agriculture (Census of Agriculture) provides a periodic statistical picture of a vital sector of the nation's economy. While much of the same kind of information collected in the census is gathered by other federal or state agencies in periodic or occasional surveys, the agricultural census is the only source of data comparable, county by county, and state by state, on a national basis. Further, the Census is the only report with statistical files that provide such data while classifying farms by size, type, tenure, type of organization and market value of farm products sold.

The first Census of Agriculture concluded in 1840 as part of a decennial census program that collected data on manufacturing, agriculture, and mining, as well as population. CQA remained a part of the decennial program until 1925, when a mid decade enumeration covering various economic areas, including agriculture, was added.

After 1925, the precise year of each agricultural Census was subject to some adjustment, although the reports usually followed a 5 year, or quinquennial cycle. Through 1940 the agricultural censuses was taken concurrently with other economic enumerations, but subsequent changes in the time schedule for the Censuses caused a divergence of the reference year.

In the 1950's, the Agricultural Census reference years were altered from years ending in "0" and "5" to those ending in "4" and "9", and by the early 70's the economic censuses were conducted for years ending in "2" and "7". In 1972, the Bureau of Census and Department of Commerce recommended that the economic and agricultural Censuses cover the same
reference year, and thus provide a greater degree of data comparability among the various censuses.

In '76, Congress enacted legislation (P.L.94-229) incorporating this recommendation, and the intercensal periods following the '74 and '78 Agricultural Census were shortened to 4 years each. The 1982 Census of Agriculture, the 22nd such enumeration, was carried out simultaneously with the other economic censuses. For the 1982 Census approximately 3.6 million forms were mailed the last week in December. There were then seven follow up mailings to those who did not respond, between January 1 and July 1, 1983. Large farm nonrespondents, believed to have $200,000 or more in sales, were contacted by phone.

The COA is carried out by the Bureau of the Census, an agency of the U.S. Department of Commerce. The Bureau is forbidden by law to publish any information that would identify any individual or establishment.

Approximately 14 percent of the addresses on the census mail list, generally smaller farms, never responded to the census. Also, certain data variables are collected only from about one out of every five farms. The bureau of the Census employed two kinds of statistical adjustment to compensate for (1) nonresponse and (2) the use of sampling to collect certain data: Imputation for nonresponse was carried out using a statistical procedure and data collected in a sample survey of addresses still nonrespondent to the census in April 1983, while stratification and sample weighting was a statistical procedure used to provide data estimates by extrapolating the characteristics of sample farms to estimate totals for selected data for all farms. That is, for
farm groups that did not respond sample surveys were taken. Then statistical tools were used, so that the data from these surveys could be used as estimates for a nonrespondent group.

**Imputation for Nonresponse**

The farms of those not responding were classified as "large" ($100,000+ in sales) or "small". In April the "large" farms were contacted by phone, and approximately 13,500 "small" farms were sent a follow up by mail. The latter was done to "develop estimates of the number of nonresponse cases that were farms". Then state level estimates of the percentage of nonrespondents were used to "estimate the number of nonrespondents for each county. Farms responding from similar groups were "randomly sampled to represent the nonrespondent farms." Otherwise in tabulating results some farms were calculated twice and others only once. This procedure assumed that "respondent and nonrespondent" farms were statistically similar for characteristics like acreage, size of herd, etc.

**Stratification and sample weighting**

In the '82 and '78 census data was included that was obtained through a random sampling of farms. A follow up survey of requesting only a sample of items was sent to farms considered having "complex organizational structure (e.g. multiunit operations)", and "large" farms. The definition of the latter varied by state. The total farms for this follow up survey comprised about twenty percent of all farms, but since nearly half of the addresses assembled did not represent farms, only a portion of the farms were used in tabulating the data. "To improve the accuracy of the estimates drawn from the sample", the
Bureau created 128 new categories formed from 8 sales groups, that where divided by 8 coded groups and then by two acreage groupings. "The Bureau multiplied the data from sample farms by the ratio of total farms to sample farms in each stratum to develop the estimates for the sample items." All data was checked and reviewed by "Agricultural Division Analysts". These critiques were then passed on to "Representatives of USDA's Statistical Reporting Service's (SRS) State offices who also reviewed the analytical tables and criticism sheets".

Historical Background

Over the years the practical development of the census has resulted in creation of "six subject areas of data collection including agriculture, each with a separate list of questions". The mail census was not adopted until the 1969 census and has been used for every census since then. Prior to that the survey information was obtained through "farm to farm canvassing". Address lists were compiled from the 1964 census, Internal Revenue Service, Social Security Administration, and U.S. Department of Agriculture files.

Even though the "mailout/mailback" method had problems stemming from an accurate address list and receiving "timely responses from operators...the overall coverage obtained is only marginally lower than the results of the old canvassing methodology." It was thought that tax savings and convenience offset the disadvantages.
3.1 Source of Data

The first phase of this study was to assemble the data by characteristics, for the periods considered. The Census data is in two forms. First, the data is provided for all farms in the Census population. This data covered the years 1974, 1978, and 1982. Second, the Census provides information for farms with Gross Sales of agricultural products of $10,000 or more, which was available for 1978 and 1982. The second analysis, that compares Association and Farm Facts data for specific characteristics, includes data for the period of 1973 through 1985.

Data for All Farms and those farm with sales of $10,000 or more were assembled by county on a microcomputer worksheet. Counties were grouped geographically by Association according to the Kansas Farm Management Association areas (figure 1). Then the individual Association worksheets were then summed, or averaged where appropriate, for each characteristic for both Association and Census data.

3.2 Variables and Statistical tests.

Statistical t-tests were used to compare means for all characteristics except for the Farm Size and Tenure of Ownership distributions. In the case of these two characteristics, a Chi-square goodness of fit test was used to test whether Association Farms were
distributed randomly in the population of Census Farms. Averages were calculated for each characteristic for both the Census and Farm Facts sources of data. For the time span of the data, ratios of averages were used as an index to compare Census data to Association Farms, for each characteristic. The specific variables used in the Census comparison part of the study are as follows:

1. Size of Farm
2. Crop acres per Farm
3. Harvested acres per Farm
4. Sales per Farm
5. Age of Farmer (All Farms only)
6. Number of Farms per size (distribution)
7. Tenure of Ownership (Operator Distribution)

The data used in the state Kansas Farm Facts comparison was assembled as discussed above, only on a statewide basis. Ratios of period averages were used to calculated indices of Farm Fact Farms to Association Farms for each variable. The variables used in this second analysis of the study are were follows:

1. Gross Sales
2. Gross Farm Income
3. Net Farm Income
4. Total Farm Expenses
5. Inventory Adjustment
6. Net Cash Income
7. Size of Farm

Definition of Variables

Farm:

1) Association counts only those farms who enroll in the Farm Management Association programs. However,

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the number of farms used in compiling the Farm Management Data Bank will not equal actual membership because corporate and partnership operations are counted as one farming unit.\(^9\)

2) Census Criteria:

a) The land involved must be used or associated with agricultural operations, and,

b) Must be operated under the day to day control of one individual or management (partnership or corporation).

c) Agricultural production must be involved in the production of livestock, poultry or animal specialties and their products; and/or the production of crops, including fruits, and greenhouse or nursery products.

d) Must have a total value of agricultural products sold of $1,000 or more.

Note: Census and farm counts are made on the basis of the individual operating unit, but land comprising the "farm" need not make up a single continuous tract.\(^{10}\)

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\(^9\) Statement by Dr. Larry Langemeier, Agricultural Economist, Manhattan, Kansas, 1988.

3. Farm Facts: Any operation with annual agricultural product sales of $1,000 or more.\textsuperscript{11}

Size of Farm: Total number of owned and rented acres operated by the farm operation.

Crop Acres: Number of crop acres planted.

Harvested Acres: Number of acres harvested.

Gross Sales: Gross receipts of agricultural products sold during calendar year. For this study, the value does not include the purchase cost of livestock. This was the definition used for all data sources.

The following variables pertain to the Farm Facts study only.

Net Sales: Gross Sales - Livestock purchases. (This variable was used in tabulation of other variables, and thus not included as a comparison variable)

Gross Farm Income: Gross Sales - Livestock Purchases + inventory adjustment.

Total Farm Expenses: Cash Operating expenses for farm operations, including livestock purchases.

Net Farm Income: Gross Farm Income - Total Farm Expenses + Livestock Purchases.

Inventory Adjustment: Gross Farm Income - Net Sales. (Association) Gross Production Value - estimate of sales and on farm use. (Farm Facts)


Net Cash Income: Net Sales - Total Farm Expenses +

\textsuperscript{11} Kansas Farm Facts, p. 1.
Depreciation.\textsuperscript{12}

Note: Livestock purchases are included in total farm expenses for Farm Facts data. For Association data, livestock purchases are not included in total farm expenses; but instead subtracted from Gross Sales in the derivation of Gross Farm Income. Thus, to allow comparison of these two important variables, livestock purchases were subtracted from Gross Sales to obtain Gross Farm Income and included in Total Farm Expenses. Since livestock purchases were both removed from Gross Farm Income and included in Total Farm Expenses, the value of the livestock purchases needed to be added to Net Farm Income when this variable was computed.

The basic statistical tool used in both studies was that of a simple t-test. For this test the hypothesis stated in the introduction will be considered the null hypothesis. Ho: $\mu_a = \mu_b$, where $\mu_a$ is the mean of Association Farms, and $\mu_b$ the mean for the Farm Facts or Census Farm population for a specific variable. The alternative hypothesis would be that these means are not equal. For this test the population of the Association Farms is assumed to be a random sample of all farms used to compile Census or Farm Facts data and give an unbiased estimate of the mean for all Kansas Farms. If the Null Hypothesis is rejected, the sample of Association Farms appears to give a biased estimate of the mean for all Kansas Farms. For this study the Census or Farm Facts data is considered as the population of Kansas Farms. Although all farms did not answer the Census survey, Census data is considered for this study to be a unbiased representation of all Kansas Farms. The t-test formula used is as follows:

$$t = \frac{\bar{y} - \mu_0}{s_\bar{y}}$$

$\bar{y} = \text{sample mean (Association)}$

\textsuperscript{12} Langemeier, 1988.
\[ \mu_0 = \text{Population mean (All Farms: Census or Farm Facts)} \]

\[ S_Y = \text{Standard error of mean for Association Farms} \]

The null hypothesis is rejected if the following condition holds for a specified value of \( \alpha/2 \), which for this study is .05, and degrees of freedom (df) of \( n - 1 \).

\[ \text{Reject } H_0 \text{ if } |t| > t_{0.05/2}^{13} \]

Due to the large number of Association Farms, \( t_{0.10/2} = + .05 \), values for infinity df were used; namely 1.645.

The other primary statistical test used was a Chi-square Goodness of Fit test used on the probability distributions of the Farm Size and Tenure of Operator distribution characteristics described earlier. This test was used only for the Census comparison. The Chi-square formula used is as follows:

\[
\chi^2 = \sum_{i=1}^{k} \frac{(\text{obs}_i - \text{Exp}_i)^2}{\text{Exp}_i}
\]

\[ \text{df} = k - 1 \]

\[ \text{obs}_i = \% \text{ of farms in category (Association)} \]

\[ \text{exp}_i = \# \text{ of farms expected in the } i \text{th category.} \]

The farms expected in each category were calculated by taking the number of farms in the sample (Association) times the percent of farms in that category of all Census Farms. This test is used for examining studies with possible multinomial outcomes.14 In this test the null

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13 Lyman Ott, p. 157.
14 Ibid., p. 179
hypothesis would be stated $H_0$: $P_1 = P_{10}$

\[ \vdots \]

\[ P_k = P_{k0} \]

The Null hypothesis states that Association Farms are hypothetically distributed in the same proportion as All Farms (Census). The alternative hypothesis would be that at least one of the percentages expected for a distribution category, will differ from what is hypothesized. If this hypothesis is not rejected, then the Association Farms are "representative" of all farms for the particular variable tested. "When one or more of the expected values are incorrect, the observed expected value will differ significantly, making $X^2$ large", and thus increasing the possibility of rejecting the null hypothesis.\(^{15}\)

The Null hypothesis is rejected if the Chi-square value for the region being tested exceeds the tabulated critical value for a specified significance level and degrees of freedom equal to $(k-1)^{16}$. In the case of the Farm Size Distribution variable $K$ equals five, since there are five size categories, and degrees of freedom would be $(K - 1)$ or 4. The tabulated Chi-square value for $df = 4$ and $\alpha = .10$ is 7.78. The Operator distribution $df$ would then be $(3-1)$ or 2, and the tabulated chi-square value is 4.61.

For the purpose of this study, a rejection of the null hypothesis would assert that the Association Farms are not distributed as would be expected if they were a representative sample for the farm population. Tabulated $t$-values and Chi-square values were included with the

\(^{15}\) Ibid., p. 178.

\(^{16}\) Ibid., p. 180.
3.3 Summary of Methodology

The steps taken in the research process began with the assembly of data by county, or state, where appropriate. Next the county data was grouped by Association, summarized and put into tabular form. Statistical methods were used to determine the statistical relationship between data sets. The latter was used in order to check the validity of the representativeness of the Association Farms compared to an average Kansas Farm. Finally, in order to quantify this relationship, percentages between the average Kansas Farm and the mean Association Farm were calculated to determine the quantitative link based on the variables studied. These percentages were calculated for all variables either by Association or by state, depending on the analysis section.

A subsequent effort to clarify this relationship was to graph all the data, for each data period, in a format of comparative mean values. These graphs were created for each characteristic for both comparison studies. Graphs for the Census analysis were created, by Association and state, while the Farm Facts graphs were only on a state-wide basis.
Chapter 4

Results

This study used two analysis to compare Association Farms with all Kansas Farms. First, Association Farms were compared with farms comprising the Census data using specific characteristics, common to both farm groups. The second analysis compared Association Farms with farms comprising Farm Facts data using another set of characteristics common to these two farm groups. There were two characteristics shared by the two analysis, Farm Size and Gross Sales.

Association Versus Census

The results presented will be for the following comparison characteristics: Size of Farm, Crop Acres per Farm, Harvested Acres per Farm, Gross Sales per Farm, Age of Operator, Farm Size Distribution, and Operator Distribution. As state results will be used for an example of each characteristic, Table 7.1 shows summary data for state data. Individual Association results are found in Appendixes. Summary tables for each characteristic by Association are found in Tables 1.1-6.1 in Appendix 1. Further, each Association's summary table of all statistical tests run for the Association and Census comparison, are located in Tables 1.2-6.2 of Appendix 2. The following farm set definitions were used.

All Farms: Refers to all farms, with no sales limitation, that make up the Association or Census data set.

$10,000+: Refers to those farms with Gross Sales of at least ten thousand dollars or more. This is for Association and Census data.
<table>
<thead>
<tr>
<th>Census Comparison State Figures</th>
<th>Association Data (all farms)</th>
<th>Census Data (all farms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number Of Farms</td>
<td>2603.00</td>
<td>3031.00</td>
</tr>
<tr>
<td>Size of Farm (mean)</td>
<td>1409.49</td>
<td>1363.32</td>
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<tr>
<td>Crop Acres (mean)</td>
<td>866.73</td>
<td>832.28</td>
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<td>Harvested Acres (mean)</td>
<td>NA</td>
<td>696.02</td>
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<td>Gross Sales (Mean)</td>
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<td>152103.02</td>
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<tr>
<td>Number Of Farms/Size</td>
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<td></td>
</tr>
<tr>
<td>1 to 219 Acres</td>
<td>61.00</td>
<td>216.00</td>
</tr>
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<td>220 to 499 Acres</td>
<td>311.00</td>
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<td>827.00</td>
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<td>1000 to 1999 Acres</td>
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<td>1043.00</td>
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<td>516.00</td>
<td>595.00</td>
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<td>Ownership (Farms)</td>
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<td>Full Owners</td>
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<td>Part Owners</td>
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<td>2463</td>
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<tr>
<td>Tenants</td>
<td>221</td>
<td>208</td>
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<tr>
<td>Age of Operator (mean)</td>
<td>46.84</td>
<td>46.90</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Census Comparison State Figures</th>
<th>Association Data ($10,000 &gt; sale)</th>
<th>Census ($10,000 &gt; sales)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number Of Farms</td>
<td>2984.00</td>
<td>2703.00</td>
</tr>
<tr>
<td>Size of Farm (mean)</td>
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<td>1437.87</td>
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<td>Crop Acres (mean)</td>
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<td>Harvested Acres (mean)</td>
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<td></td>
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<td>220 to 499 Acres</td>
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<td>309.00</td>
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<td>737.00</td>
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<td>1000 to 1999 Acres</td>
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<td>885.00</td>
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<td>2000 or &gt; Acres</td>
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<td>604.00</td>
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<td>Full Owners</td>
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<td>289</td>
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<tr>
<td>Part Owners</td>
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<td>2225</td>
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<tr>
<td>Tenants</td>
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<td>198</td>
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<tr>
<td>Age of Operator (mean)</td>
<td>46.97</td>
<td>47.20</td>
</tr>
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</table>
4.1a Size of Farm

Statistically, the mean farm size was not equal for Association and Census Farms for any of the six Associations. On a statewide basis (figure 2), for All Farms data, Census Farms ran forty-five percent the size of Association Farms. When examining those farms with Sales of $10,000 or more, the percent of Census to Association Farms for this variable increase to about sixty-five. This quantitative relationship was representative of all Associations except for Associations two and three. In Association 2, Census farms were 47% the size of Association Farms for All Farms data and 74% for those farms with sales of $10,000 or more. For Association three, the percentages were sixty-two and seventy-three percent respectfully. Graphs for these and other individual Association characteristics are assembled in Appendix 3.

4.1b Crop Acres

For the three years of All Farms data, Census Farms were approximately 51 percent of Association Farms for crop acreage (figure 3). This percent increased about twenty percent when considering farms with sales over ten thousand dollars. As with the above characteristic, the mean average crop acreage was not statistically equal between the two farm groups for any of the six Associations. The smallest increase in percentage when moving from All Farms data to those farms with sales of $10,000 or more, was found for Association one. Here the percent change when moving from All Farms data to the minimum sales farm group was about two percent, from 52 to 54 percent. The largest change was from 48 to 74 percent in Association six. Individual Association graphs are located, in Appendix three.
Figure 2

Census & Association Comparison

State: AVG. SIZE OF FARM (ALL FARMS)

Census % of Association for Period Shown
45.0%

Census & Association Comparison

State: AVG SIZE OF FARM ($10,000+)

Census % of Association for Period Shown
64.8%
Figure 3
Census & Association Comparison

State AVG. CROP ACRES (ALL FARMS)

Census % Of Association For Period Shown: 50.6%

Census Comparison: $10,000+ In Sales

State: AVERAGE CROP ACRES PER FARM

Census % Of Association For Period Shown 71.1%
4.1c Harvested Acres

This characteristic comparison shows the same type of relationship as the crop acreage, except that the percentage drops roughly twelve percent for state data (figure 4). For example, for All Farms Crop Acres data, the index of Census to Association Farms was about 51 percent, while the same index for Harvested acres was approximately 44 percent. Among the different Associations, this percentage drop, between crop and harvested acreage, ran from about ten to fifteen percent for all Associations except number three. For Association three, the change in the index for All Farms data, was less than one percent. When considering rounding error, there is no real difference existed. The change in the index for farms with sales of $10,000 or more was less than five percentage points.

4.2 Gross Sales

For Gross Sales on a state basis, Census Farms had Gross Sales of agricultural products that were 42 percent that of Association Farms (figure 5). When farms with Gross Sales of less than $10,000 are omitted from the data, this percent increased to about sixty-six percent. In an examination of the individual Associations, the relationship of Gross Sales for Association Farms being larger than Census Farms held for all but one Association. In Association three, the index dividing period means of Census and Association data shows the opposite relationship. For All Farms, Census average sales run about 18 percent above Association Farms. When examining the farms with larger sales the percent difference is approximately 60 percent. Finally, statistically, no mean values were equal between Census and Association
Figure 4

Census & Association Comparison

State: AVG HARVESTED ACRES (ALL FARMS)

Census % Of Association For Period Shown 43.9%

Census Comparison: $10,000+ In Sales

State: AVERAGE HARVESTED ACRES PER FARM

Census % Of Association For Period Shown 58.2%
Figure 5

Census & Association Comparison

Census % Of Association For Period Shown: 41.6%

Census Comparison: $10,000+ In Sales

Census % Of Association For Period Shown: 65.7%
Farms for Gross Sales.

Other Characteristics

4.3a Age of Operator

Figure 6 shows that Census Farm Operators average about nine percent older than Association Farmers. The data was insufficient to calculate the same percentages for farms with sales of more than $10,000. The relationship shown here is representative of the individual Associations for Age of Operator. State and Association graphs are included in Appendix 3.

4.3b Farm Size Distribution

Figures 7-9 display the Farm Size Distributions for All Farm data, and for farms with sales of $10,000 or more for the Association and Census comparison study. Chi-square goodness of fit tests were run to determine whether or not Association Farms were distributed in the same proportion as Census Farms. See Tables 1.2-6.2 in Appendix 2 for the six Association summary tables. The results showed, that statistically, Association Farms were not distributed in the same proportions as Census Farms regarding farm size.

Figure 7 and the top half of figures 8 and 9 show the state size distribution for All Farms data, for Association and Census farms. The figures indicate that Census Farms were skewed toward the smaller farm size categories, while Association Farms were more prevalent in a range from 500 to 1999 acres. For farms with sales of $10,000 or more, Census Farms shifted their percent distribution toward the 500 to 999 acre size category. In general, comparing All Farms size distribution to $10,000+ size distribution, the latter farm group was always skewed towards the
Figure 6

Average Age Of Farmer

Census % Of Association For Period: 109.3%
Farm Size Distribution

State All Farms 1974

<table>
<thead>
<tr>
<th>Farm Size Categories</th>
<th>Percent of Total Farms</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 219 Acres</td>
<td>35%</td>
</tr>
<tr>
<td>220 to 499 Acres</td>
<td>20%</td>
</tr>
<tr>
<td>500 to 999 Acres</td>
<td>25%</td>
</tr>
<tr>
<td>1000 to 1999 Acres</td>
<td>40%</td>
</tr>
<tr>
<td>2000+ acres</td>
<td>5%</td>
</tr>
</tbody>
</table>

Legend:
- Association
- Census
Farm Size Distribution

State All Farms 1978

Farm Size Distribution

State $10,000+ Sales 1978
Farm Size Distribution

State All Farms 1982

Farm Size Distribution

State $10,000+ Sales 1982
larger farm sizes. This tendency was found in varying degrees for All Associations. However, Association 3 found Census Farms distributed more normally for the All Farms data. From that point, the $10,000 sales farm group, was skewed toward the top two size categories. Individual Association Graphs are located in Appendix 3.

4.3c Operator Distribution

For Operator Distribution, the Chi-square test demonstrated that Census and Association Farms, were statistically unequal. Figures 10-12 show these distributions from state data, for All Farms and farms with $10,000 or more in sales. These figures show that Association farm operators were primarily Part Owners. The All Farms state data showed that Census farm operators had similar percentages of farms in Full and Part Owners categories. However, when examining the farms with sales of at least $10,000, the percent of Census farm operators becomes dominated by Part Owners. In both cases Association Farms were comprised predominately of Part Owner operators. When examining the individual Association distribution graphs (appendix 3), a specific pattern for the All Farms Census data set did not exist. For Association 4 and 6 the farm operators were dominated by Full Owners. Those farms with a minimum sales requirement, again showed the major percentage of operators as Part Owners. For the other Associations, the Part Owner category had a slightly higher percentage of farms than the Full Owner category. For farms with sales of ten thousand dollars or more every Association had distributions similar to the state data. Table 7.2 exhibits the summary data for all statistical test run for the Association and Census analysis.
Operator Distribution (by percent) 1974

STATE ALL FARMS

PERCENT OF TOTAL FARMS

Full Owner  Part Owners  Tenants

Operator Distribution Categories

CENSUS

ASSOCIATION
Operator Distribution (by percent) 1982

Operator Distribution Categories
- CENSUS
- ASSOCIATION

Operator Distribution (by percent) 1982

Operator Distribution Categories
- CENSUS
- ASSOCIATION
Table 7.2
State (all farms)

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<tr>
<th></th>
<th>t value74</th>
<th>t value78</th>
<th>t value82</th>
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<tbody>
<tr>
<td>Average Size of Farm</td>
<td>36.95</td>
<td>34.83</td>
<td>33.60</td>
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<tr>
<td>Average Crop Acres/Farm</td>
<td>30.92</td>
<td>28.76</td>
<td>26.96</td>
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<tr>
<td>Average Harv. Acres/Farm</td>
<td>NA*</td>
<td>32.13</td>
<td>35.12</td>
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<tr>
<td>Average Sales Per Farm</td>
<td>32.28</td>
<td>21.47</td>
<td>22.37</td>
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<tr>
<td>Average Age Of Farmer</td>
<td>-21.81</td>
<td>-16.27</td>
<td>-15.04</td>
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<td>Table t-values</td>
<td>1.645</td>
<td>1.645</td>
<td>1.645</td>
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<td>Farms Size Distribution</td>
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<tr>
<td>Table Chi-square values</td>
<td>7.78</td>
<td>7.78</td>
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<tr>
<td>Ownership Distribution</td>
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<td></td>
<td></td>
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<tr>
<td>Table Chi-square values</td>
<td>4.61</td>
<td>4.61</td>
<td>4.61</td>
</tr>
<tr>
<td>* Not able to calculate</td>
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FARMS WITH SALES OF $10,000 OR MORE

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<th></th>
<th>t value78</th>
<th>t value82</th>
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</thead>
<tbody>
<tr>
<td>Average Size of Farm</td>
<td>22.38</td>
<td>22.49</td>
</tr>
<tr>
<td>Average Crop Acres/Farm</td>
<td>17.75</td>
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<tr>
<td>Average Harv. Acres/Farm</td>
<td>24.49</td>
<td>25.91</td>
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<tr>
<td>Average Sales Per Farm</td>
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<td>Ownership Distribution</td>
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<tr>
<td>Table Chi-square values</td>
<td>4.61</td>
<td>4.61</td>
</tr>
</tbody>
</table>
Association versus Farm Facts

In this section, comparison results of various characteristics are shown for Association Farms with those farms included in the Kansas Farm Facts publication. Table 8.1 summarizes all data for this analysis. Data included for both farm groups covers the period of 1973 through 1985.

4.4a Size of Farm

Figure 13 shows the mean farm sizes for Association and Farm Fact farms for the entire data period. T-tests for equality of means were run for each year of the data. These tests revealed that there was no year where the mean farm size for Association Farms and Farm Facts Farms, were statistically equivalent. Over the data period, the mean farm size for Farm Facts data, was approximately 45 percent of the mean Association farm size. Note, that Census Farms were also about 45 percent of Association Farms.

4.4b Gross Sales

T-test run for equality of means, found no equality of mean Gross Sales between Association and Farm Facts data. The index of Farm Facts to Association data for Gross Sales, was about 49 percent for the data period (figure 14). This is roughly seven percent above the same index calculated for Census and Association Farms Gross Sales, but was calculated for a longer time span.

4.4c Gross Farm Income

The t-test revealed, that there was no year where the mean Gross Farm Income of Farm Facts and Association Farms, were statistically equivalent. Mean values graphed in figure 15, resulted in an index of
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<tr>
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<tbody>
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<td><strong>Association Data</strong></td>
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</tr>
<tr>
<td>Number of Farms</td>
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<td>2,561</td>
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<td>2,977</td>
<td>3,031</td>
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<td>3,148</td>
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<td>Gross Sales (mean)</td>
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<td>$116,401</td>
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<td>$124,392</td>
<td>$152,103</td>
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<td>Gross Farm Income (mean)</td>
<td>$122,444</td>
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<td>$103,359</td>
<td>$94,492</td>
<td>$103,671</td>
<td>$133,934</td>
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<td>Net Farm Income (mean)</td>
<td>$56,735</td>
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<td>$21,493</td>
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<td>1,395</td>
<td>1,376</td>
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<tbody>
<tr>
<td><strong>Association Data</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Number of Farms</td>
<td>2,956</td>
<td>2,713</td>
<td>2,422</td>
<td>2,413</td>
<td>2,360</td>
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<tr>
<td>Gross Sales (mean)</td>
<td>$191,600</td>
<td>$195,476</td>
<td>$195,560</td>
<td>$203,893</td>
<td>$205,536</td>
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<tr>
<td>Gross Farm Income (mean)</td>
<td>$138,507</td>
<td>$153,095</td>
<td>$151,857</td>
<td>$154,296</td>
<td>$151,574</td>
</tr>
<tr>
<td>Net Farm Income (mean)</td>
<td>($4,809)</td>
<td>$8,716</td>
<td>$6,180</td>
<td>$1,252</td>
<td>$2,027</td>
</tr>
<tr>
<td>Total Farm Exp. (mean)</td>
<td>$181,686</td>
<td>$191,013</td>
<td>$187,649</td>
<td>$202,353</td>
<td>$198,091</td>
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<tr>
<td>Inventory Adjust. (mean)</td>
<td>($14,734)</td>
<td>$4,551</td>
<td>($266)</td>
<td>($279)</td>
<td>($4,419)</td>
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<tr>
<td>Net Cash Income (mean)</td>
<td>$27,810</td>
<td>$23,477</td>
<td>$29,049</td>
<td>$24,101</td>
<td>$29,785</td>
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<tr>
<td>Size of Farm (mean)</td>
<td>1,398</td>
<td>1,414</td>
<td>1,377</td>
<td>1,407</td>
<td>1,422</td>
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<tbody>
<tr>
<td><strong>Kansas Farm Facts</strong></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Farms</td>
<td>86,057</td>
<td>86,057</td>
<td>79,000</td>
<td>78,000</td>
<td>77,000</td>
<td>76,000</td>
<td>75,000</td>
<td>75,000</td>
</tr>
<tr>
<td>Gross Sales (mean)</td>
<td>51,940</td>
<td>48,489</td>
<td>45,825</td>
<td>50,288</td>
<td>56,594</td>
<td>63,088</td>
<td>90,265</td>
<td>82,828</td>
</tr>
<tr>
<td>Gross Farm Income (mean)</td>
<td>44,374</td>
<td>40,204</td>
<td>42,304</td>
<td>42,189</td>
<td>44,284</td>
<td>52,983</td>
<td>69,293</td>
<td>60,375</td>
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<tr>
<td>Net Farm Income (mean)</td>
<td>$18,118</td>
<td>$12,325</td>
<td>$9,876</td>
<td>$16,228</td>
<td>$6,036</td>
<td>$5,850</td>
<td>$10,917</td>
<td>$1,792</td>
</tr>
<tr>
<td>Operating Expenses (mean)</td>
<td>36,141</td>
<td>32,814</td>
<td>36,048</td>
<td>43,690</td>
<td>48,104</td>
<td>63,128</td>
<td>60,009</td>
<td>79,525</td>
</tr>
<tr>
<td>Inventory Adjust. (mean)</td>
<td>1,865</td>
<td>(3,786)</td>
<td>1,799</td>
<td>(350)</td>
<td>(2,452)</td>
<td>5,869</td>
<td>659</td>
<td>(5,093)</td>
</tr>
<tr>
<td>Net Cash Income (mean)</td>
<td>19,861</td>
<td>20,389</td>
<td>13,927</td>
<td>13,438</td>
<td>15,860</td>
<td>7,583</td>
<td>19,928</td>
<td>13,528</td>
</tr>
<tr>
<td>Size of Farm (mean)</td>
<td>587</td>
<td>590</td>
<td>616</td>
<td>623</td>
<td>629</td>
<td>636</td>
<td>644</td>
<td>644</td>
</tr>
</tbody>
</table>
Figure 13

Kansas Farm Facts: State Comparison

![Graph showing the size of farms over years, with the mean size of farms and the percentage of farms with a specific size. The graph compares Kansas Farm Facts with the Association for a period from 1973 to 1985.](image-url)
Figure 14

Kansas Farm Facts: State Comparison

Farm Facts % Of Association For Period Shown 48.9\%
Figure 15

Kansas Farm Facts: State Comparison

Gross Farm Income Per Farm

Farm Facts %
Of Association for period
Shown: 45.1%
Farm Facts to Association data of approximately 45 percent.

4.4d Net Farm Income

T-tests for mean equality, for Association and Farm Facts' Net Farm Income found that in 1976 and 1982, means were statistically equivalent. As is shown in figure 16, Farm Facts Net Farm Income was 50 percent of Association Net Farm Income for the data period. Yet, this relationship was not consistent over the data period. In the final four years of data, Farm Facts mean values were greater than Association means (about 85% on average). One year, 1982, was also a year when mean Net Farm Income for Association and Farm Facts data was statistically equivalent. This may have been due in part to a change in Association Farms Inventory Adjustment. Prior to 1982 the mean Inventory Adjustment for Association Farms varied widely from year to year, while Farm Facts mean adjustments were not only smaller in quantity, but less volatile.

4.4e Total Farm Expenses

The t-tests ran for comparing Total Farm Expense means, revealed no years where Association and Farm Facts data were statistically equivalent. The ratio of period averages (index), showed that Total Farm Expenses were approximately 42 percent of Association Farms, for this characteristic (figure .17). As the graph reveals, this relationship was similar for each year of the data period.

4.4f Inventory Adjustment

An examination of the t-tests ran for this characteristic revealed that in 1980, 83, 84, the mean Inventory Adjustment, of Farm Facts and Association data, were statistically equivalent. Figure 18 shows the graph of mean Inventory Adjustment for the two data sources. For the
Figure 16

Kansas Farm Facts: State Comparison

Net Farm Income Per Farm

Farm Facts % Of Association For Period Shown: 50.3%

Year


Association Kansas Farm Facts
Figure 17

Kansas Farm Facts: State Comparison

Farm Facts % Of Association For Period Shown 41.8%
Figure 18

Kansas Farm Facts: State Comparison

Inventory Adjustment (Per Farm)

Farm Facts %
Of Association
For Period Shown
-6.57%

Year

Association
Kansas Farm Facts
period, Farm Facts data was about minus seven percent of Association data; but, in the last four years of data, mean values were much closer. The affect of this change is best shown in the final four years of Net Farm Income (figure 16).

4.4g Net Cash Income

The statistical t-test for equality of means, did not reveal any one year where this characteristic's mean value was equivalent for the two farm groups. The graph of the two farm groups mean values (figure 19), shows that the Farm Facts percent of Association data may vary considerably from year to year. Over the entire period, mean Farm Facts data ran 64 percent of Association data for Net Cash Income. Table 8.2 summarizes statistical tests of the Association and Farm Facts analysis.

As analysis summary, Table 9 indicates the quantitative relationships between the three farm groups.
Kansas Farm Facts: State Comparison

![Chart showing net cash income (per farm) for Kansas farms and comparison with National (Nat) and California (Caah) income data. Farm Fact % Of Association For Period Shown: 63.5%.](chart_image)
<table>
<thead>
<tr>
<th>Year</th>
<th>Gross Sales</th>
<th>Gross Farm Income</th>
<th>Net Farm Income</th>
<th>Farm Expenses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1973</td>
<td>21.13</td>
<td>36</td>
<td>32.63</td>
<td>19.16</td>
</tr>
<tr>
<td>1974</td>
<td>31.46</td>
<td>28</td>
<td>2.37</td>
<td>29.48</td>
</tr>
<tr>
<td>1975</td>
<td>28.86</td>
<td>30</td>
<td>15.18</td>
<td>26.58</td>
</tr>
<tr>
<td>1976</td>
<td>25.81</td>
<td>29</td>
<td>0.27</td>
<td>24.25</td>
</tr>
<tr>
<td>1977</td>
<td>23.27</td>
<td>32</td>
<td>13.49</td>
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<td>1978</td>
<td>22.55</td>
<td>34</td>
<td>32.05</td>
<td>16.83</td>
</tr>
<tr>
<td>1979</td>
<td>19.14</td>
<td>34</td>
<td>27.94</td>
<td>18.13</td>
</tr>
<tr>
<td>1980</td>
<td>24.09</td>
<td>32</td>
<td>12.47</td>
<td>21.40</td>
</tr>
<tr>
<td>1981</td>
<td>22.85</td>
<td>27</td>
<td>-8.11</td>
<td>22.92</td>
</tr>
<tr>
<td>1982</td>
<td>20.26</td>
<td>26</td>
<td>-0.52</td>
<td>21.18</td>
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<tr>
<td>1983</td>
<td>19.77</td>
<td>25</td>
<td>2.88</td>
<td>19.74</td>
</tr>
<tr>
<td>1984</td>
<td>18.37</td>
<td>22</td>
<td>8.57</td>
<td>19.03</td>
</tr>
<tr>
<td>1985</td>
<td>18.32</td>
<td>23</td>
<td>-11.03</td>
<td>20.26</td>
</tr>
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</table>

Table t: 1.654  1.654  1.654  1.654

<table>
<thead>
<tr>
<th>Year</th>
<th>Inventory Adjustment</th>
<th>Net Cash Income</th>
<th>Size of Farm</th>
</tr>
</thead>
<tbody>
<tr>
<td>1973</td>
<td>29.43</td>
<td>15</td>
<td>36.44</td>
</tr>
<tr>
<td>1974</td>
<td>-10.69</td>
<td>23</td>
<td>37.64</td>
</tr>
<tr>
<td>1975</td>
<td>3.29</td>
<td>21</td>
<td>21.12</td>
</tr>
<tr>
<td>1976</td>
<td>-4.43</td>
<td>13</td>
<td>34.34</td>
</tr>
<tr>
<td>1977</td>
<td>15.03</td>
<td>5</td>
<td>34.64</td>
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<tr>
<td>1978</td>
<td>17.87</td>
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<td>35.02</td>
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<tr>
<td>1979</td>
<td>24.89</td>
<td>7</td>
<td>35.51</td>
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<tr>
<td>1980</td>
<td>0.18</td>
<td>19</td>
<td>35.29</td>
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<td>1981</td>
<td>-10.76</td>
<td>10</td>
<td>34.78</td>
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<tr>
<td>1982</td>
<td>4.56</td>
<td>1.41</td>
<td>33.08</td>
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<td>1983</td>
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<td>0.47</td>
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<td>30.81</td>
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<tr>
<td>1985</td>
<td>-3.66</td>
<td>4</td>
<td>29.78</td>
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Table t: 1.654  1.654  1.654
Table 9

Percent of Association Farms (State)

<table>
<thead>
<tr>
<th>Variable</th>
<th>CENSUS</th>
<th>FARM FACTS</th>
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<tbody>
<tr>
<td></td>
<td>All Farms</td>
<td>OVER $10,000</td>
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<tr>
<td>Farm Size</td>
<td>45.0</td>
<td>64.8</td>
</tr>
<tr>
<td>Crop Acres</td>
<td>50.6</td>
<td>71.1</td>
</tr>
<tr>
<td>Harvested Acres</td>
<td>43.9</td>
<td>58.2</td>
</tr>
<tr>
<td>Gross Sales</td>
<td>41.6</td>
<td>65.7</td>
</tr>
<tr>
<td>Operator Age</td>
<td>109.3</td>
<td>—</td>
</tr>
<tr>
<td>Gross Farm Income</td>
<td></td>
<td>45.1</td>
</tr>
<tr>
<td>Net Farm Income</td>
<td></td>
<td>50.3</td>
</tr>
<tr>
<td>Total Farm Expenses</td>
<td></td>
<td>41.8</td>
</tr>
<tr>
<td>Inventory Adjustment</td>
<td></td>
<td>-6.57</td>
</tr>
<tr>
<td>Net Cash Income</td>
<td></td>
<td>63.5</td>
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Farm Size and Gross Sales variables were included in both the Census and Farm Facts analysis. For these two variables, All Farms Census and Farm Facts data should only be compared with All Farms Association data since Farm Facts data did not have an over $10000 in Gross Sales category. As shown in Table 9, Census and Farm Facts data showed a similar percentage of Association data for Farm Size. Also, the Gross Sales percentage of Association, for Census and Farm Facts data differed by less that ten percent.
Chapter Five

5.1 Discussion

The significance of this study can be evaluated by examining the accuracy of data of each source, and the adequacy of the statistical methods used. That is, do the tests examine what they are supposed to. The hypothesis stated was outlined as the basis for fulfilling the studies objectives.

By assuming the methods by which the characteristics studied are calculated by compatible methods, the results in the previous section are accurate. But, a more in-depth analysis of the results will help understand what was determined. A specific example would be to examine Gross Sales of the Census and Association farms being compared. The sales data outlined in the study were those of all agricultural products sold on the farm for a specified year, and from that viewpoint the two sets of data compared were accurate.

In the case of the Census Farms these sales could include data from Nursery's, Orchards, and Feedlots while Association Farms deal primarily with livestock and crop operations. As outlined in the results section, the mean sales value for the Census Farms was well below that of the Association farms when considering All Farms data. This result was true for state and all Associations except for Association #3 where mean Gross Sales for Census Farms were about 18 percent higher than Association Farms. The enterprise makeup of these two farm groups could explain this result. For example, the following table shows the percent of dryland and irrigated cash crop farms to all Association Farms for 1985.
Table 10

% Crop Farms of all Association Farms

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<th>State</th>
<th>Associations</th>
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<tr>
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<td>1 2 3 4 5 6</td>
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<tr>
<td>-------</td>
<td>--------------</td>
</tr>
<tr>
<td></td>
<td>55 49 71 66 58 51 49</td>
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Associations Farms are about 50% pure crop farms, with the majority of the remaining enterprises being crop and livestock operation. Considering this fact, a comparison of crop related enterprises could provide a more meaningful study.

Pertinent to this point is the fact that the difference in Association and Census farms declines when analyzing farms with sales greater than $10,000. That is, the ratio of period averages (percent) of Census to Association Farms, increased. More than likely, a portion of the unique (orchards or nurseries) and part time operations were not included in the data when only those operations with sales of $10,000 or more were considered. Conversely, the large feedlots in southwest Kansas (Association 3) were probably the cause of the larger Gross Sales figures for Census All Farms. The results may have been different if the means being compared were from more closely related enterprises. Possibly, the variance between these two farm groups, based on the specific variables, would be smaller if this analysis could be done.

In General, each characteristic's index of Census to Association Farms increased as the mean size of Association Farms became larger. This result was true for all nondistribution characteristics other than age of operator. This fact is illustrated by the average Gross Sales graphs of these two Associations in appendix 3. For eastern Kansas
Association 4, Gross Sales for Census All Farms data was approximately 23 percent of Association data. Concurrently, the larger northwestern farms of Association 5 showed an index of mean Gross Sales at about 42 percent. This index became even larger when considering those farms with sales of $10,000 or more, regardless of the Association. That is, the larger the farm size the less quantitative difference between Association and Census farms.

An examination of the Farm Size Distribution showed results that would be expected according to an areas average farm size. Association three showed a fairly even distribution of farms over the five categories with a slight edge toward larger farms. Association four, which covers the smaller sized farms of northeast Kansas, had a larger percentage of farms in the lower size categories. When the analysis compared Association Farms with those farms with sales of $10,000 or more, the distribution of farms shifted toward the larger sizes.

For the Operator Distribution, the primary pattern found was a movement of operators from the Full Owner category to the Part Owner category. This fact occurred when the farm group studied shifted from All Farms data to those farms with sales of $10,000 or more. When the average farm size increased, the proportion of the general farm population under part ownership increased for most areas. For example, for Associations 4 and 6 that represent the smaller farms of eastern Kansas, All Farms data was dominated by Full Owner operators. In comparison, the southwestern Kansas farms of Association 3 had All Farm operators clearly dominated by Part Owners.

For the Farm Facts comparison portion of the study, the results
were straight forward as shown in the comparative graphs of each characteristic. Like the Census comparison analysis most characteristics showed Association Farms higher than the Farm Facts mean data. As a result, the majority of the t-tests displayed a rejection of a like mean hypothesis.

However, as shown in Table 8.2, Net Farm Income and Inventory adjustment had two and three years, respectfully, where mean values were statistically equivalent. These were the only variables in any of the statistical test, for either analysis, that gave this result. A considerable difference existed between the Inventory Adjustment variable for Association and Farm Facts data. That is, the question could be asked as to why Farm Facts data showed an Inventory Adjustment consistently less than a plus or minus $10,000; while Association data showed that this variable fluctuated between a plus 36,000 and a minus 15,000 prior to 1982. However, from 1982 to 1985, the Inventory Adjustment for Association and Farm Facts farms was very similar. One possible explanation for this fact is that Association Inventory Adjustment is obtained on an accumulative basis from year to year, but the Farm Facts Inventory Adjustment is estimated yearly. Another possible explanation for this similarity may be due to the financial crisis agriculture was experiencing during this period. That is, farmers during this period had to keep a fairly stable inventory in order to stabilize, or increase, their cash flow and income. As a result, Inventory Adjustment values for Association and Farm Facts farms were fairly equal.

In this study, no new statistical or theoretical principals were
utilized. The use of the t-test for mean comparison and the Chi-square test of goodness of fit for farm distributions were two of the tools aimed at clarifying a relationship. By using the hypothesis that Association Farms were a representative sample of the farm population, these tests were used to decide whether or not this hypothesis could be supported. The general nature of the study was to form a framework by which to compare Association Farms and an average Kansas Farm.

The formation of this framework was one of the values of the study, and has practical ramifications. Suggested improvements for this study would start, if possible, by fine tuning the data from each source to a specific type of farm operation. Additional benefits would occur if the study could be continually updated as new data became available, either by specific farm type, or in its present format. Further improvement could be added if additional source characteristics relative to this study were made available. Use of additional variables would ensure the practical nature of this study as the state of agriculture in Kansas continues to evolve. For instance, Census Farms with Gross Sales of $10,000 or more were a higher percentage of Association Farms than Census All Farms data. So, having Census data with sales of $50,000 or more, for example, could be more useful in comparing Association and Census Farms. Since it is possible that some farms were restricted from enrolling in the Farm Management Association, examining the larger farm group would likely avoid comparing two farm groups where one group excluded farms, due to cost, that would otherwise be included.
Conclusions

The primary objective of this study was to determine whether or not Farm Management Association Farms could be considered as a representative Kansas Farm; and if not, what relationship does exist between the Association and average Kansas Farm operation. For this purpose, the hypothesis stated was that Association Farms were a representative sample of the Kansas Farm population.

Subsequently, each farm characteristic used was first defined. Then, statistical tests were executed on these farm characteristics to prove or disprove the hypothesis. In addition, percentages were calculated from the period averages for each characteristic. Use of statistical tests and percentages allowed for the determination of whether source means were statistically equivalent, as well as the quantitative relationship between farm sources. For comparison purposes, each characteristic from either Kansas Farm Facts or Kansas Census of Agriculture was graphed against the same characteristic of Association Farms for the appropriate period.

The analysis determined that Association Farms cannot be considered as representative of the Kansas Farm population. On average for the characteristics studied, Association Farms were basically twice as large as the mean Kansas Farm. However, considerable variations occurred between Census and Farm Facts farms and Association farms when the variables were compared on an individual Association Basis. Also, the method for computing the Inventory Adjustment variable for Farm Facts Farms had a definite impact on the Gross and Net Farm Income variables.
Selected Bibliography (references)


APPENDIX 1

INDIVIDUAL ASSOCIATIONS

SUMMARY DATA TABLES
### Table 1.1

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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No. of Farms</strong></td>
<td>15546</td>
<td>14236</td>
<td>13696</td>
<td>417</td>
<td>493</td>
<td>256</td>
</tr>
<tr>
<td><strong>Avg Size of Farm</strong></td>
<td>528.4</td>
<td>553.16</td>
<td>570.39</td>
<td>1202.78</td>
<td>1193.17</td>
<td>1146.12</td>
</tr>
<tr>
<td><strong>Avg Crop Acres/Farm</strong></td>
<td>363.57</td>
<td>386.39</td>
<td>413.03</td>
<td>792.476</td>
<td>673</td>
<td>671</td>
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<td><strong>Avg Harv Acres/Farm</strong></td>
<td>265.5</td>
<td>273.78</td>
<td>304.64</td>
<td></td>
<td></td>
<td></td>
</tr>
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<td><strong>Avg Sales/Farm</strong></td>
<td>36096.68</td>
<td>45127.28</td>
<td>57899.39</td>
<td>126415.58</td>
<td>162433.718</td>
<td>194329.41</td>
</tr>
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<tr>
<td>1 to 219 acres</td>
<td>5087</td>
<td>4612</td>
<td>4787</td>
<td>5</td>
<td>39</td>
<td>19</td>
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<td>220 to 499 acres</td>
<td>4621</td>
<td>3707</td>
<td>3506</td>
<td>49</td>
<td>55</td>
<td>33</td>
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<tr>
<td>500 to 999 acres</td>
<td>7384</td>
<td>3498</td>
<td>3053</td>
<td>151</td>
<td>160</td>
<td>82</td>
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<tr>
<td>1000 to 1999 acres</td>
<td>1689</td>
<td>1742</td>
<td>1807</td>
<td>164</td>
<td>172</td>
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<td>2000+</td>
<td>366</td>
<td>477</td>
<td>543</td>
<td>48</td>
<td>72</td>
<td>30</td>
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<td><strong>Ownership (Farms)</strong></td>
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Table 4.1

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| No. of Farms | | 13855 | 12734 | 12985 | 430 | 568 | 557 |  
| Avg Size of Farm | | 360 | 381.41 | 382.76 | 917.625 | 917.561 | 1057.29 |  
| Avg Crop Acres/Farm | | 213.29 | 230.82 | 238.04 | 448.5697 | 490.91 | 557.54 |  
| Avg Harv Acres/Farm | | 165.09 | 178.24 | 166.23 | NA | 467.91 | 547.7 |  
| Avg Sales/Farm | | 26227.64 | 34962.93 | 42489.54 | 106590 | 146462.99 | 193665.07 |  
| Avg No Farms/size | | | | | | | |  
| 1 to 219 acres | | 7374 | 6797 | 7244 | 22 | 48 | 42 |  
| 220 to 499 acres | | 3606 | 3054 | 2860 | 102 | 117 | 112 |  
| 500 to 999 acres | | 2021 | 1912 | 1817 | 166 | 195 | 169 |  
| 1000 to 1999 acres | | 664 | 766 | 825 | 111 | 169 | 174 |  
| 2000+ | | 166 | 205 | 239 | 29 | 39 | 60 |  
| Ownership (Farms) | | | | | | | |  
| Full Owner | | 7901 | 6786 | 7280 | 61.83 | 87 | 75 |  
| Part Owner | | 4397 | 4356 | 4184 | 332.70 | 446 | 437 |  
| Tenants | | 1557 | 1592 | 1521 | 35.57 | 33 | 45 |  
| Avg Age of Farmer | | 51.43 | 50.52 | 50.5 | 46.67 | 46.2 | 47.41 |  

| Census | | | | | | | |  
| No. of Farms | | 6929 | 6649 | | | | |  
| Avg Size of Farm | | 605.53 | 631.14 | 920.23 | 1064 | 1064 | 1064 |  
| Avg Crop Acres/Farm | | 345.07 | 366.95 | 493.21 | 560.37 | 547.24 | 547.24 |  
| Avg Harv Acres/Farm | | 266.47 | 284.7 | 470.17 | 470.17 | | |  
| Avg Sales/Farm | | 70632.41 | 77167.32 | 147721.95 | | | |  
| Avg No Farms/size | | | | | | | |  
| 1 to 219 acres | | 1685 | 1815 | 46 | 38 | 38 |  
| 220 to 499 acres | | 2451 | 2305 | 115 | 112 | 112 |  
| 500 to 999 acres | | 1833 | 1745 | 195 | 169 | 169 |  
| 1000 to 1999 acres | | 869 | 609 | 169 | 173 | 173 |  
| 2000 or > acres | | 202 | 234 | 38 | 60 | 60 |  
| Ownership (Farms) | | | | | | | |  
| Full Owner | | 2495 | 2575 | 85 | 74 | 74 |  
| Part Owner | | 3794 | 3636 | 445 | 435 | 435 |  
| Tenants | | 955 | 966 | 33 | 42 | 42 |  
| Avg Age of Farmer | | 50.04 | 46.12 | 47.52 | | | |  

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APPENDIX 2

INDIVIDUAL ASSOCIATIONS

SUMMARY STATISTICAL TABLES
Table 1.2

Association #1 (all farms)

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FARMS WITH SALES OF $10,000 OR MORE

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* Not able to calculate

FARMS WITH SALES OF $10,000 OR MORE

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Association #3 (all farms)

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FARMS WITH SALES OF $10,000 OR MORE

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**Association #4 (all farms)**

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* Not able to calculate

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**Farms with sales of $10,000 or more**

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Table 5.2
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FARMS WITH SALES OF $10,000 OR MORE

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* Not able to calculate
Table 6.2

**Association #6 (all farms)**

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<td>1147.26</td>
<td>1032.31</td>
<td>1231.26</td>
</tr>
<tr>
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<td>7.78</td>
<td>7.78</td>
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<tr>
<td>Ownership Distribution</td>
<td>529.04</td>
<td>522.54</td>
<td>685.54</td>
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<td>4.61</td>
<td>4.61</td>
<td>4.61</td>
</tr>
</tbody>
</table>

* Not able to calculate

---

**Farms with Sales of $10,000 or More**

<table>
<thead>
<tr>
<th></th>
<th>t value78</th>
<th>t value82</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Size of Farm</td>
<td>10.81</td>
<td>10.96</td>
</tr>
<tr>
<td>Average Crop Acres/Farm</td>
<td>7.95</td>
<td>9.37</td>
</tr>
<tr>
<td>Average Harv. Acres/Farm</td>
<td>11.52</td>
<td>13.98</td>
</tr>
<tr>
<td>Average Sales Per Farm</td>
<td>9.97</td>
<td>11.36</td>
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<tr>
<td><strong>Table t-values</strong></td>
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<th>Chi-square78</th>
<th>Chi-square82</th>
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APPENDIX 3

INDIVIDUAL ASSOCIATIONS

CHARACTERISTIC MEAN GRAPHS
Association #1

AVERAGE SIZE OF FARM (ALL FARMS)

<table>
<thead>
<tr>
<th>YEARS</th>
<th>CENSUS</th>
<th>ASSOCIATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1974</td>
<td>0.50</td>
<td>0.50</td>
</tr>
<tr>
<td>1978</td>
<td>0.50</td>
<td>0.50</td>
</tr>
<tr>
<td>1982</td>
<td>0.50</td>
<td>0.50</td>
</tr>
</tbody>
</table>

Census % Of Association Farms: 46.49%

Association #1 ($10,000+ Sales)

AVERAGE SIZE OF FARM

Census % Of Association Farms: 63.18%

<table>
<thead>
<tr>
<th>YEARS</th>
<th>CENSUS</th>
<th>ASSOCIATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1978</td>
<td>0.50</td>
<td>0.50</td>
</tr>
<tr>
<td>1982</td>
<td>0.50</td>
<td>0.50</td>
</tr>
</tbody>
</table>
Association #2: All Farms

AVERAGE SIZE OF FARM

\[ \text{ACRES (Thousands)} \]

\begin{align*}
1974 & : \text{46.80\%} \\
1978 & : \text{73.99\%} \\
1982 & : \text{73.99\%}
\end{align*}

Census % Of Association Farms For Period Shown

\begin{align*}
46.80\% \\
73.99\%
\end{align*}

Association #2: $10,000+ Sales

AVERAGE SIZE OF FARM

\[ \text{ACRES (Thousands)} \]

\begin{align*}
1978 & : \text{73.99\%} \\
1982 & : \text{73.99\%}
\end{align*}

Census % Of Association Farms For Period Shown

\begin{align*}
73.99\%
\end{align*}
Association #3: All Farms

![Diagram showing average size of farms for different years, with Census and Association data compared.]

Association % Of Association Farms For Period Shown: 61.94%

Years: 1974, 1975, 1982

Association #3: $10,000+ Sales

![Diagram showing average size per farm for different years, with Census and Association data compared.]

Census % Of Association Farms For Period Shown: 72.92%

Years: 1978, 1982
Association #4: All Farms

Census % Of Association Farms For Period Shown 38.69%

Association #4: $10,000+ Sales

Census % Of Association Farms For Period Shown 62.36%
Association #5: All Farms

AVERAGE SIZE OF FARM

Census % of Association Farms for Period Shown

48.33%

Association #5: $10,000+ Sales

AVERAGE SIZE OF FARM

Census % of Association Farms for Period Shown

61.37%
Association #6: All Farms

Census % of Association Farms for Period Shown: 38.71%

Association #6: $10,000+ Sales

Census % of Association Farms for Period Shown: 61.67%
Association #1

**AVERAGE CROP ACRES PER FARM (ALL FARMS)**

Census % Of Association Farms For Period Shown: 51.74%

Association #1 ($10,000+ Sales)

**AVERAGE CROP ACRES PER FARM**

Census % Of Association Farms For Period Shown: 54.17%
Association #2: All Farms

Census % Of Association Farms For Period Shown 49.64%

Association #2: $10,000+ Sales

Census % Of Association Farms For Period Shown 64.92%
Association #3: All Farms

Average Crop Acres per Farm

Year | Census | Association
--- | --- | ---
1974 | 1.6 | 1.6
1978 | 1.4 | 1.3
1982 | 1.3 | 1.3

Census % of Association Farms for Period Shown: 60.85%

Association #3: $10,000+ Sales

Average Crop Acres per Farm

Year | Census | Association
--- | --- | ---
1978 | 1.7 | 1.7
1982 | 1.6 | 1.6

Census % of Association Farms for Period Shown: 71.25%
Association #4: All Farms

AVERAGE CROP ACRES PER FARM

Census % Of Association Farms For Period Shown 45.13%

ACRES

YEARS

1974 1978 1982

CENSUS ASSOCIATION

Association #4: $10,000+ Sales

AVERAGE CROP ACRES PER FARM

Census % Of Association Farms For Period Shown 67.80%

ACRES

YEARS

1978 1982

CENSUS ASSOCIATION
Association #5: All Farms

Average Crop Acres Per Farm

Census % Of Association Farms For Period Shown
55.04%

Association #5: $10,000+ Sales

Average Crop Acres Per Farm

Census % Of Association Farms For Period Shown
68.55%
Association #6: All Farms

AVERAGE CROP ACRES PER FARM

Census % Of Association Farms For Period Shown 47.94%

<table>
<thead>
<tr>
<th>YEARS</th>
<th>CENSUS</th>
<th>ASSOCIATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1974</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1978</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1982</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Association #6: $10,000+ Sales

AVERAGE CROP ACRES PER FARM

Census % Of Association Farms For Period Shown 74.12%

<table>
<thead>
<tr>
<th>YEARS</th>
<th>CENSUS</th>
<th>ASSOCIATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1978</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1982</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Association #1

AVERAGE HARVESTED ACRES PER FARM (ALL FARMS)

Census % of Association Farms For Period Shown: 46.17%

Census % of Association Farms For Period Shown: 41.95%
Association #2: All Farms

**AVERAGE HARVESTED ACRES PER FARM**

Census % Of Association Farms For Period Shown 40.83%

<table>
<thead>
<tr>
<th>YEARS</th>
<th>CENSUS</th>
<th>ASSOCIATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1978</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1982</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Association #2: $10,000+ Sales

**AVERAGE HARVESTED ACRES PER FARM**

Census % Of Association Farms For Period Shown 52.71%

<table>
<thead>
<tr>
<th>YEARS</th>
<th>CENSUS</th>
<th>ASSOCIATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1978</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1982</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Association #3: All Farms

AVERAGE HARVESTED ACRES PER FARM

Census % Of Association Farms For Period Shown
60.28%

Association #3: $10,000+ Sales

AVERAGE HARVESTED ACRES PER FARM

Census % Of Association Farms For Period Shown
67.27%
Association #4: All Farms

AVERAGE HARVESTED ACRES PER FARM

Census % of Association Farms for Period Shown 35.92%

Association #4: $10,000+ Sales

AVERAGE HARVESTED ACRES PER FARM

Census % of Association Farms for Period Shown 54.20%
Association #5: All Farms

Average Harvested Acres per Farm

Census % of Association Farms for Period Shown: 48.17%

Association #5: $10,000+ Sales

Average Harvested Acres per Farm

Census % of Association Farms for Period Shown: 57.83%
Association #6: All Farms

AVERAGE HARVESTED ACRES PER FARM

Census % Of Association Farms For Period Shown 31.51%

Association #6: $10,000+ Sales

AVERAGE HARVESTED ACRES PER FARM

Census % Of Association Farms For Period Shown 52.76%
Association #1

AVERAGE SALES PER FARM (ALL FARMS)

Census % of Association Farms
For Period Shown: 30.11%

Association #1 ($10,000+ Sales)

AVERAGE SALES PER FARM

Census % of Association Farms For Period Shown: 29.42%
Association #2: All Farms

Average Sales per Farm

Census % of Association Farms for Period Shown: 33.88%

Association #2: $10,000+ Sales

Average Sales per Farm

Census % Association Farms for Period Shown: 46.5%
Association #3: All Farms

Average sales per farm

Census % of Association Farms for period shown 118.34%

Association #3: $10,000+ Sales

Average sales per farm

Census % of Association Farms for period shown 159.73%
APPENDIX 1

INDIVIDUAL ASSOCIATIONS

SUMMARY DATA TABLES
Association #4: All Farms

AVERAGE SALES PER FARM

Census % Of Association Farms For Period Shown
22.55%

Association #4: $10,000+ Sales

AVERAGE SALES PER FARM

Census % Of Association Farms For Period Shown
40.17%
Association #5: All Farms

AVERAGE SALES PER FARM

Census % Of Association Farms For Period Shown 41.95%

Association #5: $10,000+ Sales

AVERAGE SALES PER FARM

Census % Of Association Farms For Period Shown 54.99%
Association #6: All Farms

Average Sales Per Farm

Census % of Association Farms For Period Shown 22.43%

Association #6: $10,000+ Sales

Average Sales Per Farm

Census % of Association Farms For Period Shown 41.85%
Association #1: (All Farms)

<table>
<thead>
<tr>
<th>Year</th>
<th>Average Age Per Farmer</th>
<th>Census % Of Association For Period</th>
<th>117.5%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1974</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1978</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1982</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The diagram shows the average age per farmer over the period from 1974 to 1982, with a census percentage of 117.5%.
Average Age Per Farmer

Census % of Association
For Period: 108.3%
Average Age Of Farmer

Census % of
For Period: 103.6%

<table>
<thead>
<tr>
<th>YEAR</th>
<th>CENSUS</th>
<th>ASSOCIATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1974</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>1978</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>1982</td>
<td>50</td>
<td>50</td>
</tr>
</tbody>
</table>
Average Age Of Farmer

Census % Of Association For Period: 108.7%
Association #5: All Farms

Average Age of Farmer

Census % of Association For Period: 110.4%


Age: 0, 10, 20, 30, 40, 50, 60

Census

Association
Association #6: ALL FARMS

AVERAGE AGE OF FARMER

Census % Of Association For Period: 109.8

<table>
<thead>
<tr>
<th>YEAR</th>
<th>CENSUS</th>
<th>ASSOCIATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1978</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1982</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Farm Size Distribution (by Percentage)

ASSOCIATION #1: All Farms 1974

Percent of Total Farms

- 1 to 219 acres
- 220 to 499 acres
- 500 to 999 acres
- 1000 to 1999 acres
- 2000+

Farm Size Categories

- Census
- Association
Farm Size Distribution (by Percent)

ASSOCIATION #1: All Farms 1978

Farm Size Distribution (by Percent)

ASSOCIATION #1: $10,000+ Sales 1978
Farm Size Distribution (by Percent)

ASSOCIATION #1: All Farms 1982

Percent of Total Farms

Farm Size Categories
- Census
- Association

Farm Size Distribution (by Percent)

ASSOCIATION #1: $10,000+ Sales 1982

Percent of Total Farms

Farm Size Categories
- Census
- Association
Farm Size Distribution (by Percent)

Association #2 All Farms 1974

Farm Size Categories
- Census
- Association

- 1 to 219 acres
- 220 to 499 acres
- 500 to 999 acres
- 1000 to 1999 acres
- 2000+ acres

Percent of Total Farms

- 0
- 5%
- 10%
- 15%
- 20%
- 25%
- 30%
- 35%
- 40%
Farm Size Distribution (by Percent)

**Association #2 All Farms 1982**

<table>
<thead>
<tr>
<th>Farm Size Categories</th>
<th>Percent of Total Farms</th>
</tr>
</thead>
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<tr>
<td>1 to 219 acres</td>
<td>45%</td>
</tr>
<tr>
<td>220 to 499 acres</td>
<td>20%</td>
</tr>
<tr>
<td>500 to 999 acres</td>
<td>15%</td>
</tr>
<tr>
<td>1000 to 1999 acres</td>
<td>10%</td>
</tr>
<tr>
<td>2000+ acres</td>
<td>5%</td>
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</tbody>
</table>

Farm Size Categories:
- Census
- Association

**Farm Size Distribution (by Percent)**

**Association #2 $10,000+ Sales 1982**

<table>
<thead>
<tr>
<th>Farm Size Categories</th>
<th>Percent of Total Farms</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 219 acres</td>
<td>35%</td>
</tr>
<tr>
<td>220 to 499 acres</td>
<td>25%</td>
</tr>
<tr>
<td>500 to 999 acres</td>
<td>15%</td>
</tr>
<tr>
<td>1000 to 1999 acres</td>
<td>10%</td>
</tr>
<tr>
<td>2000+ acres</td>
<td>5%</td>
</tr>
</tbody>
</table>

Farm Size Categories:
- Census
- Association
Farm Size Distribution (by Percent)

ASSOCIATION #3: All Farms 1974

Percent of Total Farms

- 1 to 219 acres
- 220 to 499 acres
- 500 to 999 acres
- 1000 to 1999 acres
- 2000+ acres

Farm Size Categories
- Census
- Association
Farm Size Distribution (by Percent)

ASSOCIATION #3: All Farms 1978

Farm Size Categories
- Census
- Association

Farm Size Distribution (by Percent)

ASSOCIATION #3: $10,000+ Sales 1978

Farm Size Categories
- Census
- Association
Farm Size Distribution (by Percent)

ASSOCIATION = All Farms 1982

Farm Size Categories
- Census
- Association

Farm Size Distribution (by Percent)

ASSOCIATION = $10,000+ Sales 1982

Farm Size Categories
- Census
- Association
Farm Size Distribution (by Percent)

Association #4 All Farms 1974

Percent of Total Farms

Farm Size Categories

<table>
<thead>
<tr>
<th>Size Category</th>
<th>Census</th>
<th>Association</th>
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</thead>
<tbody>
<tr>
<td>1 to 219 acres</td>
<td>50%</td>
<td>40%</td>
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<tr>
<td>220 to 499 acres</td>
<td>20%</td>
<td>20%</td>
</tr>
<tr>
<td>500 to 999 acres</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>1000 to 1999 acres</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>2000+ acres</td>
<td>5%</td>
<td>5%</td>
</tr>
</tbody>
</table>

Al Fanns 1974
Farm Size Distribution (by Percent)

Farm Size Distribution (by Percent)
Farm Size Distribution (by Percent)

Farm Size Distribution (by Percent)

Farm Size Categories
- Census
- Association

Farm Size Categories
- Census
- Association
Farm Size Distribution (by Percent)

<table>
<thead>
<tr>
<th>Farm Size Categories</th>
<th>Association #5 All Farms 1974</th>
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<tbody>
<tr>
<td>1 to 219 acres</td>
<td>20%</td>
</tr>
<tr>
<td>220 to 499 acres</td>
<td>25%</td>
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<tr>
<td>500 to 999 acres</td>
<td>30%</td>
</tr>
<tr>
<td>1000 to 1999 acres</td>
<td>25%</td>
</tr>
<tr>
<td>2000 or + acres</td>
<td>15%</td>
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</tbody>
</table>

Percent of Total Farms

Census

Association
Farm Size Distribution (by Percent)
Farm Size Distribution (by Percent)

1 to 219 acres
220 to 499 acres
500 to 999 acres
1000 to 1999 acres
2000+ acres

Farm Size Distribution (by Percent)

1 to 219 acres
220 to 499 acres
500 to 999 acres
1000 to 1999 acres
2000+ acres

Percent of Total Farms

Association ≠ All Farms 1982

Association ≠ $10,000+ Sales 1982

Farm Size Categories

Census
Association
Farm Size Distribution (by Percent)

Association vs All Farms 1974

<table>
<thead>
<tr>
<th>Farm Size Categories</th>
<th>Census</th>
<th>Association</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 219 acres</td>
<td></td>
<td></td>
</tr>
<tr>
<td>220 to 499 acres</td>
<td></td>
<td></td>
</tr>
<tr>
<td>500 to 999 acres</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1000 to 1999 acres</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000+ acres</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Percent of Total Farms
Farm Size Distribution (by Percent)

Farm Size Distribution (by Percent)

Farm Size Categories
- Census
- Association
Farm Size Distribution (by Percent)

Association ≠ All Farms 1962

Farm Size Categories
- Census
- Association

Farm Size Distribution (by Percent)

Association ≠ $10,000+ Sales 1962

Farm Size Categories
- Census
- Association
Operator Distribution (by Percentage)

ASSOCIATION #1: All Farms 1974

Operator Distribution Categories
- Census
- Association

Percent of Total Farms

90%
80%
70%
60%
50%
40%
30%
20%
10%
0%

Full Owner
Part Owner
Tenants
Operator Distribution (by Percentage)

ASSOCIATION at: All Farms 1978

ASSOCIATION at: $10,000+ 1978

Operator Distribution Categories
- Census
- Association

Percent of Total Farms

<table>
<thead>
<tr>
<th>Category</th>
<th>Census</th>
<th>Association</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Owner</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Part Owner</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tenants</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Operator Distribution 1974

![Bar chart showing the distribution of operator types for all farms in 1974. The chart compares Census and Association data for Full Owner, Part Owner, and Tenants.]
Operator Distribution 1978

Operator Distribution Categories

- CENSUS
- ASSOCIATION

Operator Distribution 1978

Operator Distribution Categories

- CENSUS
- ASSOCIATION
Operator Distribution 1982

Operator Distribution Categories
- Census
- Association

Operator Distribution 1982

Operator Distribution Categories
- Census
- Association
Operator Distribution (by Percent)

ASSOCIATION #3: All Farms, 1974

Operator Distribution Categories
- Census
- Association

Percent of Total Farms

Full Owner  Part Owner  Tenants
Operator Distribution (by Percent)

ASSOCIATION #3: All Farms 1978

Operator Distribution Categories
Census
Association

Percent of Total Farms

Operator Distribution (by Percent)

ASSOCIATION #3: $10,000+ 1978

Operator Distribution Categories
Census
Association

Percent of Total Farms

Full Owner
Part Owner
Tenants
Operator Distribution (by Percent)

Operator Distribution Categories
- Census
- Association

ASSOCIATION &3: All Farms 1982

Percent of Total Farms

ASSOCIATION &3: $10,000+ 1982

Percent of Total Farms

Operator Distribution Categories
- Census
- Association
Operator Distribution (by percent) 1974

ASSOCIATION #4: ALL FARMS

PERCENT OF TOTAL FARMS

Full Owner  Part Owner  Tenants

Operator Distribution Categories

- CENSUS
- ASSOCIATION
Operator Distribution (by percent) 1978

Operator Distribution Categories

Full Owner  Part Owner  Tenants

ASSOCIATION vs. CENSUS

Operator Distribution (by percent) 1978

Operator Distribution Categories

Full Owner  Part Owner  Tenants

ASSOCIATION vs. CENSUS
Operator Distribution (by percent) 1982

ASSOCIATION vs. ALL FARMS

Operator Distribution Categories
- CENSUS
- ASSOCIATION

Operator Distribution (by percent) 1982

ASSOCIATION vs. $10,000 or + Sales

Operator Distribution Categories
- CENSUS
- ASSOCIATION
Operator Distribution (by percent) 1974

Operator Distribution Categories
- CENSUS
- ASSOCIATION
Operator Distribution (by percent) 1978

Operator Distribution Categories
- Census
- Association

Operator Distribution (by percent) 1978

Operator Distribution Categories
- Census
- Association
Operator Distribution (by percent) 1982

Operator Distribution Categories
- CENSUS
- ASSOCIATION

Operator Distribution (by percent) 1982

Operator Distribution Categories
- CENSUS
- ASSOCIATION
Operator Distribution (by percent) 1974

ASSOCIATION • ALL FARMs

Operator Distribution Categories

- CENSUS
- ASSOCIATION
Operator Distribution (by percent) 1978

Operator Distribution (by percent) 1978
Operator Distribution (by percent) 1982

Operator Distribution Categories
- CENSUS
- ASSOCIATION

ASSOCIATION vs. ALL FARMS

PERCENT OF TOTAL FARMS

Operator Distribution (by percent) 1982

ASSOCIATION vs. $10,000 or less

PERCENT OF TOTAL FARMS

Operator Distribution Categories
- CENSUS
- ASSOCIATION
A COMPARISON STUDY
HOW DO KANSAS FARM MANAGEMENT FARMS RELATE TO
ALL KANSAS FARMS

by

Jordyn T. Counts

B.S. Kansas State University, 1983
B. A. Ottawa University, 1983

An ABSTRACT OF A THESIS
submitted in partial fulfillment of the
requirements for the degree

Master of Science

Agricultural Economics

Kansas State University
Manhattan, Kansas

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Abstract

This study compared Kansas Farm Management Farms with farms in farm population in Kansas. The general farm population was represented by either farms listed in the Census of Agriculture, or by farms found in the Kansas Farm Facts publication. As a result there were two comparative analysis carried out. The first compared Association Farms with Census Farms, and the second compared Association to Farm Facts Farms. Each analysis was done using selected characteristics that were common too both farm groups, depending on the analysis.

The result of the study, found that Association Farms could not be considered as representative Kansas Farm for based on the characteristics studied. From a quantitative stand point Census or Farm Facts data was roughly half the magnitude of Association data, for the characteristics studied. One exception in the Census analysis, was the southwestern farms in Kansas. In this area Census Farms had Gross Sales about eighteen percent higher than Association Farms. A probable cause suggested was that Census data included large feedlots in their income figures whereas Association data included none.

For the Farm Facts analysis one discrepancy was found in comparing Inventory Adjustment's of Association and Census data. There were two problems in comparing this variable. One, the Farm Facts figure was derived from a data base estimate while Association data came from actual farm records. Second, Farm Facts Inventory Adjustment is recalculated annually, but Association Inventory Adjustment is carried over from year to year.