A COMPARISON OF KANSAS FARM MANAGEMENT FARMS TO ALL KANSAS FARMS

by

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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

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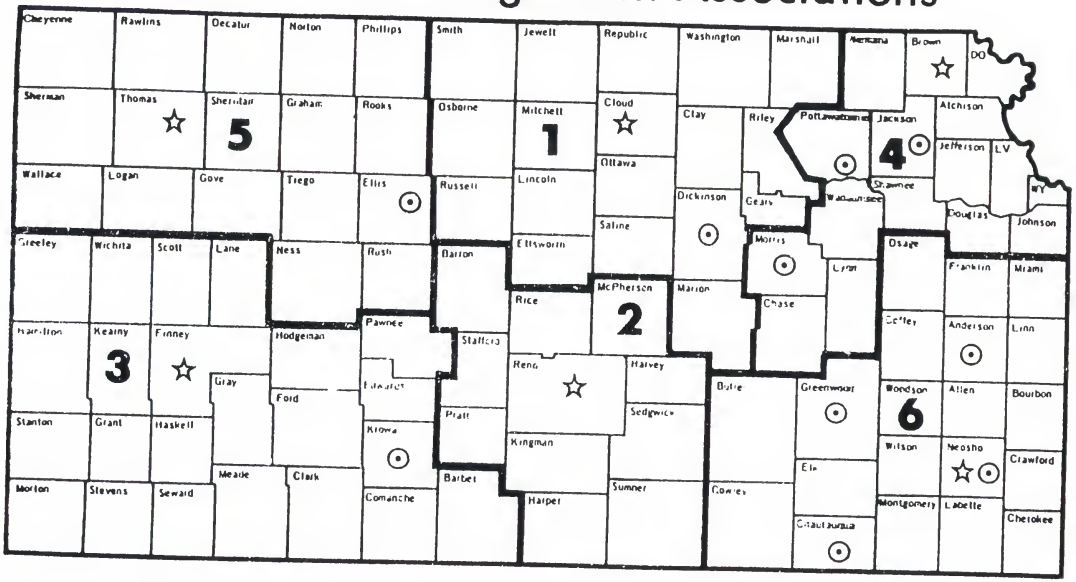
1 U.S. Department of Commerce, Bureau of the Census, 1978, 1982 Census of AGriculture, Vol. 1, Geographic Area Series, pt. 16, Kansas.

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 over all 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'[3]. The history of the Farm Facts came from "The Rise of the Wheat State"[4], and the Census review material came from a special historical addition of the 1982 Census of Agriculture[5].

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].

4 George E. Ham and Robin Higman, eds., The Rise of the Wheat State: A History of Kansas Agriculture, 1861-1986 (Manhattan, Kansas: Sunflower Press, 1987)

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 there 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 ever 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 form 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.[6]

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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[6] Cooperative Extension Service, The Kansas Extension Farm Management: Association Program, [by Leonard C. Parker] (Manhattan, Kansas. 1985), p. 2.

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. Grahm, 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."[7] Further information is drawn from printed articles that

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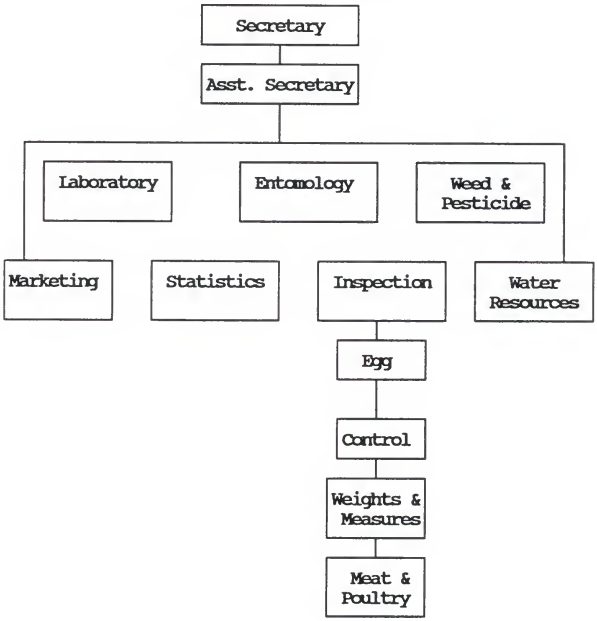
[7] Letter from Mr. M. E. (Moe) Johnson, State Statistician, Kansas State Board of Agriculture, Division of Statistics, June 22 1988.

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



2.4 Census History

The Census of Agriculture (COA) 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. COA 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.

Chapter 3

METHODOLOGY

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[8]. 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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8 Lyman Ott, An Introduction to Statistical Methods and Data Analysis (2nd ed., Boston: PWS Publishers, 1984), p. 157

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

[10] U. S. Department of Department of Commerce, Bureau of the Census, 1982 Census of Agriculture, Vol. 2 Subject Series, pt. 4, History.

3. Farm Facts: Any operation with annual agricultural product sales of $1,000 or more.[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 calender 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)

Depreciation: Includes depreciation for Motor Vehicle, Machinery, Equipment, and Buildings.

Net Cash Income: Net Sales - Total Farm Expenses +

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11 Kansas Farm Facts, p. 1.

Depreciation.[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 μ_a is the mean of Association Farms, and μ_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:

$$t = \bar{y} - \mu o / \bar{S}_y$$

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

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12 Langemeier, 1988.

μ_o = Population mean (All Farms: Census or Farm Facts)

$S_{\bar{y}}$ = 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.

$$\text{Reject } H_o \text{ if } |t| > t_{\alpha/2}$$[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:

$$x^2 = \sum_{i=1}^{k} [(\text{obs} - \text{Exp}_i)^2 / \text{Exp}_i]$$

df = k - 1
obs = % of farms in category (Association)
exp = # of farms expected in the ith 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 Lymann Ott, p. 157.

14 Ibid., p. 179

hypothesis would be stated Ho: $P_1 = P_{10}$
$\vdots \quad \vdots$
$P_k = P_{k0}$

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 α = .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

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15 Ibid., p. 178.

16 Ibid., p. 180.

corresponding table values in summary tables.

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 representativness 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 7.1

Census Comparison State Figures	Association Data (all farms) 1974	1978	1982	Census Data (all farms) 1974	1978	1982
Number Of Farms	2603.00	3031.00	2739.00	79188.00	74171.00	73315.00
Size of Farm (mean)	1409.49	1363.32	1423.59	605.00	640.00	642.00
Crop Acres (mean)	866.73	832.28	870.36	403.52	436.11	460.26
Harvested Acres (mean)	NA	696.02	701.53	281.56	292.74	321.14
Gross Sales (Mean)	124975.73	152103.02	195293.90	46497.00	67352.00	84442.00
Number Of Farms/Size						
1 to 219 Acres	61.00	216.00	197.00	29739.00	28111.00	29561.00
220 to 499 Acres	311.00	350.00	309.00	20390.00	17469.00	16234.00
500 to 999 Acres	784.00	827.00	740.00	16047.00	14871.00	13600.00
1000 to 1999 Acres	931.00	1043.00	886.00	9193.00	9501.00	9428.00
2000+	516.00	595.00	607.00	3819.00	4219.00	4490.00
Ownership (farms)						
Full Owners	244	360	311	34699.00	30061.00	31834.00
Part Owners	2137	2463	2234	32462.00	31647.00	29862.00
Tenants	221	208	194	12027.00	12463.00	11619.00
Age of Operator (mean)	46.84	46.90	47.09	52.20	50.70	50.90

Census Comparison State Figures	Association Data ($10,000 > sale 1978	1982	Census ($10,000 > sales) 1978	1982
Number Of Farms	2984.00	2703.00	47325.00	47895.00
Size of Farm (mean)	1381.68	1437.87	914.00	912.00
Crop Acres (mean)	843.89	877.79	597.56	624.58
Harvested Acres (mean)	705.70	706.40	395.47	426.51
Gross Sales (Mean)	154459.81	197835.75	102964.00	127093.00
Number Of Farms/Size				
1 to 219 Acres	182.00	168.00	6892.00	8105.00
220 to 499 Acres	342.00	309.00	12805.00	13049.00
500 to 999 Acres	824.00	737.00	14080.00	13072.00
1000 to 1999 Acres	1042.00	885.00	9362.00	9305.00
2000 or > Acres	594.00	604.00	4186.00	4458.00
Ownership (farms)				
Full Owners	333	289	12590.00	14006.00
Part Owners	2450	2225	27145.00	25981.00
Tenants	201	188	7590.00	7908.00
Age of Operator (mean)	46.97	47.20		50.40

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

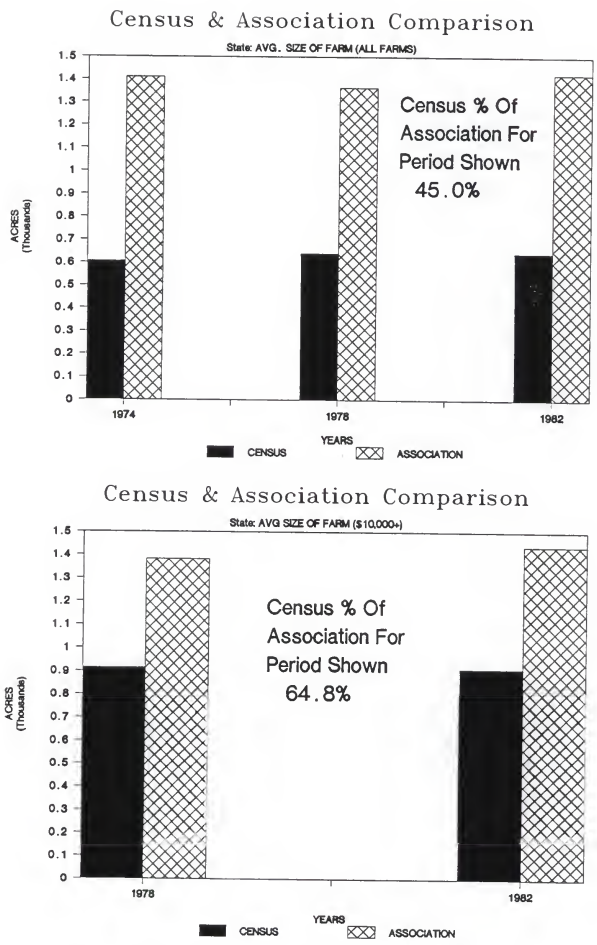
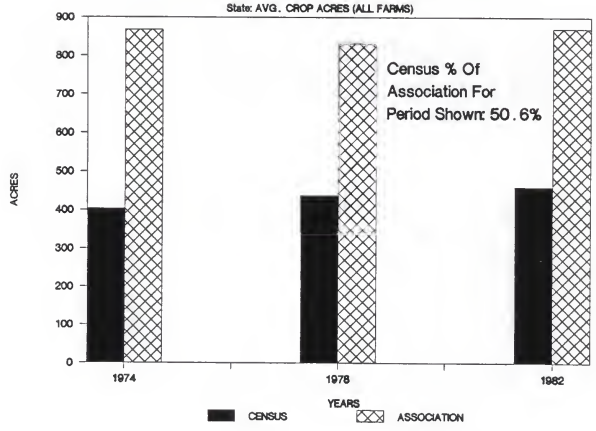
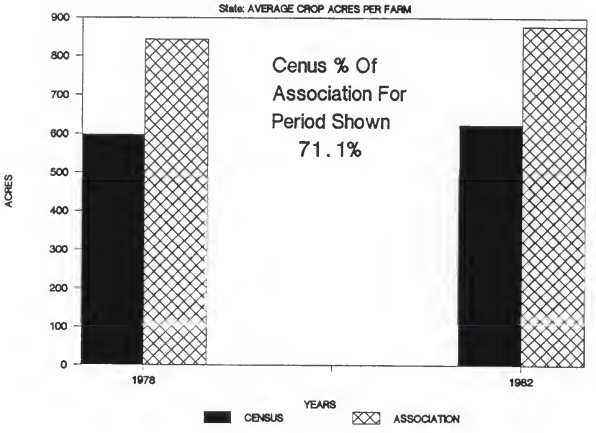

Census & Association Comparison
State: AVG. SIZE OF FARM (ALL FARMS)
ACRES (Thousands)
1.5
1.4
1.3
1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1974
1978
1982
YEARS
CENSUS
ASSOCIATION
Census % Of Association For Period Shown 45.0%
Census & Association Comparison
State: AVG SIZE OF FARM ($10,000+)
ACRES (Thousands)
1.5
1.4
1.3
1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1978
1982
YEARS
CENSUS
ASSOCIATION
Census % Of Association For Period Shown 64.8%

Figure 3
Census & Association Comparison



Census Comparison: $10,000+ In Sales



4.1c Harvested Acres

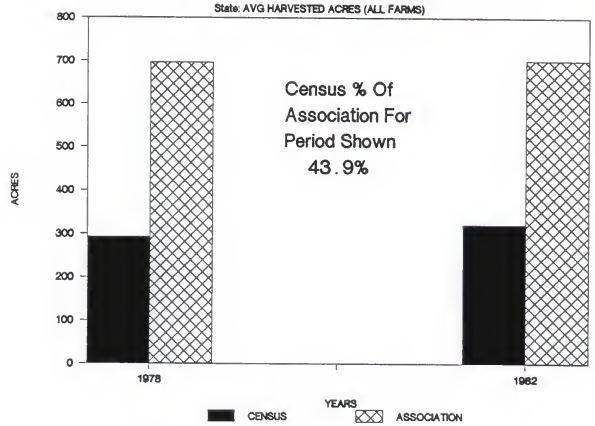
This characteristic comparison shows the same type of relationship as the crop acreage, except that the percentage drops roughly twelve percent for state data (figure 4). For example, for All Farms Crop Acres data, the index of Census to Association Farms was about 51 percent, while the same index for 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



Census Comparison: $10,000+ In Sales

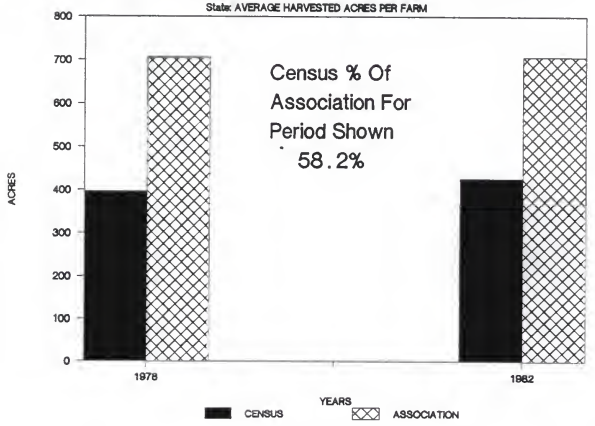
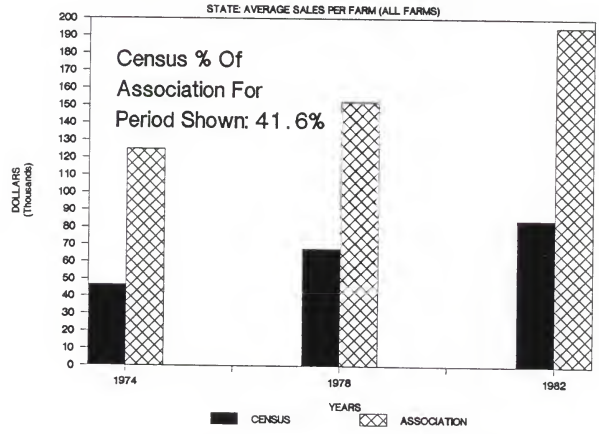
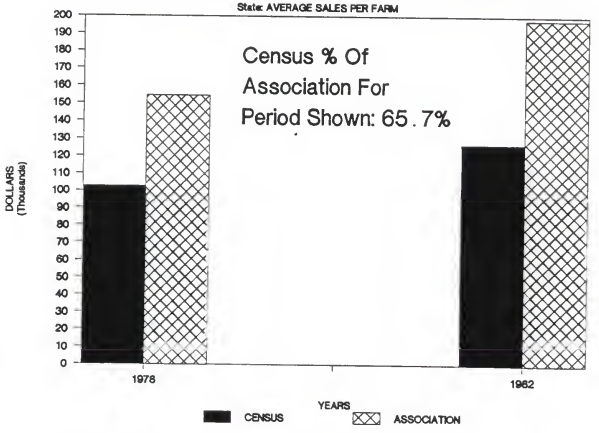


Figure 5

Census & Association Comparison



Census Comparison: $10,000+ In Sales



Farms for Gross Sales.

Other Characteristics

4.3a Age of Operator

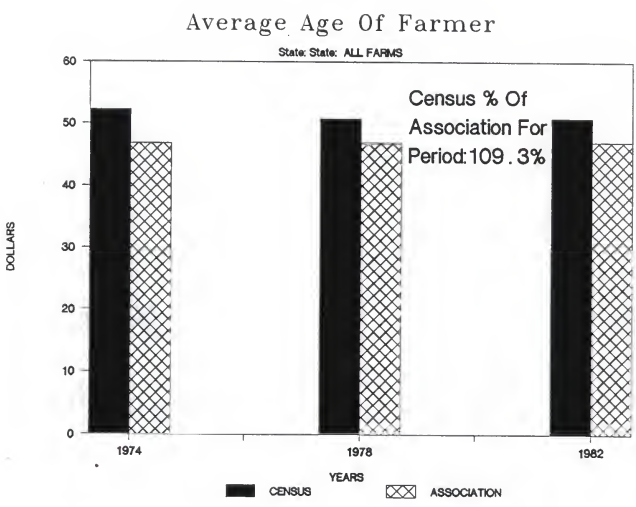
Figure 6 shows that Census Farm Operators average about nine percent older then Association Farmers. The data was insufficient to calculate the same percentages for farms with sales of more than $10,000. The relationship shown here is representative of the individual Associations for Age of Operator.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

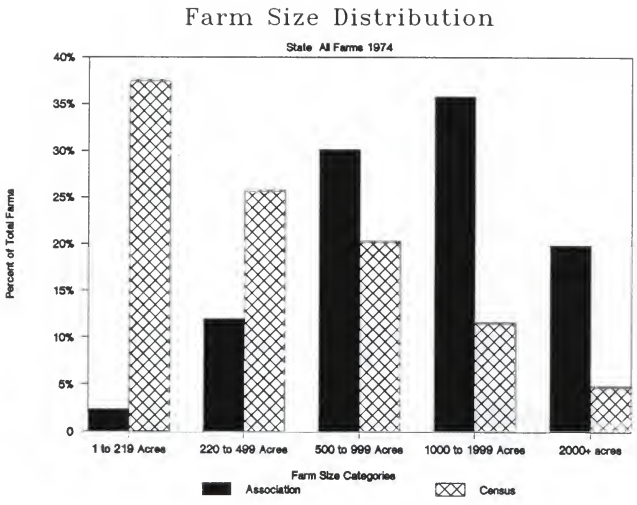
4.3b Farm Size Distribution

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.

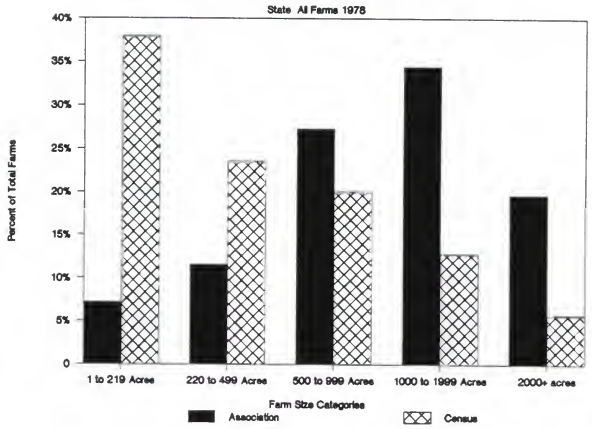
Figure 7 and the top half of figures 8 and 9 show the state size distribution for All Farms data, for Association and Census farms. The figures indicate that Census Farms were skewed toward the smaller farm size categories, while Association Farms were more prevalent in a range from 500 to 1999 acres. 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

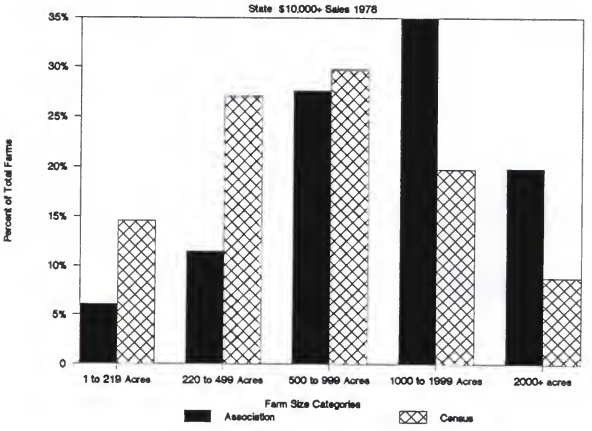

Average Age Of Farmer
State: State: ALL FARMS
Census % Of
Association For
Period: 109 . 3%
DOLLARS
60
50
40
30
20
10
0
1974
1978
1982
YEARS
CENSUS
ASSOCIATION


Farm Size Distribution
State All Farms 1974
Percent of Total Farms
40%
35%
30%
25%
20%
15%
10%
5%
0
1 to 219 Acres
220 to 499 Acres
500 to 999 Acres
1000 to 1999 Acres
2000+ acres
Farm Size Categories
Association
Census

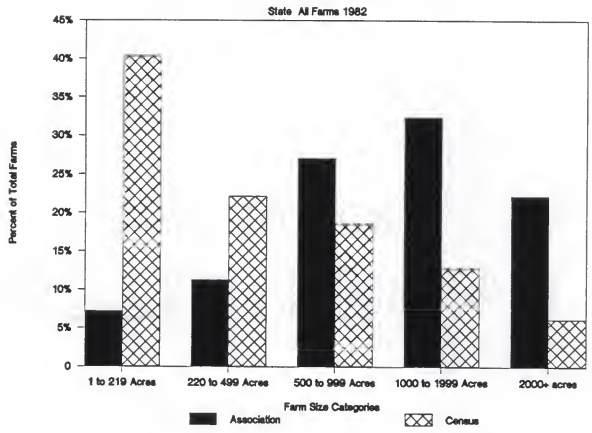
Farm Size Distribution



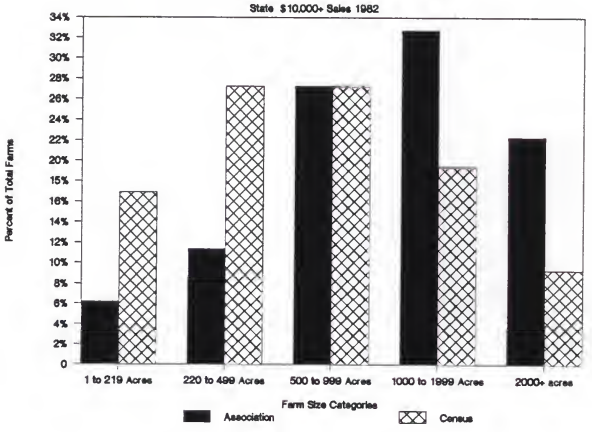
Farm Size Distribution



Farm Size Distribution



Farm Size Distribution

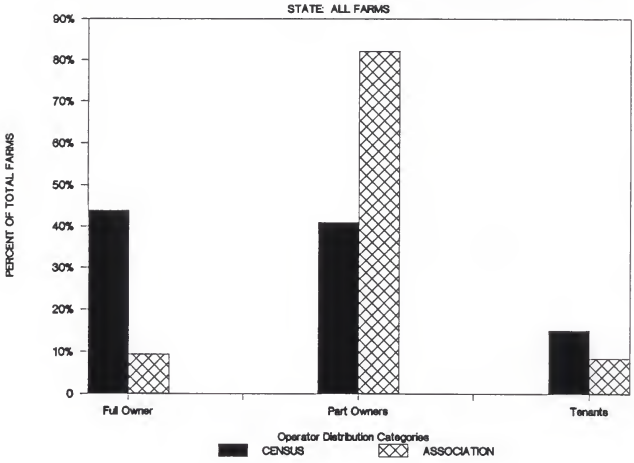


larger farm sizes. This tendency was found in varying degrees for All Associations. However, Association 3 found Census Farms distributed more normally for the All Farms data. From that point, the $10,000 sales farm group, was skewed toward the top two size categories. Individual Association Graphs are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

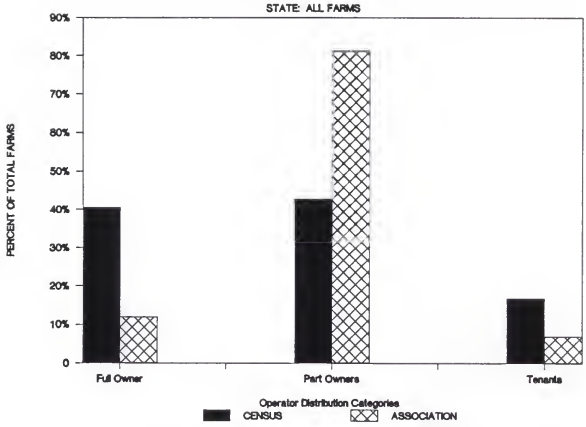
4.3c Operator Distribution

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.

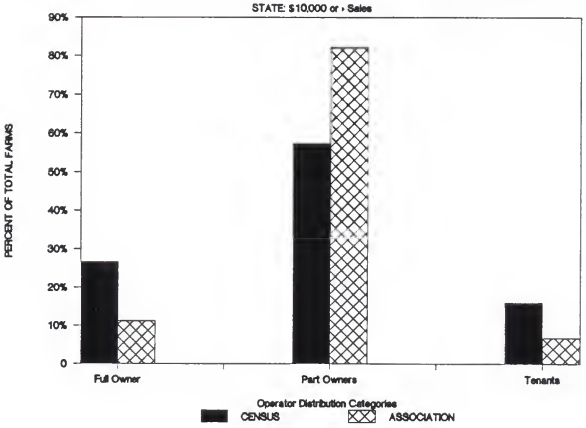
Operator Distribution (by percent) 1974



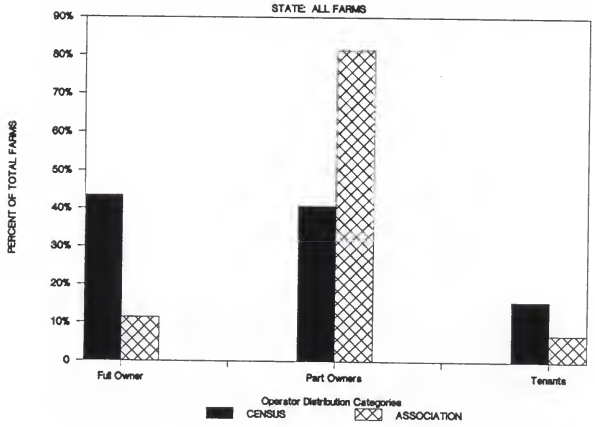
Operator Distribution (by percent) 1978



Operator Distribution (by percent) 1978



Operator Distribution (by percent) 1982



Operator Distribution (by percent) 1982

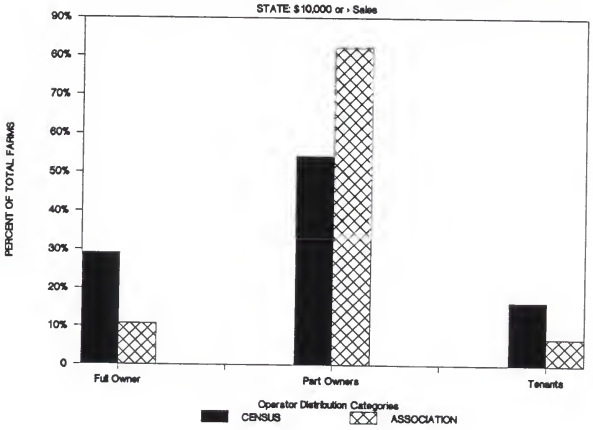


Table 7.2

State (all farms)

	t value74	t value78	t value82
Average Size of Farm	36.95	34.83	33.60
Average Crop Acres/Farm	30.92	28.76	26.96
Average Harv. Acres/Farm	NA*	32.13	35.12
Average Sales Per Farm	32.28	21.47	22.37
Average Age Of Farmer	-21.81	-16.27	-15.04
Table t-values	1.645	1.645	1.645
	Chi-square74	Chi-square78	Chi-square82
Farms Size Distribution	456047	126650	138598
Table Chi-square values	7.78	7.78	7.78
Ownership Distribution	120398	75564	89357
Table Chi-square values	4.61	4.61	4.61
	* Not able to calculate		

FARMS WITH SALES OF $10,000 OR MORE

	t value78	t value82
Average Size of Farm	22.38	22.49
Average Crop Acres/Farm	17.75	16.59
Average Harv. Acres/Farm	24.49	25.91
Average Sales Per Farm	12.89	14.14
Table t-values	1.645	1.645
	Chi-square78	Chi-square82
Farms Size Distribution	21695	25547
Table Chi-square values	7.78	7.78
Ownership Distribution	19726	26212
Table Chi-square values	4.61	4.61

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

Table 8.1

Kansas Farm Facts State Comparison	1973	1974	1975	1976	1977	1978	1979	1980
Association Data								
Number of Farms	2,471	2,603	2,561	2,837	2,977	3,031	3,161	3,148
Gross Sales (mean)	$120,193	$124,976	$116,401	$121,726	$124,392	$152,103	$179,433	$191,084
Gross Farm Income (mean)	$122,444	$93,338	$103,359	$94,492	$103,671	$133,934	$155,002	$140,614
Net Farm Income (mean)	$56,735	$14,767	$21,493	$6,427	$14,770	$35,581	$40,864	$10,546
Total Farm Exp. (mean)	$98,116	$94,619	$99,168	$111,685	$118,127	$143,886	$168,634	$175,641
Inventory Adjust. (mean)	$34,658	($15,590)	$4,260	($3,613)	$8,505	$27,364	$30,064	($4,897)
Net Cash Income (mean)	$31,414	$41,279	$29,279	$22,589	$18,818	$21,567	$26,267	$32,254
Size of Farm (mean)	1,429	1,409	1,395	1,376	1,362	1,363	1,368	1,379
Kansas Farm Facts								
Number of Farms	86,057	86,057	79,000	78,000	77,000	76,000	75,000	75,000
Gross Sales (mean)	51,940	48,489	45,825	50,268	56,594	63,088	90,265	82,828
Gross Farm Income (mean)	44,374	40,204	42,304	42,169	44,284	52,983	69,293	60,375
Net Farm Income (mean)	$18,118	$12,325	$9,576	$6,228	$6,036	$5,850	$10,917	($1,792)
Operating Expenses (mean)	36,141	32,814	38,048	43,690	48,104	63,128	80,009	79,525
Inventory Adjust. (mean)	1,885	(3,788)	1,799	(350)	(2,452)	5,889	659	(5,093)
Net Cash Income (mean)	19,861	20,389	13,927	13,438	15,860	7,583	19,928	13,528
Size of Farm (mean)	587	590	616	623	629	636	644	644

	1981	1982	1983	1984	1985
Association Data					
Number of Farms	2,956	2,713	2,422	2,413	2,360
Gross Sales (mean)	$191,600	$195,478	$195,560	$203,893	$205,536
Gross Farm Income (mean)	$138,507	$153,095	$151,857	$154,296	$151,574
Net Farm Income (mean)	($4,809)	$8,716	$8,180	$1,262	$2,027
Total Farm Exp. (mean)	$181,686	$191,013	$187,649	$202,353	$198,091
Inventory Adjust. (mean)	($14,734)	$4,251	$268	($279)	($5,419)
Net Cash Income (mean)	$27,810	$23,477	$29,049	$24,101	$29,785
Size of Farm (mean)	1,398	1,414	1,377	1,407	1,422
Kansas Farm Facts					
Number of Farms	75,000	75,000	75,000	74,000	72,000
Gross Sales (mean)	83,423	91,172	88,505	97,101	97,742
Gross Farm Income (mean)	69,327	75,233	72,245	78,446	81,635
Net Farm Income (mean)	$3,256	$9,257	$5,195	$9,938	$14,167
Operating Expenses (mean)	79,303	80,933	83,113	86,326	83,432
Inventory Adjust. (mean)	(863)	(980)	(211)	(839)	(142)
Net Cash Income (mean)	15,585	21,891	17,253	21,912	24,693
Size of Farm (mean)	644	644	644	649	667

Figure 13

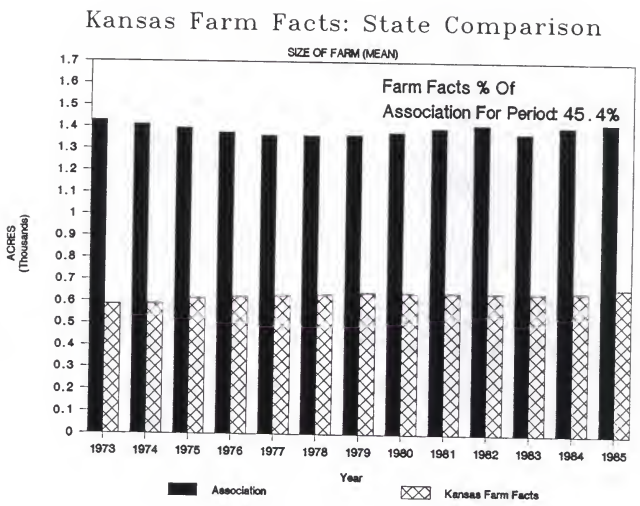

Kansas Farm Facts: State Comparison
SIZE OF FARM (MEAN)
Farm Facts % Of
Association For Period: 45.4%
ACRES
(Thousands)
1.7
1.6
1.5
1.4
1.3
1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1973
1974
1975
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
Year
Association
Kansas Farm Facts

Figure 14

Kansas Farm Facts: State Comparison

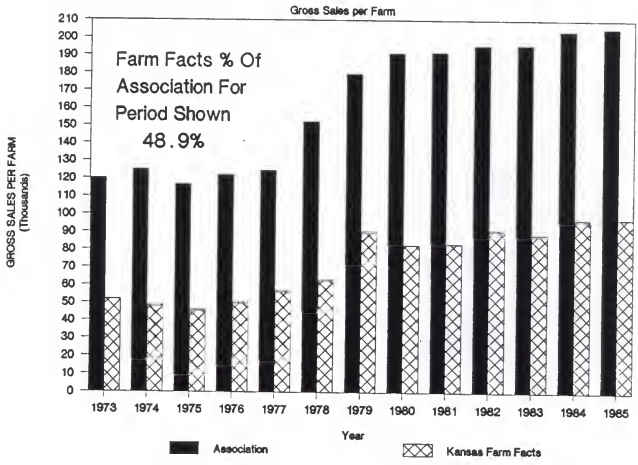
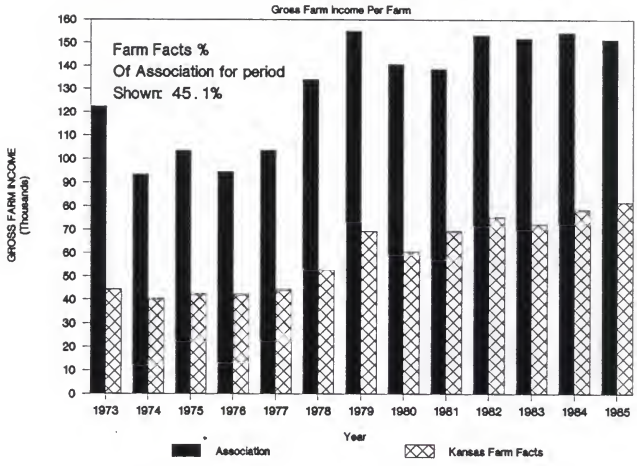


Figure 15

Kansas Farm Facts: State Comparison



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

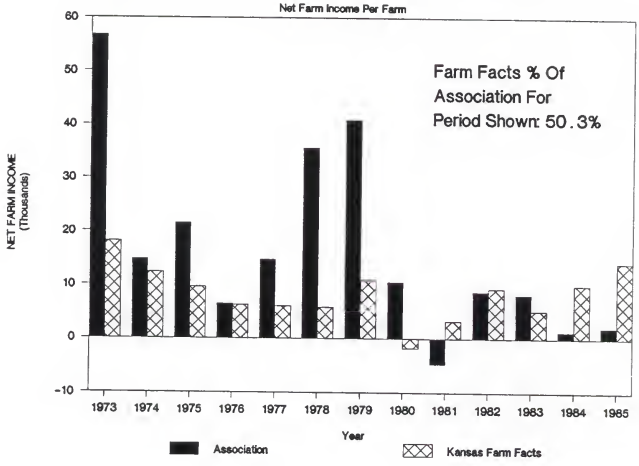


Figure 17

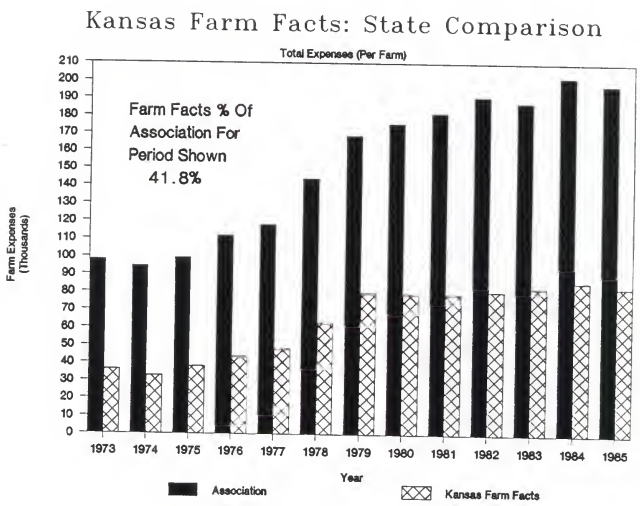
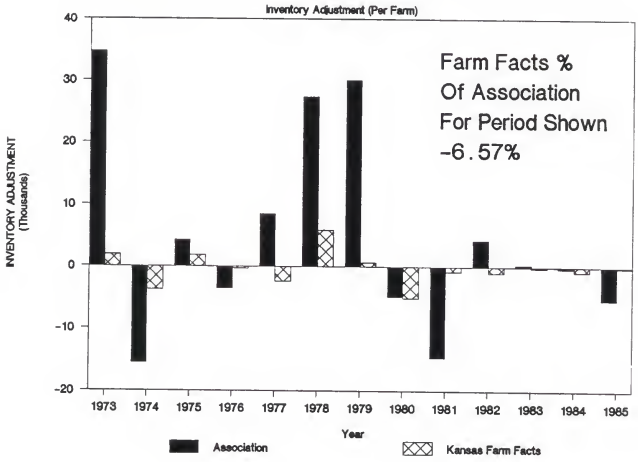

Kansas Farm Facts: State Comparison
Total Expenses (Per Farm)
Farm Facts % Of
Association For
Period Shown
41.8%
Farm Expenses
(Thousands)
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
1973
1974
1975
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
Year
Association
Kansas Farm Facts

Figure 18

Kansas Farm Facts: State Comparison



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).

4.4q 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.

Figure 19

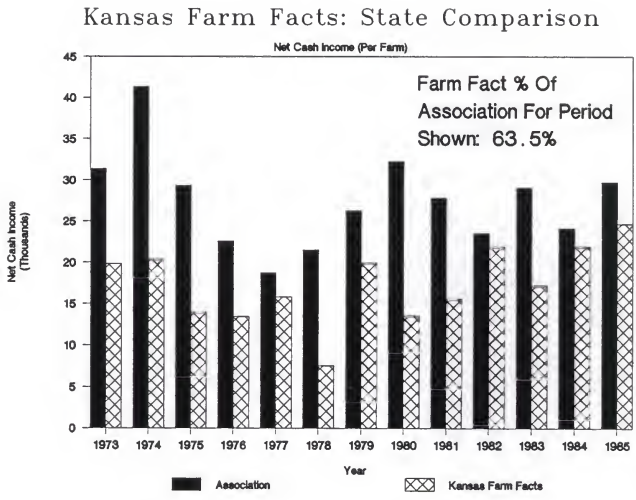

Kansas Farm Facts: State Comparison
Net Cash Income (Per Farm)
Farm Fact % Of
Association For Period
Shown: 63.5%
Net Cash Income
(Thousands)
45
40
35
30
25
20
15
10
5
0
1973
1974
1975
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
Year
Association
Kansas Farm Facts

Table 8.2

State (Farm Facts Comparison)
t-values

Year	Gross Sales	Gross Farm Income	Net Farm Income	Farm Expenses
1973	21.13	36	32.63	19.16
1974	31.46	28	2.37	29.48
1975	28.86	30	15.18	26.58
1976	25.81	29	0.27	24.25
1977	23.27	32	13.49	23.81
1978	22.55	34	32.05	16.83
1979	19.14	34	27.94	18.13
1980	24.09	32	12.47	21.40
1981	22.85	27	-8.11	22.92
1982	20.86	26	-0.52	21.18
1983	19.77	25	2.88	19.74
1984	18.37	22	8.57	19.03
1985	18.32	23	-11.03	20.26
Table t	1.654	1.654	1.654	1.654

Year	Inventory Adjustment	Net Cash Income	Size of Farm
1973	29.43	15	36.44
1974	-10.69	23	37.64
1975	3.29	21	21.12
1976	-4.43	13	34.34
1977	15.03	5	34.64
1978	17.87	17	35.02
1979	24.89	7	35.51
1980	0.18	19	35.29
1981	-10.76	10	34.78
1982	4.56	1.41	33.08
1983	0.44	10	29.67
1984	0.47	1.94	30.81
1985	-3.66	4	29.78
Table t	1.654	1.654	1.654

Table 9

Percent of Association Farms (State)

Variable	CENSUS All Farms	CENSUS OVER $10,000	FARM FACTS
Farm Size	45.0	64.8	45.4
Crop Acres	50.6	71.1	
Harvested Acres	43.9	58.2	
Gross Sales	41.6	65.7	48.9
Operator Age	109.3	--	
Gross Farm Income			45.1
Net Farm Income			50.3
Total Farm Expenses			41.8
Inventory Adjustment			-6.57
Net Cash Income			63.5

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

	Associations					
State	1	2	3	4	5	6
55	49	71	66	58	51	49

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 then 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.

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APPENDIX 1

INDIVIDUAL ASSOCIATIONS

SUMMARY DATA TABLES

Table 1.1

Association 1	Census 1974	Census 1978	Census 1982	All Farms Assoc. Data 1974	All Farms Assoc. Data 1978	All Farms Assoc. Data 1982
No. of Farms	15546	14236	13696	417	498	256
Avg Size of Farm	528.4	553.16	570.99	1202.78	1193.17	1146.12
Avg Crop Acres/Farm	363.57	386.39	413.03	792.476	673	671
Avg Harv Acres/Farm	265.5	273.78	304.64	NA‡	637.401	623.3
Avg Sales/Farm	36096.68	45127.28	57899.39	126415.58	182433.718	194329.41
Avg No Farms/size						
1 to 219 acres	5087	4812	4787	5	39	19
220 to 499 acres	4621	3707	3506	49	55	33
500 to 999 acres	3784	3498	3053	151	160	82
1000 to 1999 acres	1669	1742	1807	164	172	92
2000+	386	477	543	48	72	30
Ownership (farms)						
Full Owner	6360	5235	5311	34	49	24
Part Owner	6549	6242	5891	350	409	222
Tenants	2637	2759	2494	33	40	10
Avg Age of Farmer	52.09	50.71	50.57	42.455	45.92	45.17

Association 1	10,000 Up Census 1978	10,000 Up Census 1982	10,000 Up Assoc. Data 1978	10,000 Up Assoc. Data 1982
No. of Farms	9936	9978	497	252
Avg Size of Farm	754.4	742.71	1195.57	1163.33
Avg Crop Acres/Farm	491.4	510.28	712.408	681.08
Avg Harv Acres/Farm	333.748	373.801	638.68	632.27
Avg Sales/Farm	70567.05	77817.6	182785.25	197308.75
Avg No Farms/size				
1 to 219 acres	1379	1887	38	15
220 to 499 acres	2855	2996	55	33
500 to 999 acres	3383	2979	160	82
1000 to 1999 acres	1731	1787	172	92
2000 or > acres	472	542	72	30
Ownership (farms)				
Full Owner	2563	2889	48	23
Part Owner	5411	5203	409	219
Tenants	1812	1886	40	10
Avg Age of Farmer	NA	50.16	45.87	45.67

Table 2.1

Association 2	CENSUS 1974	CENSUS 1978	CENSUS 1982	All Farms Assoc. Data 1974	All Farms Assoc. Data 1978	All Farms Assoc. Data 1982
No. of Farms	12030	11601	11317	401	473	465
Avg Size of Farm	484.83	504.85	504.16	1043.785	1046.08	1098.04
Avg Crop Acres/Farm	391	414.38	431.33	792.476309	807.756	883.73
Avg Harv Acres/Farm	323.43	315.14	348.11	NA	810.87	812.54
Avg Sales/Farm	45192.85	49509.7	64766.72	164882.1158	124702.243	181120.35
Avg No Farms/size						
1 to 219 acres	4461	4432	4670	7	21	46
220 to 499 acres	3430	3039	2741	60	68	58
500 to 999 acres	2644	2494	2189	155	170	146
1000 to 1999 acres	1266	1342	1376	157	178	161
2000+ acres	229	296	341	22	36	54
Ownership (farms)						
Full Owner	4248	3878	4117	37	44	59
Part Owner	5672	5610	5153	326	385	355
Tenants	2110	2110	2047	38	45	51
					1.6031	3
Avg Age of Farmer	52.51	50.75	51.01	48.249	46.75	47.61

Association 2	10,000 Up Census 1978	10,000 Up Census 1982	10,000 Up Assoc. Data 1978	10,000 Up Assoc. Data 1982
No. of Farms	7628	7987	466	458
Avg Size of Farm	805.03	794.39	1058.81	1102.92
Avg Crop Acres/Farm	555.45	549.79	817.63	885.33
Avg Harv Acres/Farm	418.2	442.79	820.67	813.69
Avg Sales/Farm	43350.45	98068.24	126537	183807.39
Avg No Farms/size				
1 to 219 acres	1141	1638	17	42
220 to 499 acres	2451	2457	65	58
500 to 999 acres	2406	2157	170	145
1000 to 1999 acres	1335	1370	178	161
2000+	295	340	36	52
Ownership (farms)				
Full Owner	1611	1940	40	55
Part Owner	4778	4602	384	355
Tenants	1239	1445	42	48
Avg Age of Farmer	NA	51.15	46.922	47.78

Table 3.1

Association 3	CENSUS 1974	CENSUS 1978	CENSUS 1982	All Farms Assoc. Data 1974	All Farms Assoc. Data 1978	All Farms Assoc. Data 1982
No. of Farms	9265	9157	8883	544	483	375
Avg Size of Farm	1242.08	1253.54	1271.59	2041.0349	1946.53	2110.06
Avg Crop Acres/Farm	865.83	916.42	977.42	1519.5165	1432.22	1597.77
Avg Harv Acres/Farm	559.9	558.35	627.2	NA	942.69	1033.91
Avg Sales/Farm	132109.81	234272.32	297680.79	164882.1158	169853.366	237845.63
Avg No Farms/size						
1 to 219 acres	1619	1724	1908	10	45	15
220 to 499 acres	1780	1744	1564	18	15	15
500 to 999 acres	2155	1976	1815	77	60	56
1000 to 1999 acres	2187	2092	2007	217	177	117
2000+	1494	1621	1648	222	186	172
Ownership (farms)						
Full Owner	2167	2483	2752	33	72	33
Part Owner	4448	4502	4035	439	352	286
Tenants	2167	2220	2190	72	59	56
Avg Age of Farmer	49.95	49.93	52.07	47.863	49.17	49.93

Association 3	10,000 Up Census 1978	10,000 Up Census 1982	10,000 Up Assoc. Data 1978	10,000 Up Assoc. Data 1982
No. of Farms	7240	7284	464	369
Avg Size of Farm	1525.27	1493.52	2020.72	2131.43
Avg Crop Acres/Farm	1079.64	1119.57	1488.327	1612.76
Avg Harv Acres/Farm	649.93	704.76	979.89	1041.15
Avg Sales/Farm	302545.99	353836.35	176757.25	241685.73
Avg No Farms/size				
1 to 219 acres	606	716	29	11
220 to 499 acres	1184	1226	14	15
500 to 999 acres	1843	1747	59	55
1000 to 1999 acres	2046	1942	176	117
2000+	1610	1628	186	171
Ownership (farms)				
Full Owner	1454	1817	55	28
Part Owner	4175	3816	352	284
Tenants	1624	1651	58	56
Avg Age of Farmer		50.06	49.12	49.96

Table 4.1

Association 4	Census 1974	Census 1978	Census 1982	All Farms Assoc. Data 1974	All Farms Assoc. Data 1978	All Farms Assoc. Data 1982
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	186.23	NA	467.91	547.7
Avg Sales/Farm	26227.64	34962.93	42489.54	106590	146462.99	193865.07
Avg No Farms/size						
1 to 219 acres	7374	6797	7244	22	48	42
220 to 499 acres	3608	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+	188	205	239	29	39	60
Ownership (farms)						
Full Owner	7901	6786	7280	61.83	87	75
Part Owner	4397	4356	4184	332.70	448	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

Association 4	10,000 Up Census 1978	10,000 Up Census 1982	10,000 Up Assoc. Data 1978	10,000 Up Assoc. Data 1982
No. of Farms	6929	6849	563	552
Avg Size of Farm	605.53	631.14	920.23	1064
Avg Crop Acres/Farm	345.07	368.95	493.21	560.37
Avg Harv Acres/Farm	266.47	284.7	470.17	547.24
Avg Sales/Farm	60632.41	77167.32	147721.96	195562.83
Avg No Farms/size				
1 to 219 acres	1685	1815	46	38
220 to 499 acres	2451	2305	115	112
500 to 999 acres	1833	1745	195	169
1000 to 1999 acres	869	809	169	173
2000 or > acres	202	234	38	60
Ownership (farms)				
Full Owner	2495	2575	85	74
Part Owner	3794	3636	445	435
Tenants	955	986	33	42
Avg Age of Farmer		50.04	46.12	47.52

Table 5.1

Association 5	Census 1974	Census 1978	Census 1982	All Farms Assoc. Data 1974	All Farms Assoc. Data 1978	All Farms Assoc. Data 1982
No. of Farms	9927	9497	9399	306	458	419
Avg Size of Farm	976	1018.34	1027.47	2191.48	2025.56	2066.99
Avg Crop Acres/Farm	635.94	666.2	720.54	1299.709	1181.23	1214.66
Avg Harv Acres/Farm	343.52	342.29	387.65	NA	768.81	745
Avg Sales/Farm	52451.8	65945.04	84134.8	128206.591	143370	202178.133
Avg No Farms/size						
1 to 219 acres	1873	2334	2004	1	30	31
220 to 499 acres	2146	1951	1886	9	22	17
500 to 999 acres	2557	2336	2182	33	53	54
1000 to 1999 acres	2257	2144	2128	118	159	130
2000 or > acres	1094	1068	1199	145	194	187
Ownership (farms)						
Full Owner	3336	2972	3283	20	40	50
Part Owner	4872	4592	4391	265	400	356
Tenants	1719	1933	1725	20	18	13
Avg Age of Farmer	52.96	50.72	50.64	48.65	45.39	46.46

Association 5	10,000 Up Census 1978	10,000 Up Census 1982	10,000 Up Assoc. Data 1978	10,000 Up Assoc. Data 1982
No. of Farms	6939	7367	449	414
Avg Size of Farm	1301.12	1250.28	2065.0935	2090.64
Avg Crop Acres/Farm	817.56	848.45	1204.12	1228.74
Avg Harv Acres/Farm	437.27	451.93	783.63	753.64
Avg Sales/Farm	85185.19	105822.86	146228.42	204592.53
Avg No Farms/size				
1 to 219 acres	435	644	22	27
220 to 499 acres	1109	1396	21	17
500 to 999 acres	2043	2046	53	53
1000 to 1999 acres	2150	2093	159	130
2000 or > acres	1138	1192	194	187
Ownership (farms)				
Full Owner	1646	2091	38	47
Part Owner	4131	4040	393	354
Tenants	1162	1236	18	13
Avg Age of Farmer		50.58	45.93	46.41

Table 6.1

Association 6	CENSUS 1974	CENSUS 1978	CENSUS 1982	All Farms Assoc. Data 1974	All Farms Assoc. Data 1978	All Farms Assoc. Data 1982
No. of Farms	18565	16946	17005	505	551	641
Avg Size of Farm	415.51	450.63	441.58	1135.25	1187.22	1224.34
Avg Crop Acres/Farm	223.24	248.15	255.7	461.566	498.911	542.74
Avg Harv Acres/Farm	204.71	195.57	170.93	NA	608.802	558.13
Avg Sales/Farm	25226.39	34365.87	39651.34	106333.61	145724.277	178588.96
Avg No Farms/size						
1 to 219 acres	9326	8396	8947	16	33	43
220 to 499 acres	4805	4051	3994	73	73	73
500 to 999 acres	2886	2724	2554	202	189	232
1000 to 1999 acres	1150	1299	1286	164	188	202
2000+	398	476	524	50	68	91
Ownership (farms)						
Full Owner	10204	8707	9091	58	70	68
Part Owner	6524	6345	6208	424	466	553
Tenants	1837	1894	1706	23	15	20
Avg Age of Farmer	52.36	51.12	51.54	47.28	47.93	46.23

Association 6	10,000 Up Census 1978	10,000 Up Census 1982	10,000 Up Assoc. Data 1978	10,000 Up Assoc. Data 1982
No. of Farms	8769	8430	545	632
Avg Size of Farm	742.69	763.73	1197.03	1241.68
Avg Crop Acres/Farm	381.06	402.83	503.06	550.43
Avg Harv Acres/Farm	298.16	322.96	614.17	566.05
Avg Sales/Farm	62519.56	76189.8	147262.64	181064.57
Avg No Farms/size				
1 to 219 acres	1650	1704	30	34
220 to 499 acres	2805	2583	72	73
500 to 999 acres	2575	2415	187	232
1000 to 1999 acres	1477	1263	188	202
2000 or > acres	469	519	68	91
Ownership (farms)				
Full Owner	2821	2694	69	61
Part Owner	4990	4862	465	551
Tenants	949	874	11	20
Avg Age of Farmer		50.45	47.91	46.27

APPENDIX 2

INDIVIDUAL ASSOCIATIONS

SUMMARY STATISTICAL TABLES

Table 1.2

Association #1 (all farms)

	t value74	t value78	t value82
Average Size of Farm	16.89	15.56	10.19
Average Crop Acres/Farm	19.86	12.16	9.17
Average Harv. Acres/Farm	NA*	13.16	11.84
Average Sales Per Farm	14.43	9.65	7.95
Average Age Of Farmer			
Table t-values	1.645	1.645	1.645
	Chi-square74	Chi-square78	Chi-square82
Farms Size Distribution	738.95	538.72	221.75
Table Chi-square values	7.78	7.78	7.78
Ownership Distribution	302.51	297.78	199.53
Table Chi-square values	4.61	4.61	4.61
	* Not able to calculate		

FARMS WITH SALES OF $10,000 OR MORE

	t value78	t value82
Average Size of Farm	10.73	7.42
Average Crop Acres/Farm	9.37	6.07
Average Harv. Acres/Farm	11.02	9.59
Average Sales Per Farm	7.87	6.88
Table t-values	1.645	1.645
	Chi-square78	Chi-square82
Farms Size Distribution	251.85	115.15
Table Chi-square values	7.78	7.78
Ownership Distribution	149.17	122.34
Table Chi-square values	4.61	4.61

Table 2.2

Association #2 (all farms)

	t value74	t value78	t value82
Average Size of Farm	18.49	17.36	15.92
Average Crop Acres/Farm	17.81	16.52	14.45
Average Harv. Acres/Farm	NA*	12.47	16.68
Average Sales Per Farm	27.03	12.72	10.09
Average Age Of Farmer	-7.22	-6.39	-5.58
Table t-values	1.645	1.645	1.645
	Chi-square74	Chi-square78	Chi-square82
Farms Size Distribution	550.92	537.49	479.48
Table Chi-square values	7.77	7.77	7.77
Ownership Distribution	191.31	209.46	181.22
Table Chi-square values	4.61	4.61	4.61
	* Not able to calculate		

FARMS WITH SALES OF $10,000 OR MORE

	t value78	t value82
Average Size of Farm	8.12	8.14
Average Crop Acres/Farm	10.99	10.73
Average Harv. Acres/Farm	10.02	13.42
Average Sales Per Farm	13.96	7.35
Table t-values	1.645	1.645
	Chi-square78	Chi-square82
Farms Size Distribution	223.39	221.85
Table Chi-square values	7.78	7.78
Ownership Distribution	78.74	74.56
Table Chi-square values	4.61	4.61

Table 3.2

Association #3 (all farms)

	t value74	t value78	t value82
Average Size of Farm	13.87	10.15	11.18
Average Crop Acres/Farm	14.92	9.92	10.19
Average Harv. Acres/Farm	NA*	10.39	10.19
Average Sales Per Farm	5.09	-7.81	-4.19
Average Age Of Farmer	-4.24	-1.28	-3.28
Table t-values	1.645	1.645	1.645
	Chi-square74	Chi-square78	Chi-square82
Farms Size Distribution	433.78	264.79	261.42
Table Chi-square values	7.78	7.78	7.78
Ownership Distribution	214.86	110.62	152.46
Table Chi-square values	4.61	4.61	4.61
	* Not able to calculate		

FARMS WITH SALES OF $10,000 OR MORE

	t value78	t value82
Average Size of Farm	7.20	8.49
Average Crop Acres/Farm	7.78	8.10
Average Harv. Acres/Farm	8.92	8.49
Average Sales Per Farm	-14.92	-7.78
Table t-values	1.645	1.645
	Chi-square78	Chi-square82
Farms Size Distribution	164.37	164.57
Table Chi-square values	7.78	7.78
Ownership Distribution	62.87	96.01
Table Chi-square values	4.61	4.61

Table 4.2

Association #4 (all farms)

	t value74	t value78	t value82
Average Size of Farm	15.21	19.13	17.83
Average Crop Acres/Farm	16.65	16.76	17.23
Average Harv. Acres/Farm	NA*	19.59	19.38
Average Sales Per Farm	12.61	check	13.48
Average Age Of Farmer	-8.85	-8.38	-5.99
Table t-values	1.645	1.645	1.645
	Chi-square74	Chi-square78	Chi-square82
Farms Size Distribution	846.37	988.20	1124.04
Table Chi-square values	7.78	7.78	7.78
Ownership Distribution	422.85	505.30	556.09
Table Chi-square values	4.61	4.61	4.61
	* Not able to calculate		

FARMS WITH SALES OF $10,000 OR MORE

	t value78	t value82
Average Size of Farm	11.02	11.38
Average Crop Acres/Farm	9.51	10.27
Average Harv. Acres/Farm	13.73	14.14
Average Sales Per Farm	8.71	10.48
Table t-values	1.645	1.645
	Chi-square78	Chi-square82
Farms Size Distribution	275.67	383.14
Table Chi-square values	7.78	7.78
Ownership Distribution	154.64	172.13
Table Chi-square values	4.61	4.61

Table 5.2

Association #5 (all farms)

	t value74	t value78	t value82
Average Size of Farm	16.68	15.35	14.16
Average Crop Acres/Farm	13.34	-7.40	11.16
Average Harv. Acres/Farm	NA*	12.86	13.08
Average Sales Per Farm	12.64	13.22	8.58
Average Age Of Farmer	-6.90	-8.95	-6.70
Table t-values	1.645	1.645	1.645
	Chi-square74	Chi-square78	Chi-square82
Farms Size Distribution	532.67	571.51	457.55
Table Chi-square values	7.78	7.78	7.78
Ownership Distribution	174.61	279.14	248.80
Table Chi-square values	4.61	4.61	4.61
	* Not able to calculate		

FARMS WITH SALES OF $10,000 OR MORE

	t value78	t value82
Average Size of Farm	11.65	11.43
Average Crop Acres/Farm	9.64	8.57
Average Harv. Acres/Farm	10.65	11.02
Average Sales Per Farm	7.12	7.12
Table t-values	1.645	1.645
	Chi-square78	Chi-square82
Farms Size Distribution	286.28	300.14
Table Chi-square values	7.78	7.78
Ownership Distribution	146.67	160.35
Table Chi-square values	4.61	4.61

Table 6.2

Association #6 (all farms)

	t value74	t value78	t value82
Average Size of Farm	17.19	17.63	18.04
Average Crop Acres/Farm	7.26	16.42	18.24
Average Harv. Acres/Farm	16.47	15.18	22.33
Average Sales Per Farm	NA*	13.20	15.20
Average Age Of Farmer	-9.39	-5.81	-9.91
Table t-values	1.645	1.645	1.645
	Chi-square74	Chi-square78	Chi-square82
Farms Size Distribution	1147.26	1032.31	1231.26
Table Chi-square values	7.78	7.78	7.78
Ownership Distribution	529.04	522.54	685.54
Table Chi-square values	4.61	4.61	4.61
	* Not able to calculate		

FARMS WITH SALES OF $10,000 OR MORE

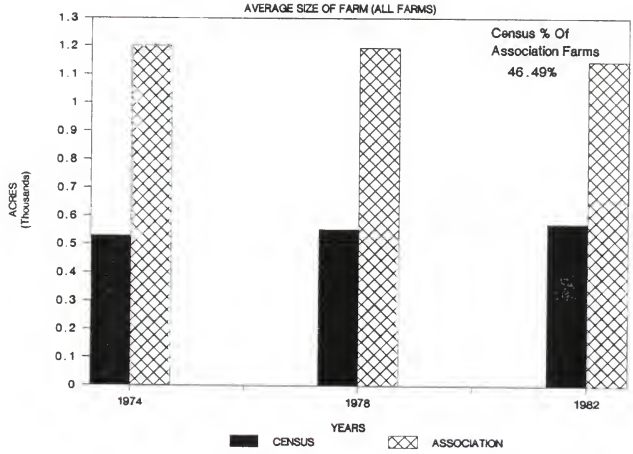
	t value78	t value82
Average Size of Farm	10.81	10.96
Average Crop Acres/Farm	7.95	9.37
Average Harv. Acres/Farm	11.52	13.98
Average Sales Per Farm	9.97	11.36
Table t-values	1.645	1.645
	Chi-square78	Chi-square82
Farms Size Distribution	286.54	349.66
Table Chi-square values	7.78	7.78
Ownership Distribution	179.78	226.16
Table Chi-square values	4.61	4.61

APPENDIX 3

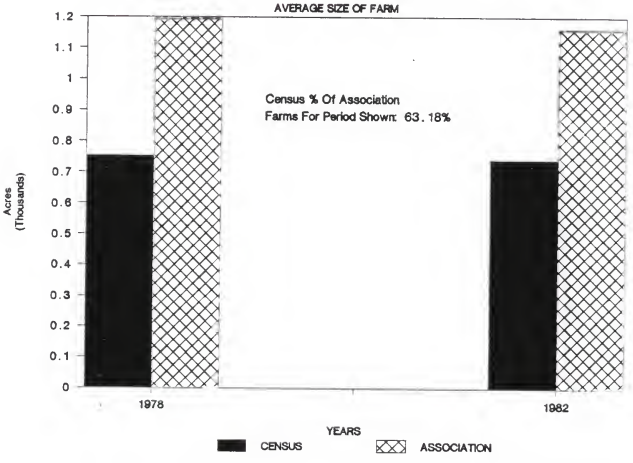
INDIVIDUAL ASSOCIATIONS

CHARACTERISTIC MEAN GRAPHS

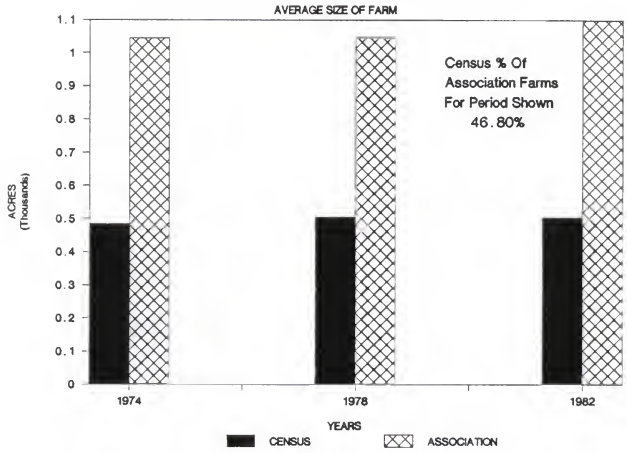
Association #1



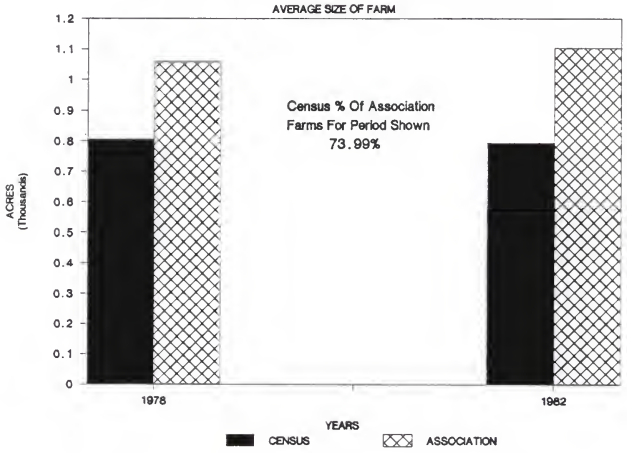
Association #1 ($10,000+ Sales)



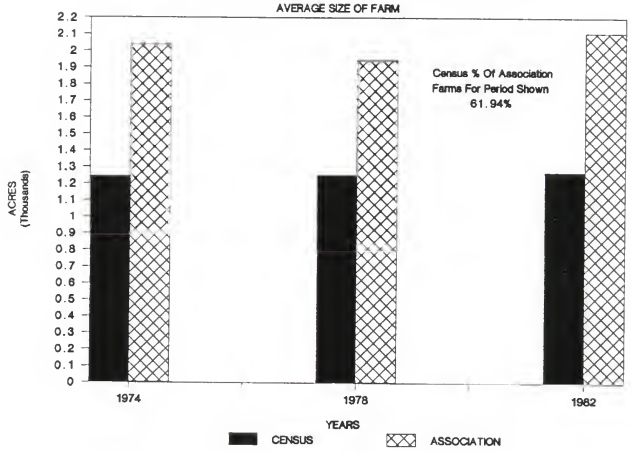
Association #2: All Farms



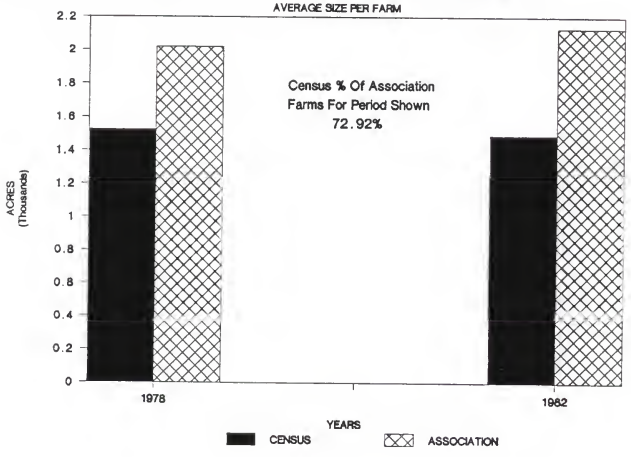
Association #2: $10,000+ Sales



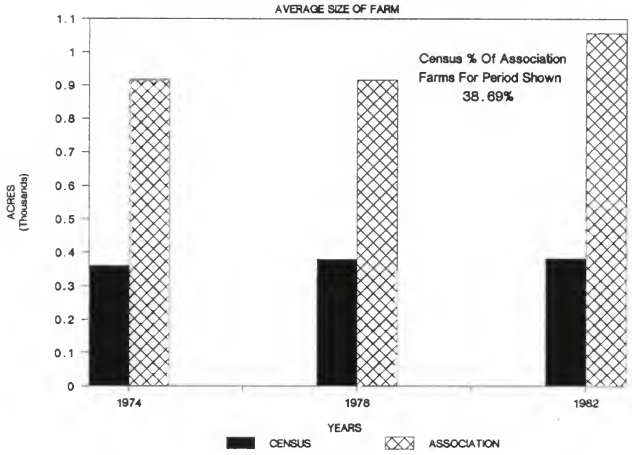
Association #3: All Farms



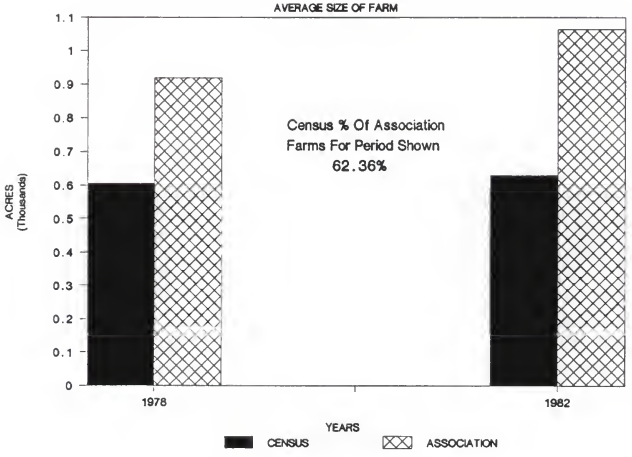
Association #3: $10,000+ Sales



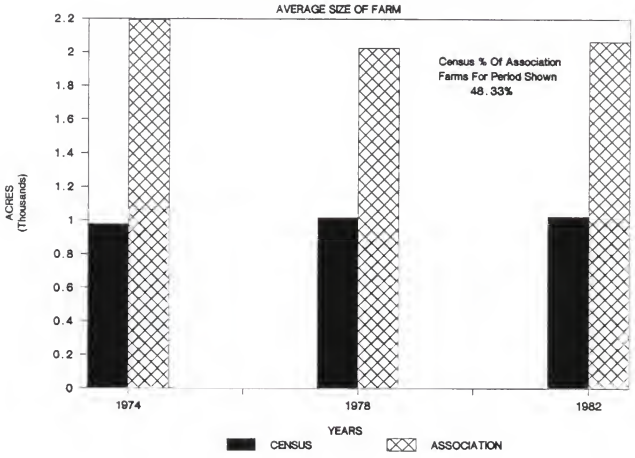
Association #4: All Farms



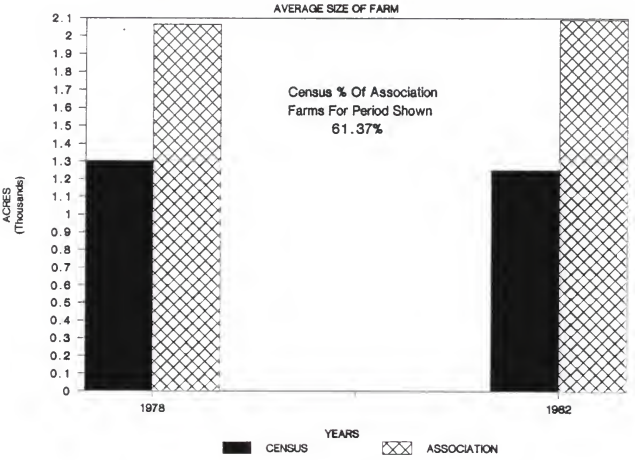
Association #4: $10,000+ Sales



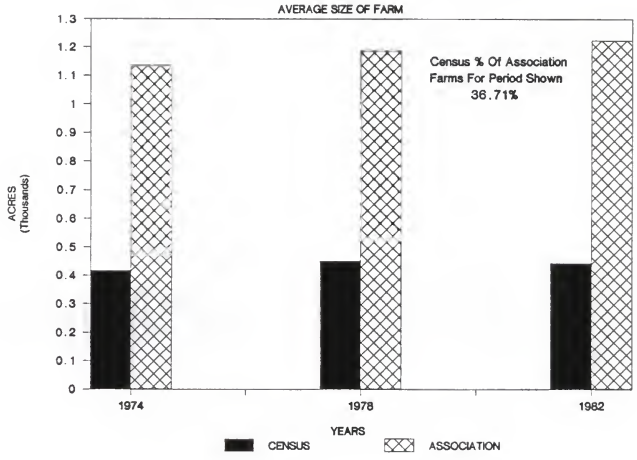
Association #5: All Farms



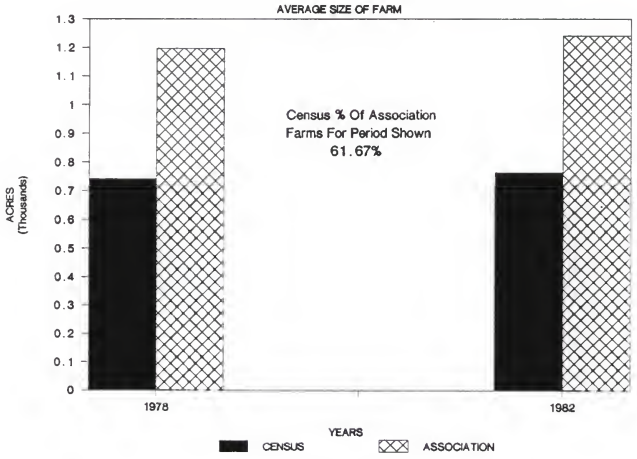
Association #5: $10,000+ Sales



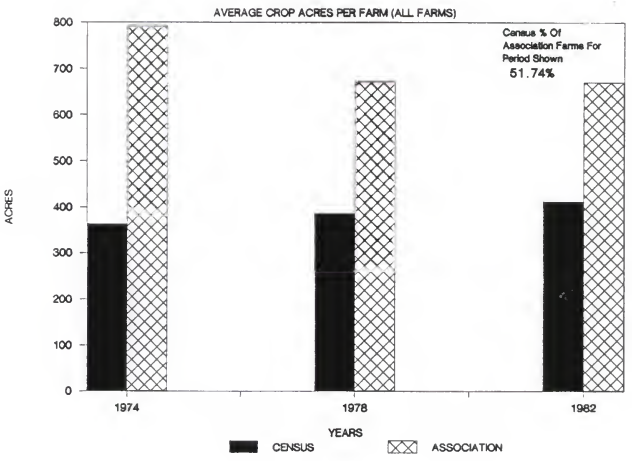
Association #6: All Farms



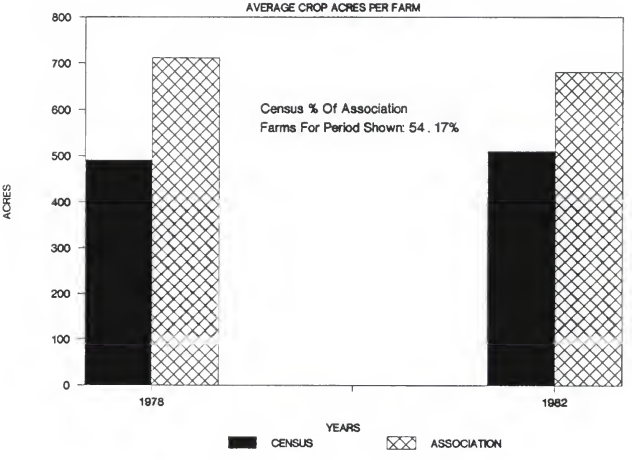
Association #6: $10,000+ Sales



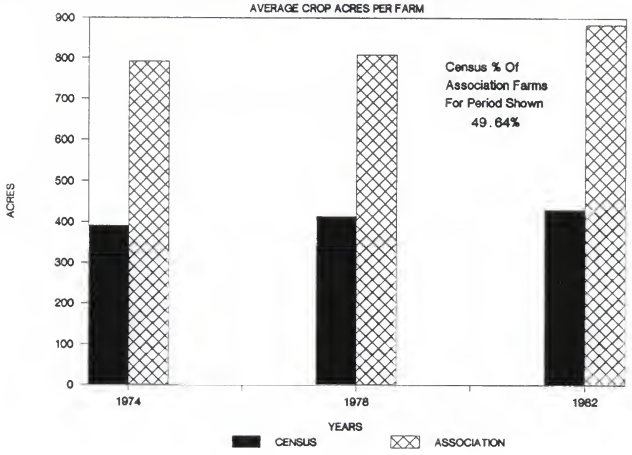
Association #1



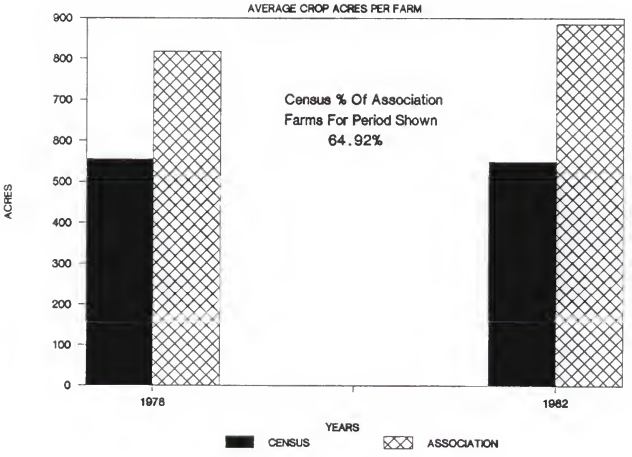
Association #1 ($10,000+ Sales)



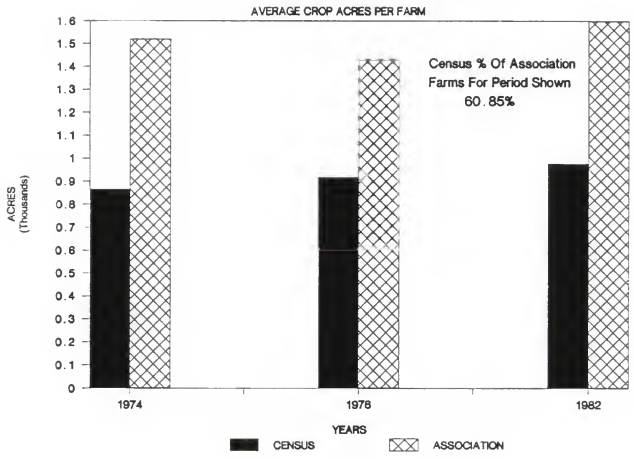
Association #2: All Farms



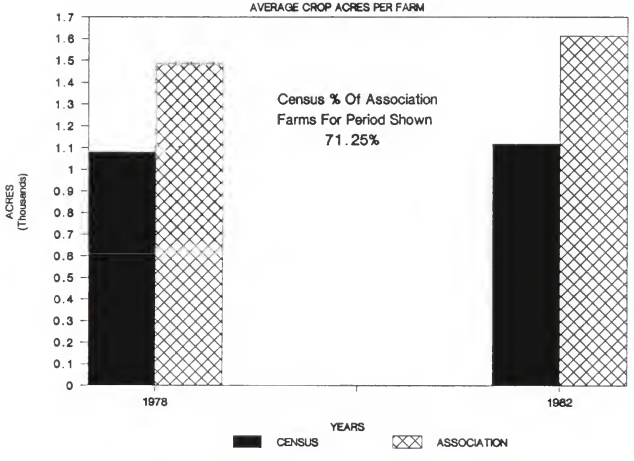
Association #2: $10,000+ Sales

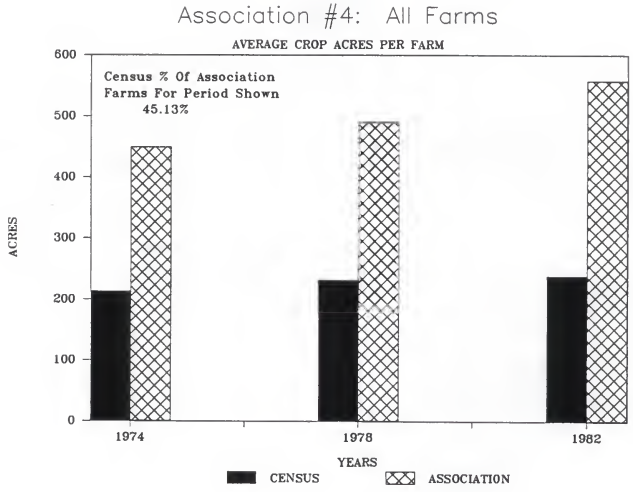


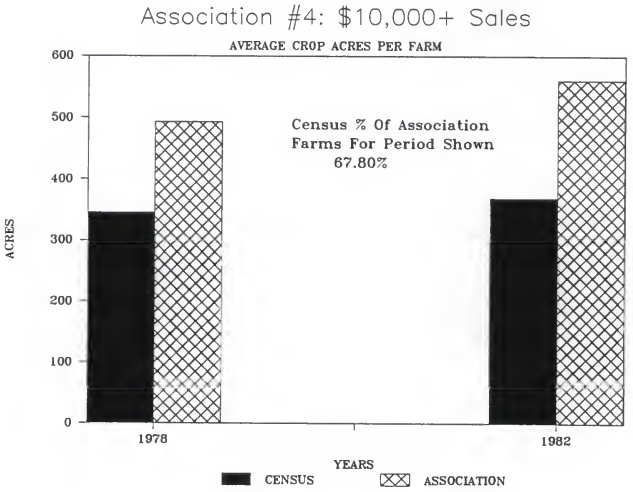
Association #3: All Farms



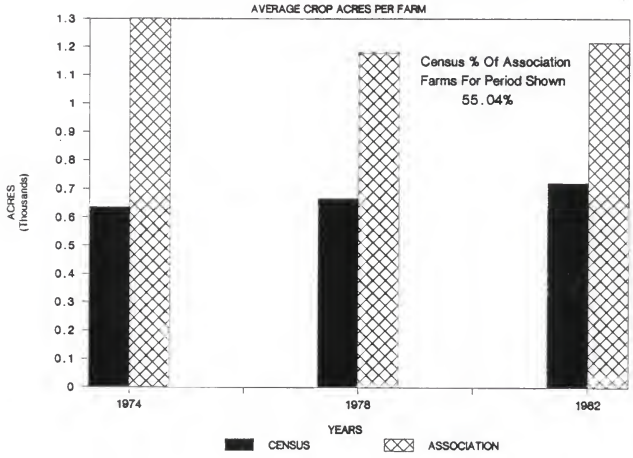
Association #3: $10,000+ Sales



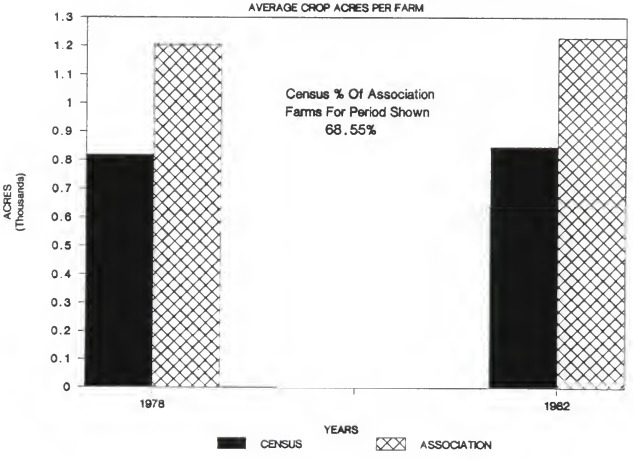

Association #4: All Farms
AVERAGE CROP ACRES PER FARM
Census % Of Association
Farms For Period Shown
45.13%
ACRES
600
500
400
300
200
100
0
1974
1978
1982
YEARS
CENSUS
ASSOCIATION

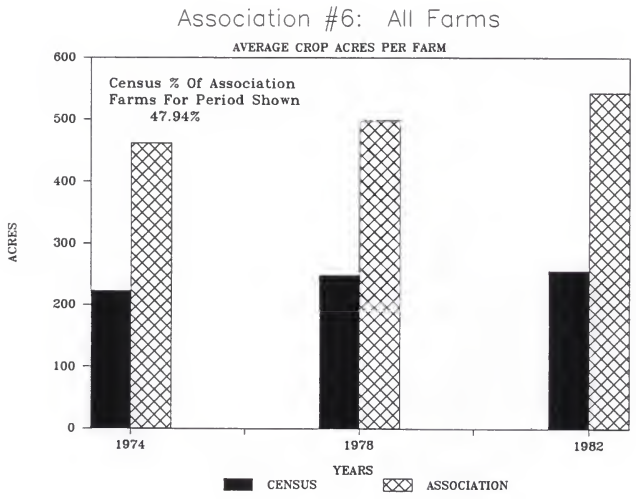

Association #4: $10,000+ Sales
AVERAGE CROP ACRES PER FARM
Census % Of Association
Farms For Period Shown
67.80%
ACRES
600
500
400
300
200
100
0
1978
1982
YEARS
CENSUS
ASSOCIATION

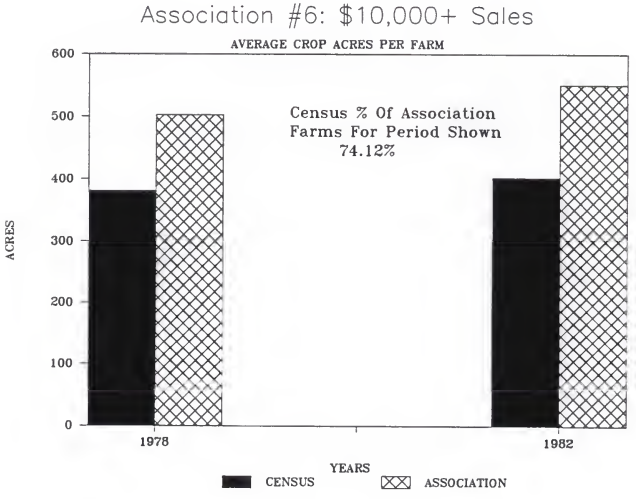
Association #5: All Farms

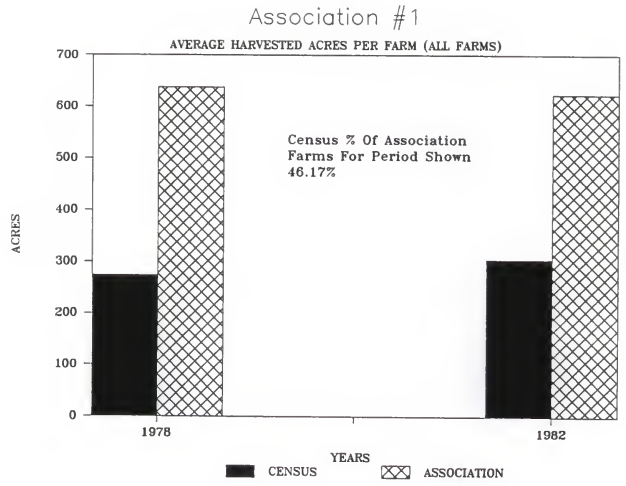


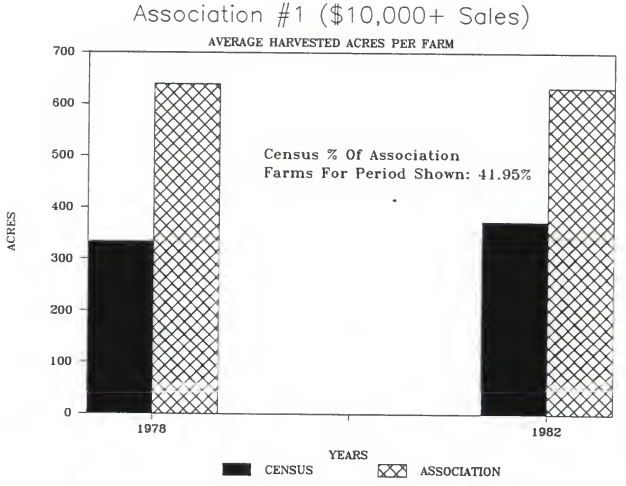
Association #5: $10,000+ Sales

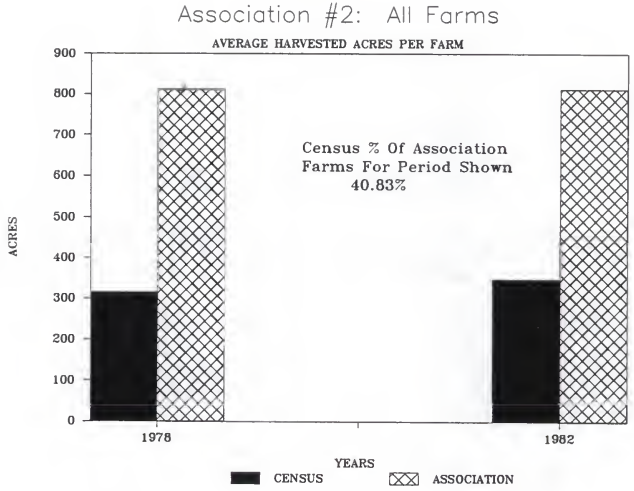


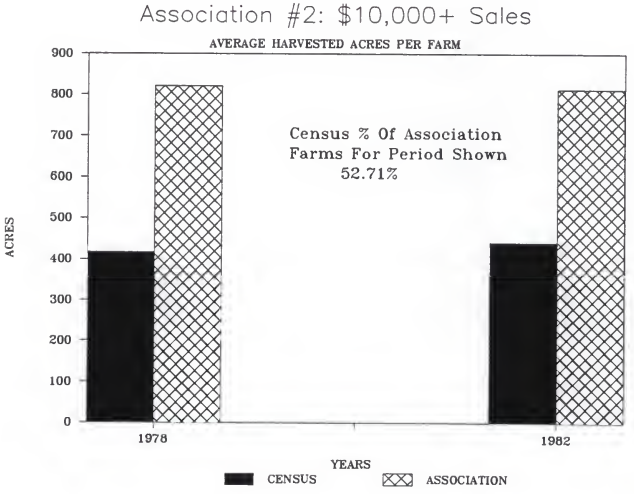

Association #6: All Farms
AVERAGE CROP ACRES PER FARM
Census % Of Association
Farms For Period Shown
47.94%
ACRES
600
500
400
300
200
100
0
1974
1978
1982
YEARS
CENSUS
ASSOCIATION

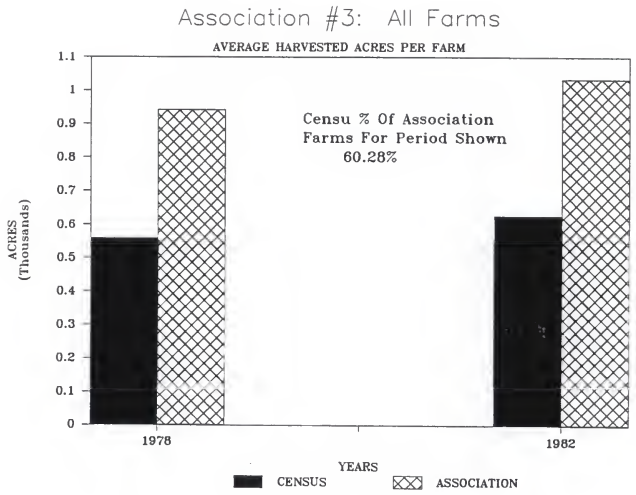

Association #6: $10,000+ Sales
AVERAGE CROP ACRES PER FARM
Census % Of Association
Farms For Period Shown
74.12%
ACRES
600
500
400
300
200
100
0
1978
1982
YEARS
CENSUS
ASSOCIATION

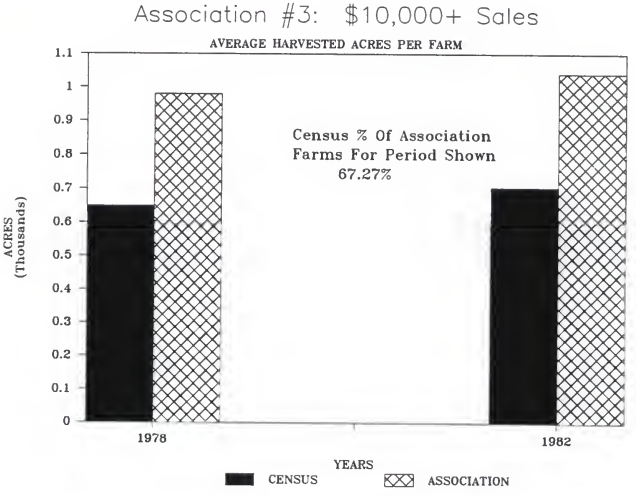

Association #1
AVERAGE HARVESTED ACRES PER FARM (ALL FARMS)
700
600
500
400
300
200
100
0
ACRES
Census % Of Association
Farms For Period Shown
46.17%
1978
1982
YEARS
CENSUS
ASSOCIATION

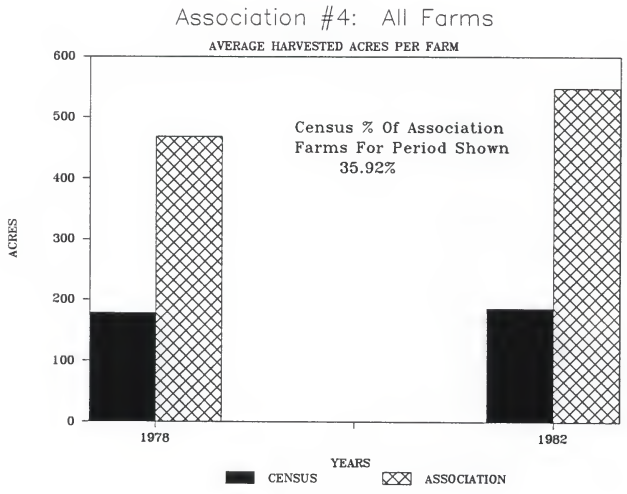

Association #1 ($10,000+ Sales)
AVERAGE HARVESTED ACRES PER FARM
700
600
500
400
300
200
100
0
ACRES
Census % Of Association
Farms For Period Shown: 41.95%
1978
1982
YEARS
CENSUS
ASSOCIATION

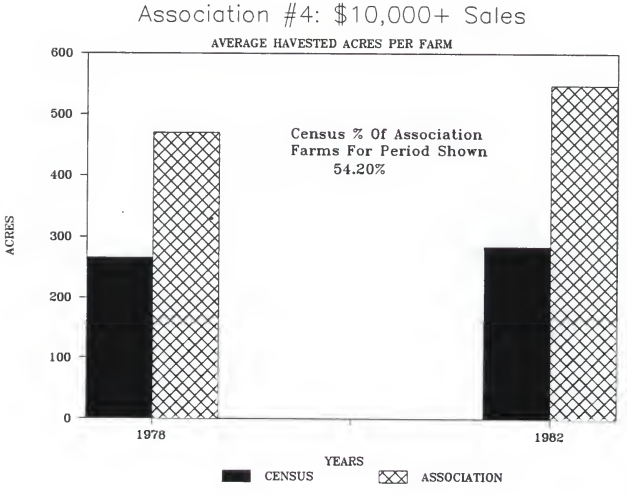

Association #2: All Farms
AVERAGE HARVESTED ACRES PER FARM
ACRES
900
800
700
600
500
400
300
200
100
0
Census % Of Association
Farms For Period Shown
40.83%
1978
1982
YEARS
CENSUS
ASSOCIATION


Association #2: $10,000+ Sales
AVERAGE HARVESTED ACRES PER FARM
ACRES
900
800
700
600
500
400
300
200
100
0
Census % Of Association
Farms For Period Shown
52.71%
1978
1982
YEARS
CENSUS
ASSOCIATION

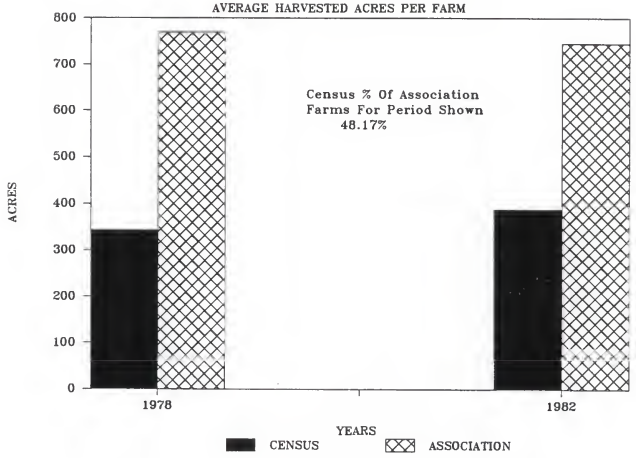

Association #3: All Farms
AVERAGE HARVESTED ACRES PER FARM
ACRES (Thousands)
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Censu % Of Association Farms For Period Shown 60.28%
1978
1982
YEARS
CENSUS
ASSOCIATION


Association #3: $10,000+ Sales
AVERAGE HARVESTED ACRES PER FARM
ACRES (Thousands)
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Census % Of Association Farms For Period Shown 67.27%
1978
1982
YEARS
CENSUS
ASSOCIATION

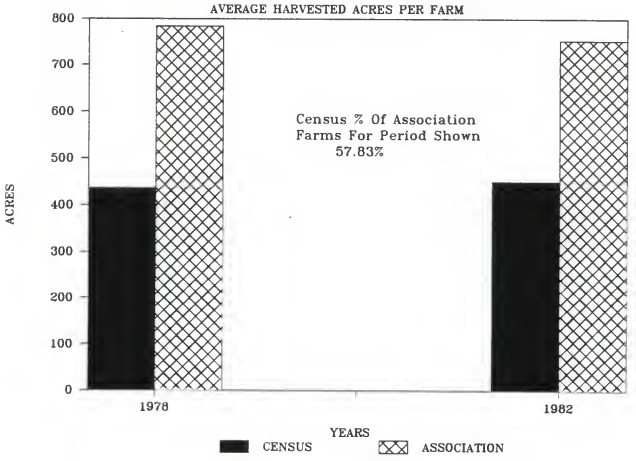

Association #4: All Farms
AVERAGE HARVESTED ACRES PER FARM
600
500
400
300
200
100
0
ACRES
Census % Of Association
Farms For Period Shown
35.92%
1978
1982
YEARS
CENSUS
ASSOCIATION

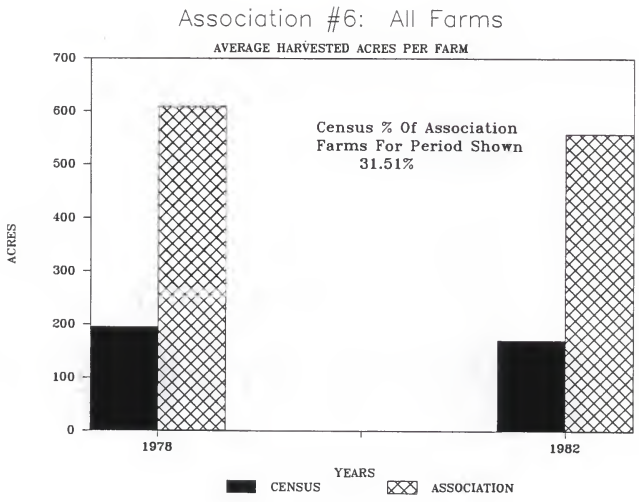

Association #4: $10,000+ Sales
AVERAGE HAVESTED ACRES PER FARM
600
500
400
300
200
100
0
ACRES
Census % Of Association
Farms For Period Shown
54.20%
1978
1982
YEARS
CENSUS
ASSOCIATION

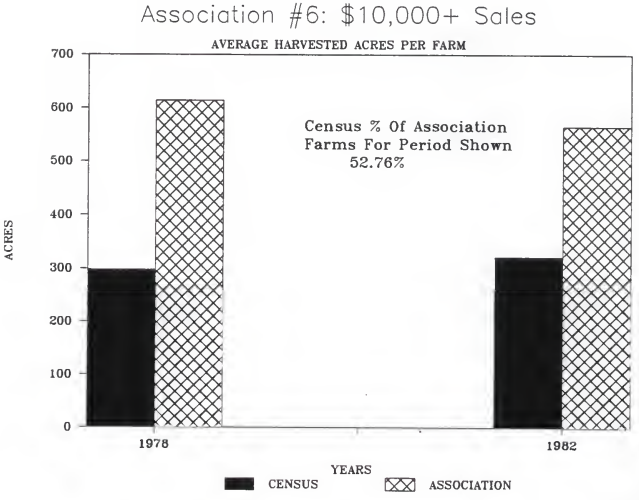
Association #5: All Farms



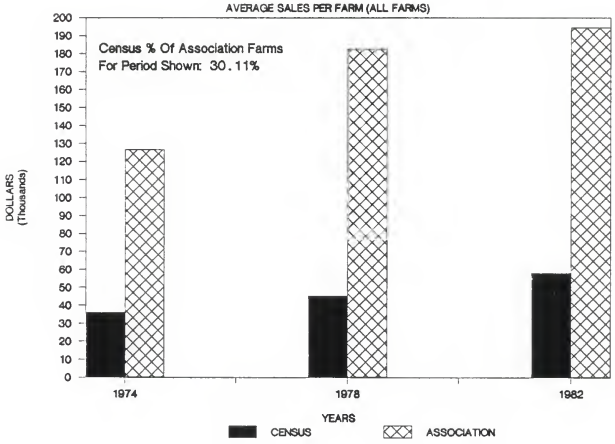
Association #5: $10,000+ Sales



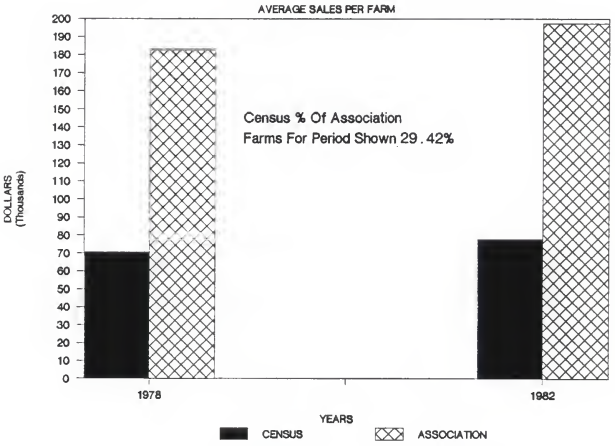

Association #6: All Farms
AVERAGE HARVESTED ACRES PER FARM
ACRES
700
600
500
400
300
200
100
0
Census % Of Association
Farms For Period Shown
31.51%
1978
1982
YEARS
CENSUS
ASSOCIATION


Association #6: $10,000+ Sales
AVERAGE HARVESTED ACRES PER FARM
ACRES
700
600
500
400
300
200
100
0
Census % Of Association
Farms For Period Shown
52.76%
1978
1982
YEARS
CENSUS
ASSOCIATION

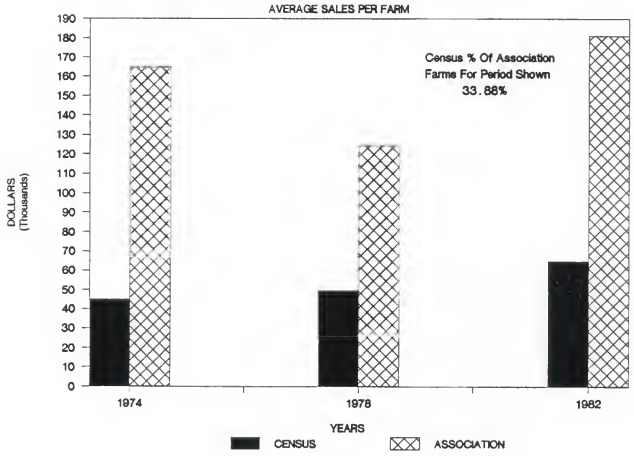
Association #1



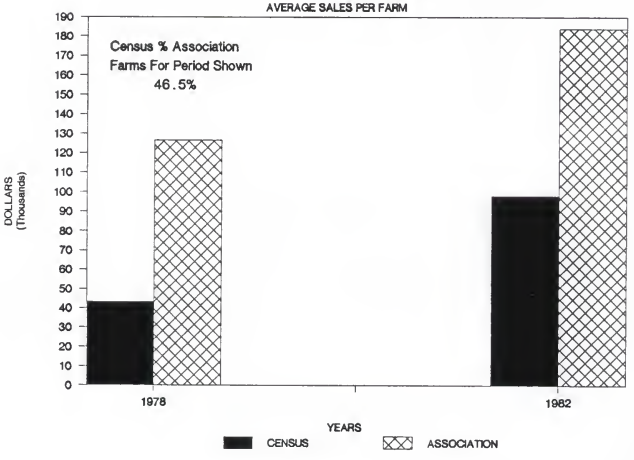
Association #1 ($10,000+ Sales)



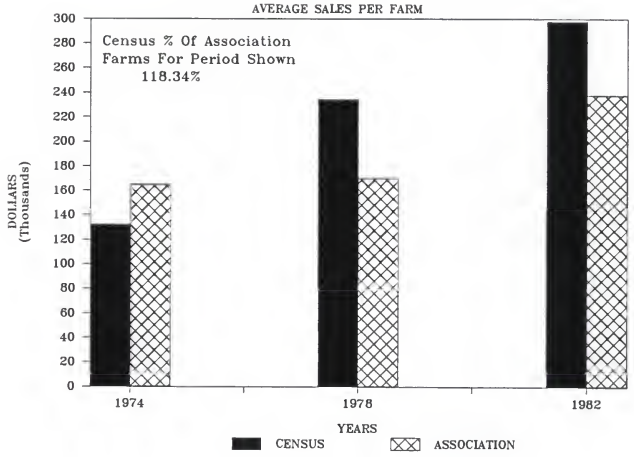
Association #2: All Farms



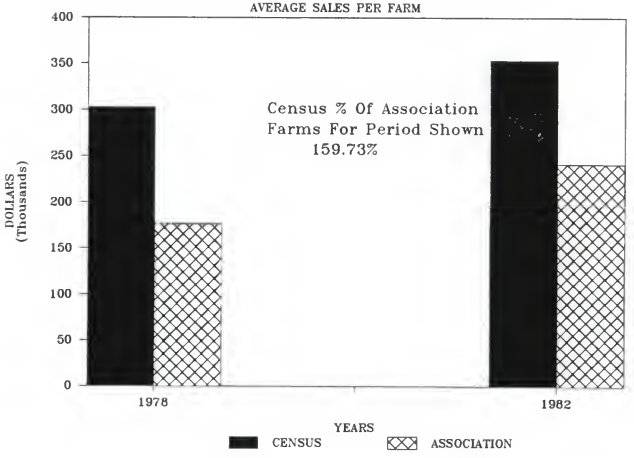
Association #2: $10,000+ Sales



Association #3: All Farms



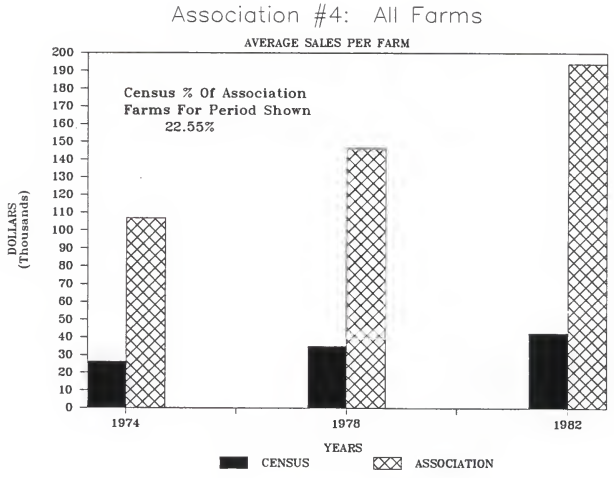
Association #3: $10,000+ Sales

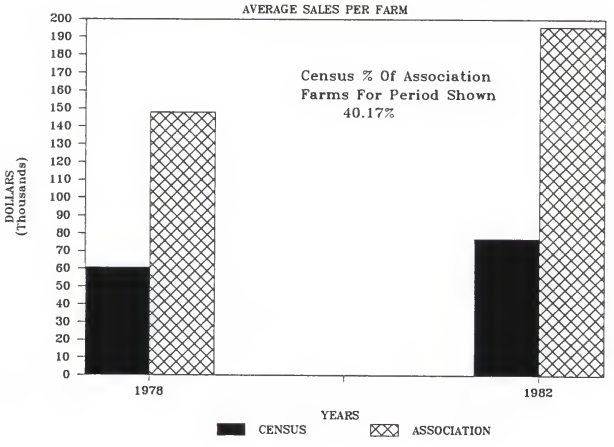


APPENDIX 1

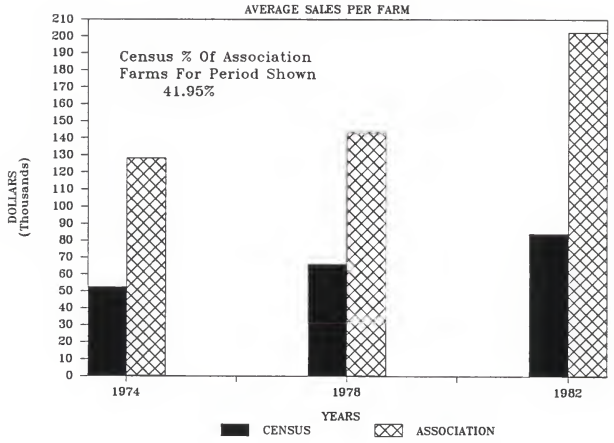
INDIVIDUAL ASSOCIATIONS

SUMMARY DATA TABLES

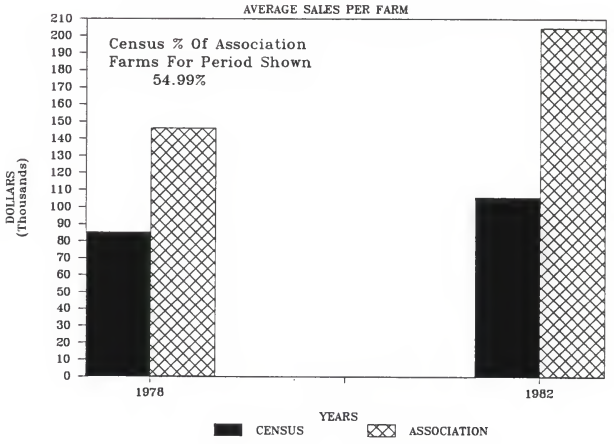

Association #4: All Farms
AVERAGE SALES PER FARM
Census % Of Association
Farms For Period Shown
22.55%
DOLLARS
(Thousands)
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
1974
1978
1982
YEARS
CENSUS
ASSOCIATION


Association #4: $10,000+ Sales
AVERAGE SALES PER FARM
Census % Of Association
Farms For Period Shown
40.17%
DOLLARS
(Thousands)
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
1978
1982
YEARS
CENSUS
ASSOCIATION

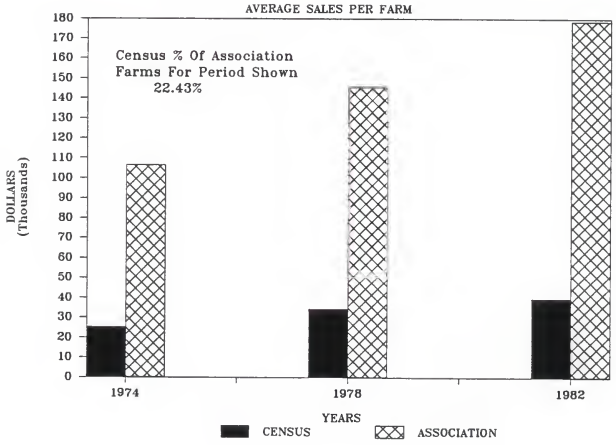
Association #5: All Farms



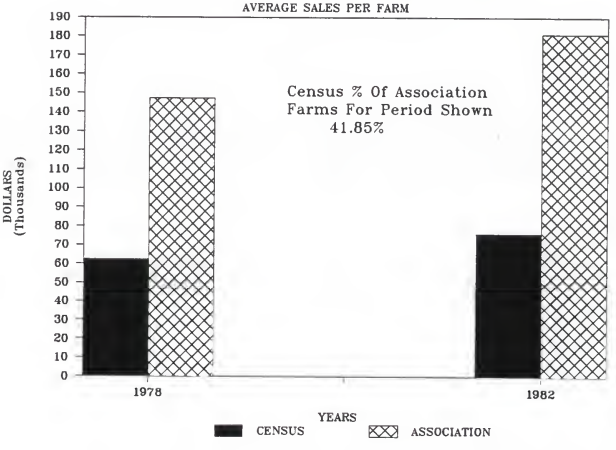
Association #5: $10,000+ Sales



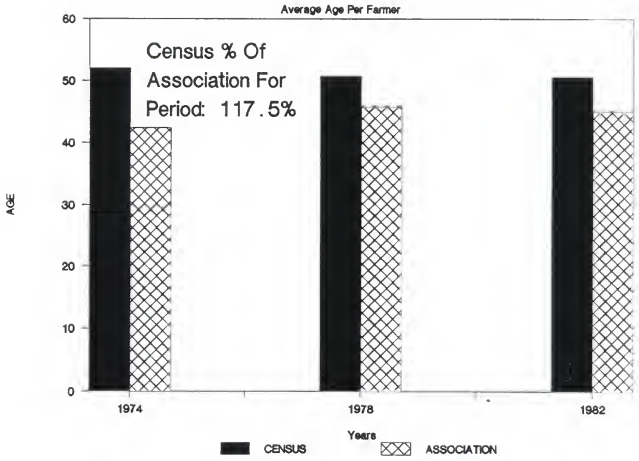
Association #6: All Farms

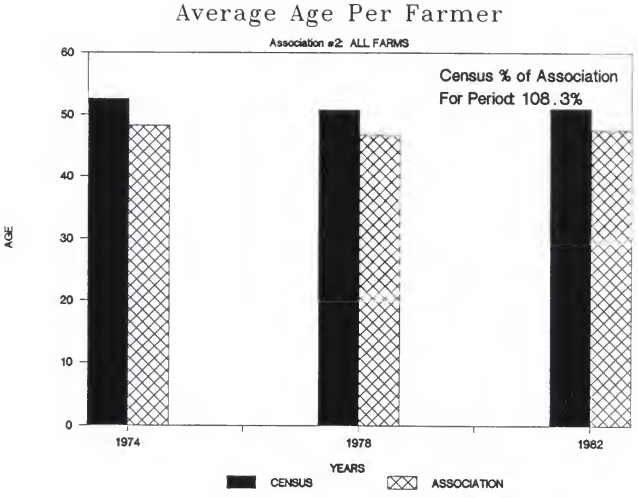


Association #6: $10,000+ Sales

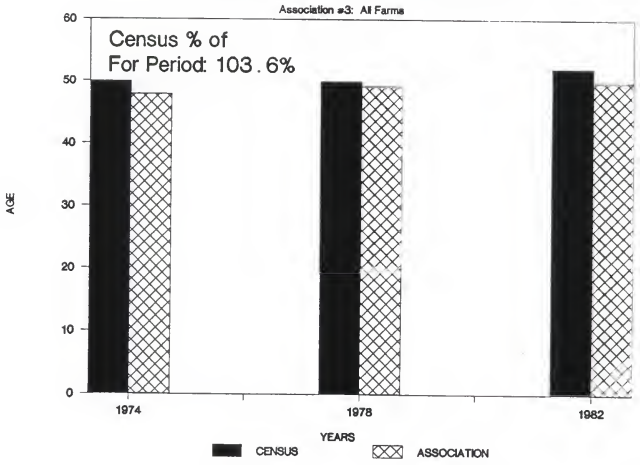


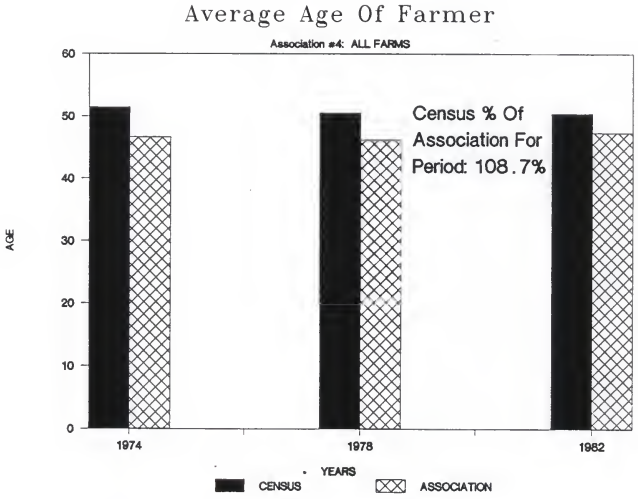
Association #1: (All Farms)

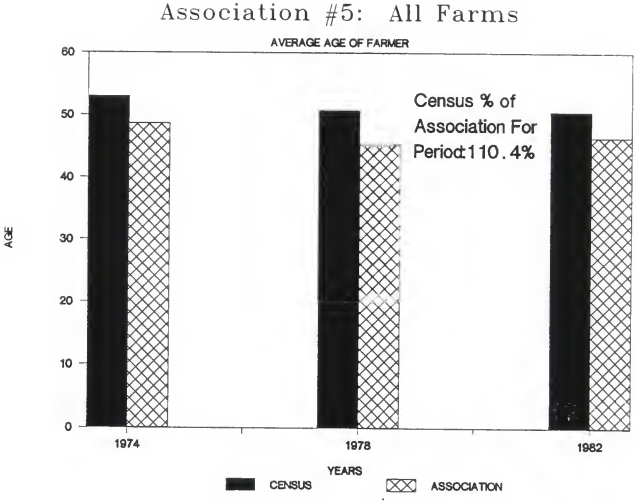


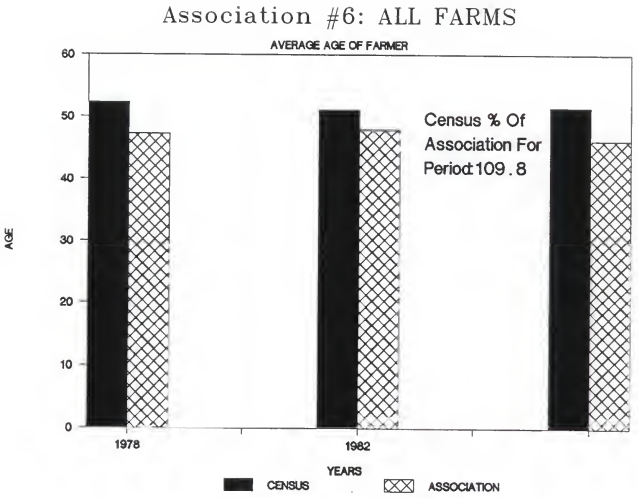

Average Age Per Farmer
Association #2: ALL FARMS
Census % of Association
For Period: 108.3%
AGE
60
50
40
30
20
10
0
1974
1978
1982
YEARS
CENSUS
ASSOCIATION

Average Age Of Farmer

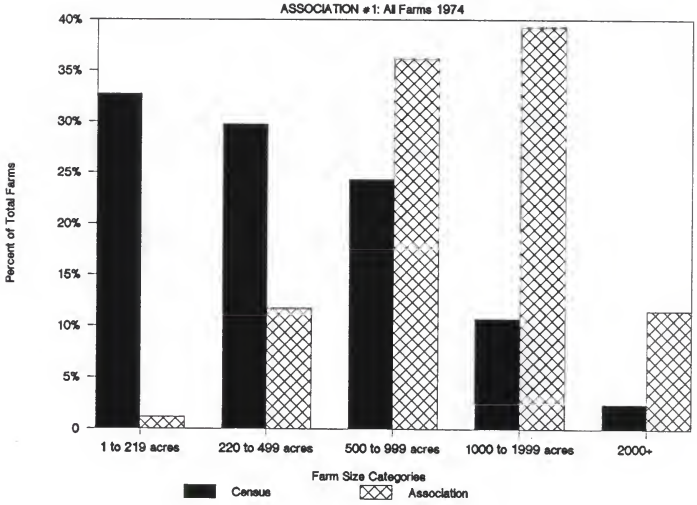



Average Age Of Farmer
Association #4: ALL FARMS
Census % Of
Association For
Period: 108.7%
AGE
60
50
40
30
20
10
0
1974
1978
1982
YEARS
CENSUS
ASSOCIATION

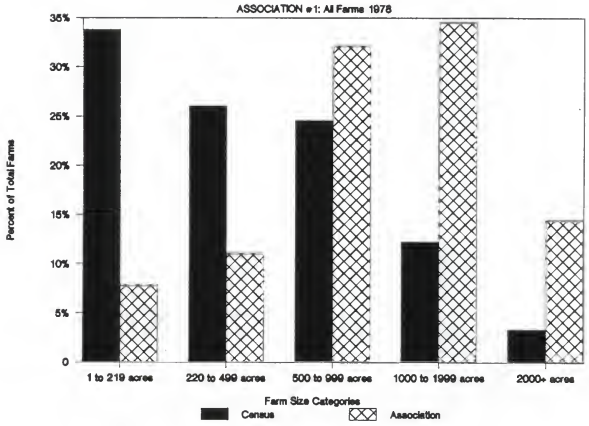

Association #5: All Farms
AVERAGE AGE OF FARMER
AGE
60
50
40
30
20
10
0
Census % of
Association For
Period:110.4%
1974
1978
1982
YEARS
CENSUS
ASSOCIATION


Association #6: ALL FARMS
AVERAGE AGE OF FARMER
AGE
60
50
40
30
20
10
0
1978
1982
YEARS
CENSUS
ASSOCIATION
Census % Of
Association For
Period:109.8

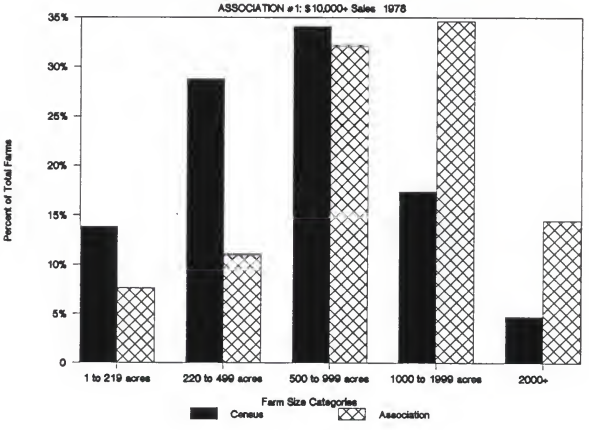
Farm Size Distribution (by Percentage)



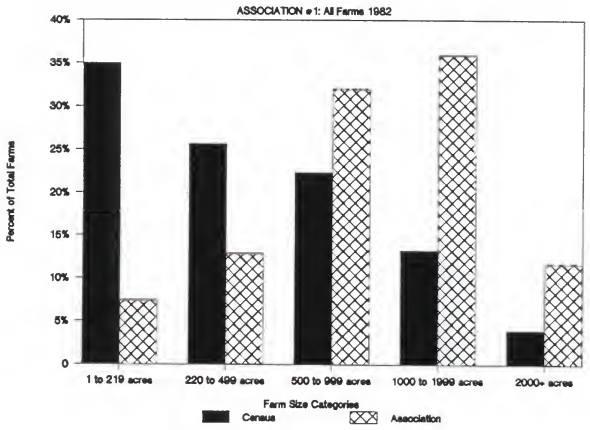
Farm Size Distribution (by Percent)



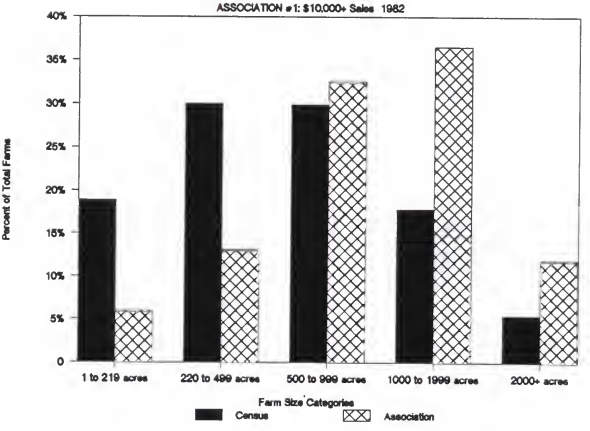
Farm Size Distribution (by Percent)

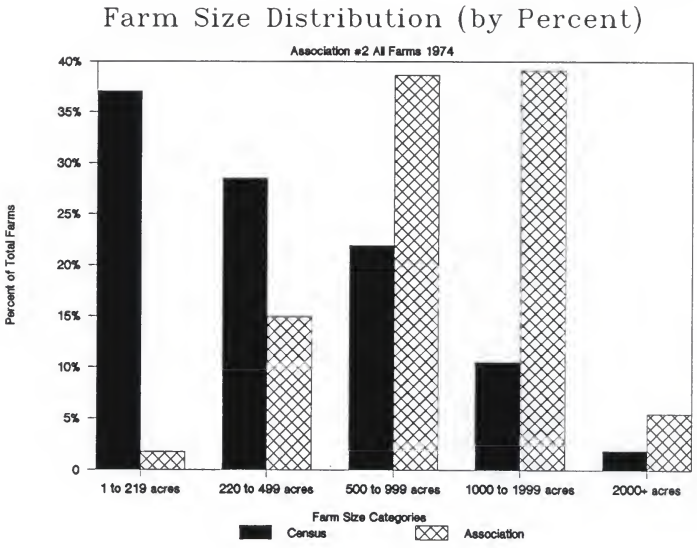


Farm Size Distribution (by Percent)

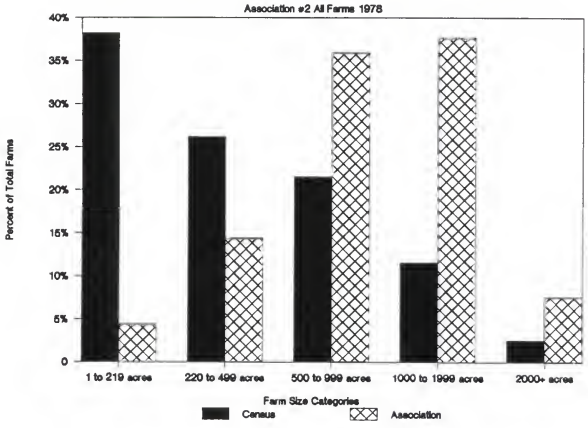


Farm Size Distribution (by Percent)

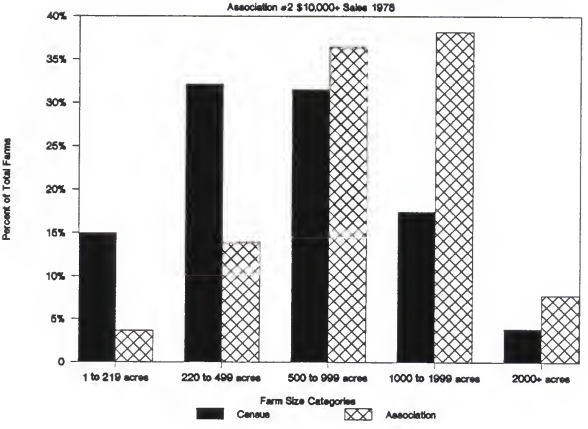



Farm Size Distribution (by Percent)
Association #2 All Farms 1974
Percent of Total Farms
40%
35%
30%
25%
20%
15%
10%
5%
0
1 to 219 acres
220 to 499 acres
500 to 999 acres
1000 to 1999 acres
2000+ acres
Farm Size Categories
Census
Association

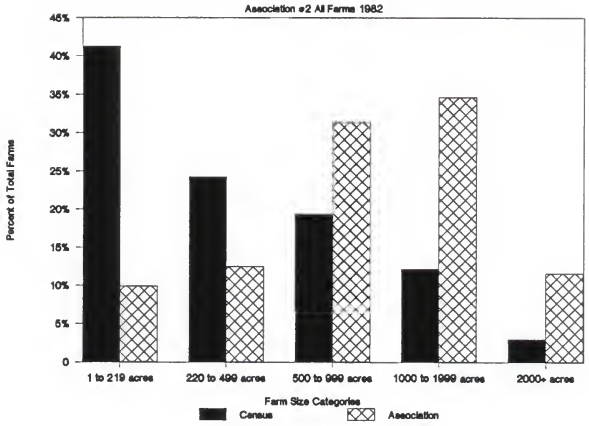
Farm Size Distribution (by Percent)



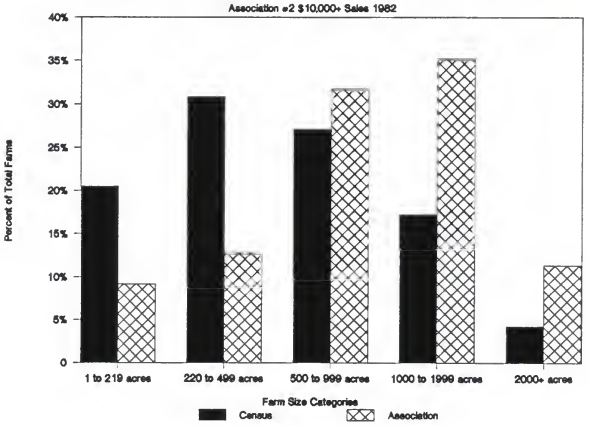
Farm Size Distribution (by Percent)

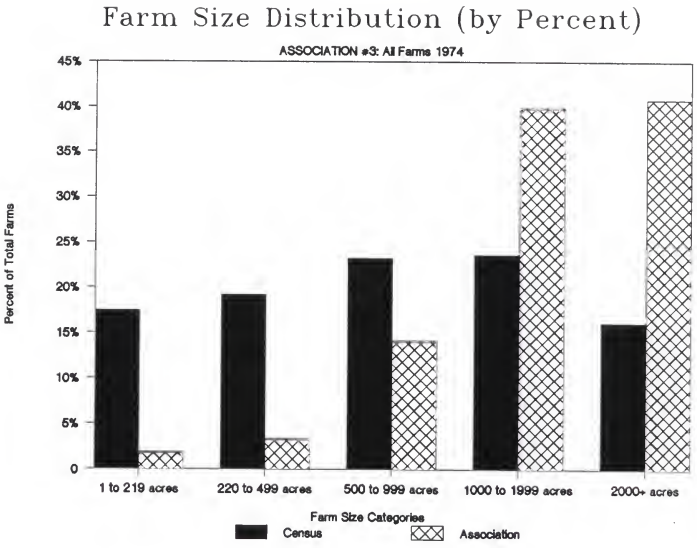


Farm Size Distribution (by Percent)

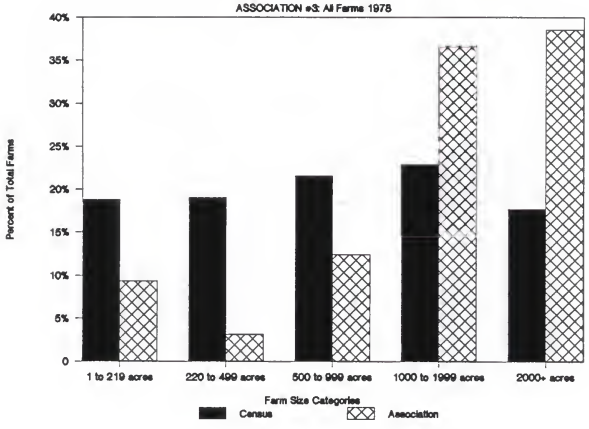


Farm Size Distribution (by Percent)

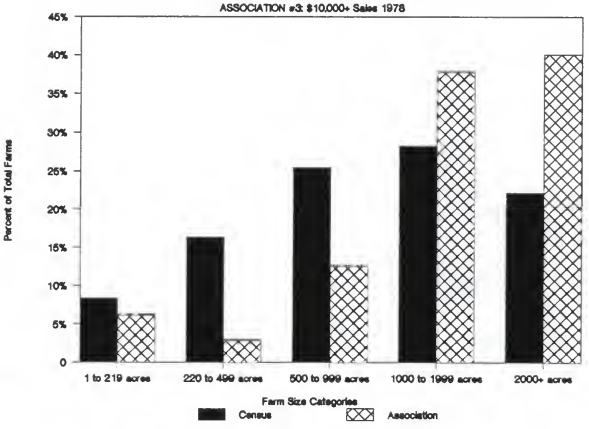



Farm Size Distribution (by Percent)
ASSOCIATION #3: All Farms 1974
Percent of Total Farms
45%
40%
35%
30%
25%
20%
15%
10%
5%
0
1 to 219 acres
220 to 499 acres
500 to 999 acres
1000 to 1999 acres
2000+ acres
Farm Size Categories
Census
Association

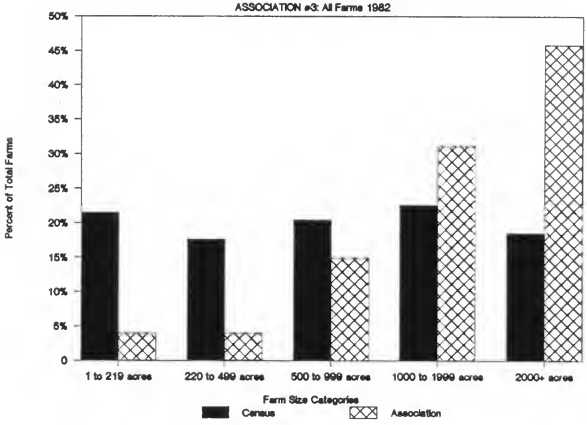
Farm Size Distribution (by Percent)



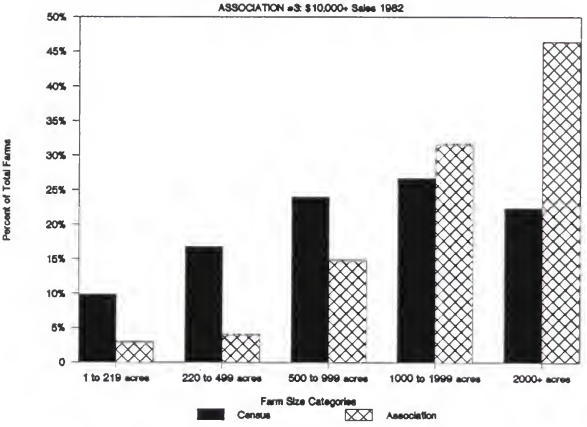
Farm Size Distribution (by Percent)

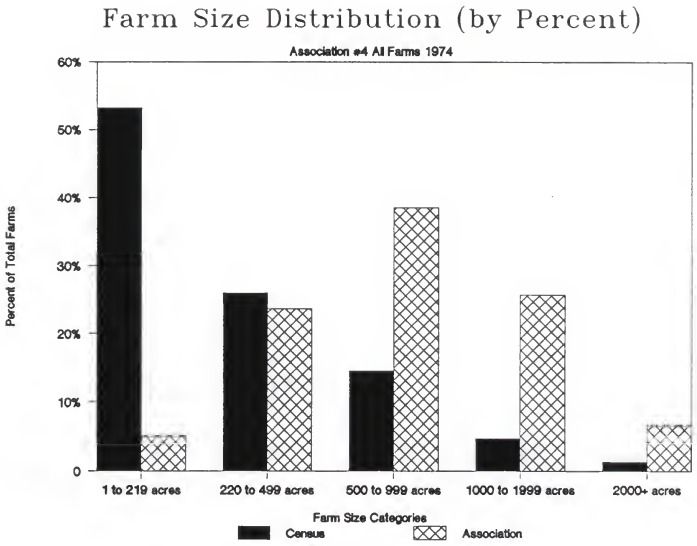


Farm Size Distribution (by Percent)

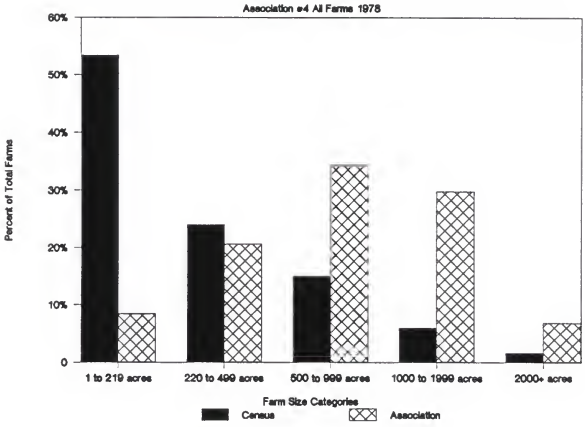


Farm Size Distribution (by Percent)

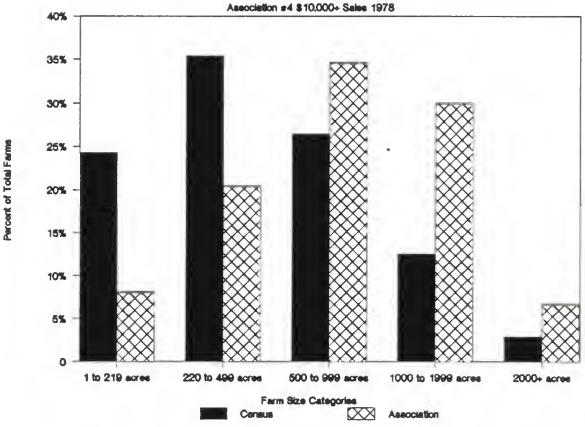



Farm Size Distribution (by Percent)
Association #4 All Farms 1974
60%
50%
40%
30%
20%
10%
0
Percent of Total Farms
1 to 219 acres
220 to 499 acres
500 to 999 acres
1000 to 1999 acres
2000+ acres
Farm Size Categories
Census
Association

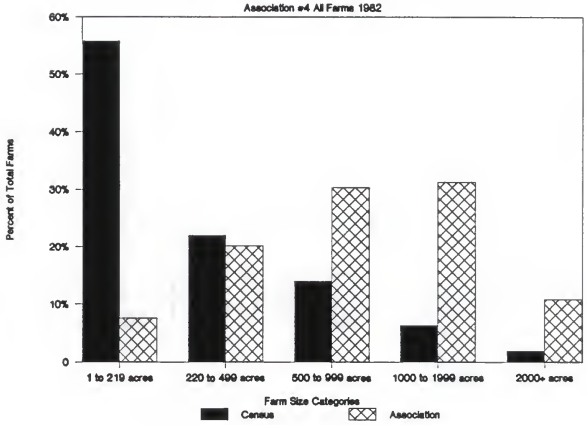
Farm Size Distribution (by Percent)



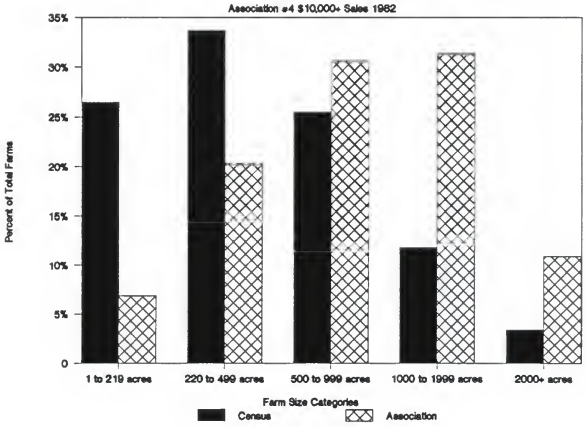
Farm Size Distribution (by Percent)

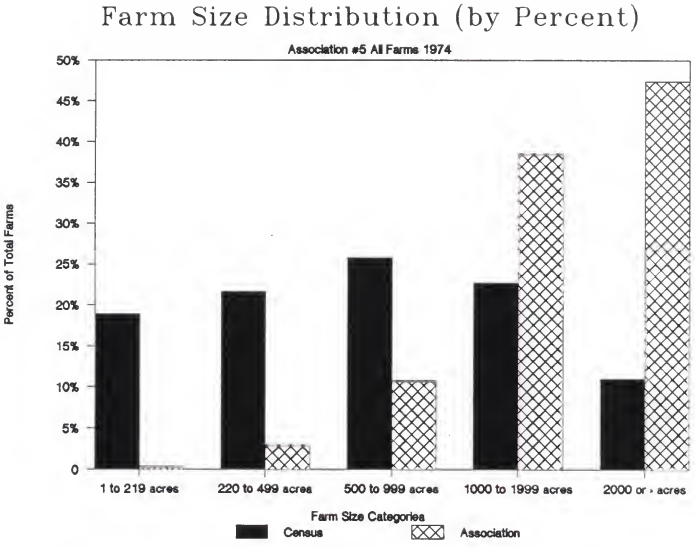


Farm Size Distribution (by Percent)

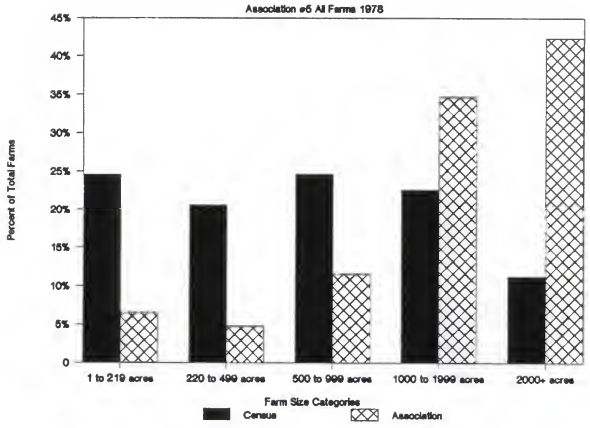


Farm Size Distribution (by Percent)

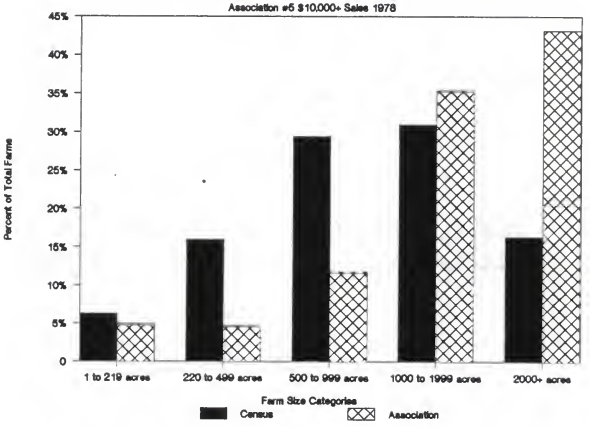



Farm Size Distribution (by Percent)
Association #5 All Farms 1974
Percent of Total Farms
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0
1 to 219 acres
220 to 499 acres
500 to 999 acres
1000 to 1999 acres
2000 or › acres
Farm Size Categories
Census
Association

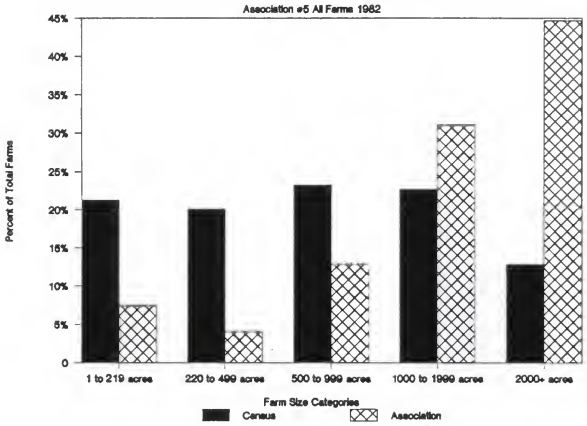
Farm Size Distribution (by Percent)



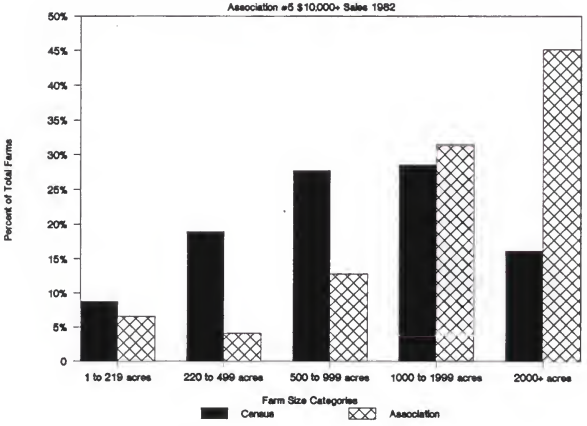
Farm Size Distribution (by Percent)

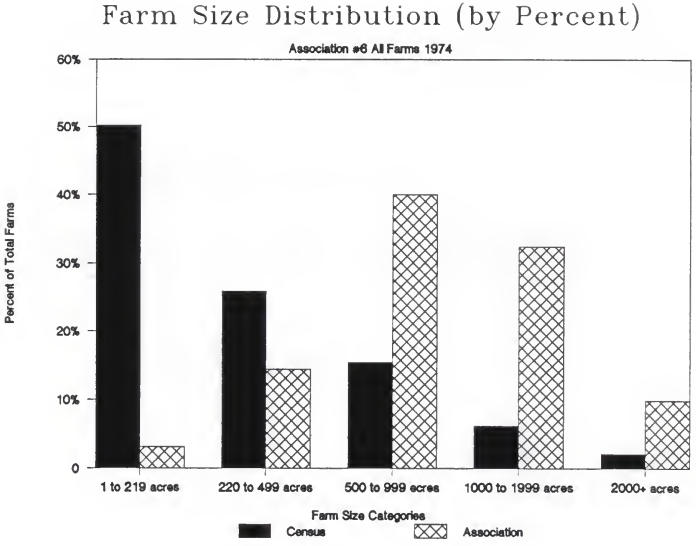


Farm Size Distribution (by Percent)

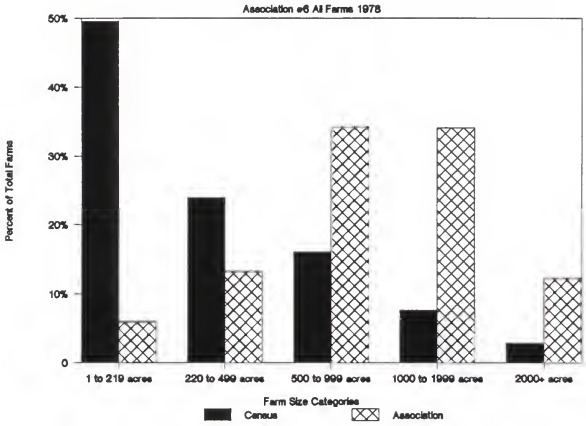


Farm Size Distribution (by Percent)

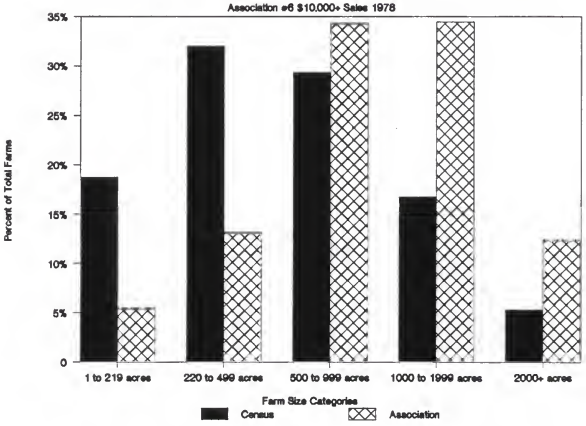



Farm Size Distribution (by Percent)
Association #6 All Farms 1974
Percent of Total Farms
60%
50%
40%
30%
20%
10%
0
1 to 219 acres
220 to 499 acres
500 to 999 acres
1000 to 1999 acres
2000+ acres
Farm Size Categories
Census
Association

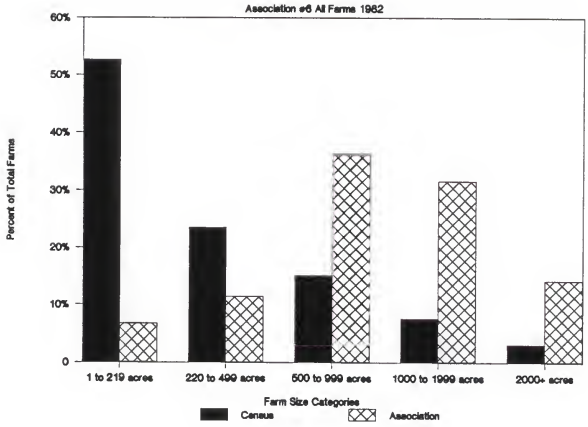
Farm Size Distribution (by Percent)



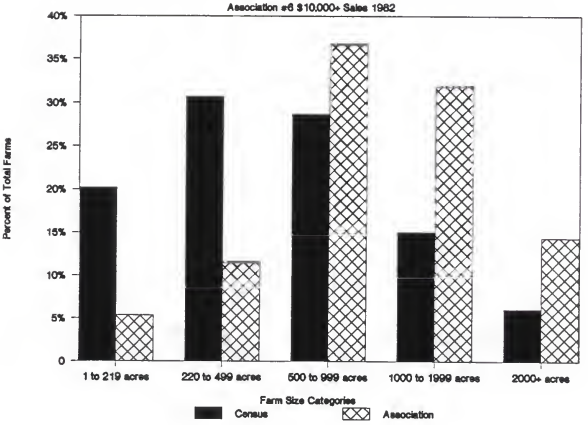
Farm Size Distribution (by Percent)

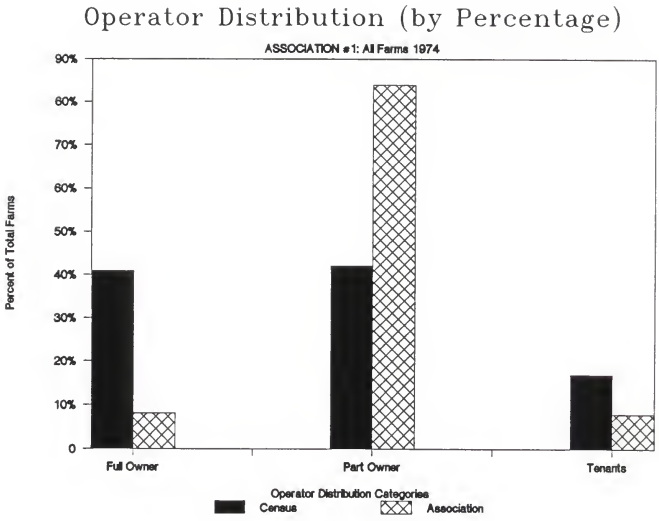


Farm Size Distribution (by Percent)

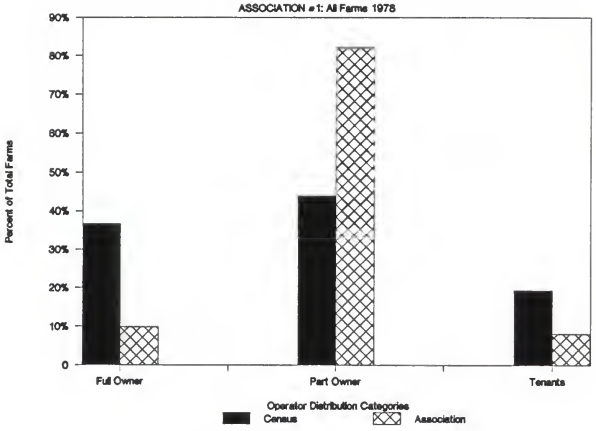


Farm Size Distribution (by Percent)

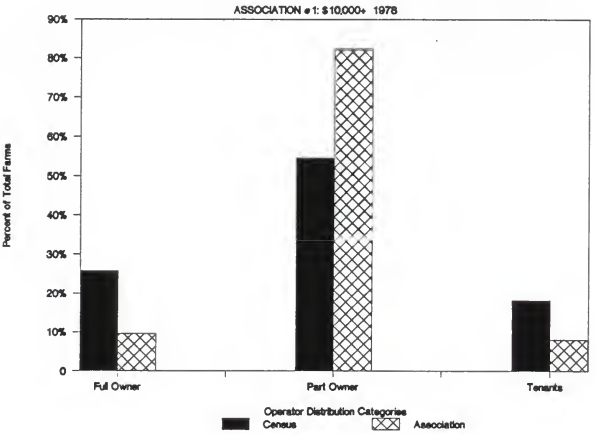



Operator Distribution (by Percentage)
ASSOCIATION #1: All Farms 1974
Percent of Total Farms
90%
80%
70%
60%
50%
40%
30%
20%
10%
0
Full Owner
Part Owner
Tenants
Operator Distribution Categories
Census
Association

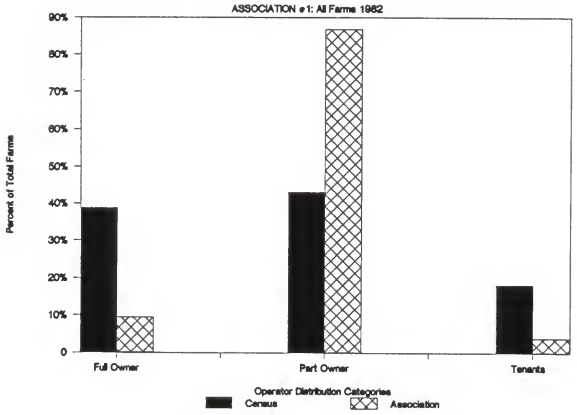
Operator Distribution (by Percentage)



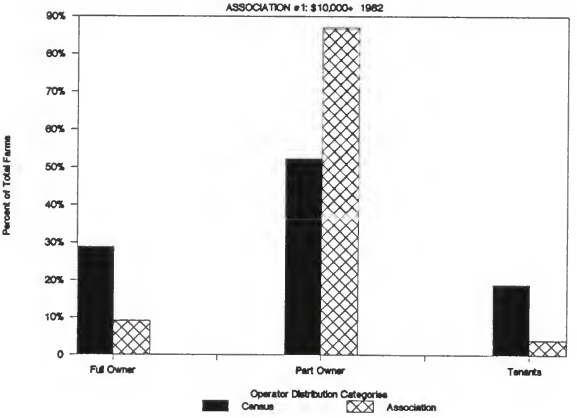
Operator Distribution (by Percentage)



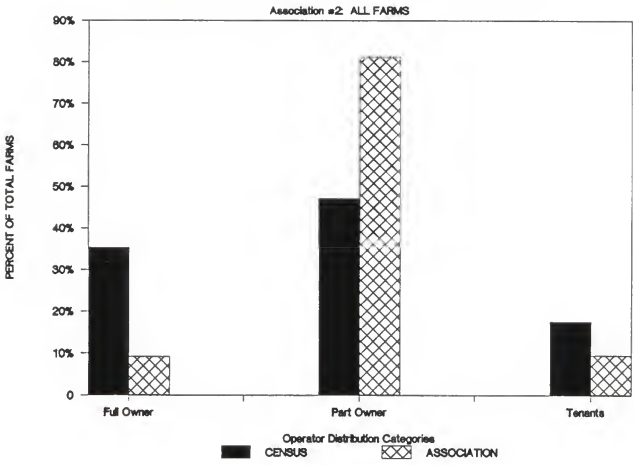
Operator Distribution (by Percentage)



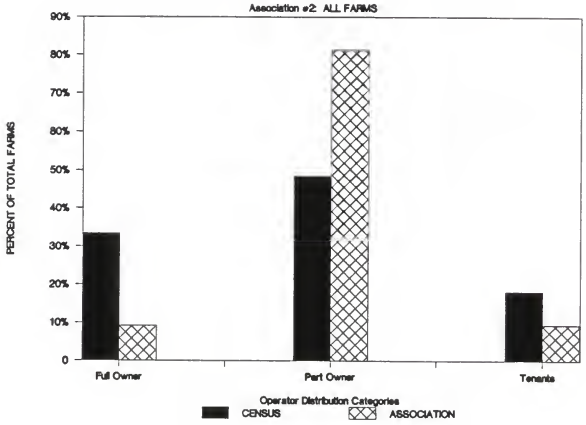
Operator Distribution (by Percentage)



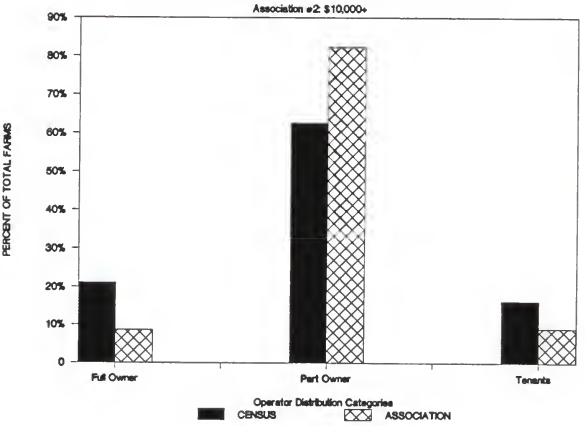
Operator Distribution 1974

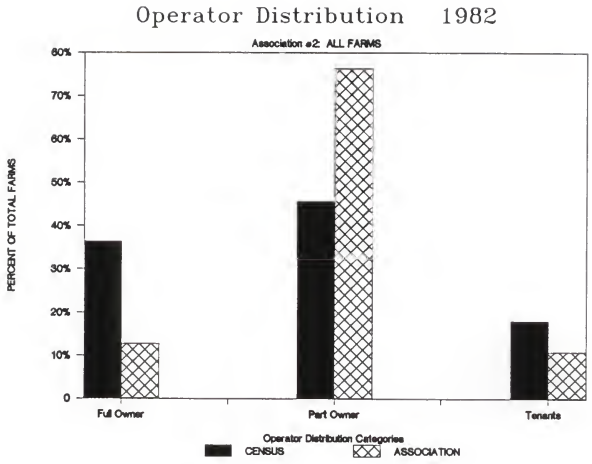


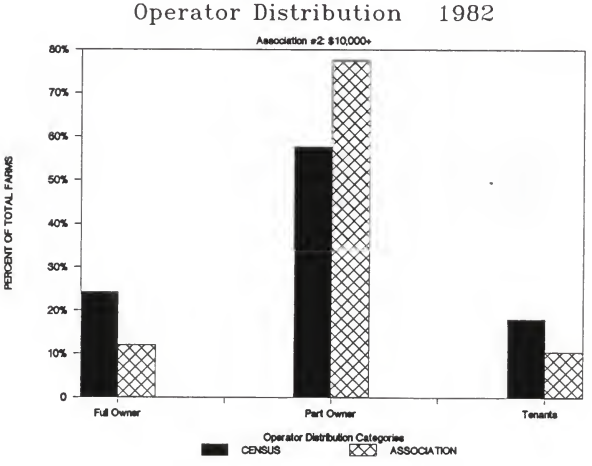
Operator Distribution 1978

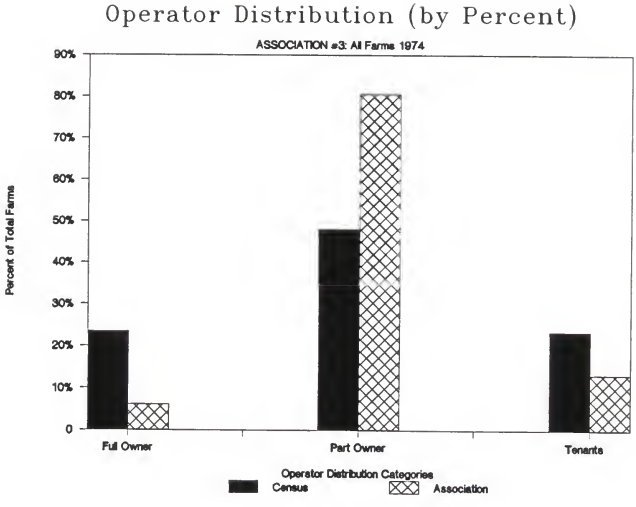


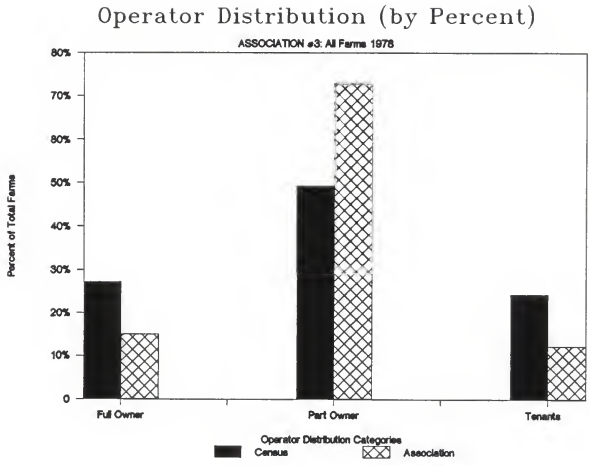
Operator Distribution 1978

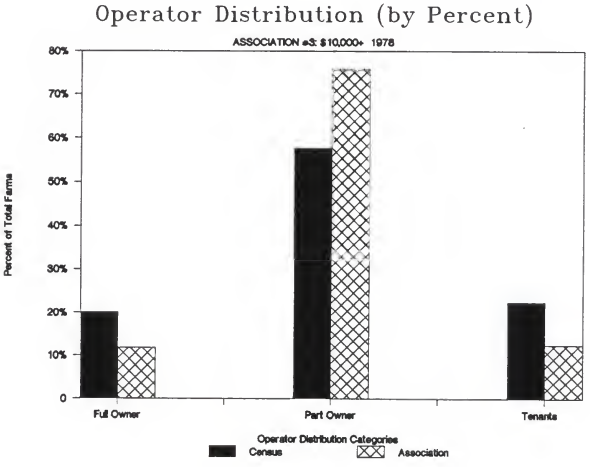



Operator Distribution 1982
Association #2: ALL FARMS
PERCENT OF TOTAL FARMS
80%
70%
60%
50%
40%
30%
20%
10%
0
Full Owner
Part Owner
Tenants
Operator Distribution Categories
CENSUS
ASSOCIATION

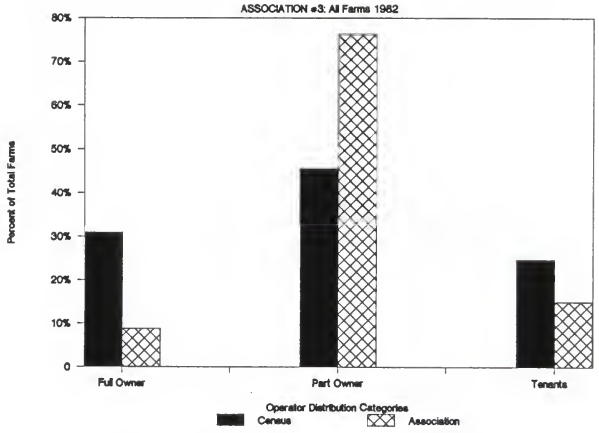

Operator Distribution 1982
Association #2: $10,000+
PERCENT OF TOTAL FARMS
80%
70%
60%
50%
40%
30%
20%
10%
0
Full Owner
Part Owner
Tenants
Operator Distribution Categories
CENSUS
ASSOCIATION


Operator Distribution (by Percent)
ASSOCIATION #3: All Farms 1974
Percent of Total Farms
90%
80%
70%
60%
50%
40%
30%
20%
10%
0
Full Owner
Part Owner
Tenants
Operator Distribution Categories
Census
Association

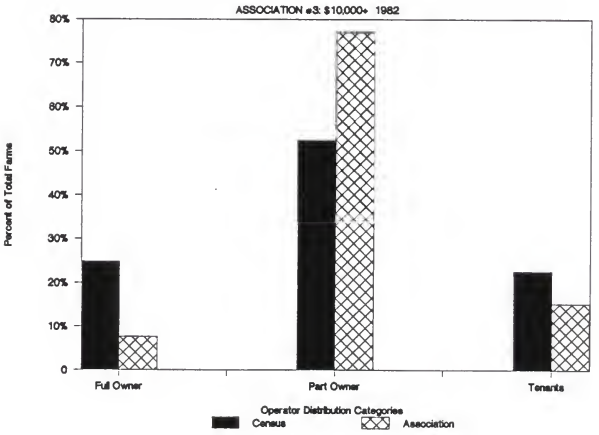

Operator Distribution (by Percent)
ASSOCIATION #3: All Farms 1978
Percent of Total Farms
80%
70%
60%
50%
40%
30%
20%
10%
0
Full Owner
Part Owner
Tenants
Operator Distribution Categories
Census
Association


Operator Distribution (by Percent)
ASSOCIATION #3: $10,000+ 1978
Percent of Total Farms
80%
70%
60%
50%
40%
30%
20%
10%
0
Full Owner
Part Owner
Tenants
Operator Distribution Categories
Census
Association

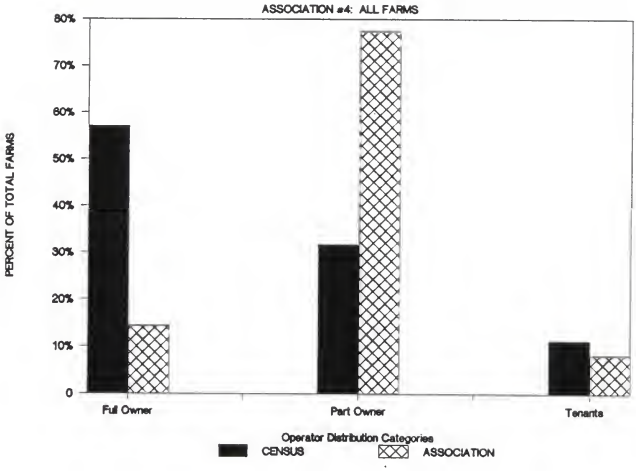
Operator Distribution (by Percent)



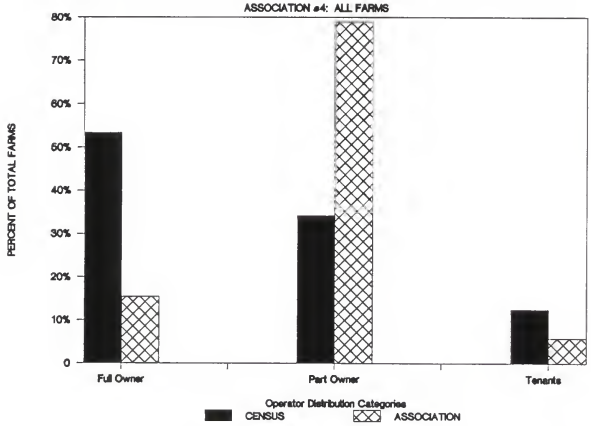
Operator Distribution (by Percent)



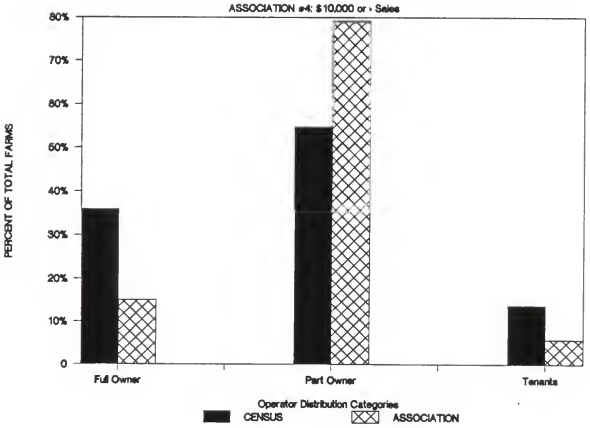
Operator Distribution (by percent) 1974



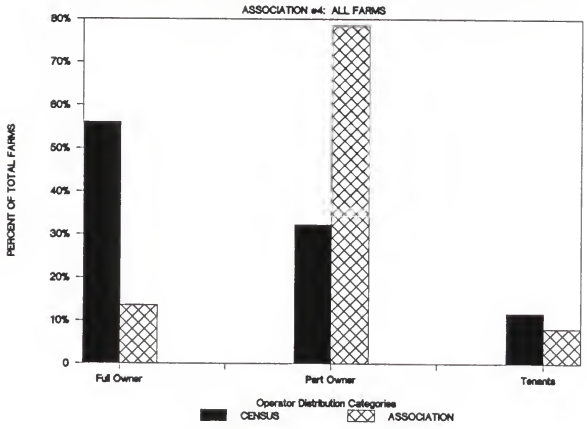
Operator Distribution (by percent) 1978



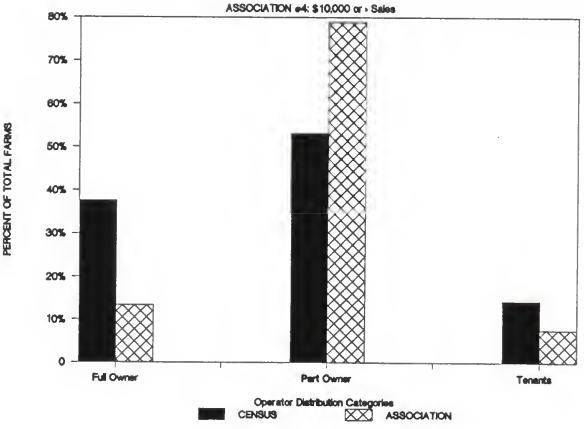
Operator Distribution (by percent) 1978



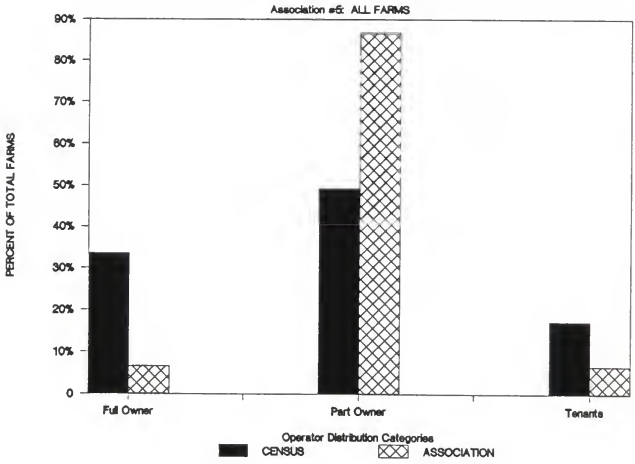
Operator Distribution (by percent) 1982



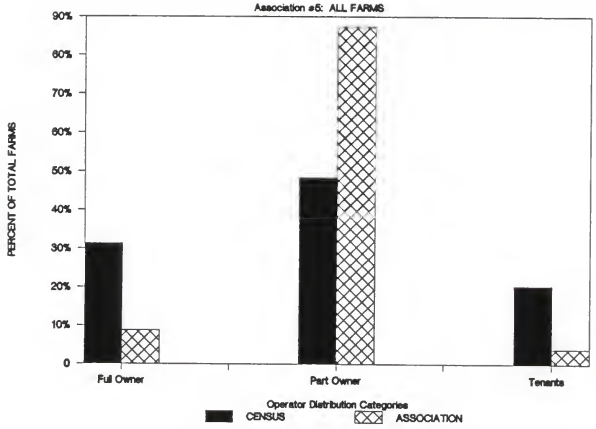
Operator Distribution (by percent) 1982



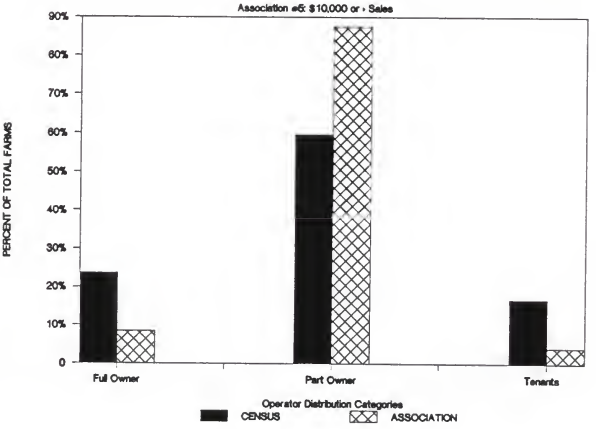
Operator Distribution (by percent) 1974



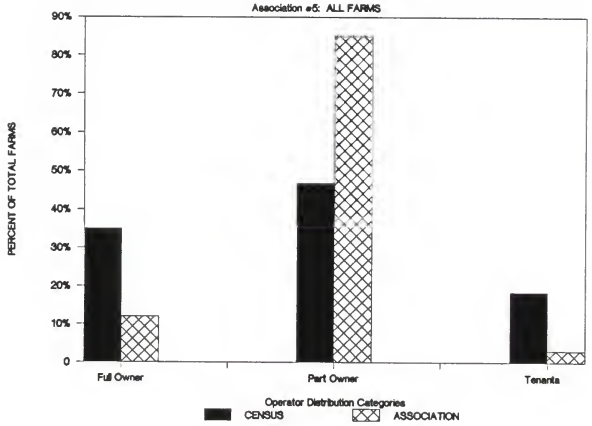
Operator Distribution (by percent) 1978



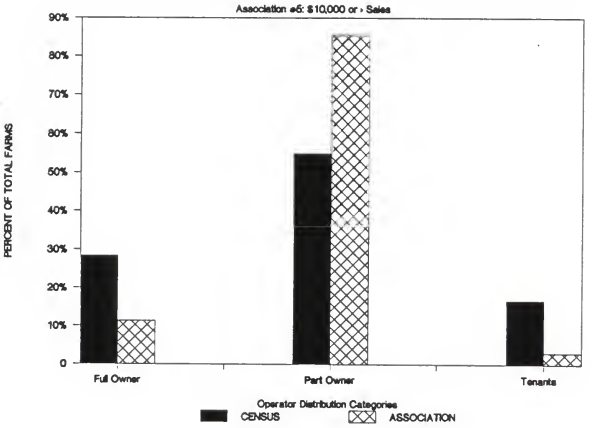
Operator Distribution (by percent) 1978



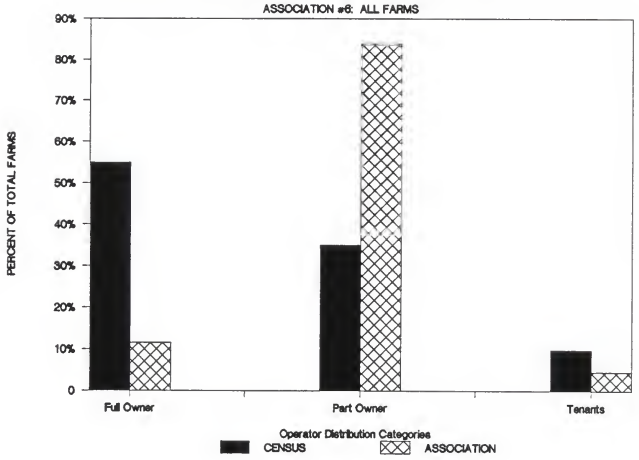
Operator Distribution (by percent) 1982



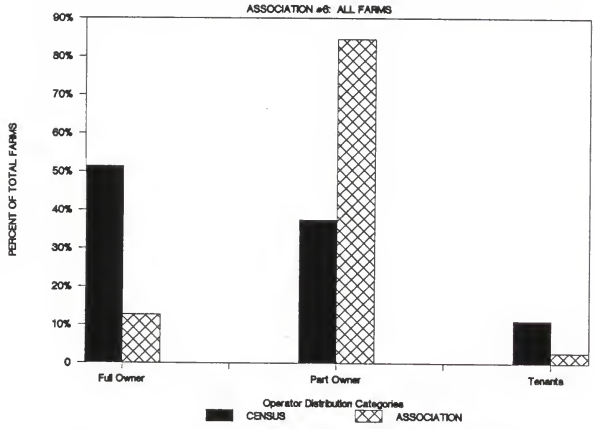
Operator Distribution (by percent) 1982



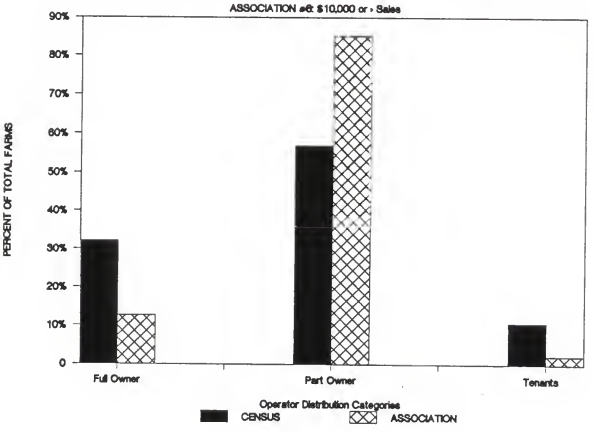
Operator Distribution (by percent) 1974



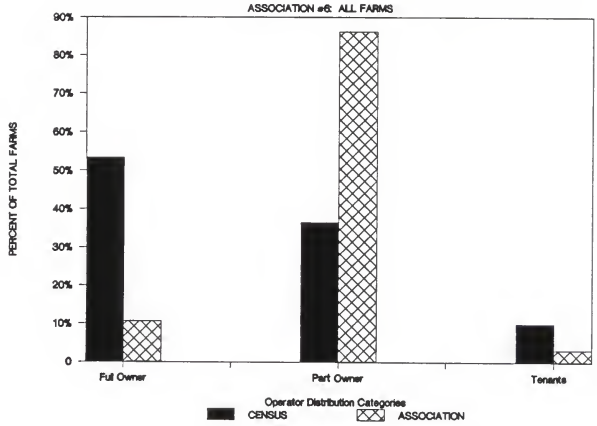
Operator Distribution (by percent) 1978



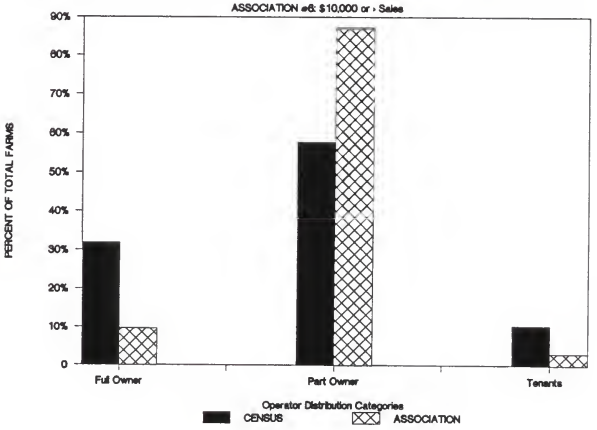
Operator Distribution (by percent) 1978



Operator Distribution (by percent) 1982



Operator Distribution (by percent) 1982



A COMPARISON STUDY: HOW DO KANSAS FARM MANAGEMENT FARMS RELATE TO ALL KANSAS FARMS

by

Jurdan 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

1988

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 there 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.