Farming in Ohio: A Historical View

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In "Farming in Ohio: A Historical View," **Davina Main** compiles a study that discusses a particular issue as well as includes statistical data as assigned by Dr. Bathi Kasturiarachi's Spring 2004 Basic Probability and Statistics course. Dr. Kasturiarachi asked his students to evaluate a study, including its nature and methodology and then to write their own analysis and interpretation of the data presented.

Section I: Nature of the Study

Introduction/Statement of the Problem

Over the past few decades, the number of family owned and operated farms has declined, giving way to larger, more efficiently run corporate farms while the production of crops has remained constant. This paper addresses the trends and changes that happened in Ohio farming from the early nineteen forties to the mid nineteen nineties. Our objective is to explore the five major crops (hay, wheat, corn, oats and soybeans) grown in Ohio, discuss changes in the number of farms, calculate the number of acres devoted to each crop, compare the data results of Ohio to that of Iowa, and determine any similarities or differences.

In 1870, Ohio was listed as one of the top three wheat-producing states along with Iowa and Illinois. Due to the growing industries of the city, farm numbers began to decrease. As technology advanced, new farm machinery was introduced and more and more farm workers lost their jobs. Many farmers lost their land during the Great Depression due to foreclosures by banks and insurance companies. There was a steady decline in the number of farms from 1942-1996; farms went from small family-owned land to large, efficient corporations.

Research Questions

While exploring how the number of acres devoted to the five major crops changed over time, it was discovered that soybeans had the most dramatic change going from the least grown crop in 1942 to the most grown crop in 1996. As you can see in figure one, corn has remained fairly constant throughout the years. Hay, oats, and wheat have all declined greatly, and soybeans have increased the most.

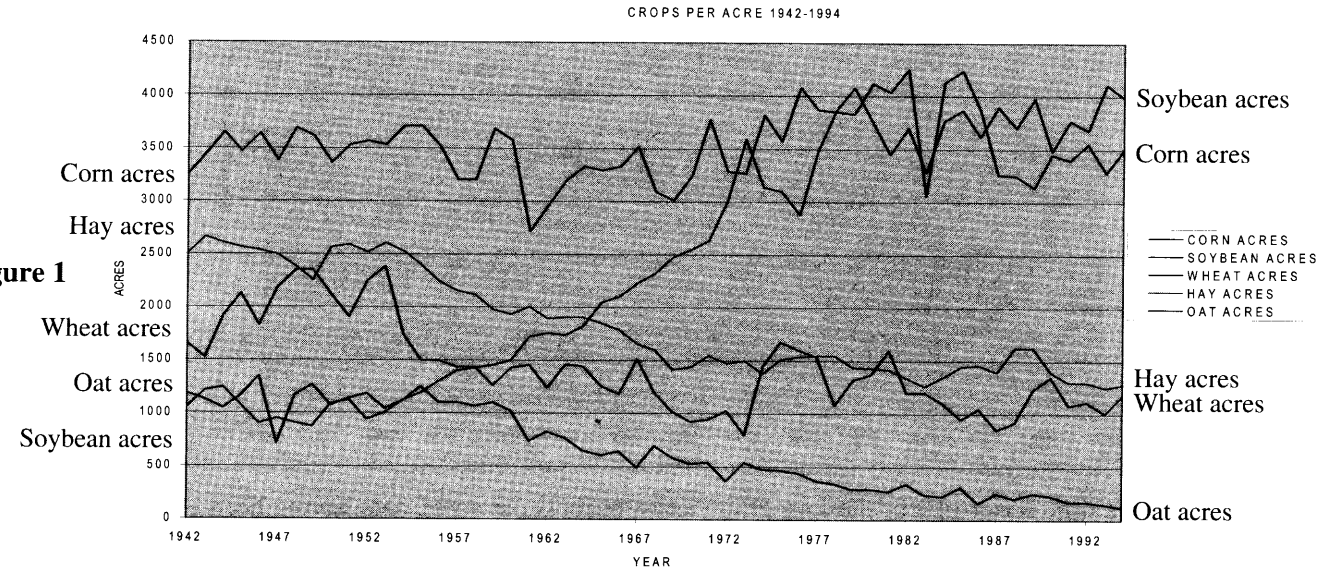


Figure 1

The decade in which corn had the largest number of acres harvested was the 1980's, the acreage being 37,375,000. Soybeans also had its highest number of acres harvested in the 1980's with 37,030,000 acres. Wheat,

hay, and oats had their largest number of acres harvested in the 1950's with 17,525,000 acres, 23,688,000 acres,and 11,183,000 acres respectively. The 1980's was the decade with the largest total number of acres harvested at 102,765,000.

One way to explore how farmers' choice of crop changes over time is to look at a series of pie charts showing what proportion of the total acreage was dedicated to a given crop for certain years. By making pie charts representing the crop allocation for the decades 1940, 1950, 1960, 1970, 1980, and 1990 some changes were noticeable. Corn stayed relatively steady with its percentage staying between 32% and 38%. Soybeans grew from a mere 11% all the way to a large 35%. Wheat made a small drop from 17% to 14%. Hay dropped significantly from 26% to 13%, while oats also dropped from an already low 12% to a very low 2%. (Figure 2)

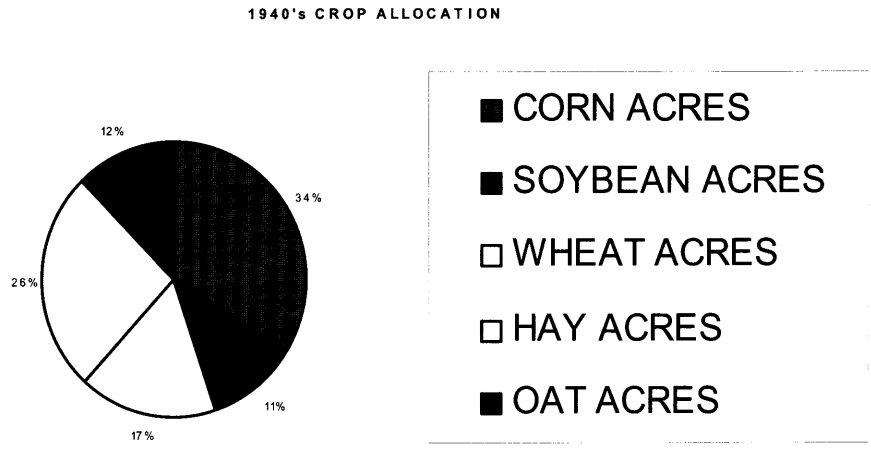
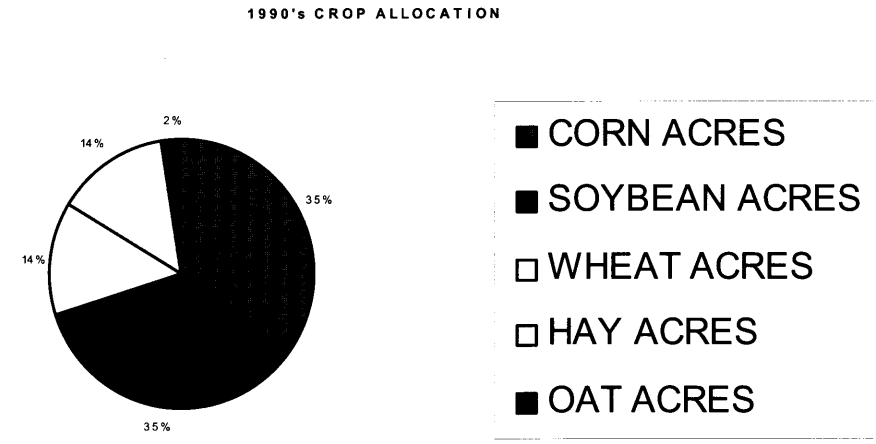
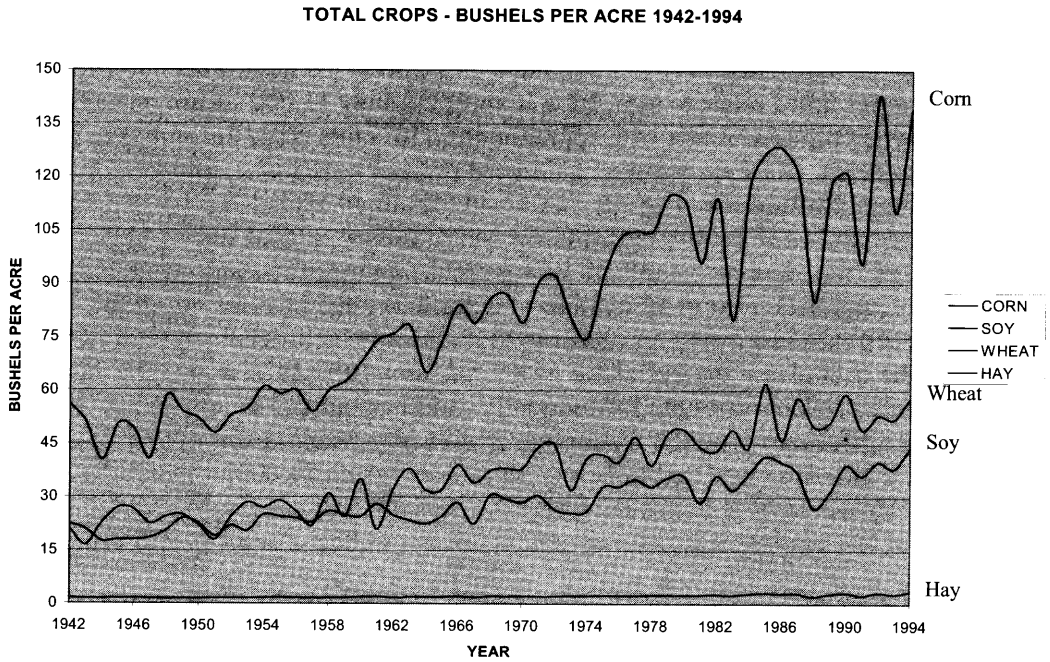


Figure 2



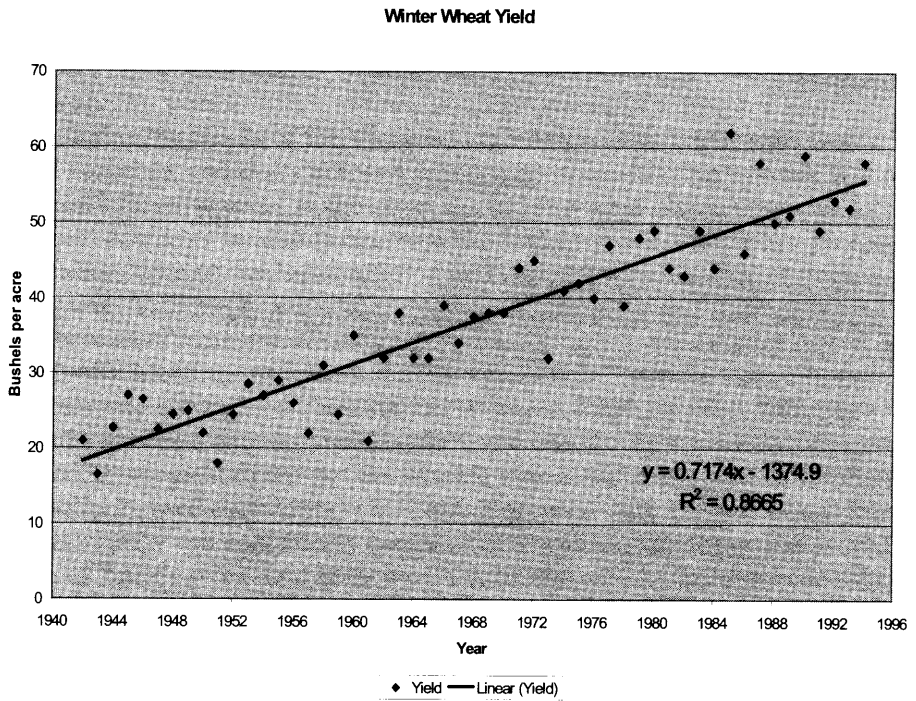
By making a time series plot of the four crop yields (bushels per acre), oats having been excluded, one can observe a few changes in the yields. Corn had a rapid, much larger incline than the other three crops. Wheat and soybeans had similar steady inclines in their bushels per acre, while hay remained relatively unchanged throughout the years with a mean of approximately 2.11 bushels per acre. (Figure 3)

Figure 3



The regression line of winter wheat yield over the years has shown a positive relationship between the year and bushels per acre (Figure 4). There is a linear correlation between the year and bushels per acre, and the line that the scattered points will "regress" to is $y' = 0.7174x - 1374.87$. This formula allows anyone to predict what the bushels per acre will be during a future year.

Figure 4



For example, if a farmer wants to know what his predicted bushels per acre will be in the year 2015, he will find that number to be 71 (rounded up). He finds this number by entering 2015 in the formula for x. That same farmer can predict his crop for any given future year by using the regression line of that crop. In this case, winter wheat yield has a very good regression line with $r^2 = .866$ or 86.6%.

Both similarities and differences were discovered while comparing Ohio farm data with similar farm data from the state of Iowa. Similarities include production of the same five leading crops, identical trends in total crops per acre, the largest incline happening between 1983 and 1984, with the largest decline happening between 1982 and 1983. Some differences noted relate to size. Iowa is approximately 11,000 square miles larger than Ohio. Ohio has less acreage devoted to crop production with approximately 50% less crops per acre than Iowa.

Assumptions, Limitations, Definitions

Even though the number of family owned farms has decreased to give way to larger, more efficient corporations, the production of crops has not. Farmers have started producing more corn and soybean while gradually weeding out wheat, hay, and oats. The total number of acres harvested has steadily dropped for three of the five crops, but the bushels per acre of each crop, except hay, have a steady incline.

According to the data given, the definition of a farm from 1959-1973 was a place of less than 10 acres if the sales of the agriculture products amounted, or normally would amount, to at least $250, or a place of 10 acres or more if the sales of the agriculture products amounted, or normally would amount, to at least $50. From 1974 to today, the definition of a farm is considered to be any place from which $1,000 or more of agriculture products are produced and/ or normally would have been sold during the (agricultural) census year.

Summary

In conclusion, of the five major crops grown in Ohio, wheat, hay and oats have gradually been weeded out while the production of corn and soybean has increased. The number of family owned farms has seen a drastic reduction while corporate owned farms have steadily risen in number. The total number of acres harvested has dropped for three of the five crops (wheat, oats and hay) as the bushels per acre of each crop, except hay, have a steady incline. Iowa and Ohio farming have both similarities and differences relating to their crops harvested and amount of acreage devoted to crop production.

Acknowledgements

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References

Bluman, Allan G. *Elementary Statistics: A Step By Step Approach*. McGraw-Hill, 5th Edition, 2004.

National Agricultural Statistics Service. www.usda.gov/nass.

U.S. Department of Agriculture. National Agricultural Statistics Service. Iowa Statistical Office. Des Moines, IA. www.nass.usda.gov/ia.