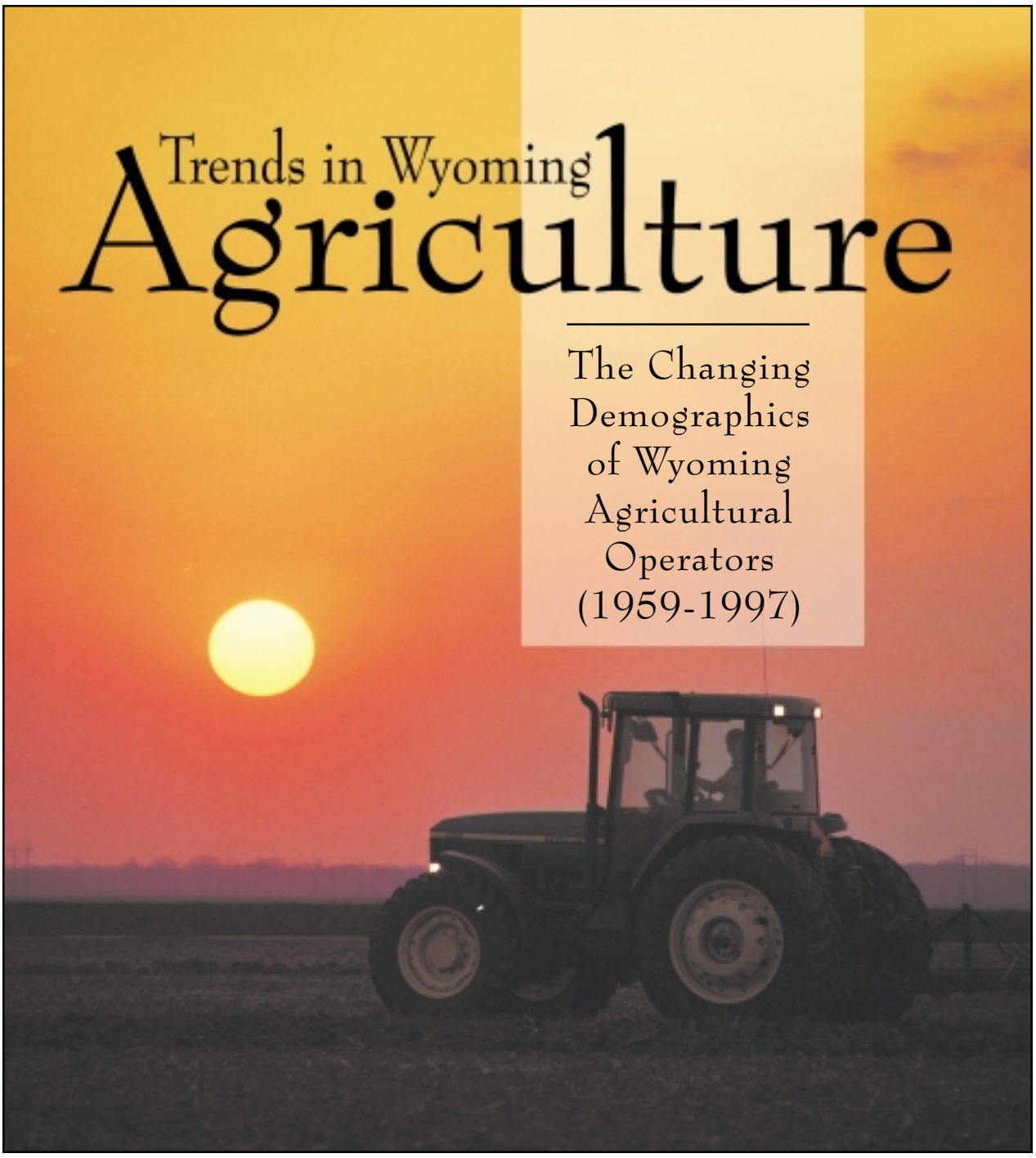


Thomas Foulke, Roger Coupal, David Taylor

College of Agriculture
Cooperative Extension Service
UNIVERSITY OF WYOMING

MP-103
July 2000

Authors:

Thomas Foulke, Information Specialist, University of Wyoming College of Agriculture Department of Agricultural and Applied Economics, P.O. Box 3354, Laramie, WY 82071

Roger Coupal, Assistant Professor, University of Wyoming College of Agriculture Department of Agricultural and Applied Economics, P.O. Box 3354, Laramie, WY 82071

David Taylor, Professor, University of Wyoming College of Agriculture Department of Agricultural and Applied Economics, P.O. Box 3354, Laramie, WY 82071

Editor: Tonya Talbert, College of Agriculture, Office of Communications and Technology

Graphic Designer: Tana Stith, College of Agriculture, Office of Communications and Technology

Issued in furtherance of Cooperative Extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture. Glen Whipple, Director, Cooperative Extension Service, University of Wyoming, Laramie, Wyoming 82071.

The structure of Wyoming agriculture is changing. This change is prominently reflected in the demographics of Wyoming's agricultural operators, and its effects have important ramifications for the future of agriculture and economic structure within the state. The authors investigated this aspect of change through the USDA Census of Agriculture, which is taken every five years. The most current year is 1997.

Demographics is the study of vital statistics, including population, births, deaths, and marriages. Many factors in our society affect demographics. Health, medical care, income, government policy, job availability, and political and cultural factors all come into play. This study examines age groups within the Wyoming agricultural operators population to highlight certain trends.

Trends can be considered structural or cyclical in nature. Structural trends are changes in how the sector operates and are important to understand because of their long-term impact on the economy. Cyclical trends have a recurring nature and can be foreseen and planned for to mitigate their impact. Most likely, the trends identified in this bulletin have components that are both structural and cyclical.

The number of agricultural operators in Wyoming was relatively stable from 1959 to 1997. There were 7,406 agricultural operators in Wyoming in 1959. This number rose to 9,232 by 1997, an increase of 24.66 percent. However, the last 10 years have seen little change in numbers. According to the Census of Agriculture's current definition, a "farm" is any place from which $1,000 (of agricultural products) or more were produced and sold, or normally would have been produced or sold, during the census. The census does not distinguish between farms and ranches. The number of operators refers to all operators, without regard to the size of the operation. The number of operators in each category was divided by the total for that year to obtain a percent share for each category. A standardized percent share can be compared with other censuses across the years. This method accounts for changes in the number of operators between censuses.

Age Groups

Figure 1 shows the number of agricultural operators in Wyoming in each age group category. Much information is presented here, but the important thing to note is the bell shape for the early years in the series (1959, 1964, 1969). Young and old are balanced around middle age, creating the relatively normal shape of the distribution. There are fewer operators in the younger categories; most are in the middle working years. And as mortality and retirement take their toll, there are fewer older operators. Demographic changes were occurring by 1964, as the number of 55 to 64-year-olds increased. The number of 35 to 44-year-old operators in 1974 roughly equaled those in the 65 and over class. Since that time, the bell shape has become more skewed toward the right as the older age groups gain numbers.

Figure 1. Wyoming agricultural operators (1959-1997) by age category.

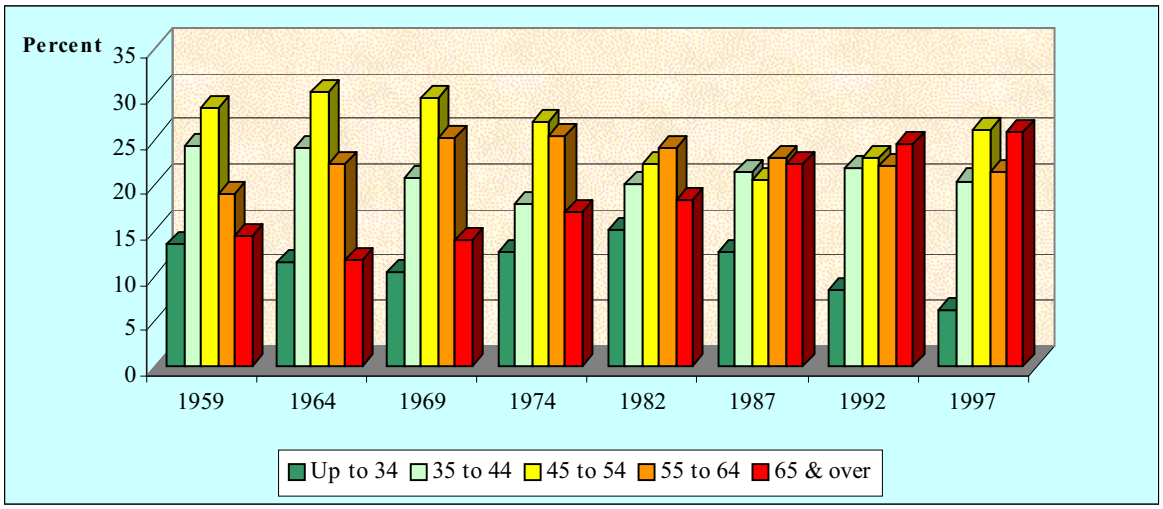


Figure 2 shows only those operators under 35. This is the entry-level age group for agricultural operators, and in 1959, this category made up 13.5 percent of the operators. The graph shows there are fewer younger operators in agriculture now. The share of younger operators had shrunk to 6.2 percent by 1997, a 54.1 percent decrease. The change has been most pronounced since 1982 and shows continuous decline. Figure 2 features evidence of both structural and cyclical changes. The structural component is the decline in overall share for the category. The regular rise and fall in number signal the cyclical component in the population.

Figure 2. Wyoming agricultural operators up to age 34.

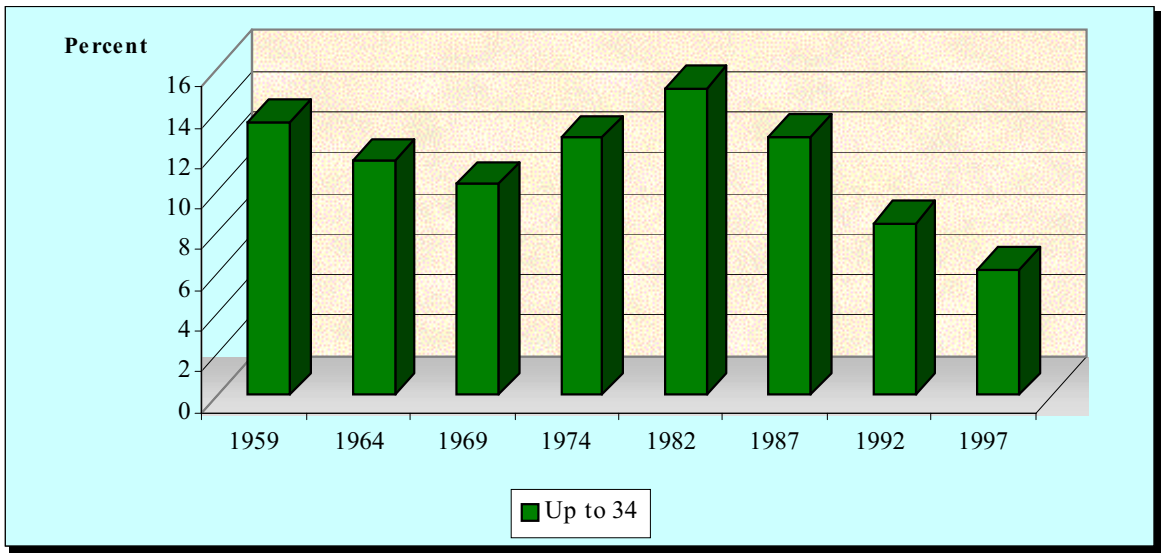


Figure 3 shows the "35 to 44" age bracket. This category has remained fairly steady as people tend to be more settled in a profession at this age. Still, there was a 16 percent decrease in this age group over the period that was probably influenced by general aging in the population. Aging is considered to be a cyclical event, yet it is not as pronounced in this graph. The dip in the year 1974 is considered to be cyclical in nature.

In Figure 4, the "45 to 54" group also shows a decrease, but there has been an upswing in the last decade. This group represented 28.6 percent in 1959, and shrunk to 26 percent by 1997, a 9 percent decrease. The decrease could be evidence of structural change, yet it is too early to tell. The shape of the graph points more directly to cyclical effects of inter-generational dynamics.

Figure 3. Wyoming agricultural operators (1959-1997) age 35 to 44.

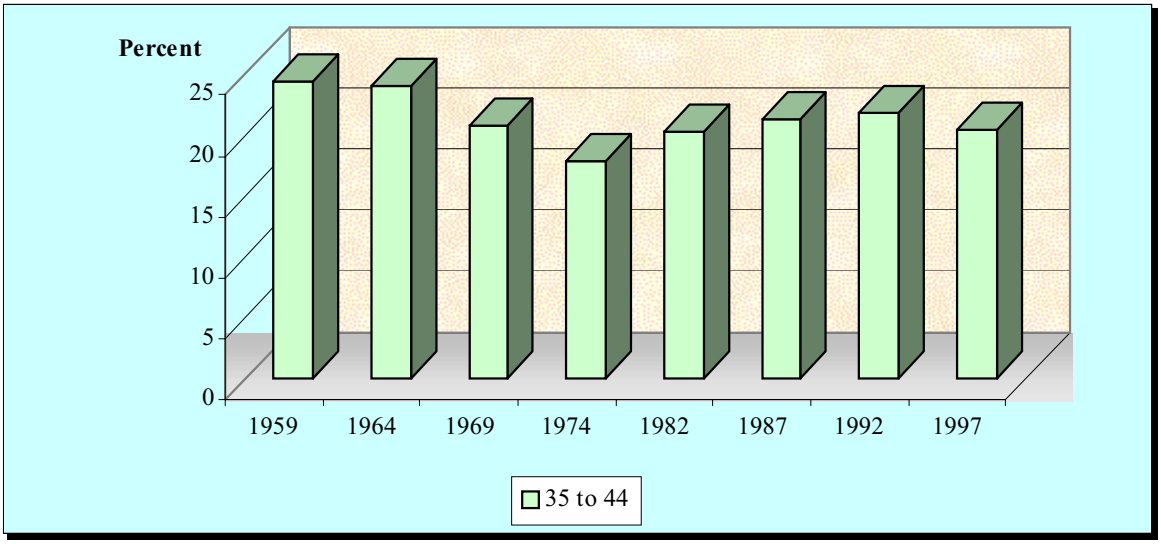


Figure 4. Wyoming agricultural operators (1959-1997) age 45 to 54.

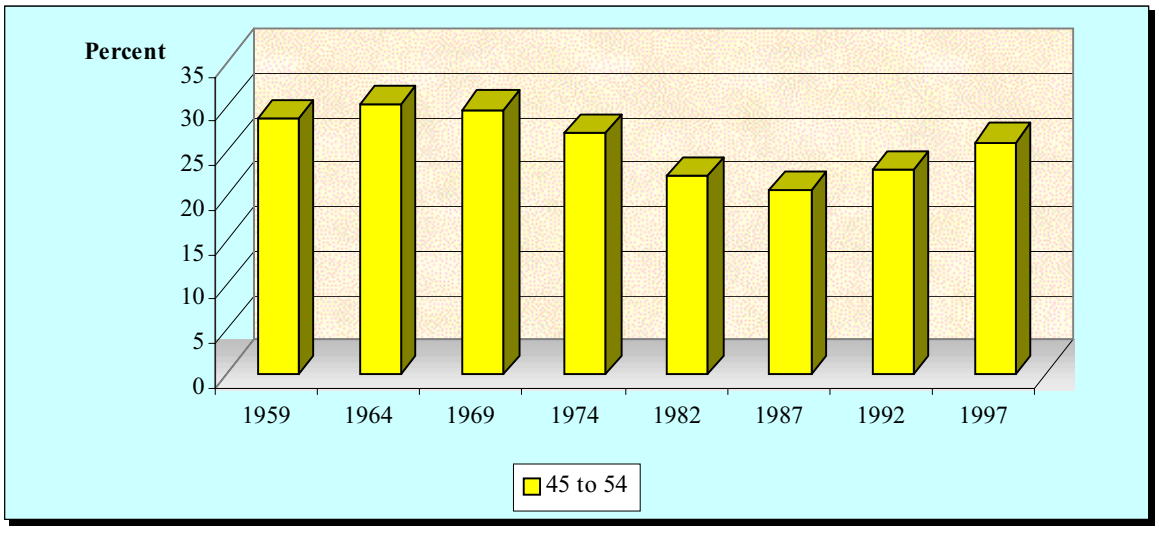


Figure 5 shows the "55 to 64" category has increased 12.75 percent. This represents a change from a 19 percent share in 1959 to a 21.5 percent share in 1997. The peak year for this category was 1974 when the group accounted for 25.5 percent of the operators. The slow decline since that time could be attributed to the cyclical nature of demographics. The population group younger than this (the 45 to 54 year category) has shown an increase in recent years. As this group ages, it will move into the 55 to 64 range, validating the view that cyclical forces are the primary forces acting upon the age group. If the number of operators in the 55 to 64 age group continues to decline, then it becomes apparent that structural forces are working on the population, creating changes beyond simple aging.

Figure 6 shows that the "65 and over" category has undergone the most dramatic change. This category represented just 14.5 percent of the operators in 1959 and now accounts for 25.8 percent, a 78.5 percent increase. Statistics show the number of "over 70" operators increased 10.9 percent from 1992 to 1997. The continuous increase in this category's share of operators points strongly toward a structural change in agriculture.

Figure 5. Wyoming agricultural operators (1959-1997) age 55 to 64.

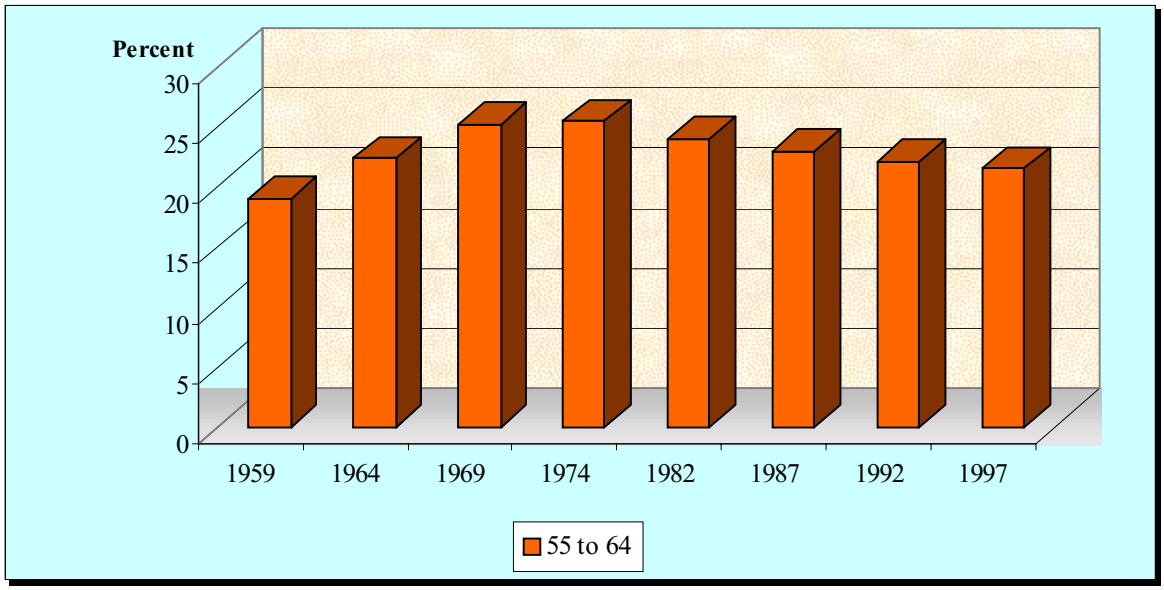
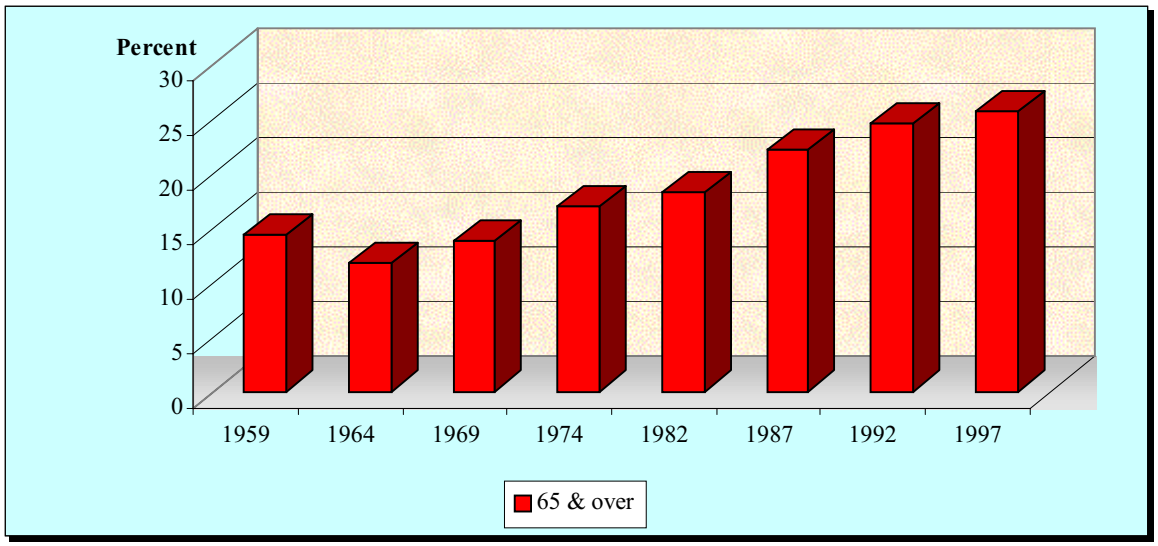


Figure 6. Wyoming agricultural operators (1959-1997) age 65 and over.



Trends and Dynamics

Two obvious trends appear to be occurring in operator demographics. The age group "65 and over" has increased dramatically during the past 40 years. The age group "Under 35" has significantly decreased during the same period. In general, the population is living longer, healthier lives as medical care improves. Technology (mechanization) has allowed operators to keep working well into their later years, being more productive longer. This means the next generation is coming into its inheritance later in life, which may help to account for the 54.1 percent decrease in the share of operators under 35 years. This trend suggests that as the population of operators ages, they are controlling farms and ranches longer. Their children will not become managers until later in life. This foreshadows a structural shift, which will take control away from the younger generation over a period of time. As an intergenerational transfer approaches, the younger generation may have been away from agriculture long enough to make the transition harder and, in some cases, less likely and less successful.

For the past 40 years, the national average operator household income has kept pace with average U.S. household income. However, new statistics show that the share of an agricultural operator's household income from farming (or ranching) has been static since the mid-1980s (USDA-ERS, 1999). Data are only available on a national basis, but researchers estimate that off-farm income accounts for 88 percent of total farm operator household income. The indication is that other members of the family (spouses of operators, their siblings, and their children) are working off-farm to keep the operation viable. This structural shift away from agriculture as a primary source of income has been occurring for some time but has become more pronounced in recent years. The effect

on the age of operators may be that fewer young people are willing to go into an enterprise with lower, or more uncertain, income potential.

Natural cyclical movements come into play as individuals of all ages enter or leave an enterprise and the numbers in a given generation change. How much of an effect these movements have on the overall operator population is difficult to say. One clue comes from the overall population trend. Measured in Wyoming during the 1990s, the age group 25 to 44 years decreased almost 12 percent; the 45 to 64 group gained 39 percent (Census Bureau, 1999). These groups do not match the groups used in this study exactly, but they follow the general trend of less younger and more older people in the state. Further study into the migration patterns of the population may reveal more significant trends.

The cause for the decrease in younger generation producers is more elusive than the increase in older operators. The census data does not break down the composition of the agricultural operator's household. Are the children of those older operators working on the ranch, waiting to take over, or have they found jobs elsewhere? If they are working in the enterprise, then the future may start to look more like the past (cyclical change). The shape of the graph showing the population distribution will start to shift back to the left, becoming more bell-shaped. However, if the younger generation has found employment off-farm and there are no family members willing to take over the operation, then the next 5 to 10 years may see significant changes in the structure of Wyoming's agricultural enterprises. The shape of the graph will continue to skew to the right as the current population continues to age. Fewer entrants into agriculture would shrink the overall number of operators, and land use would shift to other uses.

In a third scenario, the different population groups could level out. So long as agriculture remains a viable enterprise, individuals are likely to want to remain in or enter the industry. The total number of operators is likely to fluctuate, depending on the economics (size of operation, profitability, and productivity). Then, operator ages would become less dependent on generational dynamics and more dependent on economics.

The future of agriculture is looking more industrialized. The meat packing industry is an example where consolidation and concentration are producing "changes in livestock marketing with a shift away from spot markets to direct contracting between livestock growers and processors…" (USDA, ERS, 1999). If this prognosis is correct, then those structural shifts will trickle down vertically through the sector, forcing changes in production practices. Additional impacts will be seen in the rest of the economy as agricultural services, government, and local communities adjust. These structural changes could very well have cyclical implications if there is significant impact on the family structure of enterprises. A move away from family enterprises could dramatically change operator demographics.

Summary

The data clearly shows that the average age of Wyoming's agricultural operators is rising. But the question remains, are these changes structural or cyclical? There is no one clear answer. When the "65 and over" group finally relinquishes control, will there be younger operators to take their places? Are there sufficient numbers of young people willing and able to take on the responsibilities of an agricultural enterprise?

This report examined data from the Census of Agriculture to show the population distribution of Wyoming agricultural operators. The data show a rapidly aging group of operators with less younger people entering the field. This trend cannot continue indefinitely. Three alternatives have been presented: a cyclical shift in generations that could swing back toward the younger generation in the years to come, a structural shift where there are fewer entrants into the field as the population ages, and a combination that relies on the economic viability of agriculture. The latter scenario would allow the age group distribution to break out of a cyclical pattern, becoming more evenly distributed. But it presents new challenges for the whole economy as the structure of the sector changes.

The future is by no means certain. Any or none of the proposed scenarios are possible. Technology and the globalization of agricultural markets have already had deep impacts on the sector and will continue to do so. How the sector reacts and how those impacts are translated into operator demographics depends on the economic, social, and political landscape of the future.

For more information on trends in Wyoming agriculture, visit the *Wyoming Economic Atlas* at http://Agecon.uwyo.edu/EconDev.

References

United States Department of Agriculture, Economic Research Service, *Situation and Outlook Report: Agricultural Income and Finance*, AIS-73, December, 1999:17.

United States Department of Agriculture, Economic Research Service, http://www.ers.usda.gov/whatsnew/issuesconcentration/index.htm, *Concentration and Structural Change in U.S. Agriculture*, October, 1999:1.

United States Department of Agriculture, National Agricultural Statistics Service, *1997 Census of Agriculture, Volume 1, Geographic Area Series Part 50*, AC97-A-50, March, 1999:vii.

United States Department of Commerce, Census Bureau, http://www.census.gov, *Population Estimates, by State 1990-1999.*

United States Department of Commerce, Economics and Statistics Administration, Bureau of the Census, *1992, 1987, 1982, 1974, 1969, 1964, 1959 Census of Agriculture, Volume 1, Geographic Area Series Part 50*, AC97-A-50.