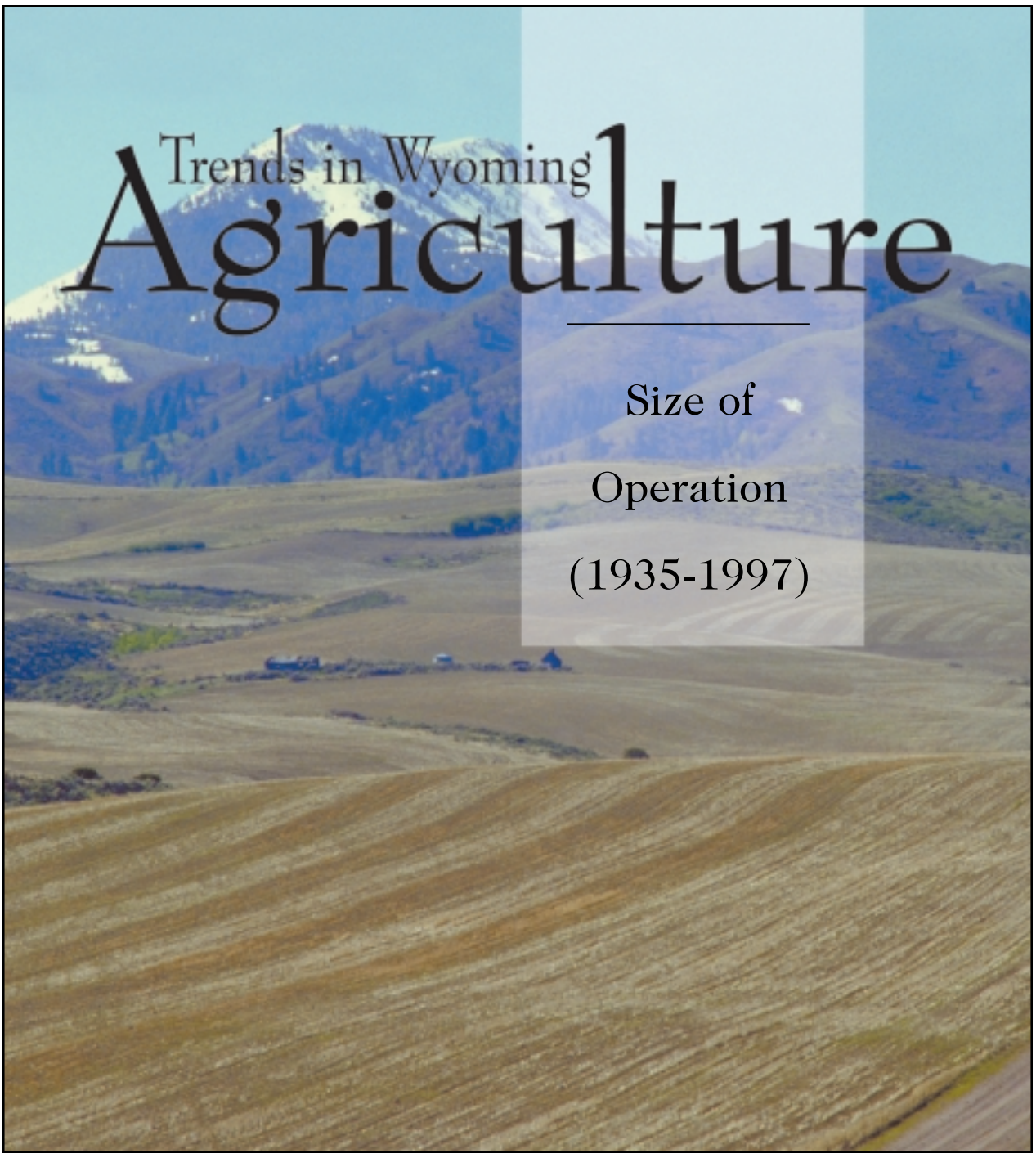

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Size matters. The size of agricultural operations always has been important to producers. From Wyoming's earliest days as a territory, the amount of land in a holding has determined productive capacity and this, in turn, influenced the income potential and social status of the agricultural operator. This report will help readers understand trends in the size of Wyoming agricultural operations and the continuing impact of size on the structure of the sector.

The data for this report comes from the *Census of Agriculture* for the years 1935 to 1997. Earlier reports exist, but 1935 is the first year that acreage categories are readily comparable to today's census. In 1934, the Taylor Grazing Act closed the West to homesteading, allowing analysis of a more stable amount of land. Analysis of earlier years would be more difficult due to the necessity of re-categorizing data. Information from earlier periods is cited from the 1920 census.

Information from the census table *Land in Farms* was used in this analysis. It should be noted that the census does not distinguish between farms and ranches even though in Wyoming ranches are more common. Therefore, the words "farm" and "ranch" are used interchangeably to denote agricultural enterprises in Wyoming.

Historical Considerations

To understand the significance of size in agricultural operations, it is important to take into account some historical considerations in the development of the state's agricultural base. The following brief overview is not meant to be all inclusive of Wyoming's rich legacy of ranching and farming but merely to frame the historical setting in the context of the report.

Wyoming agriculture has been centered on livestock from its beginnings—first cattle, then sheep, and then cattle again. Cattle from Texas were driven through the territory as early as 1866, though they had passed through the territory even earlier along the Oregon Trail. By 1870, cattle were streaming north on the Texas Trail. Wyoming was home to the "open range" concept that allowed all newcomers to graze. Because there was little competition, open range grazing was not a problem in the early days. In 1860, barbed wire was invented in France, the first U.S. Patent was issued in 1868; however, barbed wire was not available in large quantities until the mid-1870s. Without fences, cattle were turned out on the range together, separated by brand at roundup and shipped by rail to markets in the east. This type of arrangement also lent itself to investment and eventually consolidation into larger holdings. It is interesting to note that in the early days, there was considerable European investment in Wyoming ranching. The Laramie County Stock Growers Association was formed in 1873 and renamed the Wyoming Stock Growers Association in 1879. This organization became a force not only in the industry but in political circles as well. Cattle remained dominant until the severe winter losses of the late 1880s forced retrenchment in the industry (Linford, 1947).

Sheep came to prominence in the 1890s (Table 1) as they offered two products, wool and lamb, and had the ability to graze more arid lands. Yet the introduction of sheep fueled contention for the state's

Table 1. Wyoming cattle and sheep inventory, 1870-1920.*

	1870	1880	1890	1900	1910	1920
Sheep	6,409	450,225	712,520	5,099,613	5,397,161	1,859,775
Cattle	11,130	521,213	934,066	687,284	767,427	875,433

**Source: Fourteenth Census of the United States, 1920*

scarce resources (grass and water) that were already overburdened by growing numbers of livestock.

More and more homesteaders were moving into Wyoming during this time, forcing confrontation with the cattlemen. Whereas a "cattle baron" might own only a 160-acre homestead, his herds would graze thousands of acres of open range. Homesteading settlers increasingly staked out prime grass and water locations limiting access to the larger herds. The defining point came during the 1892 Johnson County War where the cattlemen tried (and failed) to remove the homesteaders with a force of regulators. After this episode, changes in the industry were inevitable as the days of the open range were numbered.

Commercial farming was not commonplace in nineteenth century Wyoming. Oats were the largest crop in 1899 with 26,892 acres, followed by wheat with 19,416 acres (Commerce, 1920). Most people considered Wyoming's semi-arid climate too dry for farming without irrigation, which was slow to develop. But new technologies and political movements in the first decade of the twentieth century changed that. An independent researcher by the name of Hardy Webster Campbell published the *Soil Culture Manual* in 1902 where he expounded on his research in dryland farming. In addition to his research, he was a good propagandist and newspapers everywhere began extolling the virtues of dryland farming (Layton, 1988).

In the early twentieth century, America was experiencing the pangs of a newly industrialized nation. People were leaving the countryside and heading to cities in search of a better life. The "Country-Life Movement" grew in response "not only to improve farming, but also to improve the quality of farm life" (Layton, 1988). A chief proponent of this movement was President Theodore Roosevelt. Roosevelt said, "No nation has ever achieved permanent greatness unless this greatness was based on the well-being of the great farmer class, the men who live on the soil; for it is upon their welfare, material, and moral that the welfare of the rest of the nation ultimately exists" (Layton, 1988).

Momentum built around the country and culminated in the Enlarged Homestead Act of 1909. The act was a dryland farming homestead act for nonirrigable, nonmineral lands in the western states. The signature parts of this act were to increase the size of a homestead from 160 to 320 acres and to decrease the residency requirement from five years to three (Layton, 1988). The Transmissouri Dry Farming Congress was holding its third annual convention in Cheyenne shortly

after the act was passed. President Roosevelt sent a letter to the congress stating, "Any organization having for its purpose the development of the agricultural resources of the great semi-arid section of the United States should have the hearty support of all good citizens" (Layton, 1988). One result of the act was a 38.2 percent increase in total farm acreage in Wyoming between 1910 and 1920 (Commerce, 1920).

Law and policy changes continued to affect the still growing sector through the 1920s. The Stock Raising Homestead Act of 1916 further enlarged the size of a homestead to 640 acres of nonirrigable land. Among the supporters of this act was Wyoming rancher and Congressman Frank W. Mondell. The act had the well-meaning design of attempting to open more public lands to settlement and economic development, but the reality was much harsher. A section was still not enough to provide for a living. Depressed grain prices and drought following World War I limited the effectiveness of the act (Layton, 1988).

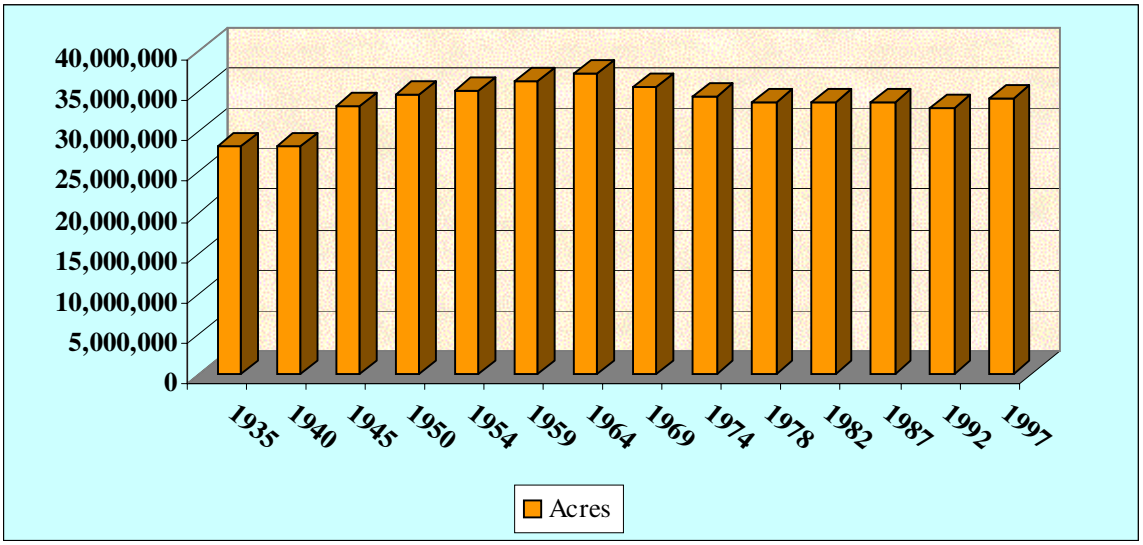
In 1930, there were still 15,929,460 acres of "vacant, unappropriated, and unreserved" public land in Wyoming (Layton, 1988). But economic and political realities of the day were changing. The Taylor Grazing Act of 1934 superceded the homestead acts, closing public lands to homesteading. The days of free land in the American West were over. A few irrigation projects were ongoing for some time, so land was still being added to the agricultural base. What the droughts in the 1920s and the depression of the 1930s started, the Taylor Grazing Act completed, ending the rush to dryland farming. Today, dryland farming continues in areas of the state where the climate and current practices will allow, but on a more sustainable level.

Although livestock always has been dominant over crops in Wyoming, the events of the 1920s and 1930s pushed producers even more toward livestock by closing the range to further settlement. Sheep and cattle producers coexisted (somewhat peaceably) on the range that became more and more firmly under federal control during the 1930s and 1940s. The shift from cattle to sheep that had occurred after the harsh winters of the late 1880s reversed itself in the second decade of the twentieth century. By 1920, the value of cattle was twice that of sheep in Wyoming (Commerce, 1920). Cattle continued to gain dominance even though sheep numbers grew until the mid-1940s. The advent of synthetic fibers, changing tastes and preferences, and increased foreign competition have contributed to declining sheep numbers ever since.

Land in Farms

Figure 1 shows the later stage of Wyoming's agricultural land development after the Taylor Grazing Act. The peak year for agricultural land was 1964 with 37,052,797 acres. This number was reduced to 32,876,071 acres by 1992. The most current census lists 34,088,692 acres. The increase is largely due to statistical counting methods. The Bureau of the Census conducted the census of agriculture up until 1992. Starting in 1997, the Department of Agriculture took over responsibilities for this function. Among other differences, the new methodology counts CRP (Conservation Reserve Program) land, which totals 229,607 acres (1997).

Figure 1. Wyoming land in farms, 1935-1997.



Average Size

With the range closed and the amount of available land no longer expanding, consolidation was the only answer for operators wishing to increase acreage. Figure 2 shows average operation size from 1935 to 1997. The average size of operation increased 129.3 percent from 1935 to 1974, largely due to the revolution in mechanization that allowed greater productivity. Average farm size peaked in 1974, the beginning of a period of profound change in agriculture. Inflation and macroeconomic forces started to work against operators and put a halt to expansion efforts (see UW CES publication MP-104: *Trends in Wyoming Agriculture: Agricultural Income: 1969-1997*). In addition, the rise in the number of smaller operations since 1974 tips the averages in favor of smaller operators for statistical purposes.

Conversely, the number of farms (or ranches) in Wyoming steadily declined from 1935 to 1974 as the size of operations grew on a fixed land base (see Figure 3). There were 16,616 farms in 1935 with an average size of 1,610 acres. Thirty-nine years later, in 1974, there were only 8,018 farms with an average size of 4,274 acres. The size and number of farms has been relatively stable and rebounded only slightly since 1974. The 1997 census reports 9,232 farms with an average size of 3,692 acres.

Size of Wyoming Agricultural Operations Today

There are two yardsticks generally used to measure the size of operations: value of products sold and acreage. Economists like to use market value of products sold since land productivity varies. However, due to inflation and, more importantly, the type of data available for study, acreage lends itself more to the type of time series analysis done here. This report will use acreage as a yardstick for looking at older data to show how the size of farms has changed in area, but it will introduce the market value of products sold to discuss current trends.

Figure 2. Average farm size, 1935-1997.

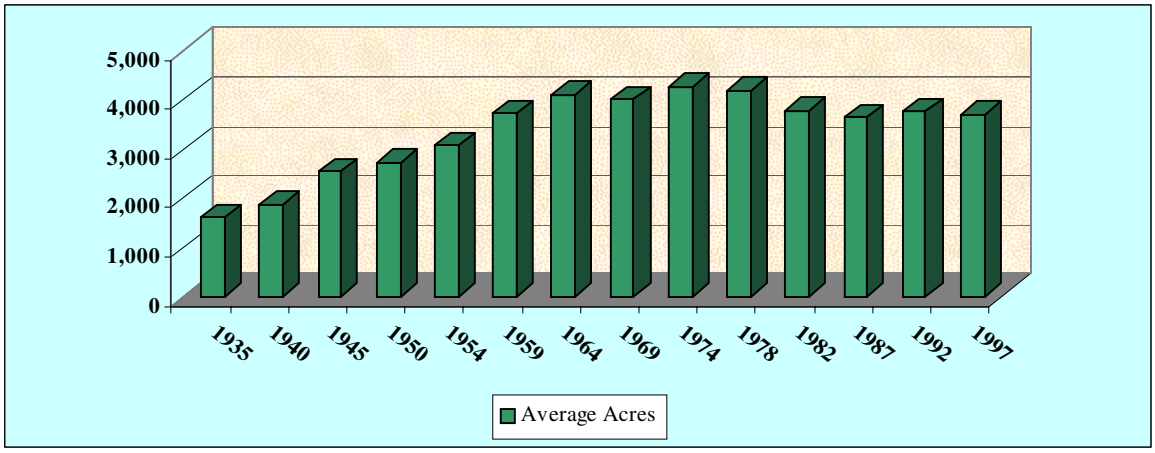
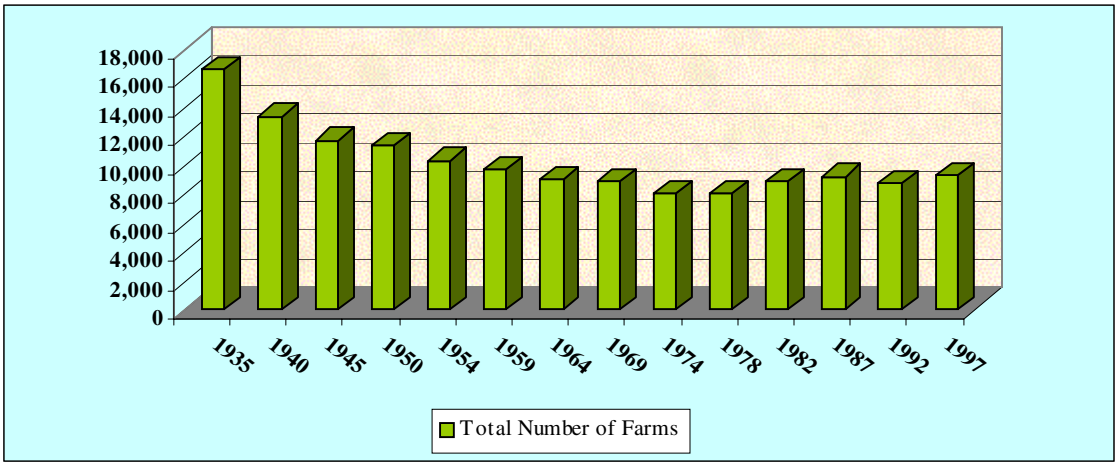


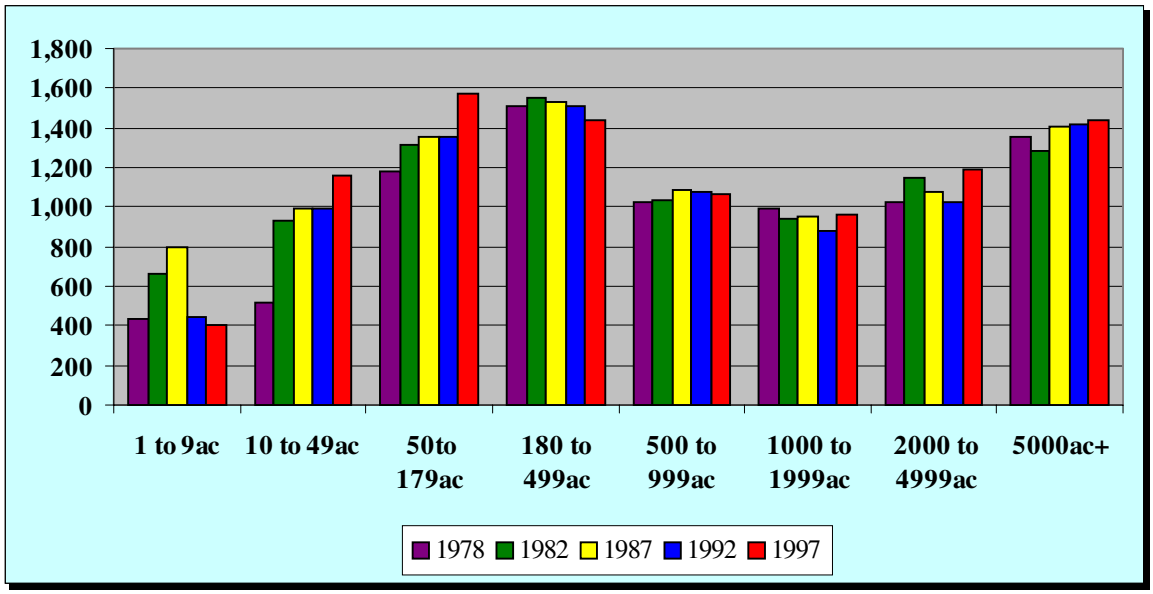
Figure 3. Wyoming, total farms, 1935-1997.



The short history in the previous section illustrates how the agricultural sector in Wyoming evolved, lending insight into the current structure. A critical aspect is the large and small holdings disposition. Figure 4 shows the number of Wyoming agricultural operations based on acreage. Note that there are a large number of operations in the 50 to 179 acre and the 180 to 499 acre categories, as well as the 5,000-acre plus group. This is called a bimodal distribution because there are two dominant categories or modes in the population (the two smaller categories being lumped together).

The bimodal phenomenon is not new to Wyoming. History reveals the number of larger and smaller operators grew at rates that were roughly similar to those of the land base. The census categories have changed over the years, making it more difficult to show just how many and what size the larger operators are. All operations over 1,000 acres were reported in one category until 1959 (even though average size reported in 1935 was 1,610 acres). The largest category from 1959 to 1978 was 2,000 acres plus. Currently, all farms with 5,000 acres or more are lumped

Figure 4. Number of farms in Wyoming by size.



together. The largest category in 1935 (1,000 plus acres) accounted for 84.1 percent of the land ownership. This same category accounted for 95.9 percent of the land ownership in 1997. Today, the 5,000-acre plus category accounts for 81 percent of the agricultural land ownership in Wyoming. The chart shows how the number of 5,000-acre plus farms has continued to grow in the time that statistics have been kept. (There were 83 more 5,000-acre plus operations in 1997 than in 1978.) Increases in productivity and economies of size keep larger operations growing to capture more efficiencies in the enterprise.

The second modal group includes the census categories of 50 to 179 acres and 180 to 499 acres. These are considered small producers by Wyoming standards since, from a historical perspective, even a section (640 acres) of (unirrigated) land was deemed too small to provide for a family (Layton, 1988).

Small producers significantly outnumber large producers. Homesteading laws ensured that each producer had at least 160 acres in the days of the open range. With the closing of the range, larger producers were able to purchase more land to ensure their position in the market place. Smaller producers were forced either to grow or fail.

Another transformation has occurred with small producers. A smaller producer's livelihood was subsistence in the days of homesteading. Today's economy dictates that the smaller producer have off-farm income to supplement (or support) his or her agricultural earnings (USDA, *Income and Finance*, 1999). The same sentiments that produced the Country Life Movement of the early twentieth century are working on people today. Many people desire the freedom and quality of life that agricultural living provides. Modern transportation and communications allow people to live farther from urban nodes

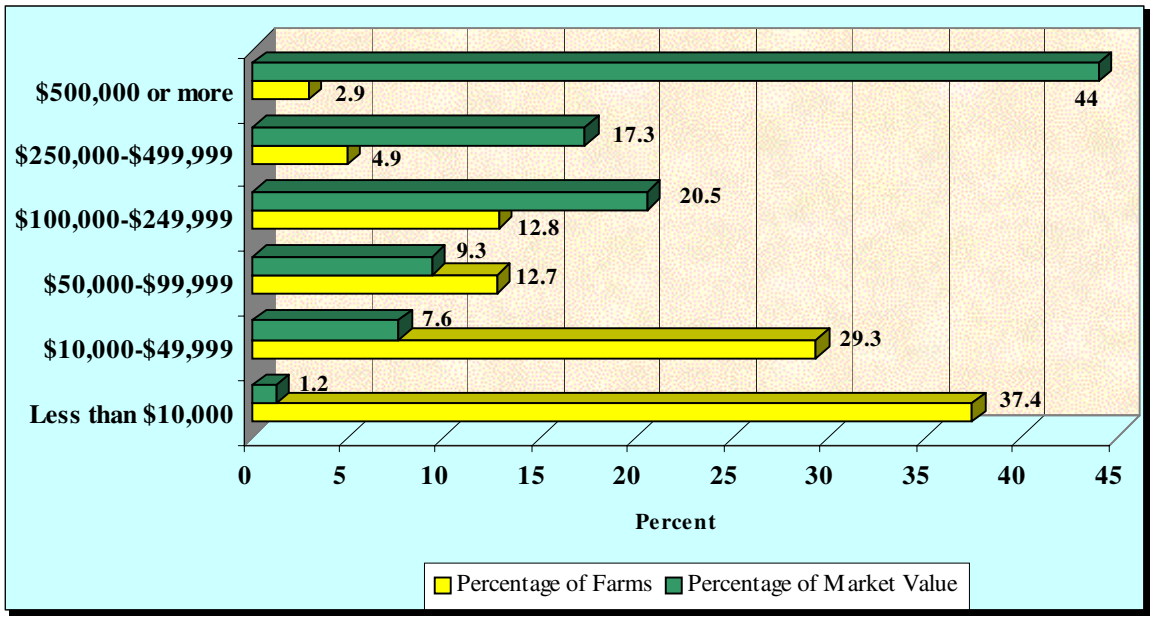
and still have modern conveniences. It is now possible to pursue a rural lifestyle and an urban career. In many cases, the result is small holdings known as "ranchettes," "hobby farms," or "lifestyle enterprises" subdivided out of larger parcels within commuting distance of larger towns. Ranging in size from 1 to 200 acres, but often found in the 35 to 40 acre size, these holdings are represented in Figure 4 by the first three clusters of columns. Note how the 10 to 49 acre and 50 to 179 acre categories made significant gains in the 1997 census. These were the fastest growing categories, increasing 15.9 percent and 13.2 percent, respectively, from the previous census. These holdings still have at least $1,000 in annual agricultural production, the minimum level the USDA considers a "farm" for statistical purposes.

In summation, with regard to area, there are two trends in the size of agricultural operations in Wyoming. One trend is for larger operations to continue to grow in acreage and become more efficient. The second trend is the growth of small holdings by individuals who desire the rural lifestyle but require proximity to larger towns.

Market Value of Agricultural Products Sold

From an economist's point of view, the market value of products sold measures more accurately than acreage the size of an agricultural operation. Wyoming farms and ranches sold $898,527,000 worth of livestock and crops in 1997. Figure 5 shows the distribution of the value of products sold by the size of operation and market value of those products (USDA, *Census*, 1999). An important aspect of this graph is that larger operations contribute the vast majority to the market value of production. The top 2.9 percent of producers produced 44 percent of the market value of production for the state. The *Census of Agriculture* reports there were just 266 of these "farms" in 1997. Similarly, the largest 20.6 percent of the producers contributed 81.8 percent of market

Figure 5. Percent of farms and market value of agricultural products sold: 1997.



value of Wyoming's agricultural production (i.e., all producers selling over $100,000 in 1997). Conversely, smaller producers (under $100,000) make up 79.4 percent of the producer population and contribute only 18.1 percent of the value of Wyoming's agricultural production.

Trends Going Forward

Industrialization is the word frequently used with regard to the trends of consolidation and concentration in agriculture. This applies to both vertical (stages in the production process) and horizontal (the size of each stage of production) aspects of the sector. Congress and the United States Department of Agriculture are concerned with these trends because they "have far-reaching impacts on farmers, agribusinesses, consumers and rural communities, and they affect the ability of the United States to compete effectively in international markets" (USDA-ERS, *Concentration*, 1999). However, "the industrialization of agriculture, including the increasing use of contracts, is likely to continue to make inroads" (USDA-ERS, *Concentration*, 1999).

The meatpacking industry has been cited as an example of an area 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, *Concentration*, 1999). If this prognosis is correct, then those structural shifts will trickle down vertically through the sector, forcing changes in production practices. "Industrialization may overwhelm existing environmental controls, create intense new stresses on local public services, undermine the incomes of producers using more traditional production methods, and change rural communities" (USDA-ERS, *Concentration*, 1999).

These trends have important implications for both small and large producers:

- Small producers are particularly concerned. Contractual arrangements used by larger buyers and sellers may limit market outlets for small independent producers, reducing their ability to compete. Another aspect is that trading on the open spot market may become more volatile when spot market prices are based on fewer trades. Finally, small producers may be subject to price discrimination if quality premiums in contractual arrangements are not made publicly available. (USDA-ERS, *Concentration*, 1999).
- If large producers in concentrated markets are able to realize economies of scale, concentration may, in some cases, lead to lower production costs, greater input demand, and lower consumer prices. In those instances, concentration would create greater economic efficiency. (USDA-ERS, *Concentration*, 1999).
- Industrialization and structural change sometimes limit competition. But their broader effects more often reflect competition while undermining traditional methods of production, environmental control, and public service delivery. The challenge for policy makers is to identify which, if any, of industrialization's effects should be constrained and to design instruments that can reach those policy goals (USDA-ERS, *Concentration*, 1999).

What this means is that industrialization and structural change are forcing change in traditional agricultural production methods. These changes, which affect both large and small producers, have unknown impacts on the future of agriculture in Wyoming. Producers and policy makers should be aware that change is taking place and should be watchful for developing trends.

Summary and Conclusions

The mosaic of historical patterns has left its mark on Wyoming agriculture. Size of operation has been important not just from a production standpoint, but from a market share, political, and social stance as well. Using data from the U.S. Census and the *Census of Agriculture*, this report has shown how size played an important part in the settlement patterns of Wyoming's early days and how the trends in size changed with political and economic conditions over time.

The average size of Wyoming operations (in terms of acreage) has more than doubled since 1935. Just as the number of farms has shrunk, their size has increased as producers attempt to capture economies of size. In addition, new factors are pushing an increase in smaller operations that produce a smaller share of the market value but account for an ever-larger proportion of the producer population. At the same time, American agriculture is becoming more industrialized, threatening both large and small producers with changes in market structure and business practices that could make the future of agriculture look very different from today.

For more information on trends in Wyoming's agricultural sector, visit the *Wyoming Economic Atlas* at http://Agecon.uwyo.edu/Econdev.

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