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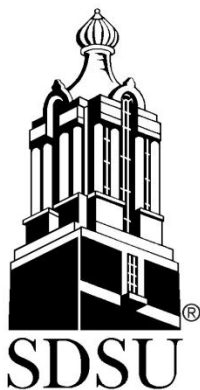
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The Structure of South Dakota Agriculture:
1935-2012

by

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THE STRUCTURE OF SOUTH DAKOTA AGRICULTURE: 1935-2012

EXECUTIVE SUMMARY

- This study presents key components of the structure of agriculture in South Dakota. As a major industry in South Dakota, agriculture plays a pivotal role in the overall vitality of the economy. Agriculture in South Dakota spans many industries, including the production of agricultural commodities, food and feed processing, agricultural input manufacturing, agribusiness, and other agricultural-based industries.
- This report is based on data from the Census of Agriculture. The report presents long-term trends for farm numbers, the number of operators, land use, and other important characteristics of agriculture. The study emphasizes family farms, because they will continue to dominate the farm operations in the state. Overall, as the agricultural sector continues to evolve, it will remain a key component of the economic base in the state.

KEY FINDINGS

- After decades of decline, **farm numbers** in South Dakota **grew from 31,169 to 31,989 farms** from 2007 to 2012.
- **The number of small farms** – those with fewer than 180 acres – **increased**. From 1982 to 2012, the number of small farms increased from 24.9% to 39.7% of all farms in the state.
- **The number of farm operators increased** from 45,810 to 48,987 between 2002 and 2012. In addition, there were 27,199 hired farm workers on farms in 2012. In total, the number of individuals working on farms (when calculated as operators plus hired farm workers) increased from 73,971 to 76,186 between 2002 and 2012.
- **Off-farm occupations became more prevalent**. Between 2002 and 2012, the number of principal farm operators with primary occupations other than farming rose from 27.4% to 41.1% of all operators. The group with the largest off-farm occupation increase constituted operators of family farms with agricultural sales of fewer than \$100,000 per year.
- **Less than one-half (44.6%) of farms earned less than 25% of their household income** from farming, and **30.9% of farms earned at least 75%** of their total household income from farming. The majority of farms earning less than 25% of household income from farming had sales below \$100,000 for the year.
- For **operators with off-farm jobs**, the majority **worked more than 200 days off-farm in 2012**. This shows farm operators who work off-farm are likely to have full-time rather than part-time jobs.
- **Farm input costs increased since 2007**. Aggregate expenditures on fertilizer, chemicals, seed, and feed increased between 80% and 109% over the period from 2007 to 2012.

- **Key animal enterprises had high per farm production costs.** In 2012, enterprises with the highest average per farm production costs were (in order from highest lowest): hog farms, dairy farms, cattle feedlots, poultry farms, grain farms, and beef farms and ranches.
- **Corn was the largest single agricultural enterprise in South Dakota** in 2012, surpassing beef cattle for the first time in decades, in terms of both farm numbers and sales volume.
- **Diversification is common across farm enterprises in South Dakota.** Oilseed and grain farms are the most diversified farm enterprises. In addition to grain sales, 40.0% of oilseed and grain farms reported sales of cattle and calves, and 24.0% reported sales of hay and other crops in 2012.

Keywords: Census of Agriculture, farms, farm operators, NAICS

JEL Codes: Q10,Q12,Q15

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I. INTRODUCTION

Agriculture in South Dakota has changed greatly since the first half of the 20th century. Many more changes are expected to occur in the coming years as technological progress, market conditions, and governmental policies affect the agricultural sector in South Dakota. The statement by Hallam (1993) that, “the technology, organization, and structure of agriculture will have important impacts on farmers and society at large” continues to ring true today and for the foreseeable future. The purposes of this report are to examine and explain key changes in the organization and structure of South Dakota’s farm sector, and to provide a contemporary profile of farm business and household characteristics.

This report includes the following major topics:

- Changes in farm numbers and physical farm size,
- Land tenure and ownership trends,
- Farm household demographics, income and employment trends,
- Farm operation costs, and
- Farm enterprise specialization and diversity.

The majority of the data examined in this report are from various Census of Agriculture reports for South Dakota. Substantial portions of this report update information presented in an earlier report specific to South Dakota (Diersen, Janssen, and Loewe, 2000). This report also complements another study completed after the 2012 Census of Agriculture (Decision Innovation Solutions, 2014).

Forces of change

Many forces influence South Dakota agriculture and have an impact on the structure of agriculture. In the earlier report Diersen, Janssen, and Loewe (2000) the forces of change affecting South Dakota agriculture in the late 1990s and early 2000s were described in detail. Many of these forces still apply to South Dakota agriculture today. Also, new and developing changes in agriculture and the economy are contributing to structural and market shifts. The

most recent significant changes include farm policy, weather events, ethanol expansion, and external changes.

The Agricultural Act of 2014 is the most recent farm bill legislation passed by Congress. The main result of this legislation was the elimination of direct payments. This change in farm policy affects the way farmers handle their risk management decisions. With the elimination of direct payments, crop insurance plays a relatively larger role in the decision making process of farmers. Indirectly this may lead to structural changes in South Dakota agriculture, as producers must decide which agricultural commodities provide the best risk-adjusted returns.

Weather and droughts have played a large role in South Dakota agriculture in the last decade. Unpredictable events, especially weather, can cause large changes in agricultural markets in the U.S. and South Dakota. Major droughts in 2002 and 2012 affected many farmers across South Dakota and the U.S., resulting in decreased crop yields and farm revenues. The 2012 drought reduced crop and cattle supplies and contributed to eventual increases in crop prices in 2012-2013 and in cattle prices in 2014-2015.

Driven by federal and state policies, the ethanol industry in South Dakota expanded rapidly in the last decade. Plants in South Dakota now have the capacity to produce more than a billion gallons of ethanol annually, using nearly 350 million bushels of corn. This expansion of the ethanol industry has had many direct and indirect effects on South Dakota agriculture. The ethanol expansion has helped grow the agribusiness industry in South Dakota. However, high corn prices contributed to increased feed costs for many agricultural producers. Structurally, the ethanol expansion has supported a growth in corn acres in the state, which led to corn becoming the largest single farm enterprise in South Dakota in 2012.

External changes can also influence the farm industry. Changes in consumers' tastes and preferences may influence demand for different agricultural commodities. Genetic and biological factors may have positive or negative impacts on the farm sector. Improved genetics may increase the yields of certain crops and also affect the diversification of the farm sector. Technology continues to play a major role in the farm sector. The use of computers and of precision agriculture has allowed farmers to increase their yields, and decrease the amount of labor needed on farm. This is correlated with increased off-farm employment among South Dakota farmers.

All of these forces of change have the ability to impact the structure of agriculture in the U.S. and South Dakota. They also may impact the comparative advantage of South Dakota agriculture. Comparative advantage may dictate what is produced, and which enterprises are undertaken. Costs and profit levels are also affected by the forces of change. The profitability of enterprises relies on a variety of factors. Farm structure is ultimately driven by profit levels of farms, so it is imperative to understand the forces of change impacting the agriculture sector.

II. NUMBER OF FARMS AND PHYSICAL FARM SIZE

Declining farm numbers and increasing physical farm sizes are the most well-known structural trends in U.S. agriculture. From 1935 to 2007, South Dakota's farm numbers decreased and average farm size increased continuously. During that time, the number of South Dakota farms decreased from 83,303 to 31,169, while average farm size increased from 445 to 1,401 acres (Table 1). However, from 2007 to 2012, the number of South Dakota farms increased by 820, and the average farm size decreased from 1,401 acres to 1,352 acres. This marks the first time in over 70 years that South Dakota farm numbers increased and the average farm size decreased between Census years.¹

The most rapid South Dakota farm exodus occurred from 1935 to 1940 when a net reduction of over 10,800 farms took place for an average annual decline of 2.8%. Farm numbers also decreased rapidly from 1954 to 1964, with 2.3% average annual declines. Since 1964, the average annual decline in farm numbers has remained below 2.0%, and slowed to below 1.0% since 1992. From 2007 to 2012, South Dakota farms number reversed the long-run trend in decline, and increased by 0.5% annually.²

The National Agricultural Statistics Service (NASS) provides annual summaries for the number of farms by state. The latest *Farms and Land in Farms* report shows the number of South Dakota farms for 2013 and 2014 (NASS, 2015). There were 32,000 and 31,700 farms in

¹Prior to 1935, farm numbers increased, both in South Dakota and for the United States as a whole.

² Overall state farm numbers also increased from 2002 to 2012, with average annual gains of 0.1% (Table 2), resulting in an increase of 0.8% over the entire period (Figure 1).

2013 and 2014, respectively, in South Dakota. Reported average farm size was 1,353 and 1,366 acres, in 2013 and 2014, respectively. Although these are not Census of Agriculture statistics, the report suggests that farm numbers have decreased and farm size increased in recent years. The recent long-term trend reversal led to an unchanged number of farms in 2014 relative to 2012.

Trends in farm numbers by region of South Dakota

In 2012, the Census defined a farm as “any place from which \$1,000 or more of agricultural products were produced or sold, or normally would have been sold, during the census year” (Appendix A, 2012 Census of Agriculture). The definition of what constitutes a farm has changed throughout the years, which is important to know when observing long-term trends in farm numbers. Between 1992 and 1997 the definition of what constitutes a farm changed. This particularly affects the number of very small farms and those with small amounts of agricultural sales, many of which may now be considered hobby or retirement farms.

Changes in farm numbers have been similar in all regions of South Dakota in the long-run (1935-2012) but major changes between regions occurred in different time periods. The regions (western, central, and eastern) and recent (2002-2012) changes in farm numbers are shown in Figure 1, and the annual percentage reductions in farm numbers by time period are shown in Table 2.

The largest decline in farm numbers was first seen in the western South Dakota region, with annual reductions of 3.4% from 1935 to 1950. Farm numbers in the western regions slowed their decline between 1950 and 1978, and remained stable after 1978, with periods of minor decreases and increases in farm numbers. The central and eastern regions both followed similar trends in farm number declines. The major periods of annual reductions in farm numbers occurred from the 1950s through the 1970s. After 1992, farm numbers in the central region slowed their decline, with annual reductions of only 1.0% from 1992 to 2002, and 0.3% from 2002 to 2012. The eastern region saw annual reductions in farm numbers of 0.6% from 1992-2002, and annual additions in farm numbers of 0.2% from 2002 to 2012.

Overall, South Dakota’s farm numbers appear to be in a period of stabilization. Between 2002 and 2012, average annual additions to farm numbers were 0.1% (Table 2). In aggregate,

South Dakota farm numbers increased from 31,736 in 2002 to 31,989 farms in 2012, resulting in an overall increase of 0.8% (Figure 1).

Table 1. Number of South Dakota Farms, 1935-2012

Census Year	Number of Farms	Net Change in Number of Farms	Annual Rate of Change	Land in Farms (Thousands of Acres)	Average Farm Size (Acres)
1935	83,303			37,102	445
1940	72,454	-10,849	-2.8%	39,474	545
1945	68,705	-3,749	-1.1%	43,032	626
1950	66,452	-2,253	-0.7%	44,786	674
1954	62,520	-3,932	-1.5%	44,949	719
1959	55,727	-6,793	-2.3%	44,850	805
1964	49,703	-6,024	-2.3%	45,567	917
1969	45,726	-3,977	-1.7%	45,584	997
1974	42,825	-2,901	-1.3%	45,978	1,074
1978	39,655	-3,170	-1.9%	44,543	1,123
1982	37,148	-2,507	-1.6%	43,811	1,179
1987	36,376	-772	-0.4%	44,157	1,214
1992	34,057	-2,319	-1.3%	44,828	1,316
1997	33,191	-866	-0.5%	44,142	1,330
2002	31,736	-1,455	-0.9%	43,785	1,380
2007	31,169	-567	-0.4%	43,666	1,401
2012	31,989	820	0.5%	43,257	1,352

Sources: U.S. Department of Commerce, Bureau of the Census, 1959 Census of Agriculture, South Dakota, Volume 1, Table 1; U.S. Department of Agriculture, National Agricultural Statistics Service, 1997 and 2012 Census of Agriculture, South Dakota, Volume 1, Table 1.

Table 2. Number of farms and annual percent change by South Dakota region, 1935-2012

South Dakota Region	Thousands of Farms						
	1935	1950	1964	1978	1992	2002	2012
Western	15.2	9.2	6.7	5.9	6.2	5.8	6.0
Central	25.6	19.3	13.9	11.2	10.0	9.0	8.8
Eastern	42.5	38.0	29.1	21.7	17.9	16.9	17.2
State	83.3	66.5	49.7	38.8	34.1	31.7	32.0
	Average Annual Percent Change During Period						
	1935-1950	1950-1964	1964-1978	1978-1992	1992-2002	2002-2012	1935-2012
Western	-3.4%	-2.3%	-0.9%	0.3%	-0.5%	0.3%	-1.4%
Central	-1.9%	-2.4%	-1.6%	-0.8%	-1.0%	-0.3%	-1.6%
Eastern	-0.7%	-1.9%	-2.1%	-1.4%	-0.6%	0.2%	-1.3%
State	-1.5%	-2.1%	-1.8%	-0.9%	-0.7%	0.1%	-1.4%

Sources: Compiled from county data in U.S. Department of Commerce, Bureau of Census, in Volume 1, Table 1 of the 1992, 1978, 1969, 1959, and 1950 Census of Agriculture, South Dakota, Volume 1, Table 1 and in U.S. Department of Agriculture, National Agricultural Statistics Service, 2012 and 2002 Census of Agriculture, South Dakota, Volume 1, Table 1.

Farm size trends

Average farm size in South Dakota increased from 445 acres in 1935 to 1,352 acres in 2012 (Table 1). Farm size also increased in each region over the same period. Figure 2 shows that average farm size in counties in the eastern, central, and western regions of the state ranged from 353 to 1,027 acres, from 1,000 to 3,797 acres, and from 509 to 3,629 acres, respectively, in 2012.

The distribution of farm size (in acres) has also changed over time (Table 3). From 1982 to 2012, the number of very small farms (180 acres or less) increased, the number of small to medium farms (180 to 1,999 acres) decreased, and the number of large and very large farms and ranches (2,000 acres or more) increased. The proportion of very small farms increased from 24.9% to 39.7% of all farms, while that of large and very large farms increased from 12.0% to 17.7% of all farms, and the share of medium-sized farms (180 to 1,999 acres) decreased from 63.1% to 42.6% from 1982 to 2012.

Table 3. South Dakota farm size distribution, 1982-2012

Farm Size (Acres)	1982		1992		2002		2012	
	No.	%	No.	%	No.	%	No.	%
1-49	4,024	10.8	4,126	12.1	4,326	13.6	6,276	19.6
50-179	5,248	14.1	4,977	14.6	5,755	18.1	6,419	20.1
180-499	9,505	25.6	7,286	21.4	6,091	19.2	5,353	16.7
500-999	8,206	22.1	6,917	20.3	5,353	16.9	4,229	13.2
1000-1999	5,723	15.4	5,584	16.4	4,758	15.0	4,075	12.7
2000-4999	3,193	8.6	3,744	11.0	3,634	11.5	3,667	11.5
5000 and Above	1,249	3.4	1,423	4.2	1,819	5.7	1,970	6.2
Total	37,148	100.0	34,057	100.0	31,736	100.0	31,989	100.0
Average Farm Size	1,179		1,316		1,380		1,352	

Sources: U.S. Department of Commerce, Bureau of Census, 1982 Census of Agriculture, South Dakota, Volume 1, Table 4 and 1992, Table 8; U.S. Department of Agriculture, National Agricultural Statistics Service, 2012 and 2002 Census of Agriculture, South Dakota Volume 1, Table 9.

Explanation of farm numbers and size

The long-term decrease in farm numbers can be explained by a multitude of reasons, including but not limited to technological changes in agriculture, social and economic conditions in the farm sector relative to those in other sectors of the economy, availability of off-farm employment, growth of urban areas, changes in consumer preferences, and elements of farm and social policies, such as those related to conservation programs and health insurance.

A prolonged period of prosperity in crop farming over the last decade generally led to improved economic conditions in the farm sector, and played a part in sustaining the number of farms. The increase in the number of very small farms and very large farms also contributed to the overall increase in farm numbers in South Dakota.

Retiring farm operators and off-farm employment opportunities partially explain the increase in the number of small farms in South Dakota. In 2012, 14.5% of farms were classified as retirement farms, 31.0% were small family farms with off-farm occupations, 28.4% were small family farms with farming as the primary occupation, 15.6% were mid-size family farms, 7.1% were large scale family farms, and 3.4% were non-family farms (Table 4).

Small family farms accounted for 36.6% of all land in farms in 2012 (Table 4). Within this group of farms, retirement farms, off-farm occupation farm households, and low and moderate-sale small farms owned 4.6%, 8.1%, and 23.9%, respectively, of the total amount of farmland in South Dakota. The largest portion of agricultural land (30.0%) was held by mid-size family farms, while large and very large family farms owned 28.0%, and non-family farms owned 5.4% of agricultural land. Overall, 94.6% of all agricultural land in South Dakota was held by family farms.

Large-scale family farms had the largest portion (48.2%) of total farm sales in 2012 (Table 4). Mid-sized family farms, small family farms, and non-family farms accounted for 26.3%, 14.7%, and 10.7%, respectively, of total farms sales. In total, family farms in South Dakota accounted for 89.3% of total farms sales in 2012.

Retirement farms and farms with off-farm employment are generally relatively small farms and do not derive large amounts of income from farming. Because retiring farm operators may retain partial ownership of their land and livestock, their operations remain classified as farms. Also, as off-farm employment opportunities increase, farm operators are likely to rely less on farming as a primary income source. The growth in the number of very small farms (less than 180 acres) is partially explained by these retirement farms and farms that rely heavily on off-farm income. Very small farms generally also have product mixes that are less labor intensive than large-scale farms.

For small family farms the contribution of off-farm income almost equals farm income. Therefore, small family farms that rely on off-farm income are particularly subject to changes in the non-farm economy (Hoppe, MacDonald, and Korb, 2010). The growth in the number of small family farms with off-farm employment shows that there have been increasing opportunities in South Dakota for farm operators and their spouses to gain off-farm employment.

Table 4. South Dakota farms by typology and gross cash farm income (GCFI), 2012

Type of Farm*	Average Size (Acres)	Farms %	Land in Farms %	Total Farm Sales %	Average per Farm Sales (\$)
Small Family Farms					
Retirement	426	14.5	4.6	1.5	33,917
Off-Farm Occupation	352	31.0	8.1	3.1	32,461
Low Sales, Less Than \$150,000	763	17.4	9.8	2.6	49,281
Moderate Sales, \$150,000 to \$349,999	1,732	11.0	14.1	7.5	223,988
Mid-Size Family Farms					
\$350,000 to \$999,999	2,597	15.6	30.0	26.3	550,185
Large-Scale Family Farms					
Large, \$1,000,000 to \$4,999,999	4,704	6.6	23.0	36.0	1,775,447
Very Large, \$5,000,000 Plus	14,215	0.5	5.0	12.2	8,341,746
Non-Family Farms	2,155	3.4	5.4	10.7	1,041,801

Source: United States Department of Agriculture, National Agricultural Statistics Service, 2012 Census of Agriculture, Typology, Table 42.

Note: *Sales include market value of agricultural products sold and government payments.

III. LAND CHARACTERISTICS

A significant portion of the total land in South Dakota is used for agricultural production. Because land also comprises a major proportion of the total asset value in the farm sector, understanding the characteristics of this large resource is fundamental. The uses of agricultural land have changed over time in South Dakota, and land use trends are connected to other developments in agriculture. Land tenure and ownership are key components of farm organization and resource management, and are connected to changing demographics in the farm sector.

Shifts in agricultural land use

The total amount of agricultural land has decreased only slightly over the last 30 years in South Dakota. Between 1982 and 2012, the total amount of agricultural land decreased by 554,000 acres or 1.3% (Table 5). Land use has shifted over time as a result of commodity price changes, agricultural policy changes and other trends in agriculture. Over the same period,

permanent pasture and rangeland decreased by 3.6%, cropland increased by 1.6%, woodland decreased by 3.9%, and other acres – consisting of farmsteads, roads and ponds – decreased by 0.2%.

Pasture and rangeland at 52.1% and cropland at 44.3% were the two major uses of total agricultural land in South Dakota in 2012. Between 2002 and 2012, the amount of cropland decreased by 1.171 million acres, the majority of which constituted a drop in cropland used for grazing and in summer fallow. In addition, droughts in 2002 and 2012 affected the amount of cropland acres harvested, as reflected in the reported increase in the amount of idled or failed cropland in 2002. Overall, harvested cropland increased from 14.43 million acres in 1982 to 16.40 million acres in 2012 (Table 5).

Acres in permanent pasture and rangeland decreased by 3.6% from 1982 to 2012, even with an increase of 519,000 acres (2.4%) between 2002 and 2012. Much of this decrease was due to a drop in fallow ground and cropland used for grazing between 1982 and 2012. Cropland used for grazing decreased rapidly from 2002 to 2012, while fallow cropland decreased most rapidly over the 1992-2002 period.

Table 5. Shifts in agricultural land use, South Dakota

	Thousands of Acres				% Change 1982 to 2012
	1982	1992	2002	2012	
Permanent Pasture and Rangeland	23,393	23,947	22,026	22,545	-3.6
Cropland	18,839	19,583	20,318	19,147	1.6
Cropland Harvested	14,433	13,624	13,492	16,392	13.6
Cropland Used for Grazing	2,309	2,485	2,352	519	-77.5
Idle or Failed Cropland*	620	2,110	4,015	1,968	217.5
Summer Fallow	1,476	1,363	459	268	-81.8
Woodland	307	255	236	294	-3.9
Other (Farmsteads, Ponds)	1,273	1,044	1,205	1,270	-0.2
Total	43,811	44,828	43,785	43,257	-1.3

Sources: U.S. Department of Commerce, Bureau of Census, 1982 Census of Agriculture, Volume 1, Table 1 and 1992, Table 7; U.S. Department of Agriculture, National Agricultural Statistics Service, 2002 and 2012 Census of Agriculture, Volume 1, Table 8.

Note: *Idle or failed cropland applies to all years. For 1982 and 1992, cover crops are included in this category.

Land tenure

Land tenure is an important component of agricultural structure because it is concerned with the extent of ownership and control of the farmland resource. Land comprises a major portion of the total value of physical assets in South Dakota's farm sector. At the farm level, land tenure influences the control and organization of resources, farm business decisions, degrees of risk assumed by the owner, ease of entry into farming, and the transfer of farmland from one generation to the next. Farm operator control is a key issue in land tenure, whether through leasing or ownership of land.

The U.S. Census of Agriculture classifies land tenure into three main categories:

- Full owners operate only land that they own. They may also lease land to other farmers;
- Part owners operate land that they own and also lease additional land from others. Some part owners may also lease land to other farmers; and
- Tenants operate only land they lease from others.

Trends in land tenure and current land tenure situations by operator age and sales class in South Dakota are shown in Tables 6 and 7.

Tenure of farms and land in farms

Major changes in farm tenure occurred from 1992 to 2002 (Table 6). During that time, the number of fully-owned farms increased from 40.1% to 50.1% of all farms, part-owned farms decreased from 45.0% to 40.3%, and tenant-operated farms decreased from 14.8% to 9.7%.

Tenure of farmland operated varied between 1974 and 2012. Overall, fully-owned land in farms increased from 24.4% to 27.7% from 1974 to 2012 (Table 6). Partly-owned land in farms decreased rapidly from 65.6% to 58.4% over the same period, but then remained steady until the recent increase from 60% to 65.5% from 2002 to 2012. Land tenancy decreased from 10.1% to 6.8% between 1974 and 2012.

Changes in farm structure, operator age, and commodity prices explain the changes in tenure of both farms and land operated in South Dakota. Years of high crop prices and expansion in the farm sector are correlated with increases in land operated by part-owners. Growth in farms and average sized farms are often seen with a growth in land leasing. "In many cases, the most efficient method of expanding commercial farm operations is to rent rather than

purchase additional farmland. Leasing often conserves expanding farmer’s working capital by reducing financial outlays to acquire farmland. Part ownership also permits these farmers to obtain the advantages of farmland ownership and the advantages of farmland leasing. In an economic environment of farm expansion, part ownership is an important capital management strategy to increase current returns and to reduce business risk” (Janssen, pp. 476, 1993).

Table 6. Agricultural land tenure trends in South Dakota, 1974-2012

Tenure class	Percent of Farms				
	1974	1982	1992	2002	2012
Full Owner	40.4	39.9	40.1	50.1	51.3
Part Owner	44.8	44.1	45.0	40.3	40.0
Tenants	14.8	16.0	14.8	9.7	8.7
Total	100.0	100.0	100.0	100.0	100.0
Number of Farms Reporting	42,825	37,148	34,057	31,736	31,989
	Percent of Land in Farms				
	1974	1982	1992	2002	2012
Full Owner	24.4	32.7	29.2	32.2	27.7
Part Owner	65.6	58.4	60.8	60.0	65.5
Tenants	10.1	8.9	10.0	7.8	6.8
Total	100.0	100.0	100.0	100.0	100.0

Sources: U.S. Department of Commerce, Bureau of the Census, 1974 Census of Agriculture, South Dakota, Volume 1, Table 3, 1982, Table 5, and 1992, Table 16; U.S. Department of Agriculture, National Agricultural Statistics Service, 2002 Census of Agriculture, South Dakota, Volume 1, Table 61 and 2012, Table 70.

Demographically, increasing farm operator age partly explains the tenure of farms in South Dakota. Older operators, those 60 or older, made up the largest proportion (48.9%) of fully-owned farms in South Dakota in 2012 (Table 7). Partly-owned and tenant farms were dominated by the middle age class of operators, those 35 to 59 years old, and accounted for 56.5% of partly owned farms and 49.5% of tenant farms. Young farm operators, those less than 35 years old, made up a small proportion of fully-owned and partly-owned farms, but accounted for 27.9% of tenant farms in the same year.

Dominant land ownership trends are revealed when comparing tenure to farm sales class. Fully-owned farms are predominantly small farms with farm sales less than \$100,000 in 2012 (Table 7). Large and very large farms are primarily partially-owned, especially in sales classes

above \$500,000. Tenant farms are mostly small farms, with a proportion of mid-size to large-size farms classified as tenant farms. Tenure by sales class shows the overwhelming trend in South Dakota that large farms rent a portion of the land they operate, while fully-owned farms are predominantly small farms that may lease a portion of the land they own.

Table 7. Farm tenancy by operator age and farm sales class in South Dakota, 2012

	Percent of Farms by Tenure Class			
	Full Owner	Part Owner	Tenant	All Farms
Age of Operator				
Less Than 35	6.0	8.8	27.9	9.0
35-59	45.1	56.5	49.5	50.0
60 and Older	48.9	34.7	22.7	40.9
Total	100.0	100.0	100.0	100.0
Average Age	58.7	54.3	47.1	55.9
Farm Sales Class				
Less Than \$10,000	50.3	6.3	19.1	30.0
\$10,000 to \$99,999	32.9	20.4	38.8	28.4
\$100,000 to \$249,999	8.1	21.1	18.8	14.2
\$250,000 to \$499,999	3.9	21.8	12.1	11.8
\$500,000 to \$999,999	2.4	16.2	6.2	8.2
\$1,000,000 or More	2.4	14.2	5.0	7.4
Total	100.0	100.0	100.0	100.0
Number of Farms	16,413	12,802	2,774	31,989

Source: U.S. Department of Agriculture, National Agricultural Statistics Service, 2012 Census of Agriculture, South Dakota, Volume 1, Table 70.

IV. FARM HOUSEHOLD AND OPERATOR DEMOGRAPHICS

Many farm households in the U.S. and South Dakota derive a portion of their income from nonfarm (off-farm) sources. Since 1964, the majority of net income earned by farm households in the U.S. originated from off-farm sources. As a result, economic decisions are formed around the allocation of managerial time, on and off the farm. The relationship between off-farm work and farm performance has important implications for the farm sector as a whole (Fernandez-Cornejo, et al., 2007).

Farm household characteristics are also an important part of the farm sector in South Dakota. Until recently, information on multiple operators per farm was not readily available, but the 2012 Census of Agriculture released information on the number of operators per farm, allowing for a description of the current characteristics of farm households in South Dakota.

Trends in number of farm operators and age of operators

The number of principal farm operators has declined over time. The age distribution of farm operators in South Dakota has also changed from 1974 to 2012 (Table 8). Generally, young operators, those less than 35 years old, remained a small percentage of total operators in South Dakota. The number of middle-age to older operators, those 35 years or older, have remained steady or increased during certain periods.

From 1974 to 1982, the number of young operators increased in South Dakota, while the number of older operators decreased, marking a structural shift in the state (Table 8). However, between 1982 and 2012 the number of young operators (less than 35 years of age) decreased from 22.3% to 9.0% of all principal operators. From 1982 to 2012, the number of middle-age operators, aged 35 to 64, increased from 63.6% to 64.3% of all principal operators. The number of older farm operators, those 65 years or older, increased from 14.1% in 1982, to 26.7% in 2012. This marks a significant upward trend in age of primary farm operators in South Dakota.

Table 9 shows the proportion of farm sales by operator age and sales class in 2012. Young operators (younger than 35) made up a small percentage of all farm sales, middle-age operators (35-64) comprised the largest proportion of farm operators by age category (64.2%) and accounted for the largest proportion of large-size farms, and older operators (65 years and over) are generally operators of low sales class farms but still account for a moderate number of mid-size to large-size farms. This is evidence for the proposition that older operators retain partial ownership, or maintain small retirement farm operations, while middle-aged farmers run the large-scale operations in the state. The largest proportion of operators are grouped in the lower sales classes, which is not surprising because of the relatively large proportion of small to large-size farms in South Dakota.

Table 8. Summary by age of principal operator in South Dakota, 1974-2012

Age In Years	Number of Operators / (Percent of Operators)				
	1974	1982	1992	2002	2012
Less than 25	1,642 (3.9%)	1,812 (4.9%)	765 (2.2%)	414 (1.3%)	258 (0.8%)
25-34	4,879 (11.6%)	6,454 (17.4%)	4,481 (13.2%)	2,249 (7.1%)	2,631 (8.2%)
35-44	7,416 (17.6%)	6,207 (16.7%)	7,696 (22.6%)	6,307 (19.9%)	3,922 (12.3%)
45-54	11,556 (27.4%)	8,057 (21.7%)	6,406 (18.8%)	9,097 (28.7%)	7,445 (23.3%)
55-64	10,551 (25.0%)	9,362 (25.2%)	7,221 (21.2%)	6,317 (19.9%)	9,182 (28.7%)
65 and Over	6,180 (14.6%)	5,256 (14.1%)	7,488 (22.0%)	7,352 (23.2%)	8,551 (26.7%)
Total	42,224	37,148	34,057	31,736	31,989
Average Age	50.1	48.6	51.1	53.3	55.9

Sources: U.S. Department of Commerce, Bureau of Census, 1974 Census of Agriculture, South Dakota, Volume 1, Table 9, 1982, Table 5, 1992, Table 16; U.S. Department of Agriculture, National Agricultural Statistics Service, 2002 Census of Agriculture, South Dakota, Volume 1, Table 60 and 2012, Table 69.

Table 9. Distribution by sales class and age of principal operator in South Dakota, 2012

Sales Class	Percent of Sales Class by Age Category		
	Less Than 35 Years	35 to 64 Years	65 Years and Over
Under \$10,000	26.4	28.6	34.5
\$10,000 to \$99,999	32.5	26.5	31.6
\$100,000 to \$249,999	20.0	13.8	13.4
\$250,000 to \$499,999	11.9	12.7	9.5
\$500,000 to \$999,999	5.4	9.6	6.0
\$1,000,000 or More	3.8	8.8	5.1
All Operators by Age Category	9.0	64.2	26.7

Source: U.S. Department of Agriculture, National Agricultural Statistics Service, 2012 Census of Agriculture, South Dakota, Volume 1, Table 69.

Farm operators by principal occupation

As the number of operators declined in South Dakota, the primary occupation of farm operators also changed. In 1982, 81.5% of principal operators listed their primary occupation as farming (Table 10). Since that time the number of principal operators listing their primary occupation as farming decreased, and the number of operators working off-farm increased. The largest shift occurred from 2002 to 2012, when the number of operators with farming as their principal occupation decreased from 72.6% to 58.9% of all farm operators.

The large increase in farmers listing their primary occupation as “other” occurred for multiple reasons. Technology change is a significant driver in the ability to work off-farm. Technology adoption on farms often increases managerial time, while it also allows farmers to work off-farm to supplement their farm income. Also, farm specialization paired with increased technology may allow farm operators the opportunity to seek off-farm employment. Small farms and those farms with low sales have benefited from new technology and are some of the largest drivers in off-farm employment. These farm operators may also seek off-farm employment to supplement farm income and obtain fringe benefits from employers, such as pensions and health insurance (Fernandez-Cornejo, et al., 2007).

The number of farm operators by occupation (farm versus non-farm) for the years 2002 and 2012 is shown in Table 11. Grouping farm operators by sales class shows that small farms with sales under \$250,000 underwent a shift in the principal operators’ occupations between 2002 and 2012. For example, 9,438 principal farm operators of farms with sales from \$10,000 to \$99,999 reported farming as their main occupation, and 2,494 listed their occupation as “other” in 2002, whereas in 2012 only 4,264 listed their primary occupation as farming and 3,490 farm operators listed their occupation as “other”. Large farms with sales over \$250,000 experienced an increase in farm operators who primarily work on farm between 2002 and 2012, as well as increases in operators working off-farm. This depicts a trend toward larger farms, as well as the ability of large farms to capture the benefits of economies of size at the farm level. Overall, an increasing numbers of farm operators primarily work off-farm in South Dakota, with large increases observed in the last 10 to 15 years. It is important to note that operators of small farms may have a primary occupation other than farming and farm as a hobby, rather than seek off-farm employment to substitute for farm income.

Farm specialization and diversity also plays a role in off-farm employment. Table 12 depicts the trends across enterprises in South Dakota in both on-farm and off-farm occupations. Labor intensive enterprises have more operators who list farming as their primary occupation than those considered less labor intensive.

The following are the enterprises with the highest proportion of farm operators listing farming as their primary occupation in South Dakota in 2012 (Table 12):

- Dairy farms, 87.0%,
- Cattle feedlots, 82.0%,
- Oilseed and grain farms, 79.5%,
- Hog farms, 76.2%, and
- Cattle and beef farms, 65.0%.

The remaining enterprises reported fewer than 50% of operators with farming as their primary occupation. Farm size and specialization go hand in hand. Grain farms and the main animal enterprises are generally larger in size, and demand more managerial time of the operator than other farms. Large farms may also derive enough income from farming to reduce the opportunity cost of off-farm labor, making off-farm labor less attractive. It is important to note that these statistics are for primary farm operators, and do not include spouses or other farm operators.

Table 10. Farm operators by principal occupation in South Dakota, 1982-2012

Principal Occupation	1982		1992		2002		2012	
	No.	%	No.	%	No.	%	No.	%
Farming	30,267	81.5	26,141	76.8	23,049	72.6	18,844	58.9
Other	6,881	18.5	7,916	23.2	8,687	27.4	13,145	41.1
Total	37,148	100.0	34,057	100.0	31,736	100.0	31,989	100.0

Source: U.S. Department of Agriculture, National Agricultural Statistics Service, 2012 Census of Agriculture, South Dakota, Volume 1, Table 1.

Table 11. Occupation of farm operator by farm sales in South Dakota, 2002 and 2012

Sales Class*	Number of Operators			
	2002		2012	
	Farming	Other	Farming	Other
Less than \$10,000	4,374	5,764	2,974	8,233
\$10,000 to \$99,999	9,438	2,494	4,264	3,490
\$100,000 to \$249,999	5,821	296	3,635	875
\$250,000 to \$499,999	2,249	75	3,358	350
\$500,000 to \$999,999	785	27	2,436	117
\$1,000,000 or More	382	31	2,177	80
Total	23,049	8,687	18,844	13,145

Sales Class*	Percent of Operators			
	2002		2012	
	Farming	Other	Farming	Other
Less than \$10,000	43.1	56.9	26.5	73.5
\$10,000 to \$99,999	79.1	20.9	55.0	45.0
\$100,000 to \$249,999	95.2	4.8	80.6	19.4
\$250,000 to \$499,999	96.8	3.2	90.6	9.4
\$500,000 to \$999,999	96.7	3.3	95.4	4.6
\$1,000,000 or More	92.5	7.5	96.5	3.5
Total	72.6	27.4	58.9	41.1

Sources: U.S. Department of Agriculture, National Agricultural Statistics Service, 2002 Census of Agriculture, South Dakota, Volume 1, Table 56 and 2012, Table 65.

Note: *Sales class includes value of agricultural products sold and government payments.

Farm households and multiple operators

The vast majority (96.6%) of all farms in South Dakota were classified as family farms in 2012. Family farms also constitute a large portion of the medium to large-size farms in South Dakota, and account for the bulk of farms sales in the state. Therefore, the family farm structure plays a large role in how farms operate in the state and how farm households make economic decisions. Some of the farms are operated on a part-time basis, while others are full-time operations. Some farms have multiple operators working off-farm, and other farms may have spouses who work off-farm while the primary operator manages the farm. The 2012 Census of Agriculture released new statistics for multiple operators on a farm, which allows a depiction of the farm household in South Dakota.

Table 12. Principal operator occupation by NAICS farm enterprise in South Dakota, 2012

North American Industry Classification System ¹	Primary Occupation					
	Number of Operators			Percent of Operators		
	Farming	Other	Total	Farming	Other	Total
Grain Farming	8,475	2,186	10,661	79.5	20.5	100.0
Hay Farming	2,538	5,458	7,996	31.7	68.3	100.0
Other Crop Farming ²	94	120	214	43.9	56.1	100.0
Beef Farming	5,387	2,901	8,288	65.0	35.0	100.0
Cattle Feedlots	530	116	646	82.0	18.0	100.0
Dairy Farming	240	36	276	87.0	13.0	100.0
Hog Farming	170	53	223	76.2	23.8	100.0
Poultry and Egg Production	81	105	186	43.5	56.5	100.0
Sheep/Goat Farming	256	434	690	37.1	62.9	100.0
Other Animal Production ³	1,073	1,736	2,809	38.2	61.8	100.0

Source: U.S. Department of Agriculture, National Agricultural Statistics Service, 2012 Census of Agriculture, South Dakota, Volume 1, Table 68.

Notes: ¹The NAICS classifies farms that are primarily engaged in the specified activity. From Appendix B-8, 2012 Census of Agriculture. ²Other crop farming is an aggregate of vegetable and melon farming, fruit and tree nut farming, and greenhouse nursery, and floriculture farming. ³Other animal production is an aggregate of animal aquaculture, and other animal production. Other animal production may include: bee farming, horses, equine, rabbits and other fur-bearing animals, or other establishments engaged in raising a combination of animals none, of which account for one-half of the establishment's agricultural production. Also farms with only 100 acres or more of pastureland were classified as "All other animal production" (Appendix B-9, 2012 Census of Agriculture).

As previously mentioned, there were 31,989 principal operators in South Dakota in 2012. In addition, there were 13,449 second operators, and 2,432 third operators on farms for a total of 47,870 farm operators (Table 13).³ In total, 42% of all farms reported a second farm operator, and 7.6% of farms reported a third operator in 2012. There are large differences in the gender balance among principal, and second and third operators in South Dakota. While 92.7% of primary operators were male, 66.6% of second operators were female.

The statistics allow for identifying how many spouses are also farm operators. There were 8,285 female second operators on farms who were the spouse of the principal operator in 2012. Therefore, 92.5% of female secondary farm operators were the spouse of the principal

³Demographic and other information was collected for up to three operators per farm – the principal operator plus up to two additional operators. This may be fewer than the total operators on some farms (Appendix B-16, 2012 Census of Agriculture). In 2012, there were a total of 48,987 farm operators in South Dakota (2012 Census of Agriculture, South Dakota, Volume 1, Table 60).

farm operators, or 61.6% of all secondary farm operators were female spouses of the principal farm operators. Only a small percentage of male operators are spouses of the principal operators, and a small percentage of third operators were spouses of the principal operator.

Table 13. Gender of operators in South Dakota, 2012

Gender	Number of Operators			
	Principal	Second	Third	All
Male	29,656	4,494	1,588	35,738
Spouse of Principal Operator	-	564	20	584
Female	2,333	8,955	844	12,132
Spouse of Principal Operator	-	8,285	326	8,611
Number of Operators	31,989	13,449	2,432	47,870
	Percent of Operators			
Male	92.7	33.4	65.3	74.7
Spouse of Principal Operator	-	4.2	0.8	1.2
Female	7.3	66.6	34.7	25.3
Spouse of Principal Operator	-	61.6	13.4	18.0
Total	100.0	100.0	100.0	100.0

Source: U.S. Department of Agriculture, National Agricultural Statistics Service, 2012 Census of Agriculture, South Dakota, Volume 1, Table 55.

Although these statistics do not provide a complete representation of farm households in South Dakota, they do characterize a large portion of the farms. Nearly one-half of farm operations reported having a secondary operator on the farm, of whom 61.6% were the female spouse of the male operator. The other portion of secondary operators may be the son or daughter of the principal operator, or a sibling operator pair.

The third operators are not as easy to distinguish, mainly because of the lack of reported third operators, who only comprise 5.0% of all operators. Table 14 shows that third operators work less off-farm than first or second operators do, and on average have spent fewer years on their present farm than have first or second operators. This suggests third operators may be children of the principal operator, siblings of the principal operator, or other relatives.

Table 14 suggests that husband-wife combinations represent many farm families. In 2012, 58.9% of principal operators had farming as their main occupation, while 45.4% of

secondary farm operators reported farming as their main occupation. Residence is also a main component, with 76.1% of principal operators living on a farm, and 76.5% of secondary operators living on a farm, which supports the presence of husband and wife combinations.

Principal operators conducted less off-farm labor (43.9% reported not working off their farm), while among second operators only 36.7% did not work off-farm. Note that the majority of all operator categories reported working off their farm for at least 200 days, suggesting that those individuals are more likely to do so on a full-time rather than part-time basis.

Table 14. Demographics of operators in South Dakota, 2012

Demographic	Percent of Operators			
	Principal	Second	Third	All
Primary Occupation				
Farming	58.9	45.4	57.7	55.0
Other	41.1	54.6	42.3	45.0
Residence				
On Farm Operated	76.1	76.5	57.5	75.2
Off Farm Operated	23.9	23.5	42.5	24.8
Years on Present Farm				
Less than 5	6.4	9.4	17.1	7.8
5-9	11.2	16.2	19.1	13.0
10 or More	82.4	74.4	63.8	79.2
Off-farm labor				
None	43.9	36.7	47.4	42.1
Any	56.1	63.3	52.6	57.9
100 or Less Days Worked Off Farm	13.1	14.1	16.0	13.5
100-199 Days Worked Off Farm	6.9	9.4	7.1	7.6
200 or More Days Worked Off Farm	36.1	39.8	29.4	36.8

Source: U.S. Department of Agriculture, National Agricultural Statistics Service, 2012 Census of Agriculture, South Dakota, Volume 1, Table 55.

Overall, off-farm labor is increasing among South Dakota farm households, especially among those who have benefited from cost-saving and time-saving technologies. The increase in the off-farm labor trend over the past 10 to 15 years was accompanied by improvements in farm technology. This enabled some farms to specialize, which allowed operators additional opportunities to engage in off-farm labor. In addition, farm profitability and costs may be

pushing more farm operators to seek off-farm income, which may force operators of small farm to supplement their farm income with off-farm labor.

Multiple-family farms

Small-size and mid-size family farms dominate the farm landscape of South Dakota, as indicated by the number of family farms in Table 4. However, large-scale farms – the majority of which are family-held – have the largest proportion of farm sales and expenses on farms. The number of farm households sharing in the net income of a farm operation is reported. This allows for insights into the operations in South Dakota that are multiple family operations.

While the majority of farms in South Dakota are run by a single family (Table 15), some farms derive income for multiple households from the single farm operation. This suggests various scenarios, such as one operator who may run the farm and share its profits with family members not involved in farming. Another scenario is of multiple family members jointly running the farm operation, perhaps as a result of farm size increases over time.

Table 15. Farms by number of households sharing net income in South Dakota, 2012

Sales class	Number of Farms / Percent of Farms					
	1 Household		2 Households		3 to 5 Households	
Under \$10,000	7,978	83%	1,152	12%	464	5%
\$10,000 to \$99,999	7,231	80%	1,402	15%	459	5%
\$100,000 to \$249,999	3,580	79%	740	16%	231	5%
\$250,000 to \$499,999	2,795	74%	703	19%	261	7%
\$500,000 to \$999,999	1,792	68%	652	25%	191	7%
\$1,000,000 or More	1,361	58%	596	25%	401	17%
All Farms	24,737		5,245		2,007	

Source: U.S. Department of Agriculture, National Agricultural Statistics Service, 2012 Census of Agriculture, South Dakota, Volume 1, Table 66.

Note: “Data were reported by the principal operator only. Households that received funds because they were only landlords, custom equipment operators, or provided other production services were not included. Published data can exceed the number of operators listed under Operators, all” (2012 Census of Agriculture, Appendix B-9).

Large and very-large farms in South Dakota often involve multiple families (Table 15). Farms with sales over \$1,000,000 have the largest share of multiple households who share in net farm income. For the largest sales class of farms, 58% of these farms are single household operations, and 42% have multiple households sharing in the income of the farm operation.

Farm incomes

The percentage of household income derived from farming aligns with the primary occupation of farm operators. The income data are based on self-reported statistics on the principal operator's percentage of total household income from the farm operation (2012 Census of Agriculture, Appendix B-16). Tables 16 and 17 show the percentages of household income derived from farming by sales and by North American Industry Classification System (NAICS), respectively.

In 2012, there were 14,268 principal farm operators (44.6% of all farms) in South Dakota who derived less than 25 percent of their household income from farming (Table 16). Of all farms, 9.8% of principal farm operators derived between 25% and 49% of their household income from farming, 14.7% of the operators derived between 50% and 74% of their income from farming, 17.5% of the operators obtained between 75% and 99% of their household income from farming, and the remaining 13.4% derived all (100%) their household income from farming. The main takeaway is that the majority of all South Dakota farms earned less than 50% of its household income from farming, while 30.9% earned at least 75% of its income from farming. These numbers and information from Table 11 suggest that farms deriving the majority of their income from farming are likely those farms in the sales classes above \$100,000.

When observing the percentage of income derived from farming by sales class it is clear that small farms – those with sales below \$100,000 – earn the majority of their income from off-farm sources. Most farms with sales over \$100,000 earn at least 75% of their household income from their farm operation. Not surprisingly, farms in each successively larger sales class earn more of their household income from farming. Farms with sales of at least \$1,000,000 earn the largest proportion of their income from farming among all sales groups.

The share of household income earned from farming is also reported by NAICS farm classification. Grain and oilseed farms, cattle feedlot farms, dairy farms, and to a less extent beef and hog farms earn the majority of their household income from their farm operations (Table 17). Farm enterprises earning small proportions of their household income from farming include: farms primarily engaged in hay production, other crop farms, poultry, sheep and goat, and other animal production farms. When cross-referenced with Table 12, it is clear that farm operations earning a major proportion of household income from farming also have principal operators who list their primary occupation as farming.

Table 16. Percent of operator's income earned from farming in South Dakota, 2012

Sales Class	Number of Farms				
	Less than 25 percent	25 to 49 percent	50 to 74 percent	75 to 99 percent	100 percent
Less than \$10,000	9,075	863	753	373	143
\$10,000 to \$99,999	3,646	1,324	1,368	889	527
\$100,000 to \$249,999	809	485	956	1,368	892
\$250,000 to \$499,999	344	232	767	1,332	1,033
\$500,000 to \$999,999	199	110	513	896	835
\$1,000,000 or More	195	126	340	742	854
All Farms	14,268	3,140	4,697	5,600	4,284
	Percent of Farms				
Less than \$10,000	81.0	7.7	6.7	3.3	1.3
\$10,000 to \$99,999	47.0	17.1	17.6	11.5	6.8
\$100,000 to \$249,999	17.9	10.8	21.2	30.3	19.8
\$250,000 to \$499,999	9.3	6.3	20.7	35.9	27.9
\$500,000 to \$999,999	7.8	4.3	20.1	35.1	32.7
\$1,000,000 or More	8.6	5.6	15.1	32.9	37.8
All Farms	44.6	9.8	14.7	17.5	13.4

Source: U.S. Department of Agriculture, National Agricultural Statistics Service, 2012 Census of Agriculture, South Dakota, Volume 1, Table 65.

Table 17. Percent of operator's household income, by farm enterprise in South Dakota, 2012

Farm Classification	Number of Farms					Total
	Less than	25 to 49	50 to 74	75 to 99	100	
	Percent	Percent	Percent	Percent	Percent	
Grain Farming	2,180	996	2,049	3,010	2,426	10,661
Hay Farming	5,551	835	815	524	271	7,996
Other Crop Farming	129	32	27	17	9	214
Beef Farming	3,253	936	1,394	1,618	1,087	8,288
Cattle Feedlots	123	82	93	176	172	646
Dairy Farming	61	35	37	58	85	276
Hog Farming	76	16	43	40	48	223
Poultry and Egg Prod.	147	5	14	10	10	186
Sheep/Goat Farming	505	57	71	28	29	690
Other Animal Production	2,243	146	154	119	147	2,809
All Farms	14,268	3,140	4,697	5,600	4,284	31,989

Farm Classification	Percent of Farms					Total
	Percent	Percent	Percent	Percent	Percent	
Grain Farming	20.4	9.3	19.2	28.2	22.8	100.0
Hay Farming	69.4	10.4	10.2	6.6	3.4	100.0
Other Crop Farming	60.3	15.0	12.6	7.9	4.2	100.0
Beef Farming	39.2	11.3	16.8	19.5	13.1	100.0
Cattle Feedlots	19.0	12.7	14.4	27.2	26.6	100.0
Dairy Farming	22.1	12.7	13.4	21.0	30.8	100.0
Hog Farming	34.1	7.2	19.3	17.9	21.5	100.0
Poultry and Egg Prod.	79.0	2.7	7.5	5.4	5.4	100.0
Sheep/Goat Farming	73.2	8.3	10.3	4.1	4.2	100.0
Other Animal Production	79.9	5.2	5.5	4.2	5.2	100.0
All Farms	44.6	9.8	14.7	17.5	13.4	100.0

Source: U.S. Department of Agriculture, National Agricultural Statistics Service, 2012 Census of Agriculture, South Dakota, Volume 1, Table 68.

Farm labor

The number of farm operators is often used as a measure of the number of farmers in South Dakota. However, many individuals work on farms either as hired farm labor, contracted labor, or hired farm managers. These individuals work directly on farms and earn a portion of their living from farming. This increases the number of people who are directly involved on farm operations in South Dakota.

The total number of farm operators increased from 48,810 to 48,987 between 2002 and 2012 (Table 18). These numbers include all operators on farms in South Dakota and are different from Table 13 which only includes up to three operators per farm. Farm operations also reported the number of hired workers on their farm, and whether the principal farm operator was a hired manager. The number of principal farm operators who are hired farm managers increased since 2002, but remained only a small portion of all principal farm operators in South Dakota. Hired farm managers may be the most common among very large farm operation, but because the proportion of such farms remains relatively small the number of hired farm managers is also limited.

Table 18. All farm operators and hired farm labor in South Dakota, 2002-2012

	2002	2007	2012
All Farm Operators	45,810	46,710	48,987
Operator Is a Hired Farm Manager	739	930	1,168
Hired Farm Workers	28,161	24,678	27,199
More than 150 Days Worked	7,932	8,206	10,162
Less than 150 Days Worked	20,229	16,472	17,037
Total Farm Operators and Employees	73,971	71,388	76,186

Sources: U.S. Department of Agriculture, National Agricultural Statistics Service, 2002 Census of Agriculture, South Dakota, Volume 1, Table 57, 2007, Table 60, and 2012, Table 66.

Farm operations also report the number of hired farm workers employed (Table 18). The data reflect total farm workers, including paid family members, but not contract laborers. The number of farm workers by number of days worked was divided into two categories: those working at least 150 days on the farm and those working less than 150 days on the farm. The number of hired farm workers decreased from 28,161 to 27,199 between 2002 and 2012. The number of workers working a majority of the year (more than 150 days) on the farm increased from 7,932 to 10,162 workers over the same time period. The total number of farm operators and farm workers has increased from 73,971 in 2002 to 76,186 individuals in 2012. While not all farm workers or operators were involved in farm operations on a full-time basis, the number of farm operators and farm employees increased during the 2002-2012 period. Also, the number of hired farm laborers reported does not document the extent of unpaid and family labor on farms

in South Dakota. Therefore, it is difficult to assess the amount of full-time labor as well as the amount of family labor involved on farms in the state.

The number of employees on farms depends on the labor-intensity of the farm operations (Table 68, 2012 Census of Agriculture). Major animal enterprises often require large amounts of labor. Among the various farm enterprises, dairy farms had the highest incidence of having hired farm labor. Of dairy farms, 51% reported having hired farm workers, nearly 41% had farm employees who worked more than 150 days on farm, and those with hired farm labor had an average of 10 workers per farm in 2012. Other major animal enterprises also had a high incidence of hired farm labor in 2012. Among cattle feedlots, hog operations, and beef cattle farms and ranches, 48%, 45%, and 32%, respectively, of the farms had hired farm labor. Oilseed and grain operations also had a high incidence of hired farm labor with nearly 43% of grain farms hiring farm labor. However, only 22% of grain farms had hired farm employees who worked more than 150 days on the farm, and grain farms with hired farm labor averaged 2.5 hired workers per farm.

Discussion

A key aspect of this section is the shift to off-farm occupations. Table 10 depicts the overall trend from 1982 through 2012. The largest shift occurred from 2002 to 2012, when operators reporting farming as their main occupation dropped from 72.6% to 58.9%, and operators reporting non-farm occupations rose from 27.4% to 41.1%. Additionally, the majority of the farmers reporting non-farm occupations occurred in low-sales and medium-sales class farms (those with sales below \$100,000). The number of farmers reporting off-farm work as their primary occupation in 2002 was 8,687, and farms under \$100,000 in sales accounted for 95.1% (8,258) of all operators who reported off-farm occupations. In 2012, 11,723 operators on farms with sales under \$100,000 reported having off-farm occupations, which was 89.2% of all 13,145 operators with off-farm occupations (Table 11). Therefore, there appears to be a dividing point in off-farm occupations in the amount of \$100,000 of agricultural sales. Among small farms, a large proportion of farmers work off-farm, while large and very-large farms predominately have operators who work on-farm.

Farm typology also appears to be correlated with the incidence of having off-farm occupations. In a preceding section of this research Table 4 presents South Dakota farms by

typology. When using \$100,000 in farm sales as the dividing point for off-farm occupation, family farms with low gross cash farm income are the major proportion of farms with primary operators having an off-farm occupation. In Table 4, small family farms with an off-farm occupation accounted for 31.0% of all farms. From Table 10, 41.1% of farms list primary operators with off-farm occupation, meaning the vast majority of farms with an off-farm occupation are small family farms, earning a small proportion of their income from farming.

Farm incomes are also directly tied to the type of farm enterprise in South Dakota. Farms that are labor-intensive, and demand more of the operator's time have a large proportion of operators working full-time on the farm. These include major animal enterprises and grain farms in South Dakota.

V. PRODUCTION COSTS

As farm size has increased, inputs required for many farm operations also increased. Recent years of high commodity prices contributed to increasing land values and input costs for farm operations. While farms may be able to cover their expenses during profitable years, suppressed commodity prices in the absence of reduced input costs may lead to financial difficulties among farm operations.

A more short-term analysis is applicable for production expenses observed on farms, as large increases in those expenses has occurred rather recently. Large increases in fertilizer, chemical, seed, feed, and land costs have been the significant changes to the farm production portfolios in South Dakota (Figure 3). Physical capital such as machinery on farms has also increased during recent years. Other important aspects to analyze include: capital-to-labor intensity trends, interest expenses on farms, and property taxes paid – for both land operated and land owned. Overall, increasing production expenses on farms has been observed in South Dakota, implying years of profitability on farm operations, and a growing agri-business sector in South Dakota.

Average farm production expenses

A useful analysis is to observe the average production expenses for farms in South Dakota. Further, analyzing production expenses by sales class and size of farms allows for a comparison of the expenses that small, medium and large farms incur. Overall production expenses in South Dakota rose from \$4.99 billion in 2007, to \$8.10 billion in 2012, a 62.4% increase (Table 19). Average per farm production expenses also increased from \$160,068 to \$253,353 from 2007 to 2012.

Average per farm production expenses increase with farm size, as measured by farm sales class. This closely fits the expected trend that costs increase as farm size increases. However, the main takeaway is that very-large farms, those with sales over \$1,000,000, account for the majority of production expenses in South Dakota (Table 20). Specifically, very-large farms had aggregate farm production expenditures of \$4.4 billion in 2012, 53.9% of the total \$8.1 billion in expenditures of all farms. The next largest proportion of expenditures is accounted for by farms with sales of \$500,000 to \$999,999, but those farms account for only 16.9% of all farm production expenditures.

Another important aspect of farm expenditures is revealed when observing expenditures by NAICS farm enterprise type. Oilseed and grain farms accounted for 53.3% of total farm expenditures in South Dakota during 2012 (Table 21). This is very close to the 53.9% of total expenditures by farms with sales over \$1,000,000 (Table 20). However, oilseed and grain farms are the largest classification of farms in South Dakota (10,661 farms). Although some of these farms have large sales a large proportion of those farms have lower sales. This is supported by the fact that average production expenditures of grain farms were \$405,334 in 2012 (Table 21). By enterprise, the most intensive production costs are incurred by animal enterprises in South Dakota. Specifically, hog farms had average production costs of \$1,504,158, dairy operations averaged \$1,278,432, and cattle feedlots averaged \$1,260,938. It is important to note that strong commodity grain prices starting in 2008 and the 2012 drought had effects on production expenses within the state, especially increasing the cost of feed for specific animal industries.

Table 19. Number of South Dakota farms by amount of production expenses, 2007 and 2012

Farm Production Expenses	Number of Farms	
	2007	2012
\$1 to \$24,999	13,339	11,911
\$25,000 to \$99,999	7,916	7,460
\$100,000 to \$249,999	5,314	5,204
\$250,000 to \$499,999	2,624	3,673
\$500,000 or more	1,976	3,741
Average per Farm Expenses (dollars)	160,068	253,353
Total Production Expenses (\$1,000)	4,989,172	8,104,502

Source: U.S. Department of Agriculture, National Agricultural Statistics Service, 2012 Census of Agriculture, South Dakota, Volume 1, Table 4.

Table 20. Production expenses by sales class in South Dakota, 2012

Sales Class*	Average per farm (\$)	Total Expenses (\$1,000)	Percent of Total
Under \$10,000	13,227	129,603	1.6
\$10,000 to \$99,999	48,532	431,794	5.3
\$100,000 to \$249,999	156,005	709,980	8.8
\$250,000 to \$499,999	292,287	1,098,706	13.6
\$500,000 to \$999,999	518,339	1,365,824	16.9
\$1,000,000 or More	1,852,670	4,368,596	53.9
All Farms	253,353	8,104,502	-

Source: U.S. Department of Agriculture, National Agricultural Statistics Service, 2012 Census of Agriculture, South Dakota, Volume 1, Table 66.

Note: *Sales class includes value of agricultural products sold and government payments.

Table 21. Farm production expenditures by NAICS farm enterprise in South Dakota, 2012

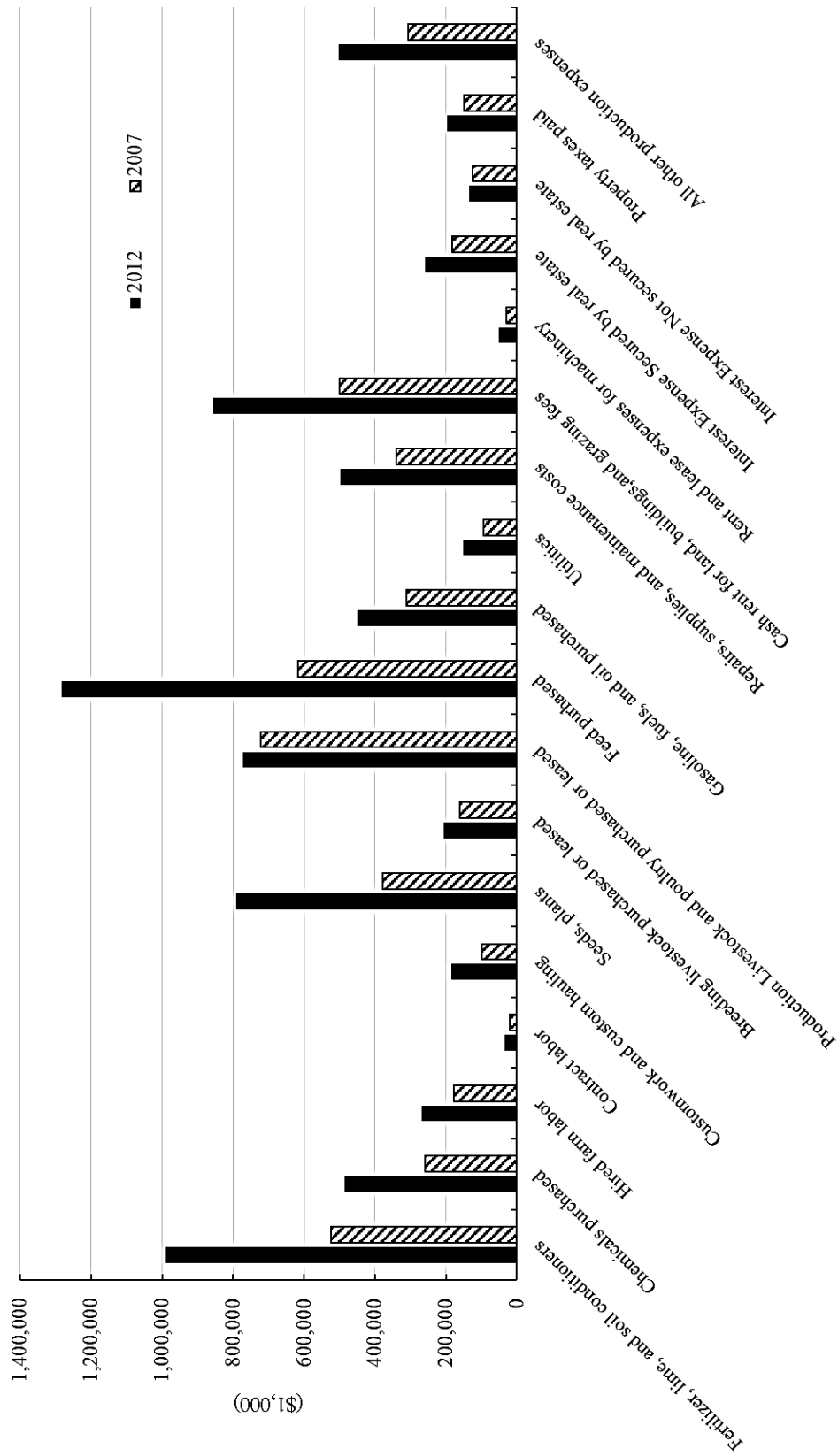
Farm Enterprise ¹	Average per Farm (\$)	Total per Category (\$1,000)	Percent of Total
Oilseed and Grain Farming	405,334	4,321,268	53.3
Hay Farming	31,949	255,461	3.2
Other Crop Farming ²	51,670	13,699	0.2
Beef Farming	188,439	1,561,782	19.3
Cattle Feedlots	1,260,938	814,566	10.1
Dairy Farming	1,278,432	352,847	4.4
Hog Farming	1,504,158	335,427	4.1
Poultry Production	664,105	123,524	1.5
Sheep/Goat Farming	38,969	26,889	0.3
Other Animal Production ³	106,457	299,038	3.7
All Farms	253,353	8,104,502	-

Source: U.S. Department of Agriculture, National Agricultural Statistics Service, 2012 Census of Agriculture, South Dakota, Volume 1, Table 68.

Notes: ¹Farm enterprise classified by North American Industry Classification System (NAICS). ²Other crop farming is an aggregate of vegetable and melon farming, fruit and tree nut farming, greenhouse nursery and floriculture farming. ³Other animal production is an aggregate of animal aquaculture, and other animal production.

Grain farms have the largest total farm production expenditures in South Dakota (Table 21). The inputs that contribute to grain farms large production expenditures include: cash rent for land, fertilizer and chemicals, and seed costs (Figure 3). Overall, farm production expenditures greatly increased from 2007 to 2012. Of the \$8.1 billion in overall expenditures in 2012, feed costs account for 15.8% of all expenditures, fertilizer 12.2%, cash rent for land, buildings and grazing fees 10.6%, seed costs 9.7%, and production livestock and poultry purchased or leased 9.5%. Figure 3 portrays precisely why the major animal industries and grain farming make up the largest proportions of production expenditures in the agriculture industry in South Dakota. Increases in production expenses from 2007 to 2012 were primarily driven by increases in chemical, fertilizer, feed, seed and land costs.

Figure 3. Farm expenditures by category, South Dakota, 2007 and 2012



Source: U.S. Department of Agriculture, National Agricultural Statistics Service, 2012 Census of Agriculture, South Dakota, Vol. 1, Table 4.

From 2007 to 2012 the net cash farm income of operations in South Dakota increased from \$2.22 billion to \$3.29 billion (Table 22). Average net cash farm income per farm also increased from \$109,965 to \$180,188. The proportion of farms with net gains slightly decreased from 2007 to 2012, with 65% of farms reporting gains in net cash farm incomes. The linkage between Figure 3 and Table 22 is that as production expenses increased substantially between 2007 and 2012, farm profitability also increased. From 2008 to 2012 the United States experienced a downturn in the overall economy. Table 22 shows that the farm industry in South Dakota did not experience the same downturn in overall economic performance.

Table 22. Net cash farm income of operations in South Dakota, 2007 and 2012

Farm Profitability	2007	2012
Net Cash Farm Income of Farm Operations (\$1,000)	2,217,996	3,289,165
Average per Farm	109,965	180,188
Farms With Net Gains	21,983	20,835
Farms With Net Losses	9,186	11,154

Source: U.S. Department of Agriculture, National Agricultural Statistics Service, 2012 Census of Agriculture, South Dakota, Volume 1, Table 5.

Farm expenses on physical capital

Over time the number of individuals directly involved in agriculture has decreased. A shift in landowners not involved in farming has occurred throughout the United States and South Dakota. This in turn has led to a shifting dynamic in farm operations land holdings. A shift towards cash rent has occurred as more landowners move away from the farm operations. Cash renting or cash leasing land allows the farm operator to incur the responsibilities of the farmland and make agronomic and economic decisions on their own behalf. The shift away from share leasing has occurred as the average age of landowners has increased over time. As landowners get older the amount of time they have to monitor land and share in the decision making process decreases. Financial decisions also play a role, as share leasing requires reporting income that can affect social security payments, taxes, etc.

The number of South Dakota farms that pay cash rent for land, buildings and grazing fees has increased since 1997. Since 1987, overall expenditures and percent of total farm production expenditures on cash rent have increased (Table 23). The increasing amount of farms paying

cash rent is a marker for the overall trend of a shift from share leasing to cash renting agricultural land. The overall increase in cash rent expenses has occurred recently, with the largest increases from 2007 to 2012. This is expected as the cost of agricultural land increased during that time period.

Table 23. Cash rent for land and buildings in South Dakota, 1987-2012

Cash Rent for Land, Buildings, and Grazing Fees	1987	1992	1997	2002	2007	2012
Farms	16,905	15,030	14,508	14,162	14,161	15,907
Percent of Farms	46.5	44.1	43.7	44.6	45.4	49.7
Total (\$1,000)	123,961	148,810	196,407	272,995	499,619	855,798
Percent of Total Farm Expenditures	5.8	5.8	7.0	8.2	10.0	10.6

Sources: U.S. Department of Commerce, Bureau of Census, 1992 Census of Agriculture, South Dakota, Volume 1, Table 3; U.S. Department of Agriculture, National Agricultural Statistics Service, 2002 Census of Agriculture, South Dakota, Volume 1, Table 4 and 2012, Table 5.

The value of a landlord's share of total sales is available and can be used as a measure of the amount of farms with share-rent. The value of agricultural sales received by the landlords may include sales other than of crops. However, it is a proxy statistic that gives a general idea for the amount of farms with crop share rent. Data for the landlord's share of agricultural sales were made available beginning with the 2002 Census of Agriculture. The amount of farms in South Dakota that have share-rent has decreased slightly since 2002, from 10.5% to 9.0% of farms (Table 24). Therefore, there is a small amount of farms in South Dakota that have crop-share rent (or other share rent), while the amount of farms with cash-rent is a larger proportion of all farms at nearly 50.0% (Table 23). Some farms may have a mixture of cash-rent and share-rent, but a majority of farms in South Dakota use cash-rent.

Table 24. Landlord's share of total agricultural sales in South Dakota, 2002-2012

Value of Landlord's Share of Total Sales	2002	2007	2012
Amount of Farms	3,337	2,728	2,893
Percent of Farms	10.5	8.8	9.0
Amount (\$1,000)	94,414	117,533	151,075

Sources: U.S. Department of Agriculture, National Agricultural Statistics Service, 2002, 2007, 2012 Census of Agriculture, South Dakota, Volume 1, Table 2.

VI. FARM SPECIALIZATION AND DIVERSITY

South Dakota has a very diverse agricultural sector. Regional differences account for a major portion of the diversity in the farming sector. While western regions of the state have relatively large farm/ranch operations that are primarily engaged in raising cattle, farm operations in the central and eastern regions of the state are generally mixed and have multiple farm enterprises.

Major farm enterprise trends in South Dakota

A farm enterprise is defined as an activity that a farm pursues. There are two main ways to categorize agricultural enterprises. One method is by land use, which is shown in Table 25. Pasture was the main use of South Dakota land, accounting for 52.1% of land in farms during 2012. Pasture was also the enterprise reported by the largest number of farms (19,530). Corn (grain and silage) and soybeans were the most important single types of crops grown, and were harvested on 5.9 and 4.7 million acres, respectively. Wheat and alfalfa were harvested on 2.2 and 1.5 million acres, respectively, in 2012. Corn for grain was grown on 12,260 farms, soybeans on 10,977 farms, and alfalfa on 10,557 farms – the largest enterprises by farm numbers after pasture land (Table 25).

There has been a major shift in the amount of agricultural land in crops in the last decade in South Dakota. Most importantly, corn acres increased by 2.04 million acres from 1997 to 2012. Soybean acres also increased during the same period, except during 2007 when market conditions prompted many farmers to plant corn rather than soybeans. The increase in corn acres occurred during a time of increasing corn prices, partly driven by the expansion of the ethanol industry. During the same period, crops with decreasing acres included oats, sunflowers, and wheat. Hay acres and pastureland remained relatively stable since 1997, with minor changes depending on market and weather conditions.

Overall, South Dakota experienced an increase in total acres of pastureland, crops and hay land over the past decades, excluding 2002 which was a major drought year in the state. While the number of crop and hay harvested acres has increased, the number of farms has decreased.

Table 25. Agricultural land use in South Dakota by major enterprises, 1997-2012

2012				2007			
Rank	Enterprise	Acres (1,000)	Farms	Rank	Enterprise	Acres (1,000)	Farms
1	Pasture	22,545	19,530	1	Pasture	23,026	19,950
2	Corn (Grain)	5,289	12,260	2	Corn (Grain)	4,455	12,198
3	Soybeans	4,714	10,977	3	Wheat	3,342	7,163
4	Wheat	2,204	4,804	4	Soybeans	3,223	9,862
5	Alfalfa	1,487	10,557	5	Alfalfa	1,997	12,653
6	Sunflower	620	1,048	6	Hay (Wild)	586	5,681
7	Corn (silage)	593	4,499	7	Hay (Tame)	467	3,596
8	Hay (wild)	526	5,186	8	Sunflower	400	910
9	Hay (tame)	402	3,108	9	Corn (Silage)	384	3,928
10	Small Grains Hay	139	1,316	10	Small Grains Hay	206	1,872
11	Sorghum (Grain)	137	420	11	Proso Millet	130	350
12	Oats	70	953	12	Sorghum (Grain)	129	394
	Total	38,725			Total	38,344	

2002				1997			
Rank	Enterprise	Acres (1,000)	Farms	Rank	Enterprise	Acres (1,000)	Farms
1	Pasture	22,026	17,798	1	Pasture	23,044	17,247
2	Soybeans	4,087	11,593	2	Soybeans	3,253	12,510
3	Corn (Grain)	3,165	11,446	3	Corn (Grain)	3,249	14,739
4	Alfalfa	2,393	15,097	4	Wheat	3,135	9,413
5	Wheat	1,596	5,007	5	Alfalfa	2,293	16,991
6	Corn (Silage)	644	5,371	6	Hay (Wild)	792	7,682
7	Hay (Wild)	475	5,503	7	Sunflower	724	2,718
8	Hay (Tame)	395	3,549	8	Hay (Tame)	507	5,871
9	Small Grains Hay	388	2,725	9	Corn (Silage)	306	4,779
10	Sunflower	349	1,078	10	Oats	248	3,667
11	Oats	130	2,097	11	Small Grains Hay	124	1,947
12	Sorghum	68	422	12	Sorghum	103	720
	Total	35,717			Total	37,778	

Sources: U.S. Department of Agriculture, National Agricultural Statistics Service, 2002 Census of Agriculture, South Dakota, Volume 1, Tables 8 and 34, 2012, Tables 8 and 37.

Another way of classifying farm enterprises is based on the sales volume of agricultural products as shown in Table 26. Beef cattle were the number one enterprise by sales volume over the last several decades in terms of both sales volume and number of farms. In 2012, corn became the largest enterprise in South Dakota, overtaking beef cattle in both sales volume and number of farms. While market conditions played a role in the overall sales volume as high corn prices increased revenues from corn sales, structural changes also played a role. Farms growing corn and soybeans increased slightly since 1997 and the number of acres planted to corn and soybeans also increased. The number of farms raising and selling beef cattle decreased as between 1997 and 2012 the number of farms with beef cattle sales decreased from 17,256 to 12,186. However, pasture acres remained constant since 1997, indicating an upward trend in the size of beef cattle farms, and a downward trend in their overall numbers.

An interesting note is the amount of hay sales in South Dakota. Hay farming is one of the largest enterprises by farm numbers in the state – around 20,000 farms reported growing hay, but only 8,875 farms sold hay in 2012. This anomaly is explained partly because of on-farm feed use; many farms growing hay end up using it on-farm to feed their livestock. Growing hay on farm without selling a major portion has been a persistent occurrence over time and serves as insurance against potential future hay crop shortfalls.

Farms with hog and pig, dairy product, and wheat sales have seen the largest declines in numbers since 1997 by agricultural sales. Farms selling wheat decreased from 9,541 to 4,800, farms selling hogs decreased from 3,067 to 678, and farms selling dairy products decreased from 1,458 to 409 between 1997 and 2012. However, the aggregate sales volumes of these enterprises increased over the same period, except during 2002, when there was a decrease in dairy product sales. While this is partly explained by increasing commodity prices, it is also correlated with increases in farm size and specialization. The number of farms growing crops or raising livestock has decreased, but the remaining farms have increased in size, suggesting that many small farms stopped producing those products, stopped farming altogether, or specialized in producing other commodities.

Table 26. Farm product sales volume by major enterprise in South Dakota, 1997-2012

2012				2007			
Rank	Enterprise	Sales (\$1,000)	Farms	Rank	Enterprise	Sales (\$1,000)	Farms
1	Corn	3,063,457	12,894	1	Beef Cows	1,592,086	13,005
2	Beef Cows	2,190,846	12,186	2	Corn	1,412,488	12,076
3	Soybeans	1,692,677	10,960	3	Soybeans	949,942	10,122
4	Wheat	755,870	4,800	4	Wheat	713,110	7,144
5	Hogs and Pigs	446,756	678	5	Hogs and Pigs	381,360	1,042
6	Dairy Products	373,735	409	6	Dairy Products	276,789	632
7	Other Grains	254,206	2,088	7	Poultry	140,798	977
8	Hay ^a	245,257	8,875	8	Other Grains	139,042	2,564
9	Poultry	182,076	1,157	9	Hay ^a	121,272	6,579
10	Dairy Cattle	102,578	648	10	Dairy Cattle	83,589	608
11	Other livestock	55,223	463	11	Sheep/Goats	36,697	1,829
12	Sheep/Goats ^b	43,636	1,915	12	Other Livestock	28,723	351
	Total	9,406,317	57,073		Total	5,875,896	56,929
2002 ^c				1997			
Rank	Enterprise	Sales (\$1,000)	Farms	Rank	Enterprise	Sales (\$1,000)	Farms
1	Beef Cows	1,276,279	14,461	1	Beef Cattle	927,440	17,256
2	Grains and Oilseeds	1,406,137	14,792	2	Soybeans	567,678	11,693
3	Dairy Products	151,444	908	3	Corn	532,159	12,820
4	Other Crops and Hay	145,766	6,573	4	Wheat	298,942	9,541
5	Poultry	70,820	451	5	Hogs & Pigs	281,516	3,067
6	Dairy Cattle	63,173	1,055	6	Dairy Products	164,714	1,458
7	Sheep/Goats	31,285	2,074	7	Other Grains	118,123	3,636
8	Other Livestock	23,179	313	8	Hay ^a	80,819	6,719
9	Hogs and Pigs	-	1,738	9	Poultry	73,637	461
				10	Dairy Cattle	65,353	1,785
				11	Sheep/Goats	37,134	2,533
				12	Other Livestock	24,380	1,604
					Total	3,171,895	72,573

Sources: U.S. Department of Agriculture, National Agricultural Statistics Service, 1997 Census of Agriculture, South Dakota, Volume 1, Table 2, 28, and 29. 2002 Census of Agriculture, South Dakota, Volume 1, Table 2, 16, and 17. 2007 Census of Agriculture, South Dakota, Volume 1, Table 2, 16, and 17. 2012 Census of Agriculture, South Dakota, Volume 1, Table 2, 16, and 17.

Notes: ^a For 2002, 2007, and 2012 the "Hay" category includes other crops and hay and for 1997 it includes hay, silage, and field seeds. ^b Sheep/Goats includes sheep and goats and their products. ^c 2002 did not include separate categories for specific field crops. Therefore beef cows are the largest single enterprise. It also did not include a sales volume for hogs and pigs.

NAICS classifications and enterprise diversity

Diersen, Janssen and Loewe (2000) analyzed data from the North American Industry Classification System (NAICS) for South Dakota. The NAICS comprises establishments primarily engaged in the specified categories. For example, grains and oilseeds farms include those primarily engaged in growing grain and oilseed crops, producing grain and oilseed seeds, and also includes corn silage and grain silage (Appendix B-8, 2012 Census of Agriculture).

Since 1997 when NAICS was first used in the Census of Agriculture, structural changes have occurred across farm enterprises. The number of farms primarily engaged in grains and oilseeds decreased from 13,049 in 1997 to 10,661 in 2012. Poultry operations saw moderate increases in their numbers, from 89 farms to 186 farms, and hay and other crop farms increased from 2,357 farms to 7,996 farms between 1997 and 2012. The number of cattle and calves enterprises decreased from 10,957 to 8,288 farms, and the number of cattle feedlots, hog and pig farms, and dairy operations also underwent moderate decreases (Table 27).

Table 27. Number of South Dakota farms by NAICS category, 1997-2012

NAICS Farm Enterprise	Number of Farms			
	1997	2002	2007	2012
Oilseed and Grain Farming	13,049	9,155	10,752	10,661
Beef Cattle Farming and Ranching	10,957	10,702	9,031	8,288
Other Crops and Hay	2,357	6,149	6,595	7,996
Aquaculture and Other Animals	1,135	2,076	2,094	2,809
Sheep and Goat Farming	751	710	706	690
Cattle Feedlots	977	1,463	794	646
Dairy Cattle and Milk Production	932	662	348	276
Hogs and Pig Farming	868	493	313	223
Poultry and Egg Production	89	125	274	186
Greenhouse, Nursery, and Floriculture Production	102	105	123	100
Vegetable and Melon Farming	54	70	74	69
Fruit and Tree Nut Farming	13	26	65	45

Sources: U.S. Department of Agriculture, National Agricultural Statistics Service, 1997 Census of Agriculture, South Dakota, Volume 1, Table 51, 2002, Table 59, 2007, Table 62, and 2012, Table 68.

The NAICS system is useful for examining the diversity of enterprises within specific farm categories. A partial selection of the major agricultural enterprises is summarized in Table 28. The table rows show a particular NAICS category while the columns show the related

agricultural products sold of the given NAICS categories. This allows making a comparison of specialization and/or diversity across agricultural categories in South Dakota. Not all NAICS categories and agricultural products are shown in this table.

Oilseeds and grain farming is the most common category in South Dakota, and in 2012 there were 10,661 such farms (Table 27). Beef cattle ranching and farming is the other major category with 8,288 farms, followed by hay and all other crop farming at 7,996 farms in 2012.

Diversification is common across farm categories in South Dakota. Oilseed and grain farms tend to be more diversified than other farm categories. For example, 99.9% of oilseed and grain farms reported having grain sales in 2012, 40.0% had sales of cattle and calves, and 24.0% indicated having sales of hay and other crops. However, grain farms are unlikely to be involved in dairy products and hogs in South Dakota – less than 1% and 1.3% of farms reported having sales of each, respectively.

Beef cattle ranches and farms are slightly less diversified than oilseed and grain farms – 94.0% of these farms reported having sales of cattle and calves, 29.4% had sales of oilseeds and grains, 27.0% had sales of hay and other crops. Similar to oilseed and grain farms, very few beef cattle farms reported having sales of dairy products and hogs.

Even though few other farms reported having sales of dairy and hogs, the latter farm categories are surprisingly diverse. In 2012, 99.0% of dairy cattle and milk production farms reported having sales of dairy products, 96.4% had sales of cattle and calves, 60.1% had sales of oilseeds and grains, and 21.7% had sales of hay and other crops. Among hog and pig farms, 100.0% reported having sales of hogs and pigs, 48.4% had sales of oilseeds and grains, 30.0% had sales of cattle and calves, and 16.6% had sales of hay and other crops. However, many farms specializing in dairy and hogs have either diversified farm sales or sell by-products from the farm operation. Overall, farms in South Dakota have kept a level of diversity, albeit less than in past decades. Farm specialization has been driven by market conditions, trends in operator age, input, land, and labor costs, among other variables.

Table 28. Farms by NAICS category and commodity sales in South Dakota, 2012

NAICS Category	Number of Farms Selling Products					Total Farms
	Oilseed and Grains	Hay and Other Crops	Cattle and Calves	Dairy Products	Hogs and Pigs	
Oilseed and Grain Farming	10,658	2,538	4,222	61	137	10,661
Hay Farming	831	3,500	816	21	44	7,996
Beef Cattle Ranching and Farming	2,440	2,239	7,782	46	106	8,288
Cattle Feedlots	460	90	646	0	16	646
Dairy Cattle and Milk Production	166	60	266	272	12	276
Hog and Pig Farming	108	37	67	6	223	223
Subtotal	14,663	8,464	13,799	406	538	28,090
Total All Farms	14,961	8,875	14,306	420	678	31,989

Source: U.S. Department of Agriculture, National Agricultural Statistics Service, 2012 Census of Agriculture, South Dakota, Volume 1, Table 68.

Enterprise diversification is relatively less pronounced when considering the volume of agricultural sales revenue across different NAICS categories. Table 29 shows the percent of agricultural sales cross-classified by farm enterprise and market values of different products in 2012. For all NAICS categories except hay and other crops, a high percentage of sales came from the corresponding commodity. Dairy products had the highest correspondence, with 92.6% of dairy products accounted for by dairy cattle and milk production farms. Sales of oilseed and grains came primarily from oilseed and grain farms, with 88.2% of all sales coming from these farms. Hog and pig farms accounted for 70.7% of all sales of hogs and pigs. Beef cattle ranching and farms accounted for 49.2% of cattle and calves sales, and cattle feedlots accounted for 27.1%, for a combined 76.3%. As previously mentioned, hay and other crops farms accounted for only 34.3% of hay sales, mainly because many hay farms grow hay for on farm use, and many other farm categories also grow hay.

Table 28 shows that there are a number of farms in South Dakota that raise livestock or grains other than their main enterprise, which contributes to the farm sector diversity. However, Table 29 shows that farm sales are indeed dominated by major enterprises across South Dakota. This suggests that farms engaged in other secondary enterprises do so at a minor level, and also indicates that farm specialization is common in South Dakota. This has been a continuing trend in South Dakota and other agricultural states.

Table 29. Sales concentrations by NAICS categories in South Dakota, 2012

NAICS Category	Percent of Sales Revenue by NAICS Category				
	Oilseed and Grains	Hay and Other Crops	Cattle and Calves	Dairy Products	Hogs and Pigs
Oilseed and Grain Farming	88.2	30.5	18.7	2.8	5.6
Hay Farming	1.3	34.3	2.3	0.3	0.4
Beef Cattle Ranching and Farming	5.1	29.9	49.2	1.4	0.9
Cattle Feedlots	2.4	1.5	27.1	-	1.1
Dairy Cattle and Milk Production	0.4	0.9	1.4	92.6	0.02
Hog and Pig Farming	0.9	-	0.4	-	70.7
Total	100.0	100.0	100.0	100.0	100.0

Source: U.S. Department of Agriculture, National Agricultural Statistics Service, 2012 Census of Agriculture, South Dakota, Volume 1, Table 68.

Notes: Totals are for specified categories only. Certain categories are not included.

Revenues from grain and cattle farms

Grain farms and cattle farms are the two largest farm enterprises in South Dakota. Table 29 shows the sale of agricultural products by farm enterprise in South Dakota in 2012. By concentrating on only grain and cattle farms, revenue concentration of South Dakota farms can be shown. Tables 30 and 31 depict revenue concentration of grain and oilseed farms and cattle farms in South Dakota. Government payments are also included to show the impact of the end of direct government payments, brought about by the 2014 Farm Bill.

Between 2002 and 2012, revenues of grain farms derived from sales of grains and oilseeds increased from 78.6% to 86.0% of all agricultural sales and government payments. Direct government payments decreased from 6.4% of revenues in 2002 to 2.7% in 2012. What this shows is that revenues of oilseed and grain farms are heavily dependent on the sale of corn, soybeans and wheat in South Dakota. In 2012, corn was the largest revenue crop for South Dakota grain farms, accounting for 45.2% of total revenues for all grain farms (Table 30). While the elimination of direct payments was debated, these data suggest that government payments are not a substantial portion of the revenues received by grain farms in South Dakota, relative to revenues and incomes associated with the sale of corn, soybeans and wheat.

Table 30. Oilseed and grain farm revenues in South Dakota, 2002-2012

Market Value of Agricultural Products Sold and Government Payments (\$1,000)	2002	2007	2012
Total	1,434,766	3,393,074	5,958,363
Average per Farm	156,719	315,576	558,893
Grains and Oilseeds	1,127,372	2,781,233	5,121,978
Corn	-	1,234,454	2,693,528
Soybeans	-	802,455	1,512,430
Wheat	-	600,693	649,403
Government Payments*	91,370	153,114	161,643

Sources: U.S. Department of Agriculture, National Agricultural Statistics Service, 2002 Census of Agriculture, South Dakota, Volume 1, Table 59, 2007, Table 62, and 2012, Table 68.

Note: *"This category consists of direct government payments as defined by the 2008 Farm Bill; payments from the Conservation Reserve Program (CRP), Wetlands Reserve Program (WRP), Farmable Wetlands Program (FWP), and Conservation Reserve Enhancement Program (CREP); loan deficiency payments; disaster payments; other conservation programs; and all other federal farm programs under which payments were made directly to farm operators" (2012 Census of Agriculture, Appendix B-10).

Beef cattle farms and ranches are also heavily specialized in South Dakota. As a percent of sales and government payments, sales of cattle and calves accounted for 81.4% of revenues in 2002, for 75.6% in 2007, and for 76.6% in 2012 (Table 31). Direct government payments accounted for 5.4% of sales and government payment revenues in 2002, for 4.1% in 2007, and for 2.7% in 2012. Similar to grain farms, beef cattle farm and ranch revenues are heavily dependent on the sale of their primary enterprise. Direct government payments did not account for a large portion of farm revenues, and actually decreased since 2002.

Table 31. Cattle farms and ranches revenues in South Dakota, 2002-2012

Market Value of Agricultural Products Sold and Government Payments (\$1,000)	2002	2007	2012
Total	1,150,435	1,438,689	1,907,778
Average per Farm	107,497	159,306	230,186
Cattle and Calves	936,234	1,087,889	1,460,415
Government Payments	61,619	58,669	52,095

Sources: U.S. Department of Agriculture, National Agricultural Statistics Service, 2002 Census of Agriculture, South Dakota, Volume 1, Table 59, 2007, Table 62, and 2012, Table 68.

Summary

One of the largest structural shifts in South Dakota agriculture has been the increasing number of grain enterprises. The number of grain farms and farms primarily engaged in hay and other crops production increased, while the number of cattle farms, dairy operations, and hog and pig farms decreased since 2002. Corn recently surpassed beef cattle as the largest single enterprise in the state in terms of both farm numbers and sales volume. Nevertheless, farm enterprises remain generally diverse in South Dakota, with grain farms having the largest amount of diversity by agricultural products sold. However, agricultural products sold are dominated primarily by their corresponding enterprises, in part because of farm specialization and economies of size. Even though farms remain diverse, farms specialized in their main enterprise account for large percentages of the total amount of agricultural products sold in South Dakota.

VII. CONCLUSIONS

Agriculture in South Dakota has undergone many changes over the past century, particularly during the most recent decades. Industrialization in agriculture and other economic sectors was a primary factor driving structural changes in the 20th century. Recently, other factors have also contributed to changes in the farm economy in South Dakota. These factors include, but are not limited to, relative economic prosperity in South Dakota and the United States, increased demand for food, fuel, and fiber products in both international and domestic markets, increased global trade in agricultural products, new technologies, and other external changes such as changes in consumer tastes and preferences. This report outlined selected key structural shifts occurring in South Dakota agriculture since the 1930s, with an emphasis on the last few decades.

Farm numbers in South Dakota grew between 2007 and 2012, reversing the decades-long downward trend. The growth in farm numbers in South Dakota is primarily a result of increasing numbers of small farms, either measured in terms of acres or volume of agricultural sales. However, large farms in South Dakota account for large proportions of agricultural

products sold and land used in agricultural production, which indicates the existence of economies of size.

Off-farm employment is one of the most significant factors influencing the farm sector in South Dakota. Off-farm employment has risen extensively across the farming sector in South Dakota, with large increases occurring in the last 10 to 15 years. Operators of small farms and spouses of principal operators account for large proportions of the total off-farm employment in the farm sector. Many operators and spouses seek off-farm employment to supplement farm incomes and gain access to fringe benefits such as health care or retirement plans. Operators working off-farm likely do so full-time (at least 200 days per year). The average age of farm operators increased over the past decades, and fewer young operators were involved in farming than in previous decades.

Farms in South Dakota continue to have a broad mix of enterprises. Cattle and grain is the most common enterprise mix across South Dakota farms. Agricultural products sold are also dominated by cattle and grain in the state, further suggesting the presence of economies of size and scale for these enterprises. Corn acres increased greatly over the last few decades, and for the first time in decades overtook cattle as the largest agriculture enterprise by volume of agricultural sales. Soybean acres also increased, while other crops such as wheat, oats and barley decreased in acres in recent decades. Beef cattle remain one of the largest enterprises in the state, as measured by agricultural sales, and the number of acres in pasture remained stable.

The farm sector in South Dakota and the United States has undergone structural changes for many decades. Recent changes have had particularly large impacts on farm households, agribusinesses and the state's economy. Understanding these structural changes is important for policymakers, business owners, farm households, and other stakeholders across South Dakota and beyond. This report provides an outline of major changes occurring in the farm sector in South Dakota over the past decades. While the future of agriculture is difficult to predict, studying long-run trends and other changes provides insights on broad-based directional changes. The structural changes documented in this report will not be the last, and South Dakota agriculture will continue to change in the future.

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