

CRCE Update

Center for Research on the Colorado Economy

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WHAT'S UP IN AG?

Latest data show moderate growth, mixed strength, and uneven impact

With the 1997 Census of Agriculture results recently released, CRCE researchers Sue Hine and Elizabeth Hornbrook Garner have sifted through the details to assess the status of agriculture within Colorado's booming economy.

The picture is mixed, according to Hine, assistant professor of agricultural and resource economics. "Although agriculture in general has not kept pace with the strong growth in the rest of the Colorado economy during the 1990s, it is still strong relative to the rest of the country," she says. "Between 1992 and 1997, employment in agriculture was up 9.5 percent overall, and income in real terms rose by almost 15 percent. The state ranks 17th in total value of agricultural products sold, and 4th in value of cattle and calf sales."

Strength is mixed within the ag sector itself, too. "In general, there has been explosive growth in the higher-value greenhouse and nursery crops and in landscape architecture," note Hine and Garner, "while traditional crops seem to be falling statewide."

The analysis is based on census data sorted, culled, and organized by Garner, research associate and statistics specialist with the Cooperative Extension Service. The study considered not just traditional farm production, but the state's much broader agribusiness system.

The Agribusiness System

As defined by Hine and Garner, the agribusiness sector encompasses: (1) the **traditional farm production** of commodities such as wheat, corn, and livestock, and the green and horse industries; (2) the **agricultural inputs** industry necessary for the operation and growth of core agricultural producers, such as farm machinery and fertilizer suppliers; and (3) the **processing and marketing** necessary to bring the final goods to the consumer.

This combined sector's economic contribution to the state economy can be measured four ways: employment, income, value added, and gross sales. Each gives a different picture of how agribusiness activity is configured. **Employment** shows the number of jobs that are located in each subsector, including farmer owner/operator's labor, and with part-time jobs counting fractionally and added into the total to produce a "full time equivalent" (FTE) measure. **Gross sales** are a common measure of economic performance. However, using them produces a double counting as each product moves from one production stage

to the next, which limits its validity as a measure for the agribusiness system as a whole. **Proprietor and labor income** includes net income from employees and business but does not include corporate farm income. This section does not suffer from the double counting problem associated with gross sales. Finally, **value added** is often cited as the most accurate measure of economic contribution. It is defined as net income plus indirect business taxes paid to government entities, and measures the economic value contributed by activity at each stage of production and marketing.

Table 1 shows how the three subsectors contribute to the overall system, measured by the four methods, based on 1997 Census of Agriculture data. While employment is close to evenly divided among the three components, almost half of the value added is in processing and marketing.

Table 1. Colorado Agribusiness by Component, 1997

	Employment (FTE jobs)	Income (\$ mill)	Value added (\$ mill)	Gross sales (\$ mill)
Farm inputs	36,364 (35%)	\$685 (28%)	\$872 (26%)	\$1,531
Farm production	38,508 (37%)	\$733 (30%)	\$816 (25%)	\$4,534
Processing & marketing	30,267 (29%)	\$1,046 (42%)	\$1,611 (49%)	\$9,803
Total agribusiness	105,140 (100%)	\$2,464 (100%)	\$3,299 (100%)	\$15,868

Colorado Agribusiness Growth

Comparison of the 1997 data with the comparable figures from 1987 and 1992 gives a picture of the evolving shape of the state's agribusiness economy. Hine and Garner highlight the following changes since 1992:

- The number of farms and ranches rose, and stood at 28,268 in 1997. However, the amount of land in farms decreased by 4 percent, to 32.6 million acres, and the average farm size decreased by 10 percent to 1,154 acres.
- Farm sales increased by 13 percent to \$4.5 billion.
- Farm assets rose by 33 percent to \$22.8 billion, while farm debt rose 27 percent to \$3.6 billion.
- Agricultural employment has grown 9.5 percent. One third of operators worked 200 days or more off farm, an

increase of 22 percent from 25 years ago.

- Proprietor and labor income is up 17.5 percent since 1992, and corporate farm income is up 23 percent.
- Agricultural exports increased by almost 18 percent to \$985 million.
- Gross sales in the agribusiness system as a whole totaled \$15.8 billion, an increase of 16 percent over 1992 and 37 percent of 1987.

Figure 2 shows the 10-year growth pattern in the three components of the agribusiness system as measured by gross sales. Farm production and processing and marketing rose steadily and were up 41 percent and 46 percent respectively. On the other hand, while the input sector saw a significant increase over the past five years of 46 percent, this seemed to offset the sharp decline in the first part of the nineties when input sales dropped sharply by 36 percent, and so the overall 1-year result is a decrease of 7 percent for the ten-year period. The drop and recovery could in part be attributed to the recession of the early nineties when a decreased demand for agricultural services occurred. This demand picked up again, however, with the expansion in the mid and later nineties.

One erratic and widely watched variable is govern-

ment payments to farmers and ranchers, which fell substantially from 1987 to 1992 and remained about the same from 1992 to 1997. However, as a percentage of income, government payments did drop by 6 percent by 1997 due to relative increases in other sources of income. "Starting in 1996 farm payments should have begun decreasing according to legislation in the 1996 Farm Bill," notes Hine. "However, due to crop failures and low crop prices it is estimated that government payments with disaster relief for 1999 were twice the 1992 payments."

Geographic Concentration of Agribusiness

The impact of changes in the agribusiness economy is uneven among the state's regions. The map shown in Figure 3 shows the location of Colorado's 63 counties and their degree of dependence on agribusiness — not just production agriculture but the three-part system including input supply as well as processing and marketing.

To crystallize the varying degrees of contribution of agribusiness to the state's counties, Hine and Garner defined two levels of significant agribusiness involvement: "agribusiness dependent" counties receive over 20 percent of total county income from agribusiness industries, while "agribusiness important" counties receive between 10 and 20 percent of total county income from agribusiness industries. (The "other" category in the map represents those counties that receive less than 10 percent of county income from agribusiness.) Agribusiness dependent counties are not the only counties with large agribusiness sectors. There are counties (Denver and Jefferson being the most obvious examples) that have significant agribusiness but are not classified as agribusiness important or dependent because they also have particularly large non-agricultural sectors that far outweigh agribusiness.

Garner and Hine say classifying a county's dependence on agriculture helps identify vulnerable areas. "If traditional production agriculture continues to decline with poor prices, these are the counties that are going to be

Figure 2.
Gross Sales for
Colorado Agribusiness,
1987 to 1997

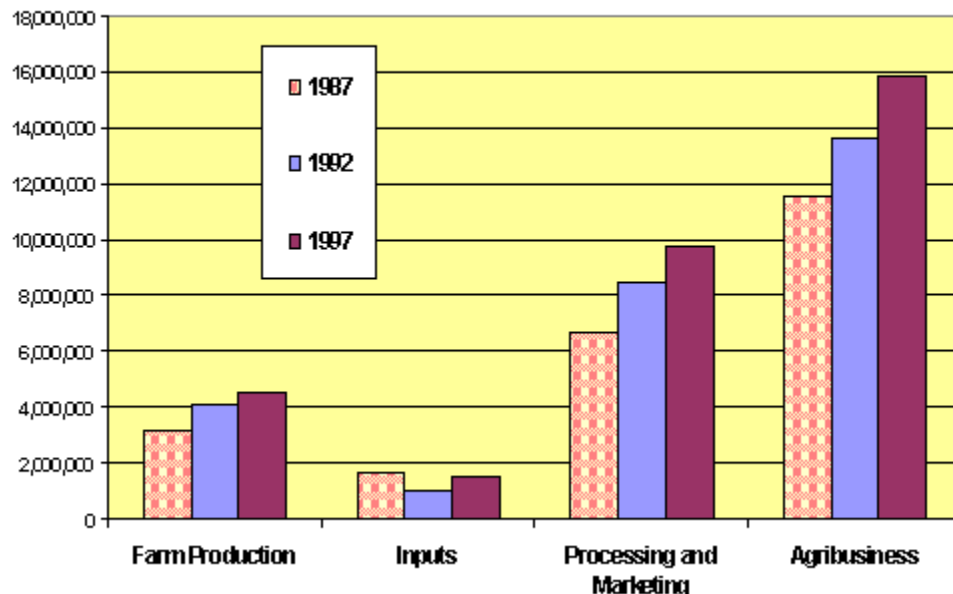


Figure 3. Colorado's Agribusiness Dependent Counties and Agribusiness Important Counties

hurting and thus are places where alternative economic drivers should be developed," Hine says.

Colorado's counties ranked by degree of agribusiness importance and dependency are shown in Table 2. In the left half of the table, the counties are ranked according to the total size of agribusiness, while in the right half the ranking is by the percentage of total county income that agribusiness provides in each county. Metro counties rank highest in size while rural areas rank highest in importance. Four counties show negative numbers; that is because farm losses swamped any other positive income in those areas, according to Garner.

Eight of the 63 counties are "agribusiness important" and twelve are "agribusiness dependent." Therefore, almost a third of Colorado counties continue to be either agribusiness dependent or agribusiness important as of 1997, not a significant change from 1992. However, there have been some individual changes within the categories. Of particular note is Lincoln County, which had been ranked in 1992 as agricultural dependent but is now at less than 10 percent, and Dolores County, which had been ranked as agricultural important is now less than 5 percent. In the other direction, Costilla County is now ranked as agribusiness dependent and Conejos County has come to be agribusiness important.

What future?

Hine and Garner point out that, while the production sector of agribusiness seems to be lagging, it is still growing and is definitely changing. There are improved efficiencies, Hine notes, that allow more and more output to be produced on less land and with less manpower. And agriculture will always be a critical part of the state's identity. "Almost 50 percent of total land, and 83 percent of private land in the state, is in farms. The agricultural image itself, and the esthetic quality it brings to the landscape, make agriculture a critical contributor to the vitality of Colorado's economy."

For more information on this project, contact Sue Hine at 970-491-7370 or Susan.Hine@ColoState.edu; or Elizabeth Hornbrook Garner at Elizabeth.Garner@ColoState.edu. The full report of this study is available from the Colorado State University Cooperative Extension Resource Center, General Services Building, Fort Collins, Colorado 80523-1172 (☎ 970-491-6198), or the Department of Agricultural and Resource Economics website: <http://dare.agsci.colostate.edu/questions.html>

Table 2. Colorado Counties Ranked by Agribusiness Income and by Percent of Total County Income in 1997

Agribusiness Income (\$1,000)		Agribusiness % of County Total	
Weld	390,528	Yuma	48.8%
Denver	316,500	Washington	41.5%
Jefferson	300,659	Phillips	39.9%
Adams	145,176	Baca	36.5%
Morgan	129,696	Kit Carson	34.5%
Larimer	121,004	Sedgwick	28.6%
Arapahoe	114,278	Kiowa	27.2%
Boulder	107,094	Saguache	25.6%
Yuma	106,200	Morgan	23.9%
Logan	77,346	Cheyenne	23.7%
El Paso	56,323	Crowley	22.0%
Kit Carson	53,752	Costilla	20.7%
Prowers	51,078	Logan	19.4%
Washington	39,105	Prowers	18.9%
Rio Grande	35,470	Rio Grande	17.4%
Phillips	35,198	Jackson	17.4%
Pueblo	33,215	Bent	16.8%
Montrose	31,065	Conejos	12.9%
Otero	30,925	Weld	11.6%
Douglas	29,741	Otero	10.0%
Baca	28,417	Lincoln	9.7%
Mesa	27,024	Alamosa	7.9%
Alamosa	21,523	Delta	6.3%
Delta	18,087	Montrose	5.8%
Bent	17,445	Dolores	3.3%
Saguache	15,713	Jefferson	2.4%
Sedgwick	11,877	Adams	2.1%
Crowley	11,185	Elbert	2.1%
La Plata	9,782	Larimer	2.1%
Cheyenne	9,586	Park	1.9%
Eagle	9,157	Douglas	1.7%
Garfield	9,006	Pueblo	1.4%
Lincoln	8,876	Mesa	1.4%
Conejos	8,847	Hinsdale	1.2%
Kiowa	8,122	Garfield	1.2%
Pitkin	7,770	Denver	1.1%
Costilla	7,332	La Plata	1.1%
Jackson	4,397	Boulder	1.1%
Routt	3,940	San Miguel	1.0%
Fremont	3,862	Pitkin	1.0%
Montezuma	2,950	Moffat	1.0%
Summit	2,689	Montezuma	0.9%
Moffat	2,640	Mineral	0.8%
Elbert	2,402	Eagle	0.8%
San Miguel	1,758	Routt	0.8%
Park	1,737	Archuleta	0.7%
Las Animas	961	Arapahoe	0.7%
Gunnison	916	Fremont	0.6%
Chaffee	747	Las Animas	0.5%
Archuleta	698	El Paso	0.5%
Dolores	583	Summit	0.4%
Clear Creek	404	Chaffee	0.4%
Hinsdale	126	Gunnison	0.3%
Lake	116	Clear Creek	0.3%
Mineral	115	Lake	0.1%
Grand	37	San Juan	0.1%
Teller	24	Grand	0.0%
Gilpin	20	Teller	0.0%
San Juan	7	Gilpin	0.0%
Custer	-324	Custer	-1.2%
Ouray	-968	Rio Blanco	-1.7%
Huerfano	-1,455	Ouray	-2.1%
Rio Blanco	-2,379	Huerfano	-2.2%

The **Center for Research on the Colorado Economy** is designed to pool, integrate, and focus Colorado State University's expertise in economic modeling and policy analysis. **CRCE** is building a front-line program of research, outreach, and teaching intended to serve economic managers, policy makers, and students in the State of Colorado.

The Center's Mission is to generate high quality economic research and analysis focused on contemporary economic issues facing Colorado's economy. This work will be available to and utilized by public and private sector decision makers at state, regional, and local levels in Colorado. **CRCE** serves Colorado State University's three primary missions: it generates knowledge by organizing data and applying frontier analytical methods; it provides outreach to the state by offering information and policy analyses to public policy makers and other constituencies; and it teaches students by involving them in applied research related to their classroom learning and by providing data, analyses, and case studies useful within the classroom.

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