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Economic Issues with Dry-Edible Beans

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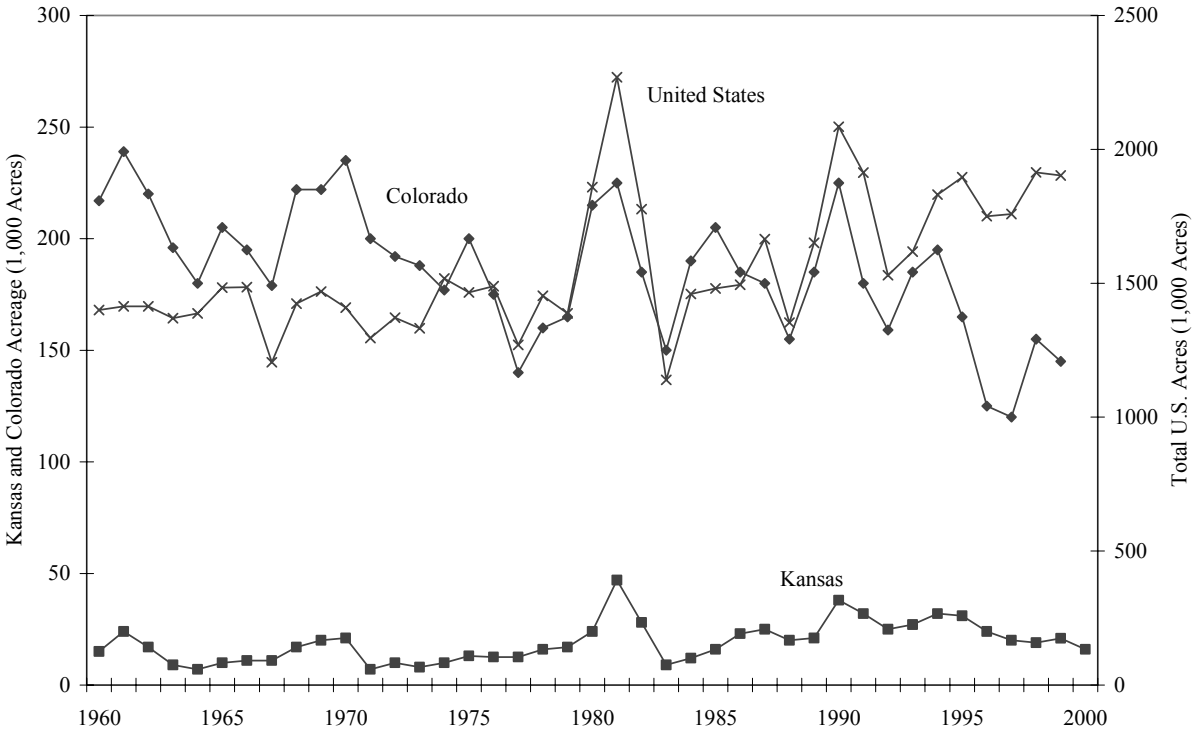
Dry-edible beans and more specifically, pinto beans have been a popular crop for many western Great Plains producers. Within the past several years, there has been a consolidation in the number of delivery points for pinto beans in the western Great Plains. In 1997, a producer-owned cooperative entered the processing industry with the purchase of plants in Sharon Springs and Goodland, Kansas. Several plants in western Colorado closed. The purpose of this publication is to describe trends in the dry-edible bean industry and discuss their implications for Kansas and Colorado producers.

Production Trends

The dry-edible bean industry is composed of many different types of beans. These include navy, Great Northern, pinto, light red kidney, dark red kidney, large lima, baby lima, small white, blackeye (cow-peas), pink, small red, cranberry, garbanzo (chickpeas), black (commonly called black turtle), and other beans. Other beans include yellow eye, fava (horse or broad beans), mung, adzuki, marrow, appaloosa, Christmas lima, and blackgum beans (Lucier). Table 1 shows the percentage of beans grown by state. Pinto beans are the dominant bean grown in the United States with 40.36 percent of total output, followed by navy (18.04 percent), Great Northern (9.41 percent), and light red kidney beans (5.12 percent). North Dakota produced 28.79 percent of the total dry edible bean production in 2000 followed by Michigan (15.6 percent), Nebraska (12.22 percent), Minnesota (9.08 percent), and Colorado (7.49 percent). Kansas produced 1.46 percent of the dry-edible beans in the United States in 2000.

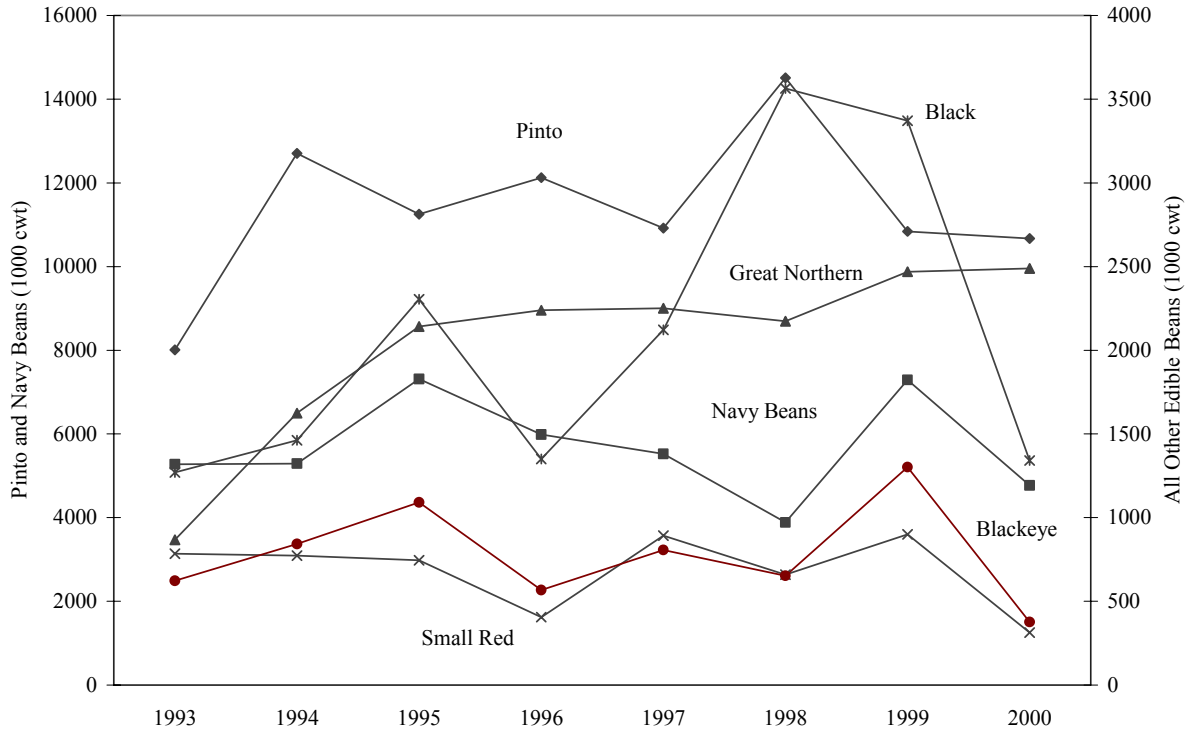
Total dry-edible bean acreage is somewhat cyclical over time as seen in Figure 1. Both Kansas and Colorado acreage have experienced similar trends as the United States. Colorado had a 38 percent decrease in acreage from 195,000 to 120,000 acres for 1994 to 1997 followed by a 29 percent increase from 1997 to 1998. A decrease of 28 percent from 155,000 to 110,000 acres occurred from 1999 to 2000. Kansas acreage has decreased 23 percent since 1999 and 50% since 1994 (32,000 to 16,000 acres). In 2001, USDA NASS reported a dry-edible bean harvest of 105,000 acres in Colorado and 14,000 acres in Kansas. Some reasons for this decline include fewer delivery points and the fact that edible beans have intensive management requirements relative to other crops.

Figure 1. Kansas, Colorado, and United States Dry Bean Acreage, 1960 to 2000



With respect to individual dry-edible beans, all beans except Great Northern have decreased in production from 1999 to 2000 (Figure 2). Blackeye beans had a decrease of 71percent while black beans declined 62 percent. Pinto beans have declined 26% since 1998. These decreases suggest an oversupply and lack of profitability in the dry-edible bean industry.

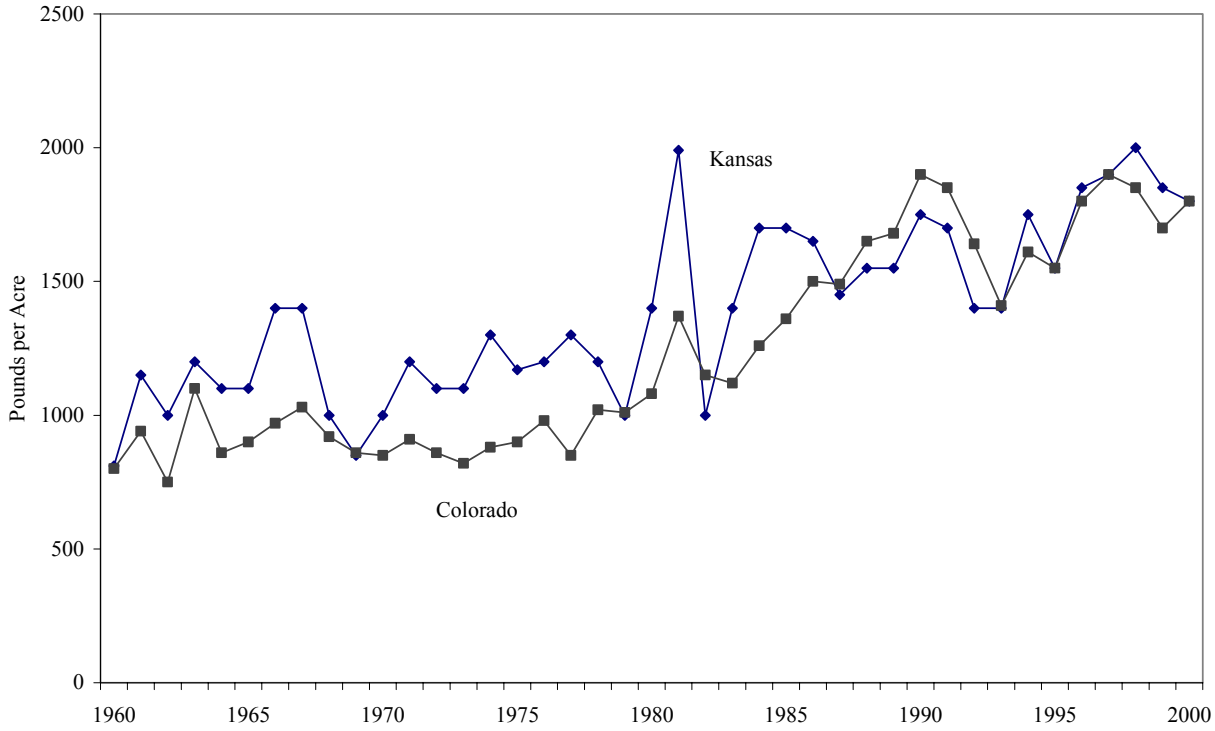
Figure 2. Volume of Various Edible Beans Over Time, 1993 to 2000 (USDA NASS)



Yields per acre have increased over time as shown in Figure 3. Since 1960, yields have increased by 122 percent in Kansas and 125 percent in Colorado. The average yield over this time period was 1,388 and 1,241 pounds per acre with a standard deviation of 327 and 382 pounds per acre for Kansas and Colorado, respectively.

The coefficient of variation is calculated as the standard deviation divided by the average. This ratio is often multiplied by 100 to convert to a percentage for ease of interpretation. It is a measure of risk in that a higher number indicates greater variability relative to a lower number. The coefficient of variation for Kansas bean yields is 23.54 percent and for Colorado, 30.77 percent. This suggests that yields in Kansas have experienced slightly less variability over this time period. Since 1993 yields in Kansas have increased by 29 percent due to improvements in varieties, better management practices, and increased use of irrigation.

Figure 3. Kansas and Colorado Edible Bean Yields per Acre Over Time, 1960 to 2000 (USDA NASS)



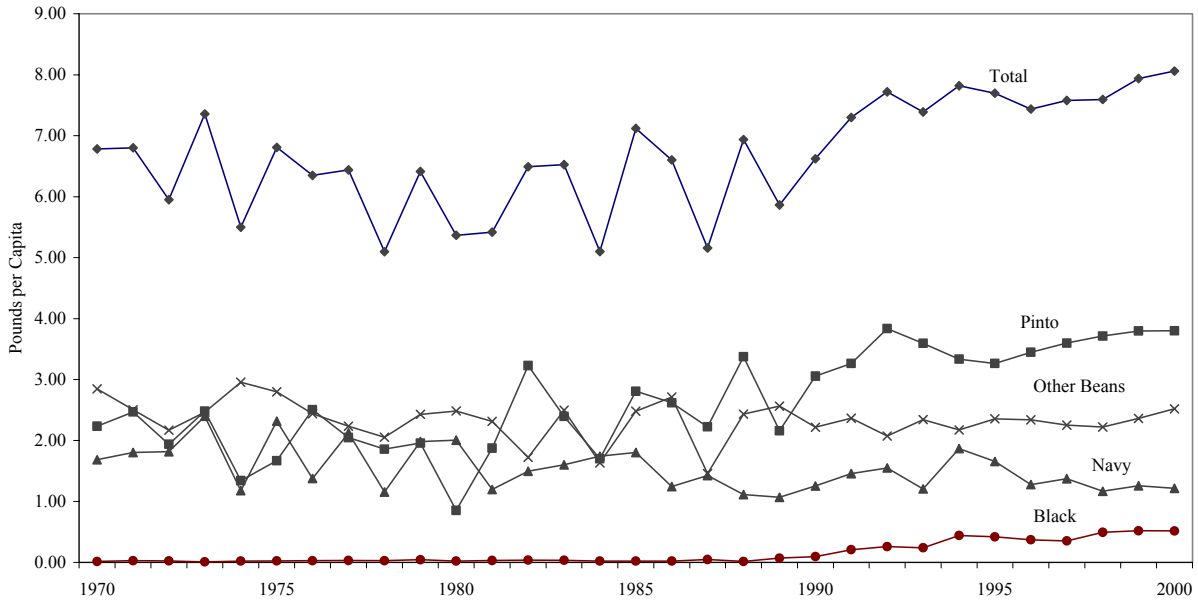
Production Management of Beans

Beans are a high-cost irrigated crop relative to alternatives such as sunflowers and wheat. Two to three fungicide treatments are needed to combat disease. In addition, dry-edible beans are prone to iron deficiency, leave little crop residue to inhibit post harvest erosion, and require irrigation. Multiple irrigation applications also lead to the fungus problem.

Consumption Trends

Per capita consumption, which is measured as wholesale disappearance, of dry-edible beans has increased from 5.1 pounds per person in 1984 to 8.1 pounds per person in 1999, a 58 percent increase (Figure 4). The U.S. population consumes an average of 3.8 pounds of pinto beans per person annually. Black beans have seen the greatest growth in consumption with a 148 percent increase from 1991 to 2000 with an annual per capita consumption of 0.50 pounds per capita. Per capita consumption of navy beans has increased by 35 percent since 1994.

Figure 4. Per Capita Consumption of Different Dry Edible Beans, 1970 to 2000 (USDA ERS)



Supermarket sales of each bean type have increased over this period, particularly the "other" bean category that includes pinto beans. Canned products include refried beans, soups, chilis, and baked beans. Restaurant use of dry-edible beans has also increased during the past ten years in foods such as tacos, burritos, and chili.

Using the 1994-96 USDA ARS Continuing Survey of Food Intakes by Individuals, Lucier et al. found five important trends in dry-edible bean consumption. Slightly more than 75 percent of all cooked beans are purchased in retail stores, with lima beans being used mostly at home and refried pinto beans being used mostly in restaurants.

Cooked dry-edible bean consumption is concentrated in the Southern and Western states which account for 39 percent and 38 percent, respectively, of all bean consumption. These areas have the highest percentage of Hispanic population which account for 33 percent of all dry-edible bean consumption, despite comprising just 11 percent of the population. Hispanics of Mexican descent are the largest consumers of cooked beans, with nearly 21 percent of total volume. Pintos and lima beans are favored by low income households while black and garbanzo beans are preferred by higher income households. Lucier further notes that navy beans are canned and consumed mostly in the South and Midwest. Black beans are consumed mostly in the South.

Exports

The top five world dry-edible bean exporting nations of Burma (Myanmar), United States, China, Argentina, and Canada account for approximately 80 percent of total world exports in any given year. The United States exports pinto, navy, great northern, and light red kidney beans. The majority of U.S. exports are purchased by Mexico (22 percent), United Kingdom (16 percent), Canada (9 percent), Italy (6 percent), and Japan (5 percent). The United States has 95 percent of the Mexican import market share and 50 percent of the United Kingdom import

market share. From 1994 to 2000 an average of 20 percent of U.S. dry-edible beans were exported. The four largest producers of beans are India, Brazil, Mexico, and the United States.

Quality Issues

The cash market is beginning to be replaced by marketing and production contracts for some dry-edible beans. There are two categories of quality specifications for dry-edible beans. The first category uses USDA specifications: moisture content, broken seeds, uniformity of size, color, and specification of foreign matter. These are easily measurable by an elevator and bean canner.

The second category includes the previous specifications along with post-canning quality. Canning quality or seed integrity determines the appearance of the product after it has been canned. Seedcoat checks are designed to identify small breaks in the seedcoat that are difficult to locate and not an objective measure of quality. An elevator can use an on-site canning lab to test the product for canning quality before selling to a canner. Producers have a great deal of control over canning quality that is affected by variety, timing of harvest, and handling procedures.

Prices

Average marketing year 2000 grower prices for pinto beans in the two largest production states of Colorado and North Dakota are the lowest since the 1991/92 marketing year (Figure 5). The average Kansas and Colorado grower price per hundredweight over the 1979/80 to 1999/00 marketing years was $19.46 with a standard deviation of $5.72 and a coefficient of variation of 29.4 percent. The average dealer price for northern Colorado was $25.03 with a standard deviation of $7.16 and a coefficient of variation of 28.62 percent over this same time period. Grower prices declined by 24 percent from 1996/97 to 1998/99 (36 percent from 1996/97 to 1999/00) while dealer prices declined by 26 percent over this same time period (data for 1999/00 is not yet available).

Grain Elevator Survey

A telephone survey of 35 grain elevator managers who handled dry-edible beans was conducted to determine further information on production and marketing. Elevators in the central Great Plains accepted pinto, Great Northern, navy, black, and light red kidney beans. More than 50 percent of the total edible bean volume was pinto beans. Forward contracts with growers were done only if the elevator had a contract with a processor. The relative percentage of contracts varied from year to year depending upon supply and demand for dry-edible beans. But in general, almost all Kansas beans are grown under a marketing contract. The relatively high cost of production, coupled with price volatility, lends itself to a contractible commodity.

Bean brokers (e.g., dealers) act as middlemen between elevators, and processors and canners. Many processors purchase beans on six-month contracts and tend to purchase at harvest when supply was greatest. However, most elevators sold directly to a processor. On average, 65 percent of the beans were marketed domestically and 35 percent for export.

The ability to clean and sort beans is important when selling on quality. Several washed beans so

that a “defect-free” bean could be sold. Others segregated by color and seedcoat splits. Seedcoat quality was most important, and premiums (called bonuses) are used to provide incentives to growers to provide “non-splits,” which means no breaks in the seedcoat. Lack of a dry-edible bean checkoff program to help promote beans was cited as a limitation for an increase in demand. Consolidation among processors was also cited as a problem.

Summary

Dry-edible beans, like many specialty crops, are price sensitive to small changes in supply. It is difficult to differentiate beans on quality except on ensuring that there are no breaks in the seedcoat. Growers have a large impact on reducing these splits. It is not surprising that vertical integration between growers into collection and marketing has occurred. Pinto beans will likely remain a rotation crop for some Kansas producers.

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Table 1. Percentage of Dry Edible Bean Production by State in Year 2000 (USDA NASS)

	California	Colorado	Idaho	Michigan	Minnesota	Nebraska	New York	North Dakota	Washington	Wyoming	Other	Total Production	% of Production
Navy			9.32%	43.64%	41.25%	2.38%		21.28%		5.25%	5.54%	4771	18.04%
Great Northern			8.51%		1.46%	63.16%		1.09%	3.75%	21.13%		2489	9.41%
Pinto		84.60%	37.35%	7.03%	20.58%	23.19%		69.54%	37.81%	71.13%	49.01%	10670	40.36%
Light red kidney	7.86%	9.75%	1.57%	6.91%	7.42%	8.39%	58.38%	0.00%	4.06%			1354	5.12%
Dark red kidney	4.05%		1.22%	4.41%	21.25%		6.42%	0.66%			9.63%	1017	3.85%
Large lima	20.71%											435	1.65%
Baby lima	26.10%											548	2.07%
Small white			1.69%									29	0.11%
Blackeye	15.71%									2.49%	1.06%	365	1.38%
Pink	0.33%		4.08%		3.54%			0.72%	16.25%		3.03%	367	1.39%
Small red			8.57%	2.74%					8.28%			313	1.18%
Cranberry	1.90%		1.46%	9.21%	0.29%							452	1.71%
Garbanzo	16.67%		23.89%					1.90%	18.44%		19.26%	1315	4.97%
Black	0.48%		1.40%	20.36%	2.38%	0.56%	21.79%	3.70%	5.00%			1341	5.07%
Others	6.19%	5.66%	0.93%	5.70%	1.83%	2.32%	13.41%	1.10%	6.41%		12.47%	974	3.68%