United States
Department of
Agriculture

Economic
Research
Service

**Commodity
Economics
Division**

Sorghum

Background for 1990 Farm Legislation

William Lin
Linwood Hoffman

It's Easy To Order Another Copy!

Just dial 1-800-999-6779. Toll free.

Ask for *Sorghum: Background for 1990 Farm Legislation (AGES 89-67).*

The cost is $11.00 per copy. For non-U.S. addresses (including Canada), add 25 percent. Charge your purchase to your VISA or MasterCard, or we can bill you. Or send a check or purchase order (made payable to ERS-NASS) to:

ERS-NASS
P.O. Box 1608
Rockville, MD 20849-1608.

We'll fill your order via 1st class mail.

Can You Use an Electronic Database?

Electronic databases containing the data in this report are available. These databases are in the form of Lotus 1-2-3 (Release 2) worksheet files on MS-DOS and PC-DOS compatible, 5.25-inch DDSD diskettes.

Write to the above address and ask for the *Feed Grain Yearbook* database (order #99007, two diskettes, $35) and the *Feed Grain Data by States* database (order #87013, four diskettes, $55). Non-U.S. addresses (including Canada), add 25 percent. **Or use our toll-free number, 1-800-999-6779.**

For further information on these databases, write Evelyn Blazer, Room 1228, 1301 New York Avenue, NW, Washington, DC 20005-4788 or phone 1-202-786-3306.

Sorghum: Background for 1990 Farm Legislation. By William Lin and Linwood Hoffman. Economic Research Service, U.S. Department of Agriculture. ERS Staff Report No. 89-67.

Abstract

U.S. sorghum acreage and use have trended down slightly since the early 1970's. Large sorghum harvests, greater corn and wheat feed use, and high foreign currency prices of sorghum helped raise U.S sorghum stocks in the early 1980's. Sorghum stocks buildup (especially CCC stocks) became more pronounced in the mid-1980's as a result of high yields and large harvests. Government payments to sorghum producers climbed from one-seventh of total sorghum returns above cash expenses in 1980 to three-fourths by 1987. Growth in U.S. sorghum demand will likely come from exports, mainly determined by U.S. and foreign government policies, growth in foreign incomes and livestock output, and export credit availability. Policy issues for 1990 legislation include the level and flexibility of price and income supports relative to corn, the buildup of sorghum CCC stocks, and policy effects on trade, the livestock sector, resources, consumers, and taxpayers. Corn and wheat policies usually have been major factors affecting the consequences of sorghum policy.

Keywords: Costs and returns, exports, farm programs, livestock feeding, program effects, sorghum

Foreword

Congress will soon consider new farm legislation to replace the expiring Food Security Act of 1985. In preparation for these deliberations, the Department of Agriculture and many groups throughout the Nation are studying the experience under the 1985 law and preceding legislation to see what lessons can be learned that are applicable to the 1990's. This report updates Sorghum: Background for 1985 Farm Legislation (AIB-475) by Keith Collins and William Lin. It is one of a series of updated and new Economic Research Service background reports for farm legislation discussions. These reports summarize in a nontechnical form the experience with various farm programs and the key characteristics of the commodities and the farm industries which produce them. For more information, see the Additional Readings listed at the end of the text.

Washington, DC 20005-4788 December 1989

Contents

Summary

Sorghum is second to corn in U.S. production of feed grains. Its production value was $1.2 billion in 1987, 2 percent of farm receipts from crops. During 1964-82, the number of farms producing sorghum fell from 249,000 to 106,900, while the acreage of sorghum harvested per farm rose from 45 to 126 acres. In 1982, farms harvesting sorghum averaged 457 acres of cropland. Farms with more than 1,000 acres of cropland, which accounted for 17 percent of farms growing sorghum, marketed 46 percent of all sorghum. Farms with fewer than 250 acres of cropland accounted for 33 percent of farms growing sorghum, but only 10 percent of sorghum production.

U.S. sorghum production is highly concentrated in the Central and Southern Plains. A declining share of sorghum acreage in Texas and Oklahoma over the past three decades coincided with gains in Kansas, Nebraska, and Missouri. Beginning in 1984, Kansas has surpassed Texas as the top sorghum-producing State. U.S. farmers planted 11.8 million acres of sorghum in 1987, down from 18.4 million averaged during 1970-74 and the 15.8 million averaged during 1977-80. Sorghum acreage in the Delta expanded sharply between 1982 and 1984, but dropped after 1985. Removing wheat base acres from production under the wheat program reduced the amount of cropland that can be double-cropped with sorghum.

Acreage planted in sorghum in the major producing States is inversely related to acreage planted in competing crops. In the late 1970's, drops in sorghum acreage were offset by increased wheat, cotton, and corn acreage. In Texas, winter wheat, corn, and cotton are the most important competitors of sorghum. In parts of Kansas and Nebraska, corn and soybeans compete with sorghum.

Increased yields largely explained the rise in sorghum production during 1950-72. Except in 1979 and 1981, growth of sorghum yields was negligible after the late 1960's. Also, a switch of irrigated sorghum acres to corn in response to corn's higher returns increased the proportion of lower yielding, dryland sorghum production.

The quantity of sorghum use trended upward from 1960 to 1973 and reached a record 935 million bushels in 1973/74: 690 million bushels for domestic use and 234 million for exports. Total use of sorghum declined sharply in 1974 and has fluctuated between 650 and 830 million bushels, with a slight downward trend, since then. Feeding to livestock and poultry accounts for about 98 percent of total domestic use. Sorghum is second only to corn in concentrate feed consumed by beef cattle. Sorghum feeding nearly doubled wheat feeding in 1987/88 as wheat prices relative to sorghum rose to 150 percent.

Since 1970, U.S. sorghum exports have fluctuated between 123 million bushels in 1971/72 and 330 million in 1979/80. About 30 percent of U.S. sorghum production was exported in 1987/88, primarily to Mexico, Japan, Israel, and Venezuela. Unlike the

corn market, the U.S. market share of world sorghum trade has been steadily declining, from a record 90 percent in 1950 to the present 45 percent. The loss of U.S. market share has been offset by increased exports from Australia and Argentina. U.S. sorghum exports tend to rise and fall with corn exports, as foreign demand and supplies of feed grains and high-protein feeds change. Because 45-50 percent of world sorghum use is as a food grain, conditions in the world food grain market also affect U.S. exports of sorghum. U.S. sorghum exports tend to change dramatically when the price of sorghum deviates from feed-value parity with corn.

Growth in total use of U.S. sorghum will likely depend on exports. Income growth in developed countries and rising meat consumption in developing countries will spur exports. Availability of credit in developing countries and competitiveness of U.S. prices--partly determined by the U.S. sorghum loan rate and the value of the dollar--will be important determinants of growth. With total U.S. use of grains and meals in the early 1980's about the same as in the early 1970's, total U.S. consumption of animal products growing slowly, and a large U.S. capacity to produce corn and wheat, domestic use of sorghum is likely to rise slowly.

Direct per acre cash expenses of growing sorghum have continued to increase, particularly between 1978 and 1981. The result has been financial distress for some sorghum producers during the intermittent periods of weak prices experienced since 1974. In real terms (1982 dollars), the returns above cash expenses per bushel during the period were the lowest in 1982. Since then the returns fluctuated, with a noticeable improvement in the 1987 crop year. Large commercial farms growing sorghum are on average more cost efficient than small farms; however, additional gains in efficiency are minimal once a farm reaches 500 to 1,000 acres of cropland.

Government programs for sorghum to enhance prices, support farm income, and periodically reduce surplus stocks have a 50-year history. Prior to the Agricultural Act of 1961, farmers planted sorghum in the wheat areas and the southwestern Corn Belt because allotments limited the acreage of crops such as wheat and corn. The 1961 legislation shifted the approach to voluntary programs that featured direct payments and acreage diversion. In the 1970's, programs shifted to a market orientation with more freedom allowed for farmer control over the production mix.

Set-aside, acreage reduction, cash diversion, and payment-in-kind programs have been used to reduce corn and sorghum acreage in 10 out of the 12 years beginning in 1978. The programs were ineffective in 1978 and 1982; acreage and stocks rose in both years. In 1983, the payment-in-kind program sharply reduced acreage, but stocks remained high. Because sorghum prices tend to parallel corn prices, prices of sorghum strengthened with corn following the 1983 drought, despite large sorghum stocks. The weaker prices contributed to higher program participation and lower sorghum plantings in 1986 and 1987. High sorghum yields in

the mid-1980's, however, contributed to the buildup of sorghum stocks, to the point where carryover stocks were sufficient to meet the overall demand for domestic use and exports. Wheat and corn programs can affect the outcome of sorghum programs.

The sorghum program has supplemented the incomes of sorghum producers. Direct payments to producers were 15 percent of net returns above cash expenses in 1980, but 84 percent in 1987. Because payments are based on production, the largest 10 percent of farms which account for about two-fifths of sorghum acreage received 37 percent of deficiency and disaster payments in 1982. The average payment was about $2,650, compared with the U.S. average of $715.

Consumers are affected by sorghum programs primarily through their purchases of meat and poultry. Sorghum accounts for about a tenth and feed grains about a quarter of the costs of feeding out a steer for slaughter in the Great Plains. Changes in sorghum and feed grain prices can cause changes in livestock production which can persist for up to several years.

Net expenditures on sorghum programs are taxpayer costs. These expenditures have risen during the last several years, reaching a record $1.2 billion during fiscal year 1987. Expenditures per bushel produced were $1.26 in 1986, $1.62 in 1987, and $1.32 in 1988.