California sugarbeet growers respond quickly to price

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The U. S. sugar industry has been subject to substantial price variability since Congress voted not to extend the Sugar Act on June 5, 1974. That vote ended over 40 years of economic protection for the domestic industry and moved price determination from government formula to market forces, effective January 1, 1975. After reaching record highs in late 1974, U. S. sugar prices declined during 1975, 1976, and 1977 to levels below production costs for many producers. A number of beet sugar processing plants closed and farmers switched from beets to other crops. To date, repeated industry efforts have failed to produce long-term domestic legislation for sugar that is independent from other agricultural commodities as was the Sugar Act of 1948.

The U. S. government responded to low sugar prices under provisions of the Food and Agriculture Act of 1977, with tariffs, duties, import fees, a sugar loan program, and direct producer payments. Without these actions, domestic returns would have been lower and acreage reductions greater than was the case. Reductions in world sugar supplies led to increasing world and domestic sugar prices in 1979 and early 1980. As a result, the U. S. import duty on raw sugar was reduced from 2.8125 cents per pound to the legal minimum of 0.625 cent per pound effective February 1, 1980.

Sugarbeets are a major source of domestic sugar, accounting for about 30 percent of 1978 U. S. sugar consumption. This share has varied from 27 to 35 percent since 1974. Because sugarbeets are an annual crop, growers can respond quickly to changing price relationships between beets and alternative crops. U. S. sugarbeet harvested acreage decreased from over 1.5 million acres in 1975 to 1.17 million acres in 1979, a 26 percent reduction. The decrease varies by region depending on alternative crops available and other factors. In California, where there are a number of alternative crops, harvested sugarbeet acreage decreased 37 percent from 326,000 acres in 1975 to 206,000 acres in 1979.

Accurate empirical estimates of the impact of factors affecting sugarbeet acreage and production are needed to assess alternative policy actions and changing economic conditions. This article summarizes results of an economic study of U. S. and California sugarbeet acreage response. Acreage for nine California districts is projected to 1990 under alternative assumptions regarding annual changes in the prices of sugar and of competing crops. We also project district acreages given sugar prices ranging from 19 to 30 cents per pound.

Many factors can influence a producer's decision to allocate acreage between sugarbeets and alternative crops. Our basic approach follows that of other studies of acreage or production response for annual crops. In the model specified and estimated, planted acreage of sugarbeets for each California district and year is a function of the expected price of sugarbeets, expected prices of alternative crops, acreage allotments, processing capacity, and technological change. Attempts to include variables for crop rotation practices, input costs, and risk were generally unsuccessful.

Previous research specifically related to sugarbeet acreage response has incorporated information on other field crops. This practice was followed for the California study after attempts to include vegetable crops proved unsatisfactory. The district-specific prices of alternative crops are expressed as functions of the policy target prices of the Food and Agriculture Act of 1977 for crops under its provisions.

The district designations and the alternative crops selected for inclusion in the analysis on the basis of econometric results are shown in table 1. Prices for crops included were often highly correlated with...
prices for other crops in the region. When this occurred, the crop that provided the best statistical results was chosen.

**Estimation and projections**

Acreage response equations were estimated for each of nine California districts. Over 40 equations were estimated and linked together to form the complete model, which was then used to project sugarbeet acreage and beet sugar production. The model was verified over the period of estimation with very good results.

California’s nine sugarbeet producing districts have different estimated elasticities of acreage response, with respect to both the price of sugarbeets and prices of alternative crops. Thus, sugar and alternative crop price changes have differential regional impacts. Our results suggest that changes in the price of sugar would lead to larger percentage impacts in districts with significant differences in absolute impacts. Decreasing relative real prices for sugar, as in alternatives 5, 8, and 9, could result in plant closings, which could lead to further acreage reductions.

Another calculation that may be of interest is the regional acreage under alternative sugar prices, given 1976 market conditions. The price of refined beet sugar (wholesale, Chicago-West) was varied from 19 to 30 cents per pound and acreage projections were made for each district (Table 3).

**Summary**

California producers respond quickly to changes in the price of sugarbeets relative to alternative crops. The magnitude of the response also varies by district within California. The simulation results indicate that California sugarbeet acreage will increase with constant or increasing real prices for sugar if the real price of sugar increases relative to real prices for alternative crops. Any increase in alternative crop prices relative to sugar prices will result in reduced California sugarbeet acreage.

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