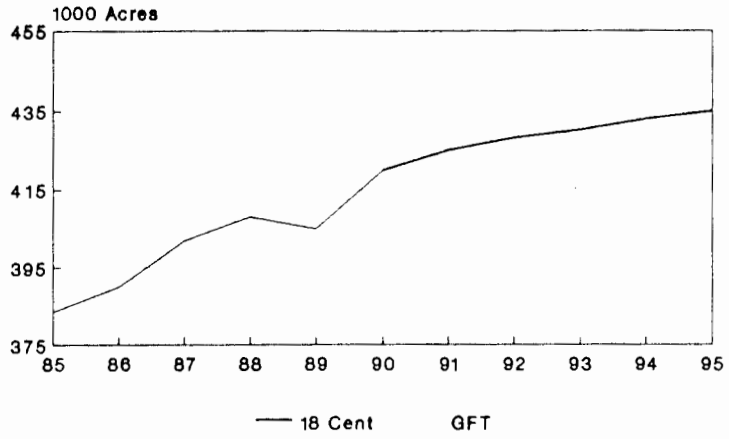
CHART 5

U.S. Sugar Cane Acreage
Florida



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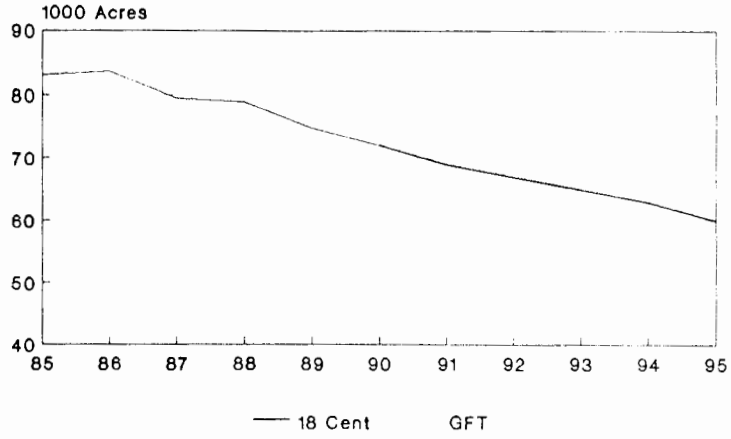
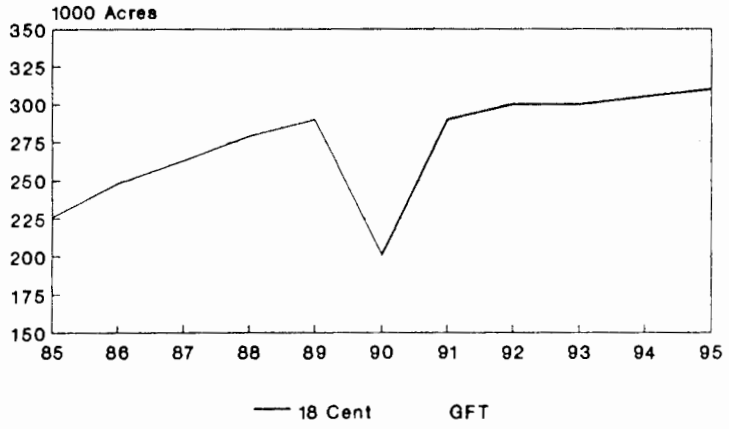
U.S. Sugar Cane Acreage
Hawaii



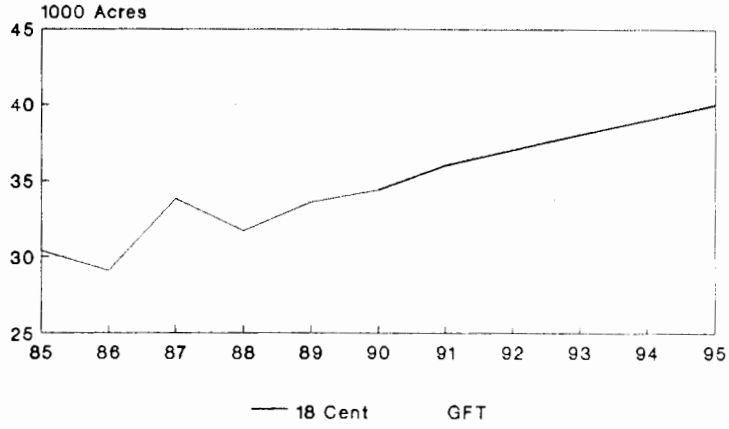
Commodity Information, Inc.

U.S. Sugar Cane Acreage
Louisiana



Commodity Information, Inc.

U.S. Sugar Cane Acreage
Texas



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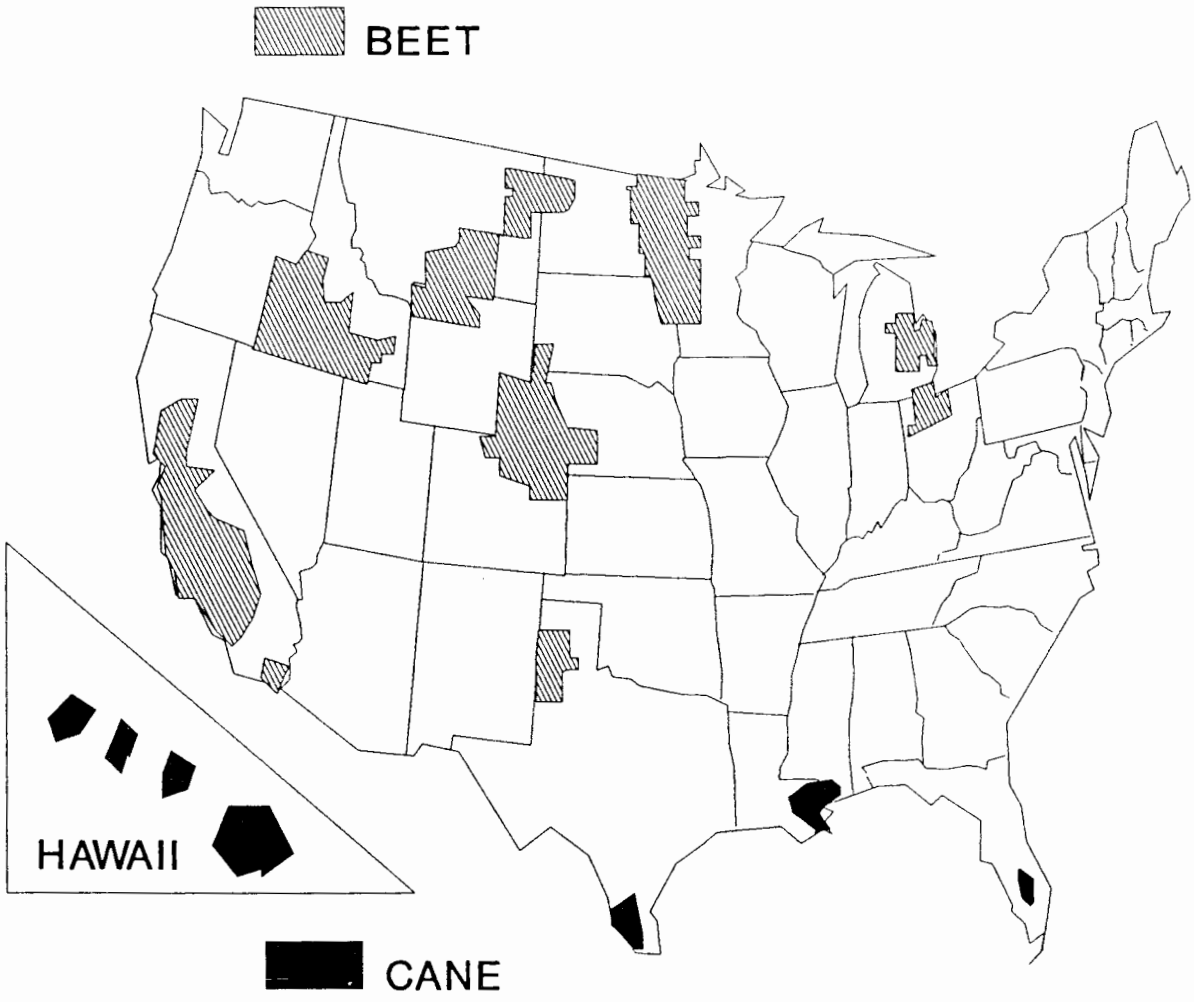
U.S. SUGAR
1991 - 1995
SPECIAL REPORT



March 12, 1991

EXECUTIVE SUMMARY

Beet Sugar Production Costs

The analysis in the report reveals that beet sugar production is a profitable venture in most beet regions of the country. The Red River Valley, the Mountain States and the Northern Plains can produce refined sugar at a total cost of 16-18 cents unless weather conditions are quite adverse. Total beet sugar production costs in the U.S. is in the 18-20 cent range given "normal" weather. All beet regions except Texas and California produce white sugar for 21 cents or less. The high cost beet sugar producer is Texas where total costs have been in the 24-27 cent range. California produces beet sugar at a cost of 22-24 cents barring adverse weather.

Cane Sugar Production Costs

It costs as much in 1986 and 1987 to produce raw sugar from cane as it did for the beet industry to produce refined beet sugar. Louisiana, the low cost producer, averages 17-18 cents in producing raw sugar versus the 16-18 cent cost of producing refined beet sugar in the efficient regions.

Texas and Hawaii are the high cost producers of cane raws. During the best years, production costs are 19-21 cents while costs soar to 30 cents or more if weather is unfavorable.

Beet Acreage, Yields and Production Prospects, 1991-1995

An analysis of recent trends plus discussions with beet sugar executives indicate that acreage and yields will continue to increase modestly during the next five years if price supports continue at 18 cents. Acreage has peaked in the Red River Valley

TABLE ES-1
U.S. SUGAR PRODUCTION COSTS*
BEET AND CANE
BY GEOGRAPHICAL AREA
1983 - 1989
(CENTS/LB.)

	1983			1987			1989		
		Total			Total			Total	
	Variable	Ex Land	w Land	Variable	Ex Land	w Land	Variable	Ex Land	w Land
BEET SUGAR (Refined)									
Eastern	13.0	20.2	22.2	10.9	16.8	18.2	11.5	19.9	21.8
Red River Valley	13.2	20.4	22.0	8.9	14.1	15.6	12.9	22.7	24.8
So. Plains	15.4	21.0	23.0	12.5	17.2	19.8	14.2	20.4	24.0
Texas	21.8	28.6	30.4	18.0	22.5	23.8	22.2	29.2	32.5
No. Plains	15.8	21.2	23.8	10.5	14.1	16.6	13.0	18.7	21.5
Mountain States	13.3	17.8	19.9	10.0	13.9	16.0	13.6	19.4	22.8
California	17.2	22.3	24.6	15.3	19.5	21.7	16.4	21.5	23.9
Total U.S. Beet	14.6	20.6	22.6	11.3	16.0	18.0	14.1	21.2	23.9
CANE SUGAR (Raws)									
Florida	13.2	18.0	20.3	12.1	16.2	18.6	13.8	18.5	21.3
Louisiana	12.0	17.8	20.0	10.1	15.0	17.3	9.4	14.9	16.7
Texas	19.6	28.9	31.6	12.6	17.5	19.4	20.8	28.2	30.5
Hawaii	17.1	22.6	23.7	14.8	19.5	20.5	16.4	21.5	22.4
Total U.S. Cane	14.5	19.8	21.7	12.5	17.0	18.9	13.9	19.1	21.0

Source: 1983-1989: USDA, ERS.

and will stagnate or decline in California, but area devoted to beets will increase moderately in the Plains, the Mountains and Michigan/Ohio. If the current price support program continues, beet acreage will increase 0.5 percent per year through 1995 and beet production will increase from 3.76 million STRV in 1990 to 4.30-4.40 million by 1995. Most of the rise will come in the Plains, the Red River Valley and the Mountains.

If the GATT Fast Track negotiations lead to a reduction of sugar price supports to the 14.4-14.5 cent range (raw sugar), beet acreage will decline 1.7 percent per annum and sugar beet production will stagnate near 3.80 million STRV. California will experience large acreage reductions (to 100,000 or less) and the state's beet sugar output will drop to 350,000 tons -- 175,000 tons below the expected 1991 total. Production will increase in the Red River Valley and the Mountains, but stagnate in other regions.

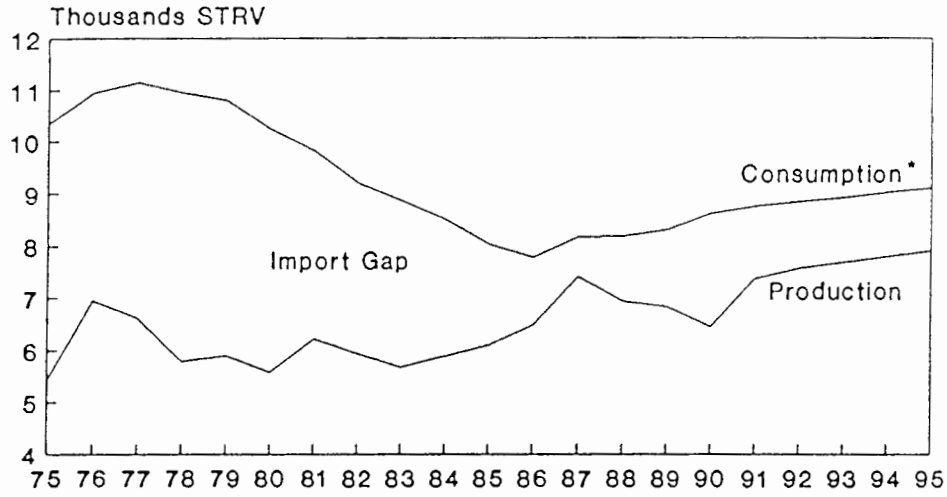
Cane Acreage, Yields and Production Prospects, 1991-1995

Cane sugar production in the U.S. will rise from the freeze-stricken level of 3.03 million STRV in 1990 to 3.60 million by 1995 if the 18 cent loan rate continues. Louisiana will increase from the freeze-reduced 446,000 in 1990 to 930,000 by 1995. Florida will increase from 1.68 million this year to 1.80 million in five years time. Texas' production will also increase from 100,000 tons in 1991 to 130,000 five years later.

The only cane state which will lose output is Hawaii. Hawaiian acreage and output will continue their long-term downtrends. Under an 18 cent scenario, output will decline from 820,000 this year to 730,000 by 1995. A 14.4 cent loan rate will

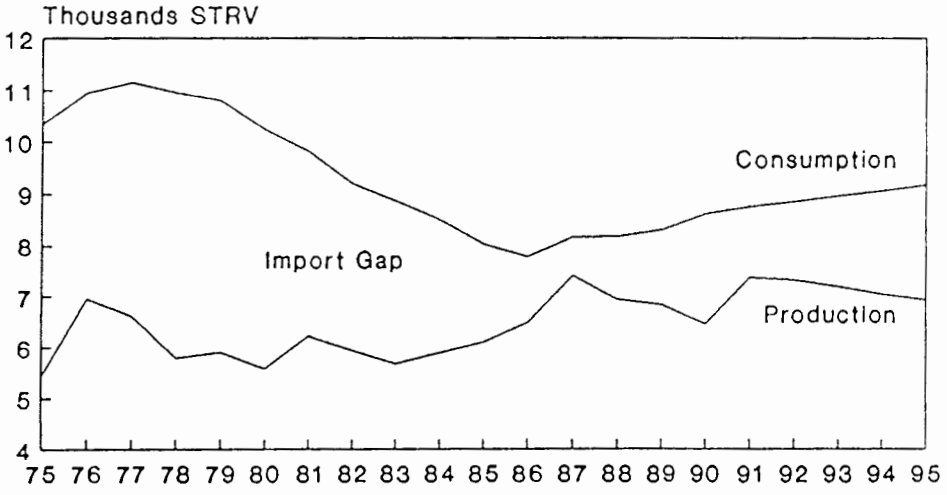
CHART ES-1

U.S. Sugar
Production & Consumption
1975 - 1995 (18 Cent Support)



Commodity Information, Inc.
•Cons. Includes non-trad. use.

U.S. Sugar
Production & Consumption
1975 - 1995 (GATT Fast Track)



Commodity Information, Inc.
•Cons. Includes non-trad. use.

TABLE ES-2

U.S. SUPPLY/DEMAND
BEET AND CANE
1985 - 1995
(000 STRV)

Crop Year*	------PRODUCTION------ Beet	Cane	Total	----CONSUMPTION--- Fiscal Year	Non-Trad+ Residual	PROD'N LESS USE
1985	3000	3098	6098	8035	198	-2135
1986	3416	3066	6482	7786	279	-1583
1987	3998	3410	7408	8167	41	-800
1988	3512	3429	6941	8188	85	-1332
1989	3490	3350	6840	8309	-24	-1445
1990	3442	3028	6470	8570	50	-2150
	18 Cent Support			Consumption Growth = 1.0% after 1991		
1991	3950	3415	7365	8700	50	-1385
1992	4080	3525	7605	8787	50	-1232
1993	4200	3525	7725	8875	50	-1200
1994	4275	3570	7845	8964	50	-1169
1995	4355	3590	7945	9053	50	-1158
	GATT FAST TRACK (14.5 Cent Loan Rate in 1992)			Consumption Growth = 1.25% after 1991		
1991	3950	3415	7365	8700	50	-1385
1992	3935	3400	7335	8809	50	-1524
1993	3915	3290	7205	8919	50	-1764
1994	3845	3195	7040	9030	50	-2040
1995	3795	3100	6895	9143	50	-2298

* Crop Year September/August

Source: 1985-1989: USDA, ERS.
1990-1995: Commodity Information, Inc.

reduce Hawaiian production to 600,000 tons.

If the Administration is successful in negotiating a 3.5 cent reduction in U.S. sugar support prices, U.S. cane sugar output will drop from 3.42 million STRV in 1991 to 3.10 million by the middle of the decade.

Production, Consumption and Import Prospects, 1991-1995

Chart ES-1 and Table ES-2 illustrate the production, consumption and import prospects for 1991-1995 given the 18 and 14.5 cent scenarios. Assuming 1 percent annual growth in domestic sugar usage if support prices remain at 18 cents, the import gap drops from 1.385 million STRV in 1991/2 to 1.158 million by 1995. The gap drops below 1.250 million in 1992/3 which will cause marketing controls to be implemented. In 1992 and 1993, the marketing constraints will act on less than 50,000 tons of potential production. It is probable that one or two cane and beet companies would constrain acreage in order to keep inventories from building.

Given a 14.4-14.5 cent support price, consumption outpaces sugar production and import requirements increase from 1.385 million in 1991/2 to 2.30 million by 1995/6. Output declines below 6.90 million tons in 1995 while usage approaches 9.20 million.

U.S. SUGAR PROSPECTS
1991-1995

Merrill J. Bateman[1]

INTRODUCTION

The purpose of this report is to analyze the different paths that beet and cane sugar production will take within the United States given two different government price support scenarios. The first scenario assumes that the loan rate for raw sugar will remain at 18 cents. The second assumes that the support price for raw cane sugar will drop to 14.4 cents as a result of the "GATT Fast Track" negotiations. In addition to the production forecast, the report also projects consumption through 1995, given the two output and price scenarios.

Production and processing costs are key to the sugar production forecasts. The beet and cane regions whose production costs are below the price supports (whether 18 or 14.4 cents) will continue to produce sugar unless competing crops provide larger returns; those regions with variable costs below price support levels, but with total costs greater than the support, will experience a slow decline in output. Finally, those regions where both variable and total costs are above the support level will decline more rapidly.

In addition to the cost analysis, an informal survey of beet and cane executives was undertaken to learn their views of future changes ir acreage, farm yields, recovery rates and capital expenditures at the farm and processing level. Most of the beet

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[1] President, Commodity Information, Inc.

processing companies and cane operations have invested heavily in recent years to lower production costs by increasing beet and cane sugar content and the efficiency of the recovery process. In most cases, capital expenditure programs will continue subject to expected returns.

The report begins with the regional analysis of production costs for beet sugar (refined) and cane sugar (raw). Seven beet and four cane areas are examined. The section that follows reviews beet and cane acreage and yield trends by region and uses the cost information plus the informal survey to forecast acreage, yields and sugar production through 1995. Two sets of forecasts are given -- one for an 18 cents loan rate and one for 14.4 cents.

The final section of the report combines the production forecasts with two potential consumption paths to determine the import gap that will likely prevail at the two support levels. The report concludes with a summary of the findings.

U.S. SUGAR PRODUCTION COSTS

Average U.S. sugar production costs mask significant regional cost differences for both beet and cane. The government's price support program allows beet and cane to be grown in a number of different geographical areas and weather regimes. Consequently costs vary significantly from one region to another.

The cost data used in this analysis is that collected by the Economic Research Service (ERS) of the USDA. The unit has conducted cost surveys since the 1970's. The latest cost data

available is for 1989.[2]

Five years of variable and total production cost data are examined in the report, the years are 1983 and 1986-1989. The 1986 data is a year in which "normal" weather occurred. 1987 is a bumper crop year in which ideal conditions existed across the United States. The 1983, 1988 and 1989 crops experienced major weather problems ranging from drought in the Red River Valley to freezes in the Plains, California, Florida, Texas and Louisiana plus hot temperatures in the West. Adverse weather during the last two years masks a decline in production costs that is occurring as a result of the investments made in both beet and cane. After examining actual costs, cost projections will be take into account more normal weather.

U.S. BEET SUGAR COSTS BY REGION

Table 1 presents variable and total production cost data for U.S. beet and cane sugar by region or state. The USDA divides the country into eight beet regions when collecting grower costs and two beet regions in assembling processor information. The analysis in Table 1 combines the two Idaho regions into one because grower costs are reasonably similar and one company processes all of the beet. Consequently, the analysis in this paper presents costs for seven beet regions.

Variable Beet Production Costs (See Tables 1-2, Chart 1)

As noted earlier, the 1983 crop was affected by adverse

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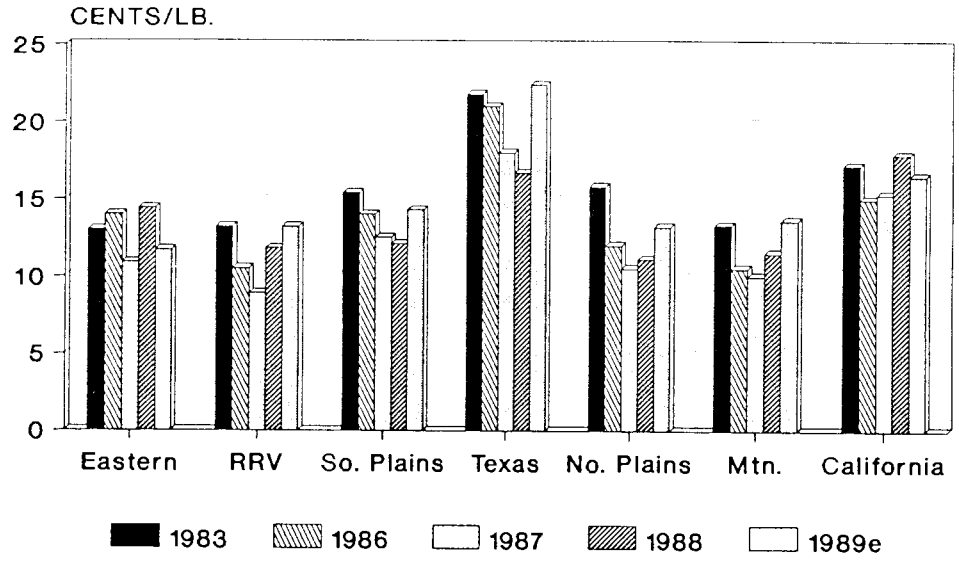
[2] Farm production cost data has been finalized for 1989. Preliminary estimates are available for processing costs.

CHART 1

U.S. Beet Sugar

Variable Production Costs



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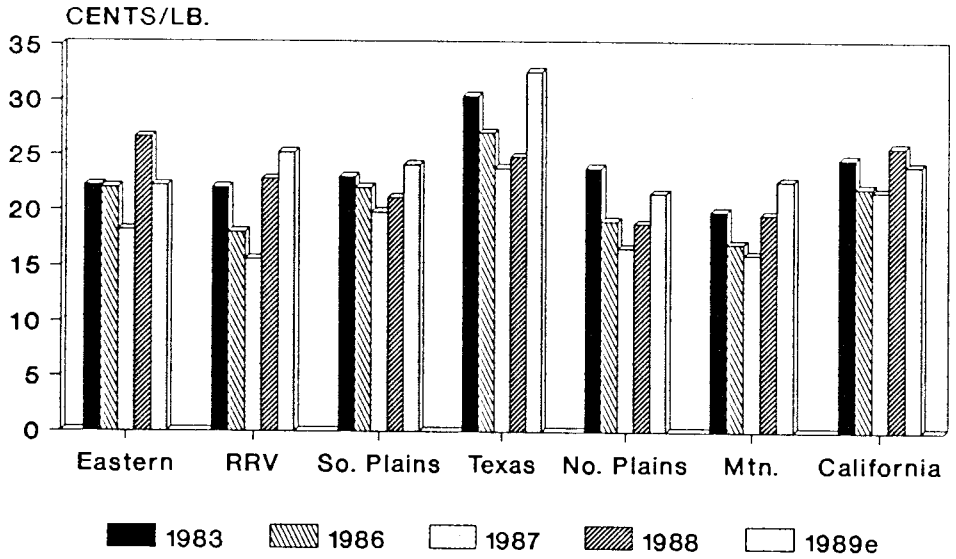
U.S. Beet Sugar

Total Production Costs



Commodity Information, Inc.

TABLE 2
U.S. SUGAR PRODUCTION COSTS
NORMAL AND ADVERSE WEATHER
1990

	------Normal------		------Adverse-----	
	Variable	Total	Variable	Total
BEET SUGAR (Refined)				
Eastern	10-11	18-19	12-13	22-23
Red River Valley	9-10	15-16	12-13	23-25
So. Plains	12-15	19-20	14-15	22-24
Texas	17-18	23-24	20-22	30-32
No. Plains	10-11	16-17	13-14	22-23
Mountain States	9-10	15-16	13-14	22-23
California	15-16	21-22	16-17	23-25
Total U.S. Beet	11-12	18-19	14-15	22-24
CANE SUGAR (Raws)				
Florida	11-12	18-19	13-14	21-22
Louisiana	9-10	16-17	12-13	20-21
Texas	12-13	18-19	20-21	30-31
Hawaii	14-15	20-21	16-17	22-24
Total U.S. Cane	12-13	18-19	14-15	21-23

Source: Commodity Information, Inc. forecasts based on USDA, ERS data for 1983-1989 costs.

TABLE 1
U.S. SUGAR PRODUCTION COSTS*
BEET AND CANE
BY GEOGRAPHICAL AREA
1983 - 1989
(CENTS/LB.)

	1983			1987			1989		
		Total			Total			Total	
	Variable	Ex Land	w Land	Variable	Ex Land	w Land	Variable	Ex Land	w Land
BEET SUGAR (Refined)									
Eastern	13.0	20.2	22.2	10.9	16.8	18.2	11.5	19.9	21.8
Red River Valley	13.2	20.4	22.0	8.9	14.1	15.6	12.9	22.7	24.8
So. Plains	15.4	21.0	23.0	12.5	17.2	19.8	14.2	20.4	24.0
Texas	21.8	28.6	30.4	18.0	22.5	23.8	22.2	29.2	32.5
No. Plains	15.8	21.2	23.8	10.5	14.1	16.6	13.0	18.7	21.5
Mountain States	13.3	17.8	19.9	10.0	13.9	16.0	13.6	19.4	22.8
California	17.2	22.3	24.6	15.3	19.5	21.7	16.4	21.5	23.9
Total U.S. Beet	14.6	20.6	22.6	11.3	16.0	18.0	14.1	21.2	23.9
CANE SUGAR (Raws)									
Florida	13.2	18.0	20.3	12.1	16.2	18.6	13.8	18.5	21.3
Louisiana	12.0	17.8	20.0	10.1	15.0	17.3	9.4	14.9	16.7
Texas	19.6	28.9	31.6	12.6	17.5	19.4	20.8	28.2	30.5
Hawaii	17.1	22.6	23.7	14.8	19.5	20.5	16.4	21.5	22.4
Total U.S. Cane	14.5	19.8	21.7	12.5	17.0	18.9	13.9	19.1	21.0

Source: 1983-1989: USDA, ERS.

weather. The crop was planted late in most areas largely because of a cold, wet spring, and yields never reached normal levels. Sucrose recovery fell from 13.1 percent per ton in 1982/83 to 12.3 percent in 1983/84. As a result, variable and total costs in 1983 were on the high side. In contrast, weather was ideal in 1987. Greenhouse conditions existed in most regions. High beet yields and good sucrose content reduced costs below those normally experienced. Finally, weather was mixed in 1989. Drought conditions existed in the Red River Valley, the Idaho/Oregon crop was planted late, and high summer temperatures lowered sugar content in a number of areas.

Variable production costs for U.S. refined beet sugar dropped from 14.6 cents per pound in 1983 to 11.3 cents in 1987 and then rose to 14.1 cents in 1989. The low variable cost producer during the two poor yield years was the Eastern Region with 13 cents in 1983 and 11.5 cents in 1989. The low variable cost producer in 1987 was the Red River Valley at 8.9 cents. The data indicates that Texas is the highest cost producing beet region with variable costs ranging from 18 cents in the best year to 22.2 cents in 1989.

Table 2 divides cost data into two sets -- "Normal" weather and "Adverse" conditions. The most efficient regions from a variable cost standpoint are the two eastern areas (Michigan/Ohio and Red River Valley) and the two northern areas (Northern Plains and Mountains). During the years of good weather, variable costs are in the 9-11 cent range and during adverse weather, variable costs were 12-14 cents.

Beet Sugar Production Costs (Tables 1-2, Chart 2)

Total production costs for beet sugar range from the Red River Valley's 15.6 cents in 1987 to 32.5 cents for Texas in 1989 -- a wide range. The most efficient areas from a total cost perspective are the four low variable cost regions (Eastern, Red River Valley, Northern Plains and Mountains). During good weather, total production costs for these areas are in the 15-16 cent range; and during adverse weather, costs rise to 19-22 cents.

California and Southern Plains are in the middle of the pack with costs during better-yielding years in the 21-22 cent range and near 24 cents during the off-years. The beet operation in Texas is the high-cost producer in the three years shown in Tables 1 and 2 and in all five years shown in Chart 2 with total costs fluctuating in the 23.8-32.5 cent range.

U.S. CANE SUGAR PRODUCTION COSTS BY STATE (Tables 1-2, Charts 3-4)

The low cost raw cane sugar producer is Louisiana with variable costs in the 9-10 cent range in good years and 12 cents or more in periods of bad weather. Total production costs in Louisiana are 16-17 cents with favorable growing conditions and 20 cents or more if a freeze occurs.

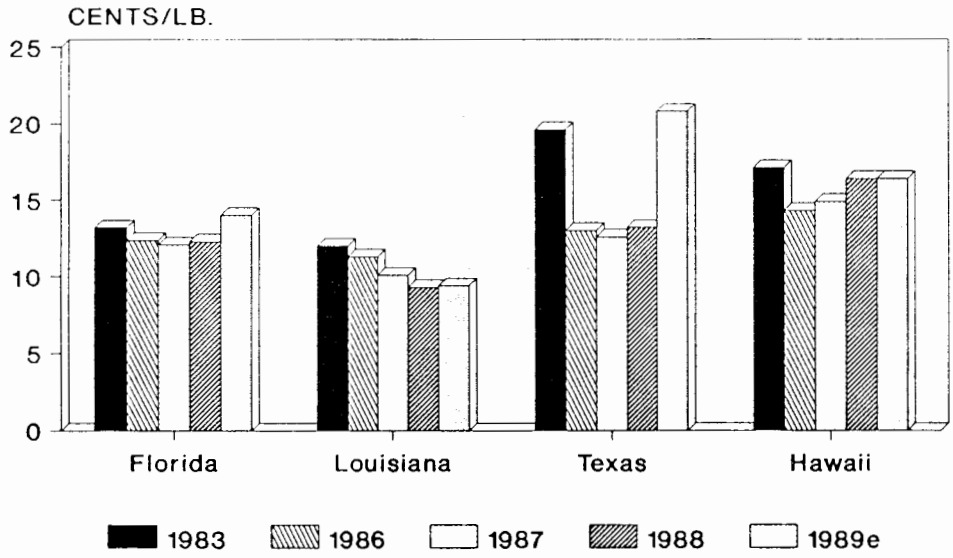
Florida's variable production costs varied from 12 to 14 cents while total costs were 18.6 to 21.3 cents. The high cost year was 1989 when the Florida crop was hit by the December freeze and production fell from an expected 1.600 million tons to 1.399 million.

Production costs in Texas also experienced a wide range because of the 1983 and 1989 freezes. In these two years, variable

CHART 2

U.S. Cane Sugar

Variable Production Costs



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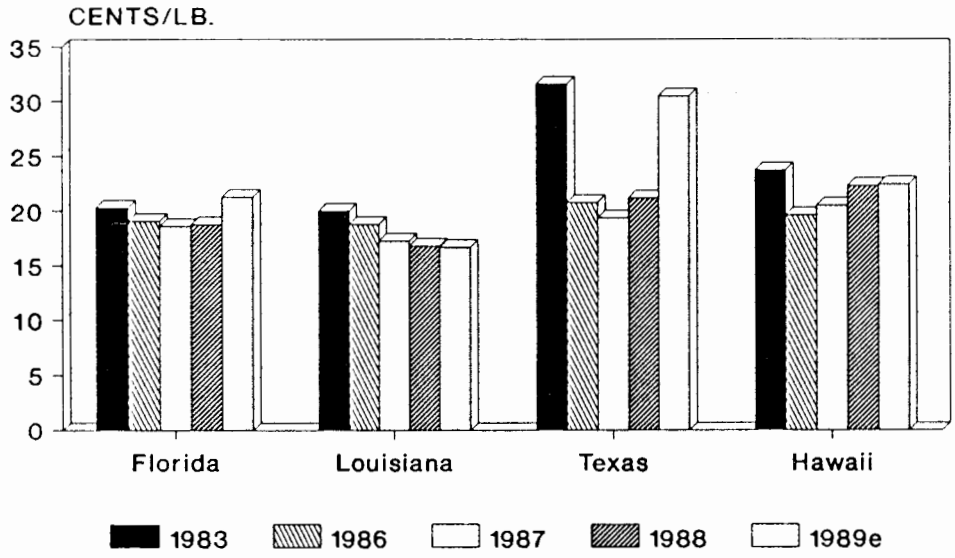
U.S. Cane Sugar

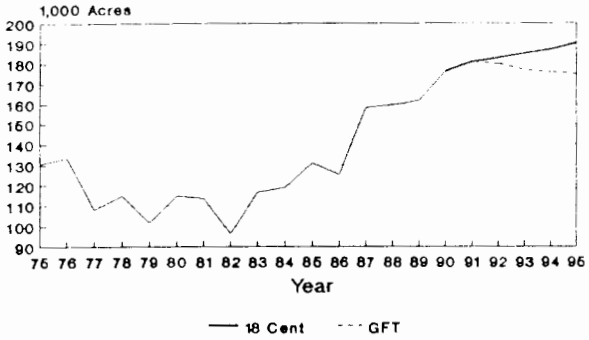
Total Production Costs



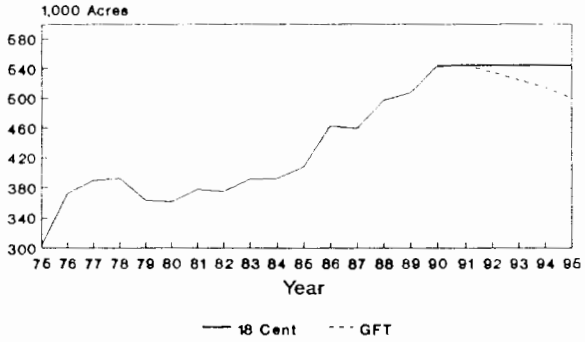
Commodity Information, Inc.

CHART 3

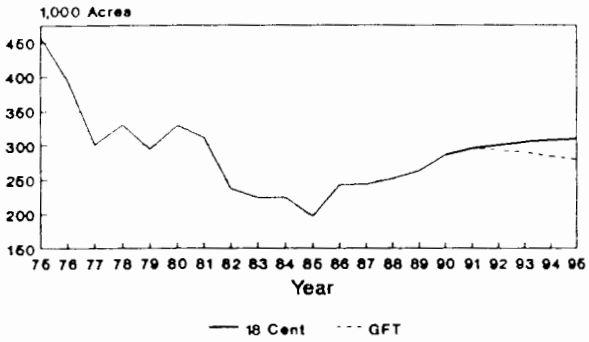
U.S. Sugar Beet Acreage
Eastern



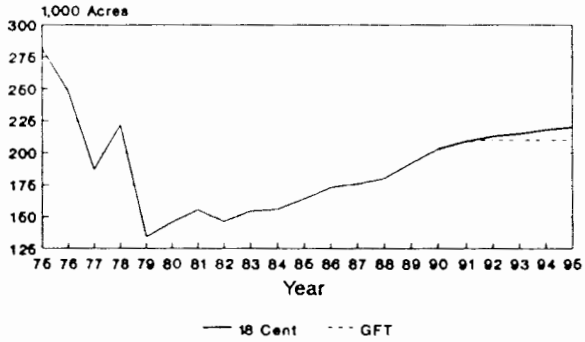
U.S. Sugar Beet Acreage
RRV



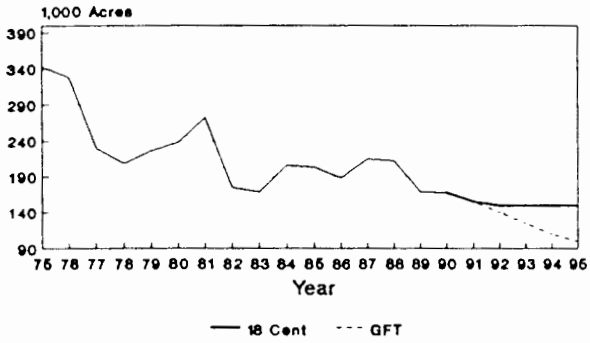
U.S. Sugar Beet Acreage
Plains



U.S. Sugar Beet Acreage
Mountain



U.S. Sugar Beet Acreage
California



U.S. Sugar Beet Acreage
TOTAL

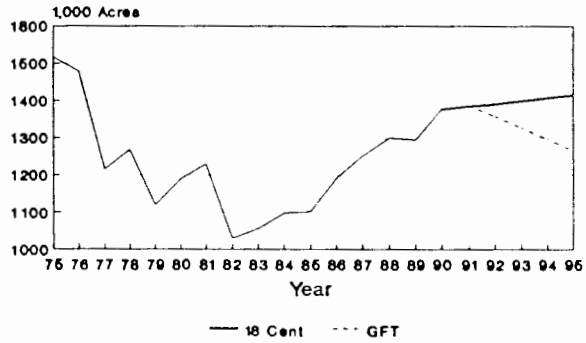
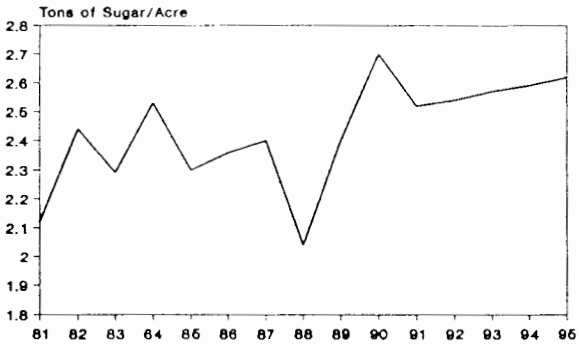


CHART 4

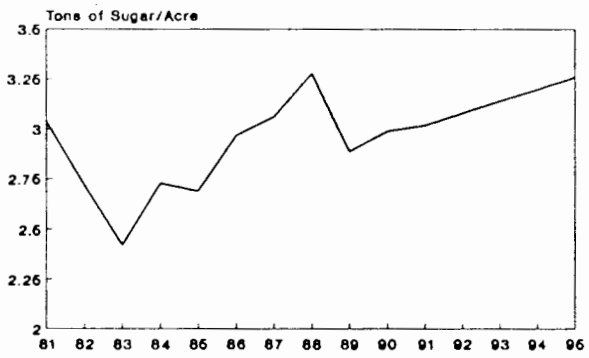
U.S. Sugar Beet Yields

Eastern Region



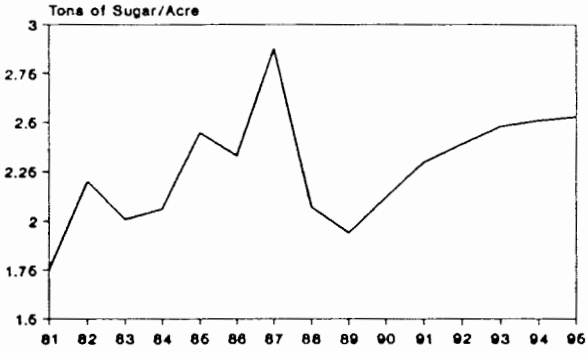
U.S. Sugar Beet Yields

Plains Region



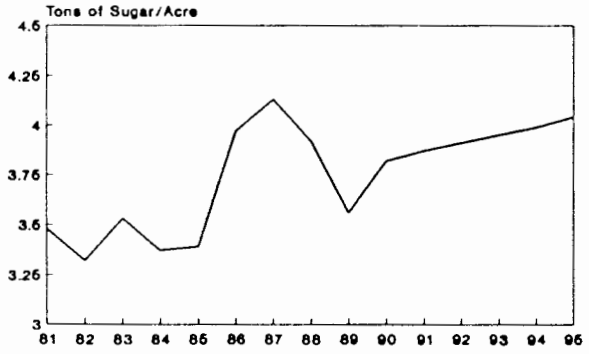
U.S. Sugar Beet Yields

Red River Valley



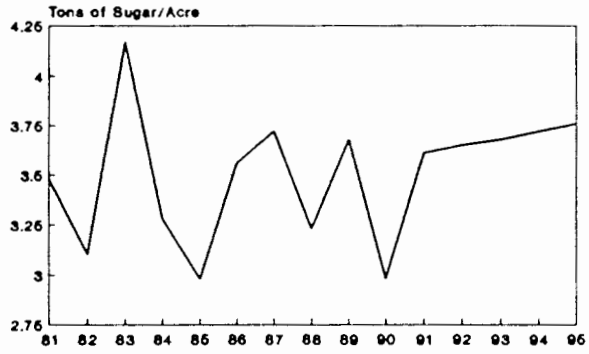
U.S. Sugar Beet Yields

Mountain Region



U.S. Sugar Beet Yields

California



costs were near 20 cents with total costs above 30 cents. In 1987, good weather reduced variable costs to 12.6 cents and total costs below 20 cents.

Hawaiian costs are more stable than other regions primarily because freezes do not occur. Variable production costs fluctuate between 15 and 17 cents while total costs are in the 20-23 cent range.

COMPARISON OF BEET AND CANE SUGAR PRODUCTION COSTS

Generally speaking, the cost of producing refined beet sugar in the United States is approximately the same as the cost of producing raw cane sugar. Variable costs for producing white beet sugar range from 9 to 22 cents (with all regions except Texas in the 9-16 cent range). Variable costs for raw cane sugar range from 8 to 21 cents (with all states except Texas in the 9-17 cent range).

Total beet sugar production costs for all regions but Texas are 16-24 cents with Texas in the 24-32 cent range. Total cane sugar costs are 17-22 cents for most states with Texas ranging from 19 to 30 cents.

The U.S. is one of the few countries where beet sugar is produced at less expense than domestic cane sugar. Another 5 to 7 cents must be added to cane raws to obtain refined cane sugar. Consequently, U.S. beet sugar is approximately 25%-30% cheaper to produce (18-21 cents versus 22-25 cents).