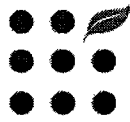


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Sugar Backgrounder

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Contents

Introduction.....	2
Production.....	6
Sugar and Competing Sweeteners: Deliveries and Consumption.....	31
Domestic Price Support, Marketing Allotments, and Sugar Trade Policies.....	41
Appendix I—An Income Support Alternative for Sugar?.....	51
Appendix II—Farm Profile.....	54

Approved by USDA's
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Abstract

The sugar title in the 2007 Farm Bill will determine how U.S. sugar policy is to be conducted. Currently, the U.S. sugar program uses domestic marketing allotments, price supports, and tariff-rate quotas to influence the amount of sugar available to the U.S. market. The program's effect has been to support U.S. prices of sugar at levels above world market levels. U.S. sugar users maintain that keeping U.S. sugar prices higher than world levels has made U.S. sugar manufacturers increasingly uncompetitive in domestic and export markets and that a new approach to sugar policy is needed. Also, the U.S. sugar program's effectiveness will be challenged in 2008 when all sweetener trade restrictions with Mexico are removed as part of the North American Free Trade Agreement. This report on the U.S. sugar sector places into context the challenges facing sugar producers, users, and policymakers in the United States, including description and analysis of farm-level production of U.S. sugar crops, cane and beet sugar processing and refining industries, imports and exports of sugar, sugar consumption, and U.S. sugar policy issues likely to be important in the 2007 Farm Bill.

Keywords: Sugar, sugarcane, sugarbeets, U.S. sugar program

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Introduction

The United States is one of the world's largest sugar producers, ranking high in the second tier of sugar-producing countries, with less production than China but more than Thailand or Mexico (table 1). Unlike most other producing countries (China being an exception), the United States has large and well-developed sugarcane and sugarbeet industries. The United States also has the world's largest corn-based sweetener industry. If the production of high fructose corn syrup were added to the sugar total, U.S. production of the combined sweeteners would be over 16.4 million tons, raw sugar equivalent basis.

Although the United States is an important sugar producer, sugar crop production accounts for a relatively small part of total agricultural output. The value of the combined 2004 sugarbeet and sugarcane crop was \$1.93 billion. This amount constituted about 2.4 percent of the all U.S. field and miscellaneous crop values in 2004 (table 2). Its value was higher than some crops such as tobacco, rice, and peanuts, but much less than other crops such as corn, soybeans, wheat, and cotton (fig. 1)

Table 1 -- World sugar production, average 2000/01 - 2004/05

Country/region	Production (1,000 metric tons, raw value)
Brazil	23,177
Western Europe, including EU-15	18,679
India	18,491
China	9,419
United States	7,552
Thailand	6,197
Sub-Saharan Africa, excluding South Africa	5,630
Mexico	5,419
Australia	4,970
Middle East	4,801
Central America	3,773
Caribbean	3,496
Pakistan	3,406
South America, excluding Argentina, Brazil, and Colombia	3,192
South Africa	2,658
Colombia	2,544
Philippines	2,071
Eastern Europe	1,855
Indonesia	1,812
Russian Federation	1,788
Argentina	1,706
Ukraine	1,701
Japan	847
Others	4,147
World total	139,333

Source: USDA, Foreign Agricultural Service, PSD Database.

Table 2 – U.S. field and misc. crop values in 2004

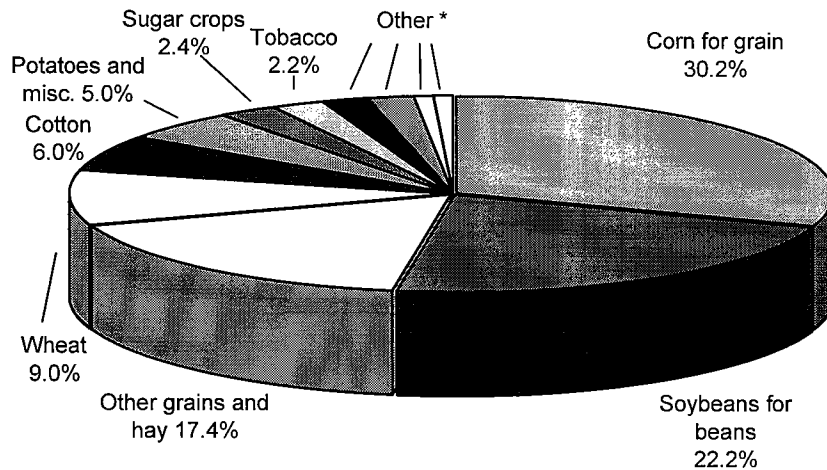
Crop	Value	Amount of total
	<i>Million dollars</i>	<i>U.S. crops</i> <i>Percent</i>
Corn for grain	24,381	30.22%
Soybeans for beans	17,895	22.18%
Other grains and hay	14,001	17.36%
Wheat	7,283	9.03%
Cotton	4,854	6.02%
Potatoes and misc.	4,055	5.03%
Sugar crops 1/	1,928	2.39%
Tobacco	1,752	2.17%
Rice	1,702	2.11%
Other oilseeds	1,411	1.75%
Peanuts	814	1.01%
Dry beans, peas and lentils	596	0.74%
Total	80,671	100.00%

1/ Includes value of sugarcane for seed.

Source: USDA, National Agricultural Statistics Service, *Crop Values*.

Figure 1

U.S. field and miscellaneous crop values in 2004



* Other includes (left to right) rice; other oilseeds; peanuts; and dry beans, peas and lentils.
Source: USDA, National Agricultural Statistics Service, *Crop Values*.

The value of the sugarbeet crop since 1978 has constituted about 55.7 percent of the combined sugar crop value (table 3). The sugarbeet share has been growing about 0.2 percentage points a year. Likewise, beet sugar production has the larger share of production in terms of tonnage: 53.1 percent for 1980/81-2005/06 (table 4). The production share has been growing at about 0.25 percent per year. The latest 5-year average (2000/01-2005/06) is 54.5 percent.

Table 3 -- Sugar crops - marketing year average price received and value of production

Crop year	Sugarbeets		Sugarcane for sugar	
	Unit return <i>Dollars per ton</i>	Production value <i>Dollars (1,000)</i>	Unit return <i>Dollars per ton</i>	Production value <i>Dollars (1,000)</i>
1979	33.90	745,273	38.50	661,212
1980	47.20	1,108,974	26.00	984,559
1981	32.20	803,569	24.90	650,721
1982	35.40	740,342	26.50	755,038
1983	37.00	777,718	27.80	755,574
1984	33.90	750,162	28.20	734,026
1985	33.80	761,236	26.70	717,690
1986	35.90	901,771	27.30	788,678
1987	38.20	1,073,584	29.10	816,801
1988	41.20	1,022,284	29.40	836,810
1989	42.10	1,058,298	29.20	819,057
1990	43.00	1,182,220	30.80	815,630
1991	38.50	1,085,728	29.00	840,194
1992	41.40	1,206,480	28.10	811,350
1993	39.00	1,023,687	28.50	846,132
1994	38.80	1,234,470	29.20	857,438
1995	38.10	1,070,663	29.50	859,604
1996	45.40	1,211,001	28.30	784,113
1997	38.80	1,160,029	28.10	842,840
1998	36.40	1,181,494	27.30	893,049
1999	37.20	1,242,895	25.60	859,175
2000	34.20	1,113,030	26.10	895,917
2001	39.80	1,025,306	29.00	951,813
2002	39.60	1,097,329	28.40	961,896
2003	41.40	1,270,026	29.50	943,646
2004	36.90	1,106,878	28.30	771,734
2005	41.30	1,137,777	27.90	688,973

Source: USDA, National Agricultural Statistics Service, *Crop Values*.

Table 4—U.S. beet and cane sugar production (including Puerto Rico), by fiscal year and share of total

Year	Fiscal year 1/ (October/September)			Share of production		
	Beet	Cane	Beet and cane	Beet	Cane	Beet and cane
	1,000 short tons, raw value			Percent		
1980/81	3,234	2,987	6,221	52.0	48.0	100
1981/82	3,318	2,804	6,122	54.2	45.8	100
1982/83	2,692	3,263	5,955	45.2	54.8	100
1983/84	2,837	3,073	5,910	48.0	52.0	100
1984/85	2,915	3,025	5,940	49.1	50.9	100
1985/86	2,988	3,136	6,124	48.8	51.2	100
1986/87	3,653	3,506	7,159	51.0	49.0	100
1987/88	3,822	3,425	7,247	52.7	47.3	100
1988/89	3,396	3,408	6,804	49.9	50.1	100
1989/90	3,466	3,225	6,691	51.8	48.2	100
1990/91	3,854	3,124	6,978	55.2	44.8	100
1991/92	3,845	3,461	7,306	52.6	47.4	100
1992/93	4,392	3,446	7,838	56.0	44.0	100
1993/94	4,090	3,565	7,655	53.4	46.6	100
1994/95	4,493	3,434	7,927	56.7	43.3	100
1995/96	3,916	3,454	7,370	53.1	46.9	100
1996/97	4,013	3,191	7,204	55.7	44.3	100
1997/98	4,389	3,632	8,021	54.7	45.3	100
1998/99	4,423	3,951	8,374	52.8	47.2	100
1999/00	4,956	4,076	9,032	54.9	45.1	100
2000/01	4,680	4,089	8,769	53.4	46.6	100
2001/02	3,915	3,985	7,900	49.6	50.4	100
2002/03	4,462	3,964	8,426	53.0	47.0	100
2003/04	4,692	3,957	8,649	54.3	45.7	100
2004/05	4,611	3,265	7,876	58.5	41.5	100
2005/06	4,444	2,956	7,399	60.1	39.9	100

1/ Reported quarterly by *Sugar Market Statistics*, National Agricultural Statistics Service, prior to IV quarter 1991, and currently by *Sweetener Market Data*, Farm Service Agency.

Sources: USDA, National Agricultural Statistics Service, *Crop Report*, and Farm Service Agency, *Sweetener Market Data*.

Production

Sugarbeets

Sugarbeets are currently grown in 11 States grouped into 5 regions (fig. 2): Great Lakes (Michigan); Upper Midwest (Minnesota, North Dakota); Great Plains (Colorado, Montana, Nebraska, Wyoming); Northwest (Idaho, Oregon, Washington); and Southwest (California). Production no longer takes place in several States, including Ohio, New Mexico, Texas, and Arizona.

Sugarbeet production has grown from about 21 million tons in the first half of the 1980s to between 29 million and 30 million tons since 1995 (table 5, fig. 3). Production growth has been largest in the Upper Midwest—its share of national production has grown from about 30 percent in the early 1980s to about 48 percent in the 2000s. The Northwest has also seen its share of national production grow from about 17 percent to 20 percent over the same time period. Production has held steady in the Great Lakes region (10 percent to 11 percent). Production declines have taken place in the Great Plains (20 percent in early 1990s to 13 percent in the 2000s) and especially in the Southwest (24 percent in the early 1980s to just above 7 percent in the 2000s).

In 2002 there were 5,027 farms producing sugarbeets (table 6). This level represented about a 29-percent decline in sugarbeet-producing farms since 1997. Although this decline seems large, the total number of crop-producing farms in those same States fell about 12 percent over the same time period. The largest sugarbeet-farm reductions took place in California (50 percent), Nebraska (50 percent), Wyoming (50 percent), and Colorado (43 percent). Harvested sugarbeet acreage fell the most in these same States. However, on an aggregate basis, harvested sugarbeet acreage fell only 6 percent from 1997 to 2002, a decline which is only slightly higher than the 5-percent rate for all crops in the same States.

Average sugarbeet farm size increased from 205 acres in 1997 to 272 acres in 2002. The number of farms averaging less than 500 acres fell between 1997 and 2002, while those exceeding 500 acres grew in number (fig. 4). In comparison with 1997, more production has taken place on larger farms (fig. 5). In 2002, 75 percent of all sugarbeet production occurred on farms harvesting more than 250 acres. This compares with 64 percent in 1997. Farms over 500 acres produced 46 percent of the crop in 2002 and only 33 percent in 1997; and farms over 1,000 acres produced 18 percent of the crop in 2002 and only 11 percent in 1997.

Unlike other crops, sugar crops must be processed soon after being harvested into either refined beet sugar (sugarbeets) or raw cane sugar (sugarcane). There are no markets for the crops themselves. The crops' chief economic value is as a source for sucrose, which requires processing for the recovery of the sugar. Sugarbeets can be stored for a period of time in piles adjacent to or otherwise close to the processing facility before the sucrose in them deteriorates. The implication is that the costs and returns to the sugarbeet (and sugarcane) processors are just as important to the viability of sugar crop farming as are the costs and returns of growing the crop. If a processing facility is shut down, the grower must have an alternative processor destination available in close proximity for the crop or cease producing the sugar crop.

**Figure 2 Sugarbeets 2004
Harvested Acres by County**

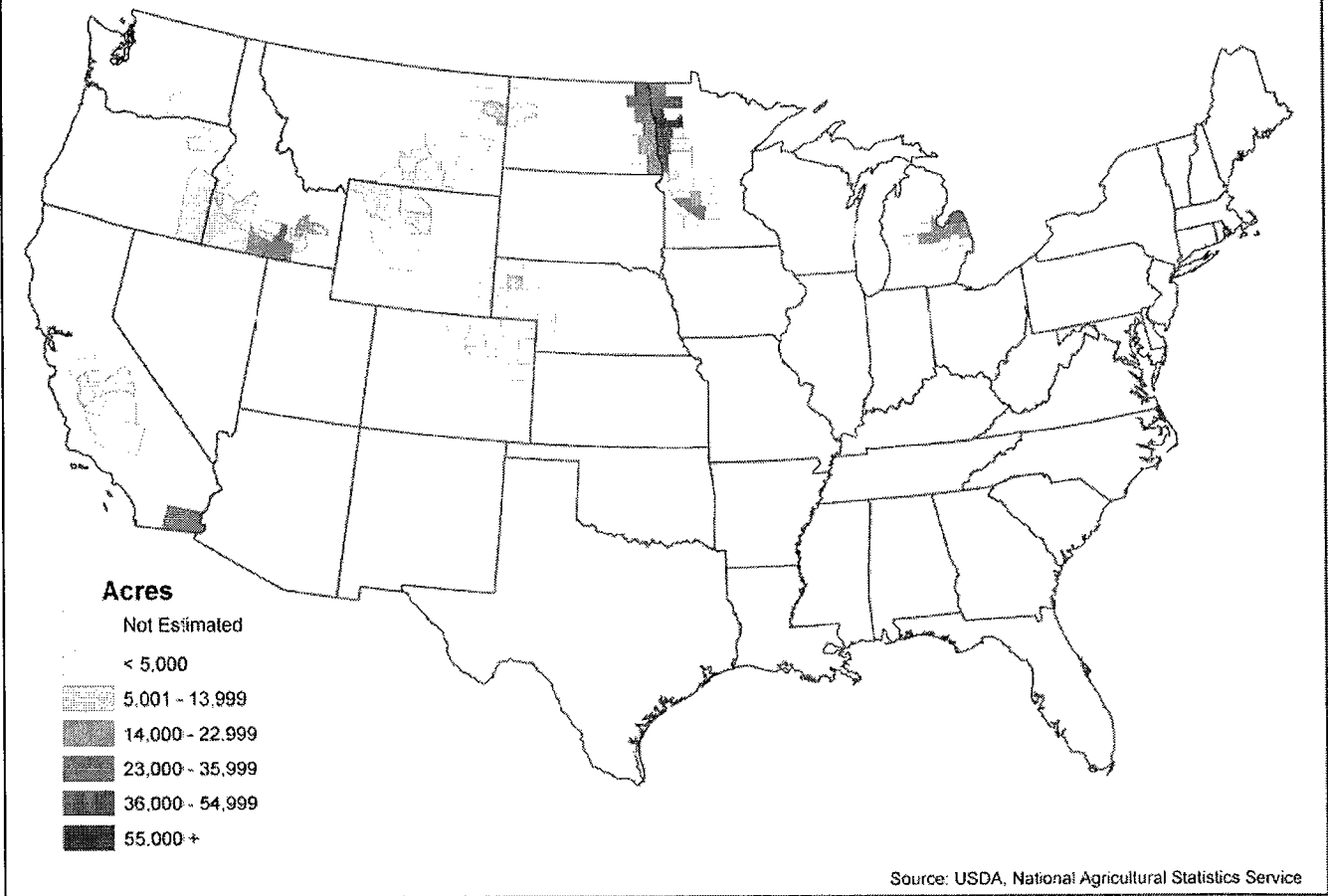


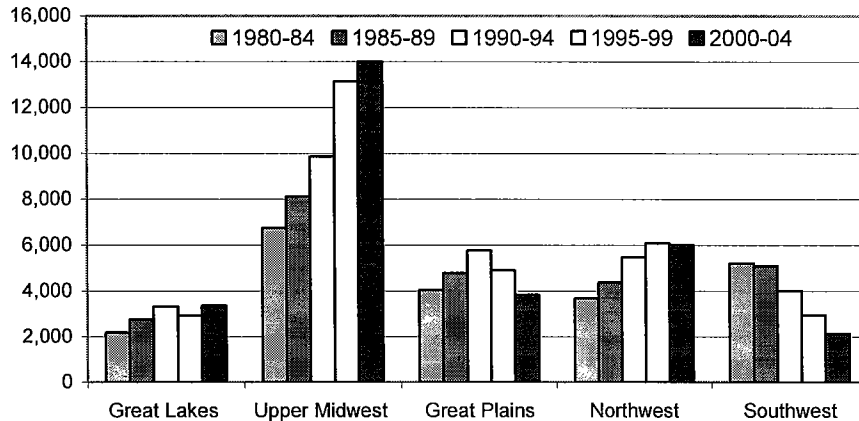
Table 5 -- U.S. sugarbeet production, by region, crop years 1980-2005

Year	Great Lakes (MI, OH)	Upper Midwest (MN, ND)	Great Plains (CO, MT, NE, NM, TX, WY)	Northwest (ID, OR, WA)	Southwest (CA, AZ)	Others 1/	Total U.S.
<i>1,000 short tons</i>							
1980	2,231	5,638	4,808	3,493	5,885	1,447	23,502
1981	2,314	7,098	5,166	4,054	7,254	1,652	27,538
1982	1,853	7,214	3,264	3,433	3,852	1,278	20,894
1983	2,198	7,066	3,276	3,803	3,938	711	20,992
1984	2,318	6,649	3,684	3,619	5,088	776	22,134
1985	2,583	7,511	3,951	3,815	4,669	0	22,529
1986	2,597	8,126	5,121	4,486	4,832	0	25,162
1987	3,180	9,361	4,739	4,699	6,091	2	28,072
1988	2,627	7,323	5,091	4,460	5,300	9	24,810
1989	2,764	8,284	4,996	4,429	4,614	44	25,131
1990	3,621	8,169	6,000	5,324	4,334	65	27,513
1991	2,869	9,739	5,894	5,595	4,029	77	28,203
1992	3,426	10,233	5,888	5,294	4,230	72	29,143
1993	3,391	8,456	5,658	5,105	3,536	103	26,249
1994	3,293	12,739	5,357	6,064	3,948	452	31,853
1995	3,200	11,363	4,694	5,132	3,192	484	28,065
1996	2,049	12,184	4,588	5,440	2,419	0	26,680
1997	3,057	12,456	5,104	6,299	2,970	0	29,886
1998	2,787	15,096	4,729	7,164	2,723	0	32,499
1999	3,567	14,585	5,390	6,422	3,456	0	33,420
2000	3,420	14,372	4,793	6,811	3,145	0	32,541
2001	3,232	12,086	3,671	5,179	1,596	0	25,764
2002	3,241	13,653	3,309	5,544	1,960	0	27,707
2003	3,446	15,234	3,565	6,506	1,959	0	30,710
2004	3,476	14,669	3,831	6,050	1,995	0	30,021
2005	3,167	13,977	3,701	5,102	1,707	0	27,654

1/ Includes Arizona, New Mexico and Washington prior to 1996, after 1996 these states are included in the regional totals.
Source: USDA, National Agricultural Statistics Service, *Crop Production*.

Figure 3
U.S. sugarbeet production, by region, averaged over 5-year periods, 1980-2004

1,000 short tons



Source: USDA, National Agricultural Statistics Service, *Crop Production*.

Table 6 -- Sugarbeets and other crops, farm numbers and harvested acres, 2002 and 1997, by State

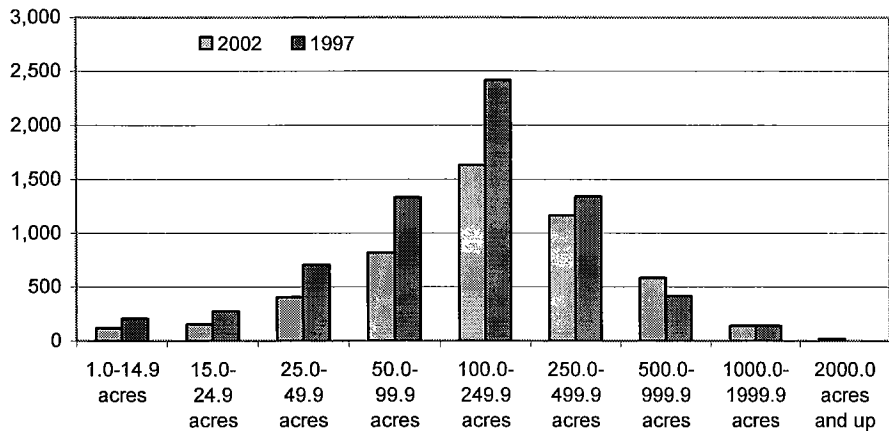
States	-----Number of producing farms-----			-----Harvested crop acreage-----		
	2002	1997	Percent change	2002 (1,000 acres)	1997	Percent change
<i>Sugarbeets</i>						
California	228	456	-50.0	55.7	104.4	-46.6
Colorado	312	544	-42.6	39.4	67.4	-41.6
Idaho	655	926	-29.3	202.9	195.9	3.6
Kansas	1	3	-66.7	NA	NA	NA
Michigan	989	1,164	-15.0	180.1	160.1	12.4
Minnesota	1,369	1,536	-10.9	476.6	446.0	6.9
Montana	282	408	-30.9	56.0	58.1	-3.6
Nebraska	184	366	-49.7	41.3	59.5	-30.6
North Dakota	694	901	-23.0	260.2	239.0	8.9
Ohio	21	34	-38.2	1.5	1.9	-17.5
Oregon	101	173	-41.6	11.3	19.6	-42.2
Utah	3	NA	NA	NA	NA	NA
Washington	7	59	-88.1	3.7	17.8	-79.1
Wyoming	181	360	-49.7	36.1	65.3	-44.7
Total	5,027	7,057	-28.8	1,365.8	1,449.8	-5.8
<i>All crops</i>						
California	54,115	62,031	-12.8	8,466.3	8,676.2	-2.4
Colorado	14,655	18,532	-20.9	4,347.0	6,099.4	-28.7
Idaho	13,444	16,388	-18.0	4,313.3	4,581.2	-5.8
Kansas	--	--	--	--	--	--
Michigan	38,244	42,704	-10.4	6,827.9	6,989.3	-2.3
Minnesota	57,323	62,760	-8.7	19,398.3	19,794.1	-2.0
Montana	16,543	19,254	-14.1	8,742.1	9,792.2	-10.7
Nebraska	37,143	43,198	-14.0	17,336.6	17,897.6	-3.1
North Dakota	20,789	25,813	-19.5	19,908.7	20,675.0	-3.7
Ohio	58,577	63,686	-8.0	10,041.4	10,070.8	-0.3
Oregon	23,013	24,392	-5.7	3,119.4	3,258.1	-4.3
Utah	--	--	--	--	--	--
Washington	21,802	24,168	-9.8	4,894.6	5,160.7	-5.2
Wyoming	5,003	6,198	-19.3	1,298.7	1,801.3	-27.9
Total	360,651	409,124	-11.8	108,694.4	114,795.9	-5.3

Source: USDA, National Agricultural Statistics Service, *Census of Agriculture*.

Figure 4

U.S. farms producing sugarbeets by beet farm acreage size distribution, 2002 and 1997

Number of farms

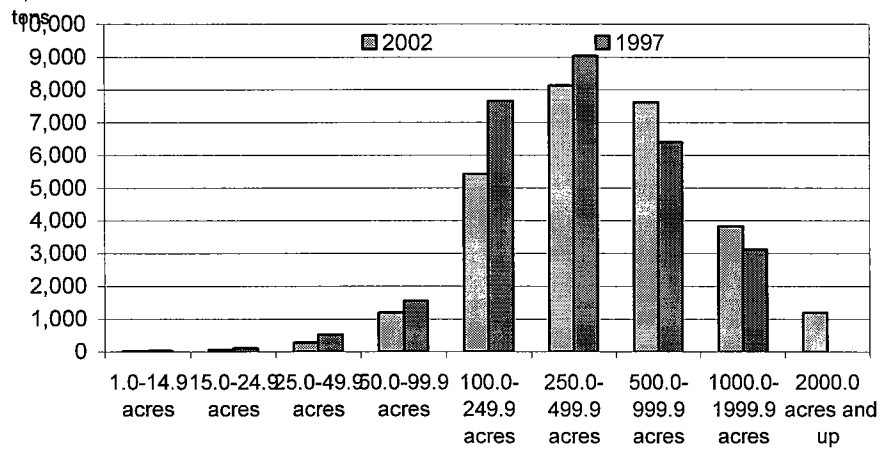


Source: USDA, National Agricultural Statistics Service, Census of Agriculture.

Figure 5

U.S. sugarbeet production by beet farm acreage size distribution, 2002 and 1997

1,000 short tons



Source: USDA, National Agricultural Statistics Service, Census of Agriculture.

Table 7 -- U.S. sugarbeet factories: location, capacity, current owner

State	Factory (Date of construction) * = molasses desugaring	Daily capacity (tons)					
		1992	1995	1998	2001	2004	2006
California	Clarksburg, CA (1935)	3,000	--	--	--	--	--
	Hamilton City, CA (1906)	4,000	4,000	--	--	--	--
	Betteravia, CA (1897)	5,600	--	--	--	--	--
	Manteca, CA (1919)	4,200	--	--	--	--	--
	Tracy, CA (1917)	5,000	5,000	5,000	--	--	--
	Brawley, CA (1947)	8,000	8,000	8,200	8,500	9,000	8,500 1/
	Woodland, CA (1937) *	3,600	3,600	3,600	--	--	--
	Mendota, CA (1963)	4,200	4,200	4,200	4,200	4,500	4,000 1/
Colorado	Greeley, CO (1902)	2,200	3,500	4,000	4,000	4,000	-- 2/
	Fort Morgan, CO (1906)	3,800	5,000	5,250	5,250	5,800	5,820 2/
Idaho	Mini-Cassia, ID (1917)	9,000	10,000	10,000	12,500	14,000	17,500 3/
	Twin Falls, ID (1916) *	6,200	6,200	6,200	6,500	6,700	6,500 3/
	Nampa, ID (1942) *	11,800	11,800	11,800	12,000	12,000	12,000 3/
Michigan	Caro, MI (1899)	3,500	3,500	3,600	3,600	3,700	4,000 4/
	Carrington, MI (1902)	2,900	3,000	3,200	3,200	3,300	3,300 4/
	Croswell, MI (1902)	3,200	3,780	3,852	3,850	3,900	4,000 4/
	Sebewaing, MI (1902)	4,300	5,500	5,500	5,550	5,500	5,500 4/
	Bay City, MI (1901)	8,000	8,000	8,000	8,000	8,000	7,500 4/
Minnesota	Moorhead, MN (1948)	4,400	5,500	5,400	5,600	5,900	5,900 5/
	Crookston, MN (1954)	4,500	5,400	5,300	5,600	5,900	5,900 5/
	Renville, MN (1975)	9,000	10,000	10,000	11,000	12,500	16,000 6/
Montana	Sidney, MT (1925)	5,400	5,400	5,500	6,300	6,200	6,400 7/
	Billings, MT (1906)	4,000	4,800	2,900	4,600	4,600	4,850 2/
North Dakota	Hillsboro, ND (1974) *	4,500	5,850	5,900	7,200	8,200	9,000 5/
	E. Grand Forks, MN (1926) *	6,700	8,500	8,000	9,000	9,300	9,200 5/
	Wahpeton, ND (1974)	5,900	5,900	7,500	9,000	9,300	9,400 8/
	Drayton, ND (1965)	5,400	6,100	5,900	5,900	6,700	6,700 5/
Nebraska	Scottsbluff, NE (1910) *	3,200	4,700	5,000	5,000	4,700	5,000 2/
	Bayard, NE (1917)	2,250	2,900	3,050	2,900	--	--
	Mitchell, NE (1920)	2,250	2,600	--	--	--	--
Ohio	Freemont, OH (1900)	3,800	3,800	--	--	--	--
Oregon	Nyssa, OR (1938)	9,000	9,000	9,000	9,000	9,000	--
Texas	Hereford, TX (1964) *	7,700	7,700	7,000 Molasses Desugaring		--	--
Washington	Moses Lake, WA (1997) *	--	--	6,000	--	--	--
Wyoming	Torrington, WY (1923)	5,400	5,400	5,500	5,500	5,500	5,500 2/
	Worland, WY (1917)	3,600	3,600	3,500	6,300	3,500	3,300 9/
	Lovell, WY (1916)	2,500	3,050	3,050	3,050	3,000	3,000 2/
Total capacity		182,000	185,280	180,902	173,100	174,700	168,770

1/ Owner in 2005: Imperial Sugar Co., sold to Southern Minnesota in 2005. 2/ Western Sugar Co. 3/ Amalgamated Sugar. 4/ Michigan Sugar Co. 5/American Crystal Sugar Co.

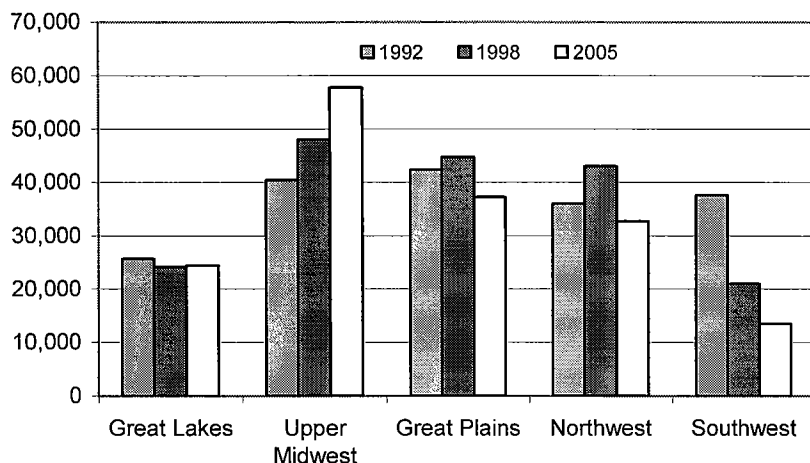
6/ Southern Minnesota. 7/ Sidney Sugars Inc. 8/ Minn-Dak. 9/ Wyoming Sugar Co. LLC

Source: U.S. Beet Sugar Association, Sugar Journal.

Figure 6

U.S. sugarbeet factories, 24-hour slicing capacity

Tons/24 hours



Source: U.S. Beet Sugar Association, *Sugar Journal*.

Table 7 shows sugarbeet-processing facilities that were operating in 1992, how capacities have been added to, and which factories have ceased operations. Figure 6 shows processing adjustments for the sugarbeet regions. The figure is roughly comparable to figure 3, especially where capacity has expanded in the Upper Midwest and contracted in the Southwest.

Sugarcane

Sugarcane is grown in four States: Florida, Louisiana, Texas, and Hawaii (fig. 7). Sugarcane production has grown from an average of 27.7 million tons in the first half of the 1980s to about 32.0 million tons in the 2000s (table 8, fig. 8). The largest growth has been in Louisiana, where production has more than doubled since the early 1980s. Growth in Florida and Texas has been strong as well. Area and yield growth have both been instrumental in increasing sugarcane production. In Hawaii, on the other hand, high costs and better alternative uses for land have meant a reduction in sugarcane production from 8.8 million tons in the early 1980s to 2.0 million tons in the 2000s. Sugarcane is now grown on only two islands, Kauai and Maui.

In 2002 there were 953 farms producing sugarcane (table 9). This level represents about a 12-percent decline in sugarcane producing farms since 1997. In percentage terms, the farm number decrease is about the same as for all other farms producing other crops within a particular State, except for Texas, where the number of sugarcane farms increased by more than 60 percent and total-crop farms decreased by almost 10 percent. Overall sugarcane harvested area increased about 10 percent from 1997 to 2002, and average sugarcane farm size increased from 825 acres in 1997 to 1,027 acres in 2002, an increase of more than 24 percent. Sugarcane farms are much larger than sugarbeet farms: on average 3.75 times larger in 2002.

