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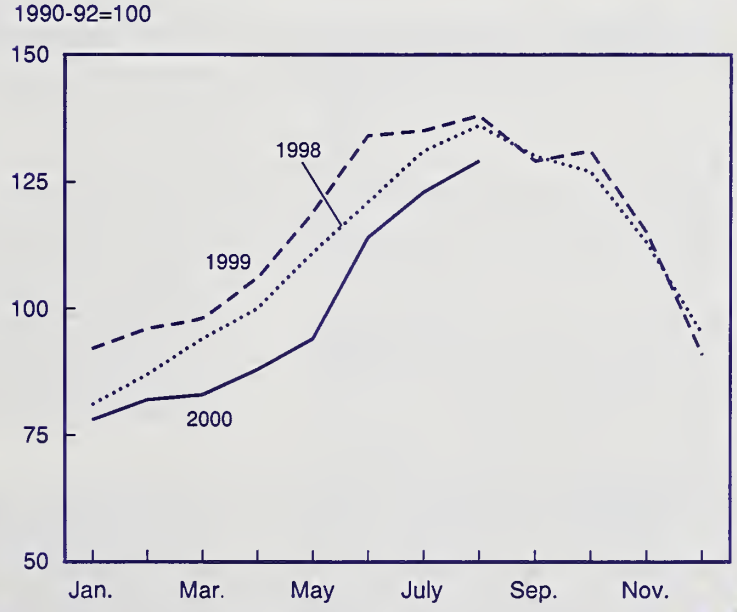
Fruit and Tree Nuts

Situation and Outlook Report

Index of prices received by growers for fruit and nuts lower in 2000



Source: National Agricultural Statistics Service, USDA.

Fruit and Tree Nuts Situation and Outlook. Market and Trade Economics Division, Economic Research Service, U.S. Department of Agriculture, September 2000, FTS-289

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This issue is dedicated to our colleague and friend
Doyle C. Johnson
July 7, 1946—August 28, 2000

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The *Fruit and Tree Nuts Situation and Outlook* is published two times a year and supplemented by a yearbook. To order, call 1-800-999-6779 in the United States or Canada. Other areas please call (703) 605-6220. Or write ERS-NASS, 5285 Port Royal Road, Springfield, VA 22161.

Summary

Grower prices for many fruit crops averaged lower than a year ago this summer due to increased production. Included are grapes, strawberries, oranges, grapefruit, and lemons. Improved weather conditions, specifically in California, Washington, and Florida, contributed to the expected larger crops in 2000. The grower price index for fruit and nuts in July and August 2000 averaged 8 percent below the July-August 1999 index. Prices are likely to remain below a year ago through most of the second half of the year, as the anticipated slightly larger apple crop this fall could lead to lower prices. Meanwhile, grower prices for pears and tree nuts are expected higher in 2000/01 due to reduced production.

Lower retail prices for Valencia oranges, grapefruit, lemons, strawberries, and Thompson seedless grapes weakened retail prices for fresh fruit in July 2000 compared with a year ago. During the fall, retail prices will continue to be weakened by slightly larger apple supplies.

The 2000 U.S. apple crop is forecast to be up 1 percent from a year ago. Increased production in most Western States will offset anticipated declines in the Central and Eastern States. Due to the slightly larger crop, apple prices in 2000/01 will likely average lower than in 1999/2000. Ample supplies and slightly lower prices will likely improve both domestic and export demand for U.S. apples, particularly in the fresh-market sector. Domestic consumption of fresh apples is forecast to increase 1 percent from the 18.7 pounds per person estimated in 1999.

U.S. grape production for 2000 is forecast at 14.7 billion pounds, up 18 percent from a year ago and surpassing the previous record of 14.6 billion pounds in 1997. California's production is expected to set a record, up 21 percent from 1999. Larger crops are also anticipated in other major producing States, except New York and Pennsylvania. Record production this year points to lower grape prices. Increased competition from ample supplies of stone fruit and citrus fruit has put additional downward pressure on fresh grape prices during the summer. A combination of increased production, lower prices, and the good quality of this year's crop will help promote domestic consumption and U.S. exports of fresh grapes. Domestic consumption of fresh grapes is forecast to increase about 7 percent from 1999's estimate of 8.2 pounds per person.

U.S. pear production for 2000 is forecast down 2 percent from 1999 due to reduced production of Bartlett pears, mostly used for processing. The overall decline in pear production this year is expected to lead to higher grower prices in 2000/01. Lower supplies and higher prices will likely lead to a decline in domestic consumption of fresh pears from the 3.5 pounds per person in 1999. U.S. fresh pear exports will also likely be limited by these same factors.

Overall stone fruit production (peaches, nectarines, plums, prunes, apricots, and cherries) in 2000 is expected to be up from a year ago due mainly to a larger U.S. peach crop. Peaches make up about 70 percent of U.S. stone fruit production, and this year's increased harvest is enough to offset expected output declines for cherries and combined output of prunes and plums in Idaho, Michigan, Oregon, and Washington. The larger, good-quality crop, along with lower retail prices, will likely boost consumption of fresh peaches (including nectarines) in the United States in 2000 about 1 percent higher than last year's 5.3 pounds per person. Larger supplies of California plums and apricots are also expected to lead to lower prices and increased domestic consumption in 2000. Meanwhile, the smaller sweet cherry crop, combined with a strong export market, will likely reduce domestic cherry consumption about 4 percent from last year's estimate of 0.65 pound per person.

Commercial strawberry production in the six major producing States (CA, FL, OR, WA, MI, and NJ) is forecast up 7 percent from a year ago. Oregon and Michigan are the only States where production is expected to decline. The larger domestic crop and anticipated reduced exports from Mexico will lead to lower imports of fresh strawberries in 2000. Increased supplies, good quality, and lower prices are likely to boost this year's U.S. fresh strawberry consumption from 1999's 4.52 pounds per person. Demand for U.S. fresh strawberries is expected to continue strong in major markets such as Canada, Japan, and Mexico, as economic conditions there have improved.

Based on preliminary crop indications reported by the North American Blueberry Council (NABC), the 2000 U.S. cultivated blueberry crop is estimated to be down about 3 percent from a year ago. Much of the decline appears to be a result of significantly lower production in Michigan and New Jersey, where more than half the U.S. cultivated blueberry crop is produced. NABC estimated there were fewer blueberries for fresh use this year, while processing use increased.

U.S. cranberry production is expected to decline 8 percent in 2000 from a year earlier. Production declines are expected in Massachusetts, New Jersey, and Wisconsin, while output increases are anticipated in Oregon and Washington. Continued large supplies stemming from an above-average crop this year and large inventories will likely keep grower prices for cranberries low during the 2000/01 season.

Tropical fruit imports were up in 1999. Per capita consumption of the major imported tropical fruit—bananas, pineapples, mangoes, and papayas—is estimated to increase 18 percent between 1990 and 1999. Banana consumption accounted for the largest share, increasing from 51 percent

of all tropical fruit consumed in 1990 to 79 percent in 1999. Fresh mango and papaya consumption, however, has increased the most.

The forecast 1999/2000 citrus crop increased 27 percent from the previous year under good growing conditions in both California and Florida. All citrus crops, except Florida tangelos, were larger. California's citrus crop increased 59 percent over the freeze-damaged crop in 1998/99. Florida's citrus production increased 22 percent. Dry conditions in late 1999 and throughout most of 2000 could affect the 2000/01 crop. The crop has been reported to be in good condition through the middle of the year with the aid of heavy irrigation.

The 1999/2000 U.S. orange crop is expected to increase 33 percent from the previous year, but was 5 percent lower than the record 1997/98 crop. Production increased in all States except Arizona. Approximately 11 million tons are expected to go to processing, mostly as juice, a 24-percent increase over last year. Oranges this season were late to mature, small, and of reduced quality than the record crop in 1997/98. This, along with strong competition from imported Clementines, reduced the prices growers received for fresh oranges. The larger crop this year will likely reduce imports and increase exports of both fresh oranges and orange juice.

Orange juice production in 1999/2000 is forecast to increase 24 percent over 1998/99, the second highest on record. Juice yields were slightly below the average over the past 5 years. Domestic supplies were estimated to set a record as a result of increased production, high juice stocks, and continued strong imports. Hence, prices Florida growers received for their processing oranges have averaged lower thus far this season.

Grapefruit production is expected to rise 11 percent in 1999/2000 from a year earlier, the largest crop in 3 years. Production was up in Florida and California, but down in Texas and Arizona. Florida's crop, which accounts for 81 percent of the total crop, was up 13 percent. Florida fresh grapefruit grower prices fell 15 percent from last year, but remained strong relative to the previous 2 seasons as a result of demand from processors to build juice stocks. Florida grower prices for processing grapefruit increased in 1999/2000, the first season in 3 years when growers received positive returns. Continuing the downward trend observed since 1996/97, fresh grapefruit consumption in 1999/2000 is expected to decline about 11 percent from a year ago, reflecting more fruit going to processing and weak consumer demand.

Total production of tree nuts will likely decline this season from the record set at 2.6 billion pounds in 1999/2000. The California Agricultural Statistics Service forecast lower production of almonds and walnuts. Smaller crops of hazelnuts and pecans are likely. Pistachio production, meanwhile, is forecast at a record high. With reduced overall supplies, grower prices are likely to average higher than a year earlier, but domestic use and exports are expected to be limited.

Fruit Price Outlook

Larger Crops Point to Lower Fruit Prices During the Second Half of 2000

Grower prices for many fruit crops averaged lower than a year ago this summer due to increased production. Included are grapes, strawberries, oranges, grapefruit, and lemons. Improved weather conditions, specifically in California, Washington, and Florida, have contributed to the expected larger crops in 2000. California and Washington are key growing regions for noncitrus fruit. In addition, Florida and California claim a major share of citrus production. The grower price index for fruit and nuts in July and August 2000 averaged 8 percent below the July-August 1999 index (table 1). Grapes, oranges, and apples carry the most weight in the calculation of this index. Other fruit (and nuts) used in the calculation of the index include grapefruit, lemons, peaches, pears, strawberries, and almonds. The weaker July-August index was attributed to lower grower prices for grapes, oranges, apples, strawberries, grapefruit, and lemons. While the smaller 1999 fall apple crop resulted in higher prices through most of last season, ample stocks remaining in cold storage as of July 1, 2000, forced grower prices for fresh apples that month to average below the average in July 1999. Peach prices averaged higher despite increased production, reflecting in part a strong domestic and export market. Grower fruit prices are likely to remain below a year ago through most of the second half of the year, as the anticipated slightly larger apple crop this fall could lead to lower prices. Meanwhile, grower prices for pears and tree nuts are expected higher in 2000/01 due to reduced production.

Increased supplies for most fresh fruit are going to keep retail prices lower than a year ago throughout the second half of 2000. In July, the Consumer Price Index (CPI) for fresh fruit averaged 6 percent lower than the same period a year earlier (table 2). The lower CPI compared with a year ago reflects lower retail prices for Valencia oranges, grapefruit, lemons, strawberries, and Thompson seedless grapes (table 3). Retail prices for these fruit commodities are likely to weaken, given seasonal supply increases during the summer, forcing the CPI to drop from the July CPI. The CPI strengthened in July, reflecting gains in retail prices for Red Delicious apples and bananas. Higher retail prices for bananas are a result of lower imports thus far this year. Following the trend in grower prices, lower retail prices are expected for apples during the fall, but higher prices are anticipated for pears.

Table 1--Index of prices received by growers for fruit and nuts, 1996-2000

Month	1996	1997	1998	1999	2000
			1990-92=100		
Jan.	95	93	81	92	78
Feb.	95	90	87	96	82
Mar.	104	97	94	98	83
Apr.	100	89	100	106	88
May	114	106	111	119	94
June	134	127	121	134	114
July	130	127	131	135	123
Aug.	131	126	136	138	129
Sep.	144	131	130	129	
Oct.	140	121	127	131	
Nov.	125	109	113	115	
Dec.	103	92	95	91	
Annual	118	109	111	115	

Source: National Agricultural Statistics Service, USDA.

Table 2--U.S. consumer price indexes for fresh fruit, 1996-2000

Month	1996	1997	1998	1999	2000
			1982-84=100		
Jan.	228.0	239.1	240.2	267.4	266.6
Feb.	218.8	231.5	240.3	257.8	263.0
Mar.	221.5	234.6	235.9	257.4	257.9
Apr.	232.3	235.8	241.6	271.9	257.0
May	234.2	239.4	249.0	280.6	257.3
June	233.7	228.5	247.3	273.4	244.6
July	232.7	229.9	247.4	264.9	248.9
Aug.	231.8	237.0	248.7	266.2	
Sep.	243.7	243.9	247.6	265.8	
Oct.	243.9	242.6	251.8	262.3	
Nov.	241.4	233.9	249.6	260.5	
Dec.	251.1	239.4	258.7	266.9	
Annual avg.	234.4	236.3	246.5	266.3	

Source: Bureau of Labor Statistics, U.S. Department of Labor.

Table 3--U.S. monthly retail prices for selected fruits and juice, 1997-2000

Month	Valencia oranges				Navel oranges				Orange juice, concentrate 1/				Grapefruit			
	1997	1998	1999	2000	1997	1998	1999	2000	1997	1998	1999	2000	1997	1998	1999	2000
	--Dollars per pound--				--Dollars per pound--				--Dollars per 16 fl. oz--				--Dollars per pound--			
Jan.	--	--	--	--	0.555	0.525	0.830	0.607	1.737	1.601	1.753	1.823	0.515	0.499	0.543	0.567
Feb.	--	--	--	--	.554	.507	.889	.586	1.768	1.568	1.780	1.811	.489	.481	.545	.572
Mar.	--	--	--	--	.546	.505	.869	.572	1.747	1.587	1.741	1.807	.496	.503	.546	.556
Apr.	--	--	--	--	.598	.571	.944	.573	1.727	1.634	1.779	1.819	.512	.510	.556	.551
May	--	--	0.865	--	.706	.672	--	.638	1.736	1.589	1.764	1.802	.518	.491	.606	.585
June	0.580	0.664	.942	--	--	--	--	.699	1.752	1.633	1.758	1.800	.520	.587	.712	.603
July	.607	.683	.959	.666	--	--	--	--	1.770	1.655	1.813	1.875	.592	.695	.778	.633
Aug.	.669	.679	.989		--	--	--		1.755	1.668	1.825		.646	.738	.803	
Sep.	.670	.650	.974		--	--	--		1.695	1.599	1.825		.681	.750	.762	
Oct.	.616	.643	.955		--	--	--		1.711	1.655	1.784		.628	.767	.710	
Nov.	--	.621	--		.642	--	.884		1.666	1.654	1.841		.543	.618	.631	
Dec.	--	--	--		.583	.608	.641		1.670	1.679	1.822		.532	.548	.582	

	Lemons				Red Delicious apples				Bananas				Peaches			
	1997	1998	1999	2000	1997	1998	1999	2000	1997	1998	1999	2000	1997	1998	1999	2000
	--Dollars per pound--				--Dollars per pound--				--Dollars per pound--				--Dollars per pound--			
Jan.	1.115	1.026	1.402	1.436	0.907	0.922	0.860	0.952	0.497	0.473	0.489	0.490	--	--	--	--
Feb.	1.084	.976	1.274	1.416	.912	.960	.870	.974	.518	.489	.509	.528	--	1.894	1.856	1.773
Mar.	1.005	.959	1.167	1.338	.914	.962	.852	.960	.532	.475	.506	.517	--	--	1.941	--
Apr.	.990	.946	1.188	1.298	.895	.949	.870	.957	.512	.511	.482	.510	--	--	--	--
May	1.059	1.027	1.159	1.200	.912	.974	.881	.927	.484	.510	.492	.509	--	--	--	--
June	1.309	1.059	1.183	1.195	.914	.955	.893	.918	.488	.507	.502	.506	1.122	1.425	1.413	1.211
July	1.519	1.262	1.282	1.253	.918	1.000	.905	.940	.487	.530	.494	.512	.951	1.179	1.160	1.180
Aug.	1.623	1.405	1.397		.935	.990	.921		.475	.489	.490		.973	1.065	1.098	
Sep.	1.631	1.428	1.463		.933	.971	.972		.458	.476	.481		1.143	1.221	1.100	
Oct.	1.477	1.462	1.535		.881	.902	.919		.459	.470	.471		--	--	--	
Nov.	1.162	1.453	1.538		.864	.878	.902		.468	.487	.480		--	--	--	
Dec.	1.057	1.372	1.414		.897	.854	.918		.461	.510	.494		--	--	--	

	Anjou pears				Strawberries 2/				Thompson seedless grapes				Wine 3/			
	1997	1998	1999	2000	1997	1998	1999	2000	1997	1998	1999	2000	1997	1998	1999	2000
	--Dollars per pound--				--Dollars per 12-oz. pint--				--Dollars per pound--				--Dollars per liter--			
Jan.	1.017	0.863	0.923	1.017	--	2.135	--	2.167	1.981	1.815	2.341	2.450	5.266	5.302	5.287	5.458
Feb.	1.001	.931	.925	1.011	1.514	2.080	2.102	1.935	1.508	1.722	1.663	1.872	4.933	4.790	5.103	5.256
Mar.	1.003	.878	.942	1.003	1.317	1.751	1.960	1.825	1.675	1.579	1.613	1.663	5.337	5.306	5.262	5.471
Apr.	1.011	.918	.953	1.015	1.179	1.613	1.751	1.450	1.876	1.516	2.262	1.746	4.933	4.764	5.129	5.156
May	1.026	.962	.960	.999	1.073	1.386	1.419	1.218	2.136	--	--	1.872	5.320	5.322	5.302	5.530
June	--	.996	.913	.871	1.213	1.413	1.490	1.187	1.606	1.651	1.864	1.359	4.992	4.808	5.093	5.273
July	--	--	--	.835	1.383	1.346	1.375	1.246	1.372	1.256	1.678	1.358	5.406	5.319	5.384	5.547
Aug.	--	--	--		1.375	1.454	1.557		1.240	1.448	1.522		5.022	4.801	5.141	
Sep.	--	--	--		1.488	1.469	1.679		1.275	1.393	1.453		5.414	5.370	5.385	
Oct.	--	--	--		--	1.779	1.664		1.646	1.564	1.557		5.132	4.823	5.166	
Nov.	--	--	--		1.654	--	1.948		2.035	1.941	1.897		5.275	5.274	5.452	
Dec.	.854	.983	1.034		--	--	--		2.188	--	2.403		5.001	4.978	5.171	

-- = Insufficient marketing to establish price.

1/ Data converted from 12 fluid ounce containers.

2/ Dry pint.

3/ Data series began August 1995.

Source: Bureau of Labor Statistics, U.S. Department of Labor.

Noncitrus Fruit Outlook

Weather brought mixed effects on noncitrus fruit production throughout the United States during 2000. Many fruit orchards and vineyards in California and Washington experienced generally favorable weather conditions this year that have been conducive to either average to large or higher production. Combined production of primary noncitrus fruit crops such as apples and grapes in these two States contribute over half the quantity and over 45 percent of the total value of noncitrus fruits produced in the United States. Among the other leading noncitrus fruit crops, California is the number one producer of strawberries, peaches, and other stone fruit, and Washington is the largest producer of pears. Given the magnitude of their contribution to the noncitrus fruit sector, the good performance of many of their fruit crops this year are likely to balance out expected production declines brought by weather problems in other regions and boost overall noncitrus fruit output for marketing year 2000/01.

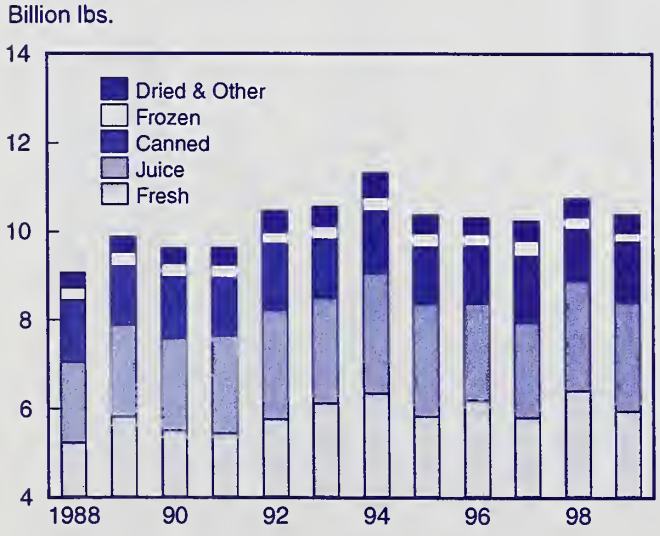
U.S. production of apples, grapes, peaches, and strawberries are all expected to be larger than last year, which could put a damper on noncitrus fruit prices. However, the harvest of good quality crops, a continued robust U.S. economy, and strong domestic and international demand will likely help mitigate some of the downward pressure on prices.

U.S. Apple Crop Expected Larger in 2000, Prices Likely To Be Lower

The U.S. Department of Agriculture's (USDA) forecast for 2000 U.S. apple production was 10.7 billion pounds, up 1 percent from a year ago but down 8 percent from the record crop in 1998 (table 4). Increased production in most Western States will offset anticipated declines in the Central and Eastern States. Because of the slightly larger crop this year, apple prices in 2000/01 will likely decline slightly from price levels of 1999/2000. Less competition from a smaller pear crop this fall will likely offset some of the downward pressure in apple prices. Ample supplies and slightly lower prices will likely improve both domestic and international demand for U.S. apples, particularly in the fresh-market sector. Domestic consumption of fresh apples is expected to increase 1 percent from last year's 18.7 pounds per person.

Figure 1

U.S. apple utilization



Source: National Agricultural Statistics Service, USDA.

Apple production in the Western States is expected to be 7.1 billion pounds in 2000, up 16 percent from a year ago. Larger crops are expected in all apple-producing States in the region, except California. Washington is the largest producer of domestic apples, accounting for more than half of the U.S. apple crop. Production in Washington is expected to reach 5.8 billion pounds, up 16 percent from a year ago and bearing excellent quality and size. While favorable weather conditions improved crop performance among most Western States, apple-producing areas in most Central and Eastern States suffered from freeze damage, poor pollination conditions, hail, and fire blight problems, causing declines in production. Production declines are expected to be significant among the major producers in the two regions; Michigan (down 34 percent), New York (down 17 percent), Pennsylvania (down 5 percent), Virginia (down 14 percent), and West Virginia (down 38 percent).

The expected larger crop in Washington—the largest supplier to the domestic fresh apple market as well as the U.S. fresh apple export market—will likely raise fresh-market supplies in 2000 above last year. This will likely translate to lower prices and raise export potential for U.S. fresh apples. Crop maturity in Washington was reported to be 5 days earlier than normal. Stocks in cold storage appear large. Depending on how fast the industry could move 1999 crop apples out of cold storage, the earlier crop in Washington could put additional pressure on prices. As of July 1, 2000, U.S. apple holdings totaled 19.5 million bushels, up 10 percent from this time last year and 23 percent higher than the 5-year average, according to the U.S. Apple Association. Fresh apple holdings were up 4 percent, while total processing apple holdings were up 27 percent. Fresh apple prices received by growers in July averaged 16.2 cents per pound compared with 16.3 cents in July 1999.

Fresh-market production in 1999 declined mainly due to the smaller crop in Washington, causing fresh-market apple prices to rise, fresh apple imports to increase, and fresh apple exports to decline. The season-average price growers received for fresh-market apples rose to 21.2 cents per pound, up from 17.3 cents during the 1998/99 season. Retail

Table 4--Apples: Total production and season-average price received by growers, 1997-99, and indicated 2000 production 1/

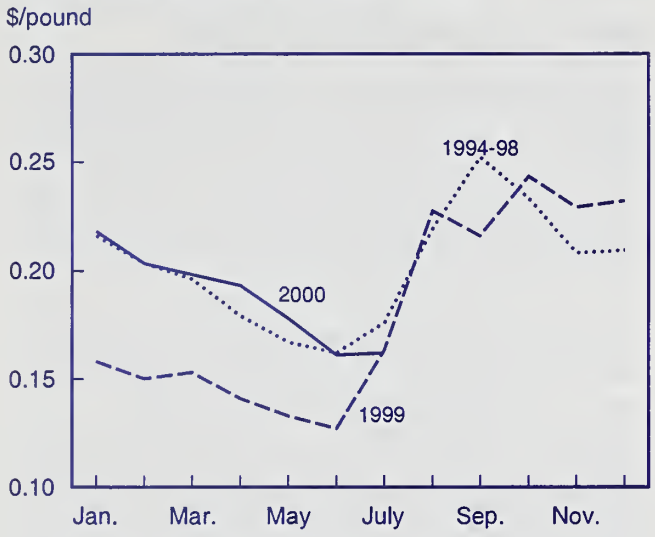
States	Production				Price		
	1997	1998	1999	2000	1997	1998	1999
	---- Million pounds ----				--- Cents per pound ---		
Eastern States:							
Connecticut	24	18	23	22	31.2	33.5	27.6
Delaware	2/	2/	2/	2/	2/	2/	2/
Georgia	15	11	12	13	13.7	16.1	17.4
Maine	64	45	72	35	19.3	21.8	20.2
Maryland	46	35	38	38	20.0	17.8	9.4
Massachusetts	60	32	65	50	25.8	30.7	26.8
New Hampshire	41	19	44	34	21.0	27.9	21.5
New Jersey	55	55	50	55	13.2	12.2	12.8
New York	1,120	1,070	1,260	1,050	12.6	11.4	11.4
North Carolina	152	185	190	190	11.0	11.1	15.1
Pennsylvania	535	395	505	480	13.3	13.9	10.9
Rhode Island	4	3	4	3	26.7	30.4	37.2
South Carolina	60	45	32	23	12.2	19.7	13.7
Vermont	50	35	60	50	18.7	21.7	20.5
Virginia	270	280	360	310	10.6	11.7	10.9
West Virginia	115	110	145	90	10.3	9.0	9.2
Total	2,610	2,336	2,859	2,443			
Central States:							
Arkansas	7	5	5	7	28.9	22.7	23.8
Illinois	74	45	59	72	19.6	18.6	21.4
Indiana	50	54	60	45	21.8	24.2	23.4
Iowa	13	9	11	12	28.6	28.6	31.9
Kansas	8	2	7	7	18.5	25.6	27.7
Kentucky	7	11	9	9	26.1	28.4	29.3
Michigan	1,000	1,000	1,210	800	9.8	8.7	8.6
Minnesota	22	24	25	22	44.3	44.4	41.3
Missouri	53	34	49	34	18.9	17.2	17.6
Ohio	60	80	100	90	22.1	20.5	21.9
Tennessee	10	13	10	9	23.8	22.2	21.1
Wisconsin	50	76	77	67	29.4	27.8	28.1
Total	1,353	1,351	1,622	1,174			
Western States:							
Arizona	45	46	34	82	10.7	14.7	12.7
California	962	860	825	730	16.9	15.3	14.6
Colorado	35	65	8	38	15.1	11.9	21.8
Idaho	110	155	70	190	13.9	8.5	17.1
New Mexico	7	8	2	3/	33.9	21.0	25.0
Oregon	160	180	150	175	23.8	14.1	10.1
Utah	42	45	9	45	16.5	14.5	21.9
Washington	5,000	6,600	5,000	5,800	16.4	11.5	17.0
Total	6,361	7,959	6,098	7,060			
United States	10,324	11,646	10,580	10,677	15.4	12.2	14.8

1/ Commercial production from orchards of at least 100 bearing-age trees. 2/ Estimates discontinued in 1997. 3/ End of season estimate only.

Source: National Agricultural Statistics Service, USDA.

Figure 2

U.S. grower prices for fresh apples



Source: National Agricultural Statistics Service, USDA.

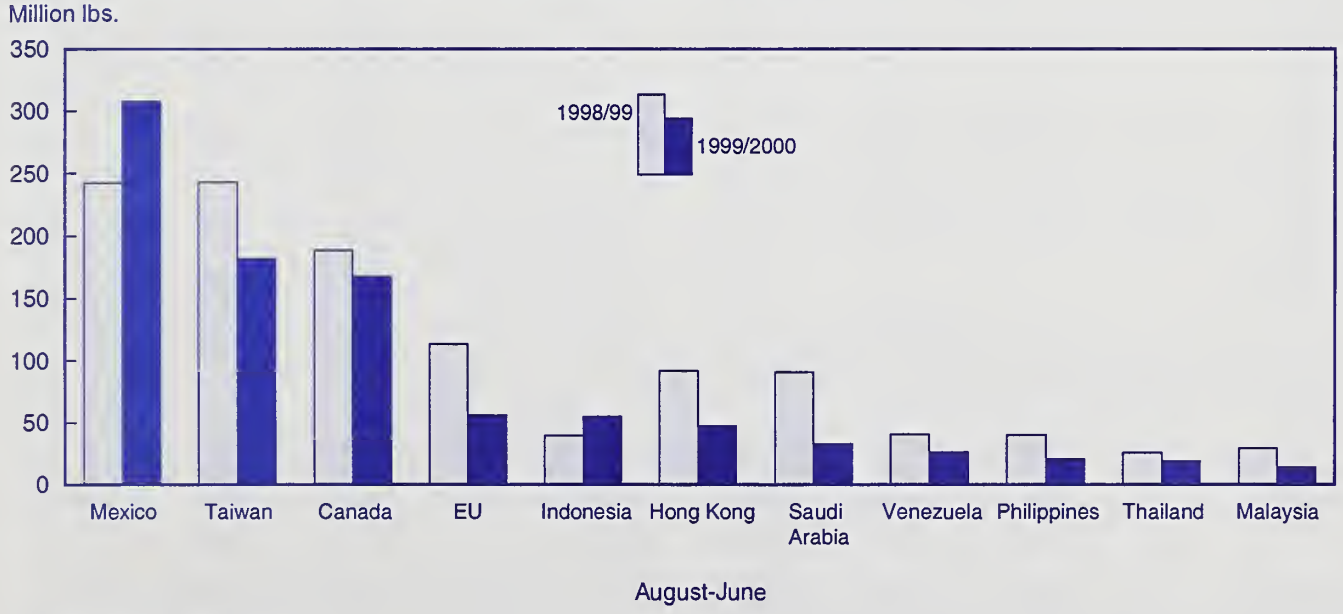
prices for Red Delicious apples mirrored the pattern in grower prices during 1999/2000 and averaged 93.8 cents per pound, up 5 percent from the previous season.

U.S. production of apples for the processing sector in 2000 will likely be limited by production declines in the Central and Eastern States where output is geared mostly to the processing sector. Reduced supplies from these regions, along with expected lower imports of concentrated apple juice from China, will help boost grower prices for processing apples. Although processing supplies were up in 1999, the season-average grower price for processing apples was 6.1 cents per pound, up from 4.7 cents the previous season, mainly reflecting sharply lower imports of concentrated apple juice from China. In addition, processing supplies in Washington, which also make up a large share of all domestic apples for processing, were lower last year and resulted in higher prices.

The United States will likely import fewer fresh apples during the 2000/01 season, as increased supplies are expected from the domestic crop. Export prospects, meanwhile, are likely to improve, not only due to increased supplies but also with the help of Washington's good-quality crop and increased export promotion funding for the U.S. apple industry through USDA's Market Access Program. During the 1999/2000 season, imports from August 1999 through June 2000 totaled 318.2 million pounds, 7 percent higher than the same period a year earlier. Shipments increased from Canada and New Zealand, but declined from Chile, as poor spring weather reduced the crop there. These three countries supply over 90 percent of U.S. fresh apple imports. During the same period, exports of fresh apples decreased 22 percent to 1.1 billion pounds. Exports slipped to all major markets, except Mexico and Indonesia. Mexico surpassed Taiwan as the top destination for U.S. fresh apples. Although still a minor market, exports to Japan rose 41 percent, due in part to the opening of the Japanese market to U.S. Fuji apples. In the past, Japanese imports of U.S. apples were limited to Red Delicious and Golden Delicious varieties.

Figure 3

U.S. shipments of fresh apples to important export markets



Source: Bureau of the Census.

U.S. imports of apple juice and cider from August 1999 through June 2000 totaled 279.7 million gallons, up 3 percent from the same period in 1998/99, attributed mainly to more imports from Chile (up 27 percent). Imports declined from Argentina (down 5 percent), the largest producer of apple juice concentrate in the Southern Hemisphere and the leading supplier to the U.S. market, as a result of a much smaller crop. Imports from China, also a major supplier, were down 28 percent, reflecting the antidumping duties imposed on the country's concentrated apple juice shipments entering the United States. On May 15, 2000, the U.S. International Trade Commission (ITC) ruled unanimously that apple-juice concentrate imports from China are causing U.S. producers economic harm. The ITC made a preliminary finding in July 1999 that there is reasonable indication that U.S. apple juice producers are materially injured or threatened with material injury by the import of nonfrozen apple juice concentrate from China. In November of the same year, the Department of Commerce made a preliminary finding that dumping has occurred. Imports of concentrated apple juice from China currently face duties of 52 percent for being sold in the U.S. market at unfairly low prices.

U.S. apple juice and cider exports in 1999/2000 (August-June) increased 3 percent from the same period in 1998/99 to 8.4 million gallons. Exports rose to Canada but declined to Japan. Decreased production in the central and eastern regions this year and the higher prices expected, are likely to diminish export prospects for U.S. apple juice and cider in 2000/01.

Record Grape Production in 2000

U.S. grape production for 2000 is forecast to be up 18 percent from a year ago to 14.7 billion pounds, surpassing the previous record of 14.6 billion pounds in 1997 (table 5). California's production is expected to set a record at 13.4 billion pounds, up 21 percent from 1999. Larger crops are also anticipated in other major producing States, except New York and Pennsylvania.

Grape production in California during 2000 is expected to consist of the following: 12 percent table varieties, 48 percent wine varieties, and 40 percent raisin varieties. Production of all variety types is expected to increase, up 6 percent, 20 percent, and 28 percent, respectively, from a year ago. Specifically, the production of wine-type varieties is expected to reach a record this year, a result of higher yields and recent new plantings of premium wine varieties coming into production. The growing demand for U.S. wine here and in export markets has rapidly expanded the number of vineyards in California in recent years, with many new vineyards adopting new technologies that help achieve higher yields. According to the Wine Institute, California now produces over 90 percent of U.S. wine grapes. Currently, the industry is faced with the growing threat of Pierce's disease, a bacterial disease transmitted by glassy-winged sharpshooters,

Table 5--Grapes: Total production and season-average price received by growers in principal States, 1997-99, and indicated 2000 production

State	Production				Price		
	1997	1998	1999	2000	1997	1998	1999
	-- Million pounds --				-- Cents per pound --		
Arizona	50	46	42	36	29.4	37.6	40.1
Arkansas	13	9	10	10	29.3	24.9	23.7
Georgia	5	6	7	7	46.7	55.5	58.5
Michigan	122	141	150	158	14.7	14.7	14.3
Missouri	4	4	6	6	24.0	26.6	29.2
New York	278	256	410	336	14.6	15.8	14.5
North Carolina	2	3	4	4	48.4	51.5	60.0
Ohio	14	12	18	15	14.4	16.6	17.1
Oregon	37	29	36	38	56.0	59.0	65.5
Pennsylvania	122	108	176	130	13.4	14.0	14.1
South Carolina	1	1	1	1	61.0	76.0	28.5
Washington	638	444	530	580	19.5	24.1	21.6
Total 1/	1,286	1,060	1,389	1,320			
California:							
Wine	5,880	5,140	5,324	6,400	29.9	29.1	29.3
Table	1,650	1,286	1,514	1,600	22.4	25.0	27.6
Raisin 2/	5,766	4,154	4,234	5,400	13.1	14.6	18.1
All	13,296	10,580	11,072	13,400	21.7	22.9	24.8
United States	14,582	11,640	12,460	14,720	21.5	22.8	24.2

1/ Some figures may not add due to rounding. 2/ Fresh weight of raisin-type grapes.

Source: National Agricultural Statistics Service, USDA.

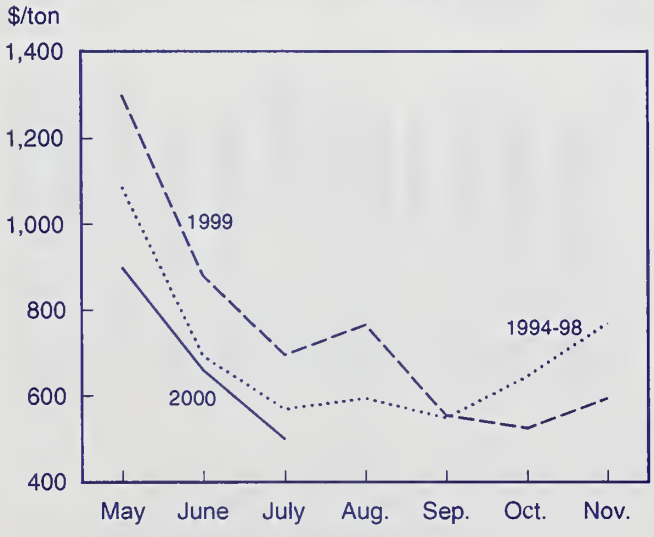
which could destroy an entire grape-growing area. Unless eradicated, future expansion in the industry will remain vulnerable to losses caused by this disease.

The California Agricultural Statistics Service estimated the State's total grape acreage in 1999 at 940,000 acres, up 6 percent from the previous year. Total bearing acreage rose 6 percent to 790,000 acres, and non-bearing acreage rose 5 percent to 150,000 acres. Acreage devoted to wine-type grape production accounted for 59 percent of total grape acres, of which bearing acreage increased 10 percent to 424,000 acres and non-bearing acreage increased about 7 percent to 130,000 acres. The largest increase in bearing acreage last year was in wine grapes, followed by table grapes (up 5 percent) and raisin grapes (up 1 percent).

The Thompson seedless variety is by far the leading grape planted in California. Although this variety is used primarily in making raisins, it is also used for fresh-market consumption and in the production of juice concentrates and wine. Flame seedless is the leading table grape variety, but while 5 percent more acreage came into production for this variety in 1999, the increase in bearing acreage for the Redglobe variety rose 21 percent. Acreage expansion for red seedless grape varieties in recent years is in response to heightened consumer demand, both in the domestic and international markets, for these types of grapes, perhaps partially due to the health benefits linked to it. Prominent wine grape varieties are Chardonnay and French Colombard for white wine and Cabernet Sauvignon, Zinfandel, and Merlot for red wine. Increases in bearing acreage last year, however, were most significant for Merlot (up 30 percent), Cabernet Sauvignon (up 16 percent), and Chardonnay (up 15 percent).

Figure 4

U.S. grower prices for fresh grapes



Source: National Agricultural Statistics Service, USDA.

Record production this year points to lower grape prices. Grower prices for fresh-market grapes from May through July declined seasonally and averaged $687 per ton, down 28 percent from the same period a year ago. Increased competition from ample supplies of stone fruit and citrus fruit provided additional downward pressure on fresh grape prices during the summer. Retail prices for fresh Thompson seedless grapes also declined seasonally, and the June-July average was 23 percent lower than the same period in 1999.

A combination of increased production, lower prices, and the good quality of this year's crop will help promote domestic consumption and U.S. exports of fresh grapes during the 2000/01 season. This year, domestic consumption of fresh grapes is forecast to increase about 7 percent from 1999's estimate of 8.2 pounds per person. Improved economic conditions in the leading export markets for U.S. fresh grapes, including important export markets in Asia, will also help raise the prospects for export gains this season. In the coming years, potential export growth could be strengthened by the opening of Australia to California table grapes. The industry is optimistic California could begin shipping grapes to Australia next season, with an estimated market potential of 1 million boxes per year. This could position Australia in the top five markets for California grapes. The demand for fresh grapes was strong in the United States and in foreign markets during the 1999/2000 season. Even though U.S. grape production increased in 1999, imports of fresh grapes (May 1999-April 2000), mainly from Chile, registered a 14-percent increase from the same period a year ago (table 6). For the same period, exports rose 19 percent, with increased shipments to the leading markets—Canada, Hong Kong, and Mexico. Also notable were significant export increases to the Philippines, Taiwan, Japan, and the United Kingdom. On the domestic scene, per capita consumption in 1999 rose 7 percent from the previous year.

On average, grapes used for processing account for about 86 percent of total grape utilization. Grapes crushed for wine make up 64 percent of all grapes processed, those dried 27 percent, those crushed for juice about 8 percent, and those canned 1 percent. During 1999, strong demand from proces-

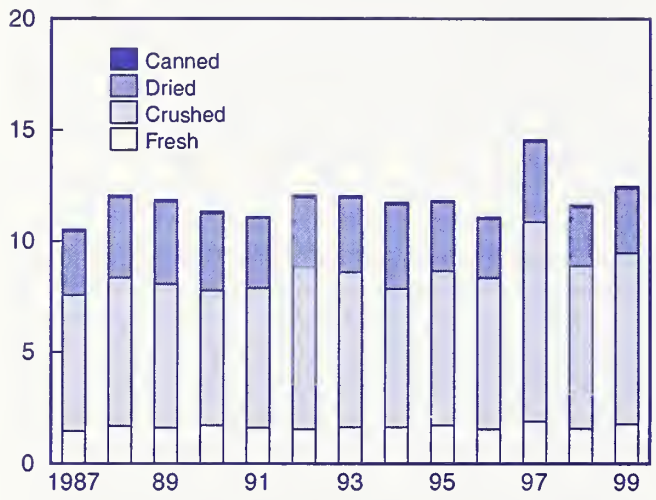
Table 6--U.S. imports of fresh grapes, by country, (May-April) 1995/96-1999/2000

Source	1995/96	1996/97	1997/98	1998/99	1999/00
	Million pounds				
Chile	603.4	590.1	662.2	608.5	757.5
Mexico	177.6	132.2	166.9	223.5	192.7
Rep. of South Africa	6.5	16.6	22.7	30.0	22.9
Canada	2.8	6.5	7.1	9.2	13.0
Argentina	0.0	0.0	0.6	1.4	5.3
Other	2.2	1.2	2.6	2.2	2.4
World	792.6	746.5	862.2	874.6	993.7

Source: Bureau of the Census, U.S. Department of Commerce.

Figure 5

U.S. grape utilization



Source: National Agricultural Statistics Service, USDA.

sors of wine and raisins led to higher grower prices for grapes used in these two categories, even though supplies increased from the previous year. Grapes used for wine rose 1 percent in 1999, and grower prices for grapes used for wine increased 4 percent to $530 per ton. In the same year, the quantity of grapes dried increased 9 percent, and corresponding grower prices increased 32 percent.

Due to strong domestic demand, U.S. wine imports in 1999 were up nearly 1 percent from the previous year, to 109.9 million gallons. Among the leading suppliers, imports rose from Italy, Australia, Spain, and Germany. Also strong was the export market for U.S. wine. U.S. wine exports reached a record in 1999, increasing 4 percent from a year ago to 70.0 million gallons. Among the top markets were the United Kingdom, Canada, Japan, and the Netherlands, whose combined share was 69 percent of the U.S. wine export market. Of these leading markets, export gains were achieved to Canada and the Netherlands. Imports and exports of U.S. wine from January-June 2000 were up 14 percent and 8 percent, indicating a continuing strong market for domestic wine.

Strong domestic demand and low stock levels limited exports of U.S. raisins during the 1999/2000 (August-July) season. Exports through June fell 28 percent. Imports for the same period also fell 28 percent, reflecting the increase in the quantity of domestic grapes used for raisin production in 1999 and reduced world supplies stemming from smaller raisin crops in Chile, South Africa, Greece, Turkey, and Mexico.

U.S. Pear Production Expected To Decline in 2000

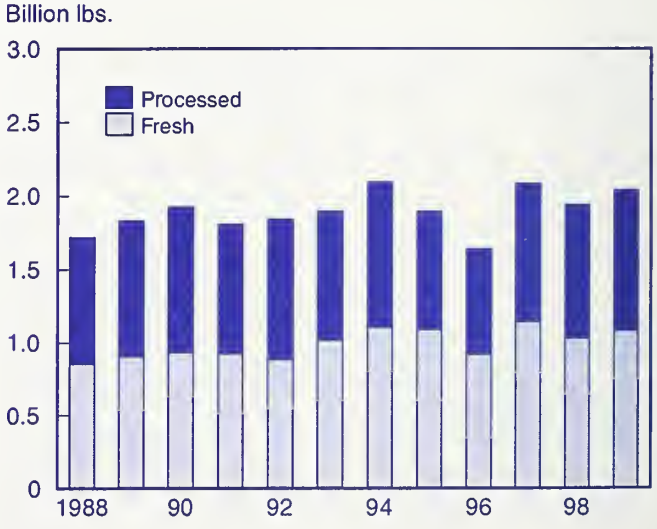
Total U.S. pear production for 2000 is forecast down 2 percent from 1999 to 2.0 billion pounds (table 7). The harvest of Bartlett pears is projected to reach 1.1 billion pounds, down 8 percent from 1999, while combined production of other U.S. pear varieties is forecast at 860 million pounds, up 5 percent.

Bartlett production is forecast down in the three Pacific Coast States that produce nearly all the U.S. Bartlett pear crop. California expects a 10-percent decrease from 1999, Washington 5 percent, and Oregon 9 percent during 2000. Over 70 percent of all Bartlett pears in the United States are processed, while the balance are marketed for fresh use. Production of other-than-Bartlett pears is expected to increase 9 percent in Washington, while output of these varieties in California and Oregon are expected to remain unchanged from last year.

The overall decline in pear production this year will likely lead to higher grower prices in 2000/01, particularly for processing pears. As of June 30, 2000, the end of the 1999/2000 marketing season, stocks of Bartlett pears in cold storage were already depleted versus stocks of 3.7 million pounds during the same time last year. This will help put additional upward pressure on processing pear prices. At the same time, stocks of fresh other-than-Bartlett pears in cold storage were 311 percent higher. The combined effects of large carry-over stocks and increased competition from

Figure 6

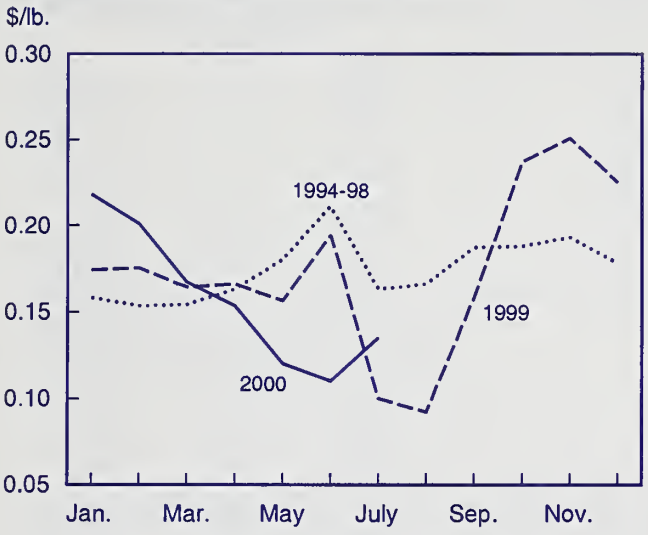
U.S. pear utilization



Source: National Agricultural Statistics Service, USDA.

Figure 7

U.S. grower prices for fresh pears



Source: National Agricultural Statistics Service, USDA.

expected increased supplies of fresh-market apples this fall will likely moderate increases in fresh-market pear prices during 2000/01. Lower supplies and higher prices will likely lead to a decline in domestic consumption from the 3.5 pounds per person in 1999. U.S. fresh pear exports will also likely be limited by these same factors.

Even with increased production in 1999, U.S. imports of fresh pears during 1999/2000 (July-June) rose to 199.0 million pounds, 33 percent higher than the previous season. Exports, likewise, rose 10 percent to 336.8 million pounds, with increased shipments to major markets such as Mexico and Canada.

Increased Peach Production To Drive Up Total Stone Fruit Output in 2000

Overall stone fruit production (peaches, nectarines, plums, prunes, apricots, and cherries) in 2000 is expected to be up from a year ago due mainly to a larger U.S. peach crop (table 8). Peaches make up about 70 percent of total stone fruit production in the United States, and this year's

Table 7--Pears: Total production and season-average price received by growers, 1997-99, and indicated 2000 production

State	Production 1/				Price		
	1997	1998	1999	2000	1997	1998	1999
	---- Million pounds ----				--- Cents per pound ---		
Pacific Coast:							
California:							
Bartlett	564	554	622	560	13.2	12.3	10.4
Other	60	60	60	60	18.6	21.8	14.8
Total	624	614	682	620	13.7	13.2	10.8
Oregon:							
Bartlett	150	130	132	120	15.0	17.1	14.9
Other	360	360	320	320	13.5	16.9	23.5
Total	510	490	452	440	13.9	16.9	21.0
Washington:							
Bartlett	410	320	420	400	13.1	14.5	11.4
Other	500	460	440	480	14.0	13.4	16.9
Total	910	780	860	880	13.6	13.9	14.2
Three States:							
Bartlett	1,124	1,004	1,174	1,080	13.4	13.7	11.3
Other	920	880	820	860	14.1	15.4	19.3
Total	2,044	1,884	1,994	1,940			
Colorado	5	7	1	6	14.8	22.5	32.9
Connecticut	2	2	2	2	35.0	38.8	38.8
Michigan	8	10	10	11	12.5	13.6	13.3
New York	16	23	25	29	19.2	18.8	19.4
Pennsylvania	8	12	8	12	27.6	17.6	21.3
Utah	1	2	1	1	29.3	15.4	22.9
Total	41	56	47	62			
United States							
Bartlett	1,124	1,004	1,174	1,080	13.4	13.7	11.3
Other	961	936	867	922	14.1	15.4	19.3
Total	2,085	1,940	2,041	2,002	13.8	14.6	14.7

1/ Includes unharvested production and production not sold.

Source: National Agricultural Statistics Service, USDA.

Table 8--Peaches: Total production and season-average price received by growers, 1997-99, and indicated 2000 production

State	Production				Price		
	1997	1998	1999	2000	1997	1998	1999
	-- Million pounds --				-- Cents per pound --		
Alabama	25	16	20	17	30.2	45.6	29.7
Arkansas	14	13	12	18	29.0	32.8	34.0
California							
Clingstone	1,148	1,045	1,059	1,120	13.0	11.0	11.3
Freestone	739	681	763	840	12.2	15.7	16.1
Colorado	7	20	3	21	66.1	48.8	64.0
Connecticut	2	2	2	2	70.0	70.0	65.0
Delaware	1/	1/	1/	1/	1/	1/	1/
Georgia	160	70	110	105	24.3	34.5	37.3
Idaho	8	9	8	9	57.4	43.6	47.2
Illinois	13	15	19	19	40.6	43.3	38.9
Indiana	3	4	3	3	54.5	31.8	36.9
Kansas	0	1	1	2/	42.0	47.0	42.0
Kentucky	1	2	2	4	30.0	37.5	43.0
Louisiana	1	1	1	2	45.3	71.0	88.0
Maryland	10	11	9	9	43.0	30.0	47.1
Massachusetts	2	2	2	2	70.0	80.0	80.0
Michigan	55	43	23	47	26.3	27.2	23.7
Missouri	10	9	11	10	35.0	39.6	41.7
New Jersey	65	70	70	70	44.9	44.9	43.3
New York	12	10	14	12	46.1	41.6	45.4
North Carolina	10	25	28	27	35.0	38.0	36.0
Ohio	6	7	9	8	40.0	41.6	44.7
Oklahoma	2	20	15	15	22.4	41.2	49.3
Oregon	6	8	7	8	52.9	31.6	36.5
Pennsylvania	70	65	75	55	33.7	31.7	32.2
South Carolina	160	140	160	150	20.8	26.0	20.4
Tennessee	4	3	3	2	38.0	45.0	47.0
Texas	20	24	13	21	35.0	52.0	62.0
Utah	8	7	6	11	27.0	27.0	32.8
Virginia	9	14	15	10	28.0	30.0	29.0
Washington	46	52	51	55	42.0	51.5	44.4
West Virginia	11	13	13	8	29.3	26.4	30.3
United States	2,625	2,401	2,525	2,677	17.7	19.2	19.0

1/ Estimates discontinued in 1997.

2/ Estimates discontinued in 2000.

Source: National Agricultural Statistics Service, USDA.

increased harvest is enough to offset expected output declines for many crops under this category, particularly sweet and tart cherries and combined output of prunes and plums harvested in Idaho, Michigan, Oregon, and Washington. Production of apricots and prunes (dried basis) in California, a major source of domestically-grown stone fruit, is also expected to be up from1999, and are contributing to the overall rise in stone fruit output (tables 9 and 10).

Despite milder conditions this past winter, orchards in California received sufficient chill hours required to achieve full dormancy, an essential stage for the development and production of strong fruit. Rainy weather in February did not cause major damage to the blooms, particularly in peach, nectarine, apricot, and plum orchards. Weather conditions in the spring were favorable for good pollination and a heavy fruit set. Maturity of many of these tree fruit crops in California for this season is about normal, as opposed to the late start of many last year. Meanwhile, irregular blooming for California's sweet cherry crop has resulted in both an irregular fruit set and varied maturity. Scattered rains also caused patchy damage to earlier varieties of cherries. California's sweet cherry output, third largest in the United States next to Michigan and Oregon, is forecast down 43 percent this year from 1999 (table 11).

In Michigan, crop prospects were hampered by a freeze in March that brought extensive damage to buds, especially in the northwestern sweet cherry growing areas. Bee activity was hindered by a combination of cool, wet conditions and high winds during full bloom, also affecting tart cherry growing areas in the southwestern part of the State. The sweet and tart cherry crops in Michigan are forecast down 19 percent and down 11 percent from 1999 (tables 11 and

Table 9--Apricots and nectarines: Total production and season-average price received by growers, 1997-99, and indicated 2000 production

Item and State	Production				Price		
	1997	1998	1999	2000	1997	1998	1999
	-- Million pounds --				-- Cents per pound --		
Apricots--							
California	264	226	170	190	15.4	15.6	18.1
Utah	0.3	0.4	1/	0.8	24.6	36.4	
Washington	14	11	11	13	37.6	31.5	42.5
United States	278	237	181	204	16.6	16.4	19.6
Nectarines--							
California	528	448	548	na	18.8	23.6	20.6

na = Not available.

1/ No significant production due to frost damage.

Source: National Agricultural Statistics Service, USDA.

Table 10--Plums and prunes: Production and season-average price received by growers in principal States, 1997-99, and indicated 2000 production

State/item	Production				Price		
	1997	1998	1999	2000	1997	1998	1999
	-- Million pounds --				-- Cents per pound --		
California:							
Plums	492	376	392	na	15.6	26.5	21.0
Prunes (fresh basis)	1,255	659	957	na	14.5	12.0	15.6
Total California	1,747	1,035	1,349	na			
Prunes (dried basis)	428	216	356	400	44.2	38.2	45.3
Prunes and plums:							
Idaho	6	9	4	9	25.9	27.7	14.4
Michigan	8	7	8	6	17.4	15.0	15.0
Oregon	24	21	26	20	11.9	13.7	7.9
Washington	13	14	9	8	9.2	11.0	11.3
Total four States	51	51	47	43	13.7	15.6	10.3
United States	1,798	1,086	1,495	na			

na = Not available.

Source: National Agricultural Statistics Service, USDA.

Table 11--Sweet cherries: Total production and season-average price received by growers, 1997-99, and indicated 2000 production

State	Production				Price		
	1997	1998	1999	2000	1997	1998	1999
	-- Million pounds --				-- Cents per pound --		
California	98.4	30.4	159.0	90.0	64.5	77.5	43.3
Idaho	3.2	4.4	3.8	4.8	64.5	53.5	81.5
Michigan	54.0	70.0	54.0	44.0	37.0	28.1	26.7
Montana	2.2	4.1	1.4	2.2	47.7	54.0	78.0
New York	1.3	1.4	2.1	1.8	86.0	103.5	74.5
Oregon	100.0	110.0	100.0	110.0	56.5	43.1	41.7
Pennsylvania	1.0	1.1	1.6	0.8	119.0	116.0	130.0
Utah	1.4	5.4	2.3	5.2	46.0	34.4	50.0
Washington	190.0	196.0	134.0	190.0	71.5	65.5	86.5
United States	451.5	422.8	458.2	448.8	62.5	54.5	54.5

Source: National Agricultural Statistics Service, USDA.

Table 12--Tart cherries: Total production and season-average price received by growers, 1997-99, and indicated 2000 production

State	Production				Price		
	1997	1998	1999	2000	1997	1998	1999
	-- Million pounds --				-- Cents per pound --		
Colorado	0.7	1.3	0.6	0.9	56.0	30.7	30.3
Michigan	225.0	263.0	185.0	165.0	15.6	14.0	21.6
New York	14.5	14.0	17.0	14.0	17.3	18.0	15.7
Oregon	3.7	2.8	5.3	5.0	21.0	12.7	23.9
Pennsylvania	6.5	4.2	7.2	6.5	25.8	19.0	29.3
Utah	17.5	33.0	14.5	30.0	16.0	16.0	18.6
Washington	13.5	14.0	16.5	15.0	10.0	12.0	17.5
Wisconsin	11.5	15.8	10.0	9.0	17.4	15.1	18.5
United States	292.9	348.1	256.1	245.4	15.9	14.5	20.9

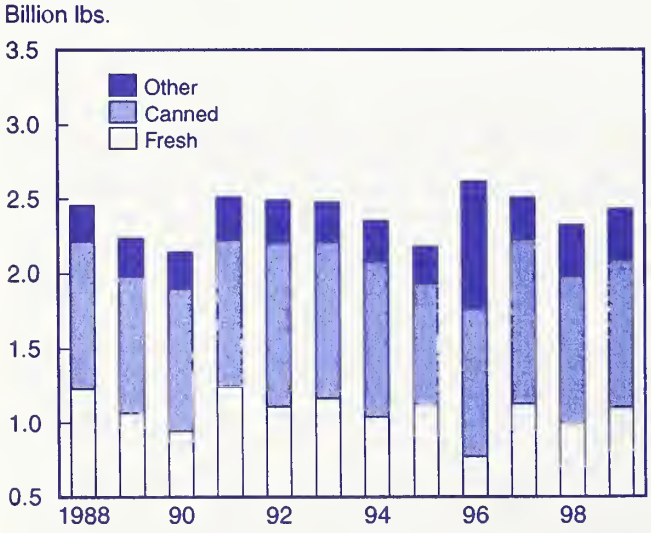
Source: National Agricultural Statistics Service and Economic Research Service, USDA.

12). Cherry crops in the northeast region experienced similar weather problems. Meanwhile, localized frost and hail damage reduced the tart cherry crops in Oregon (down 6 percent) and Washington (down 9 percent).

U.S. peach production is forecast at 2.7 billion pounds in 2000, up 6 percent from 1999. California is expected to harvest 8 percent more peaches this year, while South Carolina and Georgia, who are also large producers, are anticipated to produce 6 percent and 5 percent smaller crops. California's production of apricots and prunes (dried basis) is each forecast up 12 percent. USDA will release its first official estimate for nectarine and plum production in January 2001. Based on estimates from the California Tree Fruit Agreement, total pack out for nectarines and plums for 2000 are up 4 percent and up 5 percent from a year ago. U.S. sweet cherry production is forecast at 448.8 million pounds, down 2 percent from 1999. Total tart cherry production is forecast 4 percent lower.

Figure 8

U.S. peach utilization



Source: National Agricultural Statistics Service, USDA.

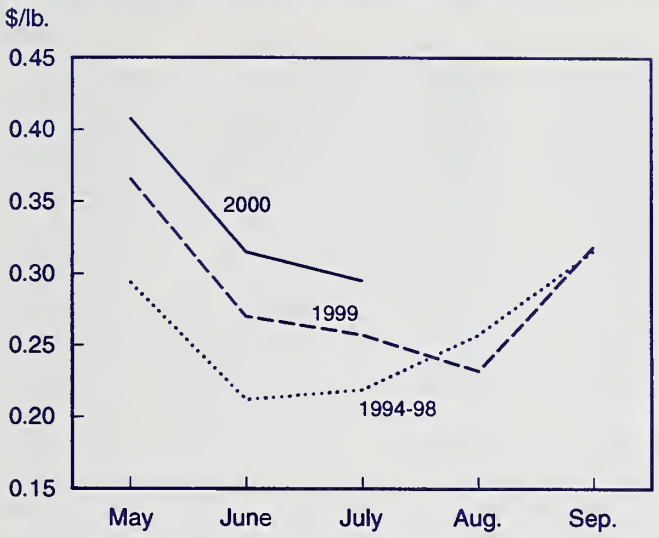
Fresh-market peach supplies are up due mainly to the larger crop. Supplies this year will likely also be affected by plant closures of the Tri Valley Growers canning cooperative, a major processor of fruit in the United States. According to the California Canning Peach Association (CCPA), peach tonnage has been cut 15 percent. Because of reduced plant capacity, peach growers in California who produce mainly for the processing sector (canning in particular) may divert some of their harvest to the fresh-market sector. CCPA are encouraging growers, particularly of late-season peaches, to remove trees from at least 1,100 acres, about 2 percent of California's peach bearing acreage. Currently, however, USDA's August forecast for California's clingstone peach production, used mostly for processing, was set at 1.1 billion pounds, up 6 percent from a year ago, and freestone peach output, mostly for fresh use, was up 10 percent.

Grower prices for fresh peaches have held strong, due in part to good quality and strong demand in both the domestic and export markets. Although prices have declined seasonally, grower prices from May through July averaged 14 percent higher than the same period a year earlier. At the retail end, prices have also declined seasonally but averaged 7 percent lower than a year ago during June through July. The larger, good-quality crop, along with lower retail prices, will likely boost consumption of fresh peaches (including nectarines) in the United States in 2000 about 1 percent higher than last year's 5.3 pounds per person. Larger supplies of California plums and apricots are also expected to lead to lower prices and increased domestic consumption in 2000. The smaller sweet cherry crop, meanwhile, along with a strong export market, will likely reduce domestic cherry consumption about 4 percent from last year's estimate of 0.65 pound per person.

Export prospects for U.S. stone fruit appear bright in 2000, partly due to increased production of good-quality fruit for many of these crops. Exports of fresh peaches from May to June this year were already up 59 percent from the same period in 1999, with sharply higher shipments to most major markets, particularly to Canada, Taiwan, and Mexico.

Figure 9

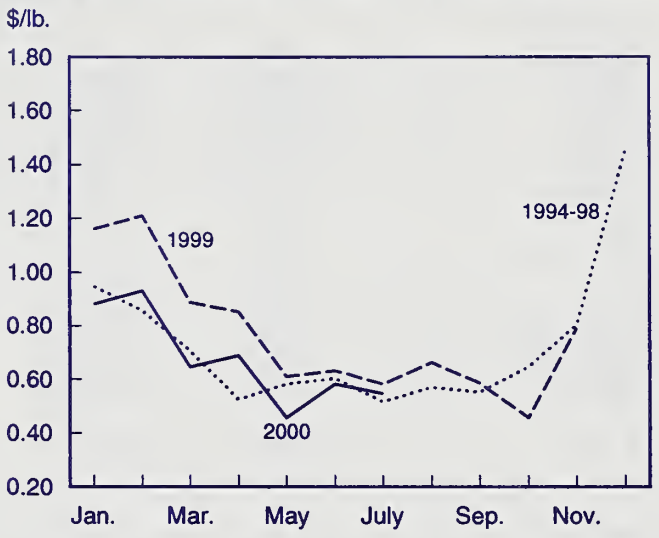
U.S. grower prices for fresh peaches



Source: National Agricultural Statistics Service, USDA.

Figure 10

U.S. grower prices for fresh strawberries



Source: National Agricultural Statistics Service, USDA.

During the same period, exports of plums were up 43 percent and exports of apricots were up over 1 percent, with significant increases to Canada and Taiwan. Despite reduced production, increased exports to Japan, Taiwan, and the United Kingdom kept May through June exports of sweet cherries up 2 percent from the same period a year ago.

Abundant Strawberry Supplies Continue

Commercial strawberry production in the six major producing States—California, Florida, Oregon, Washington, Michigan, and New Jersey—is forecast at 1.89 billion pounds in 2000, up 7 percent from a year ago (table 13). Oregon and Michigan are the only States where production is expected to decline, mainly reflecting smaller harvested acreage. Average yields are down in California due to excessive rainfall last February that caused a lot of fruit to rot. Favorable weather since then, however, allowed the California crop to rebound to an expected 1.63 billion pounds, up 7 percent. Harvested area there is expected to be up 12 percent, to 27,600 acres. From January through July, cumulative shipments of California fresh strawberries were already 11 percent ahead of the same period in 1999 (table 14).

Near-ideal growing conditions led to a larger, high-quality strawberry crop in Florida during winter 2000. Brief cold snaps in late December and late January did little damage, as growers used sprinklers to protect their fields. With higher yields and increased area harvested, the winter crop forecast was 214.2 million pounds, up 14 percent from 1999. Fresh shipments from the State peaked in March and ended in April with an overall total that was 24 percent higher than a year ago.

Increased supplies are keeping monthly grower prices for fresh-market strawberries below last year. The January-July average was 67.5 cents a pound, down 20 percent from the same period in 1999. Prices rose from 88.0 cents a pound in January to 92.9 cents in February, as heavy rains briefly disrupted the harvest of California strawberries in late January, and imports from Chile, a major supplier of fruit to the United States during the winter season, were still running behind last year. Prices began to decline seasonally in March, as larger volumes of California berries were shipped to the domestic market, Florida shipments were at its peak, and competition with Chilean fruit supplies intensified. Prices dropped to 64.5 cents in March and in July fell to 54.7 cents. Retail prices for fresh strawberries also declined seasonally and averaged $1.52 per 12-ounce pint—about 22 cents lower than last year. Increased supplies and lower prices are likely to boost this year's U.S. fresh strawberry consumption from 1999's 4.52 pounds per person.

U.S. fresh strawberry imports are expected to lag last year's volume of 94.8 million pounds as a result of the large domestic crop and an anticipated reduction in exports from Mexico, the primary supplier to the United States. According to USDA's Foreign Agricultural Service, Mexico's fresh strawberry exports, mainly sold in the U.S. market, will be down 6 percent in 1999/2000 compared with a year ago despite increased production due to frost-related quality problems that reduced supplies for exports. U.S. imports during the first 6 months of 2000 totaled 70.3 million pounds, down 18 percent from the same period a year ago. The larger, good-quality U.S. crop, combined with continued strong demand in large markets such as Canada and Mexico (where economic conditions have improved) will lead to a rise in this year's U.S. fresh strawberry exports from 1999's

Table 13--Strawberries: Harvested area, yield per acre, and total production, United States, 1995-2000

State	1995	1996	1997	1998	1999	2000
			-- Acres --			
Harvested area:						
Arkansas	180	170	210	180	210	na
California	23,600	25,200	22,600	24,200	24,600	27,600
Florida	6,000	6,000	6,100	6,200	6,200	6,300
Louisiana	950	750	450	400	400	na
Michigan	1,700	1,500	1,500	1,400	1,400	1,300
New Jersey	450	450	450	450	450	450
New York	2,200	1,900	1,600	1,600	1,600	na
North Carolina	2,400	1,800	1,500	1,600	1,600	na
Ohio	1,100	1,000	950	1,000	1,000	na
Oregon	5,700	5,200	5,000	4,400	4,200	3,500
Pennsylvania	1,400	1,300	1,400	1,200	1,300	na
Washington	1,300	1,300	1,400	1,500	1,500	na
Wisconsin	1,100	1,100	1,100	1,100	1,100	na
U.S. total	48,080	47,670	44,260	45,230	45,560	na
			-- Pounds per acre --			
Yield per acre:						
Arkansas	6,700	2,100	7,100	4,400	5,200	na
California	55,000	54,000	59,000	56,000	61,500	59,000
Florida	28,000	26,000	29,000	26,000	30,000	34,000
Louisiana	9,500	7,500	11,000	15,000	15,000	na
Michigan	6,000	4,000	6,500	6,800	6,400	6,700
New Jersey	3,400	3,500	4,400	4,400	4,400	4,500
New York	3,500	3,900	4,200	3,800	4,900	na
North Carolina	8,000	9,000	12,000	12,500	11,000	na
Ohio	4,500	3,600	3,600	5,200	4,000	na
Oregon	10,500	9,200	10,000	11,500	9,900	11,000
Pennsylvania	4,600	4,300	4,600	4,200	4,000	na
Washington	8,000	8,100	6,500	8,000	8,000	na
Wisconsin	5,000	4,000	5,100	5,500	4,400	na
U.S. total	33,300	34,100	36,800	36,300	39,800	na
			-- Million pounds --			
Total Production:						
Arkansas	1.2	0.4	1.5	0.8	1.1	na
California	1,298.0	1,360.8	1,333.4	1,355.2	1,515.5	1,628.4
Florida	168.0	156.0	176.9	161.2	186.0	214.2
Louisiana	9.0	5.6	5.0	6.0	6.0	na
Michigan	10.2	6.0	9.8	9.5	9.0	8.7
New Jersey	1.5	1.6	2.0	2.0	2.0	2.0
New York	7.7	7.4	6.7	6.1	7.8	na
North Carolina	19.2	16.2	18.0	20.0	17.6	na
Ohio	5.0	3.6	3.4	5.2	4.0	na
Oregon	59.9	47.8	50.0	50.6	41.6	38.5
Pennsylvania	6.4	5.6	6.4	5.0	5.2	na
Washington	10.4	10.5	9.1	12.0	12.0	na
Wisconsin	5.5	4.4	5.6	6.1	4.8	na
U.S. total	16,020.0	1,625.9	1,627.8	1,639.7	1,812.6	na

na = Not available.

Source: National Agricultural Statistics Service, USDA.

Table 14--Fresh strawberry shipments in the United States, monthly, by source, 1995-2000

Source/year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
							Million pounds						
California													
1995	0.6	17.2	46.8	149.7	159.5	145.0	114.1	77.8	70.3	46.7	11.3	1.4	840.4
1996	19.2	26.9	71.4	209.7	175.3	115.3	112.3	79.2	54.2	51.2	8.5	1.6	924.8
1997	7.2	24.8	101.4	184.8	195.5	104.1	94.0	76.9	48.1	36.7	14.3	1.9	889.9
1998	14.0	6.5	58.9	163.7	157.7	156.6	124.4	71.5	62.9	37.3	9.5	2.2	865.2
1999	6.9	17.1	60.9	145.2	216.0	172.2	134.5	76.9	62.3	52.6	21.9	9.3	975.8
2000	25.0	22.1	87.3	188.1	251.3	150.0	108.5						
Florida													
1995	4.7	5.4	23.0	4.1	--	--	--	--	--	--	0.1	5.1	42.4
1996	7.4	9.2	35.6	8.1	0.1	--	--	--	--	--	0.5	10.5	71.4
1997	21.2	46.8	33.1	0.2	--	--	--	--	--	--	0.3	10.5	112.1
1998	18.0	28.0	34.7	10.2	--	--	--	--	--	--	1.9	16.4	109.2
1999	24.8	19.1	47.6	9.0	0.1	--	--	--	--	--	0.8	14.0	115.4
2000	28.5	38.1	56.8	7.9	--	--	--						
Mexico													
1995	3.2	5.3	12.3	11.6	11.5	8.4	0.7	--	--	0.1	0.8	1.5	44.0
1996	5.2	7.7	13.4	21.4	11.4	1.7	--	--	--	--	0.9	2.2	55.4
1997	4.6	6.0	14.1	3.3	0.3	--	--	--	--	--	0.5	1.6	63.9
1998	4.7	6.3	11.3	13.9	8.3	7.7	2.2	--	--	--	1.0	1.4	56.8
1999	3.9	7.4	16.8	24.0	25.0	15.9	4.0	--	--	0.1	1.1	2.3	100.5
2000	7.0	10.3	16.3	17.3	13.5	5.8	1.1						
Total													
1995	8.5	27.9	82.1	165.4	171.0	153.4	114.8	77.8	70.3	46.8	12.2	8.0	938.2
1996	31.8	43.8	120.4	239.2	186.8	117.0	112.3	79.2	54.2	51.2	9.9	14.3	1,060.1
1997 1/	33.0	77.6	148.6	188.5	196.2	104.1	94.2	76.9	48.1	36.7	15.5	14.9	1,034.5
1998 1/	36.7	40.8	104.9	187.9	166.6	164.4	126.6	71.5	62.9	37.4	13.6	20.6	1,033.9
1999 1/	35.6	43.6	125.3	178.7	241.9	188.2	138.6	77.1	62.3	52.7	24.6	26.0	1,194.6
2000 1/	60.5	70.5	160.4	208.5	265.8	155.8	109.6						

-- = No shipments reported.

1/ Total includes small volume shipments from North Carolina during April and May and import shipments from New Zealand during November and December.

Source: Agricultural Marketing Service, USDA.

124.3 million pounds. Already, exports during the first 6 months of 2000 are 24 percent greater than the same period a year ago. Of the three major markets, exports rose to Canada and Mexico but declined to Japan, partly due to increased competition from South Korea and New Zealand.

Although the good-quality crop has resulted in increased supplies for the fresh market, strawberries for the processing sector are still expected to be relatively large. Combined with carryover stocks from last year's record crop, NASS reported cold storage stocks of frozen strawberries as of June 30, 2000, to be 515.8 million pounds, 41 percent higher than the same period a year ago. Because of these large stocks, grower prices for processing strawberries are likely to average lower than last year, and imports, mostly from Mexico, are expected to decline. Exports, on the other hand, are likely to increase.

Blueberry Production Expected Smaller in 2000

The National Agricultural Statistics Service will report its first official estimate of U.S. cultivated blueberry production for 2000 in January 2001. Based on preliminary crop indications reported by the North American Blueberry Council (NABC) as of July 26, 2000, the 2000 U.S. cultivated blueberry crop is estimated to be down about 3 percent from last year's 180.3 million pounds (table 15). Much of the decline appears to be a result of significantly lower production in Michigan and New Jersey, where more than half the U.S. cultivated blueberry crop are produced. Crops in Michigan and New Jersey are estimated to be 19 percent and 11 percent smaller than last year, while combined production in Oregon, Washington, North Carolina, and Georgia are estimated up 30 percent.

Of the U.S. cultivated blueberry crop, NABC estimated fresh use in 2000 was down 4 percent from a year ago, while processing use was up 6 percent. Fresh use was estimated to be down mainly in Michigan (23 percent), New Jersey (8 percent), and Indiana (25 percent), offsetting significant increases in fresh-market production in Oregon, Washington, Georgia, North Carolina, and Florida. Agricultural Marketing Service data on fresh shipments from Michigan and New Jersey during June through July were 22 percent and 31 percent behind the same period a year ago (table 16). Limited supplies, along with strong

Table 15--North American blueberry production, 1996-2000

State or Province	1996	1997	1998	1999	2000F
			Million pounds		
Cultivated:					
Michigan	42.0	72.0	49.0	72.0	58.2
New Jersey	35.0	35.0	37.0	41.0	36.4
British Columbia	37.1	22.3	34.1	32.5	38.0
Oregon	17.0	21.0	23.0	22.5	25.6
North Carolina	12.0	8.6	15.0	13.0	15.0
Washington	8.7	8.7	10.7	11.1	14.0
Georgia	6.0	14.0	9.0	12.0	21.4
Ontario	1.3	1.2	1.4	1.8	1.8
Other	9.0	10.7	9.4	8.7	4.9
Total	168.1	193.5	188.6	214.6	215.3
U.S.	129.6	170.0	153.1	180.3	175.5
Wild:					
Maine	59.2	73.8	63.0	65.9	75.0
Quebec	23.1	31.3	3.3	3.3	na
Nova Scotia	29.6	22.9	22.7	22.7	na
New Brunswick	11.5	8.8	11.9	11.9	na
Newfoundland and	2.5	1.2	2.3	2.3	na
Prince Edward Island	2.2	2.8	2.4	2.4	na
Total	128.2	140.7	105.6	105.6	na
Total U.S.	188.9	244.1	215.7	215.7	na

na = Not available. F = Forecast for cultivated varieties from the Economic Research Service, USDA based on crop indications from the North American Blueberry Council. Forecast for wild varieties from New England Agricultural Statistics Service.

Sources: National Agricultural Statistics Service, USDA and the North American Blueberry Council (Canada).

Table 16--U.S. blueberry shipments, monthly, 1996-2000

Source/year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Total
							Million pounds						
All 1/													
1996	0.8	0.6	0.4	0.1	3.2	13.5	23.0	20.1	4.4	0.6	0.2	0.5	67.4
1997	1.0	0.6	0.3	0.7	5.8	8.1	24.3	19.3	6.0	1.4	0.1	0.7	68.5
1998	1.1	0.9	0.5	0.7	7.0	17.7	30.7	15.6	2.2	0.4	0.5	0.7	78.0
1999	1.7	1.5	0.5	0.4	3.1	18.8	38.1	32.1	5.5	1.4	0.6	0.8	104.5
2000	3.2	2.0	1.5	0.7	6.0	14.3	25.0						
Florida													
1996	--	--	--	0.1	0.7	0.5	--	--	--	--	--	--	1.3
1997	--	--	--	0.6	1.0	0.1	--	--	--	--	--	--	1.7
1998	--	--	--	0.6	1.0	--	--	--	--	--	--	--	1.6
1999	--	--	--	0.2	0.6	--	--						
2000	--	--	--	0.6	1.3	--	--						
North Carolina													
1996	--	--	--	--	2.5	8.1	0.3	--	--	--	--	--	10.9
1997	--	--	--	--	4.8	3.7	--	--	--	--	--	--	8.6
1998	--	--	--	--	5.7	5.5	--	--	--	--	--	--	11.2
1999	--	--	--	--	1.8	9.3	--						
2000	--	--	--	--	4.7	4.0	--						
New Jersey													
1996	--	--	--	--	--	4.9	16.8	0.4	--	--	--	--	22.1
1997	--	--	--	--	--	4.3	17.3	0.5	--	--	--	--	22.1
1998	--	--	--	--	0.3	11.6	16.7	--	--	--	--	--	28.6
1999	--	--	--	--	--	11.8	19.1						
2000	--	--	--	--	--	9.6	11.6						
1995	--	--	--	--	--	--	6.4	9.1	1.4	--	--	--	16.9
1996	--	--	--	--	--	--	4.4	7.8	2.6	0.3	--	--	15.1
1997	--	--	--	--	--	--	4.4	9.8	3.6	1.2	--	--	19.0
1998	--	--	--	--	--	0.5	10.2	4.7	1.6	--	--	--	28.6
1999	--	--	--	--	--	1.0	10.6						
2000	--	--	--	--	--	0.4	8.6						

-- = No shipments reported. 1/ Includes imports from Canada, Chile, and New Zealand.

Source: Agricultural Marketing Service, USDA.

domestic demand, will likely keep fresh-market blueberry prices above last year's $1.16 per pound.

Similar to last year, lower stocks of frozen blueberries in cold storage could prevent processing blueberry prices from falling, despite increased production for the processing sector. Last year, processing use was up 32 percent from 1998, but grower prices for processing blueberries rose 38 percent, to 66 cents per pound (table 17). For this year, USDA reported U.S. stocks of frozen blueberries (wild and cultivated) on January 1, 2000, to be 12 percent lower than the same period a year ago.

Even with production declines in Michigan and New Jersey, processing use in 2000 will be up mainly due to the larger crop of wild blueberries in Maine, which account for nearly half the domestic production going into the processing sector. Processing use is also expected to be up in Georgia, Indiana, North Carolina, Oregon, and Washington. The New England Agricultural Statistics Service forecast wild blueberry production in Maine, mostly used for processing, at 75 million pounds in 2000, 14 percent above last year's drought-reduced output. The crop received minimal damage from winterkill this winter. Despite cool, wet, and windy conditions that hampered pollination in June, fruit set was generally very good. Growers also indicated that rains in July provided adequate moisture to promote good berry size.

Strong demand continues to outpace processing supplies. This, along with increased competition brought by a larger crop in Canada, will likely result in rising U.S. imports of frozen blueberries in 2000. Preliminary indications provided by NABC suggest that the Canadian cultivated blueberry crop will be up 16 percent in 2000 compared with a year ago, and processing use there will be up 14 percent. U.S. imports of frozen blueberries from January through June mostly from Canada, were up 41 percent from the same period last year. Due to reduced fresh-market production, U.S. fresh blueberry imports, primarily from Chile, totaled 5.7 million pounds during the same period, up 50 percent.

Demand in the international market, especially for fresh use and in specific markets such as Japan and Canada, has kept exports strong thus far in 2000. Cumulative U.S. exports of fresh blueberries from January through June were up 32 percent from the same period a year ago despite the decline in domestic fresh-market production. At the same time, exports of frozen blueberries rose less than 1 percent.

Table 17--Blueberry prices received by growers, 1997-99

Use and State	1997	1998	1999
		Cents per pound	
All Uses:			
Michigan	69.5	61.8	79.1
New Jersey	99.9	78.8	93.8
North Carolina	117.0	91.3	103.0
Oregon	73.3	50.2	79.7
Washington	89.2	62.5	72.0
U.S. average	83.1	72.5	88.6
Fresh:			
Michigan	98.8	86.0	113.0
New Jersey	102.0	87.0	102.0
North Carolina	135.0	109.0	119.0
Oregon	87.5	72.0	105.0
Washington	167.0	103.0	122.0
U.S. average	110.0	96.8	116.0
Processed:			
Michigan	59.0	50.0	66.0
New Jersey	95.0	50.0	73.0
North Carolina	59.0	35.0	51.0
Oregon	67.0	38.5	67.0
Washington	66.0	53.0	64.0
U.S. average	64.0	47.7	66.0

Source: National Agricultural Statistics Service, USDA.

Kiwifruit Imports To Break 5-Year Trend

Following five consecutive years of rising imports, the United States will likely receive fewer kiwifruit from foreign suppliers during the 1999/2000 season, despite the much smaller California crop harvested in the fall of 1999. Based on data from the U.S. Bureau of Census, cumulative imports during 1999/2000 thus far (October-June) totaled 77.0 million pounds, 1 percent less than the same period in 1998/99 (table 18). Among the top three suppliers to the United States, imports were down thus far from Chile (14 percent) and New Zealand (31 percent), but were up from Italy (118 percent). Shipments from Chile, accounting for

Table 18--U.S. imports of fresh kiwifruit, by country, (October-September) 1994/95-1999/2000

Sources	1994/95	1995/96	1996/97	1997/98	1998/99	1998/99 (October-June)	1999/00 (October-June)
				1,000 pounds			
Chile	73,916	69,108	61,490	59,483	55,050	49,880	42,636
Italy	907	4,095	14,729	4,298	8,783	8,783	19,165
New Zealand	5,770	8,723	5,663	27,796	31,926	17,507	12,145
Other countries	3	309	1,188	986	2,078	1,581	3,034
World	80,596	82,235	83,070	92,563	97,837	77,751	76,980

Source: Bureau of the Census, U.S. Department of Commerce.

Table 19--California kiwifruit: Acreage, production, and value, 1994-99

Year	Bearing acreage	Total production	Price 1/	Value 2/
	Acres	Million pounds	Cents per pound	1,000 dollars
1994	6,500	78.8	24.6	18,413
1995	6,100	75.6	23.0	15,434
1996	5,700	63.0	23.5	13,157
1997	5,300	70.0	25.9	16,483
1998	5,300	73.2	37.2	24,544
1999	5,300	54.0	31.7	15,215

1/ Season-average grower price. 2/ Value is based on utilized production.

Source: National Agricultural Statistics Service, USDA.

more than half of the kiwifruit supplies entering the U.S. market, fell despite a larger and better quality crop there in 1999 compared with the previous year. Meanwhile, lower production limited the amount of exports from New Zealand, the second largest supplier.

Virtually all U.S. kiwifruit is grown in California. Domestic production reached 54 million pounds in 1999, 26 percent lower than the previous year and the smallest crop since 1986 (table 19). While bearing acreage remained unchanged for the third consecutive year in 1999, freeze-related damage significantly reduced average yields. While the harvested crop still achieved excellent quality, reduced supplies have limited export potential in 1999/2000. Cumulative exports from October 1999 to June 2000 totaled 11.4 million pounds, down 25 percent from the same period a year ago, with lower shipments to large markets such as Canada and Japan. Because weather has been ideal for growing the fall 2000 crop in California, production is more likely to recover, strengthening the potential for more exports during the marketing year 2000/01.

Cranberry Production To Decline in 2000

U.S. cranberry production is expected to decline in 2000. USDA's August forecast of the 2000 U.S. cranberry crop totaled 584 million pounds, 8 percent smaller than last year's bumper crop but the second largest on record (table 20). Production declines are expected in Massachusetts (down 3 percent), New Jersey (down 20 percent), and Wisconsin (down 13 percent), while increases are anticipated in Oregon (up 28 percent) and Washington (up 4 percent). A mild winter resulted in less winter damage to the overall U.S. crop. Favorable weather during pollination also prevailed in growing areas in the Pacific Northwest, resulting in good pollination and fruit set. Meanwhile, heavy rains in July created some problems with the crops in Wisconsin and Massachusetts.

Continued large supplies stemming from an above-average crop this year and large inventories will likely keep grower prices for cranberries low during the 2000/01 season. Last year, grower prices fell from 38.8 cents per pound in 1998 to 17.0 cents, the lowest price on record. Even with the record-large crop, sharply lower prices last year reduced the value of the 1999 crop to $109 million, just barely over half the value of the previous year's crop.

Efforts are being undertaken to resolve the oversupply situation. A Federal marketing order regulation, established by USDA in July of this year, will regulate the volume of cranberries that can be marketed during the 2000-01 crop year. Under the regulation, growers are only allowed to sell 85 percent of their sales history to processors for the new season beginning September 1 to help stabilize sinking prices and swelling inventories. In order to cut total output and production costs, growers cut back on production inputs or acres. USDA's National Agricultural Statistics Service reported reduction in production inputs by growers in New Jersey and Wisconsin. Increased USDA spending on cranberry products such as cranberry-apple juice and trail mix (that includes dried cranberries) for distribution to the Needy Family and other related domestic food assistance programs during the 2000 fiscal year will also help alleviate the oversupply situation.

Table 20--Cranberries: Total production and season-average prices received by growers, 1997-99, and indicated 2000 production

State	Production				Price		
	1997	1998	1999	2000	1997	1998	1999
	-- Million pounds --				-- Cents per pound --		
Massachusetts	210	188	188	183	66.2	37.3	16.1
New Jersey	58	52	69	55	56.6	26.3	10.7
Oregon	35	36	32	41	55.7	39.8	10.5
Washington	17	17	15	15	55.7	25.0	10.5
Wisconsin	230	253	334	290	65.0	43.3	19.8
United States	550	544	637	584	63.7	38.8	17.0

Source: National Agricultural Statistics Service, USDA.

Tropical Fruit Outlook

Tropical fruit imports were up in 1999. Per capita consumption of the major imported tropical fruit—bananas, pineapples, mangoes, and papayas—is estimated to increase 18 percent between 1990 and 1999. Banana consumption accounted for the largest share, increasing from 51 percent of all tropical fruit consumed in 1990 to 79 percent in 1999. Fresh mango and papaya consumption, however, have increased the most.

Banana Imports and Prices Up in 1999

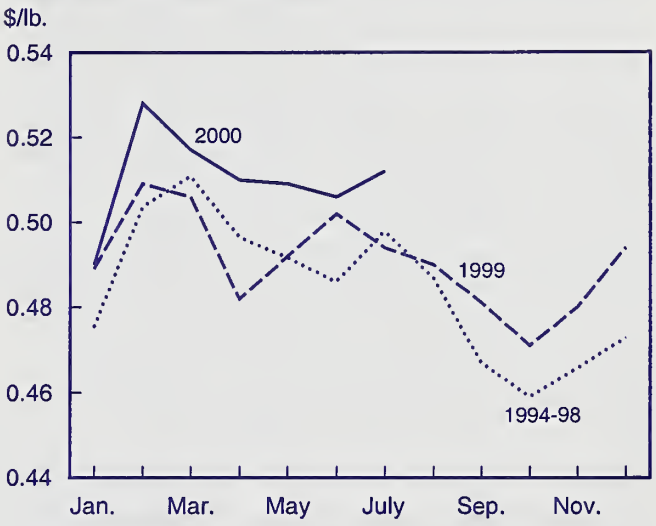
Banana imports were strong in 1999, increasing 10 percent from the previous year (table 21). Imports were 47 percent higher from Costa Rica, the major source for the U.S. market, and 46 percent higher from Colombia, the third major source. Ecuador remained the second major banana exporting country to the United States, but imports grew only 8 percent from 1998. Honduran imports, the third largest until Hurricane Mitch destroyed its banana-production region in November 1998, fell 77 percent between 1998 and 1999. November and December typically averaged 20 percent of Honduras' banana exports to the United States. After the hurricane, the 2 months accounted for 1 percent of the exports, dropping total 1998 shipments by 33 percent. Shipments in 2000 from January to May were still averaging 57 percent lower than pre-hurricane exports.

Per capita consumption of fresh bananas is estimated to increase 10 percent between 1998 and 1999 to 31.4 pounds. Much of the increase in banana consumption in 1999 can be attributed to the sharp decline in the domestic fresh orange crop. The short supply and high prices for oranges increased demand for bananas.

Retail prices for fresh bananas are running 3 percent higher from January to July 2000. At an average of $0.51 a pound, 2000 prices are the highest since 1991. Imports are about 2 percent below last year from January through May. Imports are up from Costa Rica and Guatemala, but down from Ecuador, Colombia, and Mexico.

Figure 11

Bananas: Retail prices



Source: Bureau of Labor Statistics Service, USDL

Hawaii's banana production reached a record high in 1999, reaching 24.5 million pounds, up 17 percent from a year ago. New and maturing banana acreage increased production. Total acreage reached 1,760 in February 2000, up 8 percent from last February. Harvested acres accounted for 81 percent of the total. Growers planted 220 new acres in 1999 and are expected to plant about 430 acres in 2000. With the continuous new plantings, Hawaii's banana production can be expected to continue its upward trend of the past 7 years.

Growers received an average of $0.35 per pound for all banana varieties in 1999, unchanged from a year earlier. Grower prices for Cavendish bananas, the major variety grown in Hawaii, averaged $0.315 per pound, up 1 percent from the previous year. The farm value reached a record $8.6 million due to higher production. Production during the first 6 months of 2000 totaled 14.2 million pounds, up 25 percent from last year. Grower prices for all banana varieties averaged $0.36 during this time, fractionally lower than last year.

Table 21--U.S. imports of fresh bananas, excluding plantains, by country, 1990-99

Country	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
					Million pounds					
Costa Rica	1,260	1,513	2,104	2,034	2,154	2,112	2,138	2,103	2,405	3,536
Ecuador	2,518	2,458	1,976	1,679	1,733	2,054	1,871	1,925	2,381	2,578
Colombia	788	1,001	917	1,315	1,388	969	841	1,028	915	1,336
Guatemala	733	650	843	833	970	1,022	1,114	1,020	1,443	1,114
Mexico	335	475	873	680	423	343	312	446	486	311
Panama	102	80	82	169	342	280	580	474	12	289
Honduras	1,071	918	905	941	1,096	1,285	1,410	1,243	831	184
Other countries	15	24	85	96	38	13	60	78	153	121
World	6,821	7,119	7,785	7,745	8,144	8,077	8,327	8,317	8,627	9,469

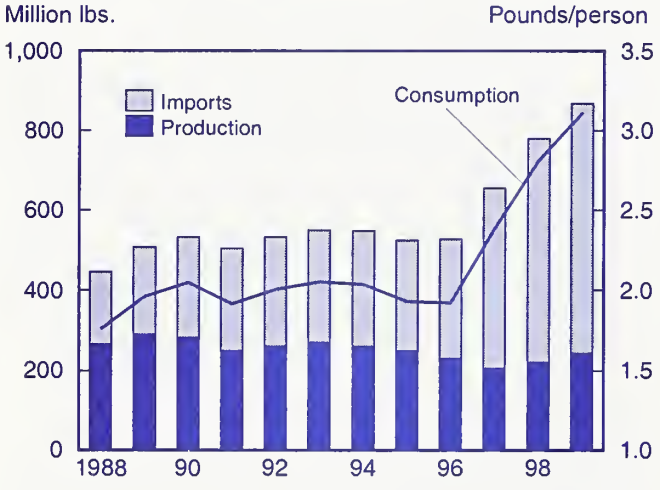
Source: Bureau of the Census, U.S. Department of Commerce.

Pineapple Imports Up in 1999, Boosting Consumption

Imports of pineapples (fresh/frozen, canned, and juice) increased in 1999 from a year ago. As a result, per capita consumption for 1999 is expected to increase 20 percent to 13.3 pounds, fresh-weight equivalent. For the first time since 1994, per capita consumption of canned pineapples will exceed juice. Canned pineapple is estimated to increase 33 percent in 1999, juice 13 percent, and fresh 11 percent. In 1999, fresh pineapple consumption accounted for 20 percent of all pineapple consumption. While low relative to other pineapple uses, fresh/frozen consumption, at 3.1 pounds per person, is the highest in at least the last 20 years. Consumption is projected to be down for canned and juice pineapples in 2000, with imports running about 17 percent behind January through May 1999. Fresh consumption, however, is expected to continue to grow, with imports 22 percent above a year ago for the same period.

Figure 12

U.S. fresh pineapple supply and consumption



Source: National Agricultural Statistics Service and Economic Research Service, USDA.

Imports of fresh pineapple increased 12 percent in 1999 from a year earlier, totaling 624 million pounds (table 22). Imports from Costa Rica totaled 498 million pounds, 13 percent higher than the previous year. In 1999, Costa Rica provided 80 percent of the fresh pineapples to the U.S. market. Honduras, Mexico, Ecuador, and Thailand rounded out the top five sources of fresh pineapples for the United States. Together they accounted for 99 percent of the imports.

Hawaii's pineapple crop is estimated to be 6 percent higher in 1999 than a year earlier, at 352,000 tons. Acreage remained unchanged from 1998 at 21,000 acres. Most of Hawaii's pineapple crop is processed. In 1999, 65 percent went to processing. Growers receive about 80 percent less for pineapples going to processing than to the fresh market. In 1999, growers received about 4 percent less per ton for processing pineapples and 3 percent more for fresh-market pineapples. The value of the 1999 crop totaled $101.4 million, 9 percent higher than last year. The higher value was a result of the bigger crop.

Imports of canned and juice pineapple increased in 1999 over the previous year. However, 1999 quantities were still lower than 1993 and earlier levels (tables 23 and 24). In 1999, canned pineapple imports totaled 754 million pounds, 39 percent above 1998. Canned pineapple imports were up from the four major sources, the Philippines, Thailand, Indonesia, and China. Together they accounted for 94 percent of imports in 1999. Imports from Thailand, the second major source of canned pineapples, showed the biggest increase between 1998 and 1999. Heavy duties on canned pineapples from Thailand reduced imports after the levy of the duty in 1994. Tight world supplies in 1999, however, forced importers to turn to Thailand to meet demand, temporarily increasing trade.

Pineapple juice imports rose 27 percent to 78 million single-strength gallons. Imports declined 1 percent from the Philippines, the number one source. Imports from the remaining top five sources, Thailand, Indonesia, Costa Rica, and Brazil increased. Shipments from Brazil increased

Table 22--U.S. imports of fresh and frozen pineapples, by country, 1990-99

Country	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
					1,000 pounds					
Costa Rica	120,015	111,161	128,679	159,230	181,538	170,010	186,721	339,916	442,906	498,308
Honduras	32,929	56,282	69,158	57,972	63,474	73,142	59,744	54,410	59,414	73,976
Mexico	8,508	12,191	14,740	16,913	12,739	13,369	17,608	33,982	38,795	31,948
Ecuador	0	0	0	0	289	3,241	8,692	9,244	5,047	11,383
Thailand	2,757	2,534	3,935	5,773	6,709	3,993	6,179	5,299	6,505	4,599
Guatemala	0	0	77	233	156	1,202	877	221	587	3,787
Singapore	18	0	18	0	0	0	55	0	0	35
Colombia	1,162	2	0	94	0	0	30	47	16	30
Dominican Republic	85,055	71,332	55,566	38,606	23,396	7,169	8,899	1,106	322	28
Other countries	627	358	494	1,461	759	2,591	9,381	5,503	3,842	13
World	251,072	253,860	272,668	280,283	289,059	274,716	298,186	449,727	557,434	624,106

Source: Bureau of the Census, U.S. Department of Commerce.

Table 23--U.S. imports of canned pineapples, by country, 1990-99

Country	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
					1,000 pounds					
Philippines	203,464	258,597	282,596	283,216	284,619	274,707	276,574	277,709	247,345	274,036
Thailand	282,233	268,138	383,774	379,226	339,843	219,302	172,032	166,847	109,011	256,663
Indonesia	26,718	30,063	36,299	42,093	53,819	61,580	120,862	145,840	108,676	144,897
China	243	1,265	2,027	974	666	1,051	3,907	5,011	22,354	29,904
Malaysia	11,315	8,043	5,047	5,533	11,741	18,340	18,044	20,915	15,084	15,077
Vietnam	0	0	0	0	0	354	5,479	7,859	7,198	11,692
Republic of South Africa	0	0	10	1,347	4,016	12,509	14,228	18,642	21,248	11,405
Singapore	7,931	4,235	5,385	6,777	5,200	2,050	3,777	6,247	7,880	6,655
Mexico	1,520	3,381	4,500	801	522	626	1,507	3,743	1,480	1,619
Japan	53,455	29,702	15,161	29,267	27,422	52,232	33,885	570	2,019	963
Other countries	17,144	29,420	16,919	5,268	7,700	8,704	5,248	3,659	1,330	1,573
World	604,024	632,844	751,717	754,504	735,548	651,454	655,542	657,041	543,625	754,484

Source: Bureau of the Census, Department of Commerce.

Table 24--U.S. imports of pineapple juice, by country, 1990-99

Country	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
					1,000 single-strength gallons					
Philippines	31,491	42,784	41,461	37,689	36,795	43,716	36,805	37,672	33,962	33,458
Thailand	35,636	31,537	35,363	41,768	27,121	30,439	31,130	23,045	17,203	29,563
Indonesia	710	708	288	871	3,423	3,951	6,771	8,888	5,244	9,770
Costa Rica	2,068	3,141	1,973	2,859	1,874	1,780	1,704	2,916	1,598	3,073
Brazil	259	0	299	79	52	0	11	0	43	904
Mexico	3,203	2,753	1,230	220	94	523	640	732	2,093	509
Republic of South Africa	0	0	209	327	372	315	475	310	286	442
Canada	20	0	23	4	7	48	24	65	142	106
Japan	7,249	3,691	3,417	2,536	2,500	3,529	2,299	380	394	97
Honduras	890	1,066	1,142	984	112	48	970	472	114	84
China	0	20	61	0	0	52	0	21	121	80
Other countries	7,849	7,229	2,427	1,664	863	614	3,014	1,581	300	138
World	89,374	92,929	87,895	89,001	73,213	85,016	83,843	76,080	61,500	78,224

almost 2,000 percent between 1998 and 1999 as it continues to grow in importance as a supplier to the United States. The Philippines accounted for 43 percent of pineapple juice imports in 1999, down from 55 percent in 1998. The share of imports from the next four major sources increased from 39 percent in 1998 to 55 percent in 1999.

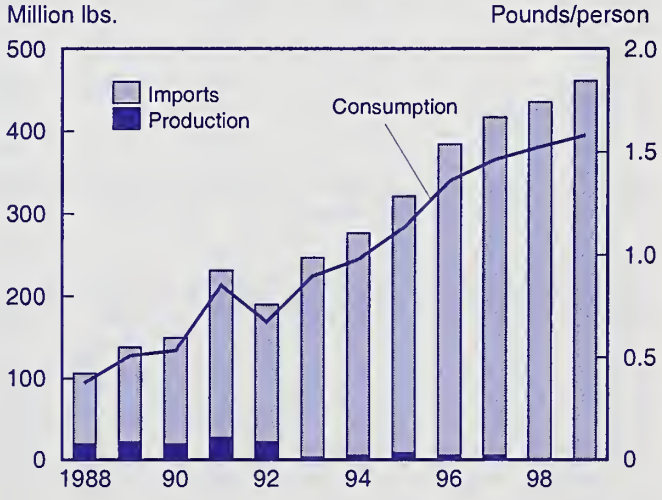
Mango and Papaya Popularity Continue To Grow

Mango consumption in the United States continues to grow. In 1999, Americans are estimated to have consumed 1.6 pounds per person. Consumption increased 5 percent over the previous year, however, that was below the annual rate of 15 percent throughout the nineties. Papaya consumption is low relative to other fruit, estimated at 0.64 pound per person in 1999. Papaya consumption increased last year after 2 years of declining demand. Throughout the nineties, papaya consumption grew at a rate of 17 percent annually.

Mango imports increased 13 percent in 1999 from a year ago (table 25). Mexico is the major supplier of fresh mangoes to the U.S. market, providing 75 percent of the total.

Figure 13

U.S. fresh mango supply and consumption



Source: National Agricultural Statistics Service and Economic Research Service, USDA.

Other major suppliers include Brazil, Peru, Ecuador, and Guatemala. Shipments from Ecuador and Peru grew dramatically between 1998 and 1999, helping to supply the increased demand in the United States.

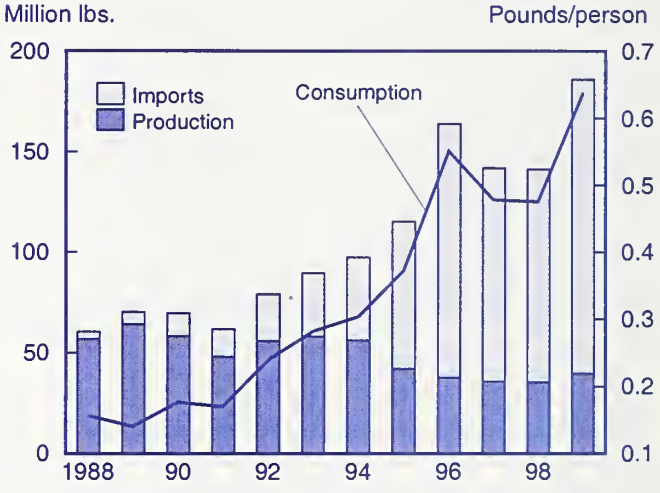
Mango production in the United States is very small. Mangoes require a tropical climate, limiting regions in the United States where they can grow. Southeastern Florida has the largest domestic commercial production, limited to very few producers. As a result, the Florida Agricultural Statistics Service has not reported mango production or value for 1998 or 1999. Florida mango production is mostly sold to specialty markets or as green fruit for marketing. The number of bearing acres has remained steady over the past 3 years at 1,400 acres. Bearing trees rose in 1999 to 142,000.

Papaya imports grew 39 percent between 1998 and 1999 (table 26). Mexico is also the major supplier of fresh papaya for the United States, accounting for 84 percent of all shipments in 1999. Exports to the United States from Brazil are growing rapidly. Prior to last year, Brazil was not even a U.S. source for papayas.

Hawaii's papaya crop increased in 1999 for the second consecutive year, after the industry experienced declining production from 1993 to 1997. Output, totaling 42.4 million pounds, was 6 percent above 1998. The number of harvested acres declined 8 percent in 1999 to about 1,940 acres. The Island of Hawaii accounted for 65 percent of the State's production, down from 90 percent in 1996. Production in recent years has been moving to other islands, especially Kauai and Oahu, as growers move away from areas where the Papaya ringspot virus is a problem.

Figure 14

U.S. fresh papaya supply and consumption



Sources: National Agricultural Statistics Service and Economic Research Service, USDA.

Table 25--U.S imports of fresh mangoes, by country, 1990-99

Country	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
					1,000 pounds					
Mexico	112,290	168,618	151,083	211,134	241,037	256,303	311,682	354,417	365,659	379,452
Brazil	370	2,281	3,769	6,972	4,860	6,516	10,773	11,950	15,562	28,267
Peru	0	482	6,696	6,060	7,864	8,506	9,897	7,378	8,007	25,368
Ecuador	0	290	825	731	1,933	3,285	8,647	1,936	12,113	23,860
Guatemala	0	32	0	1,395	5,260	12,830	15,217	15,976	22,774	21,175
Haiti	17,217	29,922	611	18,445	8,418	22,078	18,181	22,872	15,763	20,196
Costa Rica	0	41	49	85	184	145	968	1,647	1,046	2,425
Nicaragua	0	0	0	0	395	1,650	2,081	1,708	3,236	1,495
Venezuela	0	1,638	5,830	6,260	7,407	4,616	5,138	1,054	1,174	900
Dominican Republic	199	335	185	302	381	288	307	562	569	436
Other countries	264	393	187	322	237	371	329	285	263	790
World	130,340	204,032	169,236	251,705	277,976	316,589	383,219	419,785	446,166	504,367

Source: Bureau of the Census, U.S. Department of Commerce.

Table 26--U.S. imports of fresh papayas, by country, 1990-99

Country	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
					1,000 pounds					
Mexico	6,522	8,927	18,615	21,533	32,996	67,156	110,661	88,233	87,438	123,307
Belize	873	82	1,347	4,297	3,962	1,438	5,347	7,971	9,397	8,485
Brazil	0	0	0	7	0	0	0	19	1,102	6,229
Jamaica	96	720	2,324	4,509	2,588	3,462	5,244	4,582	4,562	4,194
Dominican Republic	82	521	768	683	783	1,251	2,517	2,122	1,152	2,608
Costa Rica	0	9	4	11	796	19	2,134	3,164	1,848	1,592
Other countries	3,911	3,119	36	260	52	62	192	174	120	147
World	11,483	13,378	23,094	31,301	41,176	73,388	126,095	106,264	105,620	146,561

Source: Bureau of the Census, U.S. Department of Commerce.

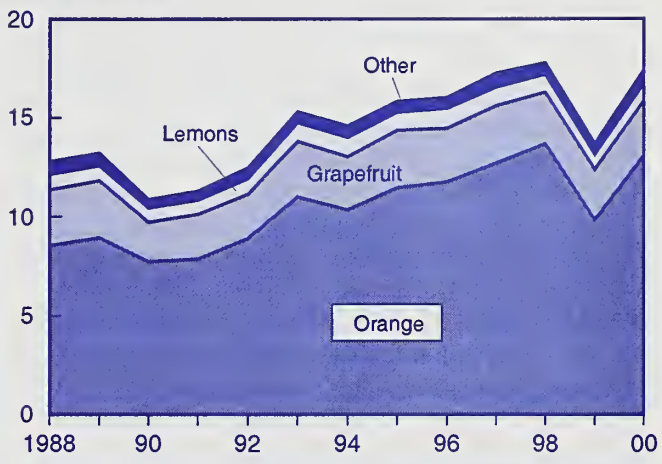
U.S. Citrus Crop Rebounds In 1999/2000

The forecast 1999/2000 citrus crop increaseed 27 percent from the previous year under good growing conditions in both California and Florida. In 1998/99, both States experienced adverse weather conditions that drastically reduced production of some citrus commodities. Production of all citrus crops, except Florida tangelos, increased (table 27). California's trees had fewer lasting effects from last year's freeze than was previously expected. Much needed rainfall in early 2000 helped increase fruit size. The rains also provided for a good start for the coming season's (2000/01) crop.

California's citrus crop increased 59 percent over last season's freeze-damaged crop. Orange production, greatest hit by the freeze in 1998, increased 86 percent. Tangerines, lemons, and grapefruit mostly grow further south than much of the orange crop, and a smaller portion felt the effects of the freeze. There is some lemon production in the San Joaquin Valley, where the freeze occurred and trees

Figure 15

U.S. citrus production



Year harvest was completed.
Source: National Agricultural Statistics Service, USDA.

Table 27--U.S. citrus fruit: Utilized production by crop and State, 1996/97-1999/2000 1/

Crop and State	1996/97	1997/98	1998/99	1999/2000	1996/97	1997/98	1998/99	1999/2000
	-- 1,000 boxes 2/ --				-- 1,000 short tons --			
All oranges	293,020	315,525	224,580	300,800	12,692	13,670	9,824	13,023
Arizona	1,400	1,000	1,150	1,100	53	38	43	42
California	64,000	69,000	36,000	67,000	2,400	2,588	1,350	2,513
Florida	226,200	244,000	186,000	231,000	10,179	10,980	8,370	10,395
Texas	1,420	1,525	1,430	1,700	60	64	61	73
All grapefruit	70,100	63,150	61,400	67,750	2,885	2,593	2,520	2,789
Arizona	800	800	750	500	27	27	25	17
California	8,200	8,000	7,500	8,000	275	268	251	268
Florida	55,800	49,550	47,050	53,300	2,371	2,106	2,000	2,266
Texas	5,300	4,800	6,100	5,950	212	192	240	238
All lemons	25,300	23,600	19,650	23,100	962	897	747	878
Arizona	2,700	2,600	3,450	3,100	103	99	131	118
California	22,600	21,000	16,200	20,000	859	798	616	760
Limes:								
Florida	320	440	500	600	14	19	22	26
Tangelos:								
Florida	3,950	2,850	2,550	2,200	178	128	115	99
All tangerines	9,650	8,200	7,400	9,950	425	360	327	444
Arizona	750	600	950	850	28	23	36	32
California	2,600	2,400	1,500	2,100	98	90	56	79
Florida	6,300	5,200	4,950	7,000	299	247	235	333
Temples:								
Florida	2,400	2,250	1,800	1,950	108	101	81	88
K-early citrus:								
Florida	150	40	80	110	7	2	4	5
U.S. total citrus	--	--	--	--	17,271	17,770	13,640	17,352

-- = Not applicable.

1/ The crop year begins with bloom of the first year shown and ends with harvest.

2/ Net pounds per box: oranges-California and Arizona-75; Florida-90; Texas-85; grapefruit-California and Arizona-67; Florida-85; Texas-80; lemons-76; limes-88; tangerines-California and Arizona-75; Florida-95; tangelos, Temples, and K-early-90.

Source: National Agricultural Statistics Service, USDA.

appeared to suffer less damage than was originally expected. California lemon production increased by 23 percent.

Most of Florida's citrus production benefited from good weather for most of 1999, despite the effects of Hurricane Irene in mid-October. The hurricane hit mostly the eastern coast of Florida, where most of the grapefruit production takes place. The storm turned out to have less of an effect on the final grapefruit crop than was earlier anticipated. Dry conditions in late 1999 and throughout most of 2000 could affect the 2000/01 crop. The crop has been reported to be in good condition through the middle of the year with the aid of heavy irrigation.

Florida's citrus production increased 22 percent from 1998/99, and was just 3 percent smaller than the record 1997/98 crop. The beginning of the harvest was late again this year due to lagging fruit maturity. The orange crop was 24 percent larger than a year ago, and 5 percent below the record crop of 1997/98. Florida experienced some erratic bloom set this year, which is unusual for the orange crop. The erratic bloom also affected the forecast for this year's crop, resulting in the final estimate increasing 9 percent from the initial October estimate.

Grapefruit and tangerine production also increased in 1999/2000 from the previous year. This year's tangerine crop set a record at 333,000 tons, 41 percent over a year ago. The previous record, set in 1979/80, was 4 percent smaller than this year's crop. The early tangerine varieties, Robinson, Fallglo, Dancy, and Sunburst accounted for 42 percent of the crop, similar to last year. The late Honey variety accounted for the remainder of the crop. The tangerine marketing season was mostly completed by early- to mid-May.

Under the Florida Citrus Marketing Order, USDA's Agricultural Marketing Service has proposed a rule to increase the minimum size requirement for all shipments of Dancy, Robinson, and Sunburst tangerines grown in the State. The proposed regulation would help reduce supplies of small fruit for which there is poor demand, increasing grower returns.

This year's Florida lime crop was 20 percent larger than last season, according to the Florida Agricultural Statistics Service. Limes are mostly produced in southeastern Florida. The lime groves have been severely infected with citrus canker, a bacteria with no known cure or control other than tree removal. The presence of citrus canker in Florida's lime groves has the potential to wipe out the U.S. lime industry. The industry had just begun to recover from the effects of Hurricane Andrew in 1992. Most limes in the retail market are imported from Mexico.

Texas had good weather for much of the season in its major citrus region, the Rio Grande Valley, boosting production. Growers had favorable marketing conditions at the beginning of the harvest. They benefited from short supplies coming out of California from the previous season and the late start from Florida's harvest this year. Dry weather conditions throughout much of 2000 in Texas could affect the 2000/01 crop, depending on the availability of water for irrigation. Texas' citrus crop increased 3 percent from 1998/99 due to a larger orange crop. The grapefruit crop, which accounted for 77 percent of the State's citrus production, fell fractionally.

In 1999/2000, Arizona's citrus harvest declined 11 percent from a year ago. All crops declined, with lemon production, 56 percent of Arizona's citrus crop, falling 11 percent.

In March 2000, the United States shipped its first citrus fruit to China. China is expected to be a $500-million market for the U.S. citrus industry. California shipped its first containers of fresh oranges, and Florida shipped fresh grapefruit shortly after China completed its inspection of the production regions and issued its rules governing citrus and other agricultural imports. It was already the end of the season for both California navel oranges and Florida grapefruit. The U.S. industries should see shipments increase during the 2000/01 marketing year when they have a full season for trade.

Orange Crop Rebounds in 1999/2000

The 1999/2000 U.S. orange crop is expected at 13 million tons, 33 percent higher than a year ago, but 5 percent lower than the record 1997/98 crop (table 28). Approximately 11 million tons are expected to go to processing, mostly as juice, a 24-percent increase over last year. The larger crop and lower prices this year will likely reduce imports and increase exports of both fresh oranges and orange juice.

Production increased in all States except Arizona. Florida's crop, accounting for about 80 percent of all oranges pro-

Table 28--U.S. oranges: Supply and utilization, 1988/89-1999/2000

Season 1/	Supply		Utilization		
	Production	Fresh imports	Processed	Fresh exports	Fresh consumption
	-- 1,000 short tons --				
1988/89	9,117	9	7,062	559	1,505
1989/90	7,873	13	5,763	576	1,547
1990/91	7,961	69	6,704	257	1,068
1991/92	9,015	17	6,837	546	1,649
1992/93	11,105	11	8,664	613	1,839
1993/94	10,329	18	8,075	604	1,668
1994/95	11,432	20	9,241	635	1,576
1995/96	11,426	25	9,227	560	1,664
1996/97	12,692	33	10,190	662	1,873
1997/98	13,670	44	11,012	711	1,991
1998/99	9,824	113	8,637	255	1,045
1999/00f	13,023	43	10,750	525	1,791

f = Forecast.

1/ Marketing season begins in November of the first year shown. Includes Temples before 1993/94.

Source: Economic Research Service and Foreign Agricultural Service, USDA.

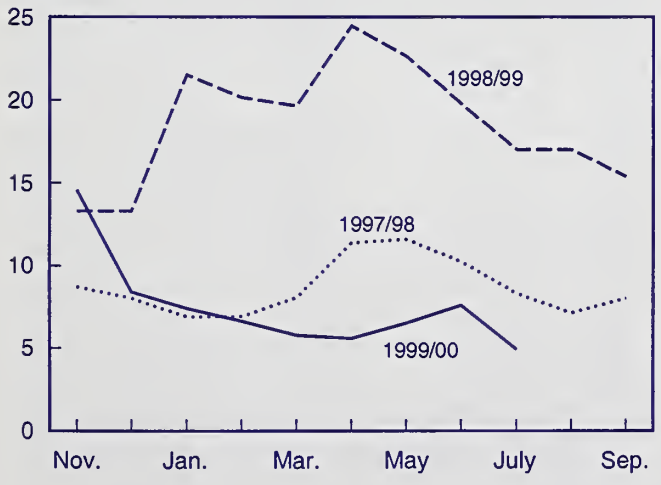
duced in the United States, increased 24 percent. Texas had its biggest crop since 1988/89. Production rose 20 percent to 73,000 tons. Good growing conditions early in the season helped the crop.

California's crop, which sustained the greatest loss in 1998/99, returned to normal and was the second largest orange crop since 1991/92. The navel orange crop increased 90 percent from 1998/99 and was 91 percent of the large 1997/98 crop. The Valencia crop increased 80 percent over a year ago and was 8 percent larger than the 1997/98 crop. Arizona's orange crop declined 2 percent this year, totaling 42,000 tons.

California fresh-market orange prices averaged $7.47 per 75-lb. box between November 1999 and July 2000, 61 percent lower than last year. This year's average grower returns were the lowest since 1992/93. Oranges this season were late to mature, small, and of reduced quality, especially if compared with the quality of the 1997/98 crop. Both the small size of the fruit and the quality reduced the prices growers received. The fresh orange market also faced increasingly strong competition this year from imported clementines. Clementine demand, and therefore imports, were up this year. Becoming more available throughout the United States, many consumers purchase clementines as a substitute for oranges. Retail prices for navel oranges averaged $0.55 a pound, 12 percent lower than last year. The later maturity of this year's fruit, coupled with the large crop, pushed the navel harvest into June. Typically by June, the market is dominated by Valencia oranges, as the navel crop is almost finished. Because there were still so many navel oranges in the market this spring, relative to Valencias, retail prices for May and June Valencia oranges were not calculated by the Department of Labor's Bureau of Labor Statistics (BLS). The last time BLS reported retail prices for navels in June was 1990, when California produced its largest orange crop.

Figure 16

Fresh-market orange prices in California



Source: National Agricultural Statistics Service, USDA.

From November through May, exports of fresh oranges exceeded the previous year by 92 percent. Last year, however, shipments were hampered by a small crop and poor quality. While running ahead of last year thus far in 2000, exports have been off 20 percent from 1997/98, considered a very good year for fresh orange exports. The smaller size of this year's oranges, along with the late start of the harvest, adversely affected exports. The California Department of Food and Agriculture ranked fresh oranges as the fourth largest agricultural export in 1998.

Orange Juice Production Second Highest on Record

Florida's 1999/2000 orange production is expected to increase 24 percent over last year, surpassing all other years except 1997/98. Florida's production accounts for about 95 percent of the orange juice manufactured in the Untied States.

Florida's early-mid season varieties totaled 6 million tons, up 20 percent from a year ago. Harvesting of these varieties was late to start and ended mostly by mid-March, slightly behind last year. The lower juice content and higher acid levels of this year's early-mid season oranges, along with the unusual multiple blooming that occurred at the beginning of the season, delayed the beginning of the harvest. Valencia production totaled 4.4 million tons, 31 percent above last year. The Valencia harvest ran later than usual, and there was about 4 percent of the crop remaining toward the end of June.

Orange juice production in 1999/2000 is forecast to increase 24 percent over 1998/99, the second highest on record (table 29). Juice yields were slightly below the average of the past 5 years. At a seasonal average of 1.55 gallons (42^0-Brix per 90-lb. Box), this year's frozen concentrate orange juice (FCOJ) yield is 5 percent below last year. The yield for not-from-concentrate (NFC) orange juice was reported by the Florida Citrus Processors Association to be 6.20 single-strength gallons per 90-lb. box, 2 percent lower than last year. High juice stocks coming into this marketing year, along with continued strong imports, put this year's estimated supply at 2.4 billion single-strength equivalent (sse) gallons, setting a record. Despite an expected increase in per capita consumption to 6.14 pounds for 1999/2000, ending stocks are still expected to reach 550 million sse gallons, up 4 percent from a year ago.

The larger crop in 1999/2000 drove October-June average prices Florida growers received for their processing oranges down 29 percent from the previous year (table 30). Large beginning juice stocks lowered processors' demand for

Table 29--United States: Orange juice supply and utilization, 1988/89-1999/2000

Season 1/	Beginning stocks	Production	Imports	Exports	Domestic consumption	Ending stocks 2/
			Million SSE gallons 3/			
1988/89	212	970	383	73	1,258	233
1989/90	233	652	492	90	1,062	225
1990/91	225	876	327	96	1,174	158
1991/92	158	930	286	107	1,097	170
1992/93	170	1,207	324	114	1,337	249
1993/94	249	1,133	405	107	1,320	360
1994/95	360	1,257	198	117	1,342	356
1995/96	356	1,271	261	119	1,358	411
1996/97	411	1,437	257	148	1,454	502
1997/98	502	1,555	305	148	1,680	533
1998/99	533	1,234	346	150	1,437	527
1999/00 f	527	1,497	375	155	1,694	550

f = Forecast.

1/ Season begins in December of the first year shown until 1994/95 when the season changes to begin in October.

2/ Data may not add due to rounding. Beginning with 1994/95 ending stocks, stock data include chilled as well as canned and frozen concentrate juice.

3/ SSE = single-strength equivalent. To convert to metric tons at 65 degree brix, divide by 1.40588.

Source: Economic Research Service and Foreign Agricultural Service, USDA.

early-mid variety oranges, pushing down prices growers received at the beginning of the season. The late maturity of the crop encouraged increased imports of FCOJ, depressing Florida grower prices all season. The slower movement of NFC orange juice, the industry's fastest growing segment, also kept prices lower this year than the previous 2 seasons.

Near-term futures prices averaged 9 percent lower this October through June than a year ago. Prices remained in the $0.82-to 0.95 per pound solid range throughout the season, partly because of large beginning stocks, the continual increase in the estimate of the crop size throughout the marketing season, and slower movement of orange juice this year. Unlike futures and grower prices, retail prices rose this year. Prices ranged from a low of $1.78 per 16-ounce can of FCOJ in October to $1.84 in November. NFC orange juice retail prices averaged $5.31 a single strength gallon from October 1999 to July 2000, about 3 percent above last year, according to A.C. Nielsen Scantrack data. Retail prices remained high even though lower prices may have encouraged consumers to increase demand, and despite ample juice supplies and anticipated large ending stocks. According to the industry, as of July, Florida processors packed 12 percent more NFC this year than last. NFC's share of orange juice production, however declined to 40 percent of all orange juice in 1999/2000, compared with 45 percent in 1998/99.

Orange juice exports increased 7 percent during October 1999 to June 2000 from the same time a year ago. Shipments to the Netherlands rose 180 percent. The Netherlands is often a trans-shipment destination for other European countries. Exports to Canada, the largest market for U.S. orange juice, dropped 5 percent. NFC orange juice accounted for most of the increase in exports.

USDA forecasts Brazil's FCOJ production for 2000 to be down 18 percent and exports to be down 9 percent from 1999 (table 31). Dry weather and high temperatures during flowering and fruit set in São Paulo, Brazil's major orange-producing region, is expected to reduce the amount of oranges available for processing. Below-average rainfall, along with the high temperature reduced the amount of fertilizer producers could apply, adversely affecting fruit development. Many producers used lower quality inputs this year

Table 30--Monthly prices for processed oranges and frozen concentrated orange juice, 1997/98-1999/2000 1/

Month	Processed orange 2/			Near-term futures contract 3/			Retail frozen concentrate 4/		
	1997/98	1998/99	1999/00	1997/98	1998/99	1999/00	1997/98	1998/99	1999/00
	-- $ per 90-lb box --			-- $ per pound solids --			-- $ per 16 fl. oz. of product --		
Oct.	2.03	4.17	--	0.66	1.15	0.89	1.71	1.66	1.78
Nov.	2.44	4.03	2.20	0.78	1.18	0.95	1.67	1.65	1.84
Dec.	2.62	4.04	3.05	0.84	1.09	0.93	1.67	1.68	1.82
Jan.	2.85	4.74	3.15	0.91	1.00	0.84	1.60	1.75	1.82
Feb.	3.19	5.09	3.45	0.98	0.93	0.85	1.57	1.78	1.81
Mar.	4.80	5.25	3.47	1.06	0.83	0.85	1.59	1.74	1.81
Apr.	4.93	5.35	4.25	0.97	0.85	0.82	1.63	1.78	1.82
May	5.13	5.80	4.70	1.10	0.85	0.82	1.59	1.76	1.80
June	5.18	6.60	4.35	1.04	0.89	0.85	1.63	1.76	1.80
July	--	--		1.03	0.81		1.66	1.81	
Aug.	--	--		1.10	0.93		1.67	1.83	
Sep.	--	--		1.08	0.93		1.60	1.83	
Simple average	3.69	5.01	3.58	0.96	0.95	0.87	1.63	1.75	1.81

-- = Not applicable.

1/ The marketing year for Florida orange juice changed in 1999/2000 to begin in October and end in September. Previously the year ran December through November.

2/ Equivalent on-tree price received by growers, Florida.

3/ Average of closing prices. 4/ 16 fluid ounces of 42 degree Brix product contain 0.52 pounds of orange juice solids.

Sources: National Agricultural Statistics Service, USDA; New York Cotton Exchange; Bureau of Labor Statistics, U.S. Department of Labor.

Table 31--Brazilian FCOJ production and utilization, 1991-2000

Season 1/	Beginning stocks	Production	Domestic consumption	Exports	Ending stocks
		Million SSE gallons 2/			
1991	177	1,334	25	1,390	96
1992	96	1,610	25	1,532	148
1993	148	1,572	25	1,546	148
1994	148	1,583	31	1,482	218
1995	218	1,525	25	1,476	242
1996	242	1,620	23	1,660	177
1997	177	1,954	22	1,778	331
1998	331	1,665	26	1,600	370
1999	370	1,792	22	1,701	439
2000f	439	1,476	25	1,546	343

f = Forecast. 1/ Season begins in July of year shown.

2/ SSE=single-strength equivalent. To convert to metric tons at 65-degree Brix, divide by 1.40588.

Source: Foreign Agricultural Service, USDA.

as a result of lower orange prices received during 1999. Diseases, such as Citrus Chlorosis Variegated and Citrus Canker, continue to be a problem for Brazilian orange growers. Despite the large stocks coming into this year, the drop in production and world demand is sufficient to reduce exports considerably. Demand in the European Union is expected to remain stable and to decline in the United States as a result of higher production in Florida.

Due to weak export demand and sufficient storage capacity, ending stocks (the amount stored in Brazil, excluding offshore storage) are projected to be 343 million gallons, 21 percent lower than last year but the third largest in the nineties. Also influencing the ending stocks forecast is the low orange price. Processors might take advantage of the low prices to build their stocks. If the estimates for Brazil's orange juice production hold true, it will be expected to produce about the same amount as Florida this year; typically Brazil's production is larger than Florida's. Because of the expected decline in Brazil's production, world supplies could be the lowest in 5 years. The smaller supply could put upward pressure on world orange juice prices this coming marketing year.

Grapefruit Production Up After 2-Year Decline

Grapefruit production is expected to rise 11 percent in 1999/2000 to 2.8 million short tons, the largest crop in 3 years (table 32). Production was up in Florida and California, but down in Texas and Arizona. Florida's crop, which accounts for 81 percent of the total grapefruit crop, was up 13 percent from a year ago. In November, Hurricane Irene hit Florida's East Coast, blowing grapefruit from the trees. In response to the damage from the storm, USDA lowered its estimate from the initial October estimate. Toward the end of the season the estimate rose, mostly due to the difficulty in estimating the amount of fruit produced

Table 32--U.S. grapefruit: Supply and utilization, 1988/89-1999/2000

Season 1/	Supply		Utilization		
	Production	Fresh imports	Processed	Fresh exports	Fresh consumption
			-- 1,000 short tons --		
1988/89	2,844	4	1,449	587	812
1989/90	1,978	5	1,096	337	550
1990/91	2,256	8	1,015	513	736
1991/92	2,224	12	975	506	755
1992/93	2,791	14	1,518	486	801
1993/94	2,661	16	1,377	506	794
1994/95	2,912	14	1,597	536	793
1995/96	2,718	17	1,400	551	784
1996/97	2,885	14	1,532	529	838
1997/98	2,593	17	1,380	432	798
1998/99	2,520	14	1,300	468	766
1999/00f	2,789	16	1,675	421	709

f = Forecast

1/ Marketing season begins in September of the first year shown.

Source: Economic Research Service and Foreign Agricultural Service, USDA.

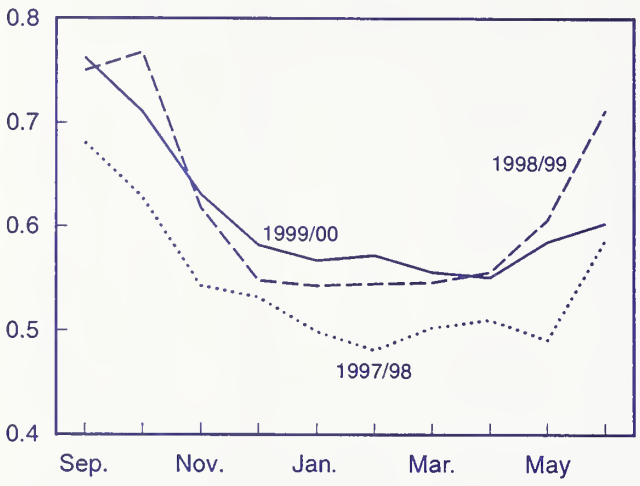
with the larger than usual irregular bloom this year. This year's harvest was delayed due to late maturity of the crop. The larger than usual quantity of fruit maturing at different times required increased spot picking in groves. Grapefruit were smaller this year than the average of the previous 9 seasons. As a result, more fruit needed to be picked to make an 85-lb. box. In July, Florida's white seedless crop utilization was forecast to be fractionally lower than last year but higher than the previous 2 years. Red seedless grapefruit production was expected to increase 1 percent over last year to 1.4 million tons. Seeded grapefruit utilization was expected to increase 9 percent this year. All of the seeded fruit go to processing.

Florida fresh grapefruit grower prices fell 15 percent from last year, but remained strong relative to the previous 2 seasons (table 33). Prices remained strong in light of the large crop due to demand from the processing sector to build grapefruit juice stocks. Packinghouses responded to the demand from the processing sector by eliminating smaller grapefruit from the fresh market, leaving only the larger, higher quality fruit that would bring higher prices. To help maintain consumer demand and therefore boost prices during the marketing season, USDA issued a proposed rule to limit the volume of red-seedless grapefruit entering the market during the first 11 weeks of the season. The proposal was issued under the Florida Citrus Marketing Order, managed by the Citrus Administrative Committee. The ruling would limit the number of small fruit entering the market at the beginning of the season. A large supply of small fruit at the beginning of the season is considered by many in the industry to give consumers a negative opinion of the season's fruit and reduce future purchases.

Fresh grapefruit consumption in 1999/2000 is expected to decline about 7 percent from the previous year and continue

Figure 17

Average retail prices for grapefruit



Source: Bureau of Labor Statistics Service, USDL.

the downward trend observed since 1996/97. Most of the decline can be attributed to the greater quantity of fruit going to processing, as well as weak consumer demand. Retail prices started strong in September when the season began, but showed a steady decline through the remainder of Florida's season. Prices began to pick up again in May, once Florida's season was mostly completed and replaced in the market by California's grapefruit. Retail prices in 1999/2000 averaged 3 percent lower than last year from September to July, probably because of the bigger crop this year.

Fresh grapefruit exports declined 10 percent from September to June 1999/2000 over the same period last year, despite the larger crop. Among the major markets, only the quantity of exports to Japan increased over the previous year. Much of that increase can be attributed to the improved Japanese economy. Japan accounted for 51 percent of U.S. grapefruit exports in 1999/2000. Exports to Canada, the next largest market, declined 4 percent, most probably due to the strong U.S. dollar relative to Canada's. The dollar's strength also likely lowered demand substantially to the top European Union markets, France, the Netherlands, Germany, and the United Kingdom.

An estimated 1.7 million tons of grapefruit were used for processing this year, 29 percent over a year ago. Grapefruit yields were 8 percent lower at 1.19 gallons per 85-lb. box for frozen concentrated grapefruit juice (FCGJ) and 15 percent lower at 4.67 single strength gallons for not-from-concentrate (NFC). The greater quantity of fruit going to processing helped offset the reduced yields. Florida processors packed 28.6 million 40-degree brix gallons of FCGJ by early August 2000, 17 percent more than the previous season. Stocks were up 12 percent for FCGJ by early August. White concentrated grapefruit juice stocks were up 22 percent from last year and accounted for 45 percent of FCGJ stocks. Red grapefruit juice stocks increased 5 percent and accounted for 55 percent of the total. Pack of NFC grapefruit juice was up 11 percent; stocks were up 43 percent. Processors began this season with low stocks and processed more grapefruit to build up their inventory. Retail prices for NFC grapefruit juice at grocery stores averaged about $5.60 a gallon from January to July 2000, about 3 percent above last year, according to A.C. Nielsen Scantrack data. High retail prices helped slow movement, allowing processors to build stocks.

Due to strong demand from processors, Florida grower prices for processing grapefruit rose dramatically in 1999/2000. The average price of $1.71 per 85-lb. box was the highest return growers received in 7 years. The 1999/2000 season was the first in 3 years that growers received positive returns, meaning they were able to cover their costs of production. Prices were high, despite the large crop, because of strong processor demand to build stocks. Because of the higher prices growers received this year, all of the crop appears to have been utilized. Harvesting costs this year could possibly be higher than previous years because of the irregular bloom.

Table 33--Grapefruit: Average monthly equivalent on-tree prices received by growers, Florida, 1996/97-1999/2000

	Fresh grapefruit				Processing grapefruit				All grapefruit			
Month	1996/97	1997/98	1998/99	1999/00	1996/97	1997/98	1998/99	1999/00	1996/97	1997/98	1998/99	1999/00
	-- Dollars per 85-lb box --											
Sep.	--	--	--	--	--	--	--	--	--	--	--	--
Oct.	6.76	4.57	6.20	8.92	-0.50	-0.31	-1.74	-0.10	5.24	3.65	3.96	6.52
Nov.	4.20	3.36	4.89	5.07	-0.44	-0.71	-1.81	0.60	2.75	1.93	2.65	3.55
Dec.	3.38	3.77	4.22	4.56	-0.17	-0.59	-1.00	1.25	1.94	2.10	1.97	3.15
Jan.	3.75	3.27	4.39	1.35	-0.06	-0.29	-0.27	3.20	1.99	1.53	2.13	2.38
Feb.	3.29	3.46	4.88	5.19	0.09	-0.13	0.30	2.60	1.52	1.19	2.01	3.56
Mar.	3.88	3.11	5.07	4.83	0.07	-0.30	0.54	3.10	1.05	0.70	1.92	3.59
Apr.	3.24	2.97	5.43	4.84	-0.02	-0.40	0.91	2.38	0.90	0.65	2.29	2.81
May	1.92	2.29	6.91	3.26	-0.05	-0.40	1.34	2.33	0.53	0.34	2.80	2.48
June	2.16	--	--	2.00	0.40	--	--	0.00	1.42	--	--	0.55

-- = Insufficient marketing to establish price.

Source: National Agricultural Statistics Service, USDA.

Tree Nuts Outlook

Tree Nut Supply To Decline

Total production of tree nuts will likely decline this season from the record set at 2.6 billion pounds in 1999/2000. The California Agricultural Statistics Service forecast lower production of almonds and walnuts. Smaller crops of hazelnuts and pecans are likely in 2000. Pistachio production, meanwhile, is forecast higher than last year.

Almond Production Slips

The 2000 California almond crop is forecast at 640 million pounds, shelled basis, down 23 percent from last year's crop. Bearing acreage is estimated at 500,000 acres, 20,000 more acres than in 1999, and tree density is up about 2 percent, to 99 trees per acre. Due to some weather problems and to the alternate-bearing nature of almonds, yields are down 30 percent, to 5,280 nuts per tree. Cool, rainy weather in February affected the critical bloom stage and resulted in an uneven set. Warm weather in April speeded up crop development by about 2 to 3 weeks ahead of last year and somewhat ahead of normal. Harvest in the northern and central growing areas began in mid-to-late August while harvest in the southern portion was in full swing around the second week of August. Some of the almonds harvested in the southern region had a poor shell seal, raising concern for increased insect damage, particularly to the nuts remaining on trees for a later harvest. Production for the Nonpareil variety, which makes up over a third of total almond output, is forecast down 36 percent.

During 1999, California produced a record large crop. In an attempt to help stabilize plummeting almond prices, the Almond Board of California, which administers the Federal marketing order for almonds, recommended to the Secretary of Agriculture a reserve pool for the record large 1999/2000 crop. Reserve almonds are withheld from normal domestic and export markets to prevent burdensome supplies and promote orderly marketing. The reserve was approved for 22 percent of the total 1999/2000 crop, and the reserve almonds were gradually and completely released from the pool as warranted by market conditions before the start of the 2000/01 season. Both domestic and export shipments were strong in 1999/2000 because of abundant supplies and low prices. The season-average grower price was $0.87 per shelled pound, down 38 percent from the year before. Due to the expected lower production in 2000/01, the average grower price will likely improve. However, beginning stocks of almonds for the 2000/01 season remain large, likely preventing a sharp boost in almond prices. Beginning stocks for the 2000/01 season was estimated 92 percent higher than the previous season.

Much Smaller Hazelnut Crop Expected

Based upon the objective measurement survey released on August 28, 2000, by the Oregon Agricultural Statistics Service, production of hazelnuts is forecast at 25,000 tons, in-shell basis, much lower than the 40,000 tons produced in 1999. The number of nuts per tree was down 49 percent from 1999, but the percentage of good nuts from the laboratory sample was up by 4 percentage points. Those that passed as good nuts also averaged heavier on a dry-weight basis. Brown stained nuts made up 0.3 percent of the laboratory sample, the lowest percentage since 1984.

Oregon produces 99 percent of hazelnuts in the United States, with the remainder supplied by growers in Washington. Although overall crop development benefited from favorable weather conditions, production in both States are forecast sharply lower, mostly due to the alternate-bearing nature of this tree nut. To some extent, reduced production may also be linked to the presence of the Eastern filbert blight which continues to restrict output potential of infested orchards.

The larger crop last year pushed grower prices down 8 percent during the 1999/2000 season and helped the industry's export sector. Also contributing to stronger U.S. hazelnut exports in 1999/2000 was the smaller hazelnut crop in Turkey last year that diminished competition in the world market. U.S. exports and domestic consumption of hazelnuts will be limited by the expected smaller crop in 2000. Large carryover stocks, however, could offset some of the new crop supply reductions.

Pecan Crop Prospects Dim

Pecan production in 2000 could be lower than last year's record crop of 406.1 million pounds. In 1999, all pecan-producing States, except North Carolina, harvested substantially larger crops than in 1998. The first official USDA pecan production forecast will be released on October 12, 2000. Trees probably had low energy reserves because of last year's bumper crop. The record crop in 1999 led to sharply reduced grower prices. The season-average grower price was 81.4 cents per pound in 1999, compared with $1.21 per pound in 1998.

Walnut Production Lower

Based on the Walnut Objective Measurement Survey by the California Agricultural Statistics Service (released on September 1, 2000), California's walnut production is forecast at 245,000 tons, in-shell basis, 13 percent lower than last season's production of 283,000 tons. The bearing

acreage estimate is 193,000 acres, a 1-percent increase from the previous season. The yield forecast is 1.27 tons per acre, down 14 percent.

Extreme hot weather is raising concern about sunburn and insect damage to the 2000 crop. The percent of sound nuts in-shell, as measured by the 2000 Objective Measurement Survey, was 96.9 percent Statewide. In-shell weight per nut was 21.2 grams, while average in-shell suture measurement was 32.2 millimeters. The average length in-shell was 38.2 millimeters. Complete details can be found at *www.nass.usda.gov/ca.*

Domestic consumption and exports during 1999/2000 increased from the previous season, assisted in part by last year's record-large crop and lower prices. Exports were up sharply to Japan, Canada, and Mexico, but were down significantly to the European Union, the United States' largest market for walnuts. Despite increased exports, record production and increased imports led to higher ending stocks in 1999/2000, and this will supplement some of the decline in production this year, if domestic and export markets continue strong in 2000/01. Total domestic supplies, however, are expected lower than in 1999/2000 and this should lead to higher walnut prices during 2000/01.

Macadamia Production Up

Hawaiian macadamia nut production decreased slightly for the second consecutive year in 1999 to 56.5 million pounds, in-shell basis, down 2 percent from a year ago. While yields remained steady at 2,990 pounds per acre in 1999, there were more acres abandoned than acres with new plantings. Many growers continued to feel pressure from increased world competition. Total acreage in crops totaled 19,900 acres, 300 acres less than the previous year. Harvested acreage declined to 18,900 acres, 300 acres less than in 1998. Macadamia nut acreage is expected to continue to decline in 2000, as a major Maui orchard announced that the 1999/2000 season will be its final season. At this time it is unknown if production will increase or decrease in 2000. Last year's crop price was 67 cents per pound, compared with 65 cents in 1998.

Pistachio Industry Expects Larger Crop

The California pistachio production forecast as of September 1, 2000, is 205 million pounds in-shell, compared with last season's sharply reduced crop of 123 million pounds. If this forecast is realized, this will be the largest crop on record, exceeding the previous record crop of 188 million pounds in 1998. Bearing acreage is forecast at 74,600 acres, compared with 71,000 acres in 1999. Along with increased bearing acreage, the 2000 crop yield (to be reported in January 2001) is assumed to be higher due mainly to the alternate-bearing characteristics of this tree nut. Based on the California Pistachio Objective Measurement Survey, the overall average number of clusters per tree in 2000 increased 68 percent to 992 from 1999. The average cluster per tree increased sharply for Atlantica and Pioneer Gold I rootstocks, but decreased significantly for Pioneer Gold II. The number of filled nuts increased from 4,630 in 1999 to 9,321 in 2000. The 2000 average number of nuts per cluster was 13, compared with 11.1 in 1999. The percent of nuts filled was 72.2 percent, compared with 70.4 percent last year. Complete details can be found at *www.nass.usda.gov/ca.*

The California Pistachio Commission reported that 1999/2000 inventories as of July 31, 2000, were already much smaller than the final ending inventories (as of August 31, 1999) of the 1998/99 crop. Significantly lower carryover inventories would help support expected lower pistachio prices during the 2000/01 season as a result of increased production.

List of Tables

More Land But Fewer Farms Dedicated to Fruit Production in 1997

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Abstract: There were more acres devoted to the production of fruit and tree nuts in the United States in 1997 than 10 years earlier. The number of farms, however, declined. Farms became bigger and the plantings more dense. While most farms with acreage devoted to fruit or tree nut commodities are still predominantly small, most of the production and revenue came from the few largest farms. Despite the trend towards fewer, larger farms, most farms are still family or individually operated. Farming as a primary occupation was heavily skewed towards older farmers.

Keywords: Fruit, tree nuts, berries, production, acreage, farms, distribution, commodity.

As the United States continue to consume more fruit, tree nuts, and berries and international demand for these products continues to grow, more land has been dedicated to the growing of these commodities. In 1987 there were 4.7 million acres producing fruit and nuts domestically. By 1997, the amount grew to 5.3 million acres. The number of farms producing these commodities, however, declined 11 percent during this period. In 1987, there were 138,057 farms producing berries and tree fruit and nuts—by 1997, there were 122,892 farms. Many factors contributed to the restructuring of the industries toward fewer but larger farms. Larger farms could meet the changing economy of scales occurring during the 10 years resulting from higher land values; costlier labor, especially in relation to competitive producers around the world; increased cost of production geared to meet specific requirements of other countries; high costs of mechanization for some crops; and consolidation of production to regions in the United States that have comparative advantage for growing conditions.

California had by far the greatest number of farms and acres planted to fruit and nuts. By 1997, California accounted for 37 percent of the farms and 50 percent of all acreage. While the number of farms declined over the 10-year period, California's share of farms grew relative to other States. Other major producing States include Florida, with 19 percent of the acreage and 9 percent of the farms; Washington, with 6 percent of the acreage and 5 percent of the farms; and Georgia, with 3 percent of both the acreage and farms (table A-1). California, Florida, and Washington had among the largest increases in acreage between 1987 and 1997. Both California and Florida experienced smaller declines in number of farms than most States, with each registering a 6-percent decline. Larger declines occurred in States that traditionally produced for the processing market, such as Michigan, Illinois, Pennsylvania, and Wisconsin. Although still relatively small, States such as Wyoming, Nebraska, and North Dakota had big increases in the number of acres and farms producing fruit and tree nuts, as new enterprises may have been established as alternatives to other commodities.

About 80 percent of all tree fruit and nut acreage was irrigated in 1997, compared with 74 percent in 1987. Western States were more likely to rely on irrigation than most of the rest of the Nation. In California, Arizona, and New Mexico, production often took place on arid soil, and irrigation was necessary to maintain the trees. In Washington, 97 percent of farms and acreage is irrigated. Only half of Oregon's trees are irrigated. Most other States rely on precipitation. These growers have fewer options during drought years and often production can fall dramatically. Irrigation in Florida increased 8 percent between 1987 and 1997 to 91 percent of fruit acreage. During this period, Florida experienced two freezes that forced its citrus industry to move further South. The area where growers began planting required irrigation so that fresh water would feed the groves rather than the underground water that was too salient. In response to the devastating effects of the freezes, growers also wanted irrigation as a means of frost control. Irrigation can be used during a freeze to provide protection to the fruit by providing an ice coating that keeps the fruit warmer than the outside temperature. The water spray also helps keep the groves warmer than the air above, reducing freeze damage to trees.

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Table A-1--Total number of farms with land in orchards or vineyards, by State, 1987-97

State	Total farms			Share of U.S
	1987	1992	1997	1997
	--Number--			Percent
Alabama	2,536	2,309	1,874	1.77
Alaska		2	4	.00
Arizona	1,141	1,162	843	.79
Arkansas	1,017	762	646	.61
California	41,021	40,298	38,747	36.53
Colorado	838	840	761	.72
Connecticut	308	332	253	.24
Delaware	36	25	31	.03
Florida	9,965	10,258	9,379	8.84
Georgia	4,137	4,146	3,541	3.34
Hawaii	2,128	2,537	2,786	2.63
Idaho	482	472	377	.36
Illinois	955	882	734	.69
Indiana	770	755	571	.54
Iowa	508	481	448	.42
Kansas	503	448	406	.38
Kentucky	1,020	982	715	.67
Louisiana	1,065	1,019	821	.77
Maine	394	396	334	.31
Maryland	617	517	422	.40
Massachusetts	572	525	431	.41
Michigan	3,791	3,531	2,863	2.70
Minnesota	448	509	533	.50
Mississippi	1,326	1,196	902	.85
Missouri	1,127	886	1,004	.95
Montana	317	296	261	.25
Nebraska	139	142	143	.13
Nevada	78	68	68	.06
New Hampshire	219	242	219	.21
New Jersey	746	701	577	.54
New Mexico	1,526	1,885	1,744	1.64
New York	3,290	2,938	2,436	2.30
North Carolina	1,749	1,522	1,213	1.14
North Dakota	30	36	40	.04
Ohio	1,873	1,717	1,395	1.32
Oklahoma	2,351	2,112	2,733	2.58
Oregon	4,410	4,200	3,869	3.65
Pennsylvania	2,805	2,317	2,069	1.95
Rhode Island	83	72	54	.05
South Carolina	1,134	1,157	885	.83
South Dakota	64	40	52	.05
Tennessee	1,346	1,182	1,043	.98
Texas	10,524	9,995	8,804	8.30
Utah	865	790	631	.59
Vermont	221	258	228	.21
Virginia	1,463	1,387	1,080	1.02
Washington	6,839	6,220	5,700	5.37
West Virginia	646	558	530	.50
Wisconsin	993	1,079	853	.80
Wyoming	18	23	16	.02
United States	120,434	116,207	106,069	100.00

Source: Bureau of the Census, Census of Agriculture, various years.

Number of Farms Declined for Leading Crops But Increased for Minor Crops

There were more farms growing apples in the eighties and nineties than any other fruit or tree nut (table A-2). While apple farms remained the most popular in 1997, the number of farms producing apples declined 24 percent between 1987 and 1997, continuing the decline that was occurring in the eighties. Still, there were almost one and a half times more farms producing apples than grapes, the commodity with the next largest number of farms. Grape farms ranked second throughout the eighties and nineties. The number of grape farms fell 14 percent between 1987 and 1997, with the decline speeding up slightly during the second half of this period. The other crops with the greatest number of farms in 1997 included pecans, peaches, oranges, pears, strawberries, walnuts, plums, and sweet cherries.

The commodities with the fewest number of farms included wild blueberries, limes, cranberries, hazelnuts (filberts), pistachio nuts, and tangerines. Many of these minor crops, however, experienced the greatest growth between 1982 and 1997. The crops with the fastest increase in farms were pistachios, blueberries, cranberries, tangerines, and wild blueberries. All of these crops are grown in limited areas that, in the past, limited the number of farms. Pistachio farms, predominantly located in California, increased as a result of decreased competition from Iran, the world's largest pistachio producer. In 1986, countervailing and antidumping duties of about 300 percent were placed on Iranian pistachios by the U.S. Government. A U.S. embargo on Iranian pistachios followed shortly after. Both measures provided domestic growers more price security due to the reduced competition, and production expanded. The embargo has recently been lifted for Iranian pistachio nuts, causing concern for American pistachio growers. The high duties, however, still remain in effect and they make Iranian pistachios too costly to effectively compete in the U.S. market. Should the duties also be removed in the near future, the growth in pistachio production in the United States could be expected to slow. Iranian pistachios are less expensive than those produced in the United States and will likely force down grower prices for domestically-grown pistachios. U.S. pistachios, however, are said to be of higher quality than the Iranian nuts and that will likely stabilize demand for the U.S. product in the domestic and international markets.

Farms growing cranberries, wild blueberries, and cultivated blueberries, found mostly in the Northeast and Midwest, increased due to increased consumer demand. Scientific studies found beneficial chemicals in these berries, such as cranberries reducing urinary tract infections, blueberries having anti-aging properties, as well as the high levels of antioxidants in both that are said to reduce the risks of heart disease and cancer. As a result of the publicity surrounding the research, demand for these berries increased. The number of blueberry farms, both cultivated and wild (mostly in

Table A-2--Number of fruit and nut farms and acres, 1987 and 1997

Commodity	Number of farms		Percent change	Share of total farms	Number of acres 1/		Percent change	Share of total acres
	1987	1997	1987-97	1997	1987	1997	1987-97	1997
	--Number--		--Percent--		--Number--		--Percent--	
Noncitrus	132,749	106,921	-19.5	87.0	2,268,859	2,356,057	3.8	44.1
Apples	36,718	28,100	-23.5	22.9	601,021	570,320	-5.1	10.7
Apricots	3,306	3,033	-8.3	2.5	23,960	25,776	7.6	0.5
Avocados	6,902	6,089	-11.8	5.0	87,700	77,144	-12.0	1.4
Bananas	563	822	46.0	0.7	1,742	--	--	--
Sweet cherries	7,171	6,387	-10.9	5.2	60,462	69,609	15.1	1.3
Tart cherries	4,198	2,805	-33.2	2.3	68,390	50,569	-26.1	0.9
Cherries, not specified	1,720	893	-48.1	0.7	2,211	471	-78.7	--
Coffee	754	1,057	40.2	0.9	2,391	8,020	235.4	0.2
Dates	190	177	-6.8	0.1	6,800	6,611	-2.8	0.1
Figs	647	847	30.9	0.7	16,630	20,301	22.1	0.4
Grapes	23,236	19,961	-14.1	16.2	833,293	1,004,545	20.6	18.8
Guava	159	299	88.1	0.2	1,168	1,326	13.5	--
Kiwifruit	1,015	559	-44.9	0.5	9,020	6,037	-33.1	0.1
Mangoes	379	391	3.2	0.3	--	2,071	--	--
Nectarines	2,341	2,124	-9.3	1.7	33,470	43,937	31.3	0.8
Olives	1,363	1,317	-3.4	1.1	33,264	37,714	13.4	0.7
Papayas	396	556	40.4	0.5	3,905	4,217	8.0	0.1
Passion fruit	41	83	102.4	0.1	65	--	--	--
Peaches	20,995	14,459	-31.1	11.8	239,698	180,223	-24.8	3.4
Pears	10,092	8,062	-20.1	6.6	84,247	77,917	-7.5	1.5
Persimmons	965	1,280	32.6	1.0	2,627	4,184	59.3	0.1
Plums/prunes	8,789	6,585	-25.1	5.4	151,183	155,625	2.9	2.9
Pomegranates	337	342	1.5	0.3	3,477	4,242	22.0	0.1
Other noncitrus	472	693	46.8	0.6	2,135	5,198	143.5	0.1
Citrus:	17,796	17,105	-3.9	13.9	1,084,504	1,345,352	24.1	25.2
Grapefruit	4,998	4,445	-11.1	3.6	189,416	200,577	5.9	3.8
Kumquats	62	67	8.1	0.1	99	--	--	--
Lemons	1,915	2,108	10.1	1.7	68,837	75,610	9.8	1.4
Limes	985	861	-12.6	0.7	--	4,137	--	0.1
Oranges	14,312	13,468	-5.9	11.0	791,248	998,157	26.1	18.7
Tangelos	757	1,001	32.2	0.8	13,004	21,103	62.3	0.4
Honey tangerines	149	242	62.4	0.2	--	--	--	--
Other tangerines	853	1,613	89.1	1.3	11,004	31,861	189.5	0.6
Other citrus	167	493	195.2	0.4	270	3,669	1,258.9	0.1
Tree nuts	41,469	38,659	-6.8	31.5	1,202,521	1,453,380	20.9	27.2
Almonds	6,749	6,045	-10.4	4.9	427,705	540,276	26.3	10.1
Filberts (hazelnuts)	1,345	1,112	-17.3	0.9	28,745	32,721	13.8	0.6
Macadamia nuts	1,258	1,391	10.6	1.1	23,857	20,908	-12.4	0.4
Pecans	21,431	19,923	-7.0	16.2	453,243	519,054	14.5	9.7
Pistachios	830	1,140	37.3	0.9	51,959	94,893	82.6	1.8
English walnuts	8,154	6,850	-16.0	5.6	213,628	235,175	10.1	4.4
Other nuts	479	764	59.5	0.6	1,402	5,059	260.8	0.1
Other fruit and nuts	1,223	1,434	17.3	1.2	1,982	5,294	167.1	0.1
Berries	18,077	16,823	-6.9	13.7	171,999	185,869	8.1	3.5
Blackberries	2,086	2,396	14.9	1.9	6,679	7,611	14.0	0.1
Blueberries	3,911	5,159	31.9	4.2	37,247	45,000	20.8	0.8
Wild blueberries	501	671	33.9	0.5	21,969	24,679	12.3	0.5
Boysenberries	350	348	-0.6	0.3	1,198	1,552	29.5	0.0
Cranberries	912	1,059	16.1	0.9	26,983	35,250	30.6	0.7
Currants	43	61	41.9	0.0	335	219	-34.6	--
Loganberries	84	45	-46.4	0.0	240	--		
Raspberries	4,297	3,957	-7.9	3.2	15,484	17,328	11.9	0.3
Strawberries	9,398	7,141	-24.0	5.8	53,085	53,477	0.7	1.0
Other berries	93	197	111.8	0.2	205	--	--	--
Total 2/	138,511	122,892	-11.3		4,732,162	5,343,933	12.9	

-- = Not available.

1/ Acres are planted acres for tree fruit, nuts, and vines, but harvested acres for berries. 2/ Total in orchards, vineyards, and berry plants.

Source: Census of Agriculture, various years.

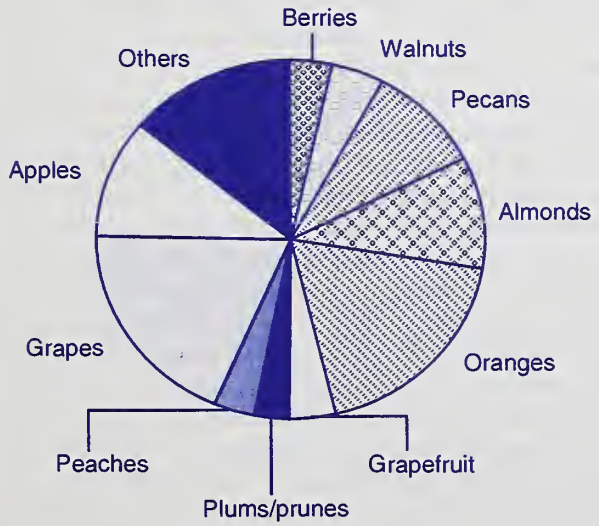
Maine) are expected to increase in the coming years. The scientific studies on blueberries are recent, and the industry has only begun to respond to higher consumer awareness of these products. Cranberry farms, however, are expected to decline in the future because of a glut of cranberries in the market recently that has greatly reduced grower prices.

Tangerine farms, found mostly in Florida and to a much lesser extent in California and Arizona, have grown in numbers in the eighties and nineties, as the citrus industry responded to consumer desire for easier to peel citrus. Florida growers were also responding to the higher prices they could receive from tangerines than to other fresh citrus fruit. Trying to tap into the surging demand for imported clementines, both Florida and California are trying to grow clementines or other seedless easy peeler varieties of tangerines. The number of farms growing tangerines is expected to increase, especially if a seedless variety that would grow successfully in either State is found.

Acreage Increased for Most Tree Fruit and Nuts

The greatest number of acres planted to fruit and nuts in 1997 was for grapes and oranges. These two commodities have consistently had the greatest acreage, followed by apples, almonds, and pecans (fig. A-1). Peaches had the next greatest number of acres in 1982 but declined 25 percent by 1997. The greatest reduction occurred between 1992 and 1997. Harsh weather conditions in the major Southern States, bringing both droughts and freezing temperatures during the nineties, forced growers in South Carolina and Alabama to reduce their acreage. Growers in many other

Figure A-1
Share of total fruit and nut acreage, by commodity, 1997



Source: National Agricultural Statistics Service, USDA.

States found it hard to compete with California's peach industry that ship peaches throughout the country at the same time as local peaches are available. The number of peach acres decreased in California as well. However, the number of peach trees in California increased during this period. New trees planted closer together than was previously the practice, contributed to decreased acreage.

Tart cherry acreage experienced a similar decline, from 68,390 acres in 1987 to 50,569 acres in 1997. Michigan, which accounted for 78 percent of tart cherry production in 1997, lost 17 percent of its acreage and 14 percent of its trees between 1992 and 1997. Despite the reduced acreage and number of trees, production rose from the eighties to the end of the nineties. A marketing order for tart cherries started in 1997 and may bring some stability to an otherwise erratic market and in turn may slow future declines in tart cherry acreage.

Lime acreage has been greatly affected by weather conditions. In the fall of 1992, a hurricane hit southern Florida, the predominant area for lime production in the United States, and destroyed many of the trees. Not all the acres were replanted. As a result, there were 38 percent more acres in the 1987 Census than the 1997 Census (due to timing, the 1992 Census was not able to capture the loss from Hurricane Andrew). Lime acreage is unlikely to recover to levels of the early eighties because the State lime industry has recently been plagued by citrus canker, requiring large portions of infected groves to be destroyed. Many of these trees were just beginning to come into full production after they had been replanted from the hurricane, and growers were not yet making a profit off of much of their acreage before they again lost trees to another natural disaster. Since many growers already were debt laden from the first disaster, and because the U.S. lime industry has strong competition from Mexico, many growers are unlikely to replant once again. Many growers will likely look towards other commodities which might be less risky to grow.

Apple acreage slid by 5 percent between 1987 and 1997. Almost all States reported acreage losses. The number of acres and farms declined throughout the East and Midwest as the industry moved westward. The increased dominance of Western apples in the domestic market make it difficult for many of the older orchards elsewhere to compete, shifting production West. Acreage increased in both Washington and California. Washington, the largest apple producer, reported a 26-percent increase in apple acreage, with most of the growth occurring in the nineties. The majority of farms growing apples in Washington are still small, 78 percent of the farms had less than 50 acres planted to apples. Half the acreage and production came from farms with 50 to 499.9 acres. While the number of farms and acreage in this category grew substantially between 1992 and 1997, the greatest increase came from farms in the 1,000 acre and over category. The number of farms in Washington with at

least 1,000 acres increased 80 percent from 1992 to 1997. Although these farms comprise only a small portion of Washington's apple industry, 15 percent of the apple acreage was located on these farms. They also contributed an increased proportion of production in 1997 relative to 1992, accounting for 18 percent of production. According to the Census, 18 farms comprised this category. Tree plantings on new acreage is very dense, said to range from 600 to 900 trees per acre. New dwarf tree varieties allow for closer planting and easier harvesting. As a result, the yield per acre is increasing. While apple producers in the East and Midwest may be converting replanted acreage to new dwarf trees, established orchards generally consist of older trees, planted further apart. More acreage in Washington and California, however, are planted with the dwarf varieties. While Washington accounted for 36 percent of apple acreage in the United States in 1997, the high tree density resulted in the State having 51 percent of the apple trees and 50 percent of the production.

Citrus acreage (excluding limes) increased between 1987 and 1997. Growers in Florida quickly replaced trees lost as a result of freezes in 1988 and 1989. Not only did they plant more acres than in 1987, but they also planted the new trees more densely. Although California continued to have a greater planting density in its orange groves at an average of 117 trees per acre in 1997, Florida's orange tree density increased 25 percent, to 114 trees per acre. The density, however, is greater in the new groves than in older plantings. Orange acreage increased in all the producing States, Florida, California, Arizona, Texas, Louisiana, and Hawaii. Most of the States grow oranges for the fresh market. Florida, however, grows predominantly for the juice market. Florida had the largest concentration of large farms. About 4 percent of farms growing oranges in Florida had 500 acres or more; in California 3 percent of the farms had at least 500 acres. In Florida, 2 percent of the farms had over 1,000 acres. These farms accounted for 59 percent of the orange trees and 59 percent of production in 1997. Similar information was not available for California for 1997. California farms with at least 250 acres, however, accounted for 40 percent of all acres and 45 percent of 1997's orange production. This is less than 1992 when farms with 250 or more acres accounted for 67 percent of production. In Florida and California, however, the greatest majority of farms had less than 50 acres planted to oranges. Eighty-two percent of Florida's groves and 86 percent of California's groves fell into this category in 1987, declining to 76 percent for Florida and 84 percent for California in 1997. Farms in this category accounted for 11 percent of Florida's production and 29 percent of California's production in 1987 and 7 percent and 20 percent in 1997.

Growers have increased production of fresh oranges both by increasing the acres planted and the tree density per acre. The impetus for this is greater demand, both domestically and internationally. Between 1987 and 1997, domestic per capita consumption of fresh oranges increased 14 percent, exports increased 13 percent. Increased demand helped raise the value of California's fresh orange crop by 27 percent from the late eighties to the late nineties. Florida's increased acreage also reflects increased overall consumption. Domestic demand for orange juice increased 3 percent between 1987 and 1997, with the domestic market accounting for 73 percent of total supply in 1997. Exports, while still small compared with other commodities, grew 94 percent.

As production of not-from-concentrate orange juice (NFC) continues to grow in popularity, demand for Florida oranges will also increase. As consumers move towards purchases of NFC, which relies totally on Florida-produced oranges, and away from frozen concentrated orange juice, which may include imported juice, demand for Florida oranges should continue to increase. Florida's production, however, has yet to reach its peak levels. Trees planted after the freezes were only beginning to produce at near full capacity when adverse weather conditions in Florida reduced crop size for about 2 years in a row. While 1997/98 was a record crop, there is potential for equal to or even larger crops with the present plantings, under good weather conditions. With the growing importance of NFC, however, acreage could continue to grow in order to meet demand. Florida growers, however, also face environmental factors that could put pressure on further acreage growth. Tight water supplies and the reclamation of the Everglades will likely affect expansion in southern Florida. Rapid urbanization throughout the State and growing intolerance by the nonfarm sector to some agricultural practices are factors affecting acreage expansion throughout most of the lower half of the State. With these factors put together, Florida's orange production may be expected to see some increases in the future, but not at the same rate as in the late eighties and early- to mid-nineties.

Grapefruit acreage also increased in Florida between 1987 and 1997, mostly in response to strong prices in the late eighties and early nineties. Prices, however, began to decline with the 1992/93 season, and growers began to have difficulties meeting their costs of production. Large juice stocks in the subsequent years kept demand for processing grapefruit (which accounted for 58 percent of total grapefruit utilization) down. As a result, 6 million boxes of grapefruit were abandoned in 1996/97 for economic reasons. Another 6 million boxes were abandoned in the following year. In the grapefruit industry, like the rest of the tree fruit and nut industry, there is a lag of several years between the receipt of lower prices and growers' response. Because of the nature of fruit production, the large investment required in a grove, and the number of years before a commercial crop is produced, growers are likely to maintain groves for several years in spite of low prices in the hope of a market turn around. Therefore, although prices began declining in 1992/93, growers did not respond by decreasing acreage or the number of trees until about 1998. The Florida Agricultural Statistics Service conducted a special grapefruit

survey in 1999 and discovered that acreage declined between 1997 and 1999. Growers were removing trees to decrease production and hopefully boost prices. Demand for grapefruit appeared to be improving in 1999/2000, mostly due to small beginning juice stocks. There also appears to be a growing consumer interest in not-from-concentrate grapefruit juice. As a result, prices improved during the marketing year. Stagnant domestic consumer demand, however, for fresh grapefruit, will likely prevent growers from replanting groves to grapefruit anytime in the near future.

Grape acreage increased almost 21 percent between 1987 and 1997. Much of the increase occurred in the nineties and was centered in the major wine-producing States—California, Washington, and Oregon. New York, however, lost about 10 percent of its grape acreage, mostly in the late eighties and early nineties. Most farms still have less than 25 acres planted to grapes. These farms decreased only slightly between 1987 and 1997, from 73 percent to 70 percent of all farms growing grapes. In 1997, there were 598 farms with 500 acres or more of grapes (2 percent of the total) while 124 farms had 1,000 or more acres. This is up from 486 farms with 500 or more acres and 85 with 1,000 or more in 1987. The increase in acreage came partly as a response to increased demand for domestic wines. In California, which accounts for about 90 percent of U.S. grape production, acreage increases were greatest in the mid-nineties for wine-variety grapes, followed by fresh-use varieties. Washington and Oregon have also been increasing their grape production for wine. By 1997, Washington replaced New York as having the second greatest amount of grape acreage, although both are far behind California, which accounted for 86 percent of all acreage in 1997.

The acres harvested for the major berries, such as strawberries, blueberries (cultivated and wild), cranberries, and raspberries increased between 1987 and 1997. Blueberries are grown commercially in just about every State, and the average sized blueberry farm in the United States decreased slightly in 1997, except in Michigan and New Jersey, the two largest producers. Throughout much of the rest of the country, the increase in acres came mostly from an increase in the number of farms growing blueberries and less from larger sized farms. In New Jersey, which accounted for 16 percent of the acres, both the number of farms and acres planted declined over the 10-year period. Farms with blueberries in other States increased their average acres from 31 to 35 acres. Michigan, the largest producer, accounting for 37 percent of acreage, had a decline in the number of farms, but an increase in the total acreage. The average blueberry farm grew from 19 acres in 1987 to 27 acres in 1997. In both of these States, farms appear to have been consolidated to produce on a more national level and to meet the stringent criteria demanded for export. The value of production for both fresh and processed blueberries has risen since 1997, which will likely result in new acreage entering blueberry production in the near future.

The wild blueberry industry experienced a slower increase in harvested acres than in the number of farms. Farms growing wild blueberries in Maine, which accounted for 96 percent of wild blueberry acres in 1997, decreased in size of acres planted to blueberries from 49 acres per farm in 1987 to 42 acres in 1997. Wild blueberry production, however, grew 117 percent over the 10 years, with most of the increase coming from new farms bringing in new acres rather than established farms increasing in size.

Cranberry production grew rapidly in the nineties. Increased demand for cranberry juice brought higher prices to growers, encouraging expansion in the industry. Massachusetts, traditionally known for cranberry production, remained the leader in cranberry farms. While harvested acreage also increased in the State, Wisconsin's production grew even more rapidly and now produces more than Massachusetts on slightly more land with less than half the number of farms. As a result, Wisconsin's cranberry farms averaged 66 acres in 1997 compared with 25 acres in Massachusetts. Both States had larger farms than 10 years earlier.

Raspberry acres harvested increased slightly over the decade while farms decreased. Washington has the most acres in raspberries, and accounted for 60 percent of production in 1997. It also had the largest farms, more than doubling in size between 1987 and 1997. Washington produces mostly red raspberries that are used for processing. With the number of harvested acres growing throughout the eighties and nineties, red raspberry production more than doubled over the 10-year period. Mostly as a result of the larger crop, the value of utilized production in 1997 was about double that of 10 years earlier. Grower prices averaged lower during 1996-98 than during 1986-88. Prices for red raspberries, however, tend to be erratic, and there is no real trend. Oregon ranked second for red raspberry acres, but its farms averaged about half the size of Washington's, not changing much from what they were 10 years before. Acreage had expanded in the late eighties and early nineties, but shows a steady decline since 1996. Along with the decline in acreage came a decline in the value of utilized production.

On a national level, strawberry harvested acres grew fractionally between 1987 and 1997. However, in the two major producing States, California and Florida, acres harvested grew rapidly over this period. California accounted for 52 percent of strawberry acreage by 1997, with most of the growth occurring throughout the eighties. Florida's growth occurred mostly in the nineties, but the number of farms increased mostly during 1987 to 1992. In California, farms growing strawberries averaged 83 percent larger in 1997 than 10 years earlier. The average farm growing strawberries in California had 37 acres in 1997, Florida's farms averaged 27 acres, 48 percent more than in 1987. California and Florida supply strawberries on a national level, complementing each other with their production. Florida's production begins in the winter months and fazes out as California's

crop hits the market around February. In the spring and early summer months, most strawberries are marketed locally from the remainder of the farms located throughout the country.

Farm size for most of the nut crops (almonds, pecans, hazelnuts, and walnuts) increased, with fewer farms from 1987 to 1997. Only pistachio nuts increased in both size and number of farms. California is the major producer of all tree nut crops, except for pecans and hazelnuts. Pistachio acreage increased most rapidly because of the reduction in domestic competition with the world's leading producer, Iran. The average sized farm in the State increased from 68 acres in 1987 to 90 acres in 1997. Arizona's acreage also increased during this period. Pistachio acreage grew steadily throughout the eighties and nineties. While minor compared with California, Arizona's acreage increased 84 percent, with an average farm having 43 acres.

Almonds accounted for the greatest number of tree nut acres. While the number of almond farms declined 10 percent between 1987 and 1997, the number of acres grew 26 percent, with most of the growth occurring between 1992 and 1997. Farms averaged about 90 acres of almonds by 1997. International demand for U.S. almonds drove most of the grower response to increase the number of acres and trees. California produces virtually all the almonds in the United States, and almonds are its second highest valued agricultural export. In 1997, almond exports were valued at $818 million, second in California only to cotton, and more than twice the value of third place, wine.

Pecan, hazelnut, and walnut acreage all rose, despite a decline in the number of farms. Pecan production is the most geographically dispersed of the commercial tree nuts. Texas and Georgia accounted for 56 percent of acreage in 1997. While acreage dedicated to pecan production increased in both States, it increased more rapidly in Oklahoma and New Mexico, the States with the next largest pecan acreage. The average-sized pecan farm was 26 acres in 1997, with Georgia and Oklahoma farms averaging higher, but Texas and New Mexico farms about average or slightly smaller. Arizona's average of 64 acres was the largest among all the States. Pecan acreage declined in Arizona between 1987 and 1997, but at a slower rate than the number of farms.

Hazelnuts are grown in Oregon and Washington at a distant second. The number of hazelnut acres declined between 1992 and 1997 after increasing between 1987 and 1992. The average size farm in Oregon grew from 23 acres in 1987 to 33 acres in 1997. Hazelnut consumption in the United States is the lowest among tree nuts. Limited domestic production result in high prices, making hazelnuts the most expensive of the major domestically grown tree nuts (*Agricultural Outlook*, Jan-Feb. 2000). The high price of hazelnuts in the domestic market, along with strong competition in the world market from lower priced Turkish hazelnuts, as well as other domestic nuts, likely led to the decline in acres in the nineties.

The average walnut farm size from 1987 to 1997 increased 31 percent to 34 acres by 1997. While there are minor walnut acres dispersed throughout the United States, California orchards accounted for 99 percent of all acres and trees. Domestic consumption of English walnuts has declined since the early nineties, but appears to have stabilized in recent years. Exports, however, have increased substantially since 1987, and now account for about half of production. A major destination is the European Union. The industry's change to meet costly requirements for export is a factor that has been driving orchards to become larger and more efficient.

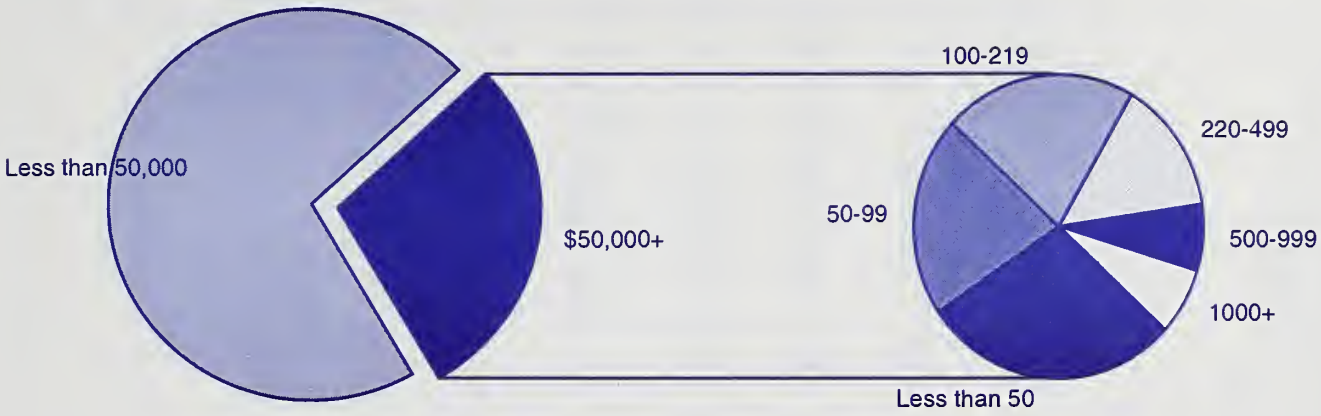
Most Farms Still Had Few Acres Planted to Any One Fruit or Tree Nut Crop

The distribution of farm size for fruit and tree nut production remained roughly unchanged between 1987 and 1997. In 1997, 57 percent of all farms that reported growing fruit and nuts had fewer than 50 acres devoted to any one commodity, virtually the same proportion reported in the 1987 Census of Agriculture. About 14 percent had 50 to 99 acres and another 13 percent had between 100 and 219 acres. About 8 percent had 200 to 499 acres. The proportion of farms with 500 or more acres remained around 7 percent. The distribution of income among farm-size categories, however, did change over this time period. Farms with fewer than 50 acres accounted for 12 percent of revenues in 1987, declining to 9 percent in 1997. The proportion of income received by growers with 50 to 99 acres declined from 11 percent to 8 percent, and growers' share of income with 100 to 219 acres declined from 16 percent to 13 percent during this period. Larger farms, however, increased their share of revenue during this time. Those with 220 to 499 acres increased their share from 16 to 17 percent, and those with 1,000 or more acres increased their share from 45 to 51 percent.

Among farms with sales of $50,000 or more, about 27 percent had less than 50 acres, 21 percent had 50 to 99 acres, 22 percent had 100 to 219 acres, 15 percent had 220 to 499, and 15 percent had 500 or more in 1997 (fig. A-2). The share of farms in the 1 to 50 acres category increased from 1987, declined slightly for those with 50 to 219 acres, and remained unchanged for farms with 220 to 499 acres, and 500 and more acres. While fruit and tree nut revenues increased for all farm sizes with sales of $50,000 or more, farms with fewer than 220 acres received a smaller share of total revenue in 1997 than in 1987 (table A-3). The share of the total revenue going to farms with 220 or more acres, however, increased in 1997 over the previous 10 years. Growers having 220 to 499 acres received a slightly higher share of total revenue from fruit and tree nut sales, and those with 500 or more acres increased their share of total revenues by 3 percentage points to earn about 53 percent. Larger growers have the advantage

Figure A-2

Share of acres for farms with sales of $50,000 or more, 1997



Source: Bureau of the Census.

Table A-3--Sales by size of farms, 1987-97

Farm size	Sales			Share of revenue		
	1987	1992	1997	1987	1992	1997
		$1,000			Percent	
Under 50 acres	868,971	994,122	1,159,167	12	11	9
50-99	741,835	893,433	1,069,748	10	10	8
100-219	1,152,761	1,431,009	1,773,920	16	16	14
220-499	1,119,603	1,528,491	2,196,143	16	17	17
500 +	3,200,848	4,353,013	6,461,283	45	47	51
1,000-1,999	704,302	1,006,740	1,519,839	10	11	12
2,000 +	1,589,190	2,128,966	3,256,518	22	23	26
Total	7,084,018	9,200,069	12,660,262	100	100	100
Farms with sales of $50,000 +						
Under 50 acres	405,382	572,094	761,719	6	7	6
50-99	638,591	806,972	991,117	10	9	8
100-219	1,077,548	1,368,302	1,719,704	17	16	14
220-499	1,081,641	1,496,123	2,166,612	17	17	18
500 +	3,167,585	4,322,705	6,433,172	50	50	53
1,000-1,999	695,790	998,595	1,511,919	11	12	13
2,000 +	1,582,442	2,122,679	3,250,029	25	25	27
Total	6,370,747	8,566,197	12,072,325	100	100	100

Sources: Bureau of the Census, and Economic Research Service, USDA.

of producing larger quantities of a commodity that can be stored over extended periods of time (when applicable) and can therefore have the opportunity to spread out their marketing and receive higher prices during periods of reduced supply. They also can market their commodities in broader geographic areas than smaller growers, often receiving higher prices for higher quality shipped produce. Larger growers also are better able to meet costly, strict requirements set by export-destined countries, both in their growing and packinghouse operations. In States with numerous small farms, it would be difficult for growers to meet strict production requirements or to maintain packinghouses that could meet various export standards.

Florida had the greatest share of large acreage devoted to a single fruit or nut crop among the top five fruit and tree nut States. The top five States in 1997 were: California, Florida, Washington, Texas, and Georgia. In Florida, 2 percent of farms had 1,000 or more acres planted to fruit and tree nuts, for a total of 184 farms in 1997. California had 295 farms in that category, accounting for less than 1 percent of its farms (table A-4). The remainder of the top five States each had

Table A-4--Farms with land in orchards: Top five States, by acres, 1997

Acres	California		Florida		Texas		Washington		Georgia	
	Farms	Share of farms 1/	Farms	Share of farms 1/	Farms	Share of farms 1/	Farms	Share of farms 1/	Farms	Share of farms 1/
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Total	38,747	100.0	9,379	100.0	8,804	100.0	5,700	100.0	3,541	100.0
0.1 -0 .9	1,223	3.2	203	2.2	309	3.5	243	4.3	103	2.9
1 - 4.9	9,832	25.4	2,097	22.4	3,217	36.5	1,291	22.6	1,128	31.9
5 - 14.9	8,058	20.8	2,557	27.3	2,721	30.9	1,230	21.6	1,131	31.9
15 - 24.9	5,105	13.2	1,213	12.9	940	10.7	645	11.3	413	11.7
25 - 49.9	5,369	13.9	1,293	13.8	794	9.0	904	15.9	330	9.3
50 - 99.9	3,932	10.1	874	9.3	458	5.2	695	12.2	181	5.1
100 - 249.9	3,225	8.3	574	6.1	252	2.9	486	8.5	125	3.5
250 - 499.9	1,211	3.1	237	2.5	67	0.8	131	2.3	62	1.8
500 - 749.9	339	0.9	87	0.9	18	0.2	33	0.6	30	0.8
750 - 999.9	158	0.4	60	0.6	10	0.1	13	0.2	11	0.3
1,000 +	295	0.8	184	2.0	18	0.2	29	0.5	25	0.7
1,000 - 1,999.9	196	0.5	95	1.0	12	0.1	21	0.4	18	0.5
2,000 - 2,999.9	46	0.1	31	0.3	4	0.0	4	0.1	5	0.1
3,000 - +	53	0.1	58	0.6	2	0.0	4	0.1	2	0.1

1/ Share may not total to 100 due to rounding.

Source: Census of Agriculture, 1997, NASS, USDA.

less than 1 percent of the farms with 1,000 acres or more. While the farms with greatest acreage accounted for increasingly greater shares of production and revenue, most farms still had less than 15 acres planted to fruit and nuts.

Many of the farms that grow fruit and tree nuts also have other agricultural enterprises. Some may grow more than one kind of fruit or tree nut and others may grow vegetables, field crops, or even raise livestock. As a result, many farms are larger than the acreage reported for fruit and tree nuts. Accounting for all their agricultural enterprises, most farms still had less than 50 acres. The percentage over 1,000 acres, however, increased to 4 percent, with about 2 percent having 2,000 or more acres. Three percent of California's farms that grew fruit and tree nuts as well as other commodities, and 5 percent of Florida's farms, fit this category. In Georgia and Texas, the share of larger farms increased greatly when other commodities were included. In Georgia, 12 percent of the farms had 1,000 or more acres in 1997, in Texas, 9 percent of farms had 1,000 or more acres.

Family-Run Farms Continued To Dominate Production

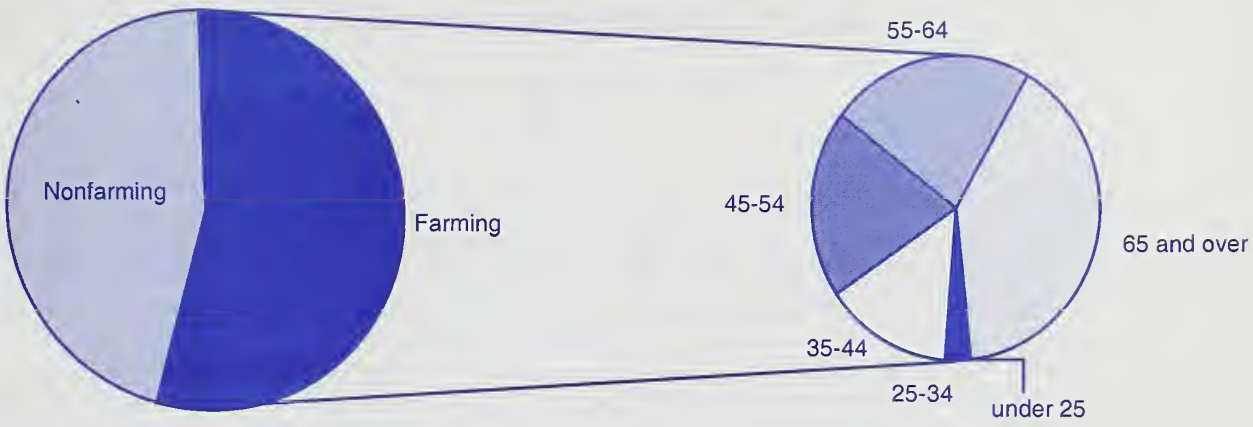
The majority of U.S. fruit and tree nut farms are still family or individually run. In 1997, 77 percent of the farms were family or individually run, down 14 percent from 1987. The next most common form of organization was the partnership, accounting for 12 percent of the farms, 12 percent fewer than 10 years previous. Corporate farming grew during this period by 14 percent to account for 9 percent of fruit and tree nut farms in 1997. Family-held corporations with 10 or fewer stockholders were the most common kind of corporation. Non-family held corporations with 10 or fewer stockholders, however, increased at a greater rate than family-held enterprises over the 10-year period. The category including cooperatives, estates or trusts, institutional organizations, and other types of organizations accounted for a very small portion of farms. This category, however, was the fastest growing form of farm organization between 1987 and 1997. This category, especially cooperatives, could increase in importance among fruit and tree nut farms in the coming years. With the increase in the share of revenues going to the largest farms and the consolidation of the retail industry, small farms may find it advantagous to join cooperatives to best market their products.

Compared with small farms, fruit and tree nut farms with sales of at least $50,000 showed an even stronger presence of corporate organization. In 1997, 21 percent of the farms fell in this category, up from 20 percent in 1987. Family-held organizations with 10 or fewer stockholders were still the most frequent form of corporation. Most of the farms, however, were family or individually run, making up 55 percent of the total in 1997, 4 percent less than in 1987. The share of total revenue was fairly evenly distributed between family or individually run farms, partnerships, and family-held corporations. Only partnership organizations experienced an increase in the share of total revenue between 1987 and 1997, each of the other major categories' share of the total declined.

Tenancy patterns remained stable over the 10 years examined. Most farms were run by full-time farmers. Although two-thirds of the farms, with sales of $50,000 or more, were run by full-time farmers, this group had the largest proportion of tenant farmers. Even with the larger share, tenant farms only comprised 9 percent of all farms in 1997. Orchards require years of commitment before a crop is even marketable, and the trees stay productive for many years,

Figure A-3

Age by principal occupation of fruit and tree nut growers, 1997



Source: Bureau of the Census.

making fruit and tree nut farming less likely to have tenant-run farms.

Over half the farmers producing fruit and tree nuts considered farming their principal occupation. This group accounted for 83 percent of the revenue earned. Within this group, more than a third of the farmers were 65 years old and over (fig. A-3). They accounted for about a quarter of the revenue. Another fifth of the farmers were 55 to 64 years of age, with another quarter of the earnings. With almost two-thirds of the farmers 55 and over, the next 10 years could be expected to see a big change in the way fruit and tree nuts are produced. As these farmers retire, the trend towards larger farms that can more efficiently compete in a world market, as well as corporate farming, whether as a means of disbursing the farming obligations to numerous family members or selling to other family or non-family corporations, will likely continue and at a faster pace.

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The U.S. Grapefruit Market

Suzanne Thornsbury and Thomas Spreen[1]

Abstract: Although geographically concentrated within four States, U.S. commercial grapefruit production accounts for approximately one-half of world output. Even with such a large share of world production, the U.S. industry has not been exempt from the changes currently impacting national produce markets. Forces of change include competition among production regions, retail buying practices, changing consumer preferences, and globalization. At least partially in response to stagnant domestic demand, the U.S. grapefruit industry has actively pursued global markets through bilateral and multilateral negotiations. Although adverse movements in exchange rates and global economic slowdowns have added additional sources of risk, the industry has been successful in penetrating and maintaining new markets. Even so, periods of over-production periodically disrupted by freeze events resulting in severe supply disruptions have established a classic price and production cycle, albeit longer than in many commodities.

Keywords: grapefruit, price-production cycle, market channels.

The United States has produced approximately 15 percent of world citrus on average since 1990, including almost one-half of the world's supply of grapefruit and pommelos (FAO 2000).[2] Although the U.S. proportion of world production declined slightly in the 1990's, it still remains high at over 47 percent. Even with such a large share of the market, the U.S. grapefruit industry has not been exempt from changes currently facing domestic produce markets. The purpose of this special article is to highlight the forces of change affecting U.S. grapefruit markets, including impacts and challenges from crop physiology, weather, retail buying practices, domestic consumer demand, and globalization. The grapefruit industry has often been proactive in their attempts to meet such challenges but has not been able to break free from a classic price and production cycle.

Production

Climatic factors and a high heat requirement for quality production limit the geographic boundaries of commercial grapefruit supply, both worldwide and domestically, to tropical or subtropical climates. Worldwide, the United States, Israel, Cuba, South Africa, Argentina, and Mexico account for over 80 percent of production (FAO 2000). In the United States, production is primarily concentrated in a sub-tropical zone between 25^0 and 35^0 north latitude which is subject to periodic freeze events.

Only four States, Florida, California, Texas, and Arizona, produce grapefruit commercially in the United States. On average between 1989/90 and 1998/99, the four States contained 76, 12, 9, and 3 percent of the national grapefruit bearing acreage, respectively (fig. B-1). Acreage in California has remained relatively constant over time, while acreage in Arizona, with increased competition for space and water for urban use, fell during the 1990's. The greater variability in bearing acreage in Florida and Texas was often influenced by weather events.

Even within the four grapefruit producing States, production is highly concentrated geographically, increasing the industry's exposure to catastrophic weather or other production events (fig. B-2). With the majority of U.S., and thus world, production occurring in relatively small areas within semi-tropical regions, grapefruit supply has been particularly susceptible to weather-related risks associated with frost or freeze conditions. The amount of damage from freezing temperatures can vary from fruit quality damage, to fruit

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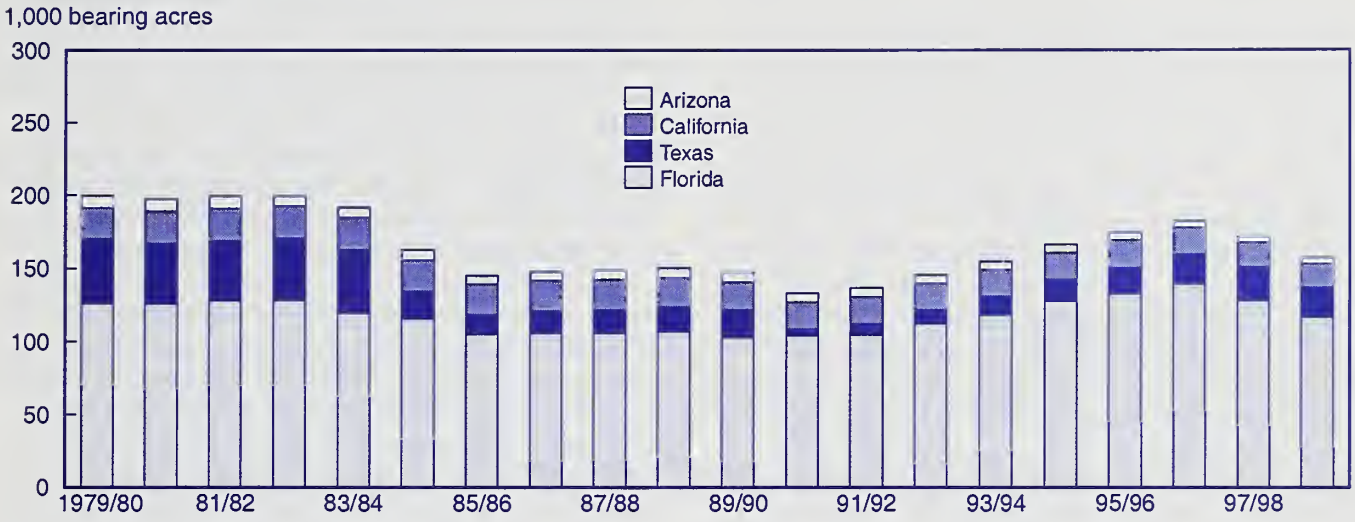
[2] Grapefruit (*citrus paradisi*) are often classified as a subspecies or botanical variety of pommelos (*citrus grandis*) which generally are larger, have a firmer flesh texture and lower juice content than grapefruit. Pummelo production on a commercial basis has been restricted to a limited geographic area within East Asia (Reuther, Webber, and Batchelor 1967; Saunt 2000). If the FAO data for pummelos could be separated from that of grapefruit, the United States would be expected to have a larger share of world grapefruit production.

Figure B-1

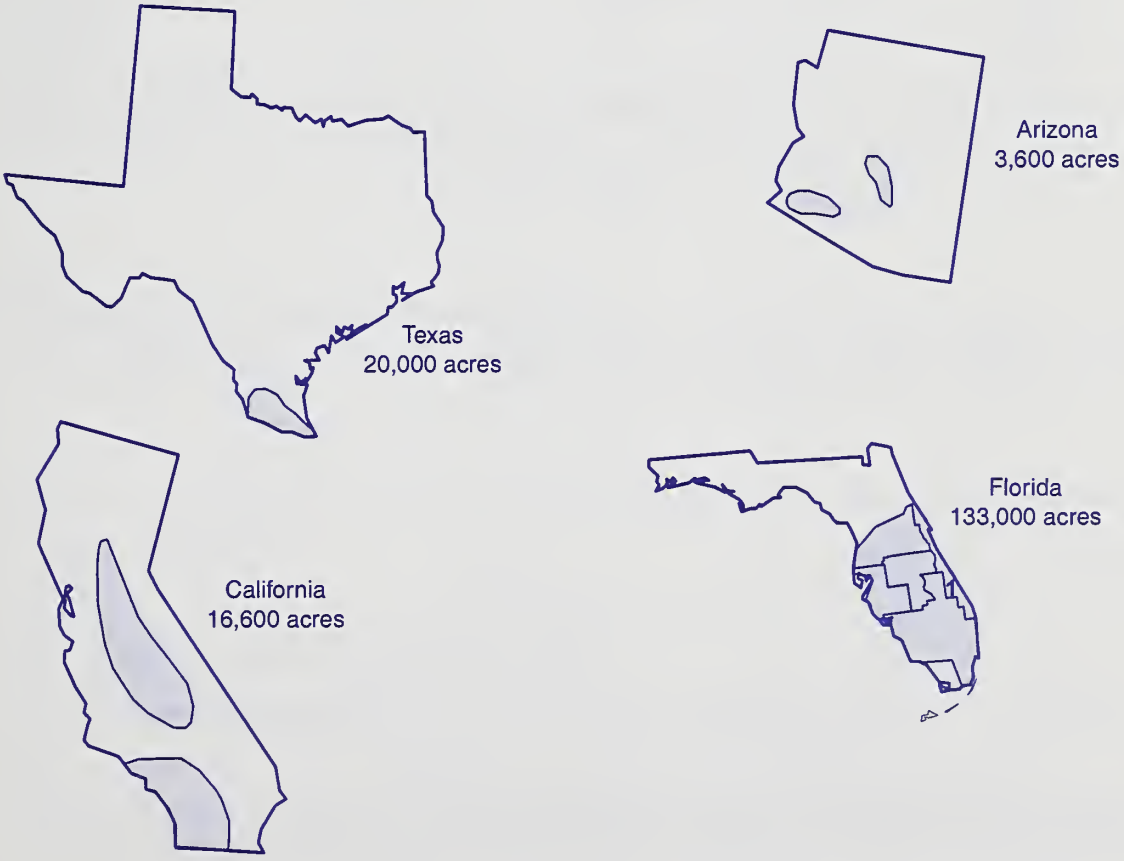
U.S. grapefruit bearing acreage



Source: Florida Agricultural Statistics Service, (2000).

Figure B-2

U.S. citrus producing areas and grapefruit bearing aceage, 1998/99



Source: Florida Agricultural Statistics Service, (2000).

loss, to total tree destruction depending on the severity of the weather event.

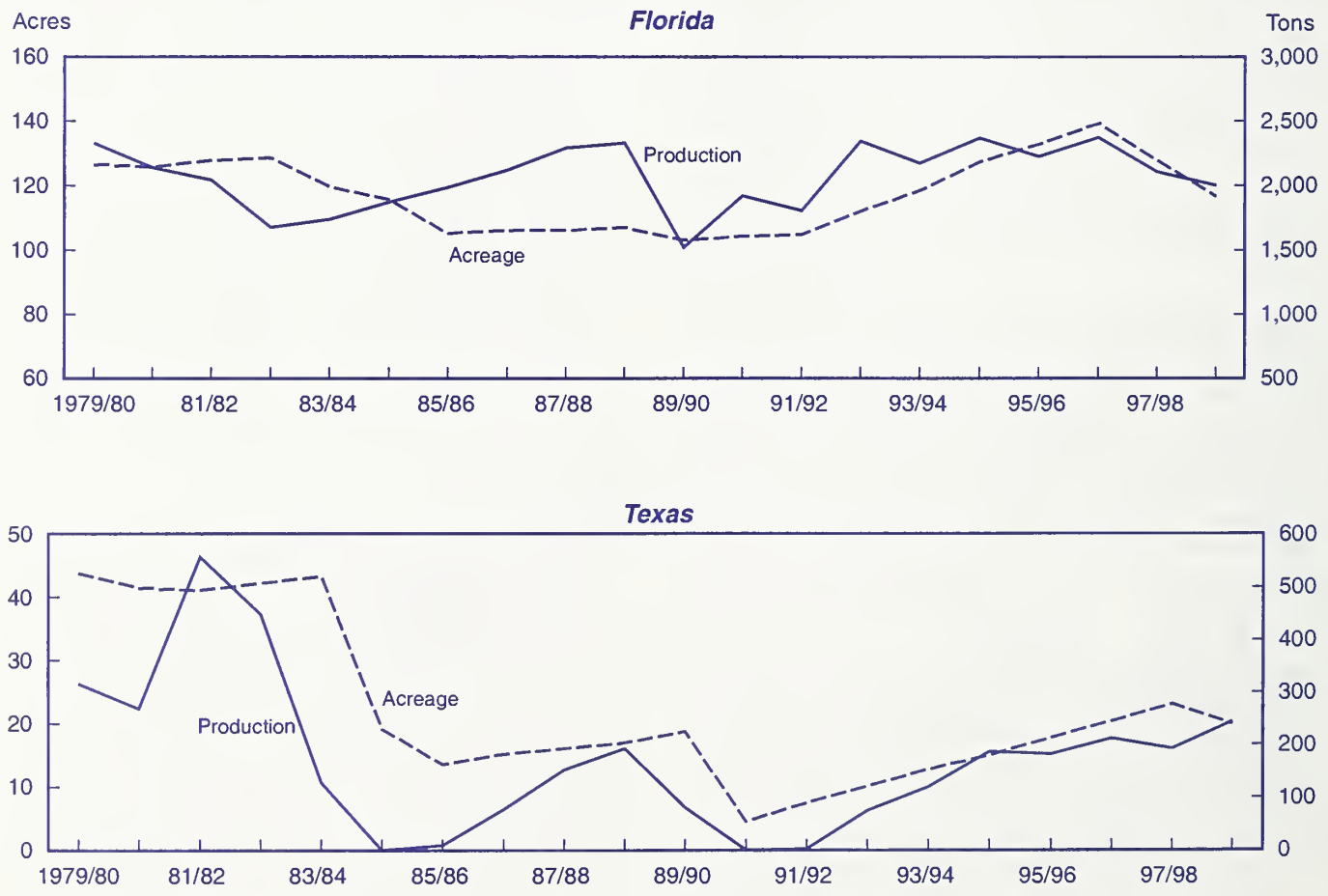
The first recorded U.S. citrus freeze occurred in Florida in 1835. More recently, moderately severe freezes were recorded in the State during 1977, 1981, and 1982, with severe freezes occurring in 1983, 1985, and again in 1989. Not only were annual output levels impacted by weather, but the severe freezes resulted in a significant portion of acreage being lost and a longer cyclical pattern developed in output. Freezes have also disrupted grapefruit production in other States; most notably, the December 1983 and December 1989 Texas freezes when marketings during 1984/85 and 1990/91 were zero (fig. B-3). Again a longer pattern of recovery can be seen after catastrophic freeze events when compared with other horticultural crops.

Supply recovery is longer than that of most horticultural crops due to the lengthy period between tree-set and maturity in grapefruit, and hence to harvesting the first crop of sufficient volume to be economically viable. Most grapefruit trees will begin bearing 2 to 3 years after planting, but initial yields may not cover the cost of harvesting. In most cases, economically viable productivity levels are not achieved until the fifth or sixth year after planting. Trees typically remain highly productive for approximately 20 years and can continue production, with only moderate yield decline in subsequent years, baring substantial damage from weather, pests, or mismanagement. Therefore, even if supply and demand signals are efficiently passed through the market, there are still significant lags in the industry's ability to respond.

Even within a single producing State, weather patterns have impacted the physical location of grapefruit production. Over time in Florida, growers have moved south to locations less vulnerable to freeze (table B-1). Currently data are recorded for five citrus-producing areas within the State; however 1980's freezes destroyed almost all the citrus in the northern areas. Recent evidence collected from Florida grapefruit shippers confirms this pattern. Of the firms inter-

Figure B-3

Florida and Texas grapefruit bearing acreage and production



Source: Florida Agricultural Statistics Service, (2000).

viewed, 37 percent reported decreasing product sourced from the central region over the last 5 years, while 50 percent report increasing the percentage sourced from the southwestern regions.

There are factors, other than freeze risk, that influence product sourcing patterns within a State, including the need to extend the supply season. The warmer weather of the more southern Florida regions allows grapefruit to reach maturity faster, and thus access the early-season market. Although the marketing season for Florida begins September 10, grapefruit harvest normally begins in September in Southwest Florida and October in the other regions of the State and extends until July 31. Marketing seasons are November 1 to July 31 in Arizona, November 15 to October 30 in California, and October 1 to May 30 in Texas.

Variations in acreage alone may mask other changes in output. As with most crops, there have been agronomic changes in commercial grapefruit production. Tree plantings for all varieties are much denser in the 1990's than during earlier decades, allowing for greater output and lower harvesting cost per bearing acre (fig. B-4). U.S. grapefruit yields averaged 15.2 tons per acre between 1971 and 1979, 15.3 tons per acre between 1981 and 1989, and 16.9 tons per acre between 1991 and 1999 (FAO 2000).

Both white and red (or colored) grapefruit are produced in seedy and seedless varieties, although seedy fruit accounts for a much smaller, and declining, portion of the commercial market (fig. B-5).[3] Red varieties have accounted for an increasing share of U.S. production in the 1990's. Recent interviews with Florida grapefruit shippers identified an average 8 percent decrease in shipments of white seedless grapefruit over the last 5 years.

[3] Seedless fruit is defined as having six or fewer seeds.

Table B-1--Average annual grapefruit production by Florida region 1/

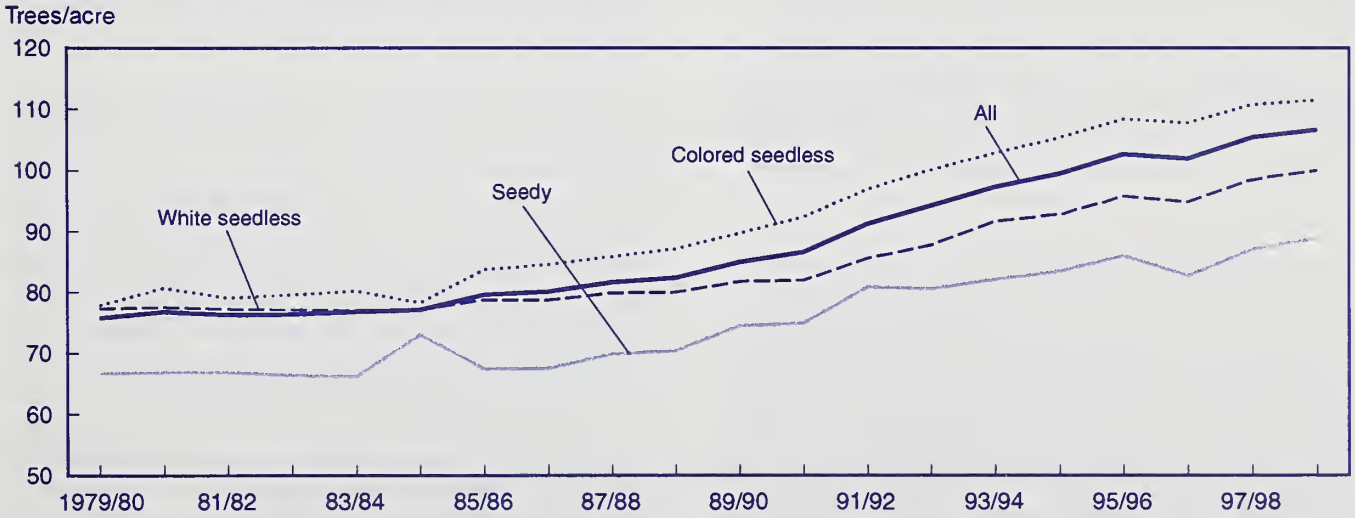
Years	Indian River	Northern	Central	Western	Southern
			1,000 boxes		
1966/67-1969/70	10,129	6,333	8,511	2,376	--
1970/71-1974/75	17,661	6,683	9,377	1,859	--
1975/76-1979/80	21,968	6,776	12,486	2,029	--
1980/81-1984/85	24,130	3,821	10,885	1,466	--
1985/86-1989/90	30,280	267	6,758	1,164	6,991
1990/91-1994/95	32,480	304	5,021	1,810	8,884
1995/96-1998/99	33,675	478	5,373	1,864	9,011

1/ Regions were adjusted between the 1984/85 and 1985/86 reporting seasons. Prior to that time regions were defined as East Coast (Indian River), Upper Interior, Lower Interior, and West Coast, and data were not kept separately for the Southern region.

Sources: Florida Agricultural Statistics Service (2000) and authors' calculations.

Figure B-4

Grapefruit trees per bearing acre in Florida



Source: Florida Agricultural Statistics Service, (2000).

Figure B-5

Florida grapefruit production by type

Source: Florida Agricultural Statistics Service, (2000).

Grapefruit are utilized in both the fresh and processed (primarily juice) market. The end use determines fruit characteristics that are desirable. Appearance is very important in the fresh market, where a regularly shaped fruit with little to no exterior blemishes is considered ideal. Seedless fruit is preferred in this market. In the processed juice market, juice color and content, high solids, and a low degree of bitterness are important fruit characteristics. Currently, white grapefruit primarily enters the juice and fresh export markets. Red grapefruit primarily enters the domestic fresh market, although as blended juice technology has evolved, an increasing amount of colored grapefruit has been processed.

From 1993/94 to 1998/99, on average, 51 percent of U.S. grapefruit production went into the processed market (FASS 2000). End use allocation varied substantially between States, reflecting both the volume of production and processing capacity in Florida and the influence of weather on fruit appearance; it is more difficult to produce blemish-free fruit under humid conditions. On average, 58, 28, 31, and 32 percent of the Florida, California, Texas, and Arizona production was utilized in the processed market.

Price-Production Cycles

Grapefruit is a commodity that has undergone periods of over-production periodically disrupted by freeze events resulting in severe supply disruptions. As a result, the U.S. grapefruit industry has demonstrated classic economic price and production cycles, albeit longer than in many commodities (fig. B-6). Unlike many produce industries, there can be significant costs associated with exit from grapefruit production limiting growers' season-to-season ability to adjust production levels. Permanent exit entails, at minimum, the cost of tree removal. There are also sunk costs at the packing/processing levels that contribute to continued excess capacity within the industry.

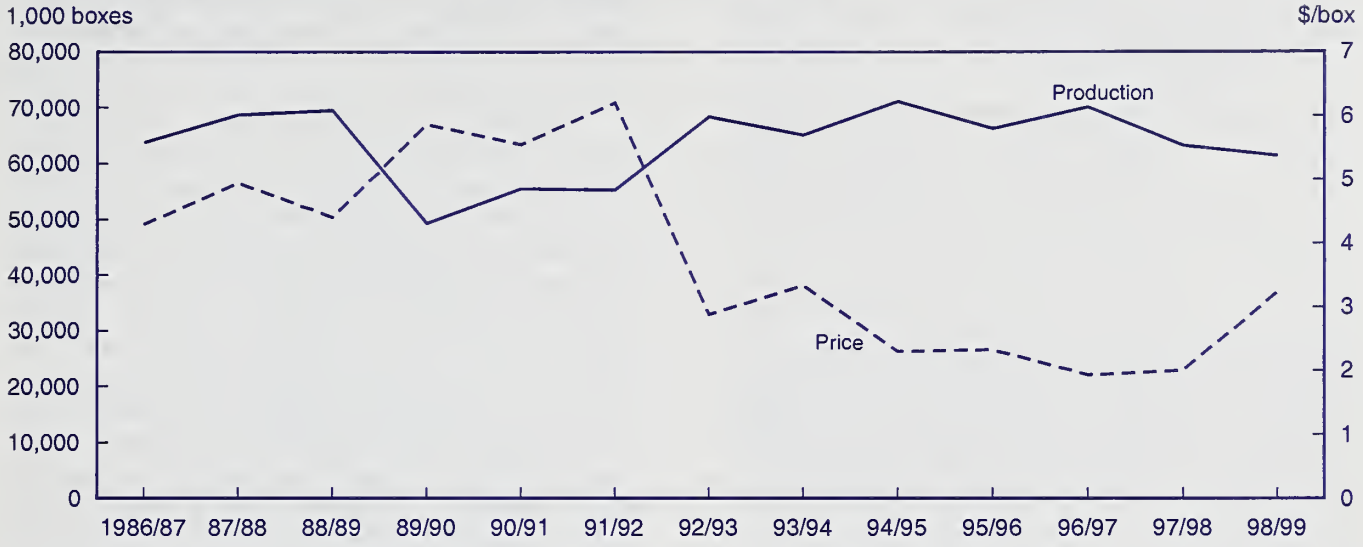
Physiologically grapefruit are non-climatic, therefore the fruit remains on the tree as it passes through the immature, mature, and over-mature stages of development, and changes occur very slowly over a long period of time compared with other noncitrus fruits, such as peaches or apples (Jackson and Davies 1999). Standards for maturity are defined by State law in each of the citrus growing States, and Federal statutes apply to interstate commerce. In addition, after harvest the quality of the fruit does not deteriorate rapidly unless there is damage. There is a relatively long time to harvest and ship fruit compared with other produce items. Thus, within a season, there is more opportunity for growers and shippers to manage supply in response to market signals.

Fruit may be sold by the grower to a shipper as either a cash sale (where the buyer assumes the market price risk) or in a participation arrangement (where the grower retains the price risk and pays the buyer a fixed marketing fee). Traditionally, when the crop is ready, a harvester is contracted to arrange for the picking, roadside (moving to the end of the row), and hauling of fruit. Depending on the sales arrangement, the harvester may be contracted by the grower or a shipper, packinghouse, or processor who has bought the fruit.

There are significant differences in price per box, and grower returns, for grapefruit in the fresh and processed markets (fig. B-7). Since in many years the processed market serves as a residual demand for fresh grapefruit, the price differentials are increased in times of oversupply. Once fruit is harvested, it can be sent to a packinghouse for uti-

Figure B-6

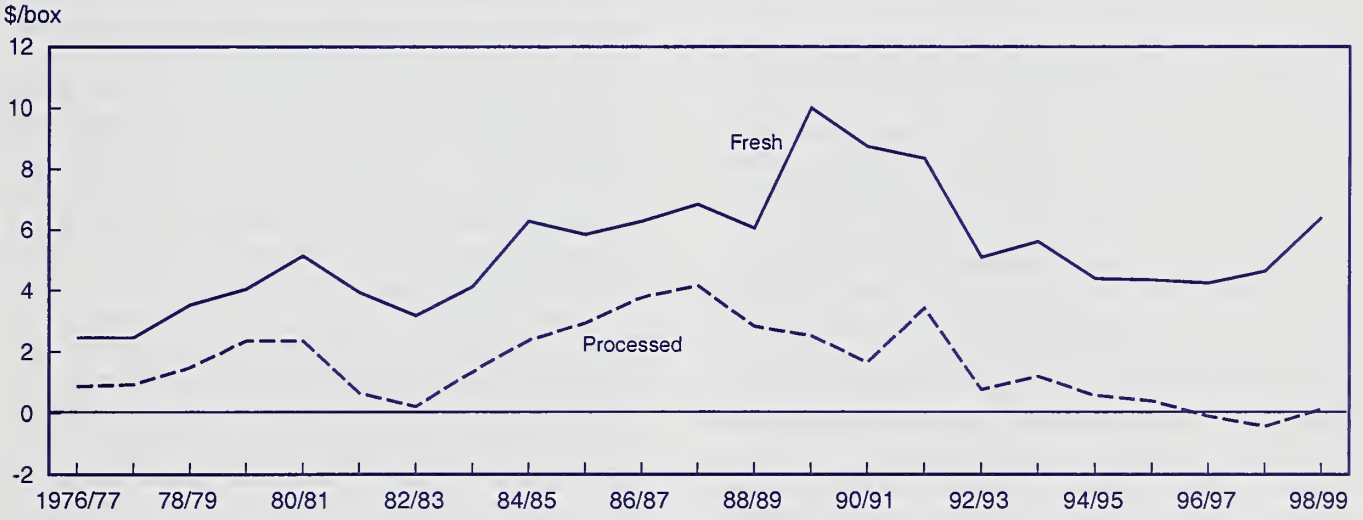
Total U.S. grapefruit production and equivalent on-tree price



Source: Florida Agricultural Statistics Service, (2000).

Figure B-7

U.S. equivalent on-tree grapefruit grower returns



Source: Economic Research Service, USDA.

lization in the fresh fruit market or sent directly to a processor. If fruit is first sent to the packinghouse, eliminations, the portion of fruit that does not meet fresh standards after grading, may then be sent to processing plants for conversion to juice or be discarded, depending on processor demand. The percentage of fruit sent to packinghouses that meets standard and is shipped fresh is referred to as the pack-out rate and will have a significant impact on grower returns. Pack-out rates are influenced by grading standards, quality of the crop, fresh utilization rates, and the extent that growers selectively harvest.

At harvest, fruit may also be sent directly to a processing plant which, is referred to as field-run processed. Growers with fruit that does not meet fresh standards will incur less cost by sending their product directly to the processing plant, as there are normally charges associated with the handling and transport of eliminations. During a particular growing season, individual growers have little control over their market allocation deci-

sion; external factors that influence fruit characteristics such as weather and earlier grove care decisions will largely determine quality and thus, given the demand by processors, end use.[4] Long-run grove care decisions, such as site and varietal selections, and pest control will influence end use.

Approximately 40 percent of the cost of production at the grower level is allocated for harvest expense (Muraro, Hebb, and Stover 1998). In low price periods, harvest and handling costs may exceed price, thus the on-tree price and corresponding grower returns can take on negative values. Regardless of the method of sale, grower returns are calculated as an on-tree equivalent value to allow annual comparisons. Price is calculated as a residual of the FOB price minus charges for harvest, roadside, hauling, marketing, assessment, and handling. Growers may choose to abandon or not harvest the crop for economic reasons. Approximately 3 million boxes of fruit were abandoned in Florida during the 1995/96 season and 6 million boxes were abandoned during 1996/97 (USDA/NASS 1999). Leaving a crop on the tree will have detrimental impacts on crop quantity and quality in subsequent years, so growers may choose to pick the fruit but never deliver it to market.

Marketing Channels

Instead of performing the marketing function individually, most packinghouses use a sales organization. There are two major sales organizations in Florida and several smaller ones. The sales organizations coordinate with packinghouses and buyers, receiving a fee for their services. Sales organizations are usually (but not always) private enterprises that source product from a mix of their own packinghouses and other houses affiliated either through formal or informal relationships. Individual packinghouses may also market their own product. These arrangements have become more common in the 1990's but still account for a relatively low share of total volume, relative to that shipped through the sales organizations. Traditionally, cooperatives have also played a large role in fresh citrus marketing. Members are individual growers or production cooperatives. Cooperatives are also active in processed grapefruit markets.

Like all produce industries, fresh grapefruit shippers have faced a number of changes in their markets over the last 5 years. Forces of change include competition from alternative production regions, retail buying practices, changing consumer preferences, and access to new markets. Since public data to assess the impacts of such changes are limited, primary data were collected through a series of written surveys and personal interviews that compared marketing practices over the last 5 seasons among fresh grapefruit shippers from all the producing regions of Florida. The firms included in the interviews accounted for over 54 percent of the volume of fresh Florida grapefruit sales (33 percent of U.S. volume) during the 1998/99 season. When the survey data were included, 65 percent and 40 percent of Florida and U.S. volume were represented.

The survey and interview results confirmed the public data for trends in fresh grapefruit sales. Among respondents, the amount of white grapefruit marketed fell by an average of 8 percent to 17 percent of sales over the last 5 seasons. There was an increase in grapefruit sourced from the southwestern region and a corresponding decrease sourced from the central region. The percentage of product sourced from the Indian River region remained approximately constant on average, although there were changes among individual firms. Shippers continue to procure 40 to 55 percent of their supply through their own or affiliated production. Among shippers organized as cooperatives, the percentage procured through cooperative arrangements increased by an average of 18 percent and ranged from 75 to 95 percent of total sales. Cooperatives did procure some product through other arrangements, primarily through participation agreements with independent growers.

Product bought through a participation arrangement where the grower receives a residual price and bears the market price risk have decreased almost 12 percent in the last 5 years. Although the majority of shippers interviewed reported decreased purchases (up to 40 percent) through this mechanism, there were some shippers who had increased participation purchases by at least an equal percentage. Cash sales that transfer at least partial, if not all, of the price risk to the shipper have increased by an average of 5 percent. Joint ventures and contract production are not commonly used by grapefruit shippers.

The perception among grapefruit shippers is that the total number of buyers for produce has decreased in the last 5 years, and on average, there were 95 regular buyers per firm in the 1993/94 season compared with 78 in the 1998/99 season. However, there were significant differences among firms. When the percentage change in the number of regular buyers for each individual firm was calculated, 25 percent indicated a decrease in the number of buyers, 12 percent indicated no change, and 63 percent indicated an increase. The average percentage change in the number of buyers across the firms interviewed increased 9 percent between 1993/94 and 1998/99.

Based on the interview results, total sales have not become significantly more concentrated. On average, the top four buyers accounted for 26 percent of total sales in 1993/94 and 29 percent in 1998/99. Conversely, the share of sales to the top 10 buyers decreased from 53 to 50 percent over the same period. Again, there was a great deal of variability among the firms, with 63 and 38 percent of respondents indicating increases in sales to their top 4 and top 10 buyers, respectively.

[4] This discussion draws heavily on "Fresh Versus Processed Utilization of Florida Grapefruit" by Brown, Spreen, and Muraro, which examines the allocation problem faced by grapefruit producers.

In addition to the number of buyers, the types of buyers for fresh grapefruit have changed over the last 5 years (table B-2). On average, sales to grocery retailers and retail cooperatives combined (such as Flemming or Associated Grocers) decreased about 4 percent between 1993/94 and 1998/99. The percentage of sales through mass merchandisers increased over the same period. Sales through produce wholesalers and distributors decreased; average sales fell 5 percent. Export markets have become more important, with an increase of over 5 percent of fresh product moving into the international markets on average from these shippers over the last 5 years. There has been increased product moving through brokers as well. Food service remains a very small market for fresh grapefruit.

Continued mergers among grocery retailers have led to growing concerns about changes in additional transactional arrangements, or off-invoice pricing, between retailers and shippers across all produce commodities. In the interview results, all shippers reported increased requests from buyers for fees and services. In general, shippers indicated that their response to requests depended on the specific request, cost of compliance, and the anticipated impact on firm resources.

When shippers were asked about specific types of fees and services, fees were perceived as much more harmful to their business than services. Specific fees and services discussed are listed in table B-3. Of the specific fees requested, only 8 percent were seen as beneficial by individual firms, compared with 34 percent of services. Approximately 62 percent of fees were seen as harmful, compared with only 15 percent of services.

At least partially as a result of changes in buyer types and market channels, there have also been changes in how prices are determined. According to the interview results, there has been an increase of over 4 percent in the use of seasonal or annual contracts for fresh grapefruit pricing. There have been corresponding decreases in the percentage of product priced through daily sales or short-term contracts. Shippers indicate they have undertaken a variety of strategies to better position themselves and their industry, including a specific marketing of product quality, extending both the length of time and types of citrus supplied, and export market development.

Table B-2--Average percentage of sales through specified market channels for fresh Florida grapefruit, 1993/94 to 1998/99

Market Channel	1993/94	1998/99
	Percent	
Grocery retailer	24.27	22.00
Retail cooperatives	10.82	8.82
Mass merchandisers	1.82	4.45
Produce wholesalers	15.18	10.09
Brokers	9.64	11.09
Food service buyers	1.55	1.73
Exports	36.73	41.82

Source: Grapefruit shipper interviews and surveys and authors' calculations.

Table B-3--Types of fees and services included in the grapefruit shipper interviews

Fees	Services
Fixed up-front slotting	Electronic data interchange
Volume rebates	Automatic inventory replenishment
Rebates, not tied to volume	Category management
Promotional allowances	Special merchandising displays
Free-product discounts	Private labels
Buy-back unsold product	Returnable containers
Capital improvement	Special packs
E-commerce fees	Food safety certification

Domestic Demand

Domestic per capita consumption of fresh grapefruit declined during the 1990's relative to the 1970's (fig. B-8). Population increases have raised total consumption slightly since 1992 but have not been enough to offset per capita declines from the previous decade. Total domestic shipments of fresh grapefruit have declined in the face of a strong domestic economy, increased population, and expansion of overall fruit consumption. Even among consumers increasingly aware of the health benefits of fresh fruit and vegetables, the largest increase in per capita fresh produce consumption has occurred in noncitrus fruits. Availability and quality of numerous fresh fruit alternatives has had a negative impact on grapefruit consumption. Consumers often find grapefruit a difficult fruit to use as it needs to be peeled, sectioned, can be too juicy and/or too tart, and is often associated with a breakfast food. Recent evidence suggests that per capita consumption of grapefruit is inversely related to age, with older consumers eating more. Unless the eating patterns of younger consumers change as they age, this will have significant negative impacts on future grapefruit demand.

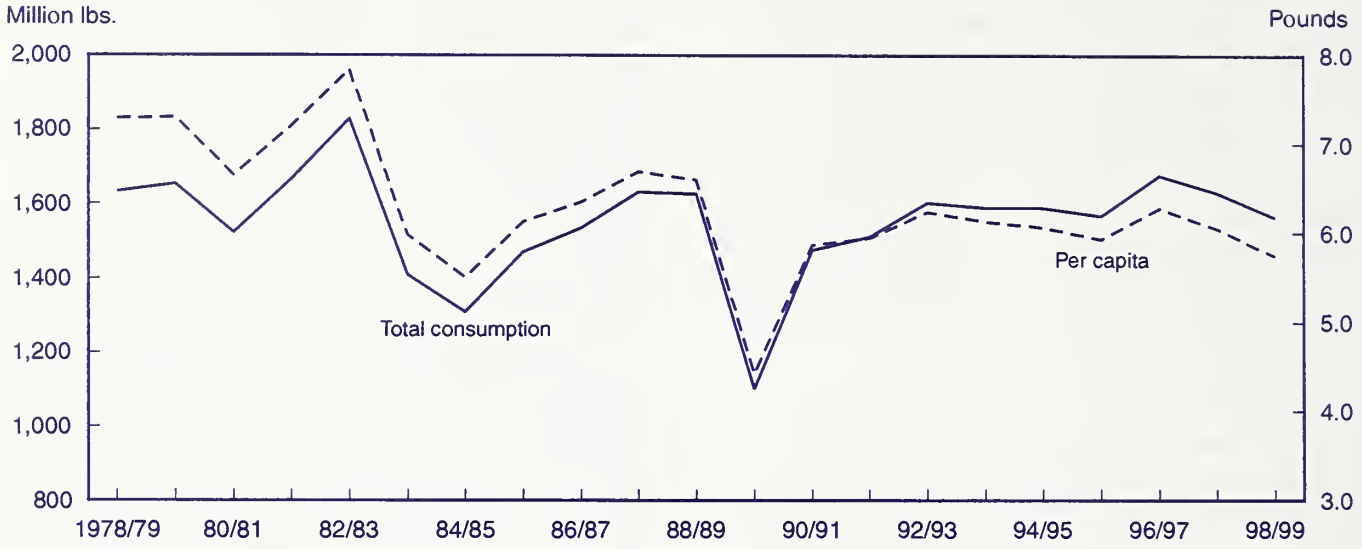
The grapefruit industry has begun a dual approach to promoting their product domestically. First is promotion of the intrinsic positive qualities of grapefruit as a natural source of quality nutrients. The "heart-healthy" advertising campaign is a visible sign of such efforts. Second is the development of alternative products or presentations of the fruit that address consumer concerns. The availability of fresh-peeled grapefruit (similar to pineapple) in retail outlets is one alternative under consideration.

Per capita consumption of fruit juices in the United States shows a pattern similar to that of fresh fruit. Grapefruit juice consumption has been relatively flat since the 1970's with substantial increases in noncitrus juice consumption. However, citrus juice still commands the largest share of the fruit juice market, given the strong demand for orange juice.

The grapefruit industry has responded to changes in consumer juice preferences, and there have been significant technological advances in grapefruit juice processing. In the 1970's and early 1980's, canned grapefruit juice accounted for a larger share of the market. Consumers were often

Figure B-8

Domestic consumption of fresh grapefruit



Source: Economic Research Service, USDA.

unhappy with the taste and consistency of the product, and by the 1990's very little canned grapefruit juice was being produced (fig. B-9). Demand for the canned product disappeared in the face of a more desirable product.

Development of frozen concentrated grapefruit juice (FCGJ), as well as the ability to include more of the colored fruit for improved visual appearance and taste, has shifted the industry towards a different product. Subsequent adjustments continue to be made in the processed grapefruit industry. Not-from-concentrate and blended juice products have become bigger components of the processed juice market for grapefruit in the 1990's as consumer demand for freshness and new tastes grow.

Juice is the storable form of grapefruit and as such, often acts as the residual commodity in the market. Not only does fruit go directly to the processed market but eliminations from the packinghouses are also delivered to the juice market. As a result, the inventory of FCGJ also displays a cyclical pattern (fig. B-10). Inventories increase between years of restricted supply and decrease following freeze events. Recovery of full productive capacity in both Florida and Texas after the freezes of the 1980's pushed juice inventory levels to record highs by 1996/97. Not surprisingly, prices in the processed grapefruit market are counter-cyclical with inventory and the U.S. average on-tree price reaching a low of -$0.43 per box in 1997/98.

Export Demand

Partially as a consequence of stagnant domestic demand, the U.S. grapefruit industry is looking outward and increasingly active in the global economy. Exports account for over 20 percent of all U.S. grapefruit production (fig. B-11). International markets are even more critical for specific products; approximately 68 percent of Florida fresh grapefruit were exported in the 1999/2000 season. During the 1990's U.S. exports were approximately 42 percent of world fresh grapefruit trade, 69 percent of world trade in grapefruit concentrate, and 28 percent of world trade in single strength grapefruit juice.

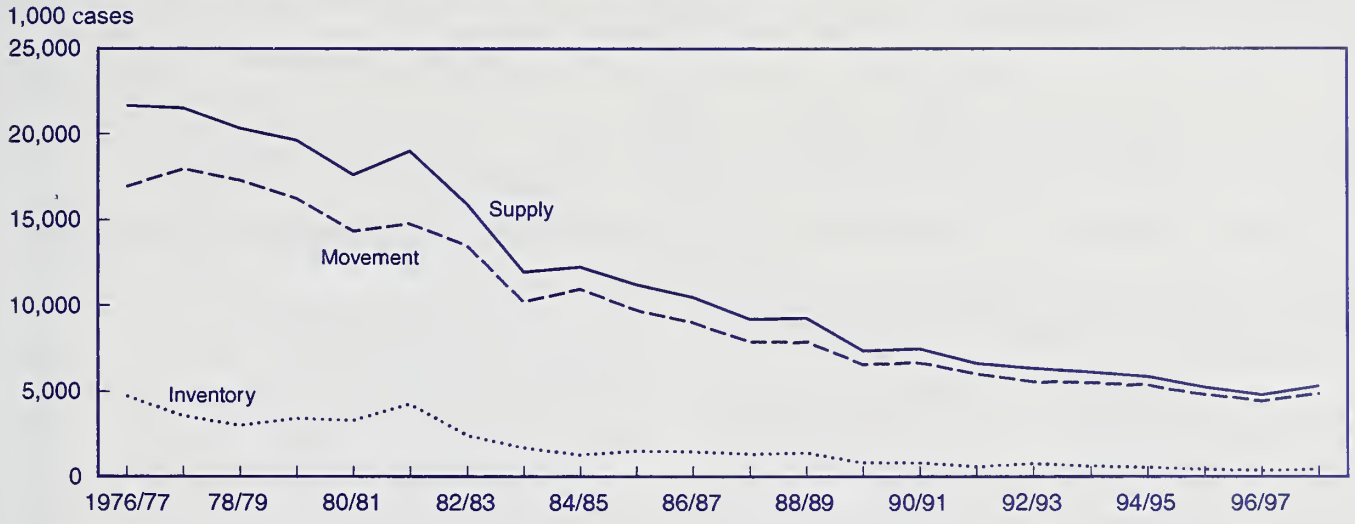
The Japanese beef and citrus agreement, signed in 1989, opened a significant new market for U.S. grapefruit exports. In the 1999/2000 season, 32 percent of all Florida fresh grapefruit sales were exports to Japan. Demand in this market is primarily for high quality white grapefruit, a product that does not sell well in domestic markets, although sales of colored grapefruit to Japan have increased in recent years. Along with increased exports to international markets has come increased exposure to global economic conditions. Grapefruit sales to the Asian markets underwent significant contractions during the 1990's, with declines in overall economic conditions. Again following the economic recovery, sales to these markets have begun to rebound.

The European Union (EU) is another important market for U.S. grapefruit, with over 9.5 million cartons of fresh fruit sold into this market in 1996/97. Sales to the EU have declined the last 3 seasons with sales of less than 7 million cartons projected for 1999/2000. The drop illustrates, at least partially, another risk faced by U.S. exporters: the U.S. dollar strengthened against most European currencies, making U.S. grapefruit more expensive relative to other supplies.

Nevertheless, the grapefruit industry has been active in pursuing new export opportunities. Recent negotiations over

Figure B-9

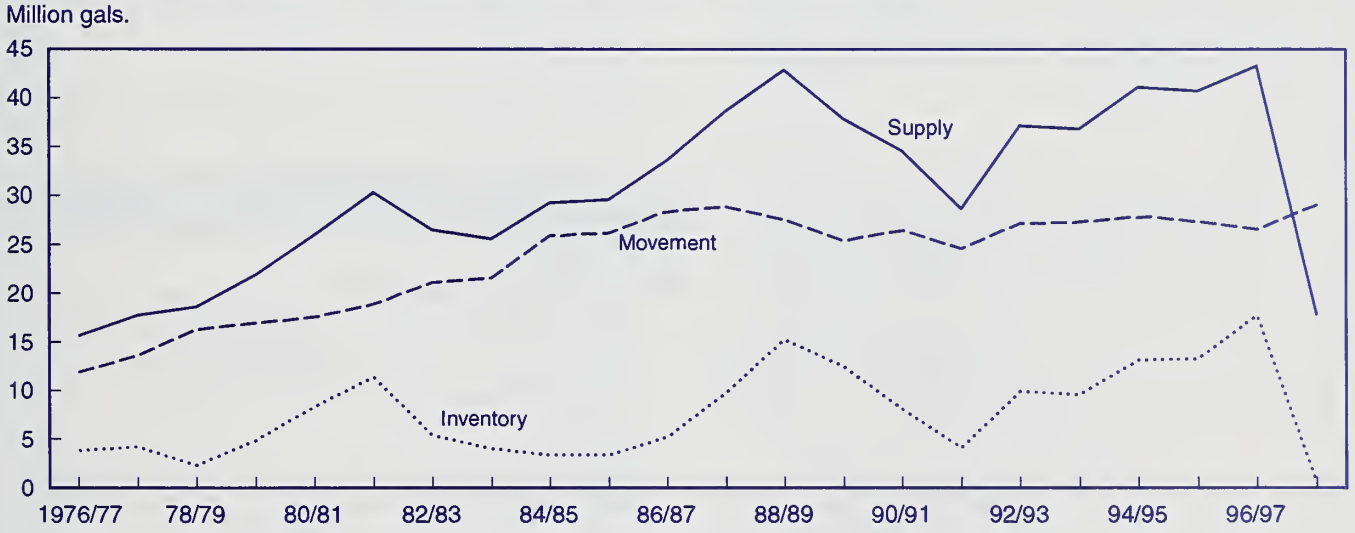
Supply and movement of U.S. canned grapefruit juice



Source: Economic Research Service, USDA.

Figure B-10

Supply and movement of U.S. frozen concentrated grapefruit juice



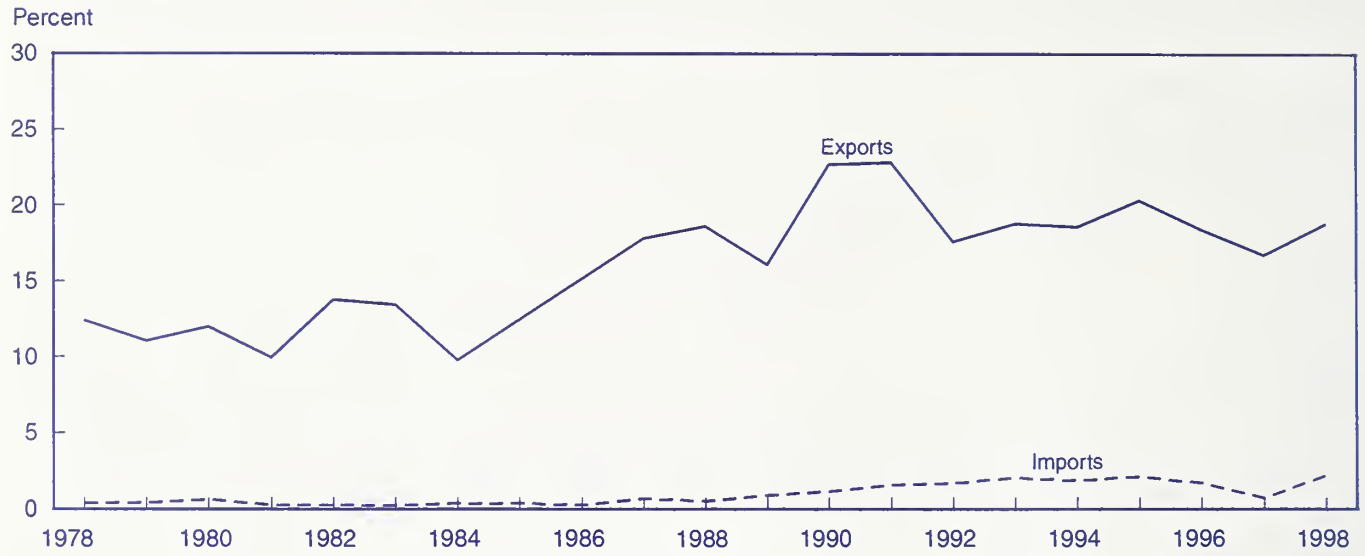
Source: Economic Research Service, USDA.

U.S. access to markets in China included the bilateral Agricultural Cooperation Agreement that was signed in April 1999 and formally lifted the ban on U.S. citrus exports to China. A March 1999 agreement opened citrus markets in India for mandarins, clementines, lemons, and grapefruit. In addition, a protocol over phytosanitary concerns was negotiated in 1999 with the Philippines to allow imports of Florida grapefruit, oranges, and tangerines. In June 2000, an agreement was signed that would allow restricted imports of citrus from Argentina to the United States. Lifting the ban on the import of Argentinean citrus has raised the expectations that the ban on Florida citrus exports to Argentina may also be lifted in the future. Worldwide, the EU is the largest importer of grapefruit, accounting for approximately one-half of the total volume. Other significant importers are Japan (13-18 percent), Canada (5-7 percent), and Poland (2-3 percent), with Argentina, the Russian Federation, and Switzerland at 1.5 percent each (FAO 2000).

There has also been an increased penetration of the U.S. market by imported grapefruit and grapefruit products. Imports as a percentage of domestic consumption was very

Figure B-11

Grapefruit imports as a percentage of U.S. consumption and exports as a percentage of U.S. production



Source: Florida Agricultural Statistics Service, (2000).

close to zero until the late 1980's but has ranged from 1 to 3 percent annually since the 1989 freeze. The desire of U.S. shippers to provide a year-round supply of product to their buyers has also provided an entry for imported grapefruit.

Conclusions

The U.S. grapefruit industry is facing mixed signals for the future. Geographically concentrated within four States, U.S. commercial production of grapefruit accounts for over one-half of world output. Periods of over-production periodically disrupted by freeze events resulting in severe supply disruptions have resulted in a classic price-production cycle. There remains excess production capacity in the domestic industry, and significant costs associated with entry and exit limit the ability for quick supply adjustments. At least partially in response to lagging domestic demand, the industry has aggressively pursued opportunities in global markets. Despite an expansion in export sales, it is not clear that the industry will be able to break the classic price-production cycles that have existed in the past. Domestic demand for grapefruit remains weak, and global demand is often subject to forces, some of which are beyond industry control, such as exchange rate variability, growth of foreign economies, and phytosanitary concerns.

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