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Fruit and Tree Nuts Outlook

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Huge Apple Crop in the West Mixes with Tight Pear Supplies This Fall

Contents

Selected Tables

Topic Page

Approved by the World Agricultural Outlook Board.

Note: *This is the first release of the ERS* Fruit and Tree Nuts Outlook *newsletter since July 2013. Budget-related cutbacks in the availability of USDA data on fruits and tree nuts necessitated cancellation of the September 2013, December 2013, March 2014, and July 2014 newsletters. USDA data collection has been restored and ERS will include future reports in the 2015 Outlook calendar.*

The index of prices received by U.S. fruit and tree nut growers remained consistently above year-ago levels and 2010-12 average levels each month since the beginning of 2014, indicating continued strong grower prices for fruit and tree nuts through most of this year. In addition to high citrus prices, August grower prices for fresh grapes, peaches, pears, and strawberries averaged strong relative to recent average prices, offsetting lower apple prices.

Despite harsh winter conditions in several parts of the country, another large crop is forecast for U.S. apples in 2014. In August, the initial forecast from USDA's National Agricultural Statistics Service (NASS) indicated a 10.9-billion-pound crop, up 4 percent from the revised 2013 estimate and the third-largest crop since 1990. Abundant supplies will move to markets in the 2014/15 marketing year, putting downward pressure on U.S. apple prices.

The 2014 U.S. pear crop was forecast by NASS in August at 1.60 billion pounds, 9 percent smaller than a year ago. The quality of this year's crop is reported as generally high, especially in the Pacific Northwest where good growing weather helped fruit to size favorably. Even in drought-stricken California, fruit size and quality were reported as good for the early-season pears. Due to the decline in domestic production, fresh-market pear output is projected to be below recent average levels, likely elevating pear prices in 2014/15, with some impending offsets from the expected larger U.S. apple crop this year.

U.S. grape production is forecast at 15.9 billion pounds in 2014, down 8 percent from the record production in 2013. California's 2014 grape crop is forecast down 9 percent from the record harvest last year, but 6 percent above the average 2008-12 crop. A warm spring advanced crop development earlier than last year. Drought remains a major concern among growers but a hail storm in the spring also affected blooms in some vineyards.

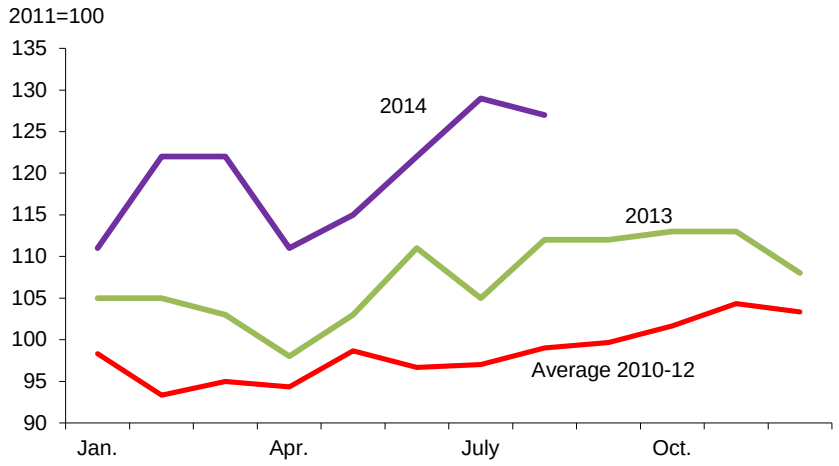
Price Outlook

Fruit and Nut Grower Prices Exceptionally Strong in 2014

The index of prices received by U.S. fruit and tree nut growers remained consistently above year-ago levels and 2010-12 average levels each month since the beginning of 2014, indicating continued strong grower prices for fruit and tree nuts through most of this year (fig.1). Continued high grower prices for fresh lemons and oranges contributed to the strength in the index, offsetting lower prices for grapefruit. As of August, the reported index, at 127 (2011=100), rose 13 percent from the August 2012 index and 28 percent above the 2010-12 average index. In addition to the high citrus prices, August grower prices for fresh grapes, peaches, pears, and strawberries also averaged strong relative to recent average prices, offsetting lower fresh apple prices (table 1). Comparison is based on the 2010-12 average prices in August because monthly grower prices for noncitrus fruit were not reported by USDA's National Agricultural Statistics Service (NASS) for all of 2013 through March 2014.

Largely influenced by late-2013 freezes in California and citrus greening issues in Florida, smaller U.S. citrus crops have bolstered grower prices for most citrus fruit in 2013/14. Apart from reduced production, a high-quality crop and a shortage of fresh limes from Mexico earlier this spring also contributed to strong lemon prices throughout 2013/14. An 18-percent reduction in orange production is pushing up fresh orange prices to highs not seen since the early 1990s. High fruit drop, smaller fruit sizes, and less juice yields due to citrus greening were mostly behind the production decline in Florida. As competition continues over the available supply for processing and fresh use, fresh-orange prices should remain elevated above last season for the remainder of the 2013/14 marketing season. With fall harvest starting, the California navel-orange crop is forecast to sustain further decline in 2014/15, potentially limiting fresh orange supplies that would keep fresh-orange prices strong this fall and winter.

Figure 1
Index of prices received by growers for fruit and tree nuts



Source: USDA, National Agricultural Statistics Service, *Agricultural Prices.*

Table 1--Monthly fruit prices received by growers, United States

Commodity	2010-12		2013		2014		2013-14 change*	
	July	August	July	August	July	August	July	August
			----------Dollars per box----------				Percent	
Citrus fruit: 1/								
Grapefruit, all	8.51	6.71	6.66	6.36	7.19	5.99	8.0	-5.8
Grapefruit, fresh	8.51	6.71	6.36	6.36	7.19	5.99	13.1	-5.8
Lemons, all	15.62	17.94	18.35	26.86	40.05	39.16	118.3	45.8
Lemons, fresh	22.66	24.05	25.82	31.62	44.22	45.01	71.3	42.3
Oranges, all	8.96	7.76	10.56	10.44	14.60	15.62	38.3	49.6
Oranges, fresh	11.16	10.09	11.90	12.30	17.67	17.67	48.5	43.7
			----------Dollars per pound----------					
Noncitrus fruit:								
Apples, fresh 2/	0.359	0.473	na	na	0.341	0.375	-5.0	-20.7
Grapes, fresh 2/	0.495	0.395	na	na	0.930	0.765	87.9	93.7
Peaches, fresh 2/	0.338	0.336	na	na	0.565	0.510	67.2	51.8
Pears, fresh 2/	0.328	0.286	na	na	0.400	0.352	22.0	23.1
Strawberries, fresh	0.751	0.818	na	na	0.893	0.843	18.9	3.1

* Percent change for noncitrus fruit is from the 2010-12 average because no monthly prices were reported for these commodities in 2013.
-- Insufficient number of reports to establish an estimate.
1/ Equivalent on-tree price.
2/ Equivalent packinghouse-door returns for CA, NY (apples only), OR (pears only), and WA (apples, peaches, and pears). Prices as sold for other States.
Source: USDA, National Agricultural Statistics Service, *Agricultural Prices* and *Noncitrus Fruit and Nuts 2013 Summary.*

Forecast smaller crops for grapes, peaches, and pears are elevating their prices. National-level production volumes for these crops are anticipated to be down from 2013. Although largely driven by expected lower production in California, smaller crops in other producing States are also contributing to the overall production declines. Drought remains a serious concern among California fruit and tree nut growers, particularly if the lack of water for growing crops lingers through next year's growing season, depleting groundwater supplies that are already at low levels. Some growers who faced little to no water allocations this year have resorted to wells to access groundwater for irrigating their crops. Despite the drought, strawberry and almond production in California is forecast to set new record highs this year. Other weather events, such as a warm winter and a spring hailstorm, have had an impact on California's fruit production in 2014 while frigid winter temperatures mostly affected fruit crops in the eastern half of the country.

Harvesting of California grapes is currently in full swing. An early finish to California's Coachella Valley grape shipments, combined with significantly lower late-season supplies from Chile, provided less competition with Mexican imports and supplies from California's main growing region—the San Joaquin Valley. Less overlapping supplies moving to market from the various sources as harvest moved to the San Joaquin Valley helped support grape grower prices. Despite forecast lower production in 2014, fresh grape shipments in the Kern and San Joaquin growing districts were running at slightly higher volumes than a year ago in July and August as the warm winter accelerated crop development. Higher average shipping-point free-on-board (f.o.b.) prices, however, were still achieved, based on USDA Agricultural Marketing Service (AMS) data. As California's pear season ends, fresh pear grower prices will likely hold strong as supplies will also be down in the Pacific Northwest. Apple prices, on the other hand, are likely to be pressured down by a forecast record large harvest this year.

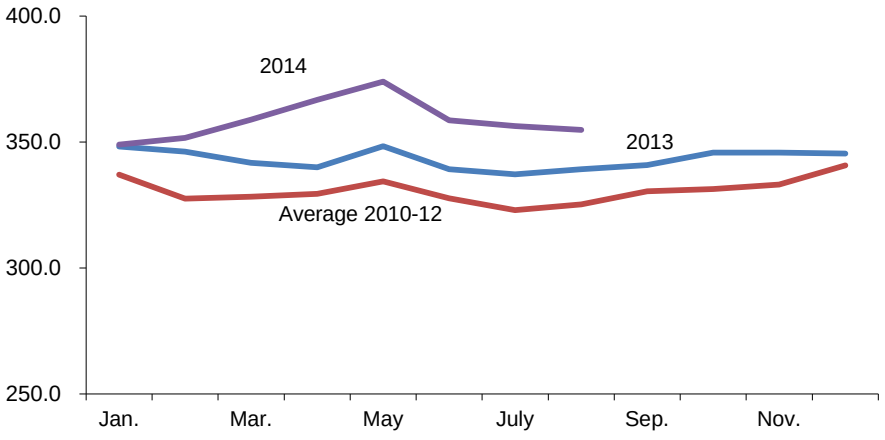
Consumers Greeted With Higher Fresh Fruit Retail Prices

According to data from the U.S. Department of Labor, Bureau of Labor Statistics (BLS), the U.S. consumer price index (CPI) for fresh fruit in August 2014 was 354.9 (1982-84=100), up from 339.2 the same period a year ago and the highest for the month in over 20 years (fig. 2). Higher retail prices for most fruit, except apples, drove the CPI in August above last year (table 2). The largest increases were in retail prices for Thompson seedless grapes, lemons, and peaches.

With the early finish to the harvest in the Coachella Valley this spring, California fresh grape supplies transitioned fairly smoothly to its main growing region. Despite increased imports from Mexico, retail prices for Thompson seedless grapes averaged 7 percent higher in July than a year ago for the same months and 17 percent higher in August. AMS data show U.S. advertised retail price for red/green grapes almost 1 percent higher in August than a year ago. A freeze-reduced crop in Chile has resulted in overall lower grape imports in the United States this winter finishing with significantly lower volumes than a year ago in the spring and early summer. Available fresh grape retail supplies for the remainder of the year will be limited by end of season Mexican supplies and conceivably lower domestic shipments from the short crop, likely holding grape prices higher for consumers.

Tight supplies are behind the high lemon and peach retail prices this summer. U.S. fresh peach shipments were down from last year in July and August, limiting promotable supplies for retailers. Though increasing from last year's low production, the freestone peach crop in California remains below average, leading to continued short fresh volume that bolstered prices this summer. The jump in lime prices on the back of a supply shortage in Mexico, aided in this summers' extremely strong lemon prices, which were consumed heavily in the spring as a lime substitute. Lower quantity of fresh lemons during the summer high-demand season further

Figure 2
Consumer Price Index for fresh fruit
1982-84=100



Source: U.S. Department of Labor, Bureau of Labor Statistics, http://www.bls.gov/data/home.htm.

raised prices, increasing 36 percent in August, year over year. Banana prices have remained almost unchanged from a year ago since April despite increased imports, but prices strengthened in August. Seasonally declining supplies helped strengthen strawberry retail prices in August from the previous month. Strawberry shipments are down from a year ago since June, resulting in higher prices year over year.

Table 2--U.S. monthly retail prices for selected fruit, 2013-14

		2013		2014		2013-14 change	
Commodity	Unit	July	August	July	August	July	August
		--- *Dollars* ---		--- *Dollars* ---		--- *Percent* ---	
Fresh:							
Valencia oranges	Pound	--	--	--	1.032	--	--
Navel oranges	Pound	1.287	1.377	1.390	1.467	8.0	6.5
Grapefruit	Pound	1.089	1.106	1.128	1.156	3.6	4.5
Lemons	Pound	1.597	1.714	2.078	2.327	30.1	35.8
Red Delicious apples	Pound	1.412	1.428	1.391	1.404	-1.5	-1.7
Bananas	Pound	0.602	0.595	0.606	0.608	0.7	2.2
Peaches	Pound	1.600	1.551	1.971	1.799	23.2	16.0
Anjou pears	Pound	--	--	--	--	--	--
Strawberries 1/	12-oz. pint	1.691	1.917	1.868	1.968	10.5	2.7
Thompson seedless grapes	Pound	2.193	1.821	2.356	2.132	7.4	17.1
Processed:							
Orange juice, concentrate 2/	16-fl. oz.	2.540	2.539	2.547	2.547	0.3	0.3
Wine	liter	9.898	11.257	10.961	12.402	10.7	10.2

-- Insufficient marketing to establish price.
1/ Dry pint.
2/ Data converted from 12-fluid-ounce containers.
Source: U.S. Department of Labor, Bureau of Labor Statistics, http://www.bls.gov/data/home.htm.

Another Large Apple Crop Will Place Pressure on Prices

Despite harsh winter conditions in several parts of the country, another large crop is forecast for U.S. apples in 2014. In August, the initial forecast from USDA's National Agricultural Statistics Service (NASS) indicated a 10.9-billion-pound crop, up 4 percent from the revised 2013 estimate of 10.4 billion pounds. A crop of this magnitude signal an abundance of supplies that will move to markets during the 2014/15 marketing year (August-July), putting downward pressure on U.S. apple prices. If realized, this year's crop is 14 percent bigger than the previous 5-year average crop size of 9.6 billion pounds and the third-largest crop since 1990.

Relative to last year, production in western States is expected to be up 13 percent while reduced outputs are expected in many central and eastern States, including regional leading producers—Michigan and New York (table 3). Below-normal temperatures dampened eastern and central U.S. apple production. The absence of adverse weather during the growing season in Washington promoted another high-quality, huge crop. Washington's 2014 apple crop is forecast at a record 6.8 billion pounds, 14-percent larger than in 2013 and 19 percent above the previous 5-year average production. Most other States in the region also expect to harvest bigger crops this year, except for California, Idaho, and Arizona. Production in the central and eastern States is forecast down 12 percent and 10 percent, respectively. Many trees were reported damaged by last winter's frigid temperatures in Michigan's southern production region. Michigan's crop is forecast down 12 percent and New York's crop is forecast down 10 percent.

The record crop in Washington will bring in larger-than-normal supplies of apples for fresh use during the 2014/15 marketing season (August-July). Typically, about 1 percent of the crop will not be marketed, leaving about 10.8 billion pounds of the current crop forecast as the quantity to be marketed (i.e., the projected utilized production) in 2014/15. Based on previous 3-year average apple production shares designated for fresh and processing uses, USDA's Economic Research Service (ERS) projects that about 7.5 billion pounds of production will go towards fresh use (equal to 69 percent of projected utilized production; this mirrors the production share reported by the U.S. Apple Association), with the remaining volume allocated to the processing sector. If realized, fresh-market production will be up 8 percent from last season and 15 percent above the previous 5-year average production (fig. 3). Processing-use apple production, on the other hand, will be down.

Apple harvesting for the 2014/15 season is already in progress for earlier varieties, with USDA's Agricultural Marketing Service (AMS) data showing apple shipments through end of August up 25 percent from the same period in 2013/14. Washington and California apples make up most of the shipments to date, with California even showing nearly 2 percent higher volumes than last season thus far, despite the drought. As of June 1, 2014, above-average fresh apple supplies from the large 2013 crop were still in cold storage waiting to be moved to market, based on data from the U.S. Apple Association, likely adding more downward price pressure to 2014/15 fresh apples. Already, early-season grower prices have weakened relative to recent years, except in 2013 when NASS did not report any monthly average prices until March 2014. The August 2014 average price of $0.375 per pound is 15 percent below the 2008-12 August average price. As prices may slip for growers,

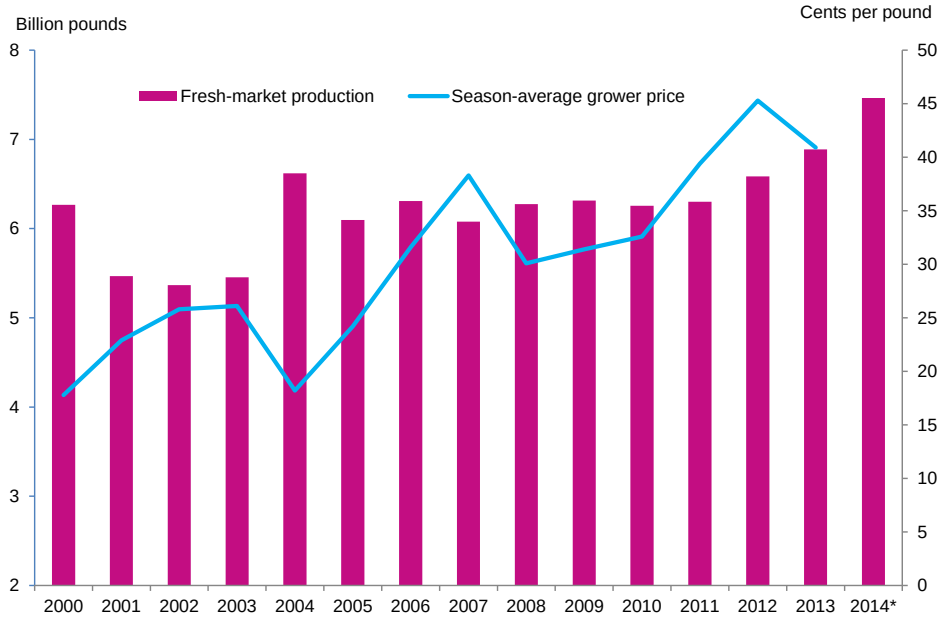
Table 3--Apples: Total production and season-average price received by growers, 2011-13, and indicated 2014 production 1/

States	Production				Price		
	2011	2012	2013	2014	2011	2012	2013
	-- *Million pounds* --				-- *Cents per pound* --		
Eastern States:							
Connecticut	22	17	27	19	53.9	65.4	74.1
Maine	29	30	27	40	47.4	56.0	51.6
Maryland	40	35	33	37	25.9	40.2	18.7
Massachusetts	39	28	44	40	60.3	62.3	52.0
New Hampshire	18	16	26	16	50.5	58.1	42.9
New Jersey	36	35	29	16	67.2	83.9	45.1
New York	1,220	720	1,410	1,250	20.2	35.2	17.9
North Carolina	140	34	135	101	19.2	31.3	20.1
Pennsylvania	458	494	469	466	18.2	28.1	18.6
Rhode Island	3	2	3	3	79.3	85.1	40.7
Vermont	34	26	34	19	30.4	43.4	45.1
Virginia	220	230	195	180	18.2	29.7	17.4
West Virginia	67	91	95	86	17.5	25.8	13.7
Total	2,325	1,756	2,526	2,272			
Central States:							
Illinois	40	32	13	21	57.5	55.7	36.4
Indiana	20	5	29	15	39.8	39.6	39.8
Iowa	4	1	7	5	66.3	67.5	69.7
Michigan	980	115	1,260	1,100	20.7	35.2	19.7
Minnesota	24	11	19	19	81.4	81.1	83.5
Missouri	15	35	14	19	31.3	47.1	36.5
Ohio	67	33	54	50	36.7	33.6	41.8
Tennessee	9	6	7	7	27.9	48.0	44.4
Wisconsin	51	24	42	39	48.5	62.6	50.9
Total	1,209	261	1,445	1,275			
Western States:							
Arizona	11	8	17	9	24.1	21.7	27.4
California	280	270	270	260	21.5	24.1	23.3
Colorado	9	17	6	11	29.3	30.4	36.3
Idaho	60	75	72	68	23.9	32.0	33.1
Oregon	93	130	141	159	22.1	25.0	36.4
Utah	19	14	17	21	22.2	26.3	48.1
Washington	5,420	6,450	5,950	6,800	35.7	38.5	36.8
Total	5,892	6,964	6,472	7,328			
United States	9,425	8,981	10,442	10,888	30.3	37.1	31.1

1/ Commercial production from orchards of at least 100 bearing-age trees.

Source: USDA, National Agricultural Statistics Service, *Noncitrus Fruit and Nuts 2013 Summary* and *Crop Production* (August 2014 issue).

Figure 3
U.S. apple producction for fresh use increasing



* ERS projection.
Source: USDA, National Agricultural Statistics Service, *Noncitrus Fruit and Nuts Summary*, various issues.

consumers will likely benefit from lower fresh apple prices this fall and winter given the high-quality, huge crop this year, especially as larger quantities are expected for most apple varieties. Retail prices for Red Delicious apples in the United States averaged lower than year-ago levels during the 2013/14 marketing year, the result of large production. As the U.S. apple season moves into peak harvesting this fall, downward price pressure may be partly offset by continued increased exports and lower supplies of competing U.S. fresh pears. Per capita fresh apple use in the United States is estimated to near 19 pounds in 2014/15, higher than the average for the past decade.

Increased domestic production and lower prices will likely result in fewer imports of fresh apples in the United States, while supporting greater U.S. apple exports in 2014/15. Based on 3-year average import volumes, including the near-record imports in 2013/14, imports are projected to decline around 10 percent in 2014/15. Following a similar approach, U.S. fresh apple exports are projected to climb at least 2 percent. The industry remains optimistic that China will re-open its market to Washington's Red and Golden Delicious apples after phytosanitary issues led to a ban in 2012. Expected increased production in Canada and the European Union (EU) will likely impact demand for U.S. apples in those markets. Export growth in 2014/15 will also be tempered by Russia's recent ban on imports of food products (including fruit and vegetables) from the United States and four other countries, although Russia remains a small export destination for U.S. apples.

Overall reduced crops in central and eastern States will cut processing-apple production in 2014/15 by about 5 percent from the 2013/14 output and total 3.3 billion pounds, still higher than the previous 3 year average. Although down from the prior season, this year's above-trend production and higher processing-apple supplies from last season will temper upward price impacts from reduced production in the two apple regions. The U.S. Apple Association reported that as of

June 1, 2014, processing apple holdings were 16 percent above those on June 1, 2013 and 7 percent above the 5-year average for that date.

Decline In Production To Boost Fresh Pear Prices

The 2014 U.S. pear crop was forecast by NASS in August at 1.60 billion pounds, 9 percent smaller than a year ago (table 4). The quality of this year's crop is reported as generally high, especially in the Pacific Northwest where good growing weather helped fruit to size favorably. Even in drought-stricken California, fruit size and quality were reported as good for the early-season pears. A "down" year in the alternate-bearing nature of pears and reduced bearing acreage in Washington and other western States mostly contributed to the overall production decline this year.

Among the top three producing States, production is forecast down 6 percent in Washington, down 12 percent in California, but up 13 percent in Oregon. The combined 3-State forecast for the Bartlett pear crop is at 742 million pounds, down 11 percent from a year ago, and the 3-State non-Bartlett crop at 834 million pounds, down 6 percent.

Table 4--Pears: Total production and season-average price received by growers, 2011-13 and indicated 2014 production

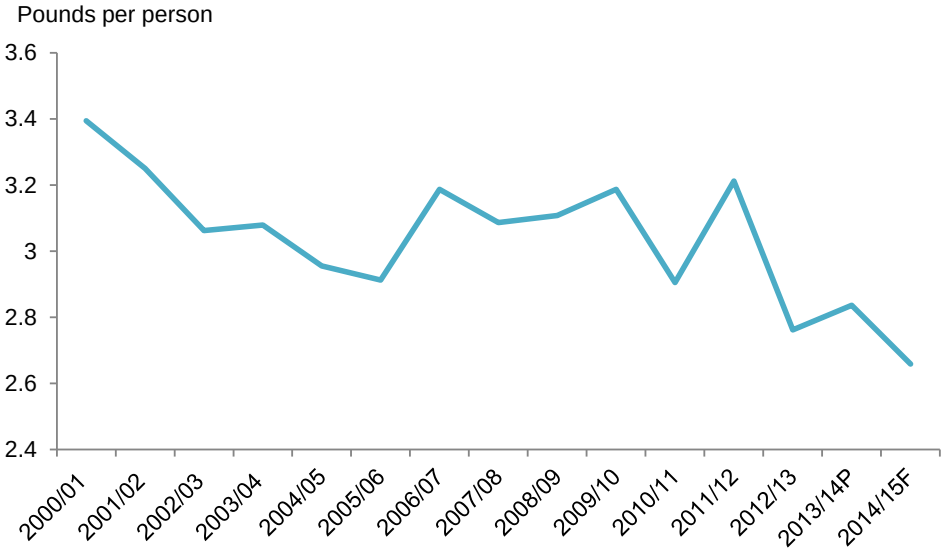
State	Production 1/				Price		
	2011	2012	2013	2014	2011	2012	2013
	--- *Million pounds* ---				--- *Cents per pound* ---		
Pacific Coast:							
California:							
Bartlett	390	326	354	310	15.6	18.5	17.9
Other	114	90	86	76	32.6	32.9	28.6
Total	504	416	440	386	19.4	21.6	20.0
Oregon:							
Bartlett	94	122	110	112	20.0	22.8	25.6
Other	360	374	304	308	16.3	28.5	27.3
Total	454	496	414	466	17.1	27.1	26.9
Washington:							
Bartlett	376	362	370	320	17.6	20.6	21.8
Other	560	420	498	450	20.6	31.3	29.1
Total	936	782	888	834	19.4	26.3	26.0
Three States:							
Bartlett	860	810	834	742	17.0	20.1	20.6
Other	1,034	884	888	834	20.4	30.3	28.5
Total	1,894	1,694	1,722	1,576			
Michigan	9	0.1	11	5	13.8	31.3	17.4
New York	24	6	18	10	30.0	37.9	28.3
Pennsylvania	4	2	3	7	49.8	39.7	46.2
Total	37	8	32	22			
United States							
Bartlett	860	810	834	742	17.0	20.1	20.6
Other	1,071	892	920	856	20.4	30.3	28.5
Total	1,931	1,702	1,754	1,598	19.0	25.5	24.7

1/ Includes unharvested production and production not sold.
Source: USDA, National Agricultural Statistics Service, *Noncitrus Fruit and Nuts 2013 Summary* and *Crop Production* (August 2014 issue).

Due to the decline in domestic production, fresh-market pear output for the 2014/15 marketing season (July-June) is projected to decline 11 percent to 1.04 billion pounds, in keeping with the previous 5-year average fresh-market share of total utilized production which is at 65 percent. If realized, this projected output falls below average levels of recent years, likely elevating prices for U.S. pears in 2014/15, with some impending offsets from the expected larger U.S. apple crop this year. Below-average production and higher prices will likely dampen demand for U.S. fresh pears in 2014/15, with the potential for exports to slow and domestic per capita use to drop to 2.5 to 2.6 pounds—the lowest level in over two decades (fig. 4). Should the export market continue to absorb slightly over one-third of fresh domestic production as has been the trend in the past several years, U.S. fresh pear exports could decline to around 355 million pounds in 2014/15, down 21 percent from the previous season and the lowest since 2010/11.

Early-season imports are low, with July 2014 volume cut by half from the same time last year. Early exports are also sluggish, with July volume down 12 percent on lower shipments to Canada and Mexico. Both markets will continue to be major export destinations for U.S. fresh pears in 2014/15 although export growth has shown promise to other markets in South America, the Caribbean, and Asia, including China, in recent years. Similar to fresh apples, trade sanctions will remove market presence of U.S. pears in Russia for one year effective August 2014. Russia, however, is not a big market for U.S. pears. New EU minimum residue regulations, specifically regarding diphenylamine (DPA), a chemical used on apples and pears to prevent scald, will fuel the ongoing trend of declining U.S. fresh pear exports to the EU market. U.S. exports share to the EU had fallen from 8 percent of total volume in 2001 to only 1 percent over the past 3 years.

Figure 4
U.S. fresh pear per capita use declining



F= forecast.
Source: USDA, Economic Research Service, *Fruit and Tree Nut Yearbook*, varioius years.

AMS reports U.S. fresh pear shipments through early September running 20 percent below the same period last year, reflecting lower shipments from California thus far. Nearly 70 percent of season-to-date shipments were California pears. U.S. fresh pear grower prices already started out strong in 2014/15, with the average prices in July and August at $0.40 per pound (or $800 per ton) and $0.35 (or $704 per ton), respectively, each over 20 percent higher than corresponding average 2010-12 prices. Disregarding 2013, when there were no monthly prices available from NASS, this year's July and August average prices were the highest for these months since the 1990s. Harvest is underway in Washington and increasing supplies are likely to lead to seasonal price declines. However, a smaller, high-quality crop signals continued high fresh pear prices this fall and winter.

Strong grower prices for pears are also translating to higher prices to consumers in 2014/15. Based on AMS data, advertised retail prices for non-organic Bartlett, Bosc, and D'Anjou pears in the United States have generally averaged significantly higher than year-ago levels in July through September, compared with the same time a year ago. Year-over-year average price gains ranged from 7 percent to almost 30 percent higher during those months, although Bartlett pears showed a 22 percent decline in July and D'Anjou pears fell 24 percent in August.

On the processing side, the 11-percent smaller Bartlett pear crop signal fewer pears moving through the processing sectors, boosting prices growers will be receiving from processors in 2014/15. During the previous marketing year, processing accounted for a smaller portion of the 2013 pear crop and the quantity processed dropped 3 percent to 291,790 tons (or 583.6 million pounds). Processing pear prices rose from $238 per ton in 2012/13 to $282 per ton in 2013/14, over 20 percent higher than the previous 5-year average. These prices are likely to stay high in 2014/15 given the forecast smaller crop and industry reports of consolidation in the canned pear industry in recent years and inventory adjustments to more favorable levels (inventory data is not publicly released).

After Record Harvest, U.S. Grape Crop Down in 2014

U.S. grape production is forecast at 15.9 billion pounds (or 7.9 million tons) in 2014, down 8 percent from the record production in 2013 (table 5). California is expected to produce 89 percent of this output, down slightly from the State's most recent 3-year average share of 90 percent. California's 2014 grape crop is forecast down 9 percent from the record harvest last year, but 6 percent above the average 2008-12 crop. Production is forecast to be down for California's wine, table, and raisin grapes. A warm spring advanced crop development earlier than last year. Drought remains a major concern among growers but a hail storm in the spring also affected blooms in some vineyards. Bunch counts are reported down from a year ago for wine and raisin grapes. Smaller crops are also forecast in New York, Michigan, Pennsylvania, Virginia, Ohio, Missouri, and Arkansas, with combined production to represent 5 percent of total volume. While mostly substantial production cuts are expected in these 7 States, forecast crop size in Washington, second-ranking State in grape production, is up 14 percent on favorable weather during the growing season. Production gains in Washington are expected for both juice and wine grapes.

Table 5--Grapes: Total production and season-average price received by growers in principal States, 2011-13 and indicated 2014 production

State	Production				Price		
	2011	2012	2013	2014	2011	2012	2013
	-- *Million pounds* --				-- *Cents per pound* --		
Arkansas	2	3	4	3	49.1	58.0	50.5
Georgia	7	9	9	10	64.0	70.5	57.5
Michigan	189	76	188	140	18.2	23.2	19.5
Missouri	10	9	12	9	41.6	36.3	36.4
New York	376	230	416	380	18.7	23.4	21.5
North Carolina	10	10	10	11	51.5	46.6	42.2
Ohio	15	11	13	9	19.9	34.3	30.0
Oregon	83	92	98	106	97.5	102.5	109.5
Pennsylvania	182	122	222	180	15.3	17.4	16.5
Texas	11	15	12	25	76.0	72.5	78.0
Virginia	14	14	13	13	77.0	81.5	84.0
Washington							
Wine	284	376	420	460	49.4	52.0	55.5
Juice	348	384	360	430	13.1	14.1	12.7
All	632	760	780	890	29.4	32.9	35.7
Total 1/	1,531	1,351	1,777	1,775			
California:							
Wine	6,774	8,036	8,490	7,800	31.9	38.7	37.7
Table	2,064	2,048	2,452	2,400	40.5	61.0	63.0
Raisin 2/	4,526	3,620	4,492	3,900	19.1	22.9	18.9
All	13,364	13,704	15,434	14,100	28.9	37.8	36.2
United States	14,895	15,055	17,211	15,875	28.9	37.6	35.8

1/ Sum of State production, excluding California. 2/ Fresh weight of raisin-type grapes.
Source: USDA, National Agricultural Statistics Service, *Noncitrus Fruit and Nuts 2013 Summary* and *Crop Production* (August 2014 issue).

Projected Smaller Fresh-Market Grape Crop To Strengthen Prices: As crop growth advanced earlier than normal this growing season for California table grapes, harvesting started early and 2014/15 grape shipments through the first week in September show a 5-percent bump in volume from the same time last season, based on AMS data. Harvest in the State's Coachella Valley already ended in early July and has moved to major growing areas in the central portion of the State, in the Kern and San Joaquin growing districts.

Despite increased shipments in 2014/15 to date, U.S. fresh grape grower prices are already showing strength, receiving a boost from the anticipated smaller California table grape crop and significantly lower imports of Chilean grapes this past winter and spring. Harvest in California's Coachella Valley ended early providing little overlap with supplies out of California's major production region—the San Joaquin Valley—and end-of-season Mexican grapes. June-August grower prices averaged almost 80 percent higher than the 2008-12 average price, based on NASS reported monthly grower prices. NASS did not report any monthly prices in 2013.

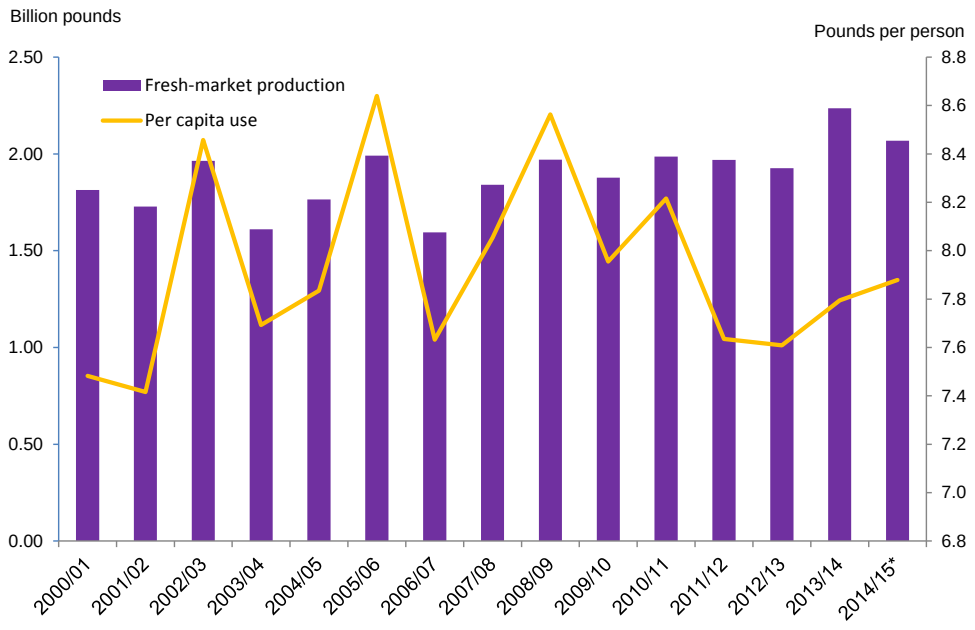
At the retail level, BLS reported mostly higher average prices for Thompson seedless grapes from May through August than a year ago. June and July prices also inched down from May with seasonal supply increases from domestic production and imports from Mexico. AMS data reported monthly advertised retail prices for red/green grapes in the United States averaged higher than a year ago in each month from April through August. So far, average prices have peaked in May at $2.63 per

pound, up slightly from $2.60 in May 2013. With seasonal declines, prices were at $2.22 per pound by August and this compares with $2.20 in August 2013.

Reduced table grape production in California will mostly account for the lower tonnage of U.S. grapes for fresh use in 2014/15. Typically, each year's crop would have some wine and raisin grapes diverted for fresh use. For wine grapes, this will be only about 1 percent and, although California's raisin grapes are mostly used for raisin (dried grapes) production, the volume of raisin grapes for fresh use far exceeds those from wine grapes. Both wine and raisin grape tonnage directed for fresh use from the 2014 California crop will be down due to the smaller crops. California is a dominant producer of U.S. grapes, supplying nearly all U.S. grapes for fresh use. Based on current NASS forecasts, ERS projects U.S. fresh-market grape production to decline 8 percent from a year ago to 2.07 billion pounds during the marketing year 2014/15. While down from the 2013/14 estimate, projected fresh production for 2014/15, if realized, will be 3 percent higher than the previous 5-year average production and therefore at a level that will enable the industry to meet current market demand (fig. 5). Domestic per capita use of fresh grapes averaged 7.8 pounds during the previous 5 years.

U.S. fresh-grape imports 3 months (May-July) into the current season are down 11 percent in volume from a year ago. Imports from Chile were down sharply due to a freeze that tightened export supplies in the country. Mexico is the primary source for grape imports in the United States before the peak domestic season for grapes. Mexican grape shipments increased 3 percent but were more than offset by the deep cuts in Chilean grape imports.

Figure 5
U.S. fresh-grape production and per capita use



* ERS projection.
Source: USDA, Nattional Agricultural Statistics Service, *Noncitrus Fruit and Nuts Summary*, various issues.

U.S. fresh-grape exports reached a record volume in 2013/14, increasing 17 percent from the previous season to 916.7 million pounds. Exports into the first 3 months of 2014/15 remained strong, with volume up 24 percent from the same period in 2013/14. Despite expected lower domestic production, higher early-season exports were partially made possible by increased domestic shipments due to the earlier harvest. Reduced production and higher prices, however, will likely limit overall export prospects for the season. May-July exports to top market, Canada, were up 17 percent alongside also higher shipments to other key markets, including Mexico, Hong Kong, and Indonesia.

Fewer Grapes To Be Crushed for Wine: Reduced wine grape production in California would be a major force limiting the quantity of 2014 grapes to be crushed for wine in the United States. California typically accounts for over 90 percent of all U.S. grapes sent to wineries each year. California's wine grape production is forecast at 3.9 million tons (or 7.8 billion pounds) in 2014, down 8 percent from the previous year. This decline more than offsets increased wine grape production in Washington, forecast up 10 percent to reach 230,000 tons (or 460 million pounds). On average, Washington accounts for 3 to 4 percent of U.S. grapes for wineries. Forecast smaller grape crops in New York, Michigan, Pennsylvania, Virginia, Missouri, and Ohio will also impact crushed tonnage. Based on recent 5-year average shares of State-level grape production going to wineries, ERS projects total grape tonnage crushed for wine to be down 7 percent in 2014/15 from the previous season, totaling 4.7 million tons. The lower volume will likely boost U.S. grower prices for grapes sold to wineries in 2014/15. In 2013/14, grape tonnage for wine increased 8 percent from the previous season to 5.1 million tons, which drove prices down 3 percent to $736 per ton.

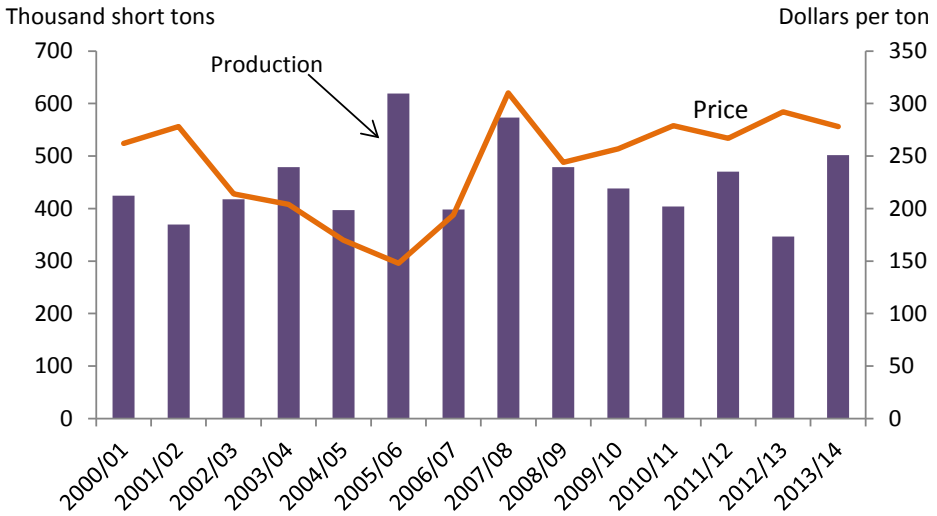
Grape Tonnage for Juice Also Likely Lower: Although juice-grape production in Washington is forecast to total 215,000 tons in 2014, up 19 percent from a year ago, fairly significant production declines in Michigan, New York, Ohio, and Pennsylvania will likely lower grape tonnage crushed for juice in 2014/15. Reduced tonnage headed to juice processors will likely boost juice-grape grower prices during the 2014/15 marketing season (August-July), which is the opposite from 2013/14, when above-trend tonnage realized a 7-percent drop in the average grower price (fig.6).

NASS State-level annual data on grapes produced for juice does not include California although grapes crushed for concentrate production has been reported by the NASS California Field Office since 1999. In 2013, grape tonnage crushed for concentrate production totaled 655,233 tons, 14 percent of the 2013 grape crush total. However, the share of total concentrate tonnage used specifically for making juice has not been disclosed, nor has the type and variety composition making up total concentrate volume. In comparison to State total crop size, tonnage crushed for concentrate production averaged 13 percent annually over the last 5 years.

Despite increased domestic grape production for juice in 2013/14, U.S. grape-juice imports still rose slightly to 63.2 million single-strength-equivalent (SSE) gallons, 2 percent above the previous season, mostly on ample supplies from Argentina. Over 80 percent of the grape juice imports came from Argentina, offsetting significantly lower imports from Chile and Mexico. At the same time, international demand for U.S. grape juice slowed in 2013/14, with volume down 8 percent to 17.2 million sse

Figure 6

U.S. utilized grape production for juice and average grower price



Source: USDA, National Agricultural Statistics, *Noncitrus Fruits and Nuts Summary,* various issues.

gallons and value down 12 percent to $87.0 million. Export value was at a record high in 2012/13, amounting to $99.4 million. Among the leading export destinations for U.S. grape juice, export volume fell to Canada, South Korea, and Mexico in 2013/14, but increased to Japan and China.

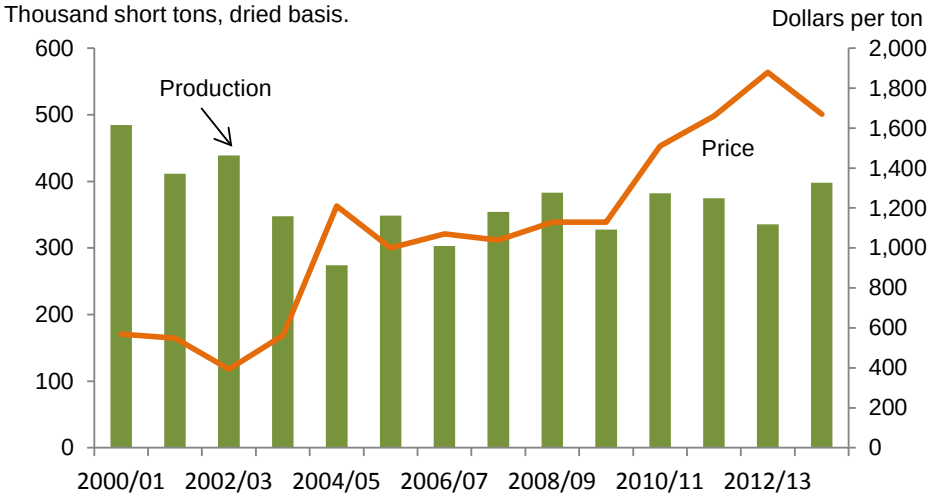
U.S. Raisin Production Slips From Large Production Last Year: In August, the NASS California Field Office released the *2014 California Raisin Grape Objective Measurement Report* with a forecast for the California raisin grape crop at 1.95 million tons, fresh basis, (or 3.90 billion pounds), down 13 percent from last year. If realized, this would be the third smallest crop since 2006. Bearing acreage for raisin grapes in California has been on a downward trend since 2003, presently estimated at 200,000 acres, 55,000 fewer acres than 11 years ago but relatively unchanged from 2013. While bearing acreage in 2014 is flat from a year ago, average yields of 9.75 tons per acre are down 13 percent, lowering production. Dampened by the lack of water and hail during bloom, average bunches per vine are reported lower at 36.5, down from the record 47.7 in 2013.

The forecast smaller California raisin crop this year is expected to lower the quantity of available grapes for drying. USDA's Foreign Agricultural Service (FAS) forecast U.S. raisin production to decline to 320,000 tons in 2014/15, down 14 percent from 2013/14. Exports are set to decline nearly 20 percent to 130,000 tons on competition from Turkey, particularly in the EU market.

U.S. grower prices for raisin grapes dried into raisins have held strong in recent years, averaging $1,570 per ton (dried basis) from 2009/10 to 2013/14 (fig.7). Despite higher domestic production and ample inventories, prices in 2013/14 remained fairly strong at $1,670 per ton, but down from the record $1,880 per ton in 2012/13. Prospects of bleak exports and continued large inventories will likely temper possible boost in prices from reduced production in 2014/15. U.S. raisin exports in 2013/14, at 351.4 million pounds (or around 176,000 short tons), increased 29 percent from 2012/13 and was the highest since 2009/10 due to

Figure 7

California raisin grape production dried into raisins and average grower price



Source: USDA, National Agricultural Statistics, *Noncitrus Fruits and Nuts Summary,* various issues.

strong demand in the EU and most leading markets for U.S. raisins, including Japan, Canada, China, Mexico, and Australia. In value terms, exports rose 17 percent to $433.6 million, the highest on record. U.S. demand for imported raisins fell in 2013/14 due to the large supplies available domestically. Among the United States' largest suppliers of imported raisins, imports declined from Chile, Mexico, and Argentina. Chilean raisin imports in the United States were also affected by the country's frost-reduced crop which limited their exports in 2013/14.

Smallest U.S. Peach Crop In Over Three Decades

Peach production in California and several other States is expected to be down in 2014 (table 6). Fruit set was patchy in California after a long and early bloom and the ongoing drought. Some of the State's peach growers reported using wells to pump groundwater to minimize the impact of the water shortage situation. Extreme winter weather and spring frosts dampened production in other minor-producing States, but larger crops are expected in South Carolina and Georgia, the second and third largest peach-producing States after the more dominant California.

Estimates from NASS indicate that the 2014 U.S. peach crop is down 4 percent from a year ago to 1.7 billion pounds—the smallest crop since 1980. The forecast includes 600 million pounds of California freestone peaches, a 7-percent increase from last year. Output from other States also represents freestone production, which when combined with California's freestone crop indicate nearly a 1 percent increase. About 80 percent of freestone peaches are used fresh, while California clingstones that make up the rest of the U.S. peach crop are mostly canned. NASS expects California's 2014 clingstone crop to be down 7 percent.

Even as supplies of U.S. peaches for fresh use may be up slightly from last year given the increase in freestone production, supplies will remain tight as the increase is based on last year's domestic fresh-market production that was below average. Tight supplies have already bolstered U.S. fresh peach grower prices in

Table 6--Peaches: Total production and season-average price received by growers, 2011-13 and indicated 2014 production

State	Production				Price		
	2011	2012	2013	2014	2011	2012	2013
	-- Million pounds --				-- Cents per pound --		
Alabama	11	11	8	8	52.5	62.0	58.5
Arkansas	4	6	3	2	77.5	82.5	80.5
California	1,546	1,426	1,296	1,250	18.7	23.2	21.5
Freestone	760	688	560	600	22.4	29.4	25.8
Clingstone	786	738	736	650	15.2	17.4	18.2
Colorado	24	34	15	24	100.0	79.0	93.5
Connecticut	2	3	3	3	105.0	115.0	138.5
Georgia	72	67	71	76	46.5	48.1	41.3
Idaho	15	15	12	11	58.0	67.0	47.3
Illinois	19	15	5	7	63.0	69.5	56.5
Maryland	8	9	8	7	61.0	59.5	53.0
Massachusetts	4	3	3	3	157.0	160.0	138.5
Michigan	33	4	41	20	36.6	66.5	35.3
Missouri	10	7	6	10	60.0	60.0	92.5
New Jersey	64	60	36	45	61.0	66.0	75.5
New York	14	5	15	13	62.0	79.0	40.8
North Carolina	11	11	12	8	50.0	61.0	57.5
Ohio	12	7	11	0	82.0	85.5	74.0
Pennsylvania	35	42	39	25	68.0	53.0	51.5
South Carolina	190	150	139	152	48.5	52.5	53.5
Texas	11	22	17	3	100.0	92.5	128.5
Utah	9	11	11	11	50.5	54.0	54.0
Virginia	13	13	15	10	42.9	46.7	46.3
Washington	26	26	26	27	29.6	31.4	38.5
West Virginia	11	8	11	11	42.6	65.0	45.0
United States	2,144	1,954	1,803	1,728	28.2	32.7	30.7

-- = Not available.

Source: USDA, National Agricultural Statistics Service, *Noncitrus Fruit and Nuts Summary,* various issues.

2014, with June-July prices averaging $0.588 per pound, up 79 percent from the average 2008-12 price for the same period (NASS did not report monthly grower prices for U.S. peaches in 2013). In August, prices weakened as harvest peaked in California and other producing States, but lower shipments from a year ago kept prices sharply higher than the recent 5-year average. Strong prices for fresh peaches at the farm level are also translating to higher prices for consumers. U.S. retail prices for peaches in June and July averaged $2.105 per pound, up from $1.764 the same time last year and the June-July average price of $1.706 in 2008-12. Prices by early- to mid-summer have declined seasonally, but limited supplies will likely keep prices strong for the remainder of the 2014 season.

The decline in California's 2014 clingstone crop is indicative that processing supplies will be limited this year, likely putting upward pressure on prices growers will be receiving for their cling peaches this year. According to the California League of Food Processors, the 2014 block by block California clingstone peach tonnage is estimated to be down 11 percent from 2013, with current deliveries to processors this season through August 23 down 8 percent from the same period a year ago. Deliveries have remained fairly steady the past 2 years (2012 and 2013), following declines in 2010 and 2011. California cling peach grower prices rose from $303 per ton in 2011 to $348 per ton in 2012 and to $364 per ton in 2013. Bearing acreage is reported at 19,902 acres, down 6 percent from 2013 but cling peach plantings are increasing with nonbearing acreage standing at 1,093 acres in 2014, up from 623 in 2013.

Large Supplies From U.S. Northwest Help Lower Sweet Cherry Prices

On June 25, NASS released its first forecast for the 2014 U.S. sweet cherry crop, which consisted of forecast production for seven of the eight States integrated in their annual sweet cherry production enumeration. The U.S. sweet cherry crop forecast is 652.5 million pounds, 2 percent smaller than in 2013 (table 7). In the western United States, weather was generally favorable this growing season, except in California where warm and dry conditions this winter provided inadequate chill hours for cherry trees to produce a full crop. In addition, poor pollination hampered fruit set, dramatically reducing yields. At 60 million pounds, California's 2014 production is down 60 percent from last year and the smallest crop since the 30.4 million-pound harvest in 1998. Production in Washington and Oregon are both at record-high levels, increasing significantly from last year to 400 million pounds and 130 million pounds, respectively. Warm, sunny days and cool nights provided optimal conditions for crop growth in these States, yielding larger-sized fruit and high sugar levels. Production will be mostly up as well in the eastern half of the country despite some winter weather issues.

Tight early-season supplies due to the small crop in California bolstered sweet cherry prices this spring and early summer but prices have since eased as demand through late summer has been met by much larger supplies, especially in Washington and Oregon. Based on AMS data, U.S. advertised retail cherry prices for red varieties in May at start of season averaged $4.01 per pound, up from last year's May average of $3.50 per pound. Cherry crop development advanced earlier than normal in California leaving not much overlap with the early-season harvest in the Pacific Northwest which also saw an overall high-quality crop. Hence, as California supplies wound down in June, supplies remained tight to support strong domestic and export demand and prices continued to increase to $4.81 per pound, 12 percent above the previous year. As harvest in the U.S. northwest got underway, prices softened, falling below year-ago levels in July and August.

International demand for U.S. sweet cherries is strong in 2014, particularly to major export markets—Canada, South Korea, and Hong Kong. May-July export volume totaled 178.2 million pounds, up 29 percent from the same period last year,

Table 7--Sweet cherries: Total production and season-average price received by growers, 2011-13 and indicated 2014 production

	Production				Price		
State	2011	2012	2013	2014	2011	2011	2012
	-- *Million pounds* --				-- *Cents per pound* --		
California	136.0	184.6	164.0	60.0	149.5	144.5	169.5
Idaho	5.6	7.2	4.6	5.8	131.0	132.0	127.5
Michigan	37.2	8.5	45.8	51.6	48.5	72.0	48.2
Montana	4.0	4.5	3.3	1/	123.5	72.5	103.5
New York	1.4	0.6	2.5	3.4	157.0	185.0	187.5
Oregon	91.0	112.0	104.0	130.0	88.5	68.5	99.0
Utah	1.6	2.6	0.9	1.7	73.5	72.5	124.5
Washington	392.0	528.0	338.0	400.0	134.5	93.0	131.5
United States	668.8	848.0	663.0	652.5	126.5	101.0	130.5

1/ The first estimate for 2014 will be released in January 2015.

Source: USDA, National Agricultural Statistics Service, *Noncitrus Fruit and Nuts Summary,* various issues.

reflecting significant gains to these top 3 markets which together absorbed over 60 percent of total export volume to date. While relatively smaller markets, season-to-date export volume growth are robust to other markets in Asia such as Taiwan, China, Thailand, and Vietnam.

Tight Tart Cherry Supplies To Boost Prices

Michigan's tart cherry output will drop in 2014 as reports of winterkill and freeze damage have dampened the crop. This decline, along with significant to sharp output reductions in New York, Pennsylvania, Wisconsin, and Oregon, will drive down overall production this year. NASS forecast the 2014 U.S. tart cherry crop at 264.4 million pounds, 10 percent smaller than a year ago (table 8). If realized, production will be 2 percent above the previous 5-year average volume (excluding the near record-low 85 million pounds in 2012). Michigan's production, forecast at 181.5 million pounds, will account for almost 70 percent of total crop volume and will be down 17 percent from a year ago.

Over 60 percent of U.S. tart cherries are utilized by the frozen fruit market. Based on NASS's *Cold Storage 2013 Summary*, domestic frozen tart cherry stocks as of December 31, 2013 increased to 111.6 million pounds, up sharply from below-average ending stocks during the two prior years. This increase would mean larger carryover supplies for the 2014 marketing season (fig. 8), mitigating potential upward price impacts for U.S. tart cherries due to the decline in domestic production. The dismal U.S. crop in 2012 led to record-high grower prices for tart cherries that year (averaging 59.4 cents per pound) but the big crop in 2013, along with large ending stocks, pressured down prices in 2013 to an average 35.6 cents per pound.

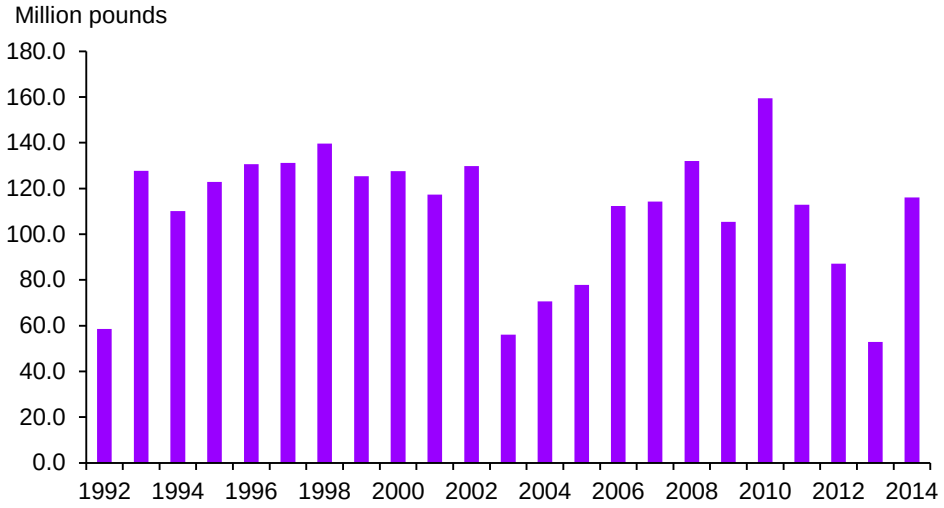
Frozen tart cherry imports in the United States during the first 7 months of 2014 rose 2 percent in volume from the same period a year ago on increased supplies from Canada. Exports only represent a small portion of the U.S. tart cherry frozen market, averaging 8 percent of domestic production going to the frozen fruit market in the past 5 years. Export demand for U.S. frozen tart cherries in 2014 through July has been very strong, increasing 65 percent in volume from the same period a year ago. While about half of U.S. exports went to Canada, exports to other markets were more robust in 2014 year to date. Exports to Canada were up 6 percent.

Table 8--Tart cherries: Total production and season-average price received by growers, 2011-13 and indicated 2014 production

	Production				Price		
State	2011	2012	2013	2014	2011	2012	2013
	-- *Million pounds* --				-- *Cents per pound* --		
Michigan	157.5	11.6	217.9	181.5	30.1	111.0	34.5
New York	5.9	2.7	12.0	6.0	24.2	105.0	35.8
Oregon	2.5	1.0	3.8	3.0	34.0	95.1	34.4
Pennsylvania	3.2	3.3	2.2	0.9	37.1	111.0	39.0
Utah	35.0	40.0	27.5	36.0	29.0	51.0	47.6
Washington	20.9	24.8	17.9	26.0	31.2	32.3	34.4
Wisconsin	6.7	1.7	12.4	11.0	28.5	111.0	35.7
United States	231.7	85.1	293.7	264.4	30.0	59.4	35.9

Source: USDA, National Agricultural Statistics Service, *Noncitrus Fruit and Nuts Summary,* various issues, and *Cherry Production* (June 2014 issue).

Figure 8
U.S. beginning stocks of frozen tart cherries in cold storage 1/



1/ Represents cold storage stocks on December 31of the previous year.
Source: USDA, National Agricultural Statistics Service, *Cold Storage Summary*, various issues.

Continued Large Supplies Will Temper Cranberry Prices

Despite a slight drop in production, processed cranberry supplies in the United States will likely remain large, putting downward pressure on cranberry grower prices. The NASS August forecast for U.S. cranberry production in 2014 is at 857 million pounds (or 8.57 million barrels), down 4 percent from record production of the year before (table 9). Should this forecast materialize, production will still be relatively large being 11 percent above the previous 5-year average output and the second largest, historically.

Weather during the growing season varied across major producing States. In Wisconsin, the largest producer, both cool weather that limited berry size and a July hail storm that affected some production areas lowered overall yields. Generally favorable growing weather benefited the crops in Massachusetts, Oregon, and Washington, although there were some reports of heat-related crop damage reported in Massachusetts. In summary, production is forecast up this year in the major cranberry-producing States, except in Wisconsin.

Wisconsin is the No. 1 cranberry-producing State, supplying over 60 percent of domestic production. Wisconsin's cranberry crop is forecast at 539 million pounds in 2014, down 11 percent from record-production last year but relatively large compared with earlier years. In recent years, harvested acreage in the State has expanded, mostly in response to generally improving grower prices for U.S. processing cranberries. Four consecutive years of increasing production in Wisconsin, prior to this year's decline, was a major driving force for recent production expansion in the U.S. cranberry industry.

Supplies are outweighing demand for U.S. cranberries. At the time this report was prepared, most recent available data (which is through cycle 3 of the 2013/14 marketing year) from the Cranberry Marketing Committee (CMC) indicated total

Table 9--Cranberries: Total production and season-average prices received by growers, 2011-13, and indicated 2014 production

State	Production				Price		
	2011	2012	2013	2014	2011	2012	2013
	-- Million pounds --				-- Cents per pound --		
Massachusetts	232	212	185	207	44.7	47.0	31.6
New Jersey	51	55	55	56	51.0	54.4	37.5
Oregon	36	41	39	40	39.5	40.4	30.6
Washington	12	14	15	16	55.0	63.5	43.0
Wisconsin	441	483	602	539	44.3	47.8	32.0
United States	771	805	896	857	44.8	47.9	32.3

Source: USDA, National Agricultural Statistics Service, *Noncitrus Fruit and Nuts 2013 Summary* and *Cranberries* (released August 2014).

U.S. cranberry sales in 2013/14 were down 7 percent in volume from the same period the previous year, with domestic sales down 9 percent and foreign sales down 3 percent. In the domestic market, processed and sold cranberry volume declined by about 9 percent while fresh sales rose 2 percent. The processed cranberry sector dominates the market for U.S. cranberries, with sales to processors making up over three-fourths of the total domestic sales volume. Processed cranberries (mostly sweetened and dried cranberries) and cranberry concentrate make up nearly all of the exports (foreign sales), with only about 2 percent of foreign sales as fresh cranberry volume.

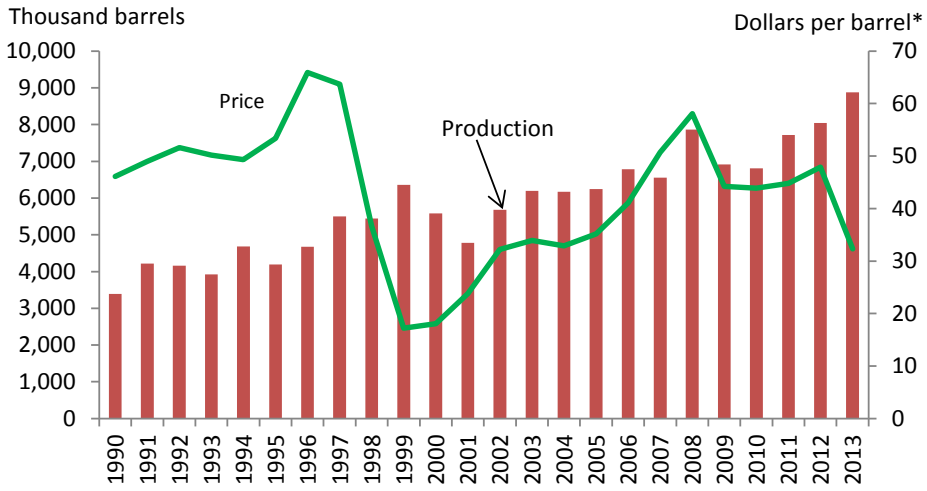
Foreign sales in 2013/14 declined significantly for U.S. cranberry concentrate—which comprise a large portion of the inventories. Sales of processed cranberries, on the other hand, continued strong in the domestic and international markets. Weaker demand, specifically for cranberry concentrate, higher-than-average beginning inventories, record-large domestic production, and increased imports all point towards the prospects of continued large ending inventories in 2013/14. As carried forward to the 2014/15 marketing year, these large inventories will meet with above-average domestic production this fall to again saturate the market.

U.S. cranberry production has increased for three straight years since 2011. Despite these increases, cranberry grower prices improved during the marketing years 2011/12 and 2012/13, although still hovering in the $40- to near $50-per-barrel range, down from the decade-high of $58.1 per barrel in 2008/09. Prices, however, tumbled from $47.9 per barrel in 2012/13 to $32.3 per barrel (about 32 cents per pound) in 2013/14 due to oversupplies in the industry (fig. 9). This price dip is mostly a reflection of the lower prices growers received for processing-use cranberries (down from $46.9 to $31.0 per barrel), although a 27-percent increase in domestic fresh-market production also drove down fresh cranberry grower prices.

Processed cranberries sold to processors fell over 20 percent in 2013/14 but those sold to the government for feeding programs were well over double the volume sold in 2012/13. As regulated by a Federal Marketing Order, USDA announced volume control will not be implemented in 2014/15 despite the current oversupply situation in the industry. The last time volume control was implemented was in 2001, which succeeded two years of rock bottom prices ($17-18/barrel). In 2001, prices improved to almost $24/barrel (up 31 percent from the previous year) as the volume control regulation—with a 65-percent producer allotment that year—contributed to

Figure 9

U.S. utilized cranberry production and average grower price



*1 barrel = 100 pounds.

Source: USDA, National Agricultural Statistics, *Noncitrus Fruits and Nuts Summary,* various issues.

a significant reduction in inventories. In the absence of volume control regulation in 2014/15, the USDA, through the AMS' commodity purchase program, as well as marketing and promotion undertakings by the industry to boost domestic and export demand will continue to serve important roles in helping to alleviate the current surplus situation in the industry.

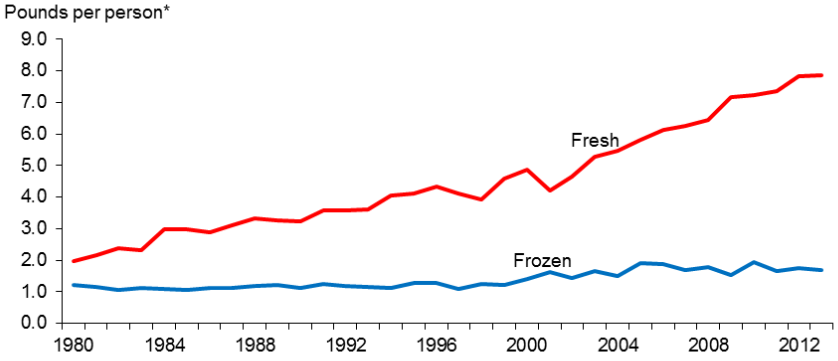
Domestic Strawberry Production Increases Slightly in 2014

In September, NASS forecast combined production in the three major strawberry-producing States at 3.05 billion pounds (or 30.5 million hundredweight (cwt)) in 2014, up 3 percent from last year. Production is forecast to increase in California (2 percent from a year ago) and Florida (11 percent), but down in Oregon (3 percent).

Strawberry harvested area in California is expected to remain steady from a year ago in 2014 at 41,500 acres but higher yields per acre will pull production to a record 2.82 billion pounds. Winter strawberry acreage in Florida increased 28 percent to 10,900 acres, the largest thus far and more than offsetting lower average yields to prevent a dip in production. In Oregon, harvested acreage remained flat at 1,700 acres but average yields declined 3 percent to push production down to 16.2 million pounds.

Despite increased production, fresh strawberry grower prices for this year have averaged relatively strong compared to average prices during 2010-12 (NASS did not report monthly grower prices for fresh strawberries in 2013 and through the first 3 months of 2014). From April through August 2014, prices averaged $0.90 per pound, 12 percent higher than the 2010-12 average for the same period. Year-to-date prices were consistently higher than the 2010-12 average for each month, except in April. U.S. fresh strawberry retail prices are also averaging higher in 2014 even with a larger domestic crop and higher imports from Mexico and Canada. Retail prices during the first seven months of the year have averaged 8 percent higher than the same period a year ago and relatively unchanged from 2010-12.

Figure 10
U.S. fresh strawberry per capita use increasing



* Fresh-weight equivalent basis.
Source: USDA, Economic Research Service calculations.

Per capita fresh strawberry use in the United States has generally trended higher since 1980, reaching a record 7.9 pounds in 2013 (fig. 10). Greater awareness of the importance of fruit and vegetables in a healthy diet, increased year-round availability through domestic production and imports, and adoption of better varieties helped promote increased strawberry consumption in the United States. Average per capita use for the years 2010-12 was estimated at 7.5 pounds well more than double the average during the 1980s, almost double the 1990s, and 33 percent higher than the 2000-09 average. U.S. fresh strawberry exports have also trended up over the last several years although a majority of U.S. strawberries continue to be consumed in the domestic market. Despite lower export volumes to Canada and Japan in 2013, strong exports to Mexico and several other markets, including the United Kingdom and the Netherlands, Saudi Arabia, and Taiwan resulted in record exports of 306 million pounds valued at $412.3 million—also an all-time high. Export volumes to most of these major markets continue higher in 2014, January through July, except to Canada. Year-to-date exports are down 10 percent in volume from a year ago but its value is up 1 percent.

Stocks of frozen strawberries were low at the beginning of 2014 and have remained below the year earlier through the end of August. Based on statistics from the Processing Strawberry Advisory Board of California, about 18 percent of California's strawberry crop in 2013 was frozen and the total U.S. frozen pack was 435.9 million pounds, down 7 percent from the prior year. As of December 31, 2013, frozen strawberry stocks were at 280 million pounds, down 8 percent from a year ago. Movement was high this winter and supplies of frozen strawberries declined seasonally before rising in the spring as California's 2014 crop got picked. Total deliveries to freezers between mid-February and early September 2014 were up 6 percent, with California deliveries up 6 percent from last year and Oregon deliveries unchanged. California has historically provided more freezer berries throughout the year than Oregon (94 percent and 4 percent, respectively, of 2013 deliveries, with the remainder coming from Washington State). As of July 31, 2014, NASS reported 361,554 million pounds of frozen strawberries in cold storage, 22 percent lower than a year ago but up from 279,977 million pounds on December 31, 2013. Cold storage volume declined further to 330,739 million pounds by the end of August and remained below a year ago. Continuing lower stocks will help support processing prices.

Total Citrus Volume Down in 2013/14, Steady for Arizona

As the 2013/14 season ends for a majority of citrus fruits, final production estimates from NASS have total U.S. citrus production down 15 percent, year-over-year (table 10). Throughout the 2013/14 season, downward adjustments were made from the initial all citrus forecast volume of 10.8 million tons reported in October 2013, just 3 percent less than the 2012/13 volume of 11.1 million tons. As of September 18, the total citrus production estimate for 2013/14 bottomed out at 9.4 million tons, down 13 percent from the initial production forecast and ending 15 percent lower than 2012/13 final production volume. Texas production declined 5 percent since 2012/13 despite upward revisions from the initial forecast. California witnessed a decline of 6 percent year over year, while Florida's citrus production dropped 21 percent. Citrus production in Arizona remained stable at 80,000 tons.

Total orange production was down 18 percent this season to end with 6.8 million tons, from the 2012/13 level of 8.3 million tons. Texas' production dropped 1 percent to 75,500 tons, while California's output dropped 8 percent, due mainly to a freeze in December 2013. Florida's all orange production declined 22 percent in 2013/14 from previous season, with early- and mid-season and navel production down 21 percent and Valencia production down 23 percent. The U.S. navel harvest declined nearly 16 percent to total 4.02 million pounds, while Valencia orange production declined 21 percent, due to combined losses from California and Florida.

High levels of fruit drop and smaller sizes were culprits behind Florida's lower overall citrus production. Florida experienced a 23 percent fruit drop in their early-mid-season oranges and a 31-percent drop in Valencia oranges. Both sets of fruit sized very small, with 286 fruit per box and 240 fruit per box, respectively. Even with grapefruit sizes up slightly, they remained smaller than average and also experienced high fruit drop.

Drop in California Navel Orange Production Forecast in 2014/15

On September 11, the California NASS Field Office released its first estimate for the 2014/15 citrus season, forecasting the California navel orange crop at 78.0 million cartons (40-lb cartons) or 1.62 million tons. The current forecast represents 4 percent decline in navel production, the lowest production has been since 2006/07 when final utilized production reached only 67 million cartons. The forecast was reported in the *2014-15 California Navel Orange Objective Measurement Report* which collected data from the Central Valley between July 13 and September 2, 2014. The estimate does not account for any potential impacts due to the ongoing drought in California.

Average fruit set per tree is up 26 percent to 333, from just 265 in 2013/14 which has been the lowest since 2008/09. The increased fruit set has not made up for the overall smaller sized fruit, coming in at 2.205 inches in diameter, down from 2.338 the previous season. Another factor behind the decreased production is the decline in bearing navel orange acreage. In 2014/15, bearing acreage is forecast at 126,000 acres, down from 128,000 acres the year before, continuing the declining trend in acreage since 2008/09 when there were 135,000 acres.

Table 10--Citrus: Utilized production, 2011/12, 2012/13 and forecast for 2013/14 1/

Crop and State	Utilized		Forecast for 2013/14	Utilized		Forecast for 2013/14
	2011/12	2012/13	as of 9-2014	2011/12	2012/13	as of 9-2014
	---- *1,000 boxes 2/* ----			---- *1,000 tons* ----		
Oranges:						
Early/mid-season and navel:						
California	45,500	42,500	39,000	1,820	1,700	1,560
Florida 3/	74,200	67,100	53,300	3,339	3,020	2,399
Texas	1,108	1,499	1,400	47	64	60
Total 4/	120,808	112,599	93,700	5,206	4,783	4,018
Valencia:						
California	12,500	12,000	11,000	520	480	440
Florida	72,500	66,500	51,300	3,263	2,993	2,309
Texas	311	289	376	13	12	16
Total	85,311	79,289	62,676	3,796	3,485	2,764
All oranges	206,119	191,888	156,376	9,002	8,268	6,782
Grapefruit:						
California	4,000	4,500	4,000	160	180	160
Florida	18,850	18,350	15,650	802	780	665
Texas	4,800	6,100	5,700	192	244	228
All grapefruit	27,650	28,450	25,350	1,154	1,204	1,053
Tangerines and mandarins:						
Arizona	200	200	200	8	8	8
California	10,800	13,000	14,500	432	520	580
Florida	4,290	3,280	2,900	204	156	138
All tangerines and mandarins	15,390	16,480	17,600	644	684	726
Lemons:						
Arizona	750	1,800	1,800	30	72	72
California	20,500	21,000	19,000	820	840	760
All lemons	21,250	22,800	20,800	850	912	832
Tangelos						
Florida	1,150	1,000	880	52	45	40
All citrus	271,559	260,618	221,006	11,702	11,113	9,433

1/ The crop year begins with bloom of the first year shown and ends with completion of the harvest following year.
2/ Net pounds per box: oranges in California (CA)-80 (75 prior to the 2010-2011 crop year), Florida (FL)-90, Texas (TX)-85; grapefruit in CA-80 (67 prior to the 2010-11 crop year), FL-85, TX-80; lemons-80 (76 prior to the 2010-11 crop year); tangelos-90; tangerines and mandarins in AZ and CA-80 (75 prior to the 2010-11 crop year), FL-95.
3/ Includes Temples. 4/ Totals may not be equivalent to the sum of the categories due to rounding.
Source: USDA, National Agricultural Statistics Service, *Crop Production,* various issues.

U.S. fresh-orange exports during the 2013/14 marketing season through July are down 25 percent compared to the same period in 2012/13. The season-to-date export volume is 1.08 billion pounds, compared to 1.45 billion pounds for the same period last year. South Korea was the leading market for U.S. fresh oranges for 2012/13 through July, with 348.5 million pounds, but volume to South Korea has declined 41 percent to hit 205.5 million pounds season to date. Canada was the top market this season so far, with 242.8 million pounds, although having a drop in shipments from the previous season. Overall, monthly orange exports were down in 7 of the 9 months of the current marketing season, year over year. Contributing to the seeming decline in international demand is the extremely strong prices for fresh oranges in the United States this season. Competition over the limited fresh supply out of California and Texas in the domestic market due to Florida's season-long orange production forecast decline, all contributed to pushing up fresh-orange prices this season.

A decline in fresh-orange exports has been affected by a ban on California citrus entering into China due to some fruit shipments being infected with brown rot, which is not common in California orange production. The trade ban was in effect from April 2013 and lifted in August 2014. Examination of trade data shows that China accounted for an average of 6 percent of total fresh-orange exports from 2008/09-2011/12 over the November through July period. Similar to the previous 4 year average, 2012/13 exports to China was 6 percent of total shipments through

July but shipments were down 11 percent from 2011/12. Due to the ban and a smaller domestic crop, exports to China dropped 70 percent from November to July for the 2013/14 marketing season and accounted for only 2 percent of total exports season to date. Since the ban has been lifted, exports should rebound but strong prices going into the 2014/15 season might defer some demand.

The *2013 Citrus Summary*, released September 18, reports that the season-average equivalent-on-tree price for California navels in 2013/14 was $17.19 per box, up 33 percent from $12.97 per box in 2012/13. The total value of the California navel crop was $671 million, 22 percent above last season and 10 percent higher than in 2011/12. The forecast of lower navel production, combined with expectations of continued drought conditions, should keep prices elevated through the 2014/15 marketing season.

Florida Fresh Citrus Shipments Down in 2013/14 Season

The Florida Department of Citrus (FDOC) released its final weekly fresh citrus shipment report for the 2013/14 season on August 12. The report shows Florida fresh citrus shipment volumes down 13 percent with revenue down 10 percent. Shipments totaled 24.4 million 4/5 bushel cartons in 2013/14 compared to 28.2 million cartons last season.

Just under half of the citrus volume was fresh grapefruit with total shipments reaching 12.1 million cartons, down 15 percent from the 2012/13 volume of 14.3 million cartons. Shipments to Canada are down 9 percent, while domestic shipments declined 14 percent. The greatest decline was on the international market where Florida fresh grapefruit experienced a 17-percent drop to hit 5.9 million cartons, from 7.2 million cartons the year before.

Domestic orange shipments from Florida are down 10 percent year over year. Canada reduced fresh Florida oranges by 7 percent, but with a 7-percent gain in revenues in 2013/14. International shipments were up by 3 percent, led by the Pacific Rim region which received 19 percent higher shipments while both shipments to Japan and Europe declined. Specialty citrus shipments slipped 16 percent, with the international marketing suffering the most with a 42 percent decline in volume and 40 percent loss in revenue.

Florida Citrus Acreage Continues Slip, Declines in 2013/14

The first official NASS estimate for Florida's 2014/15 will not be released until October but the first data regarding the upcoming crop was released on September 18 in the Florida NASS Field Office *Commercial Citrus Inventory Preliminary Report*. The report provides the first estimate of commercial citrus acreage in 2014. A total net loss of acreage occurred with 9,493 acres removed from citrus production, continuing the net loss of acres since 1998, despite new plantings annually. Florida's total citrus acreage stands at 515,147 acres, the lowest in the series which began in 1966.

New plantings are at the highest level since 2010, with 11,548 new acres brought into citrus production, an increase of 40 percent from the previous season. This new acreage could not compensate for the loss of 21,041 acres, the largest loss since

2011. Specialty citrus (tangelos and tangerines) reduced acreage by the greatest percent, with a 5 percent decline to 16,861 acres, while grapefruit lost 4 percent of acreage and oranges lost 2 percent. All citrus fruits have experienced acreage decline in recent years, partially due to disease and urban development.

Quarantine Area Increases in California for Asian Citrus Psyllid, New Greening Discovery in Texas

The area under quarantine continues to grow with eight counties, and portions of four other counties are under restrictions, with all nursery stock, plants, plant parts, including green waste, and plant products capable of propagation, unable to be moved outside quarantine areas. Anything moved out of the quarantine must be cleaned and/or treated in a manner to eliminate all live life stages of the psyllid. The restrictions also cover any growing and cultivation equipment, basically any agriculture equipment that might have come in contact with a psyllid must be decontaminated. When fruit is shipped, it must be free of all leaves, stems and plant parts. The quarantine boundary is roughly 46,702 square miles and covers most of Southern California.

On July 15, the Texas Department of Agriculture has expanded the greening quarantine area by adding Harris County (Houston and surrounding metro areas). The quarantine area also included Hidalgo and Cameron counties in South Texas. The quarantines in Texas began back in January 2012 when the first detection of the plant disease was discovered in San Juan, Texas. The newest additional area to the quarantine is the Houston metro area, where a nursery had a tree test positive for the disease. The Texas citrus industry is not forecasting an affect to production this season, and is expecting a decent citrus season.

Lemon Prices Elevated Through 2014 To Start New Season

Since the beginning of the 2013/14 lemon season, prices have trended much higher than the subsequent months in 2012/13. Production is down roughly 9 percent season over season, with 2013/14 final production estimate at 832,000 tons. Arizona's production remained steady at 72,000 tons, but California experienced a 10-percent drop as the State revised production estimates downward all season to land at 760,000 tons, from the initial October 2013 production forecast of 860,000 tons.

Prices are up, partly due to a drop in anticipated Argentinian lemon production that was affected by a severe drought, which affected fruit quality and overall size, according to FAS. The 2012/13 lemon production season started with an estimate of 1,450 million metric tons, but was revised downward 10 percent to 1,300 million metric tons, which is unchanged from 2011/12. Though the U.S. does not import fresh lemons from Argentina, competition from sourcing countries (mostly Europe and Asia) for limited supply, has elevated U.S. grower prices.

Imports for fresh lemons in 2013/14 were down just under 1 percent when compared to the 2012/13 season, standing at 97.8 million pounds. Mexico is the largest supplier of fresh lemon imports in the United States, with 63.7 million pounds in 2013/14, accounting for 65 percent of total imports. Although Mexico is predominantly a lime-growing country, acreage has been increasing for Italian

lemons, according to FAS. Chile is the second largest lemon supplier to the United States, with 25.8 million pounds for the 2013/14 season, down 18 percent from 31.5 million pounds in 2012/13. The remaining suppliers are much smaller, with New Zealand supplying just 1.5 million pounds and the Dominican Republic shipping 750,927 pounds.

Fresh lemon exports were up 19 percent to reach 275.6 million pounds in 2013/14, from the 2012/13 level of 232.6 million pounds, the highest exports have been since 2007/08. Although exports are down to Japan and Canada, they still remain the top two markets. Japan received 75.3 million pounds, down just 5 percent from the 2012/13 volume of 78.9 million pounds. Similarly, shipments to Canada were reduced by 15 percent to 66.2 million pounds, but remain the second largest lemon market. Hong Kong received 40.8 million pounds, almost a three-fold increase from the 2012/13 level of 14.5 million pounds. South Korea, Australia and China all received increased shipments of U.S. fresh lemons in 2013/14.

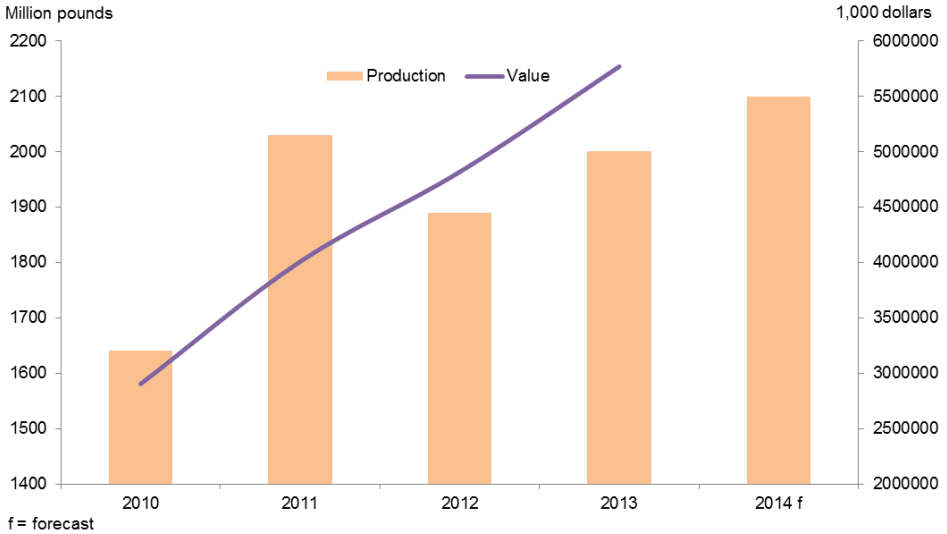
Despite Weather Woes, Almond Harvest Looks To Break Record

The under-harvest almond crop is expected to break production records with 2.1 billion pounds of almonds in 2014/15 season (fig. 11). If realized, the 2014 crop will be 5 percent larger than the previous harvest and 3 percent greater than the previous record of 2.03 billion pounds in 2011. Behind the increased production is bearing acreage which stands at an estimated 860,000 acres, with 100,000 nonbearing acres in wait to become commercially bearing. Since June 2013, more than 8.33 million almond trees were sold by California nurseries, a 25-percent uptick on amount of trees sold the prior year. Of the sold trees, roughly 24 percent were used to replant an orchard, 4 percent were to replace trees in existing orchards, and the remaining 72 percent were sold for new plantings. All the increased trees and acreage demonstrates grower confidence in the long-term growth of the almond industry, especially as growers shift more acreage into almond production than ever before.

Nut sets per tree are down but average kernel weight is up almost 7 percent when compared to 2013 crop, which was one of the smallest kernel weight crops. Overall, the kernel weight remains 7 percent lighter than the 2009-12 average kernel weight of 1.56 grams. Nuts per tree are down less than a percent from last season to hit 6,646 nuts per tree.

Due to the warm weather this winter, bloom occurred 2 weeks sooner than usual in early- to mid-February 2014. Dry weather and prolonged bloom assisted in great pollinator activity. Continued drought conditions in California aided in lower pest and disease pressure during the growing season, while growers irrigated to maintain tree health and nut development. The weather conditions also accelerated nut development with harvest beginning in mid-July, earlier than usual by a couple of weeks. As harvest continued through August, hull rot and mold seemed to be an issue in some locations, due to higher humidity. The growers in lower San Joaquin Valley are seeing greater disease pressure, with scab entering Padre almond variety hard shells, and an increased occurrence of rust across the state. NASS also reports that there is a higher rate of hull rot this season and in Merced County, uneven ripening of almond nuts are resulting in some green nuts. These factors may affect the final utilized production figure which will be released in early 2015.

Figure 11
Almond production and value of utilized production, 2010-2014.



f = forecast
Source: USDA, National Agricultural Statistics Service, *Noncitrus Fruit and Nuts Summary*, various years.

Continuing with the theme of firsts, the 2013 almond crop value smashes previous record with a 20 percent bump to reach $5.77 billion from the previous record of $4.82 billion in 2012. The high value was attributable to the much higher grower price per pound, which was also record high at $2.90 per pound. It remains to be seen if the value of the 2014 almond crop will continue the increasing value trend, but as U.S. almonds continue to broaden international appeal, competition for its supply should increase at the least, maintaining high prices for the crop.

For almond imports, an 11-percent decline was experienced from last seasons' record high import volume of 39.4 million pounds to 35.3 million in 2013/14. Inshell almond imports were greatest from Australia, with 24.2 million pounds, down 40 percent from 2012/13's volume of 40.4 million pounds. The drop in imports from Australia is partially attributed to the 5 percent decline in 2014 production. The other sources for inshell almonds into the U.S. market are Spain, with 1.1 million pounds, and Italy with 172,802 pounds. Similarly, shelled almond imports are greatest from Australia, with 6.8 million pounds, followed by Spain with 5.4 million pounds, and Italy with 2.5 million pounds.

Despite the higher value crop and grower price, exports remained strong for U.S. almonds, though not at record breaking levels. Exports reached 1.34 billion pounds (shelled equivalent) in 2013/14, up 4 percent from 2012/13. Total shelled almond exports reached 1.074 billion pounds for the 2013/14 marketing season, with inshell exports reaching 382 million pounds. Combined and converted to shelled, total exports reached 1.336 billion pounds shelled weight, up 4 percent from last seasons' total of 1.280 billion pounds, but remains 2 percent below the 2011/12 record of 1.358 billion shelled pounds. For shelled almond exports, Spain was the top destination in 2013/14, with 177.8 million pounds, followed by Germany and the United Arab Emirates. For inshell exports, India received the most U.S. almonds for 2013/14 though volume was down 22 percent from 2012/13's inshell volume to reach only 126.5 million pounds. Hong Kong was the 2nd largest receiver of inshell almonds followed by Japan.

Record Size Walnut Crop Forecast for 2014 Season

The California NASS Field Office released the *California Walnut Objective Measurement Report* on September 5, 2014, with the estimated 2014 harvest forecast at 545,000 tons. The production forecast is 11 percent higher than the 2013 harvest of 492,000 tons and 8 percent above 2010's previous record crop of 504,000 tons. Similar to almonds, walnut acreage continues to increase in California, and has reached 290,000 bearing acres in 2014, up from 280,000 acres in 2013.

Value of the 2013 walnut crop reach a record $1.8 billion, a 20-percent increase in value. Utilized production declined 1 percent but the season-average grower price set a new record at $3,650 per ton, 20 percent above the previous record of $3,030 per ton in 2012, boosting the walnut crop value.

The 2014 crop shaped up well with a long bloom period in April, and overall healthy trees thwarted a few periods of hot weather and generally low rainfall. Walnut development is about 2 weeks ahead of schedule, with some spider mite issues in August. Irrigation was implemented again to reduce effects of drought and the unusually dry winter weather. Chilling hour requirements were low this year due to the warm winter, but low pest and disease pressure assisted in the excellent crop quality. Bearing acreage increased from 280,000 acres to 290,000 for the 2014 season.

Walnut imports for September 2013 through July 2014 have been strong, with shelled shipments hitting 10.3 million pounds, up 37 percent from the same period in 2012/13. India is the largest source of shelled walnut imports, with 6.15 million pounds, about 57 percent more than 2012/13's 3.92 million pounds over the same time frame. Romania has shipped 1.6 million pounds of shelled walnuts through July, followed by Mexico with 831,112 pounds. Inshell walnut imports are at 2.2 million pounds season-to-date, up from 1.05 million pounds 2012/13 through July. Spain is the largest supplier for the 2013/14 season through July, with 1.1 million inshell pounds, followed closely by Chile, with 1.0 million inshell pounds. Germany shipped 70,879 inshell pounds through July 2014, being the third largest source market for U.S. inshell walnuts.

Walnut exports are at 299 million pounds shelled equivalent through July 2014. Overall inshell walnut exports are up 3 percent compared to the same period last year, reaching 320.3 million pounds. Hong Kong is the largest market for U.S. inshell walnut exports with 57.97 million pounds through July, down 21 percent over the same period in 2012/13. Turkey received increased walnut shipments from the United States so far in 2013/14 to reach 55.8 million pounds, while shipments to mainland China hit 38.8 million pounds, down 48 percent from last year. The strong domestic pricing might have deterred large exports to these markets in 2013/14, as countries like Italy and Vietnam increased inshell shipments.

Shelled walnut exports reached 156.8 million pounds season to date, down from 158.4 million pounds over the same period last season. Germany is the top market for shelled walnut exports this season with 24.9 million pounds. South Korea received 21.7 million shelled pounds, followed by Japan with 18.7 million pounds, both sourcing less U.S. walnuts than the same period in 2012/13.

Fruit and Tree Nut Summary Trade Tables

Table 11--U.S. exports of selected fruit and tree nut products

Commodity	Marketing season	Season-to-date (through July) 2013	Season-to-date (through July) 2014	Year-to-date change
		---------- *1,000 pounds* ----------		*Percent*
Fresh market:				
Oranges	November-October	1,447,850	1,080,987	-25.3
Grapefruit	September-August	402,834	323,443	-19.7
Lemons	August-July	232,578	275,607	18.5
Apples	August-July	1,969,093	1,858,533	-5.6
Grapes	May-April	81,699	101,767	24.6
Pears	July-June	16,918	14,777	-12.7
Peaches (including nectarines)	January-December	122,042	102,334	-16.1
Straw berries	January-December	216,953	196,021	-9.6
Cherries	January-December	139,417	187,317	34.4
Canteloupe	January-December	71,438	70,514	-1.3
Watermelon	January-December	236,622	246,896	4.3
		------ *1,000 sse gallons 1/* -------		
Processed:				
Orange juice, frozen concentrate	October-September	50,916	50,434	-0.9
Orange juice, not-from-concentrate	October-September	83,535	87,436	4.7
Grapefruit juice	October-September	12,460	10,162	-18.4
Apple juice and cider	August-July	9,540	10,356	8.6
Wine	January-December	62,500	63,396	1.4
		---------- *1,000 pounds* ----------		
Raisins	August-July	273,209	351,388	28.6
Canned pears	June-May	2,144	1,290	-39.8
Canned peaches	June-May	10,633	7,088	-33.3
Frozen straw berries	January-December	35,805	34,643	-3.2
		---------- *1,000 pounds* ----------		
Tree nuts:				
Almonds (shelled basis)	August-July	1,280,993	1,336,586	4.3
Walnuts (shelled basis)	September-August	296,133	299,111	1.0
Pecans (shelled basis)	October-September	81,865	70,900	-13.4
Pistachios (shelled basis)	September-August	169,897	186,857	10.0

1/ Single-strength equivalent.
Source: U.S. trade data provided by the U.S. Department of Commerce, U.S. Census Bureau.

Table 12--U.S. imports of selected fruit and tree nut products

Commodity	Marketing season	Season-to-date (through July) 2013	Season-to-date (through July) 2014	Year-to-date change
		---------- *1,000 pounds* ----------		*Percent*
Fresh market:				
Oranges	November-October	125,123	171,890	37.4
Tangerines (including clementines)	October-September	251,336	327,733	30.4
Lemons	August-July	98,508	97,751	-0.8
Limes	January-December	564,998	542,265	-4.0
Apples	August-July	430,170	469,983	9.3
Grapes	May-April	353,922	316,731	-10.5
Pears	July-June	3,964	1,990	-49.8
Peaches (including nectarines)	January-December	77,273	43,823	-43.3
Canteloupe	January-December	745,163	721,964	-3.1
Watermelon	January-December	1,055,274	1,199,281	13.6
Bananas	January-December	6,307,645	6,425,515	1.9
Mangoes	January-December	695,600	664,131	-4.5
		------ *1,000 sse gallons 1/* -------		
Processed:				
Orange juice, frozen concentrate	October-September	285,577	287,150	0.6
Apple juice and cider	August-July	512,151	449,909	-12.2
Wine	January-December	166,393	167,532	0.7
		---------- *1,000 pounds* ----------		
Canned pears	June-May	14,771	7,578	-48.7
Canned peaches (including nectarines)	June-May	27,197	22,811	-16.1
Canned pineapple	January-December	442,875	402,990	-9.0
Frozen straw berries	January-December	159,585	166,799	4.5
		---------- *1,000 pounds* ----------		
Tree nuts:				
Brazil nuts (shelled basis)	January-December	10,277	9,223	-10.3
Cashew s (shelled basis)	January-December	150,154	154,196	2.7
Pine nuts (shelled basis)	January-December	304	322	5.9
Pecans (shelled basis)	October-September	70,594	79,886	13.2

1/ Single-strength equivalent.
Source: U.S. trade data provided by the U.S. Department of Commerce, U.S. Census Bureau.

Contacts and Links

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- Data by Commodity provides current import and export data for more than 30 individual fresh and processed fruit and tree nut commodities on a marketing-year basis.
- Yearbook Tables, in Excel and PDF, contain a time series of annual (or some monthly) data for U.S. bearing acreage, production, prices, trade, per capita use, and more. Eventually, all data currently contained in the Fruit and Tree Nuts Yearbook will be integrated into the Data by Category and Data by Commodity series.

Related Websites

A. Fruit and Tree Nuts Outlook
http://usda.mannlib.cornell.edu/MannUsda/viewDocumentInfo.do?documentID=1378

B. Fruit and Tree Nuts Topic Page
http://www.ers.usda.gov/topics/crops/fruit-tree-nuts.aspx

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F. USDA FAS Trade Data—GATS: This online application allows the user to freely access and download detailed U.S. export and import data.
http://www.fas.usda.gov/gats/default.aspx

G. NASS Noncitrus Fruit and Nuts: Links to USDA, National Agricultural Statistics Service's annual reports on noncitrus fruit and nuts.
http://usda.mannlib.cornell.edu/MannUsda/viewDocumentInfo.do?documentID=1113

H. NASS Citrus Fruits: Links to USDA, National Agricultural Statistics Service's annual reports on citrus fruits.
http://usda.mannlib.cornell.edu/MannUsda/viewDocumentInfo.do?documentID=1031

United States Department of Agriculture

Economic Research Service

Situation and Outlook

FTS-357SA

Sept. 26, 2014

Fruit and Tree Nuts Outlook: Economic Insight

Fresh-Market Limes

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Approved by the World Agricultural Outlook Board.

Lime Overview and Varieties

Limes, along with lemons and citrons, are a species in the common-acid fruit group. Common-acid fruits have high citric-acid content and an elliptical shape with a nipple end, distinguishing them from other species within the Citrus genus. These fruits are believed to have originated in the Northeast India, Indo-China region, and followed westward trade routes to the Mediterranean and onward to the Americas. Limes are highly freeze-intolerant and require long periods of heat to suitably mature, so production is limited to areas with mild to warm winters (subtropical to tropical). Like most citrus crops, limes are ever-bearing and harvest typically occurs multiple times throughout the year, with mature fruit occurring in January-February, June-July, and September-October (Reuther, et. al., 1967).

There are three major commercially-produced lime varieties: the Persian lime, the key lime, and the makrut lime (table 1). The Persian and/or Tahitian lime is the most widely produced lime globally with Mexico being the largest producer. The fruit is medium-sized, with an oval-oblong shape (resembling a small lemon), smooth skin, thin rind, juicy and very acidic with “true” lime flavor. The Persian lime has lower heat requirements for fruit to reach maturity and size preference, and is also slightly more cold/freeze tolerant (Reuther, et. al., 1967). This lime is preferred by Americans, due to large size and high juice content.

The key lime, also known as the West Indian lime or Mexican lime, is produced heavily in India and parts of Mexico, where it is the preferred variety for domestic use. It is very smooth-skinned with a thin rind, round, juicy, highly acidic with a strong aroma (Reuther, et. al., 1967). The tree is thorny and light on foliage, with a high heat requirement for ideal fruit development, and tends to be less vigorous and less robust than Persian lime trees. When the key lime is grown in the Mediterranean climate of California, it often produces smaller fruit that must be sold at a discount, due to the occasional cold snap and lower temperatures experienced (Reuther, et. al., 1967). But it grows well in tropical environments such as those in Mexico where they are produced heavily.

Table 1: Major lime varieties and description

Lime type	Other names	Appearance
Key lime (Citrus x aurantiifolia)	West Indian, Bartender's, Omani or Mexican	1-2 in diameter, high acidity, strong aroma, tart and bitter, 7-8 percent citric acid
Persian lime (Citrus x latifolia)	Shiraz Limoo, Tahitian, Bearss (Seedless)	2.5 in diameter, slight nippled end, ripens to yellow but sold green
Makrut lime (Citrus hystrix)	Kaffir	2 in. diameter, rough-bumpy skin, thick rind. Aromatic leaves used in cooking

Source: Reuther, et. al., 1967.

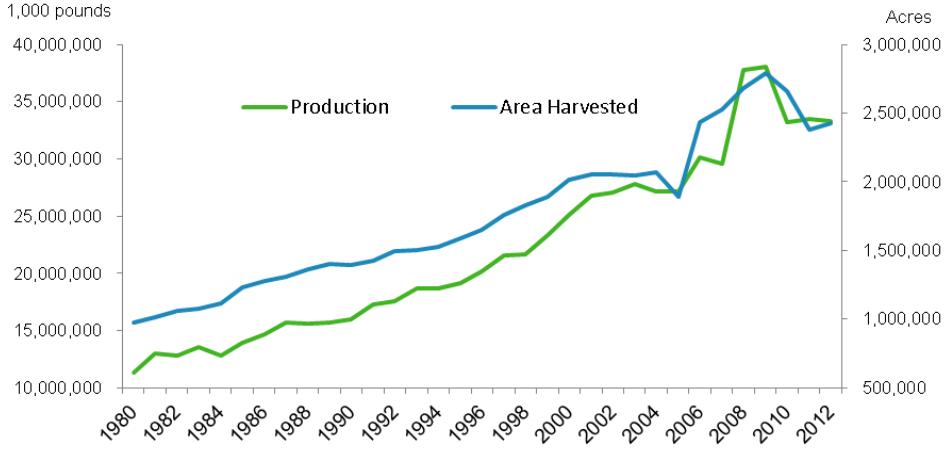
The makrut lime is a lesser-produced but well-known lime variety that is popular in Southeast Asian cuisine, distinguished by its small size, rough, bumpy skin and aromatic leaves which are also used in cooking (Reuther, et. al., 1967).

Global Lime Production

World lemon and lime production[1] has been increasing annually since 1980, with world production reaching 33.3 billion pounds in 2012, up almost threefold from 1980's production of 11.3 billion pounds (fig. 1). For lemons, Argentina, Turkey, the United States, Spain, Italy and South Africa are the largest producers as of 2012 (U.S. International Trade Commission, 2013). For limes, Mexico and Brazil are the world's largest producers (United Nations, Food and Agriculture Organization (UN/FAO), 2003). Both countries produce large quantities of key limes, with Mexico producing Persian limes as well. However, constrained by the lack of refrigeration, key limes are the preferred lime in Mexico due to its longer shelf life (Spreen, 2000). Many countries produce limes but consumption tends to remain in their respective domestic markets with little product exported.

With respect to combined global lemon and lime production, China accounted for roughly 17 percent of 2009-12 total average volume, India with 15 percent, and Mexico 13 percent (UN/FAO, 2014). For the same period, the United States came in at just 5 percent of total lemon and lime production (fig. 2). Most countries that are capable will produce small amounts of lemons or limes to meet domestic demand. Only three countries account for more than half of the world's lemon and lime harvested acreage (fig. 3). India is the largest, averaging 609,196 acres, during 2010-12 (about 25 percent of global acreage), followed by Mexico with 637,012 acres (15 percent of global acreage) and China with 292,312 acres (12 percent of global acreage). Brazil and Argentina account for 5 percent and 4 percent of global harvested acreage, respectively, rounding out the top five. The remaining 40 percent of harvested acreage is spread among 103 other countries (UN/FAO, 2014).

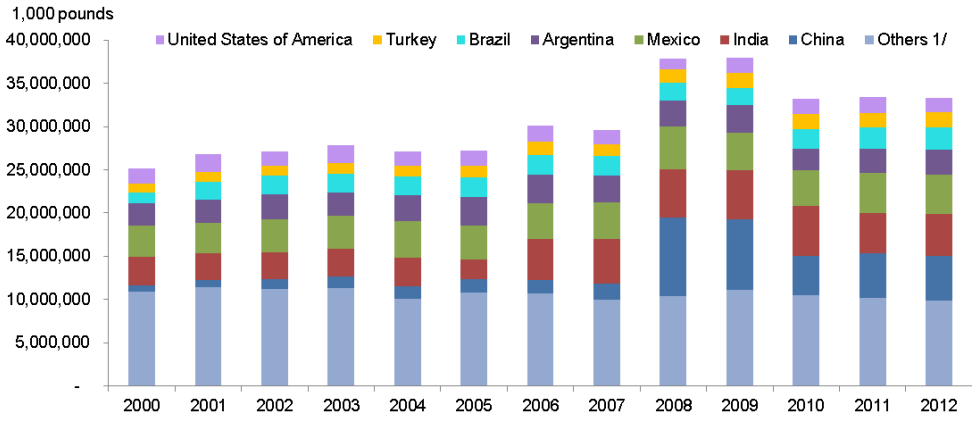
Figure 1
Lemon and lime world production and area harvested, 1980-2012



Source: United Nations, Food and Agriculture Organization, FAOSTAT.

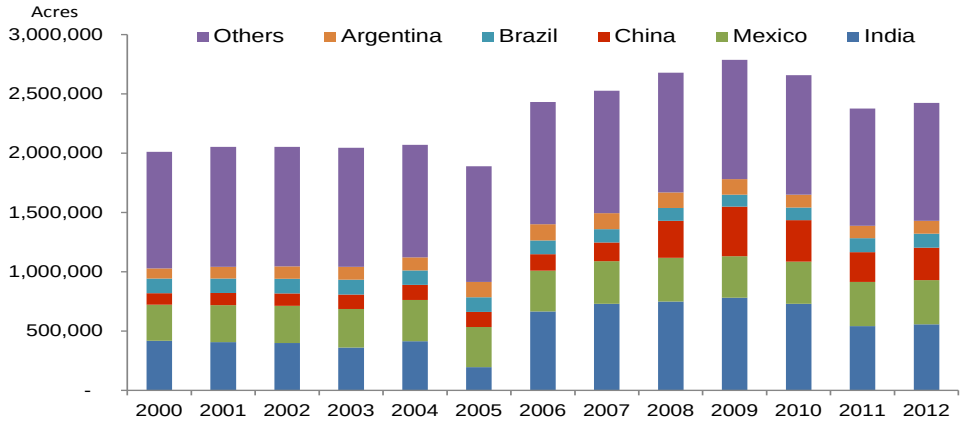
[1] Most global production figures have lemons and limes grouped together.

Figure 2
Lemon and lime global production by country, 2000-2012



1/ Others includes Spain, Iran, Italy and 103 other countries that reported lemon or lime production between 1980 and 2012.
Source: United Nations, Food and Agriculture Organization, FAOSTAT.

Figure 3
Lemon and lime global acreage by country, 2000-2012



Source: United Nations, Food and Agriculture Organization, FAOSTAT.

In terms of productivity, Israel had the highest average yields per acre during the 2010-12 period, with 33,264 pounds per acre, followed by Turkey with 33,090 pounds per acre. Yields in the United States (lemons and limes) ranked No. 3, with 31,670 pounds per acre on average while Argentina averaged 26 percent below this at 25,090 pounds per acre. Yields in Mexico averaged only 12,226 pounds per acre. While Israel's yields are over 2.5 times greater than Mexico, Mexico's large acreage makes it a larger producer.

Florida's Role in U.S. Lime Production, Historical to Present Day

Lime production, similar to other citrus fruits, has always been climatically limited in the United States. Historically, the main production areas were in South Florida. The key lime variety was introduced to the Florida Keys as early as 1838, where they eventually became naturalized; hence the name which is most commonly used in the United States. The commercial industry developed in Florida but was always relatively small, and after a hurricane in 1926, most commercial key lime production in the State was lost (Reuther, et. al., 1967).

After the loss of the key lime industry, Florida planted Persian limes (Tahitian) which have greater tolerance for cold weather and lower heat requirements, adapting better to the sub-tropical growing environment in the region. Most of the lime production was centered in Miami-Dade County, which extends south to Homestead, Florida along the Southeastern coast.

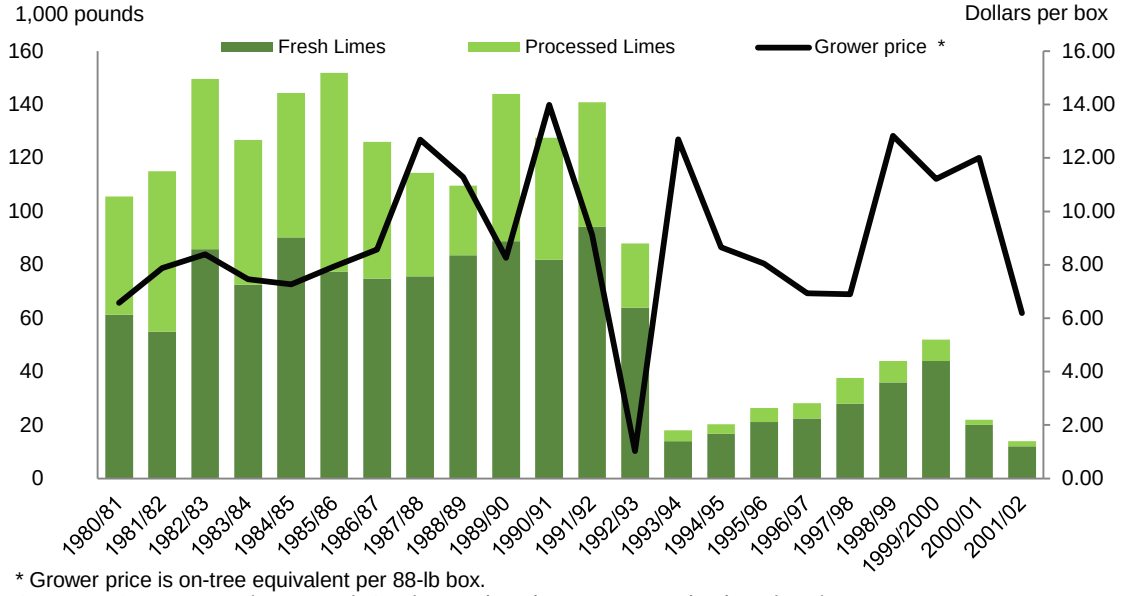
Florida's total lime production peaked in 1985/86, with 152 million pounds, equal to just over 1 percent of the 10,710 million pounds of oranges produced during the same period. Florida's lime production was mostly geared toward the fresh market, in contrast to the State's orange crop, which is produced primarily for processing. On average, over 51 percent of lime production went toward fresh use during 1970-79 (fig. 4). This share rose to 72 percent during the 1990's, the same time that only 5 percent of Florida oranges went to the fresh market. Lime production was increasing through most years, with some fluctuations attributable to a mid-January freeze in 1977, loss of acreage to urban sprawl, and tree removal from citrus canker.

Citrus Diseases and the Demise of Florida Limes

Citrus canker is a bacterial disease that was introduced to the Southeastern United States around 1910-1912 from imported Japanese seedlings but was declared eradicated from Florida and neighboring states in 1933 (Gottwald, 2002). Canker affects most commercial citrus varieties and causes lesions on fruit, stems, and leaves. As the infection worsens, plants can experience defoliation, severely blemished fruit, early fruit drop, twig and limb die back, and overall tree health decline, usually leading to removal of trees from commercial production (Schubert and Sun, 2003). There is no known cure for citrus canker and most trees are removed once they become infected (Dewdny, et. al., 2001 (revised 2013)). Key limes, along with grapefruit and trifoliate orange, are highly susceptible to all citrus canker pathogens (Schubert, 2002).

Canker was absent in Florida until 1986, when it was discovered in Manatee County, Florida, south of Tampa Bay, in less common lime-production land. By 1994, this infection was declared eradicated (Gottwald, 2002). In 1995, a separate, new canker finding in Miami was reported with infestation dated back to 1992-93, potentially introduced via Hurricane Andrew in August 1992. Wind and rain increase the chances for the disease to spread, especially over short distances with tropical storms, hurricanes, and tornadoes spreading canker for several miles (Polek, et. al., 2007). Another difference with this new infestation was the introduction of citrus leafminer, which creates further entry points for canker, but also attacks the same newly emerging leaves where canker thrives as well (Polek, et. al., 2007). This East Coast outbreak created a response from Florida government agencies and the USDA. However, despite their efforts, several other canker outbreaks occurred in both residential and commercial citrus in counties all along the southern portion of Florida. Even with the removal or cutting back (removal of infected portions of trees)

Figure 4
United States lime production and season-average grower price, 1980/81-2001/02



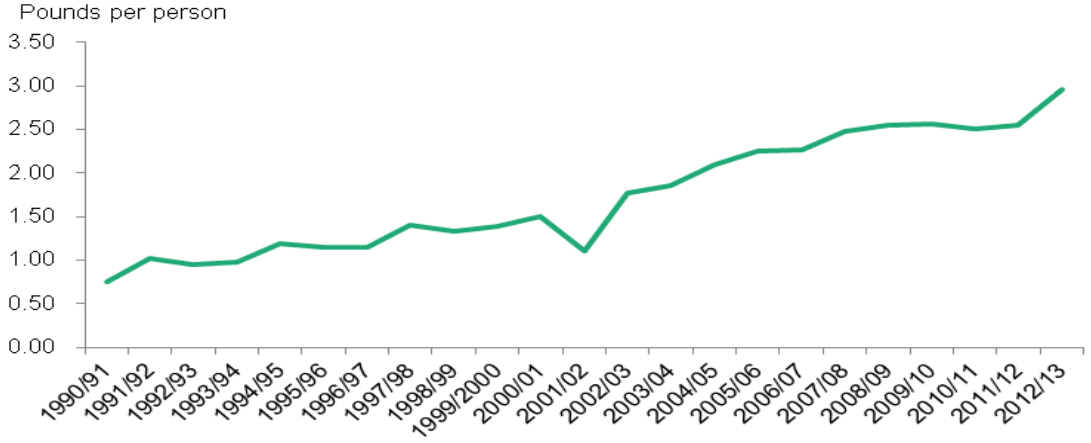
* Grower price is on-tree equivalent per 88-lb box.
Source: USDA, Economic Research Service, *Fruit and Tree Nuts Yearbook*, various issues.

of over 1.56 million commercial trees, the infected area increased from just 14 square miles in 1995 to over 657 square miles as of early 2002 (Gottwald, 2002). By 2002, USDA's commercial lime production estimates were discontinued and by 2006 the eradication effort for citrus canker ceased, as all major citrus producing counties consider canker endemic (Skaria and da Graça, 2012; Polek, et.al, 2007). Florida's commercial lime production never fully recovered since the 1995 canker finding in Miami. It was the perfect storm of canker, leafminer, hurricanes/tropical storms, and legal litigation brought about by the removal of trees on residential properties that slowed the eradication effort that truly reduced the viability of lime production in the United States. The years after 1995 witnessed an increase in production but direct competition for land and water (due to population growth in the Miami-metro area) and low-priced lime imports reduced the economic feasibility of a domestic lime industry (Spreen, 2000).

With the decline of domestic production, lime supplies were sourced from Mexico and smaller neighboring countries. Even in 1990, Mexico supplied 95 percent of total limes imported to the United States, with most of the remaining share coming from the Bahamas (3 percent) and Honduras (1 percent). Eleven other countries supplied limes to the United States in 1990. By 2010, Mexico's share of total U.S. lime import volume inched up to 97 percent, followed by Guatemala with just under 2 percent and El Salvador with less than 1 percent. The United States imported an average 912 million pounds of limes from 2011 to 2013, still mostly from Mexico. Over 90 percent of U.S. lime imports from Mexico were Persian limes, the remainders were key limes. Persian limes are grown in Mexico mostly to meet the export market demand, particularly in the United States. Mexico also supplies the bulk (over 94 percent of the 2011-13 average key lime volume) of key lime imports in the United States, accounting for over 94 percent of the 2011-13 average key lime import volume of 75 million pounds. Even as domestic production declined, domestic per capita use increased steadily (fig. 5).

In 1990/91, Americans used 0.75 pounds of limes a year per person. By 2000/01, this estimate doubled to 1.50 pounds per person, and by 2012/13 per capita use reached 2.96 pounds. This trend is not expected to decline as limes remain popular in both beverage and food choices across the United States, in Europe and in Japan (USDA, Foreign Agricultural Service (USDA/FAS), 2013). Part of the increased demand for limes over time reflects the growing Hispanic American population and the influence of Latin American cuisine in America. The United States dependence on imported limes for consumption and use will continue, especially as additional Mexican lime plantings and acreage is brought into production (USDA/FAS, 2013), illustrating market confidence in export demand to the United States and other countries.

Figure 5
United States per capita lime use, 1990/91-2012/13



Source: USDA, Economic Research Service, *Fruit and Tree Nuts Yearbook*, various years.

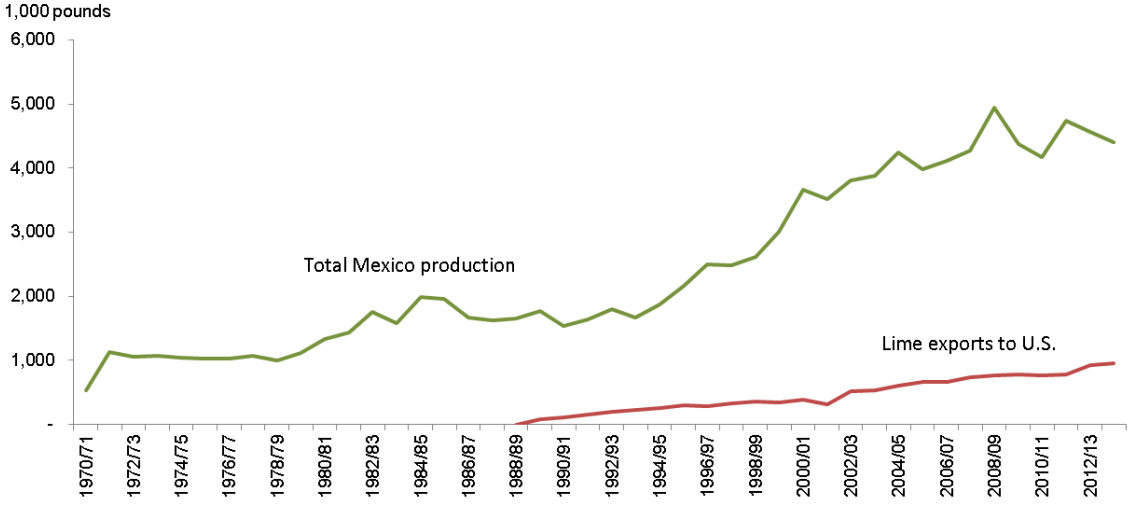
Mexico: Top Global Producer and America's Lime Supplier

Mexico is one of the largest citrus-producing and -consuming countries in the world, along with the United States (USDA/FAS, 2014; Spreen, 2000). Both Persian and key limes are very economically important in Mexico. As discussed earlier, key limes are preferred for domestic consumption and are grown mostly on the southern Pacific coast of Mexico. The key lime is produced in the states of Colima, Michoacán, Guerrero, and Oaxaca, with the former two being the largest producing States. Michoacán's winter weather provides an excellent production window, allowing limes to enter the domestic market early between December and February (USDA/FAS, 2013). Key limes mostly remain in the Mexican domestic market for consumption, but exports have been increasing (USDA/FAS, 2013).

Persian limes are grown mostly in the micro-climates of northern Veracruz, with some production in Tabasco, Oaxaca, Puebla, Jalisco and Yucatan—mostly on the Gulf of Mexico side of the country (USDA/FAS, 2013). Persian limes' peak harvest occurs between June and September. Comprised of large producers, about 25 percent of Persian lime production in Mexico is under irrigation (USDA/FAS, 2013). Roughly 50-60 percent of Persian limes are exported to the United States from Veracruz, while in total about 30 percent of Mexico's total Persian lime production is exported (fig. 6).

Strong international prices and low barriers to trade have led to increased plantings of both Persian and key limes in Mexico through 2012. Persian lime planted area increased 5 percent in 2012, accounting for 47 percent of total lime area in Mexico while key lime area decreased but make up half of total lime area. The remaining 3 percent is planted with Italian lemons. According to USDA/FAS, most producers in the country have suggested that both varietals are experiencing problems with over production. However, the state of Colima is experiencing reduced production due to citrus greening also known by the Chinese name of Huanglongbing (HLB). Key lime area in Veracruz has been planted at a lesser rate than Persian limes due to domestic price swings. However, in Michoacán, key lime acreage has increased due to the early harvest window (December to February), providing early market access before greater supplies reach market and reduce prices. Because current production is so high, this increase in key lime production could reduce prices but a common practice for Michoacán producers is to suspend harvest to prevent market saturation in hopes of preventing subsequent low prices (USDA/FAS, 2013). Prices also drop in Mexico when both varieties of limes are available, in the summer months usually, after which Persian lime prices gain ground in December due to export market demand and remain elevated until spring harvest in April (USDA/FAS, 2013).

Figure 6
Mexico lemon and lime production, 1970-2013 and exports of limes to United States, 1970-2013



* data is from USDA, Foreign Agricultrual Service, *Production, Supply, and Distrubution* data.
Source: United Nations, Food and Agriculture Organization, FAOSTAT.

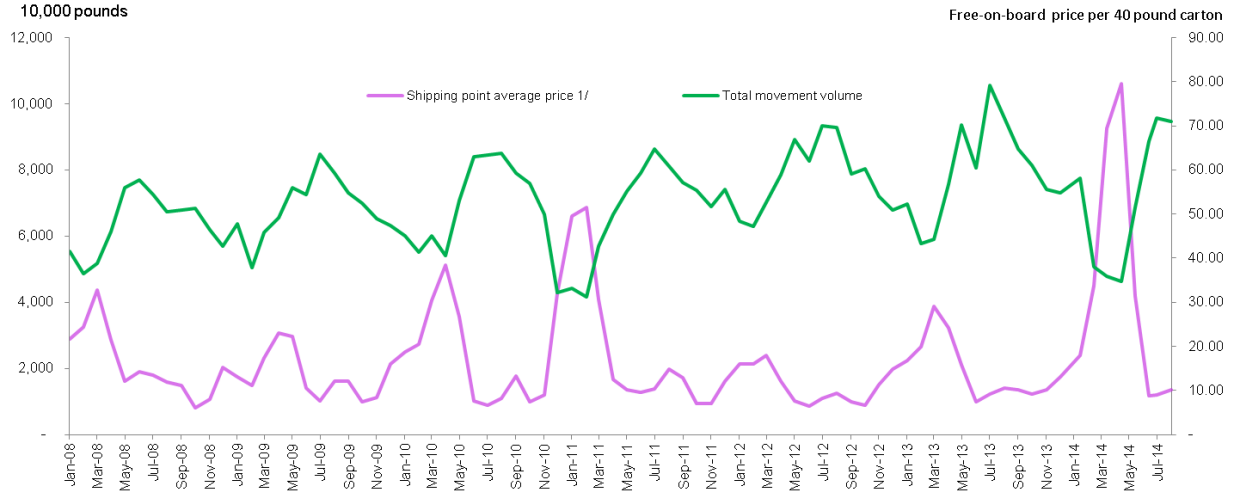
The North American Free Trade Agreement (NAFTA) has worked in favor of Mexico's lime production, as demonstrated by post-1994 production increases immediately following NAFTA implementation. However, a majority of limes produced in Mexico serve the domestic market. Mexico, on average, consumed 59 percent of all lemons and limes produced in the country, according to USDA's FAS, *Citrus World Markets* report from January 2014. While Mexico is the largest supplier of fresh limes into the United States, the country only exported an average of 19 percent of limes out of the total lemon/lime production during the 2008/09-2012/13 time period, based on UN/FAO's production data and U.S. Census Bureau trade data. Lemons are included in the total production figure, but when measured by imports to the United States, lemons amount to just 6 percent of total in 2013.

The 2014 Price Spike

In March of 2014, U.S. consumers and media took notice to the rapidly increasing retail lime prices at the grocery stores. Even wholesalers and distributers saw a jump in wholesale prices, leading some restaurants and bars to limit the use of limes. Using AMS's data of shipping-point free-on-board (f.o.b.) prices for fresh limes coming from Mexico through Texas were at their highest levels since at least the winter of 2001 (fig. 7). F.o.b. prices seem to jump in early spring, at the same time there is a visible dip in supplies entering the domestic market. Usually these price spikes occur rapidly and dissipate rapidly, and are relatively minor jumps of up to double the price. Exacerbating the typical price pattern was heavy rainfall in Veracruz in the fall of 2013 which led to the smaller Persian lime harvest in Mexico[2] last winter, making what is usually just a slight jump in prices to a very steep spike (USDA/FAS, 2013).

The shipping-point f.o.b. average price peaked in April 2014 at $79.65 per 40 pound carton, over 3-times higher than in April 2013. National average advertised retail prices reported by AMS show that prices climbed to $1.02 per lime in April 2014, a 3.5 fold increase from April 2013's price of $0.29 per lime (AMS market news portal, accessed June 2014). By June 2014, the national average advertised retail price was $0.45 per lime, a 56 percent drop from April's peak price of $1.02. The June 2014 price of $0.45 per lime remained almost double the June 2013 price of $0.24. Only 42 stores reported advertised retail prices to AMS in April 2014, with 3,100 stores in April 2013, demonstrating further supply shortage last spring.

Figure 7
Lime shipping point monthly average price and total movement from Mexico entering in Texas, January 2008 to August 2014



1/ Each monthly price point is the midpoint between the highest and lowest prices each month, including all sizes.
Source: USDA, Agricultural Marketing Service, Fruit and Vegetable Market News Portal, September 2014. http://marketnews.usda.gov/portal/fv

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[2] The USDA/FAS Mexico Citrus attaché report will not be out until December with the final production figures for 2012/13 season that would include the final lime estimate.

In popular press, there was speculation of cartel involvement with the state of Michoacán being home to a large cartel. However, Michoacan produces mostly key limes which are not heavily exported to the United States. The decline in production for both Key and Persian limes, due mostly to unfavorable weather, was the main driver behind the price spike.

Summary

Three major lime varieties are grown commercially around the world, with Persian limes being of the most important to the United States consumer. While Key limes are consumed more heavily in Mexico and India, along with makrut limes, demand is growing for alternative lime varieties in the United States but the market remains dominated by Persian limes. Production is increasing globally, with demand remaining strong both in the United States and abroad. Mexico is the major supplier and producer of limes consumed in the United States while other Central and South American countries serve as minor sources. The United States lime industry once thrived as a niche market but after several years battling with the citrus canker disease and other complications such as cold weather, labor issues, inability to fully meet domestic demand, the acid lime industry ultimately contracted, having little to no commercial production remaining after 2002. U.S. lime imports from Mexico demonstrated strong growth since early 1990s, aiding in promoting consumption in the United States. Per capita use in the United States continued on an upward trend, reaching almost 3 pounds per person in 2012/13, an over-sevenfold increase compared to 1980/81 per capita of 0.42 pounds per person. Even with occasional price spikes related to weather and socio-economic issues in Mexico, U.S. demand remains high for limes and should continue to be an important commodity in the future, as the domestic population continues to diversify, especially with increased Hispanic citizens and American's growing love for exotic and healthy foods.

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United States Department of Agriculture

Economic Research Service

Situation and Outlook

FTS-357SA

Sept. 26, 2014

Fruit and Tree Nuts Outlook: Economic Insight

U.S. Pollination-Services Market

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Approved by the World Agricultural Outlook Board.

Pollination Market Overview

Insect pollinators transfer pollen to flowers and assist with the fertilization of a diverse array of flora from alfalfa to zucchini (Crane and Walker, 1984; Morse and Calderone, 2000). For some flowering plants, such as almonds and apples, abiotic processes, like wind, are largely ineffective for transferring pollen for reproductive purposes, rendering these plants dependent on insects for pollination (National Research Council, 2007). Such pollinator-dependent crops often require the services of commercial bee hives, which growers rent from beekeepers who then place the hives in cultivated fields and orchards at prescribed rates (Klein et al., 2007). In North America, *Apis mellifera*, otherwise known as the European honey bee, is largely preferred over other pollinators (e.g., bats, wasps, and butterflies) due to the relative ease of transporting population-dense colonies of active honey bees throughout the growing season (National Research Council, 2007).

Pollination Industry at a Glance

According to the U.S. Department of Labor, Bureau of Labor Statistics (BLS) *Quarterly Census of Employment and Wages* report, the equivalent of 2,552 individuals were employed full time in the U.S. apiculture or beekeeping sector in 2012. A total of 387 establishments were counted among those engaged in private commercial apiculture activities in the same year (DOL/BLS, 2014). Among all States, California claims the largest number of registered beekeeping operations (110) that use honey bees for pollination services. Registrations in Texas, Florida, North Dakota, South Dakota, and Montana combine to account for an additional 133 beekeeping operations. Collectively, 63 percent of all private beekeeping entities in the United States are registered in these 6 States, an indication of the importance of pollination services to crop cultivation in these areas. In addition, the Upper Midwest States provide floral resources to foraging honey bees in the summer. Based on service fee data gathered from crop- and location-specific enterprise budgets, USDA/National Agricultural Statistics Service (NASS) production estimates, consultation with extension agents, members of the beekeeping industry, and university researchers, gross revenue from pollination services in 2012 is estimated at $655.6 million.

Almonds Account for Nearly Half of Collected Pollination Fees

The aggregated 2012 national-level pollination fee data reflect the findings of Caron (2011) and Caron and Sagili (2011) in terms of the relative importance of almond pollination to the commercial honey bee industry. Total almond pollination fees accounted for 45 percent of total fees collected in the same year (table 1).

Sunflowers are the second largest source of pollination fees, yet claim a comparably small 17 percent of total fees. The importance of almonds to the pollination services sector is clear; however, it is also apparent that a relatively small number of crops, compared to the total number that benefit from honey bee pollination, are responsible for generating the majority of pollination service revenues. Pollination of almonds, sunflowers, canola, grapes, and apples collectively acount for an estimated 88 percent of all pollination fees collected in the United States. Producers of the top 10 crops paid nearly 96 percent of all fees charged in 2012 (table 1).

The Provision of Pollination Services

The services of commercial honey bee pollinators are commonly arranged through a broker, and most beekeepers work on a contractual basis (Caron and Sagili, 2011). Brett Adee, one of the largest commercial beekeepers in the United States with more than 60,000 hives, notes that contract terms typically cover frame strength (measured in numbers of frames containing adult bees per hive, ranging from 6 to 12), pollination fee(s), date(s) of service, and various contingencies (Champetier, 2011). Contracted bees are transported to pollination sites by truck and can be shipped across the country on tractor trailers which typically carry between 400 and 500 hives each (Delaplane et al., 2013; Adee, 2014). Individual hives contain a single queen and commonly include between 10,000 and 30,000 worker bees, depending on the number of frames and hive health; by midsummer, a colony can include as many as 50,000-60,000 worker bees (Pettis, 2013; Sagili and Burgett, 2012).

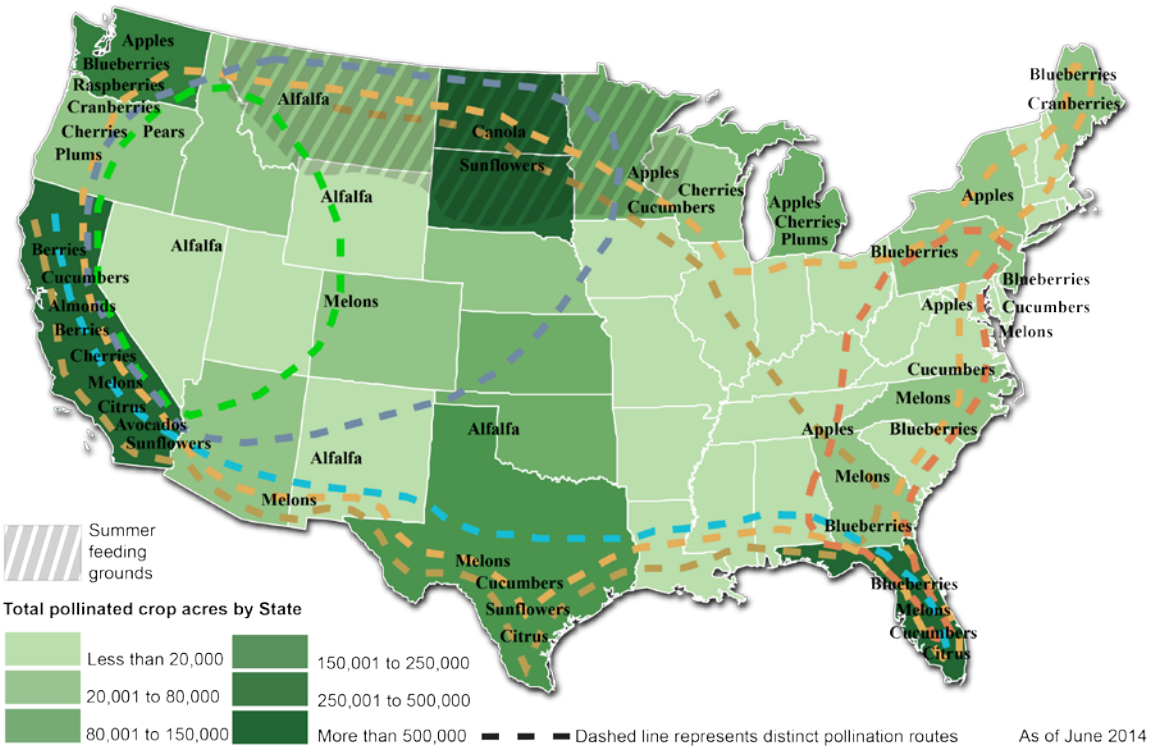
To minimize losses during transport, hives are covered with nets and loaded at night or before sunrise when bees are in their hives and relatively inactive (Drummond, 2002; Delaplane et al., 2013). Within particular fields, hives are placed in locations that maximize pollination potential while minimizing environmental stresses and pesticide exposure (Delaplane, 2010; Pettis, 2013; Adee, 2014). Numbers of hives placed per acre are typically prescribed according to crop type and in correlation to the number of flowers per acre that require pollination (Calderone, 2012). However, bees are known to fly 2 to 3 miles to forage, so neighboring producers with adjacent fields may also benefit from uncompensated pollination services (Delaplane et al., 2013; Pahl et al., 2011). The length of stay varies by crop and weather, though 3 to 5 weeks are typically required for bees to sufficiently pollinate a given crop (Adee, 2014).

Table 1: Top ten sources of pollination fees and shares in U.S., 2012

Crop	Pollination fees charged	Proportion of total collected fees
	---U.S. dollars---	*---Percent---*
Almonds	292,500,000	44.6
Sunflowers	110,460,000	16.8
Canola (seed)	108,927,000	16.6
Grapes	43,294,500	6.6
Apples	23,601,600	3.6
Sweet cherries	13,452,450	2.1
Watermelons	10,462,500	1.6
Dried prunes	8,525,000	1.3
Cultivated blueberries	8,215,200	1.3
Avocados	7,446,000	1.1
Total Top 10	***626,884,250***	**95.6**
Other Crops	*29,195,133*	4.4

Source: USDA, Economic Research Service calculations using data from USDA, Natural Resources Conservation Service and USDA, QuickStats data portal.

Figure 1: Pollinator movements and crops in the United States



Source: Adapted by USDA, Economic Research Service from Kautzmann (2011), with input from commercial beekeepers and apiculture experts, including Dr. Jeff Pettis and Dr. David Epstein, an entomologist and authority on pollinators with the USDA's Office of Pest Management Policy. Crop production acres are from USDA, NASS, 2012 Agricultural Census, 2014.

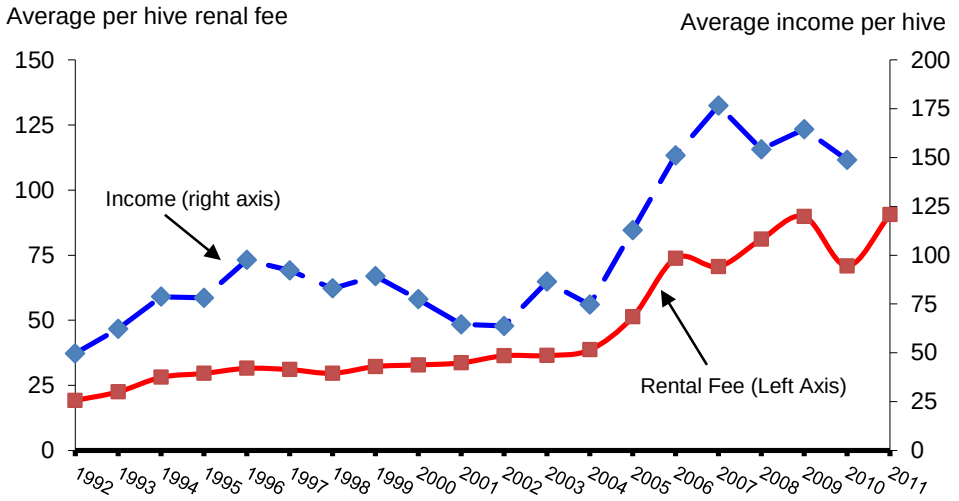
Commercial beekeepers tend to be semi-nomadic, often driving long distances to service clients' crops during peak bloom periods (Adee, 2014). Several common migration routes includes a stop in California to pollinate the almonds in early spring, between February and March (fig. 1). An estimated 60 to 75 percent of all U.S. commercial hives are employed for the State's almond bloom, and apiarists bring hives from as far away as Florida and Texas (Horn, 2006; Souza, 2011). Migratory paths diverge after the almond bloom; some beekeepers move their colonies north to service specialty crops, while others depart for Southern and Eastern U.S. locations or remain in California for their bees to forage in citrus groves and other nectar-rich locales. An estimated 65-80 percent of the Nation's commercial hives spend part of the summer in North and South Dakota, Montana, and Minnesota (Adee, 2014; USDA/NRCSa, 2014). At the end of the pollination season, hives are typically returned to overwintering sites in Southern States.

Average Pollination Fees on the Rise

Pollination fees for select crops have risen significantly in recent years (Carman, 2011). The average rental rate for a single honey-bee colony for almond pollination increased from $76 in 2005, just prior to a surge in honey-bee overwinter loss rates, to an average of $157 per hive in 2009, when a then all-time high was observed. The cost of honey-bee almond pollination services is believed to have risen in connection with increased costs of maintaining hives in the midst of an industrywide overwintering loss epidemic which is attributable to, but not limited to, colony collapse disorder (CCD) and in response to inelastic demand for pollination services, particularly for almonds (Carman, 2011; Rucker et al., 2012).

Spanning 26 years, an annual survey of commercial and semi-commercial beekeepers registered in Oregon, Washington, and Idaho provides further evidence of increases in pollination fees over time. Until 2004, rental rates appear relatively stable; between 2004 and 2005, per hive rental fees increased by 33 percent (Caron and Sagili, 2011). For the next several years, pollination fees increased at an average annual rate of 13 percent and contributed to an increase of 176 percent in the average per-hive pollination fee between 2000 and 2011 (from $32.85 to $90.62)

Figure 2: Average Pacific Northwest hive rental fee and income: 1992-2011



Sources: M. Burgett, 2011; D.M. Caron, R. Sagili, and M. Cooper, 2012.

(fig. 2). Much of the increase in pollination fees is attributable to expanded pollination of almond crops, which command a premium relative to fees charged for the pollination of other tree and row crops (Caron and Sagili, 2011; Caron et al. , 2012).[1] This premium is a function of the limited commercial value of honey produced from almond pollination and the higher management costs associated with preparing hives to pollinate an early-season bloom. Pollination fees can be reduced when valuable honey production results from forage activities (Browning, 2013; Cheung, 1973; and Rucker et al., 2012).

In 2010, hive rentals for the pollination of the California almond crop accounted for 27 percent of all rentals made by Pacific Northwest (PNW) beekeepers included in the Caron and Sagili (2011) sample and 52 percent of all rental income in the same region. The California almond bloom occurs before the bloom for a number of other fruit, nut, and row crops in the region (typically February thru March), and PNW hives have a shorter distance to travel to blooming orchards in Washington and Oregon than Southern and Eastern U.S. hives that also provide services for the almond bloom. Following the almond bloom, a relatively large number of commercial pollinators are in the PNW, resulting in lower pollination fees for regional row and orchard crops than in other parts of the United States, where pollinator supplies are relatively less abundant at that time (Browning, 2014).

Summary

Through the provision of pollination services, honey bees support the cultivation of an estimated 90-130 crops, the harvest of which, directly and indirectly, accounts for up to a third of the U.S. diet (Berenbaum, 2007; Crane and Walker, 1984; McGregor, 1976). Gross revenue generated from employing managed bees for pollination services in 2012 totaled $655.6 million. Fees collected from almond pollination are the largest source of service revenue followed by sunflowers. In recent years, average pollination fees have generally increased with much of the rise being attributed to increases in almond fees. Fluctuations in pollination fees over time have been linked to recent honey bee health challenges including CCD and a variety of diseases which have served to increase beekeeper management costs. Fee variations across crops are a function of bloom time, pollinator supply, and the quality and volume of honey that can be produced from related honey bee foraging activities.

[1] Honey bees make honey by first visiting flowers and gathering nectar that is then stored in a special "honey" stomach. In the honey stomach, enzymes convert (via inversion) sucrose in the nectar to glucose and fructose. Once the bee returns to the hive, the stomach mixture is then regurgitated into a cell of a honeycomb, after which, worker bees repeat the consumption and regurgitation process. Later, worker bees fan the inverted nectar with their wings to speed evaporation within the cell of the honeycomb. When the honey has evaporated to contain between 14-18 percent water, the cell is capped with wax and sealed. (Adapted from National Honey Board, 2014)

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