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Vegetables and Pulses Outlook

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Falling Exports More Than Offset Production Declines to Raise Per Capita Availability

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Domestic availability of vegetables grew slightly in 2017, due primarily to a steep decrease in exports. Per capita availability of fresh vegetables in the United States climbed to 188 pounds; up about 1 pound from 2016 levels. Similarly, per capita availability of processed vegetables grew to just over 200 pounds; up just over 3 pounds from the previous year.

Export volumes for both fresh and processed vegetables fell in 2017, while import levels rose for fresh vegetables and remained relatively steady in the processed market. Lower exports, plus a large amount of beginning stocks of canned vegetables, helped to raise per capita availability and put downward pressure on the price of processed vegetables.

Overall domestic fresh vegetable production was down approximately 2 percent in 2017 from the previous year, and processed vegetables were down over 12 percent from 2016 levels. Crop yields were hindered by unpredictable weather patterns, which lowered 2017 production of fresh and processed vegetables.

Through early 2018, weather in major crop areas of California points to boosted yield potential, which, when coupled with current acreage, indicates higher production of fresh-market and processed vegetables. Additionally, imports for 2018 show continued signs of growth. Exports of fresh vegetables also seem poised to surpass 2017 levels, while exports of processed vegetables remain depressed.

In 2017, dry conditions in key production regions sapped yields for nearly all pulse crops, driving down production. Despite reduced drought concerns, pulses planted area is forecast down in 2018. All dry bean area is forecast to decline by 7 percent, while dry peas and lentils planted areas are projected down 20 and 28 percent, respectively. Only chickpea planted area is forecast to rise, up 7 percent from 2017. Gains in chickpea area come despite the Indian Government's imposition of tariffs on dry peas and lentils, which has dramatically affected U.S. exports to the country.

Approved by USDA's World Agricultural Outlook Board

Industry Overview

Table 1: U.S. vegetable and pulse industry at a glance, 2015-18[1]

Item	Unit	2015	2016	2017p	Percent change 2016-17	2018f
Area harvested						
Vegetables, fresh	1,000 acres	1,392.8	1,589.3	1,434.2	-9.8	1,511.8
Vegetables, processing	1,000 acres	1,075.8	1,245.9	1,171.3	-6.0	1,171.5
Potatoes	1,000 acres	1,054.4	1,018.3	1,025.5	0.7	1,021.9
Dry beans, peas and lentils	1,000 acres	3,290.9	3,793.9	4,085.2	7.7	3,519.3
Other[2]	1,000 acres	156.5	166.6	162.4	-2.5	164.5
Total	**1,000 acres**	**6,970.3**	**7,814.0**	**7,878.7**	**0.8**	**7,389.0**
Production						
Vegetables fresh	Million cwt	357.8	363.1	356.8	-1.7	360.0
Vegetables processing	Million cwt	402.5	377.5	330.9	-12.4	340.8
Potatoes	Million cwt	440.5	441.4	441.3	0.0	441.4
Dry beans, peas and lentils	Million cwt	53.6	69.3	57.5	-17.0	56.2
Other[2]	Million cwt	40.4	41.0	45.0	9.8	43.0
Total	**Million cwt**	**1,294.7**	**1,292.3**	**1,231.5**	**-4.7**	**1,241.2**
Crop value						
Vegetables fresh	$ millions	11,698.9	9,825.3	10,706.2	9.0	10,908.1
Vegetables processing	$ millions	2,234.2	1,926.5	1,707.7	-11.4	1,750.1
Potatoes	$ millions	3,858.8	4,008.0	4,545.5	13.4	4,224.0
Dry beans, peas and lentils	$ millions	1,217.7	1,508.4	1,409.0	-6.6	1,435.3
Other[2]	$ millions	1,813.5	1,785.2	1,891.2	5.9	1,833.8
Total	**$ millions**	**20,823.1**	**19,053.3**	**20,259.6**	**6.3**	**20,151.3**
Unit value[3]						
Vegetables fresh	$/cwt	32.70	27.06	30.00	10.9	30.30
Vegetables processing	$/cwt	5.55	5.10	5.16	1.2	5.14
Potatoes	$/cwt	8.76	9.08	10.30	13.4	9.57
Dry beans, peas and lentils	$/cwt	22.72	21.78	24.50	12.5	25.55
Other[2]	$/cwt	44.94	43.59	42.06	-3.5	42.69
Total	**$/cwt**	**16.08**	**14.74**	**16.45**	**11.6**	**16.23**
Imports						
Vegetables fresh	$ millions	6,617.8	7,486.2	7,354.0	-1.8	7,338
Vegetables processing[4]	$ millions	3,067.0	2,519.0	2,618.3	3.9	2,746
Potatoes	$ millions	1,150.1	1,242.9	1,367.3	10.0	1,558
Dry beans, peas and lentils	$ millions	224.5	120.9	133.0	10.1	131
Other[5]	$ millions	745.8	1,675.6	1,694.6	1.1	1,569
Total	**$ millions**	**13,044.6**	**13,044.6**	**13,167.2**	**0.9**	**13,342**
Exports						
Vegetables fresh	$ millions	2,087.0	2,113.8	2,153.0	1.9	2,220.7
Vegetables processing[4]	$ millions	1,811.4	1,585.4	1,511.7	-4.6	1,483.3
Potatoes	$ millions	1,671.8	1,737.5	1,814.6	4.4	1,709.6
Dry beans, peas and lentils	$ millions	700.2	743.0	568.7	-23.5	615.7
Other[5]	$ millions	529.4	917.2	1,095.2	19.4	236.1
Total	**$ millions**	**6,799.9**	**7,096.9**	**7,143.3**	**0.7**	**6,265.5**
Per capita availability						
Vegetables fresh	Pounds	141.7	144.4	145.0	0.4	143.0
Vegetables processing	Pounds	101.2	107.7	116.3	8.0	109.3
Potatoes	Pounds	115.3	110.0	115.8	5.2	112.9
Dry beans, peas and lentils	Pounds	8.4	9.0	11.2	24.1	9.5
Other[2]	Pounds	11.5	11.2	11.9	6.7	11.2
Total	**Pounds**	**378.1**	**382.5**	**400.7**	**4.7**	**386.4**

f = forecast; p = preliminary; cwt = hundredweight, a unit of measure equal to 100 pounds. [1]Total rounded. [2]Includes sweet potatoes and mushrooms. [3]Ratio of total value to total production. [4]Includes canned, frozen,

and dried. Excludes potatoes, pulses, and mushrooms. [5]Other includes mushrooms, sweet potatoes, and vegetable seed. All trade data are on a calendar-year basis.

Sources: USDA, Economic Research Service using data from USDA, National Agricultural Statistics Service, Crop Production, Acreage, Agricultural Prices, Crop Values, Mushrooms, and Potatoes; and U.S. trade data from U.S. Department of Commerce, U.S. Census Bureau.

U.S. Vegetable Production

In 2017, the United States produced about 11.7 billion pounds of commercial vegetables (including mushrooms and potatoes), down 4 percent from 2016, with a value of over $18.9 billion and harvested area of about 3.8 million acres. The three leading crops, including fresh and processed, were potatoes (44 billion pounds), tomatoes (22 billion pounds), and lettuce (8.5 billion pounds), which combined accounted for approximately two-thirds of total production volume. Production value increased 7.4 percent from a year earlier due to increasing domestic prices for most fresh-market and processing vegetables.

Fresh-market vegetables down slightly

Excluding potatoes, sweet potatoes, and mushrooms, the United States produced 35.7 billion pounds of fresh vegetables in 2017, down almost 2 percent from a year earlier. This continues a gradual decline of 16 percent from the most recent peak in 2004. California leads the country in total vegetable output, accounting for 57 percent of total annual utilized production of all vegetables in the United States.

Behind California, Washington and Arizona contributed 5.5 and 5 percent, respectively, to total output of fresh vegetables. The four largest fresh-market crops, in terms of volume, in 2017 were onions, head lettuce, tomatoes, and romaine lettuce, which combined accounted for 48 percent of the total production (table 2).

Tomatoes, head lettuce, and romaine lettuce claimed the highest values of utilized production in 2017, generating $1.7 billion, $1.6 billion, and $1.4 billion of farm value, respectively. California growers accounted for 56 percent (or $7.9 billion) of vegetable farm value of utilized production, followed by Arizona with 12 percent. Total U.S. utilized production farm value increased almost 6 percent to $13.8 billion in 2017 due to higher prices for numerous fresh and processed vegetables.

Table 2: Annual U.S. production of selected fresh-market vegetables

Commodity	2015	2016	2017p	Change 2016-17
	---------- *Million pounds* ----------			*Percent*
Artichokes[1]	91.8	98.6	93.6	-5
Asparagus	47.4	58.5	52.0	-11
Beans, snap	395.2	411.5	362.0	-12
Broccoli	2,110.4	2,154.8	1,991.6	-8
Cabbage[2]	2,017.8	1,885.4	1,906.5	1
Carrots	2,574.0	2,220.0	2,081.0	-6
Cauliflower	651.1	700.5	805.9	15
Celery[1]	1,891.7	1,751.0	1,595.8	-9
Corn, sweet	2,795.2	2,334.7	2,462.7	5
Cucumbers	672.5	759.3	531.9	-30
Garlic[1]	408.9	451.5	511.5	13
Lettuce				
Head	4,310.8	4,565.1	4,282.6	-6
Leaf	1,233.5	1,328.6	1,101.2	-17
Romaine	2,542.1	3,008.6	3,075.0	2
Onions[1]	5,728.4	6,316.9	6,726.0	6
Peppers, bell[1]	1,515.5	1,451.9	1,471.7	1
Peppers, chile[1]	403.4	471.2	423.3	-10
Pumpkins[2]	1,091.4	1,679.3	1,566.0	-7
Spinach	607.6	649.4	602.6	-7
Squash[1]	601.6	601.2	581.8	-3
Tomatoes	3,342.6	2,830.9	2,845.4	1
Selected total	**35,032.9**	**35,728.8**	**35,069.9**	**-2**

p = preliminary. [1] All uses. [2] Beginning in 2016, NASS reports fresh and processed separately.
Source: USDA, Economic Research Service using data from USDA, National Agricultural Statistics Service (NASS).

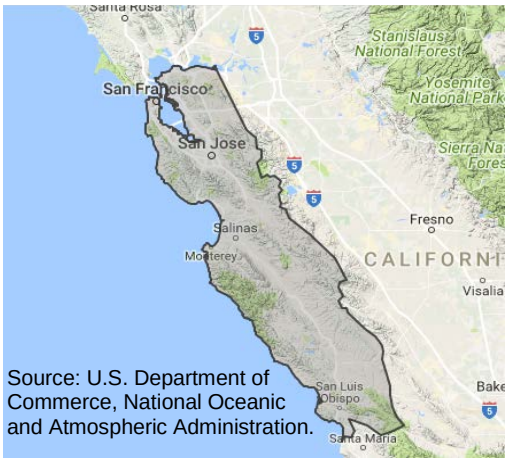
Production increases in 2017 for cabbage, cauliflower, sweet corn, garlic, romaine lettuce, onions, bell peppers, and tomatoes were offset by declines in artichokes, asparagus, snap beans, broccoli, carrots, celery, cucumbers, head lettuce, leaf lettuce, chile peppers, pumpkins, spinach, and squash, to generate an overall decline of approximately 2 percent for fresh vegetables.

A 7-percent harvested area gain boosted U.S. production of romaine lettuce to 3.1 billion pounds in 2017, up 2 percent from the previous year despite average yields declining to below trend levels. The spring and summer romaine crop is partially situated in the Central Coast California Climate Division as defined by the National Oceanic and Atmospheric Administration (NOAA) (fig. 1). Yield potential in this major California growing area was likely hindered by

precipitation well below normal in May-June 2017, coupled with above normal temperatures. The California spring and summer romaine crop constituted 54 percent of total romaine shipments during 2017. Historically, March precipitation and May temperatures have been shown to affect romaine lettuce yield potential.

Figure 1

Central Coast California Climate Division



Source: U.S. Department of Commerce, National Oceanic and Atmospheric Administration.

As of April 20, 2018, the Centers for Disease Control and Prevention (CDC) is warning customers not to buy or consume all types of romaine lettuce produced in Yuma, AZ. This is in response to a national outbreak of *E. coli* O157:H7, which so far includes 53 confirmed cases across 16 States. Arizona is the second largest domestic producer of romaine lettuce, contributing about 30 percent (924 million lbs.) of domestic production. This follows the Canadian outbreak of *E. coli* O157:H7 in November and December 2017, also linked to romaine lettuce, which included 42 cases across 5 provinces (Public Health Agency of Canada).

Looking forward, the actual March 2018 precipitation amount and projected normal May 2018 temperatures point to higher 2018 romaine lettuce production if acreage levels are consistent with 2017.

Processing-market vegetables fall sharply

Production of vegetables for the processing market (excluding potatoes and mushrooms) totaled 32.1 billion pounds in 2017—down 11 percent from 2016. The majority of individual processing crops reported volume declines, led by tomatoes, which declined 17 percent in 2017 and constituted 70 percent of total processing vegetables (table 3). However, with imports of canned vegetables at record levels, exports at their lowest in a decade, and high beginning stocks, the loss in production did not translate to lower domestic use in 2017 for total processing vegetables.

Currently below normal precipitation and near normal temperatures in the region during 2018 plantings indicate a potential boost to yields to support higher production in 2018.

Table 3: Annual U.S. production of selected processing vegetables

Item	2015	2016	2017p	Change 2016-17
	--------- *Million pounds*		----------	*Percent*
Beans, lima	100.5	74.7	71.6	-4
Beans, snap	1,529.8	1,585.0	1,436.7	-9
Carrots	588.0	930.3	950.4	2
Corn, sweet	4,976.2	5,221.3	5,432.3	4
Cucumbers	1,066.9	1,041.0	1,456.8	40
Peas, green[1]	822.6	621.9	527.9	-15
Spinach	150.4	154.1	129.4	-16
Tomatoes	29,508.7	26,453.7	22,011.7	-17
Dual uses:				
Asparagus	15.5	16.0	14.9	-7
Broccoli	78.4	91.8	47.6	-48
Cauliflower	4.8	17.2	33.3	93
Selected total	**38,841.9**	**36,207.2**	**32,112.5**	**-11**

p = preliminary. [1] All uses.

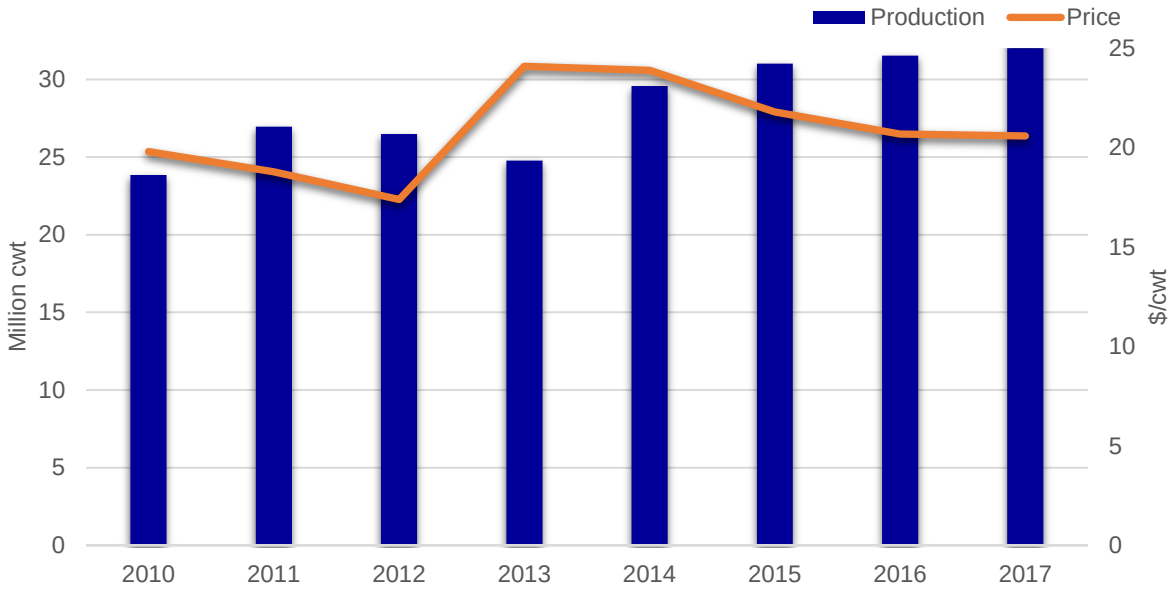
Source: USDA, Economic Research Service using data from USDA, National Agricultural Statistics Service.

Market Highlights

Sweet potato price continues slide as production climbs

In 2016, the United States produced over 3.6 billion pounds of sweet potatoes, with a value of $733 million. Production in 2017 was 13 percent larger than 2016 and represents a continued record high for the sector (fig. 2). Expanded production was largely driven by increases in North Carolina (up 259 million lbs.) and Louisiana (up 66.5 million lbs.), which accounted for 55 percent and 6 percent of the total domestic production, respectively. California, the second largest producer of U.S. sweet potatoes at 18 percent, experienced a 5-percent increase in output (up 31 million lbs).

Figure 2
U.S. sweet potato production and price, 2010-17



cwt = hundredweight, a unit of measure equal to 100 pounds.

Source: USDA, Economic Research Service using data from USDA, National Agricultural Statistics Service Crop Production 2017 Summary.

Although area harvested declined over 2 percent to 159,300 acres, it is the second highest area behind the record set last year. The decline in harvested acres was driven by North Carolina, where area fell almost 6 percent. The decline in acres harvested, however, was offset by increased yields, especially in North Carolina, where yields grew over 20 percent to 220 hundredweight (cwt) per acre, equaling the high set in 2014.

Record supply and availability in 2017 continued downward pressure on sweet potato prices. At $20.60, the 2017 price was $0.10 below the previous year.

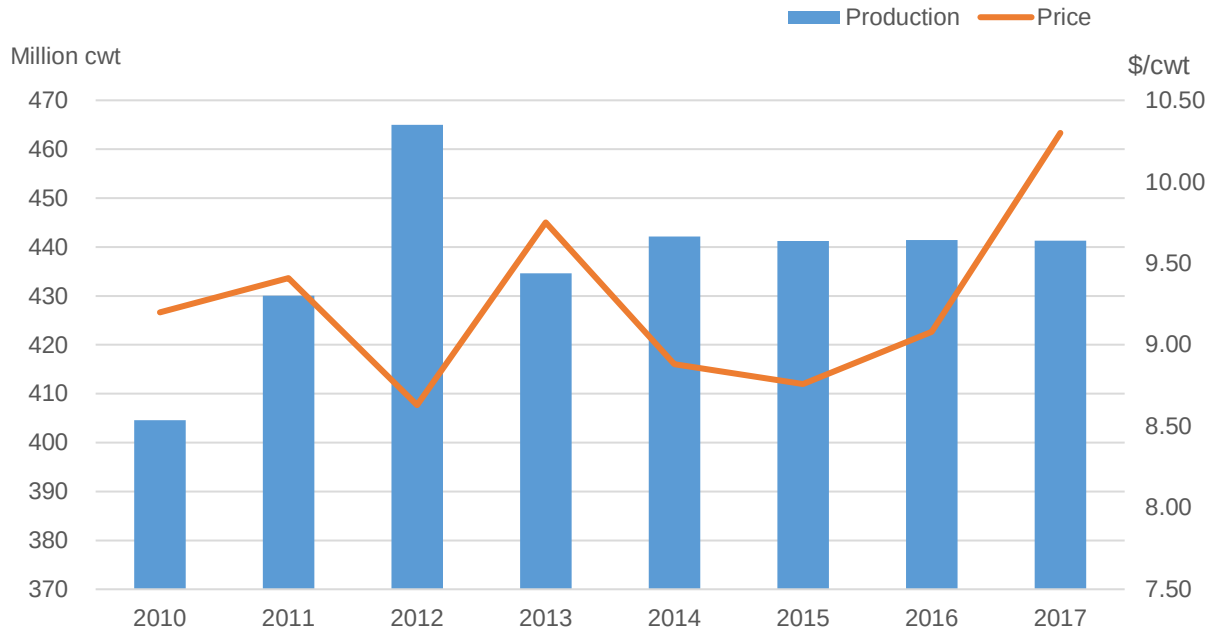
Record all-potato price despite level production

Total potato production in 2017 remained unchanged from the previous year at 44 billion pounds (fig. 3). During this period, harvested area increased 1 percent from 2016 levels, while average yield per acre fell slightly to 430 cwt per acre, the second highest behind 2016. Idaho (accounting for 30 percent of production output), Washington (22 percent), and Wisconsin (5 percent) remained the top producing States. Production varied across potato products. Fresh table stock rose 1 percent, to 11 billion pounds, from the previous year, and potatoes for processing increased by 7 percent, to 28 billion pounds.

Production value in 2017 rose slightly, due to a 13-percent increase in average price, to $10.30 per cwt for the United States as a whole, a record high for all potato price received. The increase was driven by increases across a majority of potato-producing States, notably Idaho and Washington.

With prospective plantings for spring potatoes declining, 2018 production is expected to decline slightly from 2016/17 levels under a trend yield scenario.

Figure 3
Production and price of all potatoes, 2010-17



Source: USDA, National Agricultural Statistics Service (NASS) using data from USDA, NASS Potatoes 2016 Summary.

U.S. Vegetable Trade

In 2017, the United States exported $5.5 billion in vegetable products and imported $11.7 billion. During the same period, about one-quarter of U.S. fresh-market vegetable supplies (including potatoes and mushrooms) were imported, while 20 percent of processed vegetables were supplied by imports. In 2017, fresh-vegetable exports, as a share of supply, remained relatively steady at approximately 6 percent. The United States has had a negative net vegetable trade balance since 2001.

Based on early trade data (year-to-date), 2018 seems poised to slightly surpass 2017 vegetable trade levels for imports and lag behind 2017 exports.

Fresh-market vegetable imports up slightly, while exports fall

In terms of value, the U.S. fresh-market vegetable trade deficit stabilized in 2017 as the value of fresh-vegetable imports declined and exports expanded from the previous year. Imports of fresh-market vegetables fell 2 percent from 2016 to $7.4 billion in 2017. Mexico accounted for 70 percent of the 2017 fresh-vegetable import value, followed by Canada (18 percent), Peru (4 percent), and Guatemala (2 percent).

The value of fresh-market vegetable exports from the United States increased 2 percent to $2.2 billion in 2017, largely due to small growth in the large Canadian market and expanding market shares in Mexico. Canada grew its market share in 2017 to over 74 percent, made up mainly of lettuce (26 percent) and cauliflower (11 percent). The value of exports to Mexico rose by 35 percent over 2016, and Mexico accounted for 5 percent of U.S. fresh-vegetable export value, largely driven by fresh-market potatoes (31 percent) and onions (34 percent).

In 2017, about 31.6 percent of fresh vegetables utilized in the United States were imported, compared with about 8 percent in the early 1990s and 14.9 percent during the early 2000s. In terms of volume, fresh-vegetable imports rose 2.3 percent in 2017 to 16.2 billion pounds, lifted by product from Mexico and Canada, which together accounted for 91 percent of the total.

Table 4: Vegetable trade shares by year, 2015-17

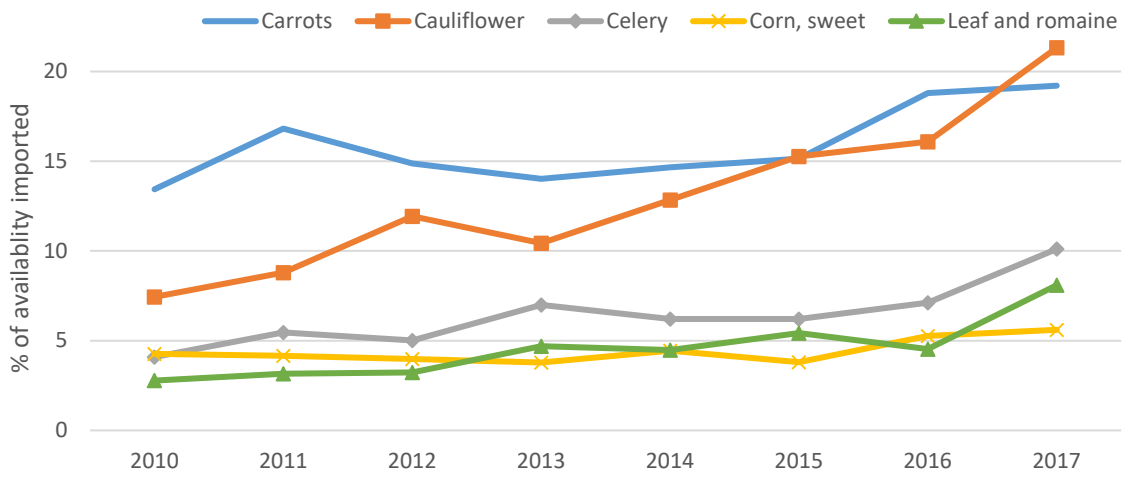
	2015	2016	2017p	Change 2016-17
Percent of availability imported	----------	*Percent*	----------	
Fresh vegetables[1]	29.0	31.3	31.6	1
Carrots	15.1	18.8	19.2	2
Cauliflower	15.3	16.1	21.3	33
Onions	18.3	19.4	16.2	-17
Garlic	58.9	70.1	59.5	-15
Head lettuce	7.0	6.4	6.2	-3
Leaf & romaine	5.4	4.5	8.1	78
Percent of supply exported				
Fresh vegetables[1]	6.1	6.3	5.9	-6
Carrots	6.0	6.4	6.0	-6
Cauliflower	30.5	35.0	26.0	-26
Onions	7.1	7.6	7.2	-5
Garlic	6.2	11.0	6.0	-46
Head lettuce	5.7	5.5	5.7	3
Leaf & romaine	10.9	9.4	9.4	-1

p = preliminary. [1]Excludes fresh potatoes, mushrooms, and sweet potatoes.
Source: USDA, Economic Research Service.

Waning demand for fresh vegetables from Canada caused total U.S. fresh-market export volume to fall more than 6 percent in 2017 to 3.1 billion pounds. Despite a reduction in volume, Canada maintains a 65-percent share of U.S. exports by volume. The drop in 2017 exports to Canada was led by onions, head lettuce, celery, and cauliflower, which combined were over 27 percent of fresh-market exports to Canada.

Overall, fresh imports as a percentage of domestic availability increased to 31.6 percent in 2017 from 31.3 percent in 2016 (table 4). This modest overall climb was driven by numerous fresh commodities continuing the trend of increasing import levels. Cauliflower, celery, and leaf & romaine lettuce all increased import percentage by more than 30 percent from 2016 to 2017 (fig. 4). Only one fresh-market commodity, head lettuce, has experienced decreasing imports as a percentage of domestic availability for the last 2 years.

Figure 4
Imports as a percentage of domestic availability for selected fresh vegetables, 2010-17



Source: USDA, Economic Research Service using data from U.S. Department of Commerce, U.S. Census Bureau.

Although these commodities still have a relatively small portion of domestic availability accounted for by imports, each near or below 20 percent, the continued climb of imports does not show signs of reversing in the near term.

Processing-market vegetable trade slows

The United States continues to be a net importer of canned, frozen, and dried vegetables (including mushrooms and potatoes) in terms of value. Import value, which totaled $5.1 billion in 2017, exceeded export value by $1.5 billion. The gain in import value continues to be driven by canned and frozen vegetables. In 2017, about 20 percent of processing vegetables utilized in

the United States were imported, compared with 8.7 percent in the early 1990s and 15.3 percent in the early 2000s.

Table 5: Vegetable trade shares by year, 2015-17

	2015	2016	2017p	Change 2016-17
Percent of availability imported	----------	*Percent*	----------	
Canned vegetables	17.5	17.3	15.7	-9
Cucumbers	8.2	8.8	7.5	-16
Sweet corn	2.4	3.3	2.8	-14
Tomatoes	7.5	7.2	6.3	-13
Frozen vegetables	40.4	41.1	38.7	-6
Carrots	3.1	5.7	5.5	-5
Sweet corn	9.7	8.2	8.3	1
Potatoes	22.3	25.0	25.6	2
Other processing[1]	7.1	8.0	9.2	14
Percent of supply exported				
Canned vegetables	14.9	14.2	13.1	-8
Cucumbers	8.4	8.4	6.6	-22
Sweet corn	16.5	16.2	16.3	1
Tomatoes	15.9	15.1	13.8	-9
Frozen vegetables	8.8	9.7	9.4	-4
Carrots	0.2	0.1	0.2	24
Sweet corn	11.8	13.5	12.8	-5
Potatoes	18.8	20.4	19.5	-4
Other processing[1]	20.7	18.7	18.2	-3

p = preliminary. [1]Includes dehydrated and chip products.
Source: USDA, Economic Research Service.

The decline of import share in U.S. processing-market vegetables in 2017 is due to both a slowing growth in canned imports and a drop in frozen imports (table 5). U.S. exports of canned vegetables to major trading partners declined, which left increased availability in the domestic market. Mexico, Japan, Italy, and Canada all declined between 2016 and 2017. The Canadian market for U.S.-produced canned vegetables fell in both 2016 and 2017 and represents about 43 percent of total volume.

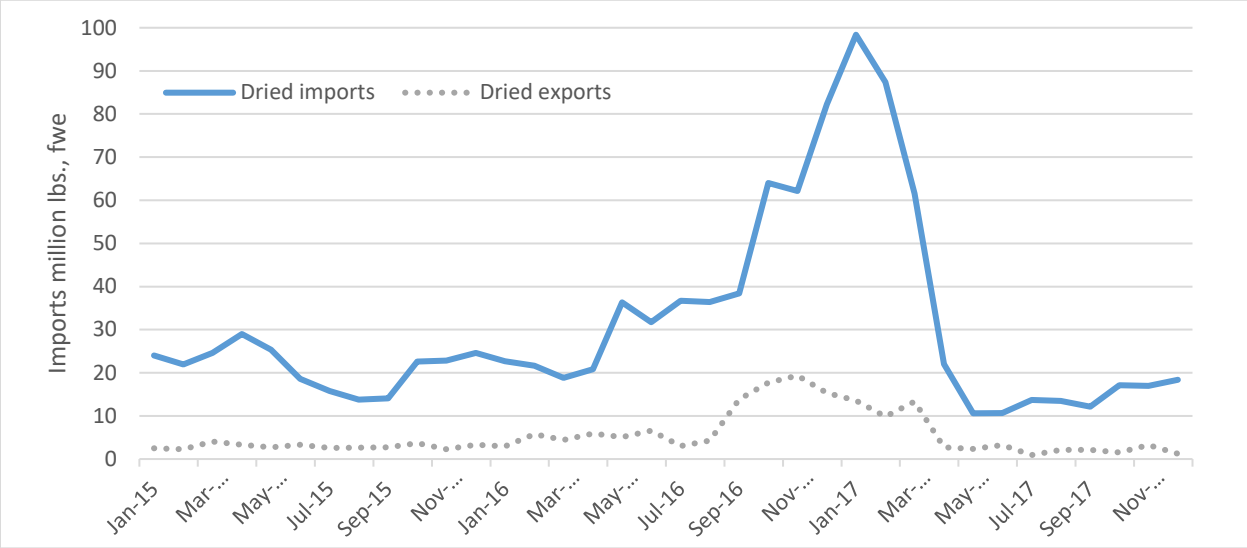
Market Highlights

Spike in dried garlic trade

Late 2016 to early 2017 saw a spike in the amount of dried garlic imported to and exported from the United States (fig. 5). China is the world's largest producer of garlic, and high prices and low

supply in 2016 encouraged overproduction the following year, which led to a reduction in the price of fresh garlic. This oversupply spilled into the market for dried garlic, viewed as a high-value-added outlet for fresh garlic, as its price was drastically reduced on the international market (fig. 6), which sparked increased global purchasing. Exports of dried garlic from the United States began to climb in September 2016, jumping nearly 10 million pounds in a single month (August to September 2016). Increased exports remained at approximately five times normal levels thorough March 2017. Much of the growth in U.S. dried garlic shipments was to markets such as Peru, India, Portugal, and Greece, where U.S. access was previously restricted due to the competitive global market.

Figure 5
Monthly imports and exports of dried garlic, 2015-17

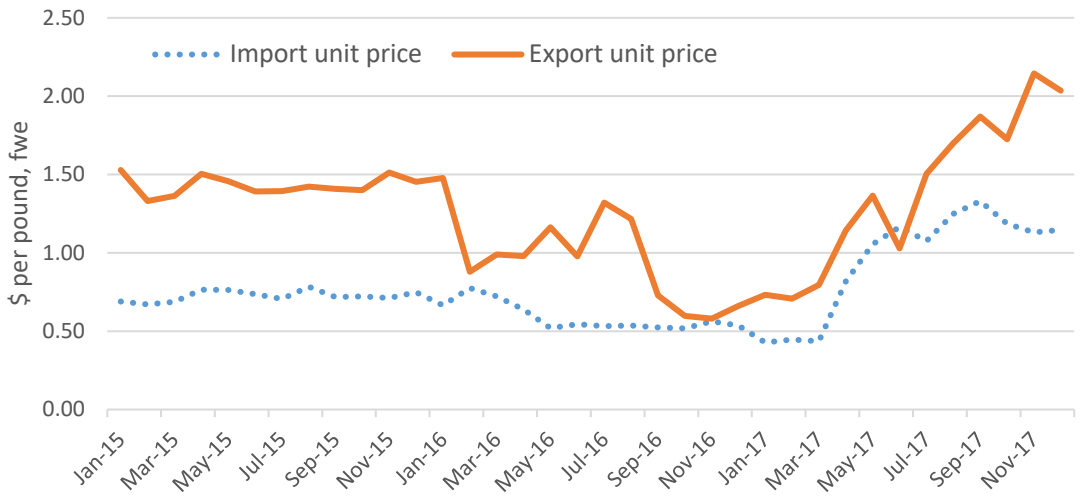


fwe = fresh weight equivalent.
Source: USDA, Economic Research Service using data from U.S. Department of Commerce, U.S. Census Bureau.

Almost simultaneously, imports began their climb around May 2016, dramatically increased in October 2016, and peaked in January 2017 at approximately 98 million pounds, fresh weight equivalent (fwe). Before and throughout this precipitous period, China accounted for over 95 percent of all dried garlic imported into the United States.

After the first quarter of 2017, both import and export volumes seem to have returned to normal levels, with many of the new markets closing up as their traditional supply channels were restored. However, after bottoming out around the first of 2017, import and export prices for dried garlic climbed through most of 2017.

Figure 6
Monthly imports and export value for dried garlic, 2015-17



fwe = fresh weight equivalent.
Source: USDA, Economic Research Service using data from U.S. Department of Commerce, U.S. Census Bureau.

U.S. Vegetable Prices

Fresh vegetable prices up in 2017

The overall season average price for fresh vegetables was up approximately 4 percent in 2017 from the previous year (table 6). However, average prices remained slightly below those seen in 2015. The overall price was lifted by some very large jumps in the price of bell peppers, broccoli, lettuce, spinach, and sweet corn. A significant portion of these price increases can be explained by flooding early in the year in California, which delayed the harvest of numerous leafy greens. This created a temporary shortage in the market and caused prices to spike around March and April 2017. Since then, average prices for many of the delayed crops have returned to within normal ranges. Although prices for some fresh commodities fell from 2016 to 2017 (artichokes, cauliflower, onions, and tomatoes), the dips in price were often less severe than the observed increases in other fresh commodities. In addition, reduced domestic production of fresh vegetables compared to the previous year generated net upward pressure on overall season average price.

Table 6: Season average price for selected fresh vegetables

	2015	2016	2017	% Change 2016-17
	---	$/cwt	---	Percent
Artichokes	87.80	78.80	70.00	-11
Asparagus	116.0	115.0	118.0	3
Broccoli	49.10	38.20	46.00	20
Cabbage	19.30	21.60	20.10	-7
Carrots	30.50	32.20	30.10	-7
Cauliflower	61.50	55.60	47.00	-15
Celery[1]	24.80	18.50	20.60	11
Corn, sweet	21.80	20.70	29.10	41
Cucumbers	26.10	25.90	29.50	14
Garlic[1]	78.50	74.00	76.30	3
Lettuce, head	29.10	27.30	36.40	33
Lettuce, leaf & romaine	25.19	16.42	19.47	19
Onions[1]	17.60	16.80	15.00	-11
Peppers, bell[1]	48.30	34.70	44.20	27
Spinach	56.50	52.10	64.50	24
Squash[1]	29.00	33.80	30.80	-9
Tomatoes	46.30	42.50	37.30	-12
Average	**45.14**	**41.42**	**43.20**	**4**

[1]All uses.
Source: USDA, Economic Research Services using data from USDA, National Agricultural Statistics Service, *Agricultural Prices*.

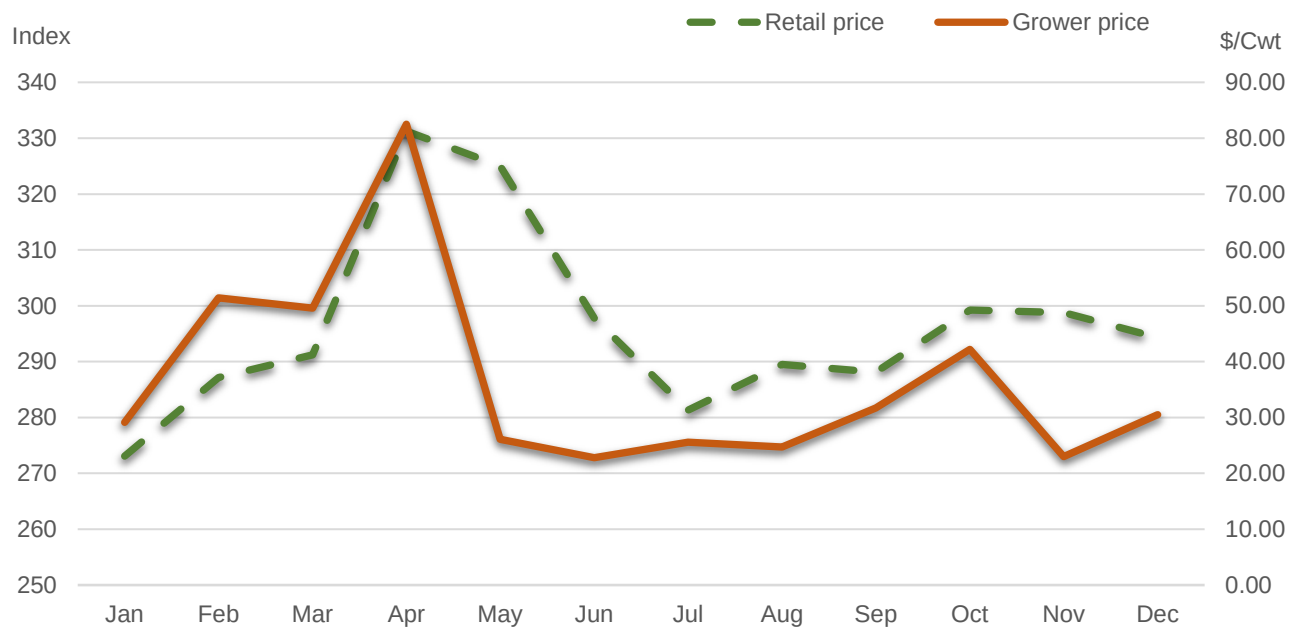
Market Highlights

Surge in spring lettuce prices

Both NASS and the Consumer Price Index (CPI) sent strong pricing signals for romaine lettuce during the April-May 2017 summer planting season for romaine. The grower price and retail index surged about 66 and 14 percent, respectively, in April to their highest levels in over a decade (fig. 7). The grower price retuned to within historical normal levels in the next month, but retail prices were slower to return.

The spring crop encountered record precipitation at the start of harvest in April, and the summer crop saw extreme wetness at the start of planting during the same time. The period for both crops represents the highest precipitation amounts in the region in 4 years and is 80 percent above normal for April. Conversely, extremely low precipitation in May-June 2017 placed downward pressure on summer romaine yields and pushed prices up in May. Normal-to-dry conditions facilitated the spring crop harvest and the fall crop progress through the end of the 2017 calendar year.

Figure 7
Grower and retail lettuce prices in the United States, 2017



Notes: Retail price is the Consumer Price Index lettuce price for all urban consumers, U.S. city average.
Source: USDA, Economic Research Service using data from U.S. Dept. of Labor, Bureau of Labor Statistics, and USDA, National Agricultural Statistics Service *Agricultural Prices*.

Processed vegetable prices dip from previous year

The season-average price for processed vegetables in 2017 was down approximately 16 percent versus a year ago, and down 7 percent from 2015 prices (table 7). Despite contracting domestic production, reduced export volumes continue to exert downward pressure on the price of many processed vegetables. Although numerous processed vegetable prices fell, including broccoli, sweet corn, and tomatoes, the most dramatic drop was in the price of processed cauliflower, which fell approximately 50 percent relative to 2016. This drop is slightly misleading, however, as prices relative to 2015 are slightly up for processed cauliflower, indicating that the season-average price from 2016 was somewhat outside of normal historical ranges. In fact, 2016 data from USDA/NASS may be somewhat skewed for processed cauliflower, as individual data for California, which is typically reported, was withheld for disclosure concerns.

Table 7: Season average price for selected processed vegetables

	2015	2016	2017	% Change 2016-17
	------	$/cwt	------	Percent
Asparagus	1,660.00	1,649.00	1,532.00	-7
Broccoli	601.00	490.00	388.00	-21
Cabbage	73.75	74.10	74.11	0
Cauliflower	480.00	990.00	494.00	-50
Carrots[1]	171.60	243.56	238.19	-2
Corn, sweet[1]	101.90	87.30	78.00	-11
Cucumbers	324.00	314.00	349.00	11
Peas, green[1,2]	323.00	257.50	251.50	-2
Spinach[1]	123.50	141.50	169.50	20
Tomatoes	93.70	87.40	82.80	-5
Average	**395.24**	**433.44**	**365.71**	**-16**

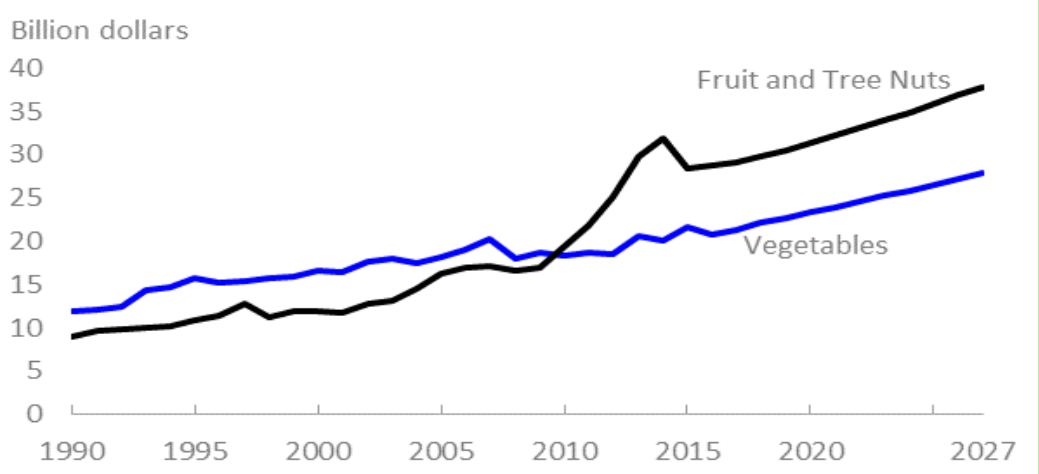
cwt = hundredweight, a measure of weight equal to 100 pounds.
[1]Average price for both frozen and canned. [2]All uses.
Source: USDA, Economic Research Services using data from USDA, National Agricultural Statistics Service, *Agricultural Prices*.

During 2017, the value of production for processing vegetables fell 11 percent to $1.7 billion, driven by lower prices and production for many commodities. The top four crops in terms of processing-vegetable farm value were tomatoes ($912 million), cucumbers ($254 million), sweet corn ($215 million), and snap beans ($136 million). The top three processing-vegetable States were California ($1.1 billion), Michigan ($99 million), and Florida ($99 million).

Long-term vegetable projections show steady growth

In February 2018, ERS released its long-term projections for agricultural markets, including the fruit, nut, and vegetable markets. The total farm value of fruit, nuts, and vegetable production is projected to grow by roughly 2.7 percent annually over the next decade. Vegetables contribute approximately 42 percent of this total value. Vegetable production, measured by farm weight (in pounds of product), is projected to rise at a compound annual rate of 0.6 percent per year, while the value of vegetable farm production is projected to grow at 2.7 percent compounded annually over the same period (fig. 8). For more information, see “USDA Agricultural Projections to 2027” on the ERS website.

Figure 8
U.S. fruit, nuts, and vegetables: Value of production



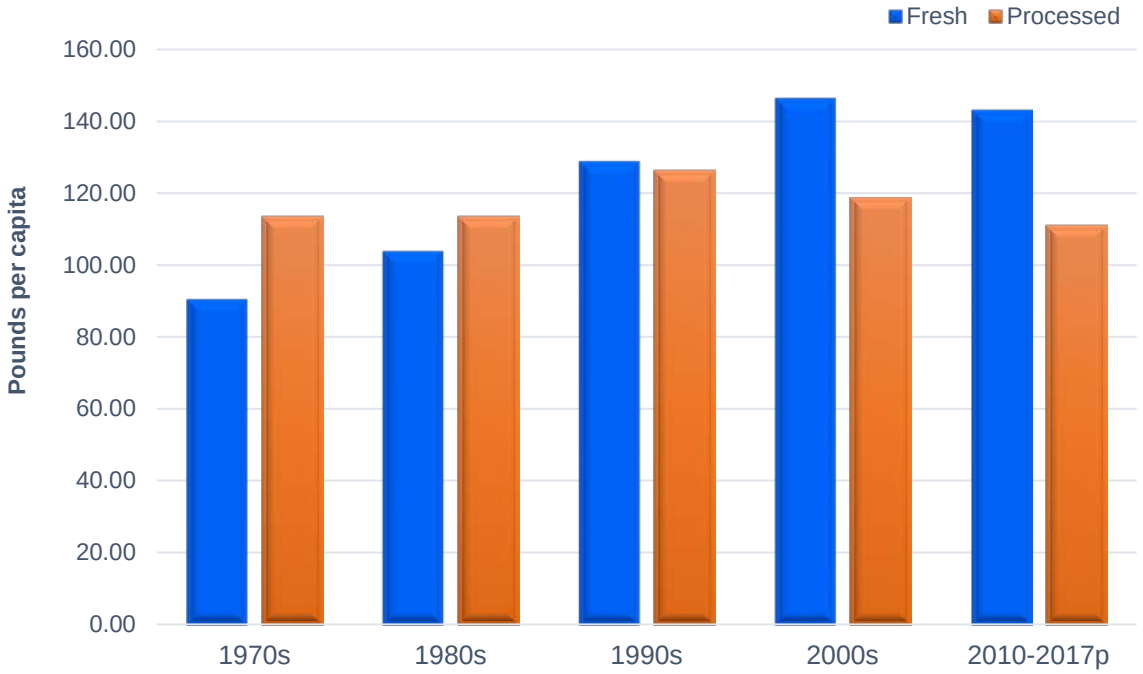
Source: USDA, Economic Research Service, USDA Agricultural Projections to 2027.

U.S. Per Capita Availability

Despite the decrease in U.S. domestic vegetable production, domestic availability grew slightly in 2017, due in part to a slight increase of imports and decrease in exports. Per capita availability (previously called disappearance or use) of vegetables and pulses in the United States averaged 401 pounds in 2017; up 4.7 percent from 2016 but still down over 5 percent from the peak of 423 pounds in 2000. Canning vegetables, particularly tomato products, accounted for the majority of the increase in domestic vegetable availability between 2016 and 2017.

Availability data measure supplies of commodities moving through production and trade channels for domestic use. The data do not directly measure food intake, but they serve as useful indicators for understanding trends over time. In addition, the data are not adjusted for spoilage and other losses. Thus, when used in this manner, the data provide an upper bound on the amount of food available for domestic use and consumption.

Figure 9
Average per capita use of fresh and processed vegetables, 1970s-2010s[1]



[1]Excludes potatoes, sweet potatoes, mushrooms, and dehydrated products.
Source: USDA, Economic Research Service.

Fresh-market vegetable per capita availability up slightly

Total per capita availability of fresh vegetables (including potatoes, sweet potatoes, and mushrooms) totaled 189 pounds in 2017—up 1 percent from 2016, but holding fairly steady since 2008. In 2017, per capita use increased for many fresh-market crops—artichokes, asparagus, bell peppers, cabbage, cauliflower, garlic, leafy greens, onions, sweet corn, and sweet potatoes. In contrast, availability of broccoli, carrots, celery, cucumbers, eggplant, head lettuce, romaine/ leaf lettuce, snap beans, spinach, squash, tomatoes, mushrooms, and potatoes declined (table 8).

Table 8: Fresh-market vegetables: Per capita availability[1]

Selected items	2015	2016	2017p	Change 2016-17
	-------Pounds per capita-------			*Percent*
Artichokes, all	1.41	1.39	1.43	2
Asparagus	1.46	1.54	1.58	2
Bell pepper	10.72	11.01	11.39	3
Broccoli	7.40	7.45	7.11	-5
Cabbage	6.28	5.88	5.98	2
Carrots	8.79	7.80	7.33	-6
Cauliflower	1.58	1.57	2.18	38
Celery	5.43	4.98	4.64	-7
Cucumbers	7.56	8.21	7.51	-9
Eggplants	0.85	0.86	0.86	0
Garlic, all	2.38	2.93	3.00	2
Leafy greens[2]	2.43	2.07	2.11	2
Head lettuce	13.55	14.30	13.27	-7
Romaine/ leaf lettuce	11.01	12.67	12.54	-1
Onions, bulb	18.90	18.98	21.91	15
Snap beans	1.59	1.67	1.51	-10
Spinach	1.73	1.83	1.67	-9
Squash	4.64	5.07	5.01	-1
Sweet corn	8.61	7.19	7.52	5
Tomatoes[3]	20.54	20.36	20.27	0
Others[4]	4.29	6.17	5.57	-10
Subtotal	139.74	143.93	144.40	0
Mushrooms	2.88	2.95	2.93	-1
Potatoes	34.13	33.62	33.38	-1
Sweet potatoes, all	7.56	7.22	8.00	11
Total	**184.3**	**187.7**	**188.7**	**1**

p = preliminary. [1]Availability is an imperfect proxy for calendar-year consumption. [2]Collards, kale, mustard greens, and turnip greens. [3]Includes both domestic and imported hothouse tomatoes.
[4]Includes brussels sprouts, escarole, endive, okra, lima beans, and pumpkins.
Source: USDA, Economic Research Service, *Vegetables and Pulses Yearbook* (April 2018).

Despite significant contributors like Arizona, Florida, and Georgia increasing their 2017 production levels, California, the fresh-market vegetable production leader, continued to decrease production. This decline was offset by decreased export levels across commodities to generate a modest increase in domestic use of fresh-market vegetables.

Potatoes, all lettuce, onions, tomatoes, and bell peppers accounted for about 60 percent of 2017 fresh-market vegetables available for consumption, largely unchanged from previous years.

Processing-market vegetable per capita availability surges

In 2017, total per capita processed-vegetable availability (potatoes and mushrooms included) totaled 200 pounds—up 7 percent from 2016 (table 9). Further, per capita availability of processed vegetables, excluding mushrooms, onions, and potatoes, increased 8 percent from the previous year to 116 pounds. Canning vegetables, particularly processing tomatoes, accounted for the majority of the increase in domestic availability.

Table 9: Vegetables for processing: Per capita availability[1]

Selected items	2015	2016	2017p	Change 2016-17
	---------- *Pounds per capita* ----------			*Percent*
Canning				
Asparagus	0.06	0.08	0.06	-17
Beets	0.53	0.53	0.53	0
Cabbage	1.20	1.42	1.39	-2
Carrots	0.69	1.04	1.05	1
Chile peppers, all	0.89	0.98	0.97	-1
Cucumbers[2]	3.41	3.09	3.84	24
Green peas	0.84	0.78	0.61	-21
Snap beans	2.95	3.20	3.13	-2
Spinach	0.15	0.15	0.13	-17
Sweet corn	5.34	5.22	5.37	3
Tomatoes	56.26	61.48	73.26	19
Other canning	8.42	9.18	4.90	-47
Canning subtotal	80.75	87.13	95.24	9
Freezing				
Asparagus	0.12	0.16	0.13	-16
Broccoli	2.59	2.63	2.37	-10
Carrots	1.36	1.86	2.31	24
Cauliflower	0.34	0.41	0.52	27
Green peas	1.48	1.03	1.18	15
Snap beans	1.89	1.99	1.90	-5
Spinach	0.73	0.68	0.66	-2
Sweet corn	8.01	7.92	8.49	7
Other freezing	3.93	3.92	3.51	-10
Freezing subtotal	20.45	20.59	21.06	2
Subtotal processing	101.20	107.72	116.30	8
Mushrooms for processing	1.05	1.04	1.01	-3
Onions for dehydrating	1.37	1.80	0.46	-75
Potatoes for processing[3]	81.15	76.40	82.40	8
Total processing	184.77	186.97	200.16	7

p = preliminary. [1]Availability is an imperfect proxy for calendar-year consumption. [2]For pickling.

[3]Includes french fries and other frozen potato products, chips, and others.

Source: USDA, Economic Research Service, *Vegetables and Pulses Yearbook* (April 2018).

Modest gains in imports and large beginning stocks offset the overall production decline of vegetables for processing. This, coupled with near-record declines in processing-market vegetables for export in 2017, facilitated the highest level of domestic availability in almost 30 years.

Per capita availability of potatoes for the processing market increased 8 percent, from 76 pounds in 2016 to 82 pounds in 2017, but is part of a longer term gradual decline since the peak of 95 pounds in 1996. The decline is largely driven by downward trends in freezing, which make up over 60 percent of processing potatoes. Potato chips and dehydrated potato products have remained relatively steady over the last decade.

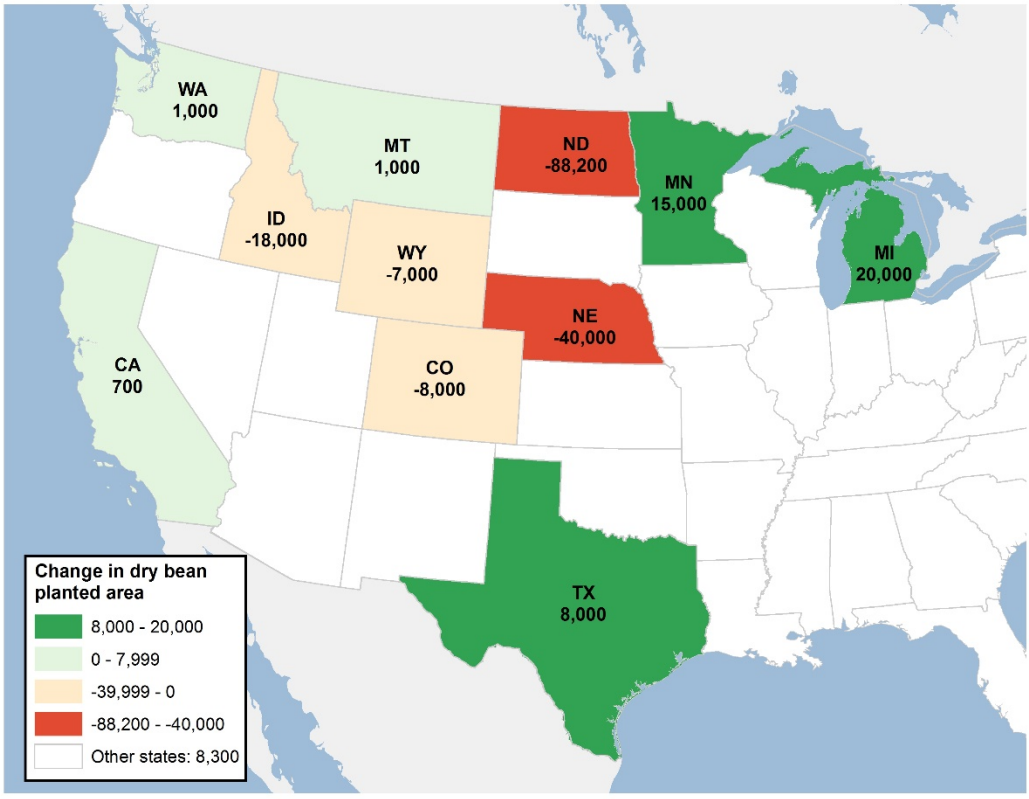
Between 2000 and 2017, availability of processing vegetables declined by as much as 4 percent year-to-year and increased by as much as 10 percent, mainly due to changes in availability levels of canning tomatoes and potatoes for processing, which account for roughly 79 percent of vegetables for processing.

Dry Edible Beans

Lower planted area and dry conditions to reduce production

Area planted to dry beans, exclusive of chickpeas (also known as garbanzo beans, and reported in a separate section), is projected to decline by more than 7 percent, or 107,000 acres, to a total of 1.366 million acres in 2018. Acreage losses are largest in North Dakota, down more than 88,000 acres, where spring wheat planted area is up sharply on favorable returns in the 2017/18 marketing year. Net losses in Colorado (-8,000 acres), Idaho (-18,000), Nebraska (-40,000), and Wyoming (-7,000) offset sizable gains in Michigan and Minnesota (up a combined 35,000 acres). Michigan and Minnesota are key navy and black bean-growing States. Planted area for these two bean classes are also projected up in 2018 (fig. 10).

Figure 10
Projected change in 2018 dry bean planted area, from 2017



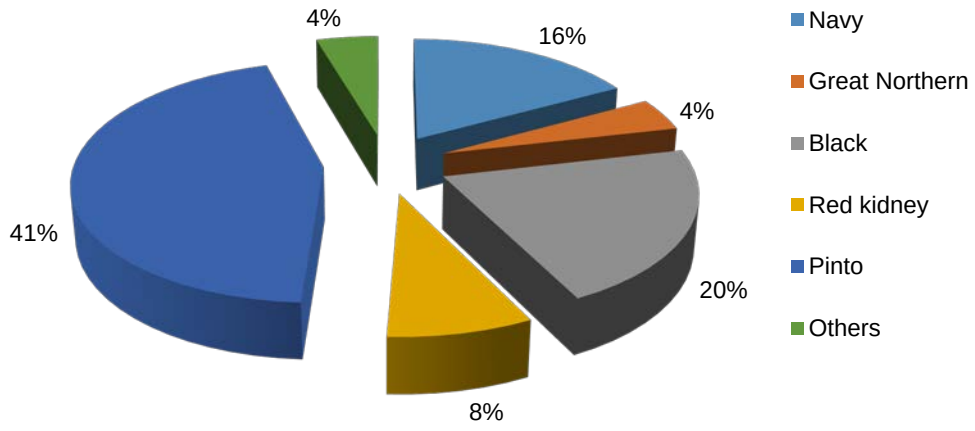
Source: USDA, National Agricultural Statistics Service, *Quick Stats* database.

Declining acreage cut dry bean production in 2017 to 2.389 million pounds, a decrease of nearly 20 percent and 504,000 pounds from 2016. Dry conditions in the key Northern Plains bean-growing region sapped yields for all pulse crops, driving down production from the initial forecast. In 2018, yields are projected to rebound to near pre-drought levels. However, the

effects of sizable dry bean acreage losses in North Dakota, in particular, weigh on prospects for production growth in 2018.

The High Plains and South regions of the United States, including Texas, Colorado, and Nebraska, are currently experiencing abnormally dry to exceptionally dry conditions. Nebraska and Colorado combined grow about 22 percent of U.S. pinto bean production, and much the Great Northern crop was sown in Nebraska in 2017. Two recent freeze events have affected sections of Texas, a key source of blackeye pea beans. The most recent USDA-NASS crop conditions report indicates that dryness in the area has greatly affected the condition of winter wheat and corn growing locally. Conditions for the dry bean crop in these three States and others will not be reported until the crop is planted and maturing. However, if dry conditions persist, it is expected that, much like the drought in the Northern Plains last year, yields in the affected areas will fall below the current trend-based projections.

Figure 11
Projected 2018 dry bean production, by class [1/]



1/ Excludes garbanzo bean production.
Source: USDA, National Agricultural Statistics Service, *Crop Production*, and USDA, Economic Research Service projections.

Projected production by class is similar to 2017's breakdown with a few notable exceptions (fig. 11). On rising planted area in Minnesota and Michigan, navy and black beans' shares of total production are projected to rise by 2 percent each, to 16 and 20 percent, respectively. Primarily due to falling acres in North Dakota, where more than 66 percent of the 2017 pinto bean crop was planted, pinto production for 2018 is projected to decline by 6 percent to 41 percent of total dry bean volume. Great Northern production is expected to decline by a sizable 25 percent as a result of returning to near-average planted area after a surge in sowings boosted production in 2017. Year-to-year planted area in drought-affected Nebraska, where 86 percent of the 2017 Great Northern crop was sown, is down 40,000 acres and indicates that a sharp decline in

Great Northern sowings for the 2018 crop year is likely. Increased sorghum production, projected to be up 11 percent year-to-year in Nebraska based on the March 1 farmer survey of intentions, likely contributes to reduced dry bean planted area in the State. The recent imposition of a 179-percent tariff on sorghum by China may yet influence planting decisions. As of April 15, 2018, USDA-NASS reports that just 20 percent of the 2018 dry bean crop had been sown in the 11-State reporting area and that none of the crop had been planted in Nebraska, Colorado, or Kansas.

Exports contract from previous year

Exports for calendar year 2017 were down 14 percent from the previous year on generally rising prices that reflected both the increased concern about how drought may have affected yields and the rising value of the U.S. dollar (table 10). In 2017, significant shifts by class are noted. Specifically, Canada imported a large volume of beans under the “beans not elsewhere specified or indicated (NESOI)” code, which shifts a large share of exports that would normally fall under the navy bean category to the “other” category (up more than three times last year’s volume). Pinto exports were down 42 percent in 2017 due to sharp reductions from both the Dominican Republic and Mexico. Exports to the Dominican Republic were curtailed due to Government action in the form of a resolution to prohibit the import of beans from any source, including the United States, between January 1 and March 31, 2017.

Table 10: U.S. dry bean calendar-year export volume [1/]

Bean class	2015	2016	2017	Change *2016-17*
	---------- *1,000 cwt (bags)* ----------			*Percent*
Black	965.4	1,301.3	1,273.4	-2
Pinto	1,313.8	1,945.5	1,123.4	-42
Small red	302.4	130.0	182.1	40
Navy	2,819.4	2,163.2	1,996.2	-8
Dark-red kidney	945.0	798.8	997.7	25
Light-red kidney	100.2	247.2	200.0	-19
Other	613.4	763.0	2,386.6	213
Total	**8,478.4**	**8,401.0**	**7,237.9**	**-14**

1/ Excludes garbanzo beans. cwt =hundredweight, a measure of weight equal to 100 pounds.
Source: USDA, Economic Research Service using data from Department of Commerce, U.S. Census Bureau.

In 2017, exports of dry beans to Mexico continued to recover to levels nearing averages from 5 years ago. The majority of U.S. sales to Mexico are black beans, which constitute a growing share of exports to the country as pinto shipments have recently fallen below trend levels.

Argentina has emerged as a strong competitor in the Mexican market for black beans with increased sales to the country in the second half of 2017 and into 2018.

Table 11: U.S. dry bean calendar-year export volume, by selected destination [1/]

Destination	2015	2016	2017	Change 2016-17
	-------- 1,000 cwt (bags) -------			*Percent*
Mexico	1,670.8	1,973.2	2,266.1	15
Canada	1,464.5	1,436.9	1,566.5	9
United Kingdom	969.0	748.2	838.8	12
Dominican Republic	983.6	728.1	432.8	-41
Italy	695.6	572.0	1,042.6	82
France	265.3	212.4	128.6	-39
Japan	271.5	155.9	154.5	-1
Other	3,333.1	4,770.1	2,500.4	-48
Total [2/]	**9,740.8**	**10,675.8**	**9,021.0**	**-16**

1/ Includes commercial sales and movement under food aid programs such as P.L.480. 2/ Excludes garbanzo bean volume and includes seed. cwt = hundredweight, a unit of measure equal to 100 pounds.
Source: USDA, Economic Research Service using data from Department of Commerce, U.S. Census Bureau.

Canadian imports of U.S. dry beans in 2017 were up modestly from a year prior, despite a marked drop in navy beans (down 62 percent from 2016). A large increase in Canadian imports of beans not otherwise specified more than compensated for the navy bean reduction, giving indications that navy beans, or a close substitute such as Great Northern beans, could have been entering Canada under the code. Collectively, North American Free Trade Agreement partner countries accounted for 42 percent of total U.S. dry bean exports in 2017. Mexico and Canada have been the top two destination countries for more than a decade. In 2017, Italy rose to become the third largest importer of U.S. dry beans, supported by a surge in imports of navy beans, up more than double the volume imported in 2016.

Dry bean imports, which augment domestically grown production and carryin from the previous year, generally represent about 7.5 percent of total dry bean supplies. The import share of supplies fell to a below-average 6.8 percent on significantly higher production, which served to reduce imported dry beans' share of total supplies in 2017. Dry bean imports totaled approximately 252 million pounds in 2017, up from 233 in 2016 (table 12).

Figure 12
U.S. dry bean trade[1/]

1/ Exclude garbonzo beans.
Source: USDA, Economic Research Service using data from the U.S. Department of Commerce, U.S. Census Bureau.

An increase in production of many bean classes, combined with sizable carryin from the previous marketing year, put downward pressure on the volume of U.S. dry bean imports in 2017. Both pinto and black bean imports for 2017 were modestly down from the year prior. Pinto and black beans saw significant production increases in 2017, despite dry conditions in key production regions, which were more than offset by increased harvested area.

Table 12: U.S. dry bean calendar-year import volume [1/]

Bean class	2015	2016	2017	Change 2016-17
	---------- *1,000 cwt (bags)* ----------			*Percent*
Black	440.5	327.7	316.2	-4
Pinto	139.4	163.2	161.5	-1
Small red	109.1	120.9	126.2	4
Navy	39.9	58.3	57.7	-1
Dark-red kidney	150.0	62.8	53.7	-14
Light-red kidney	292.4	187.8	158.2	-16
Other	1,467.0	1,425.6	1,357.8	-5
Total	**2,778.8**	**2,456.9**	**2,331.8**	**-4**

1/ Excludes garbanzo beans. cwt = hundredweight, a unit of measure equal to 100 pounds.
Source: USDA, Economic Research Service using data from Department of Commerce, U.S. Census Bureau.

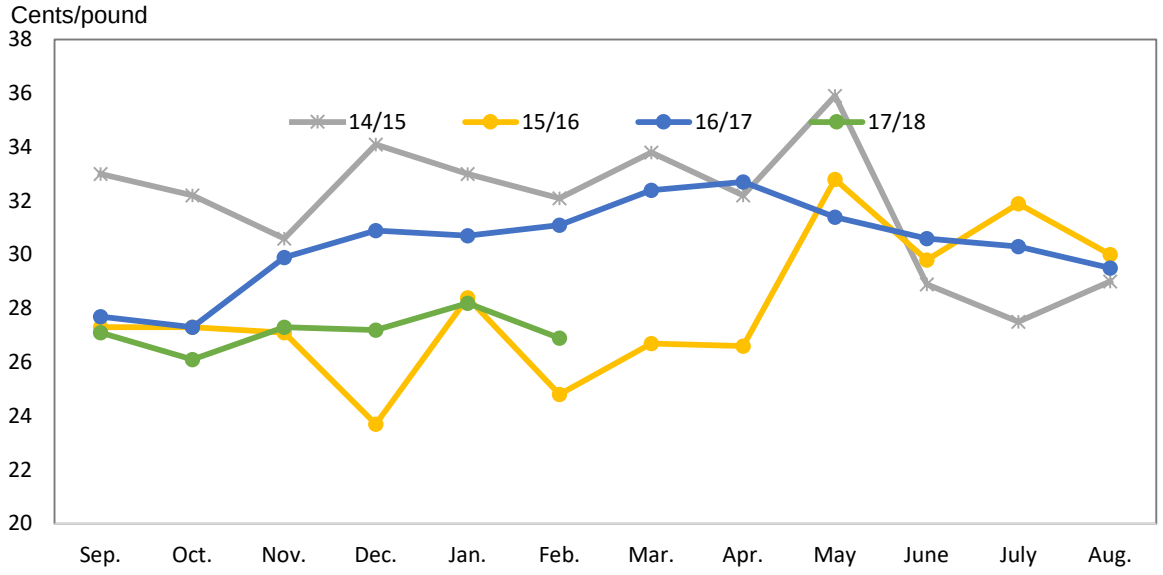
The all dry bean export projection for calendar-year 2018 is up nearly 11 percent to 804 million pounds largely on prospects for improving pinto bean exports. Trade in the first months of 2018 indicate pinto exports are nearly triple the volume shipped during the first months of 2017. Pinto bean export prospects are lifted due primarily to surging shipments to Mexico in January and

February. The United States exports an average of roughly three times as many dry beans as are imported in a given year (fig. 12). Expectations of rising production of navy and black beans have reduced import projections for these classes, forecast to drop by 11 and 5 percent, respectively, in 2018. Despite this, total U.S. dry bean imports are on track to increase by about 19 million pounds to just over 252 million in 2018.

Prices underperform relative to previous years

Average monthly grower prices for dry beans in the 2017/18 marketing year have, so far, underperformed relative to 2016/17 prices in each month of the current marketing year (fig. 13). In 2017/18, sizable stocks weighed on prices, which are projected to recover in the later months of 2018 on strengthening wheat (a key alternative crop in most producing areas) and other commodity prices. For the outyear, the current ERS all dry bean price forecast for 2018 is $29.30 per hundredweight (cwt), which represents an increase of nearly $1.60 per cwt over the USDA-NASS season average price for 2017.

Figure 13
U.S. dry edible beans: Average monthly grower price



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

Per capita availability predicted down from recent high

All dry bean per capita availability for 2018 is projected at 5.7 pounds per person, down from 6.2 pounds per person in 2017. Preliminary by-class supply and use projections, informed by the most recent USDA-NASS *Prospective Plantings* report and historical relationships, indicate that availability for nonwhite beans is expected to fall from 5.5 pounds per person in 2017 to 4.6 pounds in 2018. Reduced availability of nonwhite beans is driven by reductions for pinto beans. After jumping to almost 3.5 pounds per person in 2017, pinto bean per capita availability is projected to fall under 3 pounds per person in 2018 on sharply reduced production and expectations for growth in exports. Growth in navy bean production and availability offsets forecast declines in Great Northern production and availability for the white bean category.

Chickpeas (Garbanzo Beans)

Production continues strong growth

Sowings of chickpeas are forecast to reach a new record high of 665,000 acres in 2018, a 7-percent increase over 2017 plantings (table 13). Of this total, 479,500 acres are large (kabuli) chickpeas and 185,500 are expected to be planted to small (desi) chickpeas. Over time, the land in both large and small chickpea production has generally grown. Small chickpea planted area in 2018 is up 3 percent from 2017 levels and constitutes approximately 28 percent of total planted area; large chickpea planted area is up 9 percent from 2017 levels and constitutes approximately 72 percent of total planted area.

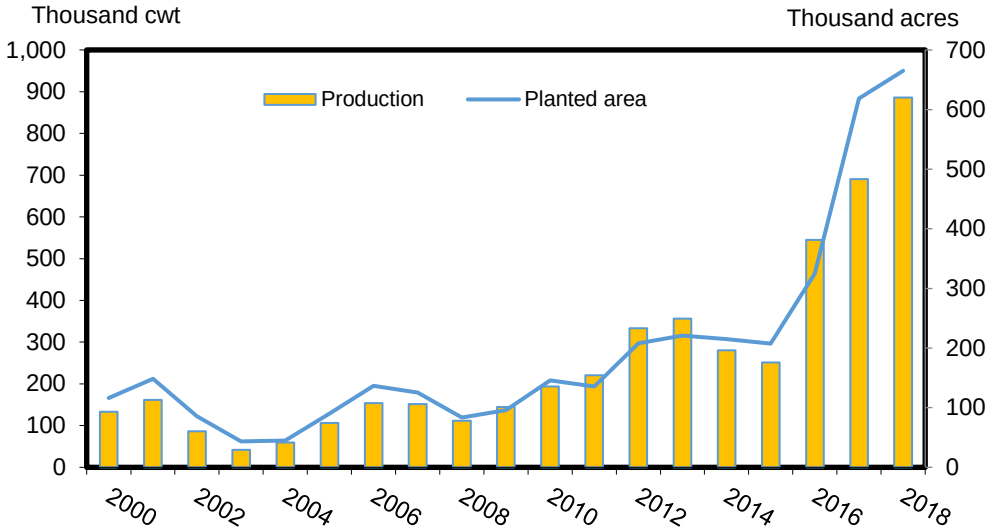
Table 13: Chickpeas (garbanzo beans): Planted area

	2016	2017	2018 1/	Change 2017/18
	----- *1,000 acres* -----			*Percent*
Chickpeas, total	**325.3**	**618.8**	**665.0**	**7**
Small chickpeas	113.8	179.5	185.5	3
Large chickpeas	211.5	439.3	479.5	9

1/ Intended plantings in 2018 as indicated by farmers and published in *Prospective Plantings*.
Sources: USDA, National Agricultural Statistics Service, *Crop Production* and *Prospective Plantings.*

Desi chickpeas are a common ingredient in the increasingly popular hummus dips, raising the possibility that consumer preferences are driving the shift across chickpea classes. In 2016, production of chickpeas totaled 545 million pounds; in 2017, production rose by 27 percent to 691 million pounds.

Figure 14
U.S. chickpea planted area and production



Source: USDA, National Agricultural Statistics Service.

In 2018, cumulative production is forecast to continue climbing, to 886 million pounds (assuming yields of 1,365 lbs. per acre and intended plantings) (fig. 14). Subsequent to the collection of Indian farmer planting intentions data, the Indian Government raised duties on imports of both desi and kabuli chickpeas from 40 to 60 percent. The potential effect of the newly raised import duties on farmer sowings is not yet clear. The next USDA-NASS crop production report to include chickpea by class data is expected in mid-July.

Trade volume up despite major tariffs

India has long been an important buyer of U.S. chickpeas, especially the large desi variety, which is generally consumed in split (dhal) or roasted form. Across both last summer's kharif and the current rabi production seasons, India is projected to harvest a record quantity of chickpeas, reducing demand for imported supplies. In India, record production has put downward pressure on average chickpea prices, which are forecast by some industry experts to dip below India's minimum support price. Imported chickpeas, from the United States, Australia, and other suppliers, have the potential to put further downward pressure on prices. As a show of support for domestic farmers, the Indian Government imposed an initial 40-percent duty on imports of both kabuli and desi-type chickpeas before raising the desi duty to 60 percent. Most recently, the duty for both chickpea types has been raised to 60 percent.

Table 14: Chickpeas (garbanzo beans): Export volume

	Sept. – Aug.			Sept. – Feb.		Change
	2014/15	2015/16	2016/17	2016/17	2017/18	16/17-17/18
	1,000 cwt					*Percent*
Chickpeas	889.8	1,181.7	2,447.0	1,939.5	2,525.7	30

Source: USDA, Economic Research Service using data from Department of Commerce, U.S. Census Bureau

In 2017/18, chickpea exports are up more than 600,000 cwt from the prior marketing year (table 14). Chickpea sales surged early in the marketing year and were largely driven by sales to Spain, Canada, Turkey, and Pakistan. To date, U.S. chickpea sales to Spain have exceeded the total sales for the previous marketing year. Sales to Canada, July through February, have also exceeded the 2016/17 marketing year total. U.S. exports to Canada are thought to largely be the kabuli-variety and may be re-exported to other countries after further processing or packaging.

Prices continue upwards

The combined effects of sustained domestic demand and rising exports help to support prices at levels slightly above the year prior (table 15). ERS projects the dealer-level price will rise $7/cwt to slightly above $63.

Table 15: U.S. chickpeas: Monthly grower prices,

	Chickpeas	
	2016/17	2017/18
Month	----- Cents per pound -----	
September	30.1	31.2
October	26.2	28.0
November	30.3	27.4
December	32.2	29.5
January	31.6	32.9
February	30.6	35.1
March	32.2	
April	33.2	
May	29.5	
June	34.9	
July	30.0	
August	32.6	

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

Per capita availability expected to continue climbing

Expanding consumer demand for hummus and other chickpea-containing products has helped to support prices and to encourage expanded plantings and record production. For 2017, per capita chickpea availability reached 1.31 pounds per person, up from 1.22 pounds in 2016. In 2018, growth in chickpea production is expected to continue to lift per capita availability.

Dry Peas and Lentils

Production expected to rebound slightly from 2017 drop

In contrast to trends over the last 3 years, the aggregate area planted to dry peas and lentils is projected to drop in 2018 (table 16). According to the March 30 USDA-NASS *Prospective Plantings* report, U.S farmers collectively intend to plant 20 percent fewer acres to these crops than they did in 2017. This decline is wholly due to sharp reductions in seeded area for dry peas (down 20 percent) and lentils (down 28 percent).

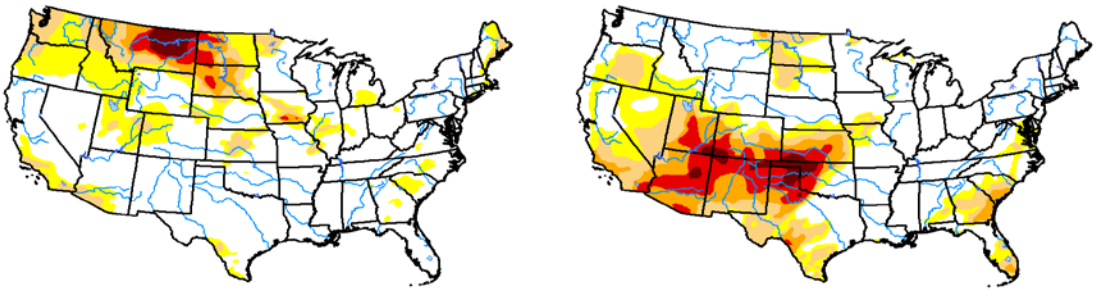
Table 16: Dry peas and lentils: Planted area

Item	2016	2017	2018 1/	Change 2017-18
	---------- *1,000 acres* ----------			*Percent*
Dry peas	1,383.0	1,128.0	908.0	-20
Austrian winter peas	37.0	26.5	19.0	-28
Lentils, all	933.0	1,104.0	791.0	-28
Total	**2,353.0**	**2,258.5**	**1,718.0**	**-20**

1/ Intended plantings in 2018 as indicated by farmers and published in *Prospective Plantings.*
Source: USDA, National Agricultural Statistics Service, *Crop Production* and *Prospective Plantings.*

In 2017, dry pea and lentil yields were greatly affected by extreme drought conditions in the Northern Plains. Exceptional drought extended from South to North Dakota and west into Montana through the growing season. While much of the drought has abated (fig. 15) and soil moisture levels have improved with recent snows, large sections of all three States remain classified as being “abnormally dry” to “moderate droughty.”

Figure 15
U.S. Drought Monitor maps, September 5, 2017, (left) and April 8, 2018 (right) 1/

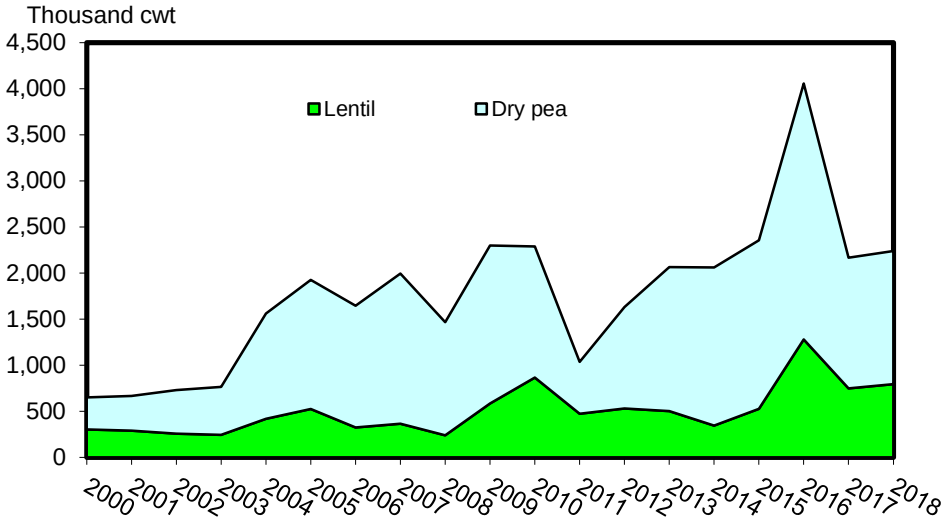


1/ Darker colors indicate driest conditions.
Source: U.S. Drought Monitor.

A large proportion in the decline in area planted to dry peas and lentils is attributable to a 335,000-acre drop in projected plantings in Montana. Through much of 2017 and into 2018, Montana was broadly affected by exceptional drought conditions.

Reduced net planted and harvested area forecasts notwithstanding, production of dry peas and lentils in 2018 is forecast to rebound from the drought-affected levels experienced in 2017 as yields improve (fig. 16). In 2016, production of dry peas and lentils totaled 4,056 million pounds; in 2017, production fell by 47 percent to 2,166 million pounds. In 2018, cumulative production is forecast to rebound modestly to 2,238 million pounds.

Figure 16
U.S. dry pea and lentil production



Source: USDA, National Agricultural Statistics Service.

A return to trend yields for dry peas in 2018 implies an increase of nearly 360 pounds per acre from the 1,350 farmers realized with the 2017 crop. The last time dry pea yields dipped to the lows experienced in 2017 was in 1996 during a similar period of drought in northern pulse-growing States including Montana, Idaho, and North Dakota. Lentil yields fell by more than 47 percent in 2017, down to 732 pounds per acre. A return to near-trend yields on the promise of more normal weather and precipitation implies yields for 2018 will be near 1,084 pounds per acre. For dry peas, production is projected to reach 1,444 million pounds, up from 1,417 million in 2017. Lentil production in 2018 is forecast to reach 794 million pounds, slightly higher than the 748 million pounds harvested in 2017.

Exports fall across primary markets

Dry pea and lentil exports are down 53 percent relative to the same 8-month period in 2016/17 (table 17). With 40 percent less crop harvested in 2017, supplies were significantly smaller, and less of the U.S. crop was marketed through export channels. Tighter supplies supported modest relative price increases and made U.S. dry peas and lentils less price competitive in the global market.

Table 17: U.S. dry peas, lentils: Export volume by class

	July-June			July-Feb.		Year-to-Date Change
Item	2014/15	2015/16	2016/17	2016/17	2017/18	16/17-17/18
	1,000 cwt					*Percent*
Exports:						
Green peas	2,890.3	2,148.8	4,297.7	2,879.1	1,704.9	-41
Yellow peas	3,463.8	3,512.3	3,686.5	2,841.9	356.2	-87
Split peas	1,413.1	2,560.9	1,672.7	758.7	679.0	-11
Austrian winter pea	16.8	11.1	23.8	17.0	21.4	26
Misc. dry peas	2,322.0	2,293.6	1,562.9	1,036.0	370.6	-62
Lentils, all	5,598.1	4,484.3	7,419.4	5,447.0	2,598.9	-52
Planting seed, all	849.5	1,073.7	2,764.1	2,083.2	1,387.3	-33
Total (without seeds)	**15,704.2**	**15,010.8**	**18,663.0**	**12,979.6**	**5,731.0**	**-56**
Total (with seeds)	**16,553.7**	**16,084.6**	**21,427.1**	**15,062.8**	**7,118.3**	**-53**

cwt = hundredweight, a unit of measure equal to 100 pounds.
Source: USDA, Economic Research Service using data from U.S. Department of Commerce, U.S. Census Bureau.

Similar to the Indian tariffs for chickpeas, newly imposed tariffs on yellow and green peas (50-percent tariff) and lentils (30 percent-tariff) have had a pronounced effect in this market. Year-to-year U.S. dry pea and lentil exports to India are down to less than 10 percent of the volume shipped during the same 6-month period in the previous marketing year. With the exception of sales to date for Peru, Columbia, and food aid to Ethiopia, dry pea and lentil exports are down across almost all major trading partners (table 18).

Table 18: U.S. dry pea and lentil marketing-year export volume, by selected destination [1/ 2/]

Destination	June-July 2015/16	June-July 2016/17	July-Feb. 2016/17	July-Feb. 2017/18	Change 16/17-17/18
	1,000 cwt				*Percent*
India	5,754.0	5,610.1	4,704.9	467.1	-90
Canada	379.1	2,374.8	1,918.4	787.7	-59
China	1,001.9	1,977.3	1,162.7	425.4	-63
Spain	690.4	861.3	588.6	428.1	-27
Peru	568.2	721.8	354.6	373.6	5
Mexico	350.0	748.8	564.2	402.0	-29
Pakistan	188.4	410.6	371.8	40.9	-89
Colombia	260.9	628.3	240.6	376.8	57
Djibouti 3/	258.8	639.5	281.9	49.8	-82
Ethiopia	1,734.7	532.9	358.2	426.1	19
Other	3,824.4	4,157.6	2,433.8	1,953.4	-20
Total	**15,010.8**	**18,663.0**	**12,979.6**	**5,731.0**	**-56**

1/ Includes commercial sales and movement under food aid programs such as P.L. 480.
2/ Includes chickpeas, Austrian peas; excludes seeds. 3/Food aid shipments to Ethiopia are often routed through Djibouti.
Source: U.S. Department of Commerce, U.S. Census Bureau.

Prices reflect reduced export demand

The price-supporting effects of sharply lower dry pea and lentil production in 2017, relative to 2016 levels, and generally rising commodity prices are offset some by above average carryin from the previous year and the associated large crop.

Table 19: U.S. dry peas and lentils: Monthly grower prices by class, 2016/17 and 2017/18

	Dry peas 2016/17	Dry peas 2017/18	Lentils 2016/17	Lentils 2017/18
Month	cents per pound			
July	11.6	9.9	36.6	28.2
August	10.5	11.1	27.2	25.9
September	10.4	13	26.6	25.9
October	13.7	13	27.1	27.9
November	10.9	12.2	27.6	26.9
December	11.3	12.1	31.5	27.6
January	10.7	11.9	29.2	29.1
February	11.6	11.5	31.5	27.5
March	11		32	
April	11.5		29.8	
May	11.6		30.4	
June	10.8		28.7	
Marketing Year	12.0	12.4	28.50	26.4

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

In addition, significantly weaker export demand for both dry peas and lentils puts downward pressure on the season-average price for 2017/18. ERS estimates the current season-average price for lentils at $26.40/cwt compared to $28.50/cwt in 2016/17 (table 19). For dry peas, despite reduced export sales, the combined effects of reduced production and sustained domestic demand help to support prices at levels slightly above the year prior. ERS estimates that for 2017/18, the season-average dry pea price will rise $0.40/cwt above the 2016/17 price to $12.40/cwt.

Per capita availability rises due to lower exports

Lentil and dry pea per capita availability is expected to rise in 2017/18 on greatly reduced exports. With less product funneled to international markets, more supply is available for domestic use. Per capita availability in 2017/18 is forecast at 1.12 pounds for lentils and 2.55 pounds for dry peas. With expectation of rising exports in 2018/19, a smaller portion of production in the outyear is available for domestic consumption, resulting in lower per capita availability.

Feature: Machine-readable Version of the Vegetables and Pulses Yearbook Now Available

Travis Minor, Gregory Astill, Jamie Chan

New data format available for download

As a new addition to the Vegetable and Pulses Yearbook, USDA's Economic Research Service is providing the data in a machine-readable format. The newly available .csv file is located alongside the previously available yearbook data tables in .xlsx and .pdf files. Reformatting the many Supply and Utilization data tables into one file facilitates analysis for interested stakeholders.

Yearbook data tables have been traditionally formatted for visual interpretation, with data for a single commodity arranged by year in a balance sheet format. (See table 1, taken directly from the 2018 Vegetable and Pulses Yearbook data release.) This information is easy for a person to read and understand quickly without further analysis. However, because the data are arranged on multiple sheets, with different years and variables on each sheet, they are not easily loaded into statistical software.

Table 1: Example of formatted yearbook table

Table 13—U.S. artichokes, all uses: supply, utilization, and price, farm weight, 1970-2017[1]

	---------- Supply ----------			---------- Availability ----------			-- Season Average Price --	
Year	**Production[1]**	**Imports[2]**	**Total Supply**	**Exports[2]**	**Domestic Availability**	**Per Capita Availability**	**Current Dollars[1]**	**Constant 2009 Dollars[3]**
	---------- Million pounds ----------					-- Pounds --	---------- $/cwt ---------	
2000	101.2	255.5	356.7	6.1	350.6	1.24	60.30	73.63
2001	100.0	258.2	358.2	7.3	350.8	1.23	58.60	69.96
2002	94.3	292.9	387.2	5.8	381.4	1.32	71.50	84.06
2003	100.8	322.8	423.6	6.0	417.6	1.44	75.10	86.57
2004	82.5	332.7	415.2	15.1	400.1	1.36	45.10	50.60
2005	86.9	337.3	424.2	11.0	413.2	1.40	45.40	49.35
2006	117.5	391.5	509.0	7.4	501.6	1.68	42.00	44.30
2007	105.6	366.5	472.1	4.5	467.7	1.55	55.00	56.51
2008	114.4	359.4	473.8	5.4	468.4	1.54	47.80	48.17
2009	107.5	363.3	470.8	4.1	466.8	1.52	56.20	56.20
2010	90.0	370.1	460.1	5.6	454.5	1.47	50.20	49.60
2011	99.9	435.2	535.1	5.2	530.0	1.70	51.10	49.52
2012	105.9	358.9	464.8	5.9	458.9	1.46	54.30	51.63
2013	95.9	315.1	411.0	5.1	405.9	1.28	61.00	57.05
2014	94.9	367.4	462.3	4.6	457.8	1.43	57.60	53.00

2015	91.8	365.2	457.0	3.3	453.7	1.41	87.80	79.98
2016	98.6	355.8	454.4	3.8	450.6	1.39	78.80	70.71
2017	93.6	374.4	468.0	4.0	463.9	1.43	70.00	61.87

-- = Not available. Cwt = hundredweight. Most recent year is preliminary.
1/ Source: USDA, National Agricultural Statistics Service (1979-81 and 1992-2001), California County Agricultural Commissioners Reports (1982-91 and 2002 to the present).
2/ Includes canned and fresh. Source: U.S. Department of Commerce, U.S. Census Bureau. From 1978-89, U.S. exports were adjusted using Canadian import data. Canned imports are adjusted to a fresh-weight basis using a factor of 3.0.
3/ Deflated by the GDP implicit price deflator, 2009=100.
Source: USDA, Economic Research Service.

The new format provides the same level of detail in a format more accessible for use in statistical analysis software. The data are arranged in a “tall, skinny” format, with one piece of data and multiple descriptors populating each row (see table 2). Data in this format are designed to be much easier to feed into additional analytical tools and automated analyses.

Table 2: Machine-readable .csv format viewed in Excel

Decade	Year	Commodity	EndUse	Category	Item	Unit	PublishValue
1970's	1970	Artichokes	All uses	Supply	Production	Million pounds	67.1
1970's	1970	Artichokes	All uses	Supply	Imports	Million pounds	28.5
1970's	1970	Artichokes	All uses	Supply	Total Supply	Million pounds	95.6
1970's	1970	Artichokes	All uses	Availability	Domestic Availability	Million pounds	95.6
1970's	1970	Artichokes	All uses	Availability	Per Capita Availability	Pounds	0.47
1970's	1970	Artichokes	All uses	Season Average Price	Current Dollars	$/cwt	10.3
1970's	1970	Artichokes	All uses	Season Average Price	Constant 2009 Dollars	$/cwt	45.17
1970's	1971	Artichokes	All uses	Supply	Production	Million pounds	79.2
1970's	1971	Artichokes	All uses	Supply	Imports	Million pounds	26.1
1970's	1971	Artichokes	All uses	Supply	Total Supply	Million pounds	105.3
1970's	1971	Artichokes	All uses	Availability	Domestic Availability	Million pounds	105.3
1970's	1971	Artichokes	All uses	Availability	Per Capita Availability	Pounds	0.51
1970's	1971	Artichokes	All uses	Season Average Price	Current Dollars	$/cwt	9.72
1970's	1971	Artichokes	All uses	Season Average Price	Constant 2009 Dollars	$/cwt	40.56
1970's	1972	Artichokes	All uses	Supply	Production	Million pounds	71
1970's	1972	Artichokes	All uses	Supply	Imports	Million pounds	46.8
1970's	1972	Artichokes	All uses	Supply	Total Supply	Million pounds	117.8

The machine-readable .csv file contains all statistics from the three Supply and Utilization data table files: production, import, export, price, and per capita availability statistics on vegetables and pulses, including commodity-specific data on fresh and processed-product markets (canned, frozen, dried, etc.). The commodities covered include major fresh-market and processing vegetables, potatoes, mushrooms, and dry pulses. Data from the General data table in the Vegetable and Pulses Yearbook are not included in the machine-readable .csv file due to differences in data structure. Currently, this data product combines information from USDA's National Agricultural Statistics Service; U.S. Department of Commerce, U.S. Census Bureau; and the U.S. Department of Labor, Bureau of Labor Statistics.

The next expected release of this data file is in May 2019, when Vegetable and Pulses Yearbook data is updated to reflect 2018 annual production.

Suggested Citation

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Vegetables and Pulses Data

Vegetable and Pulses Data provides users with comprehensive statistics on fresh and processed vegetables and pulses in the United States, as well as global production and trade data for these sectors. It harmonizes and integrates data from the ERS market outlook program with data collected by different Federal and international statistical agencies to facilitate analyses of economic performance over time and across domestic and foreign markets.

The data are currently organized in three sections:

Yearbook Tables, in Excel and a single PDF file, contain a time series of annual data for U.S. farm acreage, production, prices, trade, per capita use, and more. Eventually, data contained in the Vegetables and Pulses Yearbook tables will be encompassed in the Data by Category and Data by Commodity series.

Data by Category (e.g. price, trade production) provides current import and export data, producer and retail price indexes, and a few retail prices.

Data by Commodity provides current import and export data for more than 40 individual fresh and processed vegetable and pulse commodities.

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Web Sites

ERS Vegetables and Pulses Data: The home page for Vegetables and Pulses data. http://www.ers.usda.gov/data-products/vegetables-and-pulses-data.aspx

Vegetables and Pulses Topics Page: This ERS site contains some background information on the U.S. vegetable and dry pulses sectors, special articles, and links to more vegetable and pulses information.
http://www.ers.usda.gov/topics/crops/vegetables-pulses.aspx

Organic Production: This site contains ERS collected data from USDA-accredited State and private certification groups. http://www.ers.usda.gov/data-products/organic-production.aspx

USDA AMS Market News: Agricultural Marketing Service's web site containing fresh shipments, f.o.b. and terminal market prices, weekly truck rates, annual reports, and more. https://www.marketnews.usda.gov/mnp/fv-home

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

NASS Vegetables: Links to USDA, National Agricultural Statistics Service's annual reports on vegetables & melons.
http://usda.mannlib.cornell.edu/MannUsda/viewDocumentInfo.do?documentID=1183

FAS Fruit and Vegetable Analysis Page: USDA, Foreign Agricultural Services page with special articles, country horticultural reports, presentation and charts, data, and links.
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