



# CITRUS OCTOBER FORECAST

## MATURITY TEST RESULTS AND FRUIT SIZE

Cooperating with the Florida Department of Agriculture and Consumer Services  
2290 Lucien Way, Suite 300, Maitland, FL 32751-7058  
(407) 648-6013 · (855) 271-9801 FAX · [www.nass.usda.gov/fl](http://www.nass.usda.gov/fl)

October 12, 2016

**Florida All Orange Production Down 14 Percent**  
**Florida Non-Valencia Orange Production Down 6 Percent**  
**Florida Valencia Orange Production Down 21 Percent**  
**Florida All Grapefruit Production Down 11 Percent**  
**Florida All Tangerine and Tangelo Production 1.65 Million Boxes**  
**Florida FCOJ Yield 1.48 Gallons per Box**

### 2016-2017 SEASON FORECAST DATES

November 9, 2016      December 9, 2016

### Citrus Production by Type and State – United States

Crop and State	Production <sup>1</sup>			Forecasted Production <sup>1</sup>
	2013-2014 (1,000 boxes)	2014-2015 (1,000 boxes)	2015-2016 (1,000 boxes)	2016-2017 (1,000 boxes)
<b>Non-Valencia Oranges <sup>2</sup></b>				
<b>Florida</b> .....	<b>53,300</b>	<b>47,400</b>	<b>36,100</b>	<b>34,000</b>
California .....	38,700	39,000	45,500	42,000
Texas .....	1,401	1,170	1,351	1,000
United States.....	93,401	87,570	82,951	77,000
<b>Valencia Oranges</b>				
<b>Florida</b> .....	<b>51,400</b>	<b>49,550</b>	<b>45,500</b>	<b>36,000</b>
California .....	10,800	9,200	8,700	8,500
Texas .....	376	282	340	350
United States.....	62,576	59,032	54,540	44,850
<b>All Oranges</b>				
<b>Florida</b> .....	<b>104,700</b>	<b>96,950</b>	<b>81,600</b>	<b>70,000</b>
California .....	49,500	48,200	54,200	50,500
Texas .....	1,777	1,452	1,691	1,350
United States.....	155,977	146,602	137,491	121,850
<b>Grapefruit</b>				
<b>Florida-All</b> .....	<b>15,650</b>	<b>12,900</b>	<b>10,800</b>	<b>9,600</b>
<b>White</b> .....	<b>4,150</b>	<b>3,250</b>	<b>2,490</b>	<b>2,100</b>
<b>Red</b> .....	<b>11,500</b>	<b>9,650</b>	<b>8,310</b>	<b>7,500</b>
California .....	3,850	4,800	3,800	4,000
Texas .....	5,700	4,250	4,800	4,700
United States.....	25,200	21,950	19,400	18,300
<b>Lemons</b>				
California.....	18,800	20,600	20,500	21,000
Arizona.....	1,800	2,000	1,750	1,800
United States.....	20,600	22,600	22,250	22,800
<b>Tangelos</b>				
<b>Florida</b> .....	<b>880</b>	<b>665</b>	<b>390</b>	<b>(NA)</b>
<b>Tangerines and Tangelos <sup>3</sup></b>				
<b>Florida-All</b> .....	<b>2,900</b>	<b>2,265</b>	<b>1,415</b>	<b>1,650</b>
<b>Early <sup>4</sup></b> .....	<b>1,750</b>	<b>1,445</b>	<b>785</b>	<b>680</b>
<b>Royal <sup>5</sup></b> .....	<b>(NA)</b>	<b>(NA)</b>	<b>(NA)</b>	<b>220</b>
<b>Honey</b> .....	<b>1,150</b>	<b>820</b>	<b>630</b>	<b>430</b>
<b>Tangelo</b> .....	<b>(NA)</b>	<b>(NA)</b>	<b>(NA)</b>	<b>320</b>
California.....	14,700	18,700	21,700	23,000
Arizona <sup>6</sup> .....	150	170	(NA)	(NA)
United States.....	17,750	21,135	23,115	24,650

NA Not available.

<sup>1</sup> Net pounds per box: oranges in California-80, Florida-90, Texas-85; grapefruit in California and Texas-80, Florida-85; lemons-80; tangelos-90; and tangerines and mandarins in Arizona and California-80, Florida-95.

<sup>2</sup> Navel and miscellaneous varieties in California. Early (including Navel) and midseason varieties in Florida and Texas. Includes small quantities of Temples in Florida for 2013-2014 through 2015-2016.

<sup>3</sup> Includes tangelos and tangors in California. Beginning in 2016-2017, includes tangelos in Florida.

<sup>4</sup> Fallglo and Sunburst varieties.

<sup>5</sup> Beginning in 2016-2017, Temples have been reclassified as Royal tangerines.

<sup>6</sup> Estimates discontinued in 2015-2016.

## **All Oranges 70.0 Million Boxes**

The 2016-2017 Florida all orange forecast released today by the USDA Agricultural Statistics Board is 70.0 million boxes, 14 percent less than last season's final production. Temples are excluded from all orange production in 2016-2017. The total includes 34.0 million boxes of non-Valencia oranges (early, midseason, and Navel varieties) and 36.0 million boxes of Valencia oranges. The Navel orange forecast, at 1.00 million boxes, accounts for 3 percent of the non-Valencia total.

The estimated number of bearing trees for all oranges is 50.8 million. Trees planted in 2013 and earlier are considered bearing this season. Field work for the latest Commercial Citrus Inventory was completed in July 2016. Attrition rates were applied to the results to determine the number of bearing trees which are used to weight and expand objective count data in the forecast model.

The majority of the citrus growing region was drought-free at the beginning of the 2016-2017 citrus growing season. By March, most citrus trees were in full bloom and some had developed small pea to marble size fruit. The citrus growing area remained largely drought free. However, during intermittent times of dry weather, citrus groves required the use of irrigation systems. Temperatures and precipitation were favorable throughout the summer months for fruit growth and continued until the citrus harvest season began in late September.

A 10 year regression has been used for comparison purposes. For those previous 10 seasons, average actual production is 130 million boxes. The initial forecast has deviated from final production by an average of 6 percent with 8 seasons above and 2 below, with differences ranging from 2 percent below to 19 percent above.

The procedures used in this forecast are the same as used in past seasons. The methodology is described on page 5 of this report. All references to "average," "minimum" and "maximum" refer to the previous 10 seasons. Average fruit per tree includes both regular bloom and the first late bloom.

## **Non-Valencia Oranges 34.0 Million Boxes**

The non-Valencia forecast of 34.0 million boxes is 6 percent lower than last season's production. The estimated number of bearing trees (without Navels) is 20.9 million. The estimated fruit per tree for early-midseason oranges is 766, an increase of 3 percent from last season. Projected fruit size is below minimum, requiring an estimated 303 pieces of fruit to fill a 90-pound box. At 32 percent, droppage is at the maximum.

Based on fruit population, the prorated forecast shows a decrease of 1.76 million boxes in the Southern area compared to last season. The Indian River area shows a decrease of 530 thousand boxes. The combined other areas show an increase of 190 thousand boxes.

The Navel forecast of 1.00 million boxes is 3 percent lower than last season's production. If realized, this will be the lowest in a series dating back to 1979-1980 when separate Navel forecasts began. The estimated number of bearing trees is 1.00 million, up 4 percent from the previous season. The estimated fruit per tree is 219, a decrease of 4 percent from last season. Projected fruit size is slightly above average, requiring an estimated 138 pieces of fruit to fill a 90-pound box. Projected droppage is above maximum at 30 percent.

## **Valencia Oranges 36.0 Million Boxes**

The Valencia forecast of 36.0 million boxes is 21 percent lower than last season's production. The estimated number of bearing trees is 28.9 million, down 3 percent from the previous season. The estimated fruit per tree is 450, a decrease of 13 percent from last season. Projected fruit size is slightly below average, requiring an estimated 231 pieces of fruit to fill a 90-pound box. Projected droppage is slightly above the maximum at 31 percent.

Based on fruit population, the prorated forecast shows a decrease of 5.37 million boxes in the Southern area compared to last season. The forecast shows a decrease in the Indian River of 1.05 million boxes. The combined other areas show a decrease of 3.08 million boxes.

## **FCOJ Yield 1.48 Gallons per Box**

The projection for frozen concentrated orange juice (FCOJ) is 1.48 gallons per box of 42° Brix concentrate. Last season's final yield for all oranges was 1.405527 gallons per box, as reported by the Florida Department of Citrus. Projections for the components will be published in January. Last season's final yield for early-midseason oranges was 1.347046 gallons per box. Last season's final yield for late oranges was 1.472983 gallons per box. All projections of yield assume the processing relationships this season will be similar to those of the past several seasons.

## Forecast Components, by Type – Florida: October 2016

[Survey data is considered final in December for Navels, January for early-midseason oranges, February for grapefruit, and April for Valencia]

Type	Bearing trees (1,000 trees)	Fruit per tree (number)	Dropage (percent)	Fruit per box (number)
<b>ORANGES</b>				
Early-midseason.....	20,872	766	32	303
Navel.....	1,005	219	30	138
Valencia.....	28,925	450	31	231
<b>GRAPEFRUIT</b>				
White.....	832	410	23	124
Red.....	3,092	393	25	126

## Citrus Production and Prorated Forecast, by Production Area – Florida: 2015-2016 and 2016-2017

[Forecasts based on fruit populations. The possible differences between growing areas, concerning average fruit size, loss from dropage, and harvest patterns, can alter the prorated estimates]

Production Area	Oranges				Grapefruit			
	Non-Valencia		Valencia		White		Red	
	2015-2016	2016-2017	2015-2016	2016-2017	2015-2016	2016-2017	2015-2016	2016-2017
	(1,000 boxes)	(1,000 boxes)	(1,000 boxes)	(1,000 boxes)	(1,000 boxes)	(1,000 boxes)	(1,000 boxes)	(1,000 boxes)
Indian River.....	1,031	500	2,445	1,400	2,041	1,650	6,771	5,000
Southern.....	11,163	9,400	17,371	12,000	219	200	632	1,350
Other <sup>1</sup> .....	23,906	24,100	25,684	22,600	230	250	907	1,150
Florida Total.....	36,100	34,000	45,500	36,000	2,490	2,100	8,310	7,500

<sup>1</sup> Includes Central, Northern, and Western areas.

## Distribution of Estimated Fruit Population, by Type, Area, and Age Groups – Florida: September

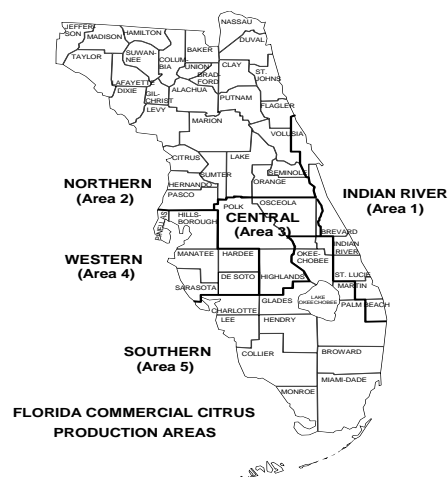
[Distribution of fruit population in September as determined by multiplying average fruit per tree from the Limb Count Survey by bearing age trees]

Areas and age groups	Oranges				Grapefruit			
	Non-Valencia		Valencia		White		Red	
	2015-2016	2016-2017	2015-2016	2016-2017	2015-2016	2016-2017	2015-2016	2016-2017
	(percent)	(percent)	(percent)	(percent)	(percent)	(percent)	(percent)	(percent)
Indian River.....	3	1	5	4	79	79	70	66
Northern.....	6	4	3	1	1	(Z)	3	3
Central.....	29	30	31	34	12	11	9	10
Western.....	35	37	26	27	1	1	3	3
Southern.....	27	28	35	34	7	9	15	18
3 - 5 years.....	3	4	3	4	2	(Z)	6	5
6 - 8 years.....	7	7	4	5	1	1	4	6
9 - 13 years.....	12	12	10	9	4	3	7	8
14 - 23 years.....	24	23	34	32	18	12	20	12
24 yrs & over.....	54	54	49	50	75	84	63	69

Z Less than half of the unit shown.

## Expected Gift Fruit Shipments Under the 6-R Program and Non-Certified Usage, by Type – Florida: 2016-2017

Type	1,000 boxes	Type	1,000 boxes
Non-Valencia Oranges.....	480	Tangelos.....	30
Valencia Oranges.....	250	Early Tangerines.....	60
White Grapefruit.....	80	Royal Tangerines.....	10
Red Grapefruit.....	280	Late Tangerines.....	25



## Maturity

Regular bloom fruit samples were collected from groves on established routes in Florida's five major citrus producing areas and tested in the Florida Agricultural Statistics Service (FASS) laboratory September 28-30, 2016. The orange sample size is 325 and the grapefruit sample size is 100.

### Citrus Unadjusted Maturity Tests – Florida: 2015-2016 and 2016-2017

[Averages of regular bloom fruit from sample groves. Juice and solids per box are unadjusted and not comparable to juice processing plant test results. All samples were run through an FMC 091 machine using mechanical pressure only. This machine utilizes a .040 short strainer and standard 5/8 inch orifice tube. The beam settings are also identical to past tests and no restrictors are used]

Fruit type (number of groves) test date	Acid		Solids (Brix)		Ratio		Unfinished juice per box		Solids per box	
	2015-2016 (percent)	2016-2017 (percent)	2015-2016 (percent)	2016-2017 (percent)	2015-2016	2016-2017	2015-2016 (pounds)	2016-2017 (pounds)	2015-2016 (pounds)	2016-2017 (pounds)
<b>ORANGES</b>										
Early (120-119)										
Sep 1 .....	1.26	1.39	9.14	9.26	7.33	6.79	44.82	41.37	4.09	3.83
Oct 1 .....	0.91	0.98	9.42	9.51	10.50	9.88	52.40	47.20	4.93	4.49
Midseason (55-55)										
Sep 1 .....	1.42	1.55	9.08	9.19	6.51	5.99	45.82	41.67	4.16	3.83
Oct 1 .....	1.06	1.13	9.21	9.38	8.93	8.46	49.59	47.72	4.57	4.48
Late (150-150)										
Sep 1 .....	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
Oct 1 .....	1.91	1.99	8.57	8.83	4.55	4.52	48.46	46.02	4.15	4.06
<b>GRAPEFRUIT</b>										
White Seedless (50-49)										
Sep 1 .....	1.65	1.77	9.74	10.23	5.91	5.77	35.06	32.06	3.41	3.28
Oct 1 .....	1.48	1.52	9.48	9.91	6.44	6.54	39.09	36.77	3.70	3.64
Red Seedless (50-48)										
Sep 1 .....	1.58	1.70	9.77	10.15	6.20	5.98	35.37	33.35	3.45	3.38
Oct 1 .....	1.37	1.45	9.60	9.91	7.03	6.85	42.55	36.68	4.08	3.64

NA Not available.

### Citrus Maturity Test Averages, by Areas – Florida: October 2015-2016 and 2016-2017

Fruit type (number of groves) test date	Acid		Solids (Brix)		Ratio		Unfinished juice per box		Solids per box	
	2015-2016 (percent)	2016-2017 (percent)	2015-2016 (percent)	2016-2017 (percent)	2015-2016	2016-2017	2015-2016 (pounds)	2016-2017 (pounds)	2015-2016 (pounds)	2016-2017 (pounds)
<b>ORANGES</b>										
Early										
Indian River (9-9) .....	0.95	1.07	9.69	9.67	10.42	9.16	47.71	43.48	4.63	4.21
Other Areas <sup>1</sup> (111-110)	0.91	0.97	9.40	9.50	10.51	9.94	52.78	47.51	4.95	4.51
Midseason										
Indian River (11-4) .....	1.17	(D)	9.49	(D)	8.40	(D)	49.41	(D)	4.69	(D)
Other Areas <sup>1</sup> (44-51) .....	1.05	1.14	9.16	9.39	9.02	8.43	49.62	47.86	4.55	4.49
Late										
Indian River (29-29) .....	1.98	2.04	8.92	9.07	4.57	4.50	47.51	45.51	4.24	4.14
Other Areas <sup>1</sup> (121-121)	1.89	1.98	8.49	8.77	4.54	4.53	48.68	46.14	4.13	4.05
<b>GRAPEFRUIT</b>										
White Seedless										
Indian River (38-38) .....	1.48	1.54	9.60	10.05	6.53	6.54	38.74	35.86	3.72	3.60
Other Areas <sup>1</sup> (12-11) .....	1.48	1.45	9.07	9.41	6.16	6.55	40.19	39.93	3.64	3.76
Red Seedless										
Indian River (40-40) .....	1.38	1.45	9.56	9.98	6.97	6.90	43.05	36.68	4.11	3.67
Other Areas <sup>1</sup> (10-8) .....	1.35	1.45	9.74	9.60	7.26	6.63	40.52	35.99	3.95	3.46

D Withheld to avoid disclosing data for individual operations.

<sup>1</sup> Includes Central, Northern, Southern, and Western areas.

## All Grapefruit 9.60 Million Boxes

The forecast of grapefruit production is 9.60 million boxes, 11 percent less than last season's production. The total includes 2.10 million boxes of white grapefruit and 7.50 million boxes of red grapefruit. All grapefruit bearing trees are estimated to be 3.90 million, down 7 percent from the previous season.

The **white** grapefruit forecast of 2.10 million boxes is 16 percent less than last season's production. The estimated number of bearing trees is down 15 percent from the previous season. The estimated fruit per tree is 410, a decrease of 9 percent from last season. Projected fruit size is above the minimum, requiring an estimated 124 pieces of fruit to fill an 85-pound box. Projected droppage is above average at 23 percent.

The **red** grapefruit forecast of 7.50 million boxes is 10 percent less than last season's final production. The estimated number of bearing trees is down 4 percent from the previous season. The estimated fruit per tree is 393, a decrease of 11 percent from last season. Projected fruit size is slightly above minimum, requiring an estimated 126 pieces of fruit to fill an 85-pound box. Projected droppage is above average at 25 percent.

## Tangerines and Tangelos Total 1.65 Million Boxes

The forecast for the tangerine and tangelos is 1.65 million boxes. The total includes 680 thousand boxes of the early varieties (Fallglo and Sunburst), 220 thousand boxes of the reclassified Royal tangerine (formerly Temples), 430 thousand boxes of the later maturing Honey variety, and 320 thousand boxes of tangelos. All tangerine and tangelo bearing trees are estimated to be 1.49 million.

The **Fallglo** tangerine forecast of 250 thousand boxes is 9 percent less than last season's final production. The estimated number of bearing trees is down 4 percent from the previous season. The estimated fruit per tree is 611, a decrease of 9 percent from last season. Projected fruit size is above minimum, requiring an estimated 437 pieces of fruit to fill a 95-pound box. Projected droppage is above average at 30 percent.

The **Sunburst** tangerine forecast of 430 thousand boxes is 16 percent lower than last season's final production. The estimated number of bearing trees is down 21 percent from the previous season. The estimated fruit per tree is 630, an increase of 2 percent from last season. Projected fruit size is near the minimum, requiring an estimated 419 pieces of fruit to fill a 95-pound box. Projected droppage is above average at 28 percent.

The initial forecast of **Royal** tangerines (formerly Temples) is 220 thousand boxes. The estimated number of bearing trees is 121 thousand. The estimated fruit per tree is 1,088. Projected fruit size will require an estimated 276 pieces of fruit to fill a 95-pound box. Projected droppage is 21 percent.

The **Honey** tangerine forecast of 430 thousand boxes is 32 percent lower than last season's final production. The estimated number of bearing trees is down 14 percent from last season. The estimated fruit per tree is 858, a decrease of 12 percent from last season. Projected fruit size is below average, requiring an estimated 317 pieces of fruit to fill a 95-pound box. Projected droppage is slightly above average at 42 percent.

The **Tangelo** forecast of 320 thousand boxes is 18 percent lower than last season's final production. The estimated number of bearing trees is down 14 percent from the previous season. The estimated fruit per tree is 557, an increase of 3 percent from last season. Projected fruit size is slightly below minimum, requiring an estimated 321 pieces of fruit to fill a 90-pound box. Projected droppage is above average at 18 percent.

## Forecast Procedures

All citrus forecasts are based on actual fruit counts and measurements. The objective count method uses four components:

- (1) bearing age trees provided from the latest Commercial Citrus Inventory;
- (2) average fruit per tree obtained from the Limb Count survey using randomly selected trees and limbs;
- (3) fruit size from the fruit measurement survey; and
- (4) fruit loss from the drop survey.

These measurements are used in the forecast models; regression data are from the 2006-2007 through 2015-2016 seasons.

The latest tree inventory is used to determine estimated tree numbers. All trees planted in 2013 and earlier are included for the current season. An attrition factor was applied to these tree numbers (by age and area) to account for losses since the inventory period.

Statistically valid procedures are used to provide unbiased estimates of fruit count. Samples are drawn with known probabilities from the Commercial Citrus Inventory, taking into account the variability in fruit per tree. Limbs are randomly selected from sample trees. Fruit on these limbs are counted in the mid-July to mid-September period.

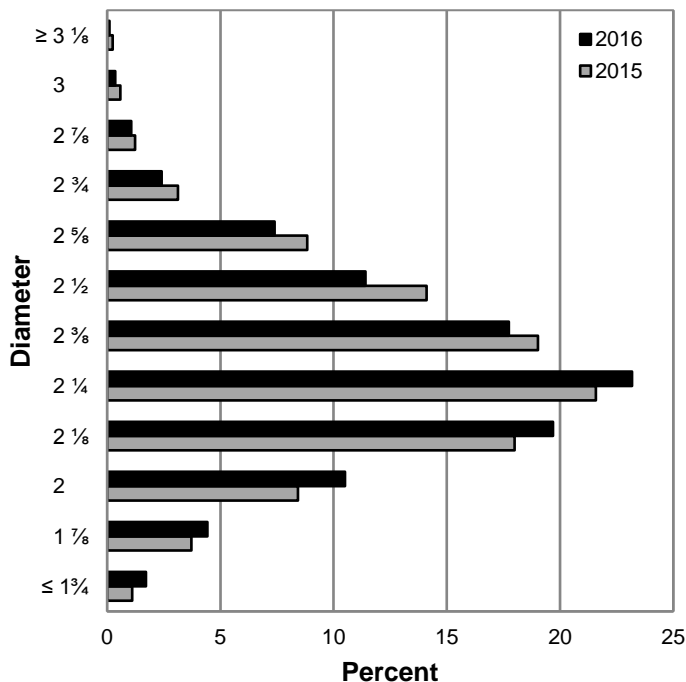
### Citrus Size Frequency Measurement Distributions, by Type – Florida: September

Type and number of fruit per 4/5 – bushel containers	2014	2015	2016	Type and number of fruit per 4/5 – bushel containers	2014	2015	2016
	(percent)	(percent)	(percent)		(percent)	(percent)	(percent)
<b>NON-VALENCIA ORANGES <sup>1</sup></b>				<b>WHITE GRAPEFRUIT <sup>2</sup></b>			
64 or less .....	0.1	0.1	0.1	32 or less .....	0.9	0.1	0.7
80 .....	1.1	1.2	0.9	36 .....	3.2	1.6	2.6
100 .....	7.2	6.6	5.7	40 .....	6.3	5.2	4.1
125 .....	21.0	20.2	16.1	48 .....	10.6	10.4	9.4
163 or more .....	70.6	71.9	77.2	56 .....	12.3	11.7	13.0
				63 or more .....	66.7	71.0	70.2
<b>NAVEL ORANGES</b>				<b>RED GRAPEFRUIT</b>			
64 or less .....	20.6	23.9	24.7	32 or less .....	0.9	1.1	0.4
80 .....	31.1	33.0	28.5	36 .....	2.8	4.3	1.6
100 .....	27.6	25.2	25.6	40 .....	6.2	7.0	5.5
125 .....	14.2	12.0	11.8	48 .....	11.4	11.9	10.4
163 or more .....	6.5	5.9	9.4	56 .....	12.1	12.9	12.5
				63 or more .....	66.6	62.8	69.6
<b>VALENCIA ORANGES</b>				<b>FALLGLO TANGERINES</b>			
64 or less .....	0.1	0.1	0.2	80 or less .....	5.0	12.1	0.3
80 .....	1.0	1.5	1.7	100 .....	28.2	13.7	6.9
100 .....	7.5	9.4	8.9	120 .....	7.3	20.0	21.5
125 .....	23.6	25.4	20.5	176 .....	5.0	12.5	14.7
163 or more .....	67.8	63.6	68.7	210 or more .....	54.5	41.7	56.6
<b>TANGELOS</b>				<b>SUNBURST TANGERINES</b>			
80 or less .....	3.0	3.4	1.9	100 or less .....	0.5	5.2	0.2
100 .....	9.4	11.2	4.4	120 .....	3.5	9.4	4.4
120 .....	18.0	19.8	12.8	176 .....	7.4	10.4	4.2
156 or more .....	69.6	65.6	80.9	210 or more .....	88.6	75.0	91.2

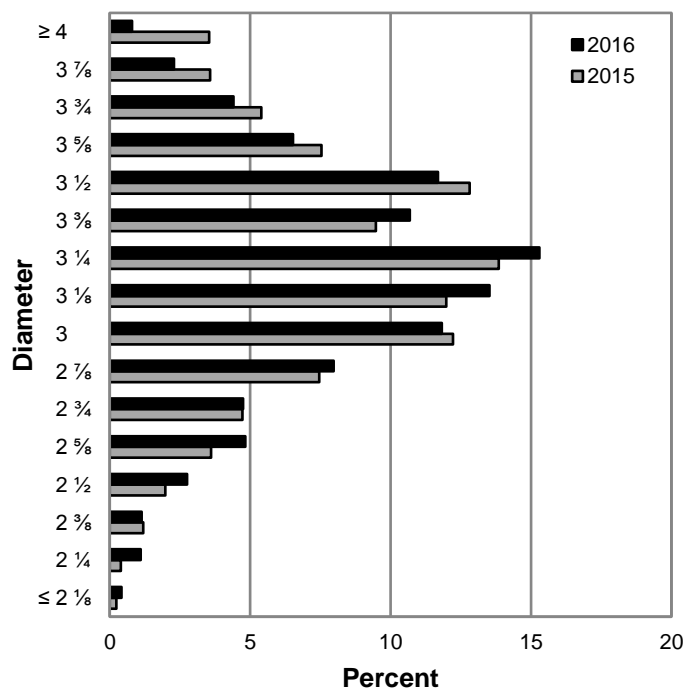
<sup>1</sup> Excludes Navel and Temple varieties.

<sup>2</sup> Excludes seedy variety.

**Fruit Size Frequency Measurements, Non-Valencia Oranges <sup>1</sup>, by Diameter - Florida: September**



**Fruit Size Frequency Measurements, Red Grapefruit, by Diameter - Florida: September**



<sup>1</sup> Excludes Navel variety.