United States Department of Agriculture
National Agricultural Statistics Service

CITRUS

OCTOBER FORECAST
MATURITY TEST RESULTS AND FRUIT SIZE

Cooperating with the Florida Department of Agriculture and Consumer Services
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October 9, 2020

Florida All Orange Production Down 15 Percent from Last Season
Florida Non-Valencia Orange Production Down 22 Percent
Florida Valencia Orange Production Down 10 Percent
Florida All Grapefruit Production Down 7 Percent
Florida All Tangerine and Tangelo Production Up 8 Percent

FORECAST DATES – 2020-2021 SEASON
November 10, 2020 (Maturity only)
December 10, 2020

Citrus Production by Type – States and United States

Crop and State	Production [1]			Forecasted Production [1]
	2017-2018	2018-2019	2019-2020	2020-2021
	(1,000 boxes)	(1,000 boxes)	(1,000 boxes)	(1,000 boxes)
Non-Valencia Oranges [2]				
Florida	**18,950**	**30,400**	**29,650**	**23,000**
California	35,900	42,000	44,300	42,000
Texas	1,530	2,210	1,150	1,300
United States	56,380	74,610	75,100	66,300
Valencia Oranges				
Florida	**26,100**	**41,450**	**37,650**	**34,000**
California	8,300	10,200	9,000	8,500
Texas	350	290	190	200
United States	34,750	51,940	46,840	42,700
All Oranges				
Florida	**45,050**	**71,850**	**67,300**	**57,000**
California	44,200	52,200	53,300	50,500
Texas	1,880	2,500	1,340	1,500
United States	91,130	126,550	121,940	109,000
Grapefruit				
Florida-All	**3,880**	**4,510**	**4,850**	**4,500**
Red	**3,180**	**3,740**	**4,060**	**3,800**
White	**700**	**770**	**790**	**700**
California [3]	3,800	4,200	3,800	3,800
Texas	4,800	6,100	4,400	4,900
United States	12,480	14,810	13,050	13,200
Lemons				
Arizona	1,000	1,350	1,800	1,300
California	21,200	23,700	25,700	22,000
United States	22,200	25,050	27,500	23,300
Tangerines and Tangelos				
Florida	**750**	**990**	**1,020**	**1,100**
California	19,200	26,500	22,000	23,000
United States	19,950	27,490	23,020	24,100

[1] Net pounds per box: oranges in California-80, Florida-90, Texas-85; grapefruit in California and Texas-80, Florida-85; lemons-80; tangerines and mandarins in California-80, Florida-95.
[2] Early non-Valencia (including Navel) and midseason non-Valencia varieties in Florida; Navel and miscellaneous varieties in California; Early and mid-season varieties in Texas.
[3] Includes pummelos in California.

All Oranges 57.0 Million Boxes

The 2020-2021 Florida all orange forecast released today by the USDA Agricultural Statistics Board is 57.0 million boxes, down 15 percent from last season's final production. The total includes 23.0 million boxes of non-Valencia oranges (early, midseason, and Navel varieties) and 34.0 million boxes of Valencia oranges. The Navel orange forecast, at 700,000 boxes, accounts for 3 percent of the non-Valencia total.

The estimated number of bearing trees for all oranges is 50.1 million. Trees planted in 2017 and earlier are considered bearing this season. Field work for the latest Commercial Citrus Inventory was completed in June 2020. Attrition rates were applied to the results to determine the number of bearing trees used to weigh and expand objective count data in the forecast model.

A 9-year regression was used for comparison purposes. All references to "average", "minimum", and "maximum" refer to the previous 10 seasons, excluding the 2017-2018 season, which was affected by Hurricane Irma. Average fruit per tree includes both regular bloom and the first late bloom.

Non-Valencia Oranges 23.0 Million Boxes

The non-Valencia forecast of 23.0 million boxes is 22 percent less than last season's production. The estimated number of bearing trees (without Navels) is 19.1 million, down 2 percent from the previous season. The estimated fruit per tree for early-midseason (non-Valencia) oranges is 590, a decrease of 24 percent from last season, and the lowest in a series dating back to the 1964-1965 season. Projected fruit size is above average, requiring an estimated 281 pieces of fruit to fill a 90-pound box. At 27 percent, projected droppage is above average.

The Navel forecast of 700,000 boxes is 13 percent less than last season's production. The estimated number of bearing trees is 902 thousand, down 2 percent from the previous season. The estimated fruit per tree is 194, a decrease of 18 percent from last season. Projected fruit size is above average, requiring an estimated 139 pieces of fruit to fill a 90-pound box. Projected droppage is above average at 26 percent.

Valencia Oranges 34.0 Million Boxes

The Valencia forecast of 34.0 million boxes is 10 percent lower than last season's production. The estimated number of bearing trees is 30.2 million, up 2 percent from the previous season. The estimated fruit per tree is 441, a decrease of 18 percent from last season, and the lowest since the 2006-2007 season. Projected fruit size is below average, requiring an estimated 243 pieces of fruit to fill a 90-pound box. Projected droppage is above average at 27 percent.

Reliability

To assist users in evaluating the reliability of the October 1 Florida production forecasts, the "Root Mean Square Error," a statistical measure based on past performance, is computed. The deviation between the October 1 production forecast and the final estimate is expressed as a percentage of the final estimate. The average of squared percentage deviations for the latest 20-year period is computed. The square root of the average becomes statistically the "Root Mean Square Error." Probability statements can be made concerning expected differences in the current forecast relative to the final end-of-season estimate, assuming that factors affecting this year's forecast are not different from those influencing recent years.

The "Root Mean Square Error" for the October 1 Florida all orange production forecast is 10.8 percent. However, if you exclude the three abnormal production seasons (three hurricane seasons), the "Root Mean Square Error" is 6.6 percent. This means chances are 2 out of 3 that the current all orange production forecast will not be above or below the final estimates by more than 10.8 percent, or 6.6 percent excluding abnormal seasons. Chances are 9 out of 10 (90 percent confidence level) that the difference will not exceed 18.7 percent, or 11.6 percent excluding abnormal seasons.

Changes between the October 1 Florida all orange forecast and the final estimates during the past 20 years have averaged 9.43 million boxes (6.35 million, excluding abnormal seasons), ranging from 0.30 million boxes to 42.3 million boxes including abnormal seasons, (0.30 to 20.4 million boxes excluding abnormal seasons). The October 1 forecast for all oranges has been below the final estimate 3 times, above 16 times, (below 3 times, above 13 times, excluding abnormal seasons). The difference does not imply that the October 1 forecast this year is likely to understate or overstate final production.

Weather and Crop Progress

The citrus growing region experienced warmer than average temperatures leading up to the bloom period in early March. Most areas were drier than normal for the time of year. The bloom in late March and early April was uniform overall. By the beginning of April, trees formed pea size fruit for the next season. Some caretakers sprayed fungicides when necessary to prevent post bloom fruit drop (PFD). Reports from the field indicated that some were cutting back on spraying. During most of May, the citrus region showed moderate to severe drought. June had average rainfall, bringing back normal growing conditions. During the summer, the fruit sized better than in recent previous seasons. Although fruit sets were not as robust as former seasons, the fruit, in well-cared for groves, had large sizes and looked good. Temperatures during July and August were warmer than normal and rainfall was about average. Two named storms (Hurricane Isaias and Hurricane Sally) threatened the Florida coast; however, no damage was reported to the trees or fruit. By the end of September, fruit maturity was normal, groves looked good, and harvest on early tangerines and early oranges was beginning.

Forecast Components, by Type – Florida: October 2020

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

Type	Bearing trees	Fruit per tree	Droppage	Fruit per box
	(1,000 trees)	(number)	(percent)	(number)
ORANGES				
Non-Valencia	19,050	590	27	281
Navel	902	194	26	139
Valencia	30,169	441	27	243
GRAPEFRUIT				
Red	1,983	372	31	119
White	376	409	29	107

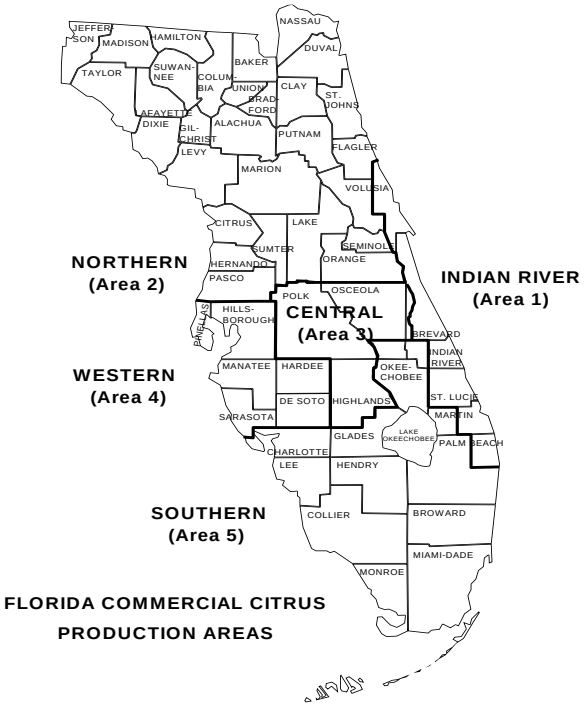
Citrus Production and Prorated Forecast, by Production Area – Florida: 2019-2020 and 2020-2021

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

Production Area	Oranges			
	Non-Valencia		Valencia	
	2019-2020	2020-2021	2019-2020	2020-2021
	(1,000 boxes)	(1,000 boxes)	(1,000 boxes)	(1,000 boxes)
Central	9,225	7,200	13,302	13,100
Southern	7,524	6,200	11,640	9,100
Western	11,187	8,450	10,279	9,950
Other [1]	1,714	1,150	2,429	1,850
Florida Total	29,650	23,000	37,650	34,000

Production Area	Grapefruit			
	White		Red	
	2019-2020	2020-2021	2019-2020	2020-2021
	(1,000 boxes)	(1,000 boxes)	(1,000 boxes)	(1,000 boxes)
Indian River	726	600	3,140	2,850
Other [2]	64	100	920	950
Florida Total	790	700	4,060	3,800

[1] Includes Indian River and Northern areas.
[2] Includes Central, Northern, Southern, 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		Red		White	
	2019-2020	2020-2021	2019-2020	2020-2021	2019-2020	2020-2021	2019-2020	2020-2021
	(percent)	(percent)	(percent)	(percent)	(percent)	(percent)	(percent)	(percent)
Indian River	2	3	5	4	69	75	82	90
Northern	2	2	1	1	2	1	1	(Z)
Central	30	31	35	39	6	5	8	4
Western	37	37	27	29	5	4	(Z)	1
Southern	29	27	32	27	18	15	9	5
3 - 5 years	4	4	6	9	4	2	(Z)	(Z)
6 - 8 years	7	7	7	7	9	10	(Z)	1
9 - 13 years	14	15	10	10	8	10	1	1
14 - 23 years	25	26	29	30	10	10	6	5
24 yrs & over	50	48	48	44	69	68	93	93

Z Less than half of the unit shown.

Maturity

Regular bloom fruit samples (325 orange and 99 grapefruit) were collected from groves on established routes in Florida's five major citrus producing areas and tested by the Florida Agricultural Statistics Service (FASS) on September 28-30, 2020.

Unadjusted Maturity Tests – Florida: 2019-2020 and 2020-2021

[Averages of regular bloom fruit from sample groves. Juice and solids per box are unadjusted and not comparable to juice processing plant test results. Samples were run through an FMC 091B machine using pneumatic pressure. This machine utilizes a 0.025 short strainer and a 1.00 inch orifice tube for the 3 inch cup and a 1.25 inch orifice tube for the 4 inch and 5 inch cups]

Fruit type (number of groves) test date	Acid		Solids (Brix)		Ratio		Unfinished juice per box		Solids per box	
	2019-2020	2020-2021	2019-2020	2020-2021	2019-2020	2020-2021	2019-2020	2020-2021	2019-2020	2020-2021
	(percent)	(percent)	(percent)	(percent)			(pounds)	(pounds)	(pounds)	(pounds)
ORANGES										
Early N-V (120-120)										
Sep 1	1.21	1.21	9.06	8.82	7.58	7.42	45.11	44.44	4.09	3.91
Oct 1	0.89	0.88	9.69	9.18	11.04	10.58	49.65	49.74	4.81	4.57
Midseason N-V (55-55)										
Sep 1	1.37	1.26	9.04	8.57	6.71	6.91	45.55	45.27	4.12	3.88
Oct 1	1.04	0.97	9.76	9.00	9.54	9.45	49.37	50.04	4.81	4.51
Valencia (150-150)										
Sep 1	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
Oct 1	1.97	1.79	9.08	8.75	4.68	4.95	47.73	48.55	4.33	4.25
GRAPEFRUIT										
Red Seedless (50-50)										
Sep 1	1.53	1.46	10.10	9.89	6.63	6.80	39.41	38.64	3.98	3.82
Oct 1	1.31	1.25	10.21	9.79	7.84	7.86	46.18	44.43	4.71	4.35
White Seedless (49-49)										
Sep 1	1.63	1.46	10.33	9.99	6.35	6.88	38.84	39.06	4.01	3.90
Oct 1	1.41	1.31	10.33	10.00	7.37	7.65	46.00	44.18	4.75	4.41

NA Not available.

Unadjusted Maturity Test Averages, by Areas – Florida: October 2019-2020 and 2020-2021

Fruit type (number of groves) test date	Acid		Solids (Brix)		Ratio		Unfinished juice per box		Solids per box	
	2019-2020	2020-2021	2019-2020	2020-2021	2019-2020	2020-2021	2019-2020	2020-2021	2019-2020	2020-2021
	(percent)	(percent)	(percent)	(percent)			(pounds)	(pounds)	(pounds)	(pounds)
ORANGES										
Early N-V										
Indian River (9-9)	0.95	0.98	10.01	9.48	10.59	9.90	47.97	47.54	4.81	4.50
Other Areas [1] (111-111)	0.89	0.87	9.66	9.15	11.08	10.64	49.79	49.92	4.81	4.57
Midseason N-V										
Indian River (2-2)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Other Areas [1] (53-53)	1.04	0.97	9.76	8.98	9.57	9.41	49.58	50.20	4.84	4.51
Valencia										
Indian River (29-29)	2.23	1.96	9.53	9.29	4.32	4.82	46.48	48.36	4.43	4.50
Other Areas [1] (121-121)	1.91	1.75	8.97	8.62	4.77	4.99	48.03	48.59	4.31	4.19
GRAPEFRUIT										
Red Seedless										
Indian River (42-42)	1.34	1.25	10.30	9.87	7.74	7.92	46.06	44.16	4.75	4.36
Other Areas [1] (8-8)	1.17	1.25	9.71	9.40	8.36	7.55	46.82	45.86	4.53	4.31
White Seedless										
Indian River (43-42)	1.40	1.32	10.38	10.04	7.42	7.61	45.52	44.47	4.72	4.46
Other Areas [1] (6-7)	1.42	1.24	9.98	9.76	7.05	7.87	49.38	42.44	4.93	4.14

D Withheld to avoid disclosing data for individual operations.
[1] Includes Central, Northern, Southern, and Western areas.

All Grapefruit 4.50 Million Boxes

The forecast of all grapefruit production is 4.50 million boxes, 7 percent less than last season's utilization of 4.85 million boxes. The total is comprised of 3.80 million boxes of red grapefruit and 700 thousand boxes of white grapefruit.

The **red** grapefruit forecast at 3.80 million boxes is 6 percent less than last season's final production. Bearing trees are 9 percent less than last season's revised bearing tree numbers. The average fruit per tree is 50 pieces less than last season, and the lowest in a series dating back to the 1968-1969 season. Fruit droppage is projected to be above average. Fruit size at the final month is expected to be above average.

The **white** grapefruit forecast of 700,000 boxes is 11 percent less than last season's final production. White grapefruit bearing trees declined by 10 percent from last season's revised bearing tree numbers, and are 21 percent less than two seasons ago. The average fruit per tree is 52 pieces less than last season, yet 46 pieces more than two seasons ago. Current fruit sizes are above average, and at the rate of growth measured in last month's survey, indications show that the final size will be above average. Final drop is expected to be slightly above average.

Tangerines and Tangelos Total 1.10 Million Boxes

The forecast for tangerine and tangelos is 1.10 million boxes, 8 percent more than last season's utilization of 1.02 million boxes. This forecast number includes all certified tangerine and tangelo varieties.

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;
(4) fruit loss from the drop survey.

These measurements are used in the forecast models; regression data are from the 2010-2011 through 2019-2020 seasons.

The latest Tree Inventory is used to determine estimated tree numbers. All trees planted in 2017 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.

Expected Gift Fruit Shipments Under the 6-R Program and Non-Certified Usage, by Type – Florida: 2020-2021

Type	1,000 boxes
Navel Oranges	50
Non-Valencia Oranges (excluding navels)	75
Valencia Oranges	100
Red Grapefruit	100
White Grapefruit	20
Tangerines and Tangelos	65

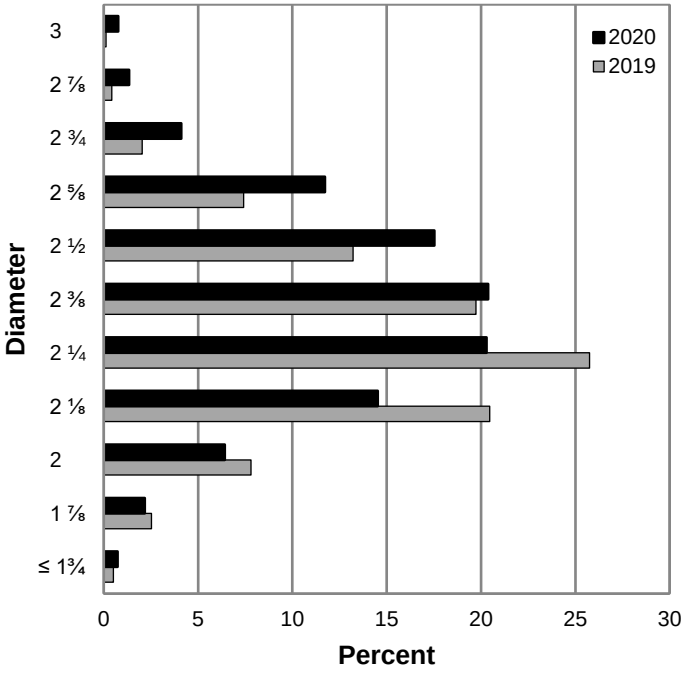
Citrus Size Frequency Measurement Distributions, by Type – Florida: September

Type and number of fruit per 4/5 – bushel containers	2018	2019	2020
	(percent)	(percent)	(percent)
NON-VALENCIA ORANGES [1]			
64 or less	0.0	0.0	0.1
80	0.3	0.3	1.2
100	2.5	4.6	8.8
125	12.9	18.3	25.4
163 or more	84.3	76.8	64.5
NAVEL ORANGES			
64 or less	29.4	27.7	38.7
80	27.8	32.6	28.8
100	25.6	24.2	19.4
125	11.7	11.9	9.5
163 or more	5.5	3.6	3.6
VALENCIA ORANGES			
64 or less	0.0	0.0	0.1
80	0.2	0.3	1.0
100	3.0	4.9	7.4
125	13.8	19.8	20.2
163 or more	83.0	75.0	71.3

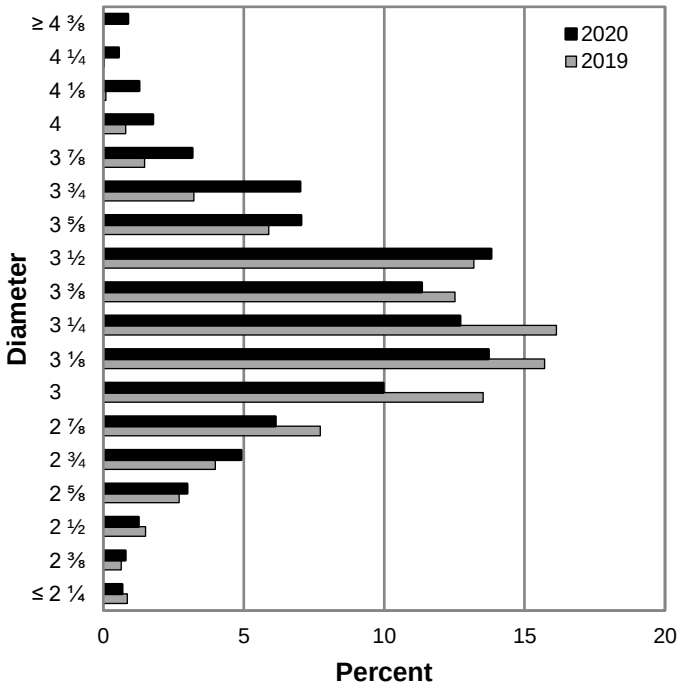
Type and number of fruit per 4/5 – bushel containers	2018	2019	2020
	(percent)	(percent)	(percent)
RED GRAPEFRUIT			
32 or less	0.4	0.1	1.8
36	1.3	1.4	4.0
40	4.5	4.1	8.9
48	8.8	10.0	11.4
56	9.8	13.7	13.7
63 or more	75.2	70.7	60.2
WHITE GRAPEFRUIT [2]			
32 or less	1.0	0.3	1.1
36	2.8	2.6	3.7
40	6.6	6.5	8.2
48	10.1	14.9	16.8
56	13.9	14.4	15.6
63 or more	65.6	61.3	54.6

[1] Excludes Navels.
[2] Excludes seedy variety.

Fruit Size Frequency Measurements, Non-Valencia Oranges [1], by Diameter - Florida: September



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



[1] Excludes Navel variety.