

Current forecast update (variation regarding the September forecast update):  
 Total orange crop production forecast<sup>1</sup>: 385.31 million boxes (decreased of 0.80%)  
 Hamlin, Westin and Rubi: 76.27 million boxes (unchanged)  
 Other early season<sup>2</sup>: 19.83 million boxes (decreased of 0.75%)  
 Pera Rio: 118,29 million boxes (increased of 1.80%)  
 Valencia and Valencia Folha Murcha: 124.45 million boxes (decreased of 3.00%)  
 Natal: 46.47 million boxes (decreased of 2.52%)

December, 10 2019

**Publication Schedule 2019-2020**

3<sup>rd</sup> Crop forecast update: February 11, 2020  
 Final crop forecast: April 10, 2020

**Orange crop forecast update by sector and variety group – citrus belt**

Month	Forecast components				Crop forecast update 2019-2020			Crop forecast update 2019-2020		
	September/2019 and December/2019 (strike-through values were presented in September, to their left are their respective values updated in December)				September/2019			December/2019		
	Bearing trees	Fruit per tree at stripping <sup>3</sup>	Fruit estimated per box	Estimated drop rate	Per tree	Per hectare	Total	Per tree	Per hectare	Total
Sector and variety group	(1,000 trees)	(number)	(number)	(percentage)	(boxes/tree)	(boxes/hectare)	(1,000,000 boxes)	(boxes/tree)	(boxes/hectare)	(1,000,000 boxes)
<b>CITRUS BELT</b>										
Hamlin, Westin and Rubi.....	25,482	1,114	300	10.50	2.99	1,319	76.27	2.99	1,319	76.27
Other early <sup>2</sup> .....	8,016	834	262 <del>265</del>	13.20 <del>12.00</del>	2.49	1,129	19.98	2.47	1,121	19.83
Pera Rio.....	62,869	665	261 <del>266</del>	17.50	1.85	926	116.20	1.88	943	118.29
Valencia and Folha Murcha <sup>4</sup> ..	58,269	735	242 <del>235</del>	21.50	2.20	1,018	128.30	2.14	988	124.45
Natal.....	19,337	853	248 <del>242</del>	22.00	2.47	1,107	47.67	2.40	1,079	46.47
<b>Total.....</b>	<b>173,973</b>	<b>783</b>	<b>262 <del>260</del></b>	<b>17.63 <del>17.60</del></b>	<b>2.23</b>	<b>1,050</b>	<b>388.42</b>	<b>2.21</b>	<b>1,041</b>	<b>385.31</b>
<b>NORTH SECTOR</b>										
Hamlin, Westin and Rubi.....	6,970	1,210	300	10.50	3.25	1,403	22.66	3.25	1,403	22.66
Other early <sup>2</sup> .....	2,029	808	262 <del>265</del>	13.20 <del>12.00</del>	2.42	1,157	4.90	2.40	1,150	4.87
Pera Rio.....	12,987	600	261 <del>266</del>	17.50	1.67	895	21.67	1.70	911	22.06
Valencia and Folha Murcha <sup>4</sup> ..	14,391	757	242 <del>235</del>	21.50	2.27	1,028	32.65	2.20	998	31.67
Natal.....	3,920	911	248 <del>242</del>	22.00	2.63	1,109	10.32	2.57	1,081	10.06
<b>Subtotal.....</b>	<b>40,297</b>	<b>802</b>	<b>262 <del>260</del></b>	<b>17.63 <del>17.60</del></b>	<b>2.29</b>	<b>1,076</b>	<b>92.20</b>	<b>2.27</b>	<b>1,066</b>	<b>91.32</b>
<b>NORTHWEST SECTOR</b>										
Hamlin, Westin and Rubi.....	2,565	1,031	300	10.50	2.77	1,223	7.10	2.77	1,223	7.10
Other early <sup>2</sup> .....	1,407	618	262 <del>265</del>	13.20 <del>12.00</del>	1.86	852	2.61	1.83	842	2.58
Pera Rio.....	8,278	655	261 <del>266</del>	17.50	1.82	812	15.09	1.86	827	15.36
Valencia and Folha Murcha <sup>4</sup> ..	3,600	679	242 <del>235</del>	21.50	2.04	980	7.33	1.97	951	7.11
Natal.....	1,781	711	248 <del>242</del>	22.00	2.06	954	3.66	2.00	930	3.57
<b>Subtotal.....</b>	<b>17,630</b>	<b>717</b>	<b>262 <del>260</del></b>	<b>17.63 <del>17.60</del></b>	<b>2.03</b>	<b>923</b>	<b>35.79</b>	<b>2.03</b>	<b>922</b>	<b>35.72</b>
<b>CENTRAL SECTOR</b>										
Hamlin, Westin and Rubi.....	6,390	989	300	10.50	2.66	1,146	16.98	2.66	1,146	16.98
Other early <sup>2</sup> .....	2,966	922	262 <del>265</del>	13.20 <del>12.00</del>	2.75	1,196	8.17	2.73	1,187	8.11
Pera Rio.....	18,074	671	261 <del>266</del>	17.50	1.87	942	33.75	1.90	959	34.36
Valencia and Folha Murcha <sup>4</sup> ..	15,835	746	242 <del>235</del>	21.50	2.23	1,025	35.39	2.17	995	34.33
Natal.....	4,497	921	248 <del>242</del>	22.00	2.66	1,128	11.97	2.59	1,099	11.67
<b>Subtotal.....</b>	<b>47,762</b>	<b>778</b>	<b>262 <del>260</del></b>	<b>17.63 <del>17.60</del></b>	<b>2.22</b>	<b>1,036</b>	<b>106.26</b>	<b>2.21</b>	<b>1,028</b>	<b>105.45</b>
<b>SOUTH SECTOR</b>										
Hamlin, Westin and Rubi.....	4,334	820	300	10.50	2.20	952	9.55	2.20	952	9.55
Other early <sup>2</sup> .....	450	792	262 <del>265</del>	13.20 <del>12.00</del>	2.38	862	1.07	2.35	854	1.06
Pera Rio.....	13,177	681	261 <del>266</del>	17.50	1.89	926	24.96	1.93	942	25.41
Valencia and Folha Murcha <sup>4</sup> ..	11,846	719	242 <del>235</del>	21.50	2.15	919	25.51	2.09	892	24.74
Natal.....	3,193	836	248 <del>242</del>	22.00	2.42	1,056	7.72	2.36	1,028	7.52
<b>Subtotal.....</b>	<b>33,000</b>	<b>729</b>	<b>262 <del>260</del></b>	<b>17.63 <del>17.60</del></b>	<b>2.09</b>	<b>939</b>	<b>68.81</b>	<b>2.07</b>	<b>932</b>	<b>68.28</b>
<b>SOUTHWEST SECTOR</b>										
Hamlin, Westin and Rubi.....	5,223	1,424	300	10.50	3.83	1,815	19.98	3.83	1,815	19.98
Other early <sup>2</sup> .....	1,164	931	262 <del>265</del>	13.20 <del>12.00</del>	2.78	1,392	3.23	2.76	1,384	3.21
Pera Rio.....	10,353	720	261 <del>266</del>	17.50	2.00	1,044	20.73	2.04	1,063	21.10
Valencia and Folha Murcha <sup>4</sup> ..	12,596	727	242 <del>235</del>	21.50	2.18	1,118	27.43	2.11	1,084	26.61
Natal.....	5,947	814	248 <del>242</del>	22.00	2.35	1,166	13.99	2.29	1,137	13.64
<b>Subtotal.....</b>	<b>35,284</b>	<b>850</b>	<b>262 <del>260</del></b>	<b>17.63 <del>17.60</del></b>	<b>2.42</b>	<b>1,224</b>	<b>85.36</b>	<b>2.40</b>	<b>1,213</b>	<b>84.54</b>

<sup>1</sup> Hamlin, Westin, Rubi, Valencia Americana, Seleta, Pineapple, Pera Rio, Valencia, Valencia Folha Murcha and Natal.

<sup>2</sup> Valencia Americana, Seleta and Pineapple.

<sup>3</sup> Weighted average per stratum bearing trees.

<sup>4</sup> Folha Murcha – Valencia Folha Murcha.

### Updated orange<sup>1</sup> crop forecast totals 385.31 million boxes

The 2019-2020 orange crop forecast update for São Paulo and West-Southwest Minas Gerais citrus belt, published on December 10, 2019 by Fundecitrus – performed in cooperation with Markestrat, FEA-RP/USP and FCAV/Unesp<sup>2</sup> – is of 385.31 million boxes of 40.8 kg each. This figure corresponds to a decrease of 0.80% in relation to the previous update published in September 2019, and of 0.92% compared to the first estimate of the crop, disclosed in May 2019. Out of the total crop, about 26.88 million boxes are estimated for the Triângulo Mineiro region.

Heavy rains in November on virtually the entire citrus belt eased the drought, but since May total rainfall stood at 17% below the historical average (1981-2010): 409 millimeters in the average across regions, while historical average is 495 millimeters, according to data from Somar Meteorologia. The driest period was at the beginning of the crop season, from May to August, when the negative deviation reached 32% in relation to the climatological standard normal. Although rains resumed in the first week of September, this followed a two-week window of dry weather on most of the belt, which characterized the occurrence of an Indian summer. It was not until mid-October that the rainy season began to set in, although the monthly accumulated rainfall rate was still below average. In November, rainfall was abundant and well distributed throughout the month, with accumulations ranging from 95 to 265 millimeters among the citrus belt regions.

As the crop progresses, the projected scenario of high production and small sized fruit is materializing. In order to estimate the weight that the oranges would reach at the harvest point, a regression model was used with data from the tree stripping performed in April 2019 and the 2008/09 to 2018/19 crops, as well as the historical average rainfall in the citrus belt. The values measured at the stripping of this crop season that contributed to estimate that the fruits would be small are: the large number of fruits per tree, the high proportion of oranges from the first and second blooms in relation to the total production and the weight of the fruits, measured at the stripping, which was below the average when compared to previous crops.

Based on this regression, the expectation in May 2019, when the harvest was estimated, was that oranges would reach harvest maturity with an average weight of 157 grams (260 fruits per box), about 5% lower than the average weight observed in the last eleven crops considered in the model. However, if the accumulated rainfall below the historical level does not normalize until the end of harvesting, the growth of oranges, in general, can be further inhibited. Therefore, the average fruit weight, considering all varieties, is revised to 156 grams (262 fruits per box), which means a reduction of 0.77% compared to the initial projection. The stratified analysis by variety shows that only oranges from the group referred to as other earlies and the mid-season Pera Rio are likely to record weights slightly higher than those projected in May.

The harvesting of the early Hamlin, Westin and Rubi varieties ended with an average weight of 136 grams, equivalent to 300 fruits per box. The harvesting of the other early varieties – Valencia Americana, Seleta and Pineapple – also ended, with an average weight of 156 grams per fruit, corresponding to 262 fruits per box. The Pera Rio harvest reached 85%, so the average fruit weight of this variety has possibly stabilized, allowing it to be revised to 156 grams per fruit, equivalent to 261 fruits per box, compared to the estimated of 266 in May and that was maintained in the September update. The harvesting of the Valencia and Valencia Folha Murcha varieties has been completed just over half of its total and, in this new projection, the average weight is reduced from 174 to 169 grams per fruit, which corresponds to 242 fruits per box. Natal variety harvest is close to 45% and its average weight has dropped from 169 to 165 grams per fruit, which is equivalent to 248 fruits per box. Even though fruit sizes of late varieties are being updated, they may undergo changes in the future updates depending on the average weight when their harvests are completed. Approximately 74% of the total crop has been harvested. At this time in the last crop season, harvest was 78% complete. Harvest percentages represent the status of the crop on November 30.

All varieties considered, fruit drop rate increased from 17.60% to 17.63%, on average. Such an increase is due to the intensification of the drop of the Valencia Americana, Seleta and Pineapple varieties, which totaled 13.20%. The rates of the other varieties are in line with the projection made in May. If these remain at their current levels until the end of the crop season, this season's rate will be the highest ever measured by Fundecitrus.

The method used for the update is the same adopted in the previous crop season. Information was obtained from the monitoring survey started in May on 1,200 plots that are no longer visited when fruit harvest is complete. Other data used in this study was size of fruit received throughout the crop season by orange juice companies associated to Fundecitrus – Citrosuco, Cutrale and Louis Dreyfus – for industrial processing. Each processing company supplies individual data under confidentiality to the independent consulting firm for the calculation of the average size of processed fruit.

<sup>1</sup> Hamlin, Westin, Rubi, Valencia Americana, Seleta, Pineapple, Pera Rio, Valencia, Valencia Folha Murcha and Natal.

<sup>2</sup> Department of Math and Science at FCAV/Unesp Campus Jaboticabal.