

Cost of Production for Fresh Market Grapefruit Grown in Indian River, 2020/21

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In this article, I present the cost of production per acre for growing fresh grapefruit in the Indian River region during 2020/21. The data was collected during a virtual Production Committee meeting of the Indian River Citrus League in March 2021. During the meeting each grower used his computer as a “clicker” or remote device to enter the costs for each caretaking program. By collecting the data in this way, the process was anonymous and confidential. Surveying a panel of growers to obtain the costs of their production programs allows me to report estimates that closely reflect growers’ costs and cultural practices. This is particularly important because, since HLB was found, growers have been modifying their practices from year to year in an attempt to cope with the disease. However, the cost estimates below do not represent any individual operation. Instead, their purpose is to serve as a benchmark for the Florida citrus industry.

The number of acres managed by the combined operations of the sample of participating growers accounted for approximately 8,950 acres; representing 56% of the acreage devoted to grapefruit in Indian River, which was estimated at 15,870 (USDA-NASS, 2020). The questionnaire asked growers to provide annual, per acre costs by program for a “typical” irrigated, mature grapefruit grove (10+ years old) with fruit marketed to the fresh market, including costs related to their tree replacement program. The figures below were obtained by computing the weighted average of the responses by the acreage of each of the growers.

Table 1 shows the cultural costs of production by program. Such estimates include both the costs of materials and their application. From Table 1, the total for weed management – which includes chemical and mechanical mowing as well as herbicides – was \$258.48 per acre. At \$1,176.75 per acre, foliar sprays represented the largest production cost. Fertilizer was the second largest expense at \$535.50 per acre. The expense for pruning was \$122.50 per acre, while that for irrigation was \$169.11 per acre. The cost per acre of canker control was \$25.00 and that of sub-contracted labor \$47.50. Adding all the costs listed above, the cultural cost of growing fresh grapefruit in the Indian River during 2020/21 without tree replacement was \$2,334.84 per acre.

Growers were also asked to provide details regarding their reset practices, including the number of trees replaced in their groves. On average, growers replaced three trees per acre during 2020/21. The total cost of tree replacement, including tree removal, site preparation, and care of those young trees was estimated at \$105.58 per acre. Adding such figure to the total cost above yields a total production cost with tree replacement of \$2,440.42 per acre.

Figure 1 depicts a double pie chart. The larger pie shows the cost of each program as well as the percentage relative to the cultural production costs with tree replacement. The smaller pie in Figure 1 provides greater detail regarding the individual components included in foliar sprays. Insecticides accounted for \$246 per acre and represented 10% of

the cultural cost of production; fungicides accounted for \$251 per acre (10%); foliar nutritional for \$169 per acre (7%); bactericides for \$31 per acre (1%); aerial application for \$6 per acre (0.2%); ground application of materials for \$381 per acre (16%); biostimulants \$33.75 per acre (1%), and adjuvants \$60 per acre (3%).

The main changes in cultural practices compared to 2018/19 (the last season for which estimates were available) are as follows. First, there was a decrease in nutritional spending by \$55 per acre, on average. Second, growers reported spending, on average, \$47 per acre less on fertilizer than in 2018/19. Third, on average, growers spent \$45 per acre less on irrigation, tree replacement and foliar applications. Figure 2 shows a comparison of the cost of the caretaking programs in 2020/21 relative to 2018/19.

In addition to cultural costs, growers typically have to incur in other costs when managing their groves; those costs include management, regulatory, and opportunity costs, which in 2020/21 accounted for \$559.04 per acre. Thus, table 2 shows the estimated total cost of production for fresh grapefruit growers in Indian River during 2020/21 was \$2,999.46 per acre. Based on such estimate, the break-even prices per box for different levels of yield are presented in Table 3. Break-even prices were calculated on an on-tree and delivered-in basis. The later assumes harvesting costs per box for fresh grapefruit were \$2.92. The calculations in Table 3 also include the Florida Department of Citrus (FDOC) assessment of \$0.07 per box for grapefruit. Thus, for example, the on-tree and delivered-in break-even prices for covering the total costs of production with yield at 300 boxes per acre were \$14.20 and \$16.54 per box, respectively.

Summary

This article presents a summary of the costs of production for fresh market grapefruit grown in the Indian River region during 2020/21. The methodology chosen to collect the data consisted of surveying growers directly to closely reflect growers' costs in the era of HLB. The main changes this season were the cutbacks growers made on nutritionals, fertilizer and tree replacement. The total cost of production for fresh grapefruit in Indian River during 2020/21 was \$2,999.46 per acre. Typical users of the estimates presented herein include growers and consultants, who use them as a benchmark; property appraisers, who use them to compute the taxes for property owners; and researchers, who use the estimates to evaluate the economic feasibility of potential new technologies.

References:

USDA-NASS. 2020. Florida Citrus Statistics 2018/19.

Table 1. Cultural Costs of Production per Acre for Fresh Market Grapefruit Grown in Indian River, Florida, 2020/21

Costs represent a mature grove (10+ years old) including resets	Number of Applications	Materials Cost per acre (\$)	Application Cost per acre (\$)	Total Cost per acre (\$)
Production/Cultural Costs				
<u>Weed Management</u>				
Mowing (Chemical & mechanical)	7	7.49	82.56	90.05
Herbicides	5	92.40	76.03	168.43
Total Weed Management Costs				258.48
<u>Foliar Sprays</u>				
Insecticides		246.25		246.25
Fungicides		250.50		250.50
Nutritionals		169.25		169.25
Adjuvants		60.25		60.25
Biostimulants		33.75		33.75
Bactericides		30.75		30.75
Application:				
Ground	11		380.50	380.50
Aerial	1		5.50	5.50
Total Foliar Sprays Costs				1,176.75
<u>Fertilizer</u>				
Ground/Dry Fertilizer	4	274.50	38.25	312.75
Fertigation/Liquid Fertilizer	17	201.00	21.75	222.75
Total Fertilizer Costs				535.50
<u>Pruning</u>				
Topping, Hedging & Skirting	1		122.50	122.50
Total Pruning Costs				122.50
<u>Irrigation</u>				
Irrigation System ¹				124.02
Fuel for pump				45.08
Total Irrigation Costs				169.11
Canker Control Costs ²				25.00
Grove Sub-contracted Labor				47.50
Total Production/Cultural Costs without Tree Replacement				2,334.84
<u>Tree Replacement (2 trees):</u>				
Tree Removal (Clip-shear; use front-end loader)				17.26
Site Preparation and Plant Tree (Includes reset trees)				22.98
Supplemental Fertilizer, Sprays, Sprout, etc. (Trees 1-3 years old)				65.33
Total Tree Replacement Costs				105.58
Total Production/Cultural Costs with Tree Replacement				2,440.42

¹ Irrigation system includes: Maintenance and repairs to emitters, clean ditches, ditch and canal maintenance, water control

² Canker control includes: Clean blocks before certification and harvesting; inspections before "Canker Free" certifications; mandatory citrus canker decontamination costs

Table 2. Total Costs of Production per Acre for Fresh Market Grapefruit Grown in Indian River, Florida, 2020/21

	Cost per acre (\$)
<u>Total Cultural Cost of Production</u>	2,440.42
<u>Other Costs</u>	
Interest on Operating (Cultural) Costs	122.02
Management Cost	145.00
Property Tax/Water Management Tax	18.50
Fly protocol	40.00
Water Drainage District Assessment	107.00
Interest on Average Capital Investment	126.52
<u>Total Other Costs</u>	559.04
Total Grower Costs	2,999.46

Table 3. Break-Even Price per Box for Fresh Market Grapefruit Grown in Indian River, Florida, 2020/21

	175	200	225	250	275	300	325	350	375
	<i>dollars per acre</i>								
Cost of Production per acre	2999	2999	2999	2999	2999	2999	2999	2999	2999
Pick and Haul	520	595	669	744	818	892	967	1041	1115
FDOC assessment (\$0.07/box)	12	14	16	18	19	21	23	25	26
Total Delivered-in Cost per acre	3,532	3,608	3,684	3,760	3,837	3,913	3,989	4,065	4,141
<u>Break-even Price for Fresh GF:</u>	\$ per box								
On-tree	29.07	24.61	21.14	18.36	16.09	14.20	12.59	11.22	10.03
Delivered-in	31.42	26.96	23.49	20.71	18.44	16.54	14.94	13.57	12.38

Assuming: 69% packout, 30% field run, (on-tree) price of eliminations \$5.09/box and \$6.88/box for field run

Figure 1. Cultural Costs of Production (in dollars per acre) for Fresh Market Grapefruit Grown in Indian River, Florida, 2020/21

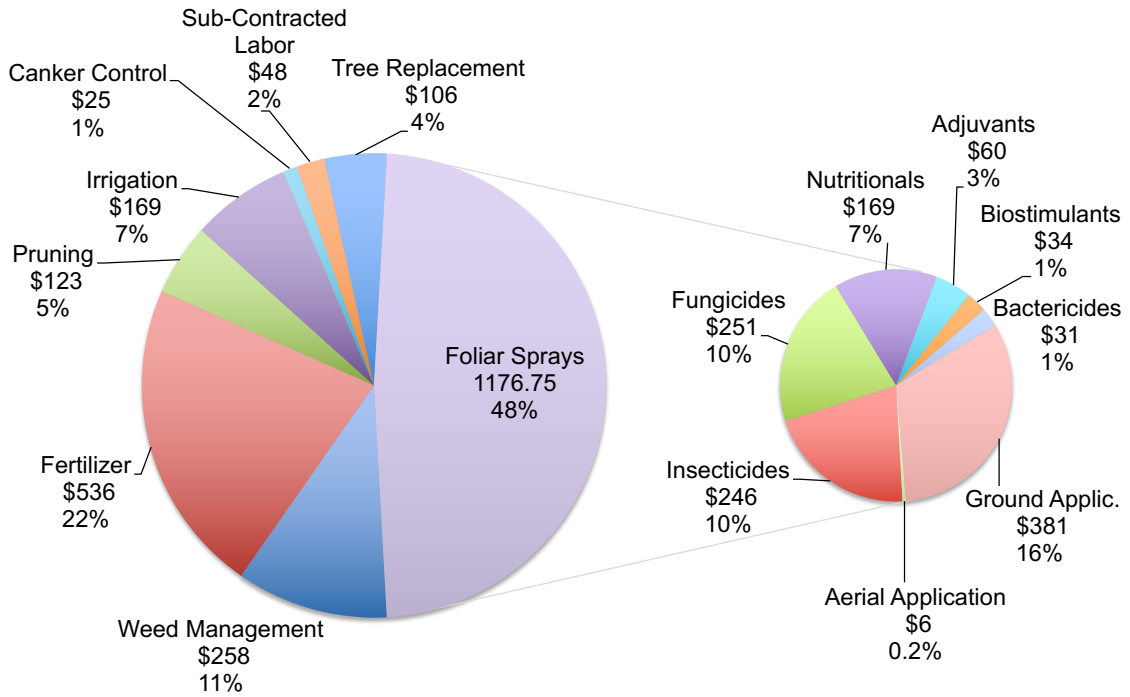


Figure 2. Cost of Production by Program for Fresh Market Grapefruit Grown in Indian River, Florida, 2020/21 vs. 2018/19

