FE802

UF UNIVERSITY of FLORIDA
IFAS Extension

Economic Impacts of the Florida Citrus Industry in 2007–08[1]

Mohammad Rahmani and Alan W. Hodges[2]

Introduction

In spite of the adverse effects of hurricanes and diseases such as citrus canker and citrus greening, the citrus industry remains a major part of Florida's agricultural and natural resource economy. Between the 2003–04 and 2007–08 production seasons, total citrus production acreage and volume declined by 20 and 30 percent, respectively; however, the total on-tree value of citrus fruit increased by 36 percent ($892 to $1,212 million) due to higher prices (Citrus Summary 2007–08).

This paper presents estimates of the total economic impacts of the Florida citrus industry on the state economy based on production values for the 2007–08 production season. Estimates are presented for citrus fruit for the fresh market and for citrus fruit for processed juice and byproducts. Economic impacts are expressed in terms of output, employment, value added, labor income, indirect business taxes, and other property incomes. This study updates previous studies for the 1999–2000 and 2003–04 production seasons (Hodges et al. 2001, 2006).

Methods

The total economic impacts of the Florida citrus industry in 2007–08 were evaluated using published values for citrus fresh fruit production, processed juices, and byproducts, together with a regional input-output model for Florida. Data for citrus fruit were taken from reports by the United States Department of Agriculture/National Agricultural Statistics Service (USDA/NASS), the Florida Department of Citrus, and the Florida Agricultural Statistics Service (FASS). Data on the value of processed citrus juice and quantities of citrus byproducts were provided by the Florida Department of Citrus, Economic Market Research. Data on the quantity of citrus byproducts were provided by the Florida Citrus Processors Association, and data on the values of byproducts were taken from Feedstuffs Magazine, and quotes from Florida Distillers, Inc. and Peace River Citrus Products.

The *IMPLAN Pro* economic impact and social accounting software package, licensed to the University of Florida by the Minnesota IMPLAN Group, Inc. (MIG), was used to develop a regional

1. This is EDIS document FE802, a publication of the Food and Resource Economics Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida, Gainesville, FL. Published July 2009. Please visit the EDIS website at http://edis.ifas.ufl.edu.

2. Mohammad Rahmani, coordinator of economic analysis, and Alan W. Hodges, extension scientist, Food and Resource Economics Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida, Gainesville, FL.

input-output model of the Florida economy with adjustments for the citrus industry. *IMPLAN*, an acronym for *Impact Analysis for Planning*, is an input-output modeling system that enables the estimation of the overall effects of changes in final demand for one or more industries in a defined region through the use of economic multipliers. Multipliers measure total changes in output, income, employment, or value added for a given change in direct output or employment, and estimate three components of change within the local area: direct effects, representing the initial change in the industry in question; indirect effects, representing changes in inter-industry transactions as supplying industries respond to changes in demands from the directly affected industries; and induced effects, reflecting changes in local spending that result from income changes in industry employee households. Social Accounting Matrix (SAM) multipliers in *IMPLAN* account for capital investment, taxes, and transfer payments such as social security, welfare, retirement pensions, and savings by household.

Regional models may be constructed with *IMPLAN* for a single county, groups of contiguous counties, or an entire state or region. In this case, the region of interest was defined as the state of Florida. Regional data for the model represent 2007, the most recent information available from the U.S. System of National Accounts and from the Regional Economic Information System maintained by the U.S. Commerce Department. Information used in the model is specific to the state for industry output, employment, income, and trade while national averages are used to estimate transactions between industries. The model was constructed with all social accounts endogenous, including households, governments (state/local, federal), and capital investment.

Four industry sectors in *IMPLAN* were used to analyze the Florida citrus industry: fruit farming (#4), frozen foods (#53), canned fruit and vegetable juices (#54), and wholesale trade (#319). These industry sectors are defined based on the primary product or service produced under the North American Industry Classification System (NAICS). It should be noted that the 2007 NAICS classification was reduced from 509 to 440 industry sectors. The output value of each major type of product was specified as an impact event in the appropriate industry sector: fresh market citrus fruit in the fruit farming sector, frozen citrus juices (FCOJ) in the frozen foods sector, chilled citrus juices in the canned (bottled) juices sector, and packed fresh citrus fruit in the wholesale trade sector. Values of processed byproducts were entered as impact events to the two processing sectors in proportion to their primary product values. Also, the export and local consumption values of citrus juice and byproducts were treated separately; only the direct impacts were considered for local consumption, since these values do not necessarily represent a change in overall regional economic activity.

Several adjustments were made to the *IMPLAN* model to reflect the special characteristics of the Florida citrus industry as distinguished from the national economy for fruit farming and frozen/canned food processing, which includes a variety of other food commodities. The set of inputs purchased by these industries, described by production functions, is what drives the estimates of indirect and induced impacts. The production functions for the two processing sectors were adjusted so that purchases from the fruit farming sector represented the only contributing sector in the model (i.e., other agricultural sectors were removed from the model). The production function for the fruit farming sector was adjusted based on budgeted production costs reported by Muraro (2007–2008) for cultural programs with and without canker-greening. Production expenditures are shown in Tables 8 and 9 for each cultural program, for the major citrus types, and for the production regions in Florida, including both fresh and processed early-season and mid-season oranges, Valencia oranges, and white and red grapefruit in the central, southern, and Indian River regions, respectively. Based on the average yield per acre for each citrus variety, the cost per box of produced citrus was estimated for each type and cultural program. Total cost of production for all types of citrus fruit is the number of boxes produced multiplied by the cost of production per box. The total expenditures then were categorized by fresh and processed products. Based on industry expert opinions, the Florida citrus production expenditure budget was constructed under the assumption that

two-thirds of citrus growers follow the recommended citrus canker-greening cultural program and one-third of citrus growers do not follow the canker-greening program (Table 1). Industry purchases from other sectors included greenhouse and nursery products, agricultural support services, petrochemical manufacturing, fertilizer mixing and manufacturing, pesticides and agricultural chemicals, monetary authorities and depository credit intermediaries, and other state and local government enterprises. Many of the cultural operations were treated as labor inputs to production and represent value-added rather than industry purchases.

Results and Discussion

The value of citrus fruit production for the fresh market and for processing is summarized by citrus variety in Tables 2 and 3. In the 2007–08 season, total citrus fruit production in Florida was 203.8 million boxes, including 170 million boxes of early season, mid-season, Temple, Navel, and Valencia oranges; 27 million boxes of grapefruit; and 7 million boxes of specialty citrus (tangelos and tangerines). Of the total citrus crop, some 20 million boxes (10 percent) were produced for the fresh market and 184 million boxes (90 percent) were utilized for processing (Table 2). About 50 percent of the red seedless grapefruit was produced for the fresh market, while 79 percent of the white seedless grapefruit and more than 96 percent of the oranges were processed for juice. Average free on board (F.O.B.) prices for fresh market fruit sold from packinghouses ranged from $18.40 for tangelos to $26.20 for tangerines and mandarins. Average packing house door (P.H.D.) prices received from producers for fresh fruit were $11.30 per box for early, mid-season, and Navel oranges; $10.40 for Valencia oranges; and $12.15 to $13.00 for grapefruit (Table 2). The total value of Florida citrus fruit based on delivered prices in 2007–08 was $1.76 billion, with fresh fruit accounting for $253 million and processed fruit accounting for $1.50 billion. The value of red seedless grapefruit for the fresh market was more than $113 million, or 45 percent of the total value of fresh market citrus. Valencia oranges represented 54 percent of the processed fruit market value, while early, mid-season, and Navel oranges accounted for 43 percent. The total values of Florida fresh and processed citrus as well as the value of fresh packinghouse product values based on F.O.B. prices are shown in Table 3. The fresh wholesale margin is the difference between what is paid by packinghouses (delivered prices) and the value of shipped fruit (F.O.B. prices).

The total (F.O.B.) value of citrus juice in the 2007–08 production season was $3.45 billion, including $2.37 billion for chilled juice and $1.08 billion for frozen juice (Table 4). More than $3.25 billion, or 94 percent of the citrus juice was exported outside of Florida to other states or foreign countries, while only 6 percent was consumed in Florida. In addition to orange and grapefruit juices, the citrus processing industry produces several other important byproducts, including citrus pulp and meal, molasses, and citrus oil. The essential oil D-limonene, recovered from the distilled extracts of fruit peel and seeds (citrus oil), is used for a variety of chemical products such as cleaners, disinfectants, flavors, and fragrances. Citrus pulp and meal, and molasses are sold as livestock feed ingredients. During the 2007–08 production season, Florida citrus processors produced 722,895 tons of citrus pulp and meal, 57,058 tons of molasses, and more than 24 million pounds of citrus oil. The total value of these byproducts in 2007–08 was about $136 million (Table 5), with citrus pulp and meal representing about 74 percent of the byproduct values.

Total economic impacts estimated for the Florida citrus industry in 2007–08 are summarized in Table 6. The direct output or sales revenue was more than $4.02 billion and the total output impact of the industry exceeded $8.9 billion, including $3.57 billion from citrus fruit for juice production, $601 million from citrus fruit for fresh market, $4.32 billion from citrus juice and byproducts, and $415 million from fresh citrus marketing (packing) margins. The indirect output impacts resulting from purchases of inputs from other industry sectors were $1.37 billion, while the induced output impacts resulting from consumer spending by employee households were $3.51 billion. The ratio between the total output impact and direct output implies an overall multiplier effect of about 2.2. These multiplier effects are significant because the export-based

nature of the Florida citrus industry brings new money into the state economy.

The Florida citrus industry had a total employment impact of 75,828 jobs, including 27,425 jobs directly in the industry, plus 16,967 indirect jobs in allied industries, and 31,436 jobs created by employee spending (induced effect). These employment impacts represent both full-time and part-time jobs, and are *not* adjusted to a full-time equivalent basis.

Total value-added impacts were $4.62 billion, including $1.72 billion in the citrus industry and $2.90 billion in other sectors. Value added is a broad measure of labor and property income generated, and is equivalent to industry output less industry purchases. Labor income impacts amounted to about $2.77 billion, which represented all wages and salary earnings by industry employees and proprietor's income to business owners. Other property income impacts of $1.45 billion represented rents, interest, dividends, royalties, etc. Indirect business tax impacts were $310 million, which included most forms of local and state taxes, such as property taxes, sales taxes, water management district levies, intangible taxes, motor fuel and vehicle taxes, excise taxes, etc., but did not include federal income taxes.

Total economic impacts of the Florida citrus industry by major industry group are shown in Table 7 . Naturally, the largest impacts occurred in the agriculture and manufacturing groups, where the direct impacts occurred from fruit farms and citrus processing. Output impacts in agriculture and manufacturing were $2.06 billion and $2.48 billion, respectively. Large output impacts also occurred in wholesale trade ($548 million); real estate and rentals ($534 million); government ($428 million); construction ($409 million); finance and insurance ($363 million); health and social services ($347 million); professional, scientific, and technical services ($318 million); and retail trade ($312 million). Employment impacts for agriculture (30,568 jobs) were much greater than for manufacturing (7,607 jobs) due to the labor-intensive nature of agriculture, particularly for citrus fruit harvesting. Important employment impacts also occurred in government (5,285 jobs), retail trade (4,682 jobs), and health and social services (4,143 jobs). These impacts in other industries indicate the significant linkages of the citrus industry throughout the Florida economy.

While the citrus industry still represents a major agricultural activity in Florida, these economic impact results for 2007–08 were lower compared to the previous study using 2003–04 data. The total output impacts decreased from $9.29 billion in 2003–04 to $8.91 billion in 2007–08; employment impacts declined from 76,336 to 75,827 jobs; and value added shrank from $4.87 billion to $4.62 billion. On the other hand, the measures for labor income increased from $2.73 billion to nearly $2.77 billion, and indirect business taxes increased from $287 million to $310 million.

These economic impact estimates are based on well-documented values for citrus products; however, certain limitations of the analysis should be considered when interpreting the results. First, the budget information for citrus fruit production was aggregated into a relatively small number of *IMPLAN* sectors, which may lead to underestimation of the linkages to other sectors of the state's economy. Second, there was no specific information available for the citrus processing sector, other than purchases from the fruit farming sector, which would enable adjustment of the production function for this sector. To more accurately estimate the economic impacts of this large sector would require further details on processing expenditures. Finally, the change in NAICS classification, which reduced the number of industry sectors in the model, may have affected the estimated multiplier effects.

References

Feedstuffs. 2008. Price data for citrus pulp and meal. *Feedstuffs*, *the Weekly Newspaper for Agribusiness*, Minnetonka, MN (various issues).

FCPA. 2009. *Statistical Summary 2007–2008 Season*. Florida Citrus Processors Association, Winter Haven, FL.

FDACS/FASS. 2009. *Citrus Summary, 2007–08.* Florida Department of Agriculture and Consumer Services, Florida Agricultural Statistics

Service, Tallahassee, FL (March 2009). http://www.nass.usda.gov/fl

Hodges, A.W, E. Phillippakos, W.D. Mulkey, T. Spreen, and R. Muraro. 2001. *Economic Impact of Florida's Citrus industry, 1999–2000.* Economic Information Report 01–02, Food and Resource Economics Department, University of Florida, Gainesville, FL (July). http://www.economicimpact.ifas.ufl.edu/publications/Commodity/er01-2-citrus.pdf

Hodges, A.W., M. Rahmani, and W.D. Mulkey. 2006. Economic impact of Florida's citrus industry, 2003–04. Electronic Data Information Source (EDIS) FE633. Food & Resource Economics Department, University of Florida, Gainesville, FL. http://edis.ifas.ufl.edu/FE633

Minnesota *IMPLAN* Group (MIG). *IMPLAN* economic impact and social accounting software and 2007 data for Florida. Minnesota IMPLAN Group, Inc., Stillwater, MN. http://www.implan.com

Muraro, R.P. 2009. *Summary of 2007–2008 Citrus Budget for the Central Florida (Ridge) Production Region*. Citrus Research and Education Center, University of Florida, Lake Alfred, FL. http://www.crec.ifas.ufl.edu/extension/economics/pdf/CF_Budget_Summ_2007_2008.pdf

Muraro, R.P. 2009. *Summary of 2007–2008 Citrus Budget for the Indian River Production Region.* Citrus Research and Education Center, University of Florida, Lake Alfred, FL. http://www.crec.ifas.ufl.edu/extension/economics/pdf/IR_Budget_Summ_2007-2008.pdf

Muraro, R.P. 2009. *Summary of 2007–2008 Citrus Budget for the Southwest Florida Production Region*. Citrus Research and Education Center, University of Florida, Lake Alfred, FL. http://www.crec.ifas.ufl.edu/extension/economics/pdf/SW_Budget_Summ_2007_2008.pdf

USDA/NASS. 2008. *Citrus Fruits, 2008 Summary* (Fr Nt 3–1 08). United States Department of Agriculture, National Agricultural Statistics Service (USDA/NASS), Washington, D.C. (September). http://www.nass.usda.gov/

Table 1. Industry purchases for Florida citrus fruit production, by *IMPLAN* sector, 2007–08.

IMPLAN Sector	Fresh Fruit	Processed Fruit	TOTAL (Processed + Fresh)
	(*million dollars*)		
Greenhouse & nursery products (6)	3.6	34.8	38.4
Agricultural support services (19)	80.7	710.5	791.2
Petrochemical manufacturing (120)	6.1	42.3	48.4
Fertilizer mixing & manufacturing (130)	17.9	205.5	223.5
Pesticides & agricultural chemicals (131)	19.7	168.6	188.3
Monetary authorities & depository credit intermediaries (354)	17.9	170.0	187.9
Other state & local government enterprises (432)	10.0	73.7	83.7
Total intermediary commodity purchases	155.9	1,405.4	1,561.4
Indirect business taxes	10.0	73.7	83.7
Total value-added			874.9
Total sales			**1,755.7**

Table 2. Florida citrus fruit production values and average prices for Florida, 2007–08.

Citrus Type	Production Volume			Average Price		
	Fresh	Processed	Total	Fresh*	Processed*	Packed Fresh (FOB)
	(*1,000 boxes*)			(*dollars per box*)		
Early, mid-season, and Navel oranges	3,885	79,615	83,500	$11.30	$8.05	$20.30
Valencia oranges	1,977	84,723	86,700	$10.40	$9.49	$19,40
White seedless grapefruit	1,905	7,095	9,000	$12.15	$2.73	$20.90
Red seedless grapefruit	8,716	8,884	17,600	$13.00	$2.65	$21.40
Tangelos	432	1,068	1,500	$9.10	$4.61	$18.40
Tangerines and Mandarins	3,282	2,218	5,500	$14.70	$4.45	$26.20
Total	**20,197**	**183,603**	**203,800**			

* Packinghouse door (P.H.D.) prices

Sources: FASS, *Citrus Summary, 2007–08*; USDA/NASS, *Citrus Fruits 2008 Summary*.

Table 3. Value of fresh and processed Florida citrus fruit and packinghouse margin, 2007–08.

Citrus Type	Value Fresh	Value Processed	Total Value (delivered-in basis)	Total Value Fresh Shipments	Fresh Packinghouse Marketing Margin*
			(*million dollars*)		
Early, mid-season, and Navel oranges	44	641	685	79	35
Valencia oranges	21	804	825	38	18
White seedless grapefruit	23	19	42	40	17
Red seedless grapefruit	113	24	137	187	73
Tangelos	4	5	9	8	4
Tangerines and Mandarins	48	10	58	86	38
Total	**253**	**1,503**	**1,756**	**438**	**185**

* Fresh fruit packed (F.O.B.) minus cost of purchased fruit.

Table 4. Value of Florida frozen and canned citrus juice for local consumption and export, 2007–08.

Product	Out-of-State Shipments	In-State Consumption	Total Value
	(*million dollars*)		
Frozen orange juice	972.4	57.5	1,029.9
Chilled & canned (bottled) orange juice	2,141.0	132.7	2,273.7
Frozen grapefruit juice	50.6	1.5	52.1
Chilled & canned (bottled) grapefruit juice	87.8	4.3	92.1
Total for all citrus juice products	**3,251.8**	**196.0**	**3,447.8**

Sources: Florida Citrus Mutual, *Annual Statistical Report, 2007–08*; Florida Department of Citrus, Economic and Market Research Unit, Gainesville, FL.

Table 5. Volume and value of Florida processed citrus byproducts, 2007–08.

Product	Production Volume	Unit	Price	Total Value
			(*dollars/unit*)	(*million dollars*)
Citrus pulp & meal	722,895	Tons	$140.00	$101.2
Molasses	57,058	Tons	$125.00	$7.1
Citrus oil	24,041,791	Pounds	$1.15	$27.7
Total				**$136**

Table 6. Summary of economic impacts of the Florida citrus industry, 2007–08.

Citrus Industry Segment	Economic Impact Type	Output	Employment	Value Added	Labor Income	Other Property Income	Indirect Business Taxes
		(*million $*)	(*jobs*)*	(*million $*)	(*million $*)	(*million $*)	(*million $*)
Citrus fruit production for juice processing	**Total**	**3,571**	**41,206**	**2,087**	**1,185**	**762**	**139**
	Direct	1,503	16,987	814	314	457	43
	Indirect	434	9,600	283	230	37	16
	Induced	1,634	14,620	989	641	268	80
Citrus fruit production for fresh consumption	**Total**	**601**	**6,941**	**351**	**200**	**128**	**23**
	Direct	253	2,861	137	53	77	7
	Indirect	73	1,617	48	39	6	3
	Induced	275	2,463	167	108	45	13
Citrus juice processing and byproducts	**Total**	**4,319**	**24,556**	**1,920**	**1,218**	**504**	**111**
	Direct	2,080	6,522	644	411	142	4
	Indirect	819	5,380	418	256	126	36
	Induced	1,420	12,654	858	551	236	71
Fresh citrus marketing margins	**Total**	**415**	3,124	**261**	**164**	**60**	**37**
	Direct	184	1,055	120	70	23	26
	Indirect	46	370	27	18	7	2
	Induced	185	1,699	114	76	30	9
All segments of citrus industry	**Total**	**8,906**	**75,828**	**4,619**	**2,767**	**1,454**	**310**
	Direct	4,020	27,425	1,715	848	699	80
	Indirect	1,372	16,967	776	543	176	57
	Induced	3,514	31,436	2,128	1,376	579	173

* Employment impact represents full-time, part-time, and seasonal jobs.

Table 7. Economic impacts of the Florida citrus industry by major industry group, 2007–08.

Industry Group*	Output	Employment	Value Added	Labor Income	Other Property Income	Indirect Business Taxes
	(million $)	(jobs)	(million $)	(million $)	(million $)	(million $)
Agriculture, forestry, fisheries & hunting	2,061	30,568	1,167	565	546	55
Mining	13	35	3	1	1	0
Utilities	111	182	74	23	39	12
Construction	409	2,943	171	142	26	3
Manufacturing	2,478	7,607	746	477	174	8
Wholesale trade	548	3,134	356	209	68	78
Retail trade	312	4,682	216	135	33	48
Transportation & warehousing	181	1,582	87	64	19	4
Information	155	566	72	38	28	6
Finance & insurance	363	1,897	187	118	62	7
Real estate & rental	534	1,844	376	43	274	59
Professional, scientific & technical services	318	2,612	197	162	31	4
Management of companies	137	627	77	62	14	1
Administrative & waste services	129	1,987	75	60	13	2
Educational services	38	635	22	20	2	0
Health & social services	347	4,143	215	183	29	3
Arts, entertainment & recreation	44	616	28	18	7	4
Accommodation & food services	163	2,602	86	59	17	10
Other services	139	2,283	73	54	13	6
Government & non-classified sectors	428	5,284	393	334	59	0
Total	**8,906**	**75,827**	**4,619**	**2,767**	**1,455**	**310**

* Industry groupos defined according to North American Industrial Classification System (NAICS).

Table 8. Florida citrus production budgets, by type and region, without Canker-Greening Cultural Program, 2007–08.

Expense	Central, Processed Oranges (Valencia)	Central, Fresh Oranges (Valencia)	Indian River, Processed Grapefruit	Indian River, Fresh Market Grapefruit	Southern, Processed Oranges (Hamlin)	Southern, Processed Grapefruit	Southern, Fresh Oranges (Hamlin)	Southern, Fresh Grapefruit
	(*dollars per acre*)							
Tree replacement, prepare site, plant tree	45.84	45.84	61.12	61.12	61.12	45.84	61.12	45.84
Mechanical mow middle (4/year)	49.34	49.34	37.01	37.01	28.35	28.35	28.35	28.35
Chemical mow middles (2/year)	18.24	18.24	27.37	27.37	26.48	26.48	26.48	26.48
General grove work (2 hours/A)	31.30	31.30	31.30	31.30	31.30	31.30	31.30	31.30
Herbicide application	30.93	30.93	43.53	43.53	30.99	30.99	30.99	30.99
Spray/pest management, applications	60.58	60.58	159.20	159.20	49.68	114.30	49.68	114.30
Fertilizer (bulk), 4 applications	38.68	38.68	38.68	38.68	21.76	27.16	27.16	27.16
Dolomite, material/application	14.76	14.76	14.76	14.76	14.76	14.76	14.76	14.76
Pruning/topping	15.00	15.00	15.00	15.00	12.00	12.00	12.00	12.00
Pruning/hedging	15.33	15.33	15.33	15.33	15.33	15.33	15.33	15.33
Chop/mow brush after hedging	7.80	7.80	7.80	7.80	7.80	7.80	7.80	7.80
Irrigation, microsprinkler system, maintenance	60.60	60.60	60.60	60.60	60.60	60.60	60.60	60.60
Raise skirt of trees			7.40	7.40		7.40		7.40

Table 8. Florida citrus production budgets, by type and region, without Canker-Greening Cultural Program, 2007–08.

Expense	Central, Processed Oranges (Valencia)	Central, Fresh Oranges (Valencia)	Indian River, Processed Grapefruit	Indian River, Fresh Market Grapefruit	Southern, Processed Oranges (Hamlin)	Southern, Processed Grapefruit	Southern, Fresh Oranges (Hamlin)	Southern, Fresh Grapefruit
	(*dollars per acre*)							
Tree replacement, remove trees	20.49	20.49	27.32	27.32	27.32	20.49	27.32	20.49
Clean ditches (weed control)			18.56	18.56	18.56	18.56	18.56	18.56
Ditch and canal maintenance			17.48	17.48	17.48	17.48	17.48	17.48
Water control			16.72	16.72	16.72	16.72	16.72	16.72
Supplemental post bloom spray, application			0.00				24.33	
Fall miticide application		26.83	0.00				8.02	
Management costs	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00
Harvesting: pick/spot/roadside & haul, and canker decontamination	1,118.66	1,118.66	1,107.34	1,107.34	1,287.26	1,319.85	1,287.26	1,319.85
Irrigation, microsprinkler system, diesel fuel	93.16	93.16	93.16	93.16	93.16	93.16	93.16	93.16
Fertilizer materials	380.88	380.88	310.60	310.60	386.68	283.12	386.68	283.12
Supplemental fertilizer, spray, sprout	51.69	51.69	68.92	68.92	68.92	51.69	68.92	51.69
Herbicide material	113.65	113.65	92.73	92.73	84.32	84.32	84.32	84.32
Spray/pest management, materials	85.32	85.32	219.47	219.47	125.65	208.06	125.65	208.06

Table 8. Florida citrus production budgets, by type and region, without Canker-Greening Cultural Program, 2007–08.

Expense	Central, Processed Oranges (Valencia)	Central, Fresh Oranges (Valencia)	Indian River, Processed Grapefruit	Indian River, Fresh Market Grapefruit	Southern, Processed Oranges (Hamlin)	Southern, Processed Grapefruit	Southern, Fresh Oranges (Hamlin)	Southern, Fresh Grapefruit
	(*dollars per acre*)							
Spray summer oil #2 materials	54.60	54.60						
Supplemental fall miticide materials		9.60						
Supplemental post bloom spray, materials			0.00			0.00	50.80	
Fall miticide materials		32.72	0.00			0.00	28.50	
Mandatory citrus canker decontamination costs	31.67	31.67	31.67	31.67	31.67	31.67	31.67	31.67
Interest on operating (cultural) costs	58.16	58.16	65.73	65.73	56.75	59.30	56.75	59.30
Interest on average capital investment	321.22	321.22	321.22	321.22	321.22	321.22	321.22	321.22
Property tax / water management tax / fly protocol coat	61.00	61.00	182.86	182.86	61.00	117.65	61.00	117.65
DOC assessment	107.52	107.52	155.50	155.40	122.16	183.75	122.16	183.75
Total Cost Per Acre	**2,934.42**	**3,003.57**	**3,296.28**	**3,296.28**	**3,132.44**	**3,297.35**	**3,244.09**	**3,297.35**

Table 9. Florida citrus production budgets, by type and region, with Canker-Greening Cultural Program, 2007–08.

Expense	Central, Processed Oranges (Valencia)	Central, Fresh Oranges (Valencia)	Indian River, Processed Grapefruit	Indian River, Fresh Market Grapefruit	Southern, Processed Oranges (Hamlin)	Southern, Processed Grapefruit	Southern, Fresh Oranges (Hamlin)	Southern, Fresh Grapefruit
	(*dollars per acre*)							
Tree replacement, prepare site, plant tree	85.62	85.62	140.28	140.28	99.89	85.62	99.89	85.62
Mechanical mow middle (4/year)	49.34	49.34	37.01	37.01	28.35	28.35	28.35	28.35
Chemical mow middles (2/year)	18.24	18.24	27.37	27.37	26.48	26.48	26.48	26.48
General grove work (2 hours/A)	31.30	31.30	31.30	31.30	31.30	31.30	31.30	31.30
Herbicide application	30.93	30.93	43.53	43.53	30.99	30.99	30.99	30.99
Spray/pest management, applications	167.12	167.12	265.74	265.74	139.87	222.14	139.87	222.14
Fertilizer (bulk), 4 applications	38.68	38.68	38.68	38.68	21.76	27.16	27.16	27.16
Dolomite, material/application	14.76	14.76	14.76	14.76	14.76	14.76	14.76	14.76
Pruning/topping	15.00	15.00	15.00	15.00	12.00	12.00	12.00	12.00
Pruning/hedging	15.33	15.33	15.33	15.33	15.33	15.33	15.33	15.33
Chop/mow brush after hedging	7.80	7.80	7.80	7.80	7.80	7.80	7.80	7.80
Irrigation, microsprinkler system, maintenance	60.60	60.60	60.60	60.60	60.60	60.60	60.60	60.60
Raise skirt of trees			7.40	7.40		7.40		7.40

Table 9. Florida citrus production budgets, by type and region, with Canker-Greening Cultural Program, 2007–08.

Expense	Central, Processed Oranges (Valencia)	Central, Fresh Oranges (Valencia)	Indian River, Processed Grapefruit	Indian River, Fresh Market Grapefruit	Southern, Processed Oranges (Hamlin)	Southern, Processed Grapefruit	Southern, Fresh Oranges (Hamlin)	Southern, Fresh Grapefruit
	(*dollars per acre*)							
Tree replacement, remove trees	34.14	34.14	39.83	39.83	39.83	34.14	39.83	34.14
Clean ditches (weed control)			18.56	18.56		18.56		18.56
Ditch and canal maintenance			17.48	17.48		17.48		17.48
Water control			16.72	16.72	16.72	16.72	16.72	16.72
Supplemental post bloom spray, application			32.91	32.91		32.91		32.91
Fall miticide application			51.98	51.98		51.98		51.98
Management costs	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00
Harvesting: pick/spot/roadside & haul, and canker decontamination	918.90	918.90	952.71	952.71	1,145.64	1,073.48	1,145.64	1,073.48
Field inspection for citrus greening (4 inspections @ $25.99)	103.96	103.96	103.96	103.96	103.96	103.96	103.96	103.96
Irrigation, microsprinkler system, diesel fuel	93.16	93.16	93.16	93.16	93.16	93.16	93.16	93.16
Fertilizer materials	380.88	380.88	310.60	310.60	386.68	283.12	386.68	283.12
Supplemental fertilizer, spray, sprout	120.24	120.24	99.89	99.89	140.28	120.24	140.28	120.24
Herbicide materials	113.65	113.65	68.92	68.92	84.32	84.32	84.32	84.32

Table 9. Florida citrus production budgets, by type and region, with Canker-Greening Cultural Program, 2007–08.

Expense	Central, Processed Oranges (Valencia)	Central, Fresh Oranges (Valencia)	Indian River, Processed Grapefruit	Indian River, Fresh Market Grapefruit	Southern, Processed Oranges (Hamlin)	Southern, Processed Grapefruit	Southern, Fresh Oranges (Hamlin)	Southern, Fresh Grapefruit
	(*dollars per acre*)							
Spray/pest management, materials	315.52	315.52	477.74	477.74	282.85	434.37	282.85	434.37
Mandatory citrus canker decontamination costs	31.67	31.67	31.67	31.67	31.67	31.67	31.67	31.67
Interest on operating (cultural) costs	78.70	78.70	93.42	93.42	74.32	85.45	74.32	85.45
Interest on average capital investment	321.22	321.22	321.22	321.22	321.22	321.22	321.22	321.22
Property tax / water management tax / fly protocol coat	61.00	61.00	182.86	182.86	61.00	117.65	61.00	117.65
DOC assessment	88.32	88.32	133.70	133.70	108.72	149.45	108.72	149.45
Total Cost Per Acre	**3,244.08**	**3,244.08**	**3,800.13**	**3,800.13**	**3,432.90**	**3,687.81**	**3,432.90**	**3,687.81**