Laurel Wilt: Economic Impact and Economics of Control Strategies FL & CA

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Outline

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II. Farm level impact of the LW disease in Florida.

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I. Economic impact of the LW disease: Florida

Introduction

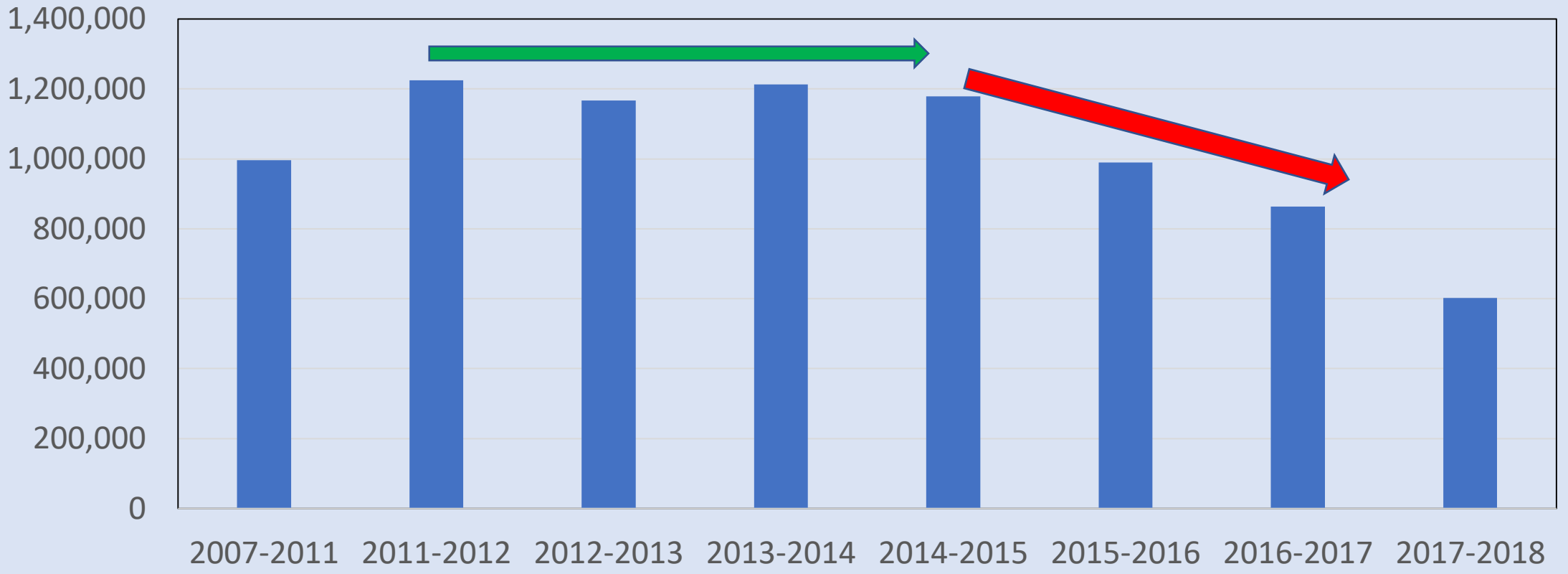
Florida Avocado Industry

- Florida produces Greenskin type avocados (~60 cultivars)
- Average farm gate value 2014/15 – 2016/17: $20.4 million
- Overall economic impact over $100 million
- Florida accounts on average for about 15% of the domestic avocado production
- Florida accounts for two thirds of the total US Greenskin avocado supply
- The Dominican Republic (DR) is the main exporter of Greenskin avocados to the US market.

- The DR contributes one third of the total Greenskin avocado supply

Economic impact of the LW disease: Florida

Figure 1. Florida avocado production 2007/11 - 2017/18 Bushels (55 bls/bu)



Economic impact of the LW disease: Florida

What has been the economic impact of the LW disease?

- Estimated avocado area in 2012: ~7,400 acres
- Disease arrived the avocado production area in February 2012
- By the crop year 2014/15 the disease has become endemic
- Estimated avocado area in 2017/18: 6,200 acres
- Area lost: ~1,200 acres (Due mainly to the disease)
- Density (100 trees/acre) ~ 120,000 trees lost

Economic impact of the LW disease: Florida

Summary of economic impact:

- **Crop year 2017/18:**
  - Output lost to the LW disease: 198,000 bu (1,200 acres*165 bu/acre)
  - Average price for 2017/18: $20/bu; ➔ $0.36/lb
  - Farm gate losses due to decrease in production $3.96 million (198,000 bu* $20/bu)
  - **The decrease in production is valued at $15.84 million (multiplier effect)**
- **Value of trees lost $42 million (120,000 trees * $350/tree)**
- **Expenditure on research $6 million**
- **Additional grower costs due to disease ~ $10 million**
- **It does not include: non-market effects, loss of canopy cover, carbon sequestration.**

II. Farm level costs of the LW disease: Florida

Coping strategies

Coping strategies currently used by growers

Healthy trees (Preventative):

- Stump only
- Stump and top work/grafting (more light/better varieties)
- Annual tree injection

Diseased trees:

- Stump, bagging and topwork
- Selective tree removal and replanting
- Orchard replanting

Coping strategies

Control Alternative	Activities & material applied	Cost $/tree	Cost $/acre
Stump only	*Trees are cut down to a 4 foot high stump*	35	
	Total	**35**	**3,500**

Coping strategies

Strategy	Activities & material applied	Cost $/tree	Cost $/acre
Stump and topwork (Healthy tree)	*Trees are cut down to a 4 foot high stump, then regrafted*	36	
	Total	**36**	**3,600**

Coping strategies

Strategy	Activities & material applied	Cost $/tree	Cost $/acre
Tree injection (Healthy tree)	*Drill 8 holes* *Inject Tilt + phosphonate*	6	
	Total	**6**	**$600**

Coping strategies

Strategy	Activities & material applied	Cost $/tree
Stump, bagging, and topwork (Diseased tree)	*Trees are cut down to a 4 foot high stump, the stump is bagged and sealed. Later tree is re-grafted*	75
	Total	**75**

Coping strategies

Strategy	Activities & material applied	Cost $/tree
Tree removal + replanting	*Tree removal, shredding/ chipping*	65
	Tree planting cost:	
	tree cost,	
	plant tree & stake	25
	Total	**90**

Coping strategies

Strategy	Activities & material applied	Cost $/tree	Cost $/acre
Replanting Entire Orchard	*Removal:* *clear existing trees* *Shredding /chipping* Replanting avocado trees: *tree cost* *plant tree & stake*	37	
	Irrigation system	25	
	Total	**62**	**6,200**

Costs and Returns Analysis in Presence of the LW disease

- Economic analysis conducted indicated that the most profitable management strategies in the presence of the disease are:
    - Early Detection, Tree removal and Replanting,
    - Prophylactic Tree injection of high-value groves
- Let’s consider some scenarios to evaluate the profitability of these two management strategies.

Farm level economics of the LW disease

Scenario 1 (Low management):

- Grower keeps production expenses at the minimum.
- Marketable yield is 150 bu/acre.
- LW disease management includes: grove scouting, tree removal and replanting (~2 trees/annum), and botanigard @ $304/acre/year.
- Management of the LW disease increases operating costs by 19%.

Florida Avocado Production costs ($/acre)			
Low management	150	bushels	
Item	**Quantity (lbs)**	**Value ($/acre)**	**Value ($/lb)**
REVENUE			
Marketable Yield (lbs/acre)	8,250		
F.O.B. Price			$ 0.36
Total revenue		$ 2,970	
OPERATING COST			
Fertilizer		$ 300	
Fungicide		$ 250	
Herbicide		$ 130	
Insecticide		$ 125	
Pruning		$ 150	
Irrigation		$ 90	
Mow, vine, miscellaneous		$ 230	
Interest on operating capital 5%		$ 64	
LW: monitoring grove, tree removal & replanting (2 trees) + botanigard		$ 304	
Total Operating cost		$ 1,643	$ 0.20

Low management	150	bushels			
FIXED COST					
Cash overhead					
Insurance		$	100		
Taxes		$	100		
Non- Cash overhead					
Land rent		$	500		
Other overhead		$	445		
Total Fixed cost		$	1,145	$	0.07
Total Pre-harvest cost		$	2,788	$	0.34
Harvest and marketing cost					
pick and haul		$	528	$	0.064
Total Harvesting and marketing cost		$	528	$	0.064
Total cost		$	3,316	$	0.33
Gross margin		$	799	$	0.10
Estimated net return		$	(346)	$	(0.04)

Farm level economics of the LW disease

Scenario 2 (Normal management):

- Grower spends more on inputs (fertilizers), and pruning program
- Marketable yield is 225 bu/acre
- LW disease management includes: grove scouting, tree removal and replanting (2 trees), and botanigard @ $304/acre/year.
- Management of the LW disease increases operating costs by 17%

Florida Avocado Production costs ($/acre)			
Normal management 225 bushels			
Item	**Quantity (lbs)**	**Value ($/acre)**	**Value ($/lb)**
REVENUE			
Marketable Yield (lbs/acre)	12,375		
F.O.B. Price			$ 0.36
Total revenue		$ 4,455	
OPERATING COST			
Fertilizer		$ 450	
Fungicide		$ 250	
Herbicide		$ 130	
Insecticide		$ 125	
Pruning		$ 175	
Irrigation		$ 90	
Mow, vine, miscellaneous		$ 230	
Interest on operating capital 5%		$ 73	
LW: monitoring grove, tree removal & replanting (up to 2 trees) + botanigard		$ 304	
Total Operating cost		$ 1,827	$ 0.15

Normal management	225	bushels			
FIXED COST					
Cash overhead					
Insurance		$	100		
Taxes		$	100		
Non- Cash overhead					
Land rent		$	500		
Other overhead		$	445		
Total Fixed cost		$	1,145	$	0.07
Total Pre-harvest cost		$	2,972	$	0.24
Harvest and marketing cost					
pick and haul		$	792	$	0.064
Total Harvesting and marketing cost		$	792	$	0.064
Total cost		$	3,764	$	0.28
Gross margin		$	1,836	$	0.15
Estimated net return		$	691	$	0.06

Farm level economics of the LW disease

Scenario 3 (Intensive management):

- Grower spends more on inputs (fertilizers) and pruning program
- Marketable yield is 300 bu/acre
- LW disease management includes: grove scouting, tree removal and replanting (2 trees), and botanigard @ $304/acre/year
- Additionally, all trees in the grove are injected (Tilt+ phosphonate)@ $600/acre/year.
- Management of the LW disease increases operating costs by 37%

Florida Avocado Production costs ($/acre)			
Intensive management 300 bushels			
Item	**Quantity (lbs)**	**Value ($/acre)**	**Value ($/lb)**
REVENUE			
Marketable Yield (lbs/acre)	16,500		
F. O. B. Price			$ 0.36
Total revenue		$ 5,940	
OPERATING COST			
Fertilizer		$ 500	
Fungicide		$ 250	
Herbicide		$ 130	
Insecticide		$ 125	
Pruning		$ 175	
Irrigation		$ 90	
Mow, vine, miscellaneous		$ 230	
Interest on operating capital 5%		$ 75	
LW: monitoring grove, tree removal & replanting (2 trees) + botanigard + grove injection		$ 904	
Total Operating cost		$ 2,479	$ 0.15

Intensive management	300	bushels			
FIXED COST					
Cash overhead					
Insurance		$	100		
Taxes		$	100		
Non- Cash overhead					
Land rent		$	500		
Other overhead		$	445		
Total Fixed cost		$	1,145	$	0.07
Total Pre-harvest cost		$	3,624	$	0.22
Harvest and marketing cost					
pick and haul		$	1,056	$	0.064
Total Harvesting and marketing cost		$	1,056	$	0.064
Total cost		$	4,680	$	0.28
Gross margin		$	2,405	$	0.15
Estimated net return		$	1,260	$	0.08

III. Potential Farm level impact of the LW disease: California

Farm level impact of the LW disease: California

- To project the LW disease farm level economic impact, the 2011 CA avocado production budget was updated.
- Cultural cost, irrigation, harvesting cost, and cash overhead costs were updated to 2018 dollars.
- Revenues are based on recent yield (by county) and prices info (crop years 2015/16 and 2017/18; crop year 2016/17 excluded).
- CAC assessment is 2.3%
- Non cash overhead costs are not included.
- The present analysis estimates the gross margin.

Farm level impact of the LW disease: California

Projected cost of managing the LW disease is based on the extra cost (%) that FL growers face.

Two Laurel Wilt disease management options are presented:

2018 LW1:

- It includes grove scouting, removal and replanting up to 2 trees.
- The extra cost of this option for FL growers is 17% of operating costs.

2018 LW2:

- It includes grove scouting, grove injection (Tilt + phosphonate), and removal and replanting up to 2 trees.
- The extra cost of this option for FL growers is 37% of operating costs.

California Avocado Production Costs ($/acre)			
Item	**San Diego**		
	2018	**2018 LW1**	**2018 LW2**
Cultural costs	$ 1,956	$ 2,289	$ 2,680
Irrigation	$ 4,663	$ 4,663	$ 4,663
Harvesting	$ 1,522	$ 1,522	$ 1,522
Interest	$ 163	$ 169	$ 142
Cash overhead	$ 1,022	$ 1,022	$ 1,022
CAC assessment	$ 182	$ 182	$ 182
Total Operating & Harvesting costs	$ 9,508	$ 9,847	$ 10,211

Projected revenue before & after LW ($/acre)			
	2018	**2018 LW1**	**2018 LW2**
Price ($/lb)	$ 1.08	$ 1.08	$ 1.08
Yield (lbs)	7,338	7,338	7,338
Revenue	$ 7,925	$ 7,925	$ 7,925
Gross margin	$ (1,583)	$ (1,922)	$ (2,286)

California Avocado Production Costs ($/acre)			
Item	**Riverside**		
	2018	**2018 LW1**	**2018 LW2**
Cultural costs	$ 1,956	$ 2,289	$ 2,680
Irrigation	$ 2,617	$ 2,617	$ 2,617
Harvesting	$ 1,251	$ 1,251	$ 1,251
Interest	$ 116	$ 123	$ 131
Cash overhead	$ 967	$ 967	$ 967
CAC assessment	$ 150	$ 150	$ 150
Total Operating & Harvesting costs	$ 7,057	$ 7,396	$ 7,796

Projected revenue before & after LW ($/acre)			
	2018	**2018 LW1**	**2018 LW2**
Price ($/lb)	$ 1.08	$ 1.08	$ 1.08
Yield (lbs)	6,032	6,032	6,032
Revenue	$ 6,514	$ 6,514	$ 6,514
Gross margin	$ (543)	$ (882)	$ (1,282)

California Avocado Production Costs ($/acre)			
Item	**Ventura**		
	2018	**2018 LW1**	**2018 LW2**
Cultural costs	$ 1,898	$ 2,221	$ 2,600
Irrigation	$ 934	$ 934	$ 934
Harvesting	$ 1,146	$ 1,146	$ 1,146
Interest	$ 89	$ 96	$ 94
Cash overhead	$ 1,381	$ 1,381	$ 1,381
CAC assessment	$ 184	$ 184	$ 184
Total Operating & Harvesting costs	$ 5,632	$ 5,962	$ 6,339

Projected revenue before & after LW ($/acre)			
	2018	**2018 LW1**	**2018 LW2**
Price ($/lb)	$ 1.08	$ 1.08	$ 1.08
Yield (lbs)	7,419	7,419	7,419
Revenue	$ 8,012	$ 8,012	$ 8,012
Gross margin	$ 2,380	$ 2,050	$ 1,673

California Avocado Production Costs ($/acre)			
Item	**Santa Barbara**		
	2018	**2018 LW1**	**2018 LW 2**
Cultural costs	$ 1,898	$ 2,221	$ 2,600
Irrigation	$ 934	$ 934	$ 934
Harvesting	$ 1,062	$ 1,062	$ 1,062
Interest	$ 87	$ 94	$ 92
Cash overhead	$ 1,381	$ 1,381	$ 1,381
CAC assessment	$ 171	$ 171	$ 171
Total Operating & Harvesting costs	$ 5,533	$ 5,863	$ 6,240

Projected revenue before & after LW ($/acre)			
	2018	**2018 LW1**	**2018 LW2**
Price ($/lb)	$ 1.08	$ 1.08	$ 1.08
Yield (lbs)	6,879	6,879	6,879
Revenue	$ 7,429	$ 7,429	$ 7,429
Gross margin	$ 1,896	$ 1,566	$ 1,188

California Avocado Production Costs ($/acre)			
Item	**San Luis Obispo**		
	2018	**2018 LW1**	**2018 LW2**
Cultural costs	$ 1,898	$ 2,221	$ 2,600
Irrigation	$ 604	$ 604	$ 604
Harvesting	$ 961	$ 961	$ 961
Interest	$ 82	$ 90	$ 99
Cash overhead	$ 1,382	$ 1,382	$ 1,382
CAC assessment	$ 179	$ 179	$ 179
Total Operating & Harvesting Costs	$ 5,106	$ 5,436	$ 5,825

Projected revenue before & after LW ($/acre)			
	2018	**2018 LW1**	**2018 LW2**
Price ($/lb)	$ 1.08	$ 1.08	$ 1.08
Yield (lbs)	7,210	7,210	7,210
Revenue	$ 7,787	$ 7,787	$ 7,787
Gross margin	$ 2,681	$ 2,350	$ 1,962

Concluding Remarks

- The disease presents the industry with an opportunity to focus production on the varieties deemed more valuable to the consumers.
- Current LW disease treatment options are still expensive, necessitating either an increase in price and/or yield per acre if many of the operations are to remain profitable.
- LW treatment options by themselves are not enough to remain viable; they should be coupled with excellent grove management practices so yield increases may offset some of the extra LW treatment costs
- Irregular weather patterns are already hurting profitability for California avocado growers; therefore, growers need to be proactive and take quick action once the disease arrives in the avocado producing region.

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