Commercial Citrus or a Really Big Backyard:
Small Citrus Growers and their Effects on Citrus Pest Populations

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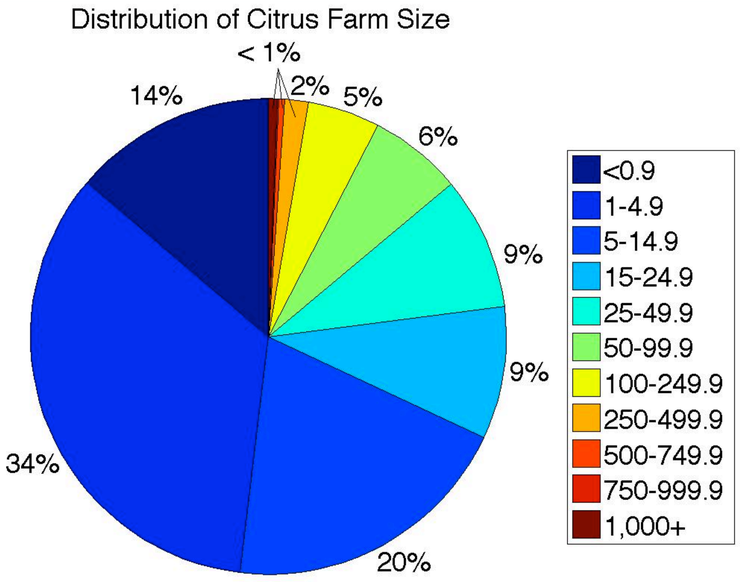
Motivation:

The majority of California citrus growers manage less than 15 acres of citrus.



A 2010 survey of citrus growers revealed that smaller growers are less likely to report the presence of major citrus pests and are less likely to treat pests that they report as present.

Pest	Percent Reporting Pest Present		
	<15 Acres	≥15 Acres	Difference
Citrus Thrips	38.3	75.7	-37.5***
California Red Scale	33.0	65.9	-32.9***
Citrus Red Mite	21.6	41.8	-20.3***
Cottony Cushion Scale	21.2	40.8	-19.6***

Pest	Percent Applying Chemical Control if Pest Present		
	<15 Acres	≥15 Acres	Difference
Citrus Thrips	32.5	70.8	-38.2***
California Red Scale	23.6	49.1	-25.5***
Citrus Red Mite	10.6	31.1	-20.4***
Cottony Cushion Scale	4.4	12.7	-8.3

Research Questions:

- How do pest presence and pest management decisions differ between large and small growers?
- Does a clear size cutoff exist between large and small? And if so, what is this cutoff?
- If small growers less actively manage their farms, how does this affect growers who do actively manage their farms?

Methods:

- Using data from the 2010 survey of citrus growers:
  - Estimate probit models for pest presence and chemical control, controlling for grower and farm characteristics and surrounding pest presence and treatment.
  - Vary division between large and small growers.
  - Separately estimate pest presence for large growers, controlling for the presence of inactive small growers.

Results:

Pest Presence

- Increasing the percent of surrounding citrus that has reported red scale present increases the probability that grower *i* reports red scale present by 37-58%.
- No size threshold detected.
- Graduate degree, and obtaining income from other growers or chemical suppliers are associated with a decreased likelihood of reporting pest present.
- Percent of total household income from citrus production is associated with an increase in likelihood of reporting pest present

Map of Red Scale Presence Reported By Small Growers, Forthcoming

Map of Red Scale Presence Reported By Large Growers, Forthcoming

Map of Red Scale Treatment Reported By Small Growers, Forthcoming

Map of Red Scale Treatment Reported By Large Growers, Forthcoming

Results:

Pest Treatment

- As the percent of surrounding citrus acreage treated for red scale increases, small growers are less likely to treat for it, relative to large growers.
  - True for divisions at 5, 10, 15, and 20 acres
- As the percent of household income derived from citrus increases, growers are more likely to treat.
- Female growers are less likely to apply chemical controls than male growers while Asian growers are more likely to apply chemical controls than white growers.

Results:

Externalities

- Results are forthcoming