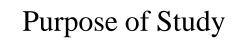
#### Economics of Biological Pest Control: A Case Study of the Red Gum Lerp Psyllid in California

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- Measure the rate of return to Biological Pest Control (BPC)
- Compare benefits and risks of BPC to chemical pest control
- Analyze economics of BPC
  - Role of university
  - Role of public funding

### Economic Importance of Eucalyptus in California

- Eucalyptus is one of the most popular urban trees in California.
- Large, fast-growing, hardy and pest free until 1998.
- Multiple-use:
  - Shade/canopy
  - Windbreak
  - Commercial

## Background on the Red Gum Lerp Psyllid

- Since spring 1998 found in at least 30 California counties
- Rapidly defoliates and weakens trees
- No natural enemies in California
- Attacking red gums as well as other Eucs
- Chemical control has not been effective

# Impact of Red Gum Lerp Psyllid

- Loss of trees
  - Loss of amenities provided by trees
  - Additional clean-up and tree maintenance
- Weakens trees and attracts other pests creates bigger problem
- Fire/safety hazard

Damages from RGLP				
	LA Parks & Recreation	LA City Streets	Redwood City	Aaction Mulch, Inc
Eucalyptus Population				
Red gum	60,000	1,511	50	10,000
Lemon gum	35,000	1,481	25	(acres)
Others	20,000	16,735	200	· · /
Total	115,000	19,727	275	
Average Age	30	45	25	9
Infestation Rate	75%	100%	90%	70%
Death Rate	33%	30%	1%	0%
Damages	Safety hazard; loss of trees, aesthetics; clean- up	Loss of trees, aesthetics; clean-up consumer complaints, additional tree care	Loss of trees, aesthetics; clean-up consumer complaints, additional tree care	Loss of production estimated at 10-15%
Cost of Removal (per tree)	\$500	\$500	\$300	-
Cost of Replacement (per tree	\$500	\$500	\$200	_

## Our Approach

- Compare the costs and benefits of BPC to other methods
- Compute the rate of return to BPC as a ratio of the value of benefit per dollar spent
- Compare to other methods of pest control

#### Benefits of BPC

- Reduced costs associated with infestation
- Specific pest control
- Reduce use of harmful pesticides

# Costs of BPC

- Rearing and dispersion of beneficial species
- Requires greater knowledge/learning than chemical control
- No preventative BPC
- Risks to native species



- Fast-acting
- Well-established system
- Easy to implement

#### Costs of Chemical Control

- High direct costs
- Broad scope—kills everything
- Environmental and health concerns

### Economics of BPC

- Few incentives for commercial development of urban BPC
  - Can't patent insects
  - High development costs but no sustainable market
- Insect BPC is public good
  - Not excludable and nonrival
  - Protection of native species

## Funding of BPC

- In 1995, US government spent \$71 million on insect BPC research
- California spent \$1.3 million on BPC research in 1994
- Value of the retail market of pest control was \$25 billion (99% chemical) in 1995



- Access need/design of quick-response system
  - Rapid-response force for urban needs
  - Improved training in identification and rearing of beneficials
  - Establish state insectaries
- Public Funding—who should pay?
- Improved prevention of pest importation