

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

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Purpose of Study

- 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

Benefits of Chemical Control

- 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

Research Directions

- 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