Slosson Progress Report: 2004-05

Title: Biological Control of the Spotted Gum Psyllid, *Eucalyptolyma maidenii*: A New Pest on Urban Eucalyptus Trees in Southern California

Principal Investigators:

Timothy D. Paine, Professor of Entomology
Department of Entomology
University of California
Riverside, CA 92521
Phone 909-787-5835, Email: Timothy.Paine@ucr.edu

Kent Daane, Biological Control Specialist
Department of Environmental Science, Policy and Management- Division of Insect Biology #3112
University of California
Berkeley, California 94720-3112
Phone 510-643-4019, Email: Daane@uckac.edu

Collaborators:

John Kabashima
Farm Advisor, Univ. Of Calif. Coop. Extension – Orange County.
Phone: 949-733-3970,
jnkabashima@ucdavis.edu

David A. Shaw
Farm Advisor, Univ. Of Calif. Coop. Extension – San Diego County.
Phone: 858-694-2853,
dshaw@ucdavis.edu

James Bethke
Floriculture and Entomology Advisor, Univ. Of Calif. Coop. Extension – San Diego County.
Phone: 951-827-4733
Ja,es.bethke@ucr.edu

A. James Downer
Farm Advisor, Univ. Of Calif. Coop. Extension – Ventura County.
Phone: 805-645-1458
ajdowner@ucdavis.edu

Summary: The spotted gum psyllid is a significant defoliating pest of spotted and lemon-scented gum trees in California. Professor Donald Dahlsten initiated a biological control program to import, host-range test, propagate, release, and evaluate parasitoids of the psyllid. A candidate parasitoid has been identified and host specificity testing completed. With the unfortunate passing of Professor Dahlsten, Drs. Paine and Daane have assumed responsibility for the successful completion of the propagation, release and evaluation phases of the project. This proposal is a direct continuation of the ongoing project. Baseline sampling of the spotted gum and lemon gum psyllids has continued during the year at permanent sites in Tustin (coastal environment) and Riverside (inland environment). Requests for release permits were submitted in early 2004 but were not granted until winter 2005. The parasite colonies will be transported to UC Riverside in December 2005 or January 2006, depending on availability of rearing hosts. The establishment and evaluation processes will continue established cooperation with UC Cooperative Extension Advisors to monitor both psyllid and, after releases are made,

parasitoid populations weekly throughout the year. Rearing methodology and parasitoid release strategies will be initially based on existing eucalyptus psyllid biological control techniques.

1. Objectives

The overall objective of this proposal is to develop a biological control program for a newly introduced psyllid pest, *Eucalyptolyma maidenii* (the spotted gum psyllid) on ornamental lemon-scented gum and spotted gum. The specific objectives for this multi-year project are as follows:

Objective 1. Document the seasonal distribution and abundance of the different life stages of *E. maidenii* and its endemic natural enemies on lemon-scented and spotted gum Eucalyptus in southern California.

Objective 2. Test monitoring methods to study population fluctuations and to evaluate control attempts.

Objective 3. Screen and select natural enemies from Australia for introduction and evaluate the impact of the selected natural enemies on *E. maidenii*.

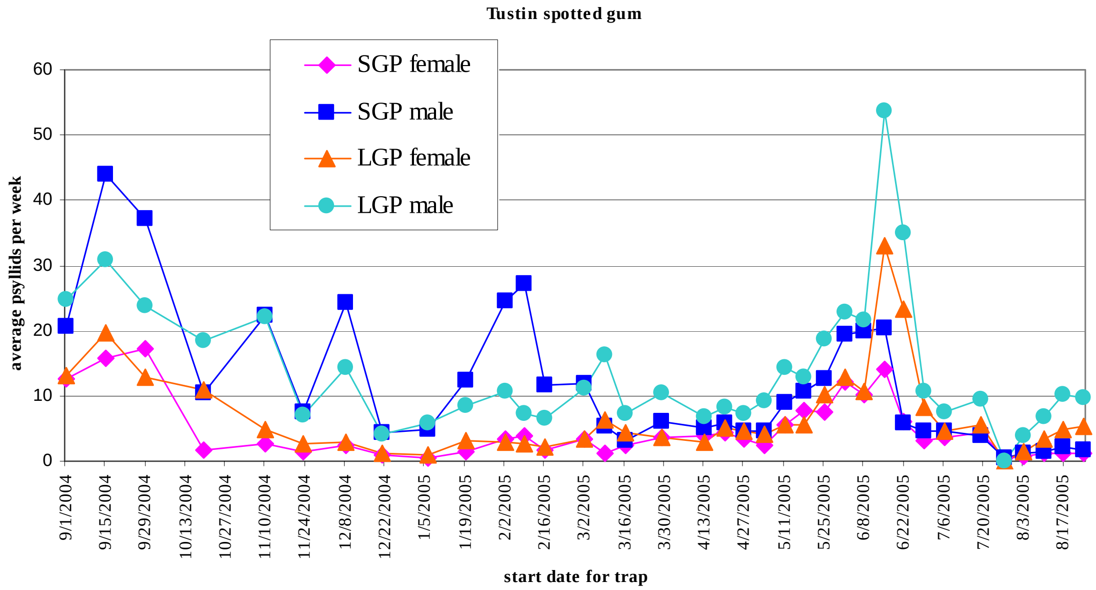
Objective 4. Implement a statewide biological control program for *E. maidenii*.

2. Research Progress

The initial project submitted to the Slosson Endowment was for three years and we have requested continued funding for the third year of the project. A final report will be submitted for the completed project. Although we submitted a request for release permits in a timely fashion to enable us to do the releases of the parasitoids this last year (2005), we encountered an unexplained delay on the part of the regulatory agency (USDA APHIS) and just this month finally received the requested permits. The problem with delayed permits has been a pervasive issue, affecting many proposed biological control efforts and not just the spotted gum psyllid biological control program. We completed a second year of population sampling in two locations in southern California in the past year (Obj. 1) (Figures 1 and 2) and the leaf sample/ trap sample regressions (Obj. 2). The non-release portions of Obj. 3 and 4 (i.e., screening of a range of parasites collected from Brisbane, Queensland, Australia by KD and assessment of non-target impacts [the parasites do not recognize alternate psyllid hosts] were required for the release permit applications) have also been completed with only the release and evaluation portions remaining to be completed. Unfortunately, the remaining work on the final objectives was not initiated as planned in 2005 because of the delays with issuing the permits. Although we are behind our projected schedule by a year in the release aspect of the study, we now have the permits and will begin the releases in 2006.

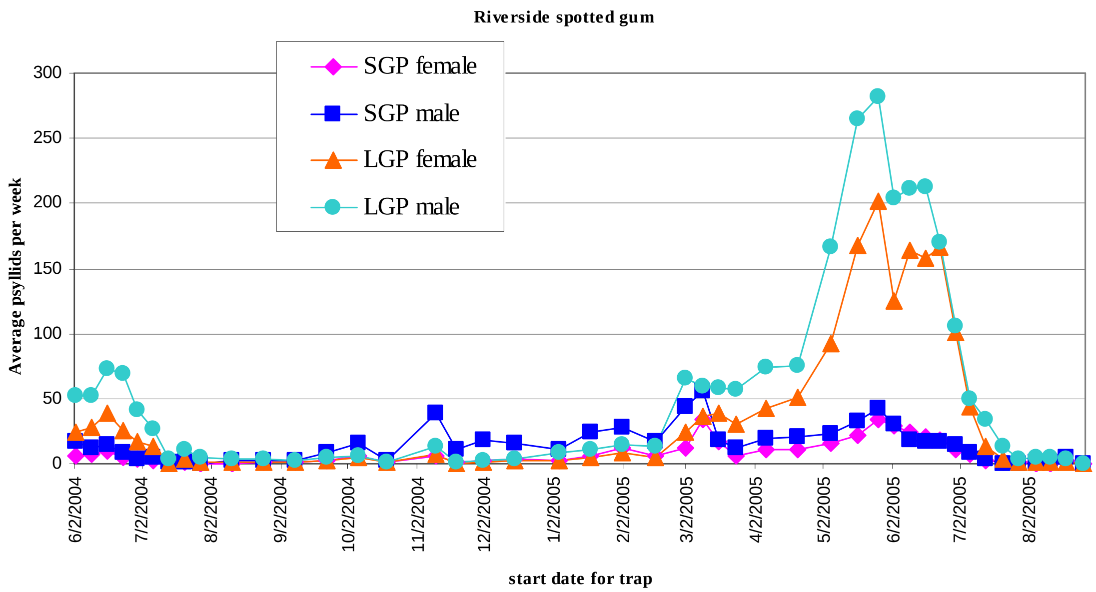
The spotted gum psyllid and the lemon gum psyllid populations begin to increase in March in both the Tustin and the Riverside locations. This will enable us to time releases of parasites for similar times in both sites. Similarly, populations at both sites decline precipitously during July. Thus, it is critical that we conduct the majority of the releases between the first week of April and the middle of June. While we can continue releases throughout the year, releases in late Spring will insure that the parasites will have readily available hosts and increase the probability of establishment. At the coastal location, there has been a secondary population peak in September. This suggests that we should be able to find sites with moderate conditions in coastal southern California that can support parasite populations in the Fall.

Figure 1.



Tustin spotted gum
SGP female
SGP male
LGP female
LGP male
average psyllids per week
0
10
20
30
40
50
60
9/1/2004
9/15/2004
9/29/2004
10/13/2004
10/27/2004
11/10/2004
11/24/2004
12/8/2004
12/22/2004
1/5/2005
1/19/2005
2/2/2005
2/16/2005
3/2/2005
3/16/2005
3/30/2005
4/13/2005
4/27/2005
5/11/2005
5/25/2005
6/8/2005
6/22/2005
7/6/2005
7/20/2005
8/3/2005
8/17/2005
start date for trap

Figure 2.



Riverside spotted gum
SGP female
SGP male
LGP female
LGP male
Average psyllids per week
300
250
200
150
100
50
0
6/2/2004
7/2/2004
8/2/2004
9/2/2004
10/2/2004
11/2/2004
12/2/2004
1/2/2005
2/2/2005
3/2/2005
4/2/2005
5/2/2005
6/2/2005
7/2/2005
8/2/2005
start date for trap