

**California Red Scale – Second Crawlers**

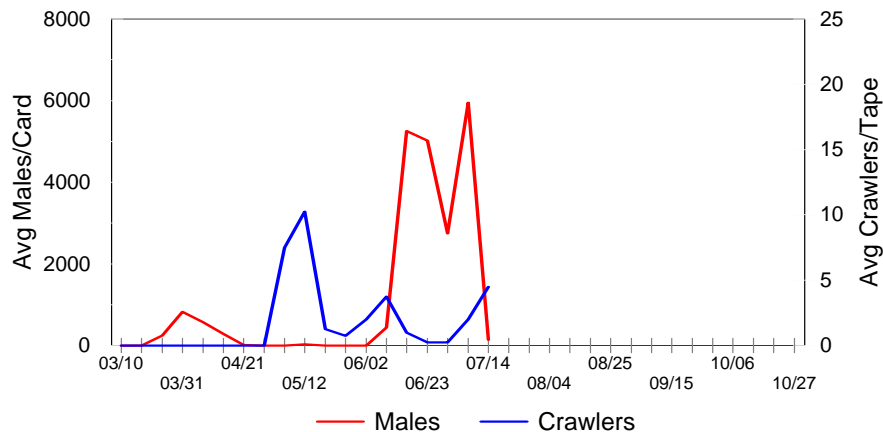
	1st male flight (observed)	1st gen. crawlers (observed)	2nd male flight (observed)	2nd gen. crawlers (observed)	3rd male flight (predicted)	3rd gen. crawlers	4th male flight	4th gen. crawlers	5th male flight
Estimated Degree Days	Biofix	550 DD	1100 DD	1650 DD	2200 DD	2750 DD	3300 DD	3850 DD	4400 DD
Kern	March 12	April 30	May 28	June 25	July 23				
Tulare	March 12	April 30	June 4	July 2	July 23				
Fresno	March 17	May 7	June 11	July 9	July 30				

**Red Scale Lower Developmental Threshold: 53°F**

**Current DD (as of July 16) - Kern: 2140 DD, Tulare: 2090 DD, Fresno: 1930 DD**

The second crawler emergence of California red scale is under way throughout the citrus growing region of the Central Valley. Now is the appropriate time for treating California red scale with insecticides. Target the 1<sup>st</sup> instar crawlers with nerve poisons such as organophosphates (Lorsban and Supracide) and carbamates (Sevin) and smothering agents such as oil. The insect growth regulators (IGRs) such as Applaud and Esteem are most effective as the scales molt from 1<sup>st</sup> instar to 2<sup>nd</sup> instar stages. With the IGRs, don't expect the scales to die until they molt: some scales might even survive to a second molt. Give it at least a month before you evaluate the scale population. If the treatment is effective, most of the scales should be dead or parasitized and there should be very few crawlers emerging and whitecaps forming at 30 days after the treatment. The third flight of males is coming up quickly in the warmer parts of the citrus growing region as temperatures remain in the upper 90s and lower 100s. Currently, degree-days for Kern and Tulare Counties are accumulating at a rate of about 30 DD per day plus or minus five DD through the month of July. Degree-day calculations for CRS as well as weather summaries for selected weather stations are maintained on our website: <http://citrusent.uckac.edu/DegreeDay.htm>.

**California Red Scale 2007**  
Lindcove Citrus Field Station Block 22



## Citricola Scale – Nymphs settling on the leaves

Examine the female scales on the twigs, and if they are dead and the eggs under their bodies are completely hatched (white skins are all that is left) and the nymphs can be found on the leaves, then it is time to start spraying. If you spray before the eggs are all hatched, then they are protected by the female scale body and they may not be killed by the insecticide. In the past, Lorsban has provided the best chemical control of citricola scale, lasting more than one season if applied at a fairly high rate (6-12 pints/acre). However, last season we found that some populations of citricola scale have developed resistance to Lorsban. This reduces the effectiveness of the Lorsban and forces the grower to treat nearly every year. Where resistance is a problem, the somewhat less effective insecticides (Assail, Applaud, oils) are at least similar and possibly better than Lorsban in terms of efficacy.

## Citrus Peelminer – Fourth Flight

	1st male flight	2nd male flight	3rd male flight	4th male flight	5th male flight	6th male flight	7th male flight	8 <sup>th</sup> male flight
Estimated Degree Days	biofix	580 DD	1160 DD	1740 DD	2420 DD	3000 DD	3580 DD	4160 DD
Host Plant	Stems	Stems	Pummelo grapefruit	Pummelo grapefruit	Susceptible oranges	Susceptible oranges	Susceptible oranges	Susceptible oranges
Tulare	March 12	May 10	June 18	July 9	August 6 (predicted)			

**Citrus Peelminer Lower Developmental Threshold: 55°F**  
**Current DD (as of July 16) – Tulare: 1940 DD**

Peelminer activity has been reported in pummelos in Kern and Tulare Counties, and we have reports indicating that some navels (TIs) in the foothill region are starting to show mining activity also. Jocelyn Millar is continuing to study the pheromone and is researching the synthesis of a more effective compound so that we will have better flight information. As peelminer degree day information accumulates, we will be posting it to our website: <http://citrusent.uckac.edu/PeelminerDD07.htm>

An updated version of our on-line peelminer moth trap count and fruit damage reporting system is now available for use at <http://arcims.gis.uckac.edu/CitrusMiner/>. Growers that have used the system already will find a streamlined interface and faster response time. One-on-one demonstrations of the system will be offered for both experienced users and growers that are using it for the first time. Please contact Greg Montez at (559) 646-6597 or [gregm@uckac.edu](mailto:gregm@uckac.edu) for further information.

Once a peelminer infestation starts, it is best to treat two to three flights in a row (at 3-4 week intervals) with a mixture of a low rate of Micromite for the eggs and a low rate of a broad spectrum pyrethroid or organophosphate for the adults and larvae. The maximum label rate for Micromite is 6.25 oz during a 90 day period.

Is there potential for biological control of citrus peelminer? *Cirrospilus coachellae* is found in the Coachella valley and assists with biological control of citrus peelminer in that region. This parasite also attacks citrus leafminer. David Headrick (Cal Poly SLO) and Beth Grafton-Cardwell released *Cirrospilus* in the San Joaquin Valley during 2001-2004, however, it never overwintered. At that time, the parasite was reared from peelminer infesting grapefruit and the parasite release numbers were low. Researchers Bob Luck and Joseph Morse have developed a method of rearing *Cirrospilus* on citrus leafminer. David Headrick and Beth Grafton-Cardwell intend to do releases of *Cirrospilus* in the San Joaquin Valley this year and with the new rearing method plus the alternative host of citrus leafminer being present in the field, we may be much more successful in establishing this natural enemy.

## Citrus Leafminer

Citrus leafminer is now infesting backyard citrus trees and commercial citrus in Imperial, Riverside, Orange, Los Angeles, San Diego, San Bernardino, Ventura, Santa Barbara, San Luis Obispo, Fresno, Tulare and Kings counties. The pheromone traps are highly effective in collecting moths. In Kern, Tulare and Fresno counties we are catching moths, yet not seeing damage in the flush leaves. If you see any leaf damage in the San Joaquin Valley, please let us know about it. Because leafminer is a small moth, we recommend triangular traps to limit other insects from accidentally being stuck in the traps – it makes it easier to find and count the moths. The exact size and color of the trap are not important.

If you would like to trap citrus leafminer, two sources of lures and traps are:

APTIV, Inc. 2828 SW Corbett Ave., Suite 114, Portland OR 97201,

(877) 244-9610, [www.aptivinc.com](http://www.aptivinc.com)

ISCA Technologies, Inc., 2060 Chicago Avenue #C2, Riverside, CA 92507,

(951) 686-5008, [www.iscatech.com](http://www.iscatech.com)

A moth trap catch reporting system similar to the one we are using for citrus peelminer has been developed for citrus leafminer and is now active on our website at <http://arcims.gis.uckac.edu/CitrusMiner/>. Growers who wish to use this system may request a one-on-one demonstration from Greg Montez (contact information above).

While the damage that the leafminer causes to flush of mature citrus trees is ugly, insecticides are not very effective and leafminer will not affect yield (except perhaps for lemons on the coast that are continuously flushing and producing multiple crops). Therefore, we recommend that you ignore this pest in mature citrus. For information on identification see our web site: <http://citrusent.uckac.edu/leafminer.htm>. Citrus leafminer will heavily damage flush of nursery citrus and newly planted citrus and could affect growth and development of young plants. Therefore treatments may be necessary in these situations. In foreign countries, such as Israel, growers apply Admire for the first three years to newly planted trees to reduce leafminer infestations and maximize growth of the trees. We have both SLN and IR4 requests to gain registration of the insecticide Intrepid (methoxyfenozide) for nonbearing citrus and are testing new insecticides for their efficacy against this pest. Additional management guidelines are posted on the UC IPM web site: <http://www.ipm.ucdavis.edu/PMG/r107303211.html>.

Dr. David Headrick (Cal Poly San Luis Obispo) is collecting parasitized leafminer larvae and pupae to determine which parasites are attacking the leafminer in coastal and central California. If you would like to assist with this project, instructions for collecting and shipping parasitized larvae are located on our web site: [http://citrusent.uckac.edu/Collect\\_leafminer\\_parasites.htm](http://citrusent.uckac.edu/Collect_leafminer_parasites.htm). This pest should eventually be controlled by natural enemies. Some of the same parasites that attack leafminer also attack peelminer (for example *Cirrospilus*) and so having both pests present should improve biological control.

**The Citrus IPM Newsletter is published by the University of California Citrus Entomology Laboratory at the Kearney Agricultural Research Center.**

For information or to subscribe or unsubscribe please send an email to [gregm@uckac.edu](mailto:gregm@uckac.edu) or call (559)646-6597

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