

California Red Scale – First Crawler Generation

	1st male flight (observed)	1st gen. crawlers (observed)	2nd male flight (predicted)	2nd gen. crawlers	3rd male flight	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	June 4						
Tulare	March 12	April 30	June 4						
Fresno	March 17	May 7	June 11						

Red Scale Lower Developmental Threshold: 53°F

Current DD (as of May 7) - Kern: 570 DD, Tulare: 540 DD, Fresno: 440 DD

The first flight of males has ended at the Lindcove Research and Extension Center and crawlers were beginning to be captured on sticky tapes as of the week of April 30. Crawler activity should already be well underway in Kern County. Fresno and Madera counties should have crawler activity starting up this week. The lower developmental threshold, which is the temperature at which California red scale begins development, is 53°F. Currently, degree-day accumulations for Kern and Tulare Counties are predicted to be about 20 DD per day plus or minus five DD through the month of May. 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>.

Citricola Scale – Adults producing eggs

This is the time of year when citricola scales have moved down to the ends of the twigs, molted into the female stage and are now starting to produce eggs. Whenever we have a cool and wet spring, female survival is highest and they produce the most eggs. The eggs will begin hatching during June. It may be tempting to try to treat citricola scale at this time of year because of the sooty mold that it is producing and the number of females present in some orchards. However, none of the insecticides (oils, Lorsban, Assail, Applaud) are very effective at this time of year. This is because the females are large and hard to kill and the eggs are protected under their bodies. If you treat a heavy population of citricola scale now, you can expect to come back in August or September and treat the 1st instar nymphs that hatched from the eggs and moved out on the leaves.

Light Brown Apple Moth

A new pest that could potentially infest citrus has arrived in the Bay Area (6 counties have infestations). Local County Ag Commissioner personnel have placed lures around the San Joaquin Valley to determine if the moth has made it this far. The damage that LBAM will cause to citrus will be very similar to Amorbia moths (larvae sit under the stem end of the fruit and make a circular scar). They should be fairly easy to control with Bt products. The most significant impact on citrus will be the inability to export fruit from infested areas to foreign countries. CDFA now has a web site that shows maps of the Bay Area infestations and this is a good place to obtain updates on the quarantine rules and the distribution of the pest http://www.cdffa.ca.gov/phpps/pdep/lbam_main.htm. If you see anything suspicious or new – please alert your County Ag Commissioners office or local farm advisor in the UC Cooperative Extension office.

Citrus Peelminer – Second Flight Arriving

	1st male flight (observed)	2nd male flight	3rd male flight	4th male flight	5th male flight	6th male flight	7th male flight	8 th 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 14 (predicted)						

Citrus Peelminer Lower Developmental Threshold: 55°F

Current DD (as of May 7) – Tulare: 452 DD

The first two peelminer generations attack willows, oleander, and stems of various crops such as walnuts, stone fruits and vines. We are predicting the second flight to occur in the next two weeks. The third flight usually arrives in mid to late June (1160 DD from March 12) and will attack grapefruit and pummelo. Usually it is the fourth or fifth flight (1740 and 2420 from March 12) that attacks susceptible navel varieties (Fukumoto, TI, Atwood, Barnfield).

Once a peelminer infestation starts, it is best to treat two to three flights in a row with a mixture of Micromite for the eggs and a broad spectrum pyrethroid or Organophosphate for the adults and larvae. Jocelyn Millar is continuing to study the pheromone and is researching the synthesis of a more effective compound.

As peelminer degree day information accumulates, we will be posting it to our website:

<http://citrusent.uckac.edu/PeelminerDD07.htm>

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, and San Luis Obispo counties. During 2006 we placed highly effective pheromone traps in Kern, Tulare and Fresno counties and were able to trap moths throughout the San Joaquin Valley during October and November (See figure on next page). Kris Godfrey (CDFA) checked her San Joaquin Valley leafminer traps on May 21, 2007 and found a few moths in them. So we know that the winter temperatures didn't eliminate leafminer. Leafminer-infested leaves were found only in Kern County during the fall of 2006. We expect to see much more leaf damage in the San Joaquin Valley this year, but most likely we will see slight leaf damage in the spring, then the leaves will harden off. When the new flush appears in the fall the populations should be quite noticeable. 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, three sources of lures and traps are:

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

(877) 244-9610, www.aptivinc.com

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

(951) 686-5008, www.iscotech.com

Suterra LLC, 213 SW Columbia, Bend, OR 97702-1013,

(866) 326-6737, www.suterra.com

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 an IR4 request to gain registration of the insecticide Intrepid (methoxyfenozide) for nursery citrus and are testing new insecticides for 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. This pest should eventually be controlled by natural enemies. Some of the same parasites that attack leafminer also attack peelminer and so having both pests present should improve biological control.

Katydids

Katydids are a serious problem because citrus growers have shifted to using soft pesticides such as Esteem for California red scale and Success for citrus thrips instead of organophosphate insecticides. Katydids are very sensitive to organophosphate and pyrethroid insecticides. In stone fruits, Success works very well for controlling katydid. However, in citrus, katydid emergence continues for a much longer period of time and Success treatments for citrus thrips are not necessarily timed for small katydid instars or the residues don't last long enough to control the nymphs that emerge later in the season. For the past few years, growers have routinely tank-mixed low rates of organophosphates (Lorsban, Dibrom, Cygon) or pyrethroids (Danitol, Baythroid, Renounce) with Success thrips treatments to control katydid, or treated with a full rate of pyrethroid for both pests. A newly registered insecticide that has a lot of promise for katydid control is Micromite (diflubenzuron). It is an insect growth regulator that prevents the nymphs from molting properly. It won't kill the katydid until they molt and so it takes about 7-10 days to take full effect. Therefore the best use of this chemical is prior to petal fall when there is no fruit available for them to damage. Micromite is soft on most beneficials except vedalia beetles. There is a new insecticide produced by Dow AgroSciences that is close to registration for citrus (spinetoram or Delegate) that has higher efficacy against katydid than Success and also controls citrus thrips and so should help to reduce katydid problems in future years.

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

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