

**California Red Scale**

**Biofix (beginning of male flight):** Low numbers of males were caught on pheromone cards during the weeks of March 22-March 29, 1999 in Tulare and Kern Counties

**Lower developmental threshold:** 53°F

**Current Accumulated Degree Day Units (as of May 24, 1999):**

**Kern:** 538 DD

**S. Tulare:** 460 DD

**N. Tulare:** 480 DD

**Fresno:** 451 DD

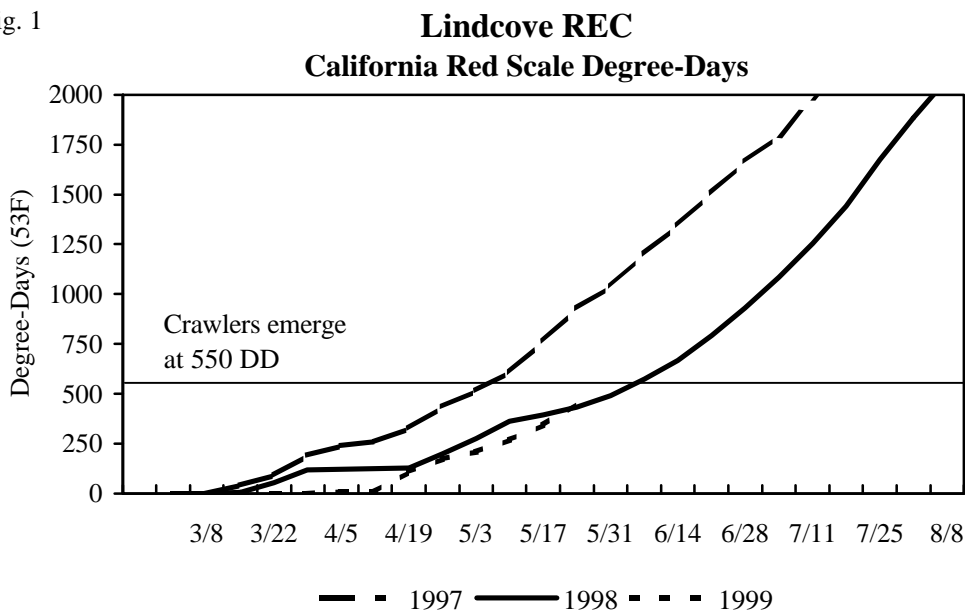
**Madera:** 369 DD

**Emergence of crawlers begins:** 550 DD

**Peak crawler activity occurs:** 650 DD (In a warm year 1-2 weeks after they begin to emerge)

Crawler emergence should start approximately 550 degree-days (using a base temperature of 53°F) after the beginning of the flight of males in each generation. Figure 1 shows that 550 degree days were accumulated (and crawler emergence began) in the warm spring of 1997 during the first week of May. In 1998, crawler emergence began during the last week of May. The 1999 degree-day accumulation pattern is similar to 1998. We are beginning to see crawler activity in some orchards in Kern County and warmer areas of Tulare County. Crawlers should be active in the Tulare, Fresno and Madera regions by the end of the month.

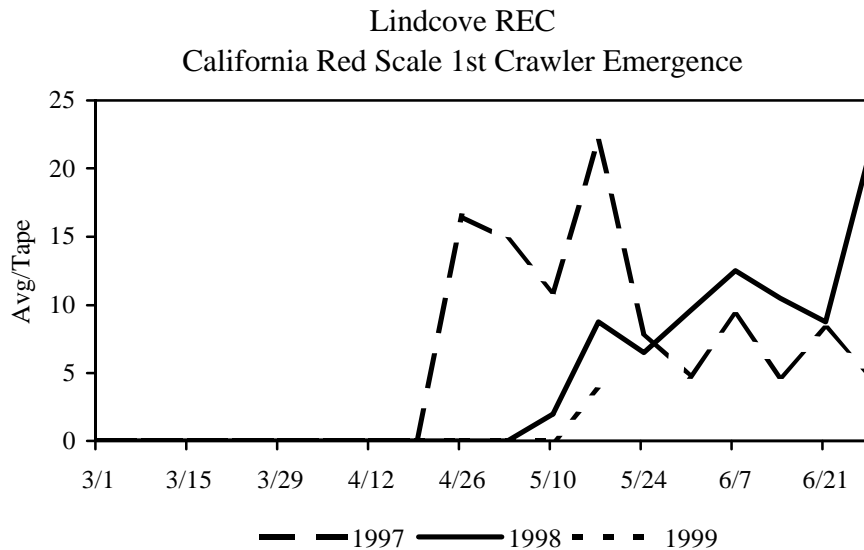
Fig. 1



The reason that you need to be aware of crawler activity in your orchard is because pesticide applications are more effective if they are timed properly. Organophosphate (Lorsban and Supracide) and carbamate (Sevin) insecticides work best if applied when the crawlers have just settled. Therefore, the best timing for these pesticides is just after peak crawler activity has occurred, usually 1-2 weeks after the crawlers begin to emerge. Crawler emergence can be monitored using double-sticky tape wrapped around branches and changed weekly to catch crawlers as they move along the branch. Notice in Figure 2 that crawler emergence begins and peaks at different times from year to year. In warm years (1997), the bulk of the crawlers

emerge over a 3 week period and the peak period is fairly obvious. In cool years (1998), emergence lasts much longer and it is not certain when the best time is to spray. There are several methods to determine the best time to spray in a warm year; 1) detect when the crawlers first emerge using sticky tape and then wait for 1-2 weeks (in a warm year) for them to finish emerging before you spray or, 2) calculate degree days and wait until about 650 degree days after the males began to fly before you spray. In a cool year, you simply have to wait a few weeks longer and hope that the insecticide residues will kill the scale crawlers as they continue to emerge. The organophosphates and carbamates will kill at least some of the scale if they are sprayed at other times of the year. They just do a better job when applied while most of the population is a young stage. The only really poor time to spray insecticides for red scale control is while the males are flying. This is because most of the population consists of recently mated females and that is the hardest stage to kill with insecticides.

Fig 2



The insect growth regulators Esteem (Knack) and Applaud kill the scale as it molts and so are best applied when the crawlers settle down as white caps. Oil smothers the insect and so the best application timing for this pesticide is also when the scale have settled as whitecaps. For these insecticides you want to wait longer before you spray than you would for the organophosphates and carbamates. A good way to evaluate the scale for this spray timing is to watch for white caps on old fruit (shiners) or on new fruit in the orchard. The insect growth regulators will not kill crawlers or whitecaps, so don't expect these stages to die and go away.

See our website at [www.uckac.edu/citrusent](http://www.uckac.edu/citrusent) for weekly updates on California red scale activity throughout the San Joaquin Valley.

## **Cottony Cushion Scale**

Vedalia beetle has arrived in many cottony cushion scale-infested orchards throughout the San Joaquin Valley. In those that it arrived in 3-4 weeks ago it has done a great job of cleaning up the scale. In other orchards, it has not arrived or has not had enough time to build up and control the pest. If you have a heavy cottony cushion scale population and the vedalia beetles are starting to work on them you should avoid broad spectrum citrus thrips sprays that would kill vedalia (Carzol, dimethoate, and Baythroid). Also you should delay treating red scale with IGRs (Esteem or Applaud) or the broad spectrum pesticides (Lorsban, Supracide, and Sevin) until the second red scale generation (July) so that the vedalia beetle has time to clean up the cottony cushion scale. None of the insecticides control cottony cushion scale as well as the vedalia beetle does.

Beth Grafton-Cardwell  
University of California  
Cooperative Extension  
[Bethgc@uckac.edu](mailto:Bethgc@uckac.edu)  
(559) 646-6500

Greg Montez  
[Gregm@uckac.edu](mailto:Gregm@uckac.edu)