

Citrus Cutworm

Source of Information: Lindcove Research and Extension Center

Biofix: January 15, 1999 for the Exeter and Ivanhoe area

Lower developmental threshold: 46°F

Current Accumulated Degree Day Units: 693 DD

Begin Sampling for Cutworm Larvae: 250 DD

First larvae seen in the Exeter/Ivanhoe area: April 1, 1999; 380 DD

Current stages of larvae found in citrus: 1st, 2^{nds}, and 3^{rds}

Citrus cutworm has been heavy in a few orchards and light in most other orchards in the San Joaquin Valley. As of April 26, we have accumulated 693 degree-days at the Lindcove Research and Extension Center and we are seeing a mixture of 2nd and 3rd instar larvae in all four Exeter/Ivanhoe orchards that we are sampling (densities of 2-6 larvae in 24 trees shaken). We have estimated that using a lower developmental threshold of 46°F and a biofix of the second week of consecutive moth flight, we will see citrus cutworm larvae emerging approximately 350-400 degree-days later. The earliest we have seen larvae emerge is after 250 degree-days so that is when we began sampling. We saw the first larvae our sample blocks at 380 DD. This closely matches our model that predicts cutworm larvae will be found 350-400 DD after the biofix. Microbial pesticides are most effective when applied approximately 400-550 degrees after moths begin flying, when the population consists primarily of 1st and 2nd instar larvae. We are past this point in time. After petal fall, the threshold of tolerance of cutworm drops because they can quickly do damage to the new fruit. You should continue to sample for this pest and if heavy populations are found, the number of blooms is low, or new fruit is on the tree, consider treating with a broad spectrum pesticide to get quick kill. We will continue to keep you informed of the degree day units as they accumulate via fax and the web page (<http://www.uckac.edu/citrusent/>).

The treatment threshold is 15 worms (per 25 net shakes, per 1 hour search, or per 20 trees sampled with a beating sheet) before petal fall and 3-5 worms after petal fall. See your Citrus IPM manual or guidelines for details of how to sample. Insecticide treatment recommendations can be found in the citrus guidelines that you can purchase from your UC Cooperative Extension Office, or by subscription as Publication 3339 from UC DANR Communication Services (800-994-8849), or on the world wide web (<http://www.ipm.ucdavis.edu>).

California Red Scale

Section 18 News

We have officially obtained the Section 18 for Esteem (Knack) (16 oz/acre) and Applaud (2.1-2.8 lb./acre) as of April 1, 1999. Valent Corporation wants us to change the name of Knack to Esteem because Knack is used in cotton and Esteem is used in tree crops. **This section 18 is very similar to last year, except that Knack can not be used in orchards that it was used in last year.** The purpose of this restriction is to slow the rate at which resistance develops. If you spray year after year with the same insect growth regulator you will select for resistance very fast. Only one application of each material is allowed per year and you are required to use dilute gallonage. These insecticides should be applied when the first generation of crawlers settle down as white caps (usually during the first two weeks of May). See your County Ag Commissioner or our web page for more complete details on the section 18 (www.uckac.edu/citrusent/section18.htm).

Scale Population Development

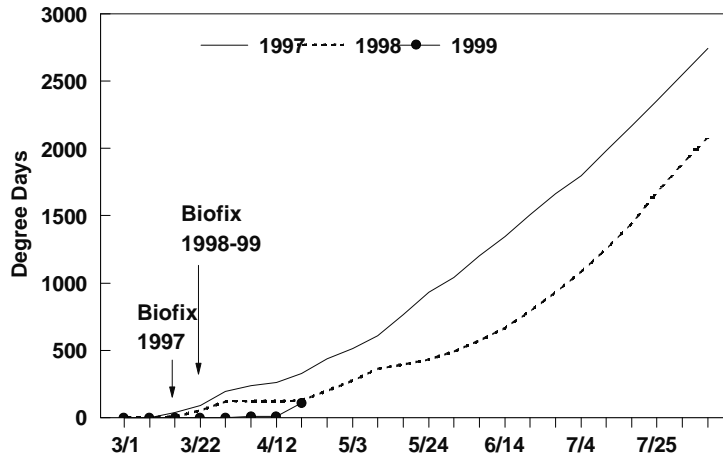
Biofix (beginning of male flight): Low numbers of males have been caught on pheromone cards during the weeks of March 22-March 29, 1999 in Tulare and Kern Counties

Lower developmental threshold: 53°F

Current Accumulated Degree Day Units (as of April 26): 170 DD

Emergence of crawlers begins: 550 DD

Fig. 1 - Degree Day Accumulation at Lindcove REC
(Lower developmental threshold of 53. F)



California red scale males began appearing in very small numbers on traps in Kern and Tulare county areas March 22, 1999. The accumulation of degree days at the Lindcove Research and Extension Center shown in Figure 1 for 1997 is close to what we consider a normal year. Spring temperatures in both 1998 and 1999 have been very cool and so the degree day units are accumulating very slowly. Since insect development depends on temperature, the insects are also developing very slowly.

Figure 2 shows that the first flight of male scale in both 1998 and 1999 started much later and the total number of males was much smaller compared to 1997.

Fig. 2 - Male Scale on Pheromone Cards at Lindcove REC
(First and second generation)

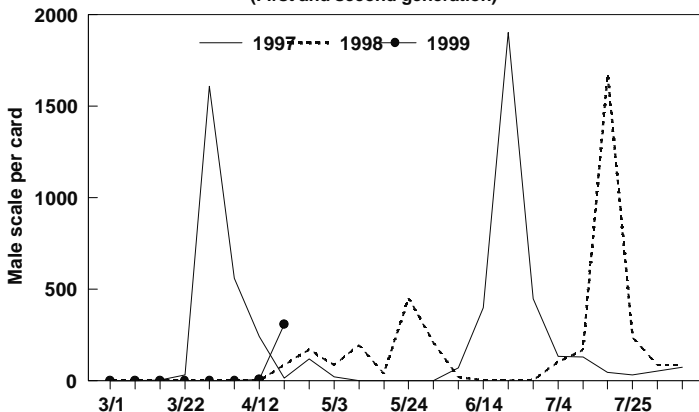
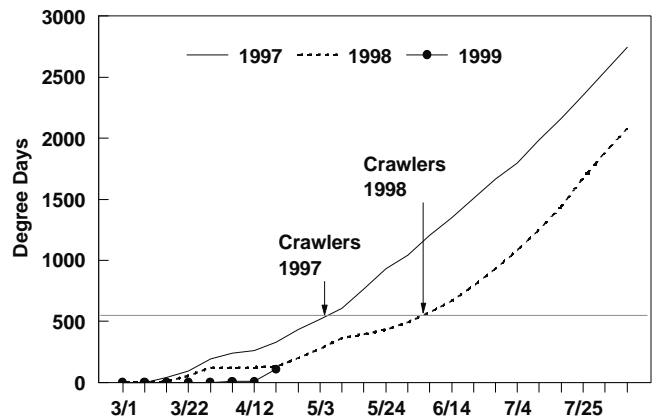


Fig. 3 - First Appearance of Crawlers at 550 DD
(Lower developmental threshold of 53. F)



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 3 shows that crawler emergence in the warm spring of 1997 began during the first week of May. In 1998, crawler emergence began during the first week of June. So far, 1999 is similar to 1998. The crawler stage is most easily killed by Lorsban, Supracide, and Sevin. Peak crawler emergence can be observed using double-sticky tape wrapped around branches to catch crawlers as the crawl along the branch or by estimating when the peak of the male flight occurred and spraying 550 degree days later. 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 is best applied when the scale have settled as whitecaps.

Cottony Cushion Scale – History Repeats Itself

“The cottony-cushion scale has been revived as a pest of citrus in California, particularly in the central valleys, by the extensive use of insecticides that have resulted in the reduction of the vedalia beetle population. Since the majority of these insecticides do not control cottony cushion scale, their use results in a rapid increase in the numbers of this pest.”

Ebling – Subtropical Fruit Pests, 1959

Cottony cushion scale has been rearing its ugly head in many orchards throughout the San Joaquin Valley. One of the reasons is that the El Niño conditions we had last year were perfect for soft scale growth and development. Another reason is that vedalia beetle is very sensitive to the new insect growth regulators, Knack (= Esteem) and Applaud, which are applied for California red scale control. The orchards that are experiencing the worst problems are next to orchards that were sprayed with Esteem or Applaud. This is because the spray drift killed the vedalia beetle but not the cottony cushion scale. The vedalia beetle adults are not killed directly but their offspring do not complete development. A sign of the negative effects of the insect growth regulators is the presence of dead vedalia pupae. During the past six weeks we have begun to see various stages of vedalia beetles returning to most orchards with heavy cottony cushion scale in Tulare and Kern counties.

If you have a heavy cottony cushion scale population and the vedalia beetles are starting to work on them you should avoid thrips sprays that would kill vedalia (Carzol and Baythroid). Also you should delay treating red scale with IGRs (Esteem or Applaud) or the older 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.

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