# Brown Almond Mites

## overwintering eggs appear in June with three life cycles a year offering an advantage in control program

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**Brown almond mite** infestations in almond orchards decline in early summer.

Many Sacramento Valley growers believe that hot weather kills these mites. An additional reason for this view is that brown mite infestations appear to be more severe when cool weather in spring lasts for a longer period than usual. This happened in 1948.

Studies recently made in Colusa, Yolo and Solano counties indicate that this early summer decline is due to a change in the hatching behavior of eggs laid during June and early July.

Most of the eggs laid during this period do not hatch immediately. A condition of arrested development sets in and persists as a state of dormancy. These become the over-wintering eggs. They do not hatch until the following spring.

Whether or not these observations apply to almonds throughout the state is not known.

Spot checks show that the behavior of this mite differs on other host plants. For example, there appears to be a longer breeding period on peaches. Although there is a decline after a June peak, it is not rapid. The presence of immature mites on peaches during August and September shows that reproduction continues to some extent until late summer.

Another variation occurs on cherries. On this host the brown mite is a late summer pest.

### Hatching of Eggs

That the brown mite over-winters in the egg stage is well known. The tiny cherry red spheres are fastened to rough bark, especially below the forks of twigs.

The over-wintering eggs exist in a true state of dormancy. A long exposure to winter weather conditions is necessary before they will hatch.

Experiments on ways of forcing winter eggs to hatch out of season have failed. Less than 10% of the eggs taken from trees before January 15 hatched in laboratory incubators. But this increased to a maximum for eggs removed from trees during February.

In order to learn when the winter restrictions upon development of eggs begin to relax, a series of hatching tests were run at weekly intervals between January 1 and September 1.

The first change in the condition of the eggs can be noticed during January. This change occurs several weeks before the regular hatching period begins. For about four months thereafter the eggs hatch freely in the laboratory.

The influence of factors which restrict hatching reappear during June. Hatchability drops to winter level by July 1.

The reappearance of the dormancy condition ends the period of reproduction. The number of adult mites declines rapidly thereafter.

### Potential Increase

If large numbers of brown mite eggs are produced during June there is a large hold-over of the population from one season to the next. About 60–75% of the over-wintered eggs are hatchable.

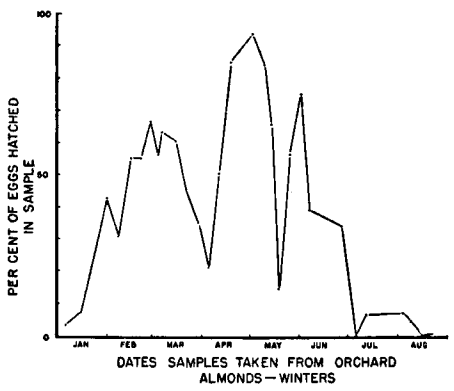
This is a low winter loss as compared with many kinds of insects. It follows then that the brown mite is capable of carrying through the winter a large potential population.

A build-up achieved at the close of one season may persist through the winter with relatively small loss.

When spring arrives the eggs give rise to a population of actively feeding mites capable of doing much harm even before reproduction begins.

Winter eggs which fail to hatch are not easily distinguished by structure from hatchable eggs. They remain on the trees throughout the season. Some of them were therefore always present in samples taken for hatching tests.

The laying of new eggs occurs in cycles. The number of eggs on the trees changes from time to time according to the laying periods. Some of the old eggs failing to hatch always occurred in the weekly samples. The ratios between the two kinds of eggs changed periodically, according to whether new eggs were being laid or were hatching, The trend of the changes recorded from week to week shows that the brown mite has only three generations per year on almond trees.




Dates on which various stages of reproduction took place in the field were determined by direct observation. In some cases supplemental tests were made.

In tests carried out in 1949, larvae began to emerge from over-wintered eggs on February 21. These early mites were few in number and were premature in relation to the definitive population. The early larvae probably came from the small percentage of eggs which can be made to hatch in an incubator in midwinter.

The rate of hatching gains rapidly as trees begin to bloom. The highest rate occurs between full bloom and the end of petal drop. This timing was determined for NePlus trees at Winters, California. The peak of the hatch, as found in the tests of 1949, was March 27.

The mite population observed during March was made up of immature stages only. The first adults were not seen until April 4.

New eggs—the first of the season—appeared in large numbers in mid-April. Hatching began soon thereafter. The growth of second generation mites was well under way by May 1. Later stages were not timed.

### Nature of Problem

On a basis of the number of generations per season it appears that the brown almond mite is a much less prolific species than red spider mites—two-spotted and pacific—which complete 10 or more generations per season.

In current experiments on mite control, a 95% kill of brown mites seems to be more difficult to obtain than is the case for red spider mites. But because it is a less prolific species, the brown mite is more easily controlled in the long run.

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