

## CONTROL OF LATANIA SCALE - (*Aspidiotus Lataniae* Sign)

**H. J. Quayle,**

*Entomologist University of California Citrus Experiment Station,  
Riverside, Calif.*

The latania scale is the most important scale insect attacking avocados in California. It has increased greatly during the last year or two and heavy infestations of this scale may now be found in several different localities. Latania scale attacks all parts of the tree and occurs about equally on the leaves, fruit, twigs, and even large branches.

Tests thus far made with the several different oil sprays give little promise of controlling latania scale satisfactorily, and at the same time considerable damage has been done to the tree by defoliation and by inhibiting the set of the fruit.

As a result of the above objections to oil sprays, the writer turned to the possibility of fumigation, and the first tests were made on seedling avocados on the Citrus Experiment Station grounds last June. While some of the tender growth was burned with the higher dosages, the injury was not serious. Other tests were made later in the same planting, since it was the purpose to determine the dosage the tree would stand at different seasons. There is no scale on the trees on the Station property, so that results on the scales could not be determined.

Early in September, at the request of Dr. J. Eliot Coit, in behalf of the California Avocado Association, tests were made of both sprays and fumigation for control of latania scale on the Rancho Leucadia grove. The sprays gave quite unsatisfactory results, while fumigation gave a complete kill at all dosages used, that is from 18 to 24 cc., and with the exception of the highest dosage no important damage was done to the trees. As a result of these tests, fumigation was recommended as the treatment for latania scale.

During August and September, Mr. Dean Palmer, agricultural inspector at Carlsbad, and A. F. Kirkpatrick, of the Owl Fumigating Corporation, of Azusa, carried on tests with fumigation, using both liquid cyanide and powdered calcium cyanide. A considerable number of trees were treated in these tests and results here were also satisfactory, both with the liquid and with the calcium cyanide.

As compared with citrus tree fumigation, which is a very old procedure, a number of new factors are involved in avocado fumigation. One of these factors is the size of the plantings, many being only from 1 to 5 acres in extent. Another factor lies in the greater danger of breaking the avocado trees as the tents are pulled over them. For these reasons a method that the individual grower can use is desirable. Such a method is met by the use of powdered calcium cyanide, which requires no special apparatus for its use and there is no particular hazard in connection with the handling of it. The method has been demonstrated to be successful by Mr. Kirkpatrick and Mr. Palmer and a number of

growers have thus fumigated their own plantings.



Fig. 1. Measuring the dosage of dry calcium cyanide for the avocado tree.



Fig. 2. Measuring the avocado tree.  
*(Photo by courtesy of Dean Palmer.)*

The dosage for a particular tree is measured by means of cups of different sizes. The powdered cyanide is placed in a tin can with a perforated bottom and with a long handle attached for shaking the material on the ground beneath the tree. The dosage used has been 2 ounces of cyanide for each of the units called for in the regular citrus-tree dosage schedule. Results with this dosage seem to be satisfactory thus far.

Far larger plantings, regular commercial fumigation is probably more practicable, because of the larger number of tents required and the consequent greater overhead charges against a single planting. In such work where 30 or more tents may be employed, the use of the liquid cyanide would be preferable to the powdered calcium cyanide, because of the quicker charging of the tree by the liquid and the lower cost of the material.

We have used dosages ranging from 14 to 24 cc. of the liquid hydrocyanic acid. Up to the present time dosages from 16 cc. and upwards have given satisfactory results and a high degree of control was secured with a 14 cc. schedule. However, since the cost of the little extra cyanide is not very great, and since there would be greater assurance of getting a satisfactory kill, for the present we are inclined to recommend a dosage of 18 cc.

The latania scale on avocados is much more easily killed than the red scale on lemons. In order to make a comparison of the susceptibility of these two scales to hydrocyanic acid gas, latania scale infested avocados from San Diego County and red scale infested lemons from Riverside County were fumigated together in a 100 cu. ft. fumatorium. The

amounts of cyanide used ranged from 2 cc. to 6 cc. per 100 cu. ft., and the exposure was 45 minutes.



Fig. 3. Pulling tent (350 sheeting) over avocado trees by means of bamboo poles. (Photo by courtesy of Dean Palmer.)



Fig. 4. Dosing the tree with dry calcium cyanide. (Photo by courtesy of A. F. Kirkpatrick.)

The following table gives the results of comparison of resistance to HCN of the latania scale and red scale:

Dosage	Kind of Scale	Number of Scales Examined	Per Cent Alive
2 cc.	red	1412	14.7
2 cc.	latania	1317	2.5
3 cc.	red	792	8.4
3 cc.	latania	917	.35
4 cc.	red	514	4.3
4 cc.	latania	476	.3
5 cc.	red	1042	1.3
5 cc.	latania	656	.0
6 cc.	red	646	1.4
6 cc.	latania	456	.0

Because of the susceptibility of the avocado tree to breaking, the tents should be as light as possible and they should be pulled over the trees with care. Many of the tents that have been in use in San Diego County are made of 350 sheeting, which is a much lighter material than any that has been used heretofore for citrus fumigation. The other material that is in use is 6<sup>1</sup>/<sub>2</sub> ounce drill. The results with the lighter sheeting seem to be satisfactory thus far with the dosages used. Just what difference there may be in the

leakage of gas between the 350 sheeting and the 6J/2 ounce drill remains to be determined. The 350 sheeting is very readily pulled over the avocado tree without doing any particular harm, although the life of such material is not so long as the 6<sup>1</sup>/<sub>2</sub> ounce special drill. We are carrying on experiments on the use of these two tenting materials from the standpoint of safety to the avocado tree, relative leakage of gas, and durability.

At the present writing we are engaged in testing fumigation on large avocado trees where 60-ft. tents are necessary. We are pulling these tents over the trees by the use of long poles with a pulley attached to one end. By means of this pulley the tent is pulled directly upward to the top of the pole and then pulled over the tree.

The most susceptible part of the avocado tree to fumigation injury is the blossom. The tender growth may be burned, but new growth quickly appears and the tree soon recovers. The question of injury to the blossoms, however, is concerned with the setting of the next year's crop. The trees in the coastal area of San Diego County start blossoming as early as the middle of October. In the more interior sections, such as at Rancho Santa Fe, and also in much of the Orange County area, blossoming appears very much later. Much remains to be learned about the effects of fumigation on the avocado tree, and particularly the effect on the blossoming; but, for the present, it seems desirable to go very carefully with the fumigation of avocado trees when in bloom. For this reason, the fumigation season should end about the time the trees first come into bloom. Judging from our preliminary work on avocado trees last June, it may be possible to start the fumigating season as early as June or July and finish just previous to blossoming, which, of course, will vary in different districts.

## **Conclusions**

Results of spraying to date have been unsatisfactory in the control of latania scale, and sprays have done more or less injury to the tree.

It is possible to effect a very high degree of control by fumigation with hydrocyanic acid gas, without injury to the tree, if the fumigation work is carried on at the proper season.

Fumigation as a method of controlling latania scale may be limited to such trees as may be covered with a tent. There are some plantings where the trees are so close together and so large that fumigation may be out of the question— or at least a very difficult operation. At the present time we are carrying on tests to see what may be done in the case of these larger trees. It will be understood that avocado fumigation has just started and many factors need to be determined regarding the procedure; but, so far as the work has gone, it seems a promising method of killing latania scale on such trees as may be satisfactorily covered with tents. November, 1931.