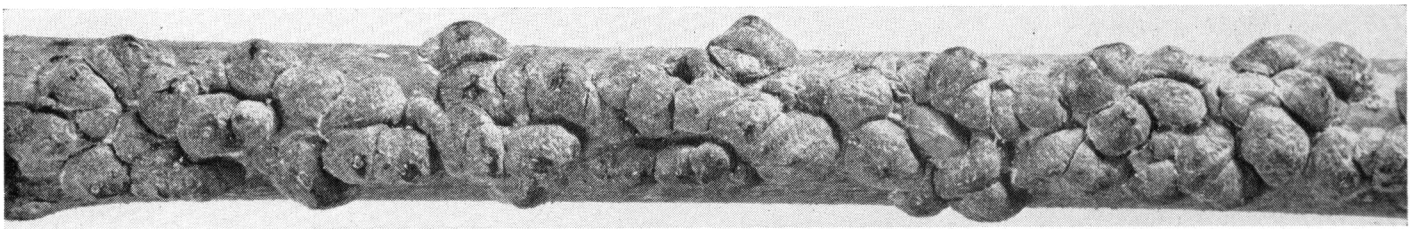
Control of the Frosted Scale

tests in southern California indicate parathion sprays effective treatment against pest on walnut

J. C. Ortega



Walnut twig encrusted with the frosted scale, *Lecanium pruninosum* Coq.

The frosted scale—*Lecanium pruninosum* Coq.—is a large, convex black scale about 5/16" long and is covered with a frostlike wax. The eggs are oval and pearly white when first laid, but as they develop under the female scale they turn darker. When ready to hatch they are pale brown in color. The hatch starts early in May and continues into July or—in some areas—into August.

There is but one generation a year. The young crawlers prefer to settle on the under side of the twigs of the last year's growth and on both leaf surfaces. During the winter months the scales remain small and show little development until the latter part of March when they grow very rapidly and mature late in April and early in May.

Outbreaks

Frosted scale has been a sporadic pest of walnuts in southern California for a number of years. Since the advent of the use of DDT to control the codling moth and the fruit tree leaf roller, outbreaks of this scale insect have been more numerous and tend to persist longer if left untreated.

Walnut trees are evidently capable of withstanding heavy infestations of frosted scale with little or no apparent effect on the tree. This could be due to the fact that when the scales are in their most rapid stage of development the tree also is in a vigorous growth period. This condition may serve to mask any deleterious effects of the scale. In heavy infestations there is some smutting of the leaves and fruit due to the excreted honey dew which provides a good medium for the growth of a sooty fungus mold. It is not uncommon to find adult scales so abundant on the twigs that they overlap and form a complete crust over the surface.

Scale Parasite

In most instances the encyrtid parasite, *Metaphycus californicus* (Howard), is very effective in keeping frosted scale populations to a point where they are of little or no consequence. However, certain necessary pest control practices, together with other factors, may inhibit the work of this parasite. The result is a tremendous and rapid build-up of the scale population. Field data show that an average of over 200 young scale insects may be present on a six-inch terminal under such conditions. The encyrtid parasite has been observed to clean up heavy infestations of this scale over a period of time. However, some growers are desirous of reducing a heavy scale population as rapidly as possible.

Insecticides for the Control of Frosted Scale

Insecticide	Air carrier equipment		Conventional spray rig equipped with a tower	
	Amount per 100 gallons of water	Gallons of finished spray per acre	Amount per 100 gallons of water	Gallons of finished spray per acre
Parathion 25% wettable powder	2 lbs.	250	1 lb.	500
or				
DDT 50% wettable powder	4 lbs.	250	2 lbs.	500
+				
Kerosene (agricultural grade)	4 gals.	...	2 gals.	...

Spray Treatment

Experiments for the control of frosted scale have been conducted during the dormant period for a number of years. During this period the scale insects are still immature and in addition, less finished spray is required to thoroughly wet the trees. The application of an insecticide immediately after the scale hatch is complete would require thorough spray coverage of the trees in full leaf and also adversely affect the parasite activity. Past experience has shown that when a satisfactory control is obtained it is usually not necessary to re-treat the following winter. Present indications are that the scale population will remain at a very low level from two to three years or longer after treatment.

Timing

Treatment for the control of frosted scale may be made during the dormant period up to the 15th of February. It is advisable to wait until defoliation is complete before spraying to insure complete coverage of the terminals. Experimental spray programs have shown that parathion is the most effective material to use. A DDT-kerosene treatment has also produced satisfactory results. Additional field work is necessary to further evaluate the effectiveness of malathion, a comparatively safe organic phosphate material which has shown some promise.

J. C. Ortega is Associate Specialist in Entomology, University of California, Riverside.

The above progress report is based on Research Project No. 1419.