

# Southern California Walnut Pests

## control program based on latest insecticides tests outlined for orchards in southern part of state

J. C. Ortega

**Control studies** of walnut pests in southern California groves included practically all of the promising new insecticides.

The fruit tree leaf roller can be controlled most effectively by DDT.

Best time of treatment depends on season but normally is about the middle of April.

Three pounds of 50% DDT wettable powder per 100 gallons of water should be applied with a speed sprayer at the rate of 200 gallons of finished spray per acre.

A 5% DDT dust applied at the rate of 50 pounds per acre is equally satisfactory.

### Codling Moth

On heavily infested groves two DDT treatments or two basic lead arsenate treatments are recommended for control of the codling moth.

One acre of average sized trees requires 16 pounds of 50% DDT wettable powder, or 32 pounds of basic lead arsenate per treatment.

The insecticides can be applied by either the speed sprayer equipped with volute which directs spray and full air stream to one side only, or the conventional high pressure spray rig equipped with tower.

The speed sprayer requires four pounds of 50% DDT wettable powder per 100 gallons of water, applied at the rate of 400 gallons per acre; or four pounds of basic lead arsenate plus one quart of a proprietary spreading and deposit-building agent per 100 gallons of water, applied at the rate of 800 gallons per acre.

The conventional high pressure rig requires two pounds of 50% DDT wettable powder per 100 gallons of water, applied at the rate of 800 gallons per acre; or four pounds of basic lead arsenate plus one quart of a proprietary spreading and deposit-building agent per 100 gallons of water, applied at the rate of 800 gallons per acre.

On moderately infested groves—having approximately 5% wormy nuts—either one application of DDT or two applications of basic lead arsenate are recommended. Each treatment should use 12 pounds of 50% DDT wettable powder or 32 pounds of basic lead arsenate per acre.

The speed sprayer requires three pounds of 50% DDT wettable powder

per 100 gallons of water, applied at the rate of 400 gallons per acre.

The dosage for lead arsenate is the same for moderate as for heavy infestations.

The conventional high pressure spray rig uses 1½ pounds of 50% DDT wettable powder per 100 gallons of water, applied at the rate of 800 gallons per acre; or lead arsenate as outlined for heavy infestations.

On lightly infested groves—where only 1% or 2% of the nuts are wormy—12 pounds of 50% DDT wettable powder or 32 pounds of basic lead arsenate are recommended per acre. The application should be made as outlined for moderately infested groves.

In normal years the first application in a two-treatment program should be made before May 10, and the second before June 1. Where only one treatment is required, it should be made about May 15.

Parathion has shown promise in the control of the codling moth but cannot yet be recommended as substitute for DDT.

### Navel Orangeworm

Effective control of the codling moth has resulted in minimum losses by the navel orangeworm. The harvesting of the walnut crop as early and rapidly as possible is of further value in reducing infestation by navel orangeworm.

Methyl bromide fumigation of the daily receipt of walnuts at the local packing house has proved effective in preventing the development of this insect in the nuts after harvest.

### Walnut Aphid

The addition of an aphicide to the codling moth spray is recommended to control the walnut aphid.

In seasons favorable to the development of the walnut aphid inclusion of the aphicide in both codling moth sprays may be necessary if two such sprays are used.

The most effective aphicides are nicotine sulfate, parathion, and tetraethyl pyrophosphate—TEPP. The accompanying table indicates the amounts of aphicide to use.

Method of application	Amount of material in ounces per 100 gallons		
	Nicotine sulfate	Parathion (25% wettable powder)	TEPP (tetraethyl pyrophosphate, 20%)
Speed Sprayer using DDT at 400 gals. per acre . . . . .	6	4	8
Speed Sprayer using basic lead arsenate at 800 gals. per acre . . . . .	4	2	4
Conventional high pressure spray rig using either DDT or basic lead arsenate at 800 gals. per acre . . . . .	5	4	8

Where control of the walnut aphid is needed either before or after the treatment for codling moth, the following applications are recommended:

1. Nicotine sulfate-hydrated lime dust, using either a 3% or 4% concentration of nicotine sulfate, applied at the rate of approximately 30 pounds per acre.

2. Sprays applied with speed sprayer at the rate of 100 gallons per acre: either nicotine sulfate at 24 ounces per 100 gallons of water; or parathion 25% wettable powder at 16 ounces per 100 gallons of water; or TEPP—20%—at 32 ounces per 100 gallons of water.

### Two-spotted Mite

Where basic lead arsenate has been used for codling moth control, a thorough application of DN-DUST-D8 used at the rate of 50 pounds per acre is recommended for the control of the two-spotted mite.

Where DDT has been used for codling moth control, a Selocide treatment is recommended.

The materials used per 100 gallons of water should be added to the spray tank in the following order: casein spreader, one fourth to one half pound; dusting sulfur, one pound; Selocide, one pint. The finished spray should be applied either with speed sprayer or conventional high pressure spray rig at the rate of 800 gallons per acre for trees of average size.

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# Linseed Oil Meal

## water-treated or supplemented with pyridoxine satisfactory for poult

F. H. Kratzer

**Turkey poults** grow slowly and some die when they are fed rations containing from 30% to 47% linseed oil meal.

Growth and survival improve when the linseed oil meal is treated with water or supplemented with pyridoxine.

The beneficial effects of water-treated linseed oil are not further increased when supplemented with pyridoxine.

The basal ration contained the following per 100 grams; wheat bran, 15.0 g.; crude casein, 10.0 g.; ground barley, 10.0 g.; alfalfa meal, 7.0 g.; ground corn, 7.0 g.; ground wheat, 5.0 g.; soybean oil, 5.0 g.; dried whey, 5.0 g.; steamed bone meal, 2.5 g.; ground limestone, 2.0 g.; sodium chloride, 1.0 g.; fish oil—1,000 A, 400D—0.25 g.; choline chloride, 0.2 g.; manganese sulfate, 0.0125 g.; nicotinic acid, 0.0009 g.; pantothenic acid, .0006 g.; riboflavin, 0.0002 g.; and thiamin hydrochloride, 0.0001 g.

Supplements to the basal were made as shown in the accompanying table. The water treatment of the linseed oil meal was carried out by mixing commercial, old-process linseed oil meal with three parts of water, allowing it to stand for 24 hours and drying at 65° C.

Bronze poults were fed a practical starting mash for 10 days before they were divided into comparable groups and were fed the experimental rations. They were housed in electrically heated batteries with wire floors and weighed at frequent intervals. The experiment was continued for 19 days.

The results are shown in the table. Poults fed the ration containing 30% of

the untreated linseed oil meal grew slowly and three out of nine birds died. Before one poult died, it underwent a convulsion similar to that observed in poults fed a pyridoxine deficient ration.

When pyridoxine was added to the ration, growth was markedly improved.

Growth of the poults fed the water-treated linseed oil meal was also equivalent to that of the group receiving the pyridoxine supplementation. Addition of pyridoxine to this ration gave no additional response.

In another experiment, when linseed oil meal was fed at 47% of the ration, nine out of 10 poults died during an 18-day period. In a group that was fed the water-treated linseed oil meal there was no mortality, and growth was much improved.

The experimental results with turkey poults were in agreement with previous work done with chickens.

This work had indicated that 4.5% linseed oil meal was the level above which growth depression would occur in chicks. In later work, with rations presumably containing more pyridoxine, 10% linseed oil meal did not cause a growth depression while higher levels did.

With turkey poults, 10% linseed oil meal also caused no growth depression but 30% of the meal did.

In chickens, too, growth was improved when the meal was given a water treatment. Addition of pyridoxine to untreated linseed oil meal also improved the growth of the chicks, although the ration contained pyridoxine in greater amounts

than is ordinarily required for good chick growth.

It has not been commonly observed that chicks fed linseed oil meal exhibit the convulsive symptoms of pyridoxine deficiency, although the growth response to added pyridoxine has been noted consistently.

The fact that one of the poults fed the ration containing 30% of the untreated linseed oil died in convulsions, gives additional support to the view that the feeding of linseed oil creates a pyridoxine deficiency. The mechanism of this action is not understood.

Linseed oil meal has been used for a long time as a protein supplement for ruminants with satisfactory results. It has also been used in rations for rats with satisfactory results, although the rat does not resemble ruminants in the structure of its gastrointestinal tract.

Turkeys thus resemble chickens in their response to rations containing linseed oil meal.

*F. H. Kratzer is Associate Professor of Poultry Husbandry, University of California College of Agriculture, Davis.*

*The above progress reports is based on Research Project No. 677 H-3.*

## WALNUT

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Two cryolite sprays are recommended for the control of heavy infestations of the walnut husk fly.

Speed sprayer application requires six pounds of cryolite per 100 gallons, using 400 gallons per acre for average sized trees.

The conventional high pressure spray rig requires three pounds of cryolite per 100 gallons, using 800 gallons per acre.

Where the walnut husk fly infestation has not been heavy, one cryolite spray treatment followed by one cryolite dust treatment is recommended. The dust application should use 50% cryolite dust with 2% oil incorporated for adhesive purposes, applied at the rate of 50 to 60 pounds per acre.

In groves that have a history of light infestations, two dust treatments are recommended.

The first treatment for the walnut husk fly usually should be applied during the last two weeks in July, the second four weeks after the first.

Cryolite often fails to give adequate control of the walnut husk fly. Parathion and dieldrin are being tested for satisfactory control of this pest.

*J. C. Ortega is Principal Laboratory Technician in the University of California College of Agriculture Citrus Experiment Station, Riverside.*

**Growth and Survival of Poults Fed Rations Containing Various Combinations of Linseed Oil Meal, Water-treated Linseed Oil Meal and Pyridoxine.**

Group	Supplement	Level	Ave. 19-day gain	Poults started	Poults surviving
			grams	no.	no.
1	Untreated linseed oil meal . . .	30%	37	9	6
2	Untreated linseed oil meal . . .	30%	305	9	9
	Pyridoxine hydrochloride . . .	0.002%			
3	Untreated linseed oil meal . . .	10%	307	9	8
	Soybean oil meal . . . . .	12%			
	Ground corn . . . . .	8%			
4	Water-treated linseed oil meal	30%	303	9	9
5	Water-treated linseed oil meal	30%	284	9	8
	Pyridoxine hydrochloride . . .	0.002%			
6	Practical turkey starting ration		263	9	9