

Coyote Damage in Orchards

*Elizabeth Fichtner, UCCE Farm Advisor,
Tulare County*

Coyotes may be a nuisance in orchards, particularly due to their disruption of irrigation lines. Coyotes (*Canis latrans*, latin for 'barking dog') have been able to increase their range concurrent with human encroachment. Their ease of adaptation to habitat changes is attributed to their ability to alter diet, social dynamics, and breeding habits. Additionally, the reduction of the gray wolf population, a natural predator of the coyote, has resulted in the expansion of coyotes across North America. The breeding season generally commences in January, and pups are born after around a 2-month gestation period, with litters consisting of 3-9 pups. Approximately 6-10 weeks after birth, pups will emerge from the den to embark on their first hunting excursions. Consequently, by mid-April, growers may start to notice increased coyote activity in orchards, and the frustration of coyote damage to drip lines may coincide with the first spring irrigation events.

Management

Because coyotes cover territories 10-12 miles from their den, destruction of known den sites may alleviate, but not eradicate, a coyote problem. Though some growers provide buckets of drinking water to dissuade coyotes from damaging irrigation lines, the overall success of this technique may be limited. Mature coyotes and pups may be intrigued by the sound of water running through irrigation lines, and damage the lines in play rather than in thirst. Due to the adverse affect of coyotes on agriculture, coyote management programs in California began in 1891. Coyotes are now classified as "non-game" animals in California and may be taken

throughout the year with an appropriate hunting license. For more information on regulations pertaining to coyote control, visit the California Department of Fish and Game website (www.dfg.ca.gov), and proceed to the link for non-game animals. In response to complaints of coyote damage, several counties (including Fresno and Kings Counties) have personnel to assist with assessment of coyote damage and humane removal of animals from coyote-impacted orchards. For more information on county-level support, call your local Ag Commissioner's office.

Early Season Ground Squirrel Management

*Kathy Kelley Anderson, UCCE Farm Advisor,
Stanislaus County*

Ground Squirrels

Controlling adult ground squirrels before they reproduce in the spring is a critical part of good management. Optimal time for control is during the breeding season when both males and females have emerged from hibernation. At this time, a majority of the squirrels are aboveground foraging for food and breeding.

Burrow fumigation is the method of choice at this time of year when squirrels feed on green vegetation and are not interested in baited grains. A fumigant program followed by anticoagulant baiting in the summer can control 90% of the population. Squirrels typically breed from late January to early March, but the time may vary with the weather and location. For the best results, use burrow fumigants about three weeks after the first squirrels emerge from hibernation. Read the label carefully and follow directions and label rates. Applying more fumigant than recommended to each burrow does not increase control.

Fumigation of holes with aluminum phosphide is prohibited within 100 feet of an occupied dwelling. A fumigation management is required.

Save material and labor costs by treating only active burrows. Shovel holes or drag middles and edge areas to cover burrow openings and treat only those that are re-opened. Fumigate following rain or irrigation since soil moisture is necessary to release the gas. The best timing is early morning or evening when ground squirrels are most likely to be inside the burrows. Check all treated burrows a couple of days after fumigation and retreat any that have opened. More information can be found on the UC ground squirrel best management practices website at <http://groups.ucanr.org/gsbmp>.

Section 18 For Manzate Flowable and Pro-Stick Fungicide

*Richard P Buchner, UCCE Farm Advisor,
Tehama County*

The section 18 for Manzate Flowable and Manzate Pro-Stick fungicides was issued February 24, 2011 and amended March 4, 2011 to allow for the use of existing stocks to control walnut blight. The section 18 will expire June 15, 2011 and covers Butte, Calaveras, Colusa, Glenn, Merced, Placer, Sacramento, San Benito, San Joaquin, Santa Clara, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Yolo and Yuba counties. These products must be tank mixed with a fixed copper product registered for use on walnut and not exceed 10 applications per season. Applications may only be made upon a written recommendation by a licensed pest control advisor or local farm advisor documenting that the weather is favorable for disease development and/or the disease is present.

Incidents of Walnut Scale Are Increasing

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and Yolo Counties*

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he infestation of scale insects in walnuts has been on the rise since 2004. Several conventional and organic orchards alike have seen an increase in walnut scale. Previously it was believed that scale insect populations were kept in check by natural predators and parasitoids. This no longer seems to be working in many locations. Reasons for this are unclear. Past use of broad range insecticides may have suppressed scale populations more than understood. The phasing out of these chemicals in favor of pesticides specifically aimed at only one insect or group of insects such as the use insect growth regulators (IGRs) or pheromone mating disruption for codling moth may have resulted in increased scale populations. It may also be the case that there are a few pesticides that are suppressing the natural predators and parasitoids at higher levels in the orchards. It has been shown that pyrethroids, spinosad, spinetoram, and neonicotinoids used in-season may decrease natural predators and parasitoids while not controlling the scale. Heavy applications of kaolin clay used in organics to discourage codling moth egg laying and in many orchards to decrease sun burning also discourages parasitoids from laying on scale if they are coated with clay. Any or all of these factors or some unknown factor could be playing a part in promoting scale populations. Be on the lookout and monitor your orchard so that scale does not get out of hand.

This is a great time to start monitoring for scale. Look for scale on prunings. Before leaving out you can easily look at the fruit wood and monitor for the presence of scale and determine which species are involved. Walnut scale and San Jose scale are armored scale that will over winter as adults. Walnut scale will be grouped together in a “daisy” flower shape with the males clustered around the larger females. Their coatings will be a whitish grey. San Jose scale over winter in the black cap stage with their waxy coatings colored black and grouped randomly or found separately along the branches. These two are the most problematic scale found in walnuts with heavy populations killing fruit wood or even splitting bark on larger

scaffolds if numerous enough. The other commonly found scale not known to cause economic damage in walnuts include frosted scale, European fruit lecanium scale, and Italian pear scale which resides under lichens and moss. High populations of any scale insects should be treated.



Walnut scale

<http://ipm/PMG/r881300311.html>

If treatment of scale is needed, an effective time to treat is delayed dormant in March before leafing occurs to achieve best coverage and to avoid killing natural enemies. If a high level of parasitism is observed, treatments may be delayed until after crawlers emerge in late spring, normally in May. Monitor for crawlers by encircling small branches that have adult scale present with double sided sticky tape. Remove and examine the tape with a hand lens for crawlers twice a week. Treat the orchard as the population of crawlers peaks. Italian pear scale is controlled by lichen or moss removal, typically with copper.



San Jose scale

<http://ipm/PMG/r881300411.htm>

Control Options

There are several control options available for orchards with heavy walnut or San Jose scale populations, minimal parasitism, weakened or dying fruitwood, and for in-season control, crawlers detected on sticky tape:

- The insect growth regulator Seize 35 WP. Coverage is very important. Use rates are 4 to 5 oz product/acre and a nonionic surfactant may be used to increase efficacy. Because it is an insect growth regulator, it may take the summer for scale to cycle out.
- Supracide 25WP at 8 lbs product/acre. Do not combine with oil or use more than once per growing season.
- Lorsban 4 EC at 4 pts product/acre. Do not make more than two applications per season.
- Narrow range oils can suppress low to moderate populations during the summer. Recommended for in-season control only directed at the crawlers. Do not apply to drought or diseased stressed trees or in temperatures over 90°F. This is the option for organic orchards.

In some orchards where heavy walnut scale and extensive dieback has been observed, we've also seen an increase in the fungal diseases Botryosphaeria and Phomopsis that cause cankers in infected limbs. We believe that the scale weakens these limbs and predisposes them to infection. Dead and dying wood should be pruned and removed, and scale should be treated in these orchards. For more information on these canker diseases and management guidelines, see http://cesutter.ucdavis.edu/newsletterfiles/Sacramento_Valley_Walnut_News20862.pdf

For more information on scale, go to the UC IPM website; www.ipm.ucdavis.edu or re-read the article in our May 2009 Walnut Newsletter at your cooperative extension websites.

Clonal Paradox Walnut Rootstocks and Pest Interactions Update

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Michael Mockery, Extension Nematologist, UC Kearney Agricultural Research and Extension Center

Greg Browne, USDA Plant Pathologist, UC Davis
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The standard walnut rootstocks are seedling Paradox and seedling black. Paradox seedling, which is a hybrid seedling between a black walnut species (usually northern California black) and English walnut, has been the rootstock of choice because of its greater vigor and relative resistance to most species of *Phytophthora*, compared to northern California black rootstock. However, seedling Paradox is highly susceptible to crown gall disease caused by *Agrobacterium tumefaciens*. Because of this susceptibility, many growers have opted to use the black rootstock, which has less trouble with crown gall in spite of the lower vigor. Work is underway to develop hybrid walnut rootstocks with desirable vigor as well as good resistance to soilborne pathogens. In the meanwhile, growers may want to consider using clonal Paradox walnut rootstocks where one expects nematode problems or other site specific diseases such as *Phytophthora* or crown gall.

The first Paradox clone to be micropropagated was 'Vlach' which came from a vigorous Paradox tree in Stanislaus County and has been available since 1999. Two other clonal Paradox rootstocks, 'VX211' and 'RX1', were released in 2007 after years of evaluation for vigor, resistance to nematodes, crown gall, and *Phytophthora*. They were identified as superior seedlings from the UC/USDA-ARS Paradox Diversity Study; micropropagated (cloned) and retested for their traits of interest before their release. Long-term evaluations of these rootstocks are continuing in greenhouse and field studies.

Clonal Paradox rootstocks provide options in selecting a rootstock to manage site specific problems or issues in orchards. The table below is our current state of knowledge and provides a guide for selecting the most appropriate clonal Paradox rootstock for certain situations. It should be noted that none of these clonal rootstocks have high levels of resistance but show promise in being able to grow because of some level of resistance or tolerance to the specific disease causing agent. The listings for 'RX1' and 'Vlach' clonal rootstocks have been updated to reflect a range of low to moderate resistance to crown gall based on more recent screening studies. For nematodes, the first letter in the table designates the nematode's ability to reproduce in the presence of the rootstock. Rootstocks designated as "susceptible" under the nematode headings will produce far fewer nematodes per gram of root than those designated as "highly susceptible". The second part deals with the rootstock's response to the nematode. Only "VX211" has some tree tolerance to nematodes.

These clonal Paradox rootstocks are readily available through the walnut nursery trade as individual plants often sold in containers or as nursery grafted or budded field grown trees. For more information on walnuts in the nursery trade, how they are propagated and understanding the terminology, a handout is available at your local UC Cooperative Extension office or on the web at <http://fruitsandnuts.ucdavis.edu>

Vigor and responses to selected nematode and disease pathogens by available clonal Paradox walnut rootstocks ¹

Trait of interest	'Vlach'	'VX211'	'RX1'
Rootstock Vigor	High vigor	High vigor	Moderate vigor
Resistance to <i>Phytophthora citricola</i> (a cause of crown and root rot)	LR	MR	MR
Resistance to <i>Phytophthora cinnamomi</i> (a cause of root and crown rot)	LR	LR	MR
	LR - MR	LR	LR - MR
	LR = low resistance	MR = moderate resistance	
Root Knot Nematode	S-IT	S-ST	S-?
Root Lesion Nematode (<i>Pratylenchus vulnus</i>)	HS-IT	S-ST²	HS-IT
	Nematode's ability to reproduce	HS = highly susceptible	
		S = susceptible	
	Tree response to nematode	ST = some tree tolerance to nematode presence	
		IT = tree intolerant to nematode presence, i.e. reduced tree vigor/health in presence of nematode	

¹Based on data from ongoing UC and USDA-ARS trials

²Tolerance due to a post infection resistance mechanism

**UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION
USDA-ARS AREA-WIDE**

**Navel Orangeworm and Pest Management
Update Seminar for Almonds and Pistachios**

TUESDAY, APRIL 5, 2011

**INTERNATIONAL AGRICENTER SOCIAL HALL
4450 SOUTH LASPINA
TULARE, CA 93274**

NOTE! SPECIAL GUEST SPEAKER: DR. JACK DIBBLE, ON SPRAY COVERAGE!

Moderator

Bob Beede, UCCE Farm Advisor, Kings County

- 7:30-8:00 A.M. **Registration and Coffee**
- 8:00-8:30 **The Dynamics of NOW Biology, Pesticide Timing and Selection on Control**
Dr. Joel Siegel, Entomologist, USDA-ARS, Parlier
- 8:30-8:50 **Improved Strategies for NOW Egg Trap Monitoring**
Dr. Chuck Burks, Entomologist, USDA-ARS, Parlier
- 8:50-9:30 **NOW Mating Disruption in Almonds and Pistachios; Will it work?**
Dr. Brad Higbee, Research Entomologist, Paramount Farming Company
- 9:30-10:00 **General Discussion and Break**
- 10:00-10:45 **A UC Historical Review of Spray Coverage and The Law of Two mph**
Dr. Jack Dibble, UC Entomology Specialist, Emeritus
- 10:45-11:10 **Spray Coverage Trials in Almonds; the 2011 Perspective**
Dr. Brad Higbee, Research Entomologist, Paramount Farming Company
- 11:10-11:30 **Spray Coverage Trials in Pistachios; the 2011 Perspective**
Dr. Joel Siegel, Entomologist, USDA/ARS, Parlier
- 11:30-12:00 **Update on Effective Mealybug Management in Pistachios**
David Haviland, UC Cooperative Extension, Entomology, Kern County

3.5 hours PCA and CCA Continuing Credit Requested

For more information call (559) 684-3300

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In-A-Nutshell

Navel Orangeworm and Pest Management Update Seminar for Almonds and Pistachios

TUESDAY, APRIL 5, 2011

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