COOPERATIVE EXTENSION UNIVERSITY OF CALIFORNIA

TREE AND VINE NOTES

5

May 2010

Central San Joaquin Valley Summer Almond Meeting

WEDNESDAY, JUNE 23RD, 2010

Merced UCCE Classroom

2145 Wardrobe Avenue, Merced, CA 95341; 209-385-7403

8:00 AM-12:30 PM

8:00 a.m. **Introduction, PCA and continuing education credits sign-up**
David Doll, Farm Advisor, UCCE Merced County

8:10 a.m. **Hull Split Insect and Disease Management Strategies**
David Doll, Farm Advisor, UCCE Merced County

8:40 a.m. **Replanting Almonds and Stone Fruits: Lessons and Challenges**
Greg Browne, USDA-ARS, Davis, CA

9:10 a.m. **Almond Growing on Marginal Soil in the Sacramento Valley**
John Edstrom, Farm Advisor, UCCE Colusa County

9:40 a.m. **Break**

10:00 a.m. **Recommended Almond Orchard Production Practices**
Roger Duncan, Farm Advisor, UCCE Stanislaus County

10:30 a.m. **Coping with and Managing Regulations**
Sean Runyon, Deputy Ag Commissioner, Merced County

11:00 a.m. **Enhancing Weed Burndown Performance with Tank MixesandNozzle Selection**
Kurt Hembree, Farm Advisor, UCCE Fresno County

11:30 a.m. **Selection, Drift Management, and Increasing Efficiency of Herbicide Use**
Brad Hanson, UC Specialist, UC Davis

12:00 a.m. **Conclusion**

2.5 hours of PCA, CCA and Private Applicators Credit have been requested - Including 0.5 hours of Laws and Regulations

2010 Spotted Wing Drosophila
Recommendations for Sweet Cherry

Robert A. Van Steenwyk, Dept. of E.S.P.M., University of California, Berkeley

These recommendations are derived from translated Japanese research articles on spotted wing drosophila (SWD), preliminary trapping data from Janet Caprile (UCCE Farm Advisor – Contra Costa County) and Bill Coates (UCCE Farm Advisor- San Benito County), insecticide efficacy data from Mark Bolda (UCCE Farm Advisor - Santa Cruz) and fruit maturity susceptibility data from Jana Lee (USDA – Corvallis, OR). Control procedures are conservative due to the lack of insecticide efficacy data on California cherries and damage experience by cherry growers this past season. These are our best guesses with limited data and we expect the recommendations to change over time.

Monitoring: Place a commercial bucket style trap or a 1 qt. plastic container with screen (3/16 inch holes hardware cloth) on the top and bait the trap with 1 inch of apple cider vinegar. The 3/16 inch holes will limit the number of large moths, flies and bees captured in the traps. The plastic containers are about 50¢ each and apple cider vinegar is about $3.00/gal from Smart & Final. Replace the vinegar weekly (remove spent bait from the orchard – do not dump the spent bait on the ground in the orchard). Place trap about 3-5 ft. off the orchard floor and monitor twice weekly from first color change (light green to straw) until completion of harvest. Count only flies with spots on the tip of the wings (male SWD). OptiVISOR (optical glass binocular magnifier) will aid in the identification of flies. If any SWD are found in the traps, take control action immediately (see insecticide control below).

Generation time: One generation requires 338 DD with a lower threshold limit of 48˚ F. The table below shows the approximate generation times throughout the spring and summer in the northern San Joaquin Valley (Linden) and the central coast (Hollister). These generation times are based on 30-year average temperatures from the UC IPM weather network and will vary depending on current temperatures.

Approximate generation time for SWD by date infestation and location

	Number of days until adult emergence	
Infestation date (egg laying)	San Joaquin Valley (Linden)	Central Coast (Hollister)
April 1	28 days	34 days
May 1	20 days	29 days
June 1	15 days	22 days
July 1	13 days	18 days

Cultural Control: If conventional insecticide treatments are not an option (organic growers), and if fruit from pollinizer varieties matures earlier than the main variety and the pollinizer fruit will not to be picked and sold, then pick and remove pollinizer fruit at least one week before harvest of the main variety. This will prevent the SWD from emerging from the pollinizer fruit during the main variety harvest. Fruit removal is a critical control step for organic growers because of the lack of known effective organic insecticides. Conventional growers can suppress SWD on pollinizer fruit by insecticide applications (below).

Chemical Control: Begin applications when the pollinizer or the earliest variety in the orchard, changes color from pink to red. Repeat applications at 7 to 10 day intervals until harvest with one of the materials listed below. From Jana Lee and from Japanese literature it appears that the SWD will infest ripe cherries of red to mahogany color. Also, from the Japanese literature it appears that 3 or 4 applications are required to control the pest and that the organophosphate and pyrethroid insecticides are effective for one to possibly two weeks. Observe all pre-harvest intervals (PHI) and re-entry interval (REI) periods and rotate between materials of different chemical classes between applications to slow the development of resistance. At this point in time, we are recommending adding Nu-Lure bait at 3 pt/100 gal with a final spray volume of 50 gal/ac. Do not include surfactant with Nu-Lure. Nu-Lure should be removed during post-harvest washing.

Trade Name	Common Name	Chemical Class[a]	PHI	REI	Rating[b]
GF-120c	Spinosad	SPIN	0 days	0 hr	4
Sevin 80S	Carbaryl	CAR	1 day	12 hr	3
Malathion	Malathion	OP	3 days	12 hr	1
Ambush/Pounce	Permethrin	PYR	3 days	12 hr	2
Renounce/ Tombstone	Cyfluthrin	PYR	7 days	12 hr	1
Baythroid	Beta-Cyfluthrin	PYR	7 days	12 hr	1
Provado	Imidacloprid	NEONIC	7 days	12 hr	3
Leverage (Baythroid + Provado)	Beta-Cyfluthrin Imidacloprid	PYR + NEONIC	7 days	12 hr	1
Entrust/Success	Spinosad	SPIN	7 days	4 hr	3
Delegate [d]	Spinetoram	SPIN	7 days	4 hr	1
Actara	Thiomethoxam	NEONIC	14 days	12 hr	3
Asana	Esfenvalerate	PYR	14 days	12 hr	2
Warrior II	Lambda-Cyhalothrin	PYR	14 Days	12 hr	2
Diazinon 50WSB	Diazinon	OP	21 Days	4 Days	1

PHI, REI & Rating are subject to change.

[a] The chemical classes are: SPIN is spinosyns, CAR is carbamate, OP is organophosphates, PYR is pyrethroids, NEONIC is neonicotinoids.

[b] The rating scale is: 1= control for 7 to 14 days, 2 = control for 3 to 7 days, 3 = control for 1 to 3 days, and 4 = control for only 1 day.

[c] GF-120 is slow acting and does not have knock-down activity but will suppress population over time.

[d] There is no MRL established for Delegate in Japan, Korea or Taiwan. Please consult your packer/shipper for export implications.

Identifying Orchard Ants

By: David Doll, UCCE Merced

Ant identification uses the color and size of the ant, as well as the shape and size of several different parts. Ants of the same species can be of different size due to class, or worker status. Usually **Major Workers** are the largest ant, while **Minor Workers** can be significantly smaller. It is important to view body parts to ensure proper identification.

Ant Anatomy:

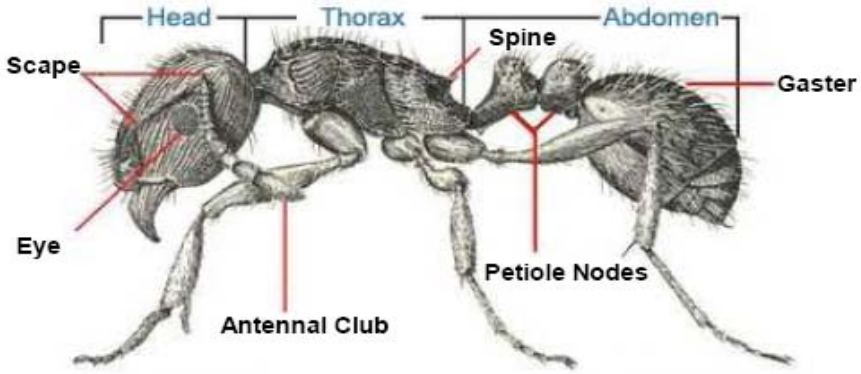


Figure 1: Basic Ant Anatomy.

Ants have three main body regions: **Head**, **Thorax**, and **Abdomen**.

Head:

The head contains several parts, which include the eyes, antennae, and mandibles. For identification purposes, the antennae and mandibles are commonly used. The antennae are composed of two parts: the **scape** and **antennal club**. The scape is the first part of the antenna that is often very long. Length of the scape is used in identification. The antennal club is the last few segments on the antenna, and the size and amount of segments found on the antennal club are used to identify ants.

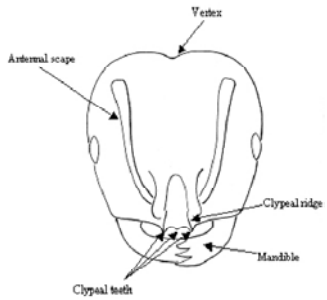


Figure 2: The parts of the ant head used in identification.

Thorax:

The thorax is the body segment in which the legs are attached. The shape of the thorax and the presence of spines are often used in ant differentiation. Spines are pointed structures that are present in pairs.

Abdomen:

The size, shape, presence of hairs, and color of the abdomen are used to identify ants. Main features include the petiole nodes and gaster. The petiole is the first portion of the abdomen, having one or two nodes. This is the first part of the ant to be looked at when trying to identify an ant species. The petiole nodes may be obvious or hidden beneath the abdomen and are often confused as spines. The gaster is the last segment of the abdomen. Gaster color, size, and presence/absence of hairs may vary within the same species.

Ants Found in the Orchard (continued from pg 4)

There are many different types of ants that are found within almond orchards. Not all of the ants contribute to harvest damage of almonds; treatment of ants is only needed when problematic ants are present. To identify ants, look for colony location and size, weeds surrounding the mound, and aggressiveness of the colony. Problematic ant colonies tend to be located on the edges of irrigation wetting patterns, in the shade, active in the mornings and evenings, and tend to have weeds emerging through the opening. When the foot is stomped near the opening, problematic ants are aggressive and swarm. In comparison, non-problematic ant colonies tend to be found in full sun, active through the afternoon, and will run in random directions when "stomp tested."

The following will help serve as a guide for ant identification:

Non-Problematic Ants found within orchards:

Argentine Ant (*Linepithema humile*)
Native Gray Ant (*Formica* species)
Pyramid Ant (*Doymymex insanus*)
Bicolored Pyramid Ant (*Doymymex bicolor*)
Small Honey Ant (*Prenolepis impairs*)
California Harvester Ant (*Pogonomyrmex californicus*)
Thief Ant (*Solenopsis molesta*)

Pest Ants of Almonds:

Pavement Ant (*Tetramorium caespitum*)
Southern Fire Ant (*Solenopsis xyloni*)
Red Imported Fire Ant (*Solenopsis invicta*)

Managing Problematic Ants in the Orchard

By David Doll, UCCE Merced

Pavement and Fire ants can cause significant damage to the almond crop. Feeding throughout the year on seeds of grasses and broadleaves, ants are only problematic once the almonds are shaken to the ground. Ants can completely hollow out the nut, leaving only the pellicle behind. Damage increases the longer the almonds are on the ground.

Within the San Joaquin Valley, the southern fire ant has a wider distribution and usually causes more damage than the pavement ant. Pavement ants are found in the northern San Joaquin Valley and into the Sacramento Valley. Within Merced County, we have both the Southern Fire Ant and the Pavement Ant. Recently, Merced County has had infestations of the Red Imported Fire Ant (RIFA), a third problematic ant for almond growers, requiring quarantine actions to control this invasive pest.

Ants tend to be problematic on drip or sprinkler irrigated orchards. Within flood irrigated blocks, ants are limited to tree berms. Moist, cool temperatures increase above ground activity of ants; hot temperatures drive the ants deeper into the colony. Varieties with a tight shell seal are more resistant to ant damage, or with shell splits less than 0.03 inches wide. Shell seal can vary greatly year to year depending on crop load, nut size, and horticultural practices.

The orchard should be surveyed for ant colonies 2-3 days after an irrigation in the months of April – May in order to determine if a treatment is needed. Once the temperatures increase, problematic ant surface activity decreases, giving an inaccurate count of the population. In scouting for ants to determine if treatment is necessary, choose five survey areas per orchard, each about 1000 sq. ft., including the soil area from mid-alley to mid-alley beneath trees. Count the number of active colonies in each area, sampling five different areas of the orchard. Total all the ant colonies to get the number in a 5000 square foot area and compare it to the table below which gives an indication of the amount of damage you can expect at harvest. A survey sheet is included in this newsletter.

Several strategies can be employed to help control ant populations and prevent the corresponding damage. Letting the almonds dry longer on the tree and rapidly removing them from the field after harvest will prevent damage, but not always possible due to other harvest activities, nut moisture content, and navel orange worm pressure. In these cases, baits and conventional sprays can be used to help reduce the populations to a reasonable level. Baits are slow acting insect growth regulators; they need to be applied several weeks before harvest. They are selective for ants and highly effective, weakening or killing the entire colony. Baits should not be used within 24 hours after an irrigation or 48 hours before an irrigation. Baits absorb moisture, which reduces its attractiveness to the ant. Do not keep baits year-to-year as they will go rancid. Conventional sprays of chlorpyrifos can also be applied to control ant populations at harvest, but will only kill foraging ants. Spraying two weeks prior to harvest is the recommended timing for these types of applications.

Please see http://ucipm.ucdavis.edu for updated pest management strategies and materials.

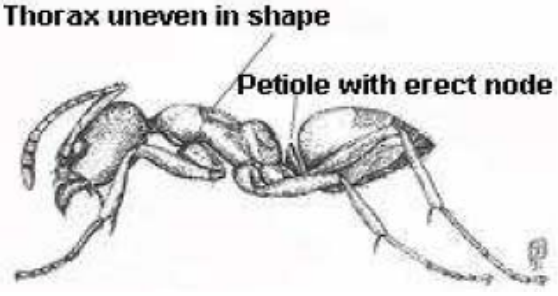
One Node Ants:

Argentine Ant (*Linepithema humile*)

One Petiole Node Ant

Characteristics:

Invasive ant that varies in size from 0.09 to 0.1 inch long,
Workers are uniformly sized and light to dark brown in color,
Adults have 12 antennal segments and no club,
Thorax is uneven in shape when viewed from the side,
Often found tending scale, and aphids, feeding on excreted honey dew,
Chase off biological predators of scale and aphids,
Mounds tend to be shallow, located in open/disturbed ground,
Millions of ants per colony, with multiple queens and nests, not antagonistic to each other.

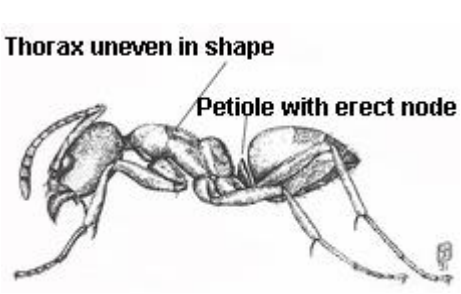


Gray Ant (*Formica* species)

One Petiole Node Ant

Characteristics:

Native ant with workers ranging from 0.1to 0.2 inches long,
Workers are variably colored with a mix of gray and dullish brown,
Adults have 12antennal segments with no club,
Move in fast and irregular patterns,
Tends to be a more solitary ant, not found in dense trails.



Pyramid Ant (*Doymymex insanus*)

One Petiole Node Ant

Characteristics:

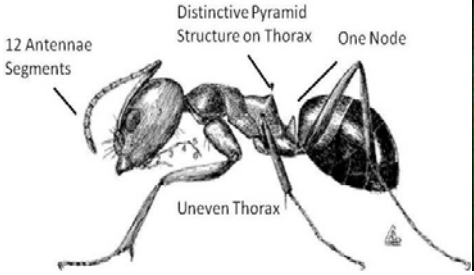
Native ant with workers ranging from 0.06 to 0.08 inch long,
Workers are uniformly brown,
Adults have 12 antennal segments with no club,
Have a pyramid like projection on the top rear surface of the thorax,
Nests tend to be located in dry, open areas with volcano-like mounds.

Bicolored Pyramid Ant (*Doymymex bicolor*)

One Petiole Node Ant

Characteristics:

Native ant with workers ranging from 0.08 to 0.1 inch long,
Workers have an orange or reddish brown head and thorax, and a dark brown gaster,
Adults have 12 antennal segments with no club,
Have a pyramid like projection on the top rear surface of the thorax,
Workers are fast moving, traveling in trails, feeding on honeydew of insects,
Nests tend to be located in dry, open areas with volcano-like mounds.



Small Honey Ant (*Prenolepis impairs*)

One Petiole Node Ant

Characteristics:

Native ant with workers ranging from 0.08 to 0.2 inch long,
Workers are shiny and may be light to dark brown or black,
Adults have 12 antennal segments with no club,
Gaster is triangular in shape,
Workers feed above ground during cool weather,
Retreat to deep nests that may be several feet deep during hot weather.

Two Node Ants:

California Harvester Ant (*Pogonomyrmex californicus*)

Two Petiole Node Ant

Characteristics:

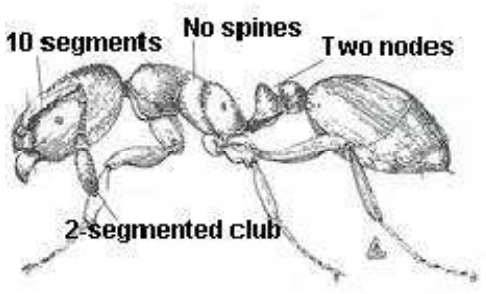
Native ant that varies in size from 0.22 to 0.4 inch long,
Workers are reddish brown,
Adults have long hairs (or beard) located behind the mouthparts,
Mounds are often cleared of surrounding vegetation and littered with seed husks and debris,
Mounds are in direct sunlight, and can sting when provoked.

Thief Ant (*Solenopsis molesta*)

Two Petiole Node Ant

Characteristics:

Native ant with small workers ranging from 0.06 to 0.09 inches long,
Workers are yellow to dark brown,
Adults have 10 antennal segments with a two segmented terminal club,
Has been noted to steal food and ant larvae from other ant nests,
Colonies tend to be small and may have multiple queens,
Does not sting or swarm.

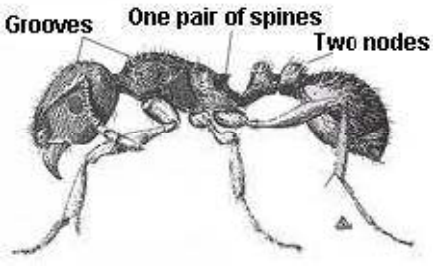


Pavement Ant (*Tetramorium caespitum*) – Almond Pest

Two Petiole Node Ant

Characteristics:

Ant that varies in size from 0.1 to 0.13 inch long,
Workers vary in color from black to brown,
Adults have 12 antennal segments and a 3 segmented club,
The top surface of the head and thorax have many parallel grooves,
A pair of spines are located behind the thorax,
Obvious piles of excavated soil, often in clusters, tending to be found near water.

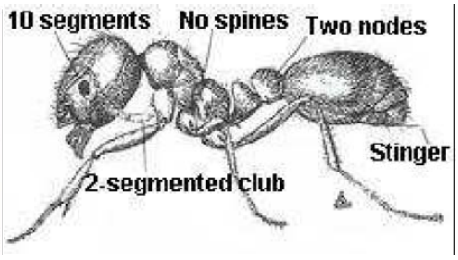


Southern Fire Ant (*Solenopsis xyloni*) – **Almond Pest**

Two Petiole Node Ant

Characteristics:

Native ant that varies in size from 0.07 to 0.2 inch long,
Workers are bi-colored, with a yellowish red head and dark gaster,
Adults have 10 antennal segments with a two segmented terminal club,
Can be differentiated from Invasive Fire Ant by absence of middle clypeus tooth (only 2 teeth),
Swarm and sting when disturbed,
Only workers are seen above ground – nests tend to be flattened and near moisture,
Often have weed seeds growing out of nest entrance, does not tolerate heat well.

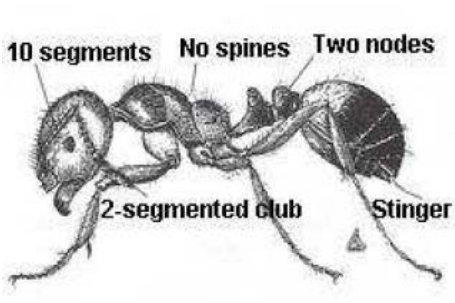


Red Imported Fire Ant (*Solenopsis invicta*) – **Almond Pest**

Two Petiole Node Ant

Characteristics:

Invasive ant with workers ranging from 0.07 to 0.2 inches long,
Workers are mostly dark reddish brown,
Adults have 10 antennal segments with a two segmented terminal club,
Can be differentiated from Southern Fire Ant by presence of middle clypeus tooth (3 teeth) and fourth mandible, Large colonies that may reach up to 18” high and are located near moisture,
Aggressively swarm and sting with large numbers when disturbed.



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Almonds—Ant Colony Monitoring

Supplement to UC IPM Pest Management Guidelines: Example Form

Directions:
1. Choose five survey areas per block of the orchard, each about 1000 sq. ft., including the soil area from mid-alley to mid-alley beneath trees. Document the survey areas in the map box below.
2. Count the number of active colonies in each of these areas. Although some colonies may have several entrance holes, count active colony entrances more than 3 feet apart as separate mounds. An active colony is one that has ants moving in and out of it.
3. Record the number of active colonies.
4. Use the total number of ant colonies per area and refer to the table below to estimate your ant damage rate based on the number of days between shaking and nut collection.

Grower/Orchard_____**Date**_____

Orchard area 1	
1000 sq. ft	Active colonies
1	
2	
3	
4	
5	
Total	

Orchard area 2	
1000 sq. ft	Active colonies
1	
2	
3	
4	
5	
Total	

Orchard area 3	
Survey row	Active colonies
1	
2	
3	
4	
5	
Total	

Orchard area 4	
1000 sq. ft	Active colonies
1	
2	
3	
4	
5	
Total	

Orchard area 5	
1000 sq. ft	Active colonies
1	
2	
3	
4	
5	
Total	

Estimated Percent Damaged Nuts at Harvest

Number of colonies per 5000 sq. ft.	Days between shaking and pickup				
	4	7	10	14	21
15 colonies	0.9	1.6	2.1	3.1	4.9
45 colonies	1.4	2.3	3.2	4.7	7.0
185 colonies	2.0	3.6	5.0	7.0	11.1

Map orchard survey block and rows