Ants of California orchards and vineyards: an identification and management guide

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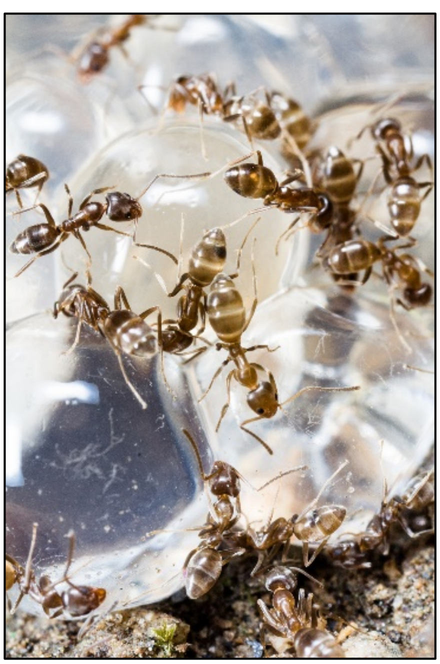
Introduction

California's diverse climates and geographies support more than 275 ant species, of which only a small percentage are considered agricultural pests. These pest species tend to thrive in environments that are typical of agricultural farms, and tend to have feeding habits directed towards proteins, such as seeds and dead insects, or towards sugars, such as nectar and insect honeydew. When ant species that prefer sugars cohabitate with insects that produce honeydew, they disrupt the balance of nature by protecting those pests from their natural enemies. Removal of ants that disrupt biological control is a critical component of integrated pest management programs that promote sustainability.

Recent studies have focused on the development of hydrogel-based baiting strategies that allow liquids to be applied to a field using a gelatinous substrate that can be applied through traditional spreaders. Baits are made by placing a small amount of toxicant into sugar-water, and then allowing this solution to absorb into hydrogel crystals or beads. Once applied, ants drink the liquid at the hydrogel surface, carry it into the nest, and distribute it as food within the colony. Over time, this causes the colony to collapse.

Hydrogels have the potential to be used in combination with other components of IPM, such as proper pest identification, monitoring programs, and cultural, biological and chemical controls. Research on hydrogels has included investigations of a



wide range of active ingredients, at varying concentrations, delivered at a range of bait volumes. The most promising results have been seen with hydrogel baits containing thiamethoxam (conventional) and spinosad (organic), using 5 to 10 gallons of bait per acre, using concentrations of pesticides that result in total amounts of active ingredient per acre that are approximately 100 times lower than what is currently recommended for foliar and soil applications.

Hydrogels have significant potential to reduce ant populations, thus maximizing the impacts of biological control organisms, resulting in decreased populations of mealybugs, psyllids, scale, and other pests in California.

Biological Control

Biological control programs are extremely valuable in IPM programs for hemipteran pests. This includes natural enemies that are native to California, and others that have intentionally been introduced. The most famous continues to be the world's first intentional introduction of a foreign natural enemy for cottony cushion scale in the late 1880s. Scientists went to Australia, the native home for this pest, and brought back and released the predatory Vedalia beetle. Since its release, it has played a major role in regulating cottony cushion scale for over 130 years.

The efficacy of biological control against hemipterans that produce honeydew can be significantly reduced when ants that feed on sugars are in orchards. These ants protect the pests from natural enemies in exchange for nutrient-rich honeydew as food. Ant control is necessary if the full impact of natural enemies is to be achieved. Studies have shown that when Argentine ant is controlled, citrus mealybug densities declined by >90% and ACP densities decreased by about 75% due to natural enemies.

Ant feeding on *Tamarixia* parasitoid

<u>Predators</u>.
Predatory beetles, such as Vedalia beetle and *Cryptolaemus montrouzieri* (a.k.a. the mealybug destroyer) are highly effective predators of sucking insects. Naturally occurring syrphid fly larvae (i.e., hover flies) are important natural enemies that feed on pest hemipterans, especially aphids and Asian citrus psyllid nymphs. Lacewing larvae also feed on a wide range of sucking insects, worms, and mites in both citrus and grapes.

<u>Parasitoids</u>
Numerous species of parasitoids have been introduced for control of citrus pests, including *Aphytis melinus* for California red scale and multiple species for citrus mealybug. Releases of *Tamarixia radiata* from Pakistan have resulted in significant density reductions of Asian citrus psyllid. In grapes, the most important parasitoid is *Anagyrus pseudocci* that helps control vine mealybug.

Mealybug destroyer beetle

Syrphid fly larvae

Anagyrus pseudococci

Monitoring

Making observations regarding the presence of ants, and species of ants present, is easy. Quantifying them is much more difficult, but can be beneficial when trying to track ant densities over time, such as prior to and after a treatment is made. Methods for quantifying ants include timed visual counts, cotton balls or vials containing sugar-water, and infra-red sensors to automatically count ants on irrigation pipes.

<u>Timed counts</u>

In tree crops with a smooth trunk, timed searches are a quick and easy way to monitor ants. This is especially true for species of ants that form trails, such as Argentine ant. Using a stopwatch, count the number of ants passing over a fixed line across the visible side of the trunk for 15 seconds. Record the results. The trick is to spend very short amounts of time sampling as many trees as possible to get a comfortable feel for ant distribution and density across the orchard. Counts are the most meaningful if they are taken at a consistent time during the day when ants are active, such as the late morning to early afternoon.

<u>Automating timed counts</u>

Researchers are working to develop a method to automate the entire ant-counting process. Infra-red (IR) sensors attached to irrigation pipes can count ants as they break an IR beam spanning the top of the irrigation pipe. Sensors can be programmed to turn themselves on for one minute on the hour every hour of every day. Count data are stored, then relayed to the cloud via gateways stationed in the orchard. An app on a smart device or desktop computer, enables the user to visual ant count data in different sections of the orchard in near real time. If ant densities exceed critical levels, control can applied in specific areas of the orchard where ant management is needed. You can find more information about the status of the development of these sensors at the Farm Sense website. https://www.farmsense.io/

Preliminary studies with IR sensors suggest that ant counts exceeding 100 or more moving on an irrigation pipe or trunk within a one minute observation period may be indicative of a problematic infestation needing management.

Monitoring Vials

Foraging activity of Argentine ant can be measured over 24-h period by deploying plastic 50-mL conical centrifuge tubes filled with 40 ml of 25% sucrose solution that are buried into the ground. Vials are fitted with weed block fabric secured between the vial opening and lid. Ants access the sucrose solution through a 2.5-mm-diameter hole made in the lid.

Vials are evaluated by taking the weights before and after deployment. After accounting for evaporative loss (i.e., liquid loss in deployed control vials with no ant access), the amount of liquid consumed is divided by 0.003 g (i.e., the average amount of liquid removed by each Argentine ant forager per visit) to determine the total number of ant visits. Provision of an additional food source, like sugar water filled monitoring vials, may artificially inflate estimates of ant densities as foragers actively recruit to these types of resources. Consequently, ground-deployed sugar baited monitoring vials may be an unreliable sampling method for monitoring Argentine ant activity but could be used to corroborate findings from other monitoring methods, like visual observations.

Cotton ball sampling

In grapevines, where the bark is rough and loose, timed searches are not an effective way to quantify ants, especially if the ants don't form trails. These ants tend to move underneath the bark where their movement is not readily seen, and cannot readily be counted. In this case, cotton balls saturated with sugar-water can be an effective way to quantify ants. Sampling is done by making a 25% sucrose solution by dissolving one part sugar in four parts water. Cotton balls soaked in the solution are placed on the ground near the base of the trunk. After 2-3 hours, return and record the number of ants. For small species of ants where counting is not practical, a ratings scale can easily be developed. Compare counts over time to evaluate changes in pest density, such as before and after implementing a pest management strategy. Also, please note that this baiting strategy is most effective in the spring, and that cotton balls containing only sugar-water are not effective at attracting ants later in the season once honeydew is present.

Cultural controls of ants

Cultural controls are non-insecticidal management options for suppressing damaging pest populations according to how the plants are produced. Several cultural control options are available in citrus.

<u>Tree skirting</u>
One cultural control practice involves skirting trees to keep foliage off of the ground and pruning trees so that canopies do not touch. These types of foliage management reduce ant access points into canopies and force ants to use tree trunks to reach pest hemipterans.

<u>Trail blocking and sticky barriers</u>
Argentine ants are notorious for making straight-line trails to their destination, commonly utilizing drip hose as the most direct, smooth-surfaced, route.
Burying drip hose under the ground, applying mulch to cover the drip line, or using a 3D printer to make ‘speed bump’ barriers can slow down and decrease the efficiency of their movement.

Application of sticky barriers to trunks restricts ant movement into the canopy because ants can’t easily cross this barrier. This cultural control technique is often temporary as dust, leaves, and twigs that get stuck on the barrier form bridges over which ants can travel. Dead ants trapped in sticky material may also contribute to bridge building, eventually allowing nest mates to cross the sticky barrier to reach pests. Sticky barriers are expensive to apply in terms of materials and labor, and may potentially cause trunk damage.

Cover crops for natural enemy enhancement

Hoverfly adult

The adult stages of many natural enemies (NE) require pollen and or nectar for survival, host seeking, mate finding and egg maturation. Floral resources can attract and feed NE in orchards or vineyards where they are desired to help manage pests like ACP, scales and mealybugs. Different types of flowers are not equally beneficial to NE. For example, research has demonstrated that citrus flowers were not beneficial to ACP parasitoids, whereas, buckwheat flowers enhanced parasitoid longevity by 30 days. The floral cups of some flowers contain hairs that deter NE from accessing the nectar.

Bickwheat (*Fagopyrum esculentum*) cover crop

Grapes are wind pollinated so their flowers do not provide pollen or nectar to NE. Mustard and sow thistle weeds may provide floral resources, but not all weed flowers are accessible to NE, weeds compete with the crop for nutrients and water, and some may harbor pests that can transfer to the crop. Cover crops that selectively benefit NE can be selected. They can also be positioned around field margins or other undisturbed areas to reduce competition with the crop and protect floral patches from insecticide application. When selecting a flowering cover crop, it is important to include plants that have flowers with shallow floral cups, such as buckwheat and alyssum, so the nectar is accessible to a wide range of NE.

Research conducted by Hoddle Lab investigating the effect of short-term summer flowering alyssum on the survival of ACP demonstrated that alyssum enhanced hoverfly oviposition and predator abundance, leading to a 10% reduction in the number of ACP nymphs surviving to adulthood. Further research in 2022 investigated whether providing an alyssum and buckwheat cover crop from April through November can lead to increased pest control of sap-sucking pests in citrus orchards in Redlands and Hemet. In cover crop plots, buckwheat and alyssum were sown in the tree line on February 28th, 2022 and sprinkler irrigation to water the cover crop was installed from the existing citrus tree irrigation. Staggered sowings extended nectar availability through November 2022. Preliminary results demonstrate that hoverflies were present in citrus orchards from April-November, whereas, general orchard practices and the hot dry climate removed most flowering weeds from June-Nov. Hoverfly abundance was 4 times higher and summer populations of scales were 8 times lower in cover crop plots compared with control plots. These findings collectively illustrate the benefit of providing flowering plants, like alyssum and buckwheat, towards sustaining hoverflies and other natural enemies in orchards.

Polyacrylamide hydrogel preparation*

Preparation instructions:

1. Determine the volume of bait needed (acres treated x 5 or 10 gallons of finished product per acre)
2. Fill a container with 2/3 of the water volume desired in finished bait.
3. Add sugar and mix. A drill with a mortar/paint-mixing paddle works well.
4. Add the remaining water to top off the container with the desired volume.
5. Add the toxicant and lightly stir. Follow all label instructions regarding PPE.
6. Add the dry hydrogel crystals and cover. Make sure that the container is properly labeled.
7. Allow to sit for a minimum of 4 hours, and ideally overnight, before use.

Table 1. Mixing amounts for thiamethoxam and spinosad[1].

Target concentrations	Finished volume	Water	Sugar to make 25% sucrose	Insect-icide[1,2]	Hydrogel[1,3]
Thiamethoxam 0.0015%	4 gal	~3.6 gal	1 gal (~8.3 lb)	0.30 g	198 g
	100 gal	~90 gal	25 gal (~208 lb)	7.5 g	10.9 lb
Spinosad 0.011%	4 gal	~3.6 gal	1 gal (~8.3 lb)	7.1 ml	198 g
	100 gal	~90 gal	25 ga (~208 lb)	177 ml	10.9 lb

[1]Research using pesticide active ingredients with polyacrylamide hydrogels was considered 'experimental'. Commercial use by farmers requires a pesticide label that allows use of the toxicant with hydrogels, and requires that they hydrogel be registered in California as an adjuvant.

[2]Insecticide amounts listed were based on the use of a formulated product containing 0.75 lb of thiamethoxam a.i. per pound of product, and of a formulated product containing 2 lb of spinosad a.i. per gallon of product.

[3]Research trials were conducted using a polyacrylamide hydrogel (SoilMoist 2-4 mm, JMR Chemical). Amounts may vary according to the hydrogel used and quality of water.

Application instructions:

1. Transfer bait to the hopper of a spreader mounted to an ATV.
2. Apply baits at a rate of 5 to 10 gallon of finished product per acre. Applications work best when the hopper is 50% or more filled, with decreased volume applied as less head pressure occurs as the hopper empties.
3. Adjust spreader to maximize the amount of bait that is deposited directly underneath the trees and vines.
4. Apply baits when ants are active with irrigation turned off.
5. Avoid applying baits during hot dry conditions.

*Methodologies described were used experimentally by Havland et al. in Department of Pesticide Regulation (DPR) grant #20-PMG-GR0004. Commercial use of this method is contingent upon the availability of labels approved by DPR.

Alginate hydrogel bead preparation

Preparation instructions

Biodegradable alginate hydrogel beads (HGBs) can be used to deliver liquid bait to sugar feeding pest ants, like Argentine ant. HGBs are easily made with materials that are available on the internet, such as sodium alginate, calcium chloride, and potassium sorbate. Because each of these ingredients is considered a food product, HGBs have the potential to be approved for use in organic production systems. There are numerous YouTube videos on how to make them.

Once made, HGBs are "conditioned" by placing them in 25% sucrose solution that is laced with a very low concentration of insecticide. HGBs absorb this liquid over a 24 hour period. After this conditioning period is over, HGBs are removed from the conditioning solution, stored in buckets, and transported to the orchard or vineyard.

Application method

HGBs should be spread on the orchard floor under citrus trees where ants are foraging. Research with HGBs was almost exclusively conducted by applying HGBs by hand underneath the canopy near the trunk.

Ants readily recruit to HGBs, drink the liquid bait, and return it to the nest where the toxicant is distributed to nest mates, the brood, and reproductive queens.

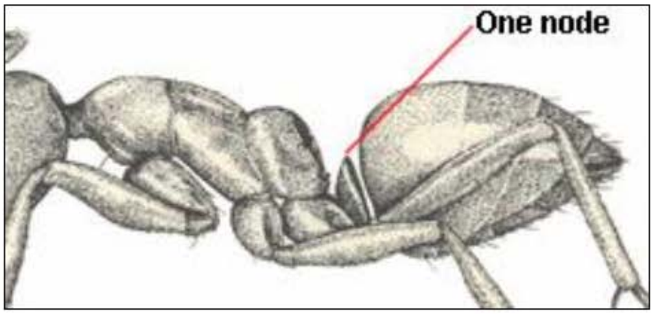
Tay, Jai Wei, M.S. Hoddle, A. Mulchandani, D-H Choe. 2017. Development of an alginate hydrogel to deliver aqueous bait for pest ant management. Pest Management Science 73: 2028-2038. DOI 10.1002/ps.4616

McCalla, K.A., J-W Tay, A. Mulchandani, D-H Choe, and M.S. Hoddle. 2020. Biodegradable alginate hydrogel bait delivery system effectively control high density populations of Argentine ant in commercial citrus. J. Pest. Sci. 93: 1031-1042 https://doi.org/10.1007/s10340-019-01175-9

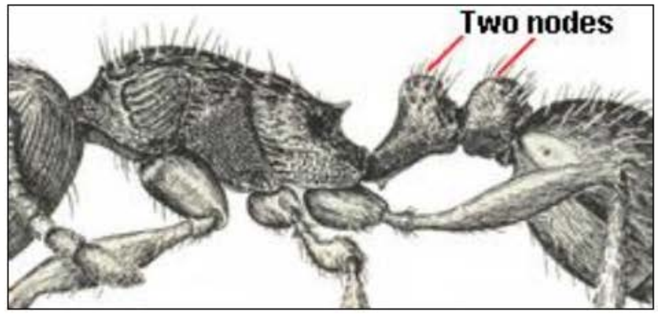
Taxonomic characteristics of common ants in CA orchards and vineyards

Common name	Scientific name	Size (mm)	Nodes on petiole	Antennae, other characteristics
Argentine	*Linepithema humile*	3.0-4.0	one	12 segments, forms huge supercolonies
Field or Native Gray	*Formica aerata*	4.0-7.5	one	12 segments, common in the Central Valley
Field	*Formica perpilosa*	4.0-7.5	one	12 segments, common in the Coachella Valley
Pavement	*Tetramorium immigrans*	2.0-3.0	two	12 segments, 3-seg.club, grooves on head, 2 spines behind thorax
Dark rover	*Brachymyrmex patagonicus*	1.0-2.0	one	9 segments
Bicolor pyramid	*Dorymyrmex bicolor*	2.0-3.0	one	12 segments, pyramid-like projection on top of the thorax
Pyramid	*Dorymyrmex insanus*	2.5-3.0	one	12 segments, pyramid-like projection on top of the thorax
High noon	*Forelius pruinosus*	1.8-2.5	one	12 segments, smells like rancid butter when crushed
Pharoah	*Monomorium pharaonis*	1.5-2.0	two	12 segments, 3-segmented club
California harvester	*Pogonomyrmex californicus*	5.5-8.7	two	12 segments, 3-4 segmented club
Carpenter	*Camponotus spp.*	>6.0	one	12 segments, terminal segment elongated and bullet shaped
False honey	*Prenolepis pmparis*	2.0-4.0	one	12 segments, long scape
Thief	*Solenopsis molesta*	1.3-1.8	two	10 segments with 2-segmented club. very small eyes
Southern fire	*Solenopsis xyloni*	2.0-4.5	two	10 segments with 2-segmented club
Red imported fire	*Solenopsis invicta*	1.6-1.8	two	10 segments with 2-segmented club

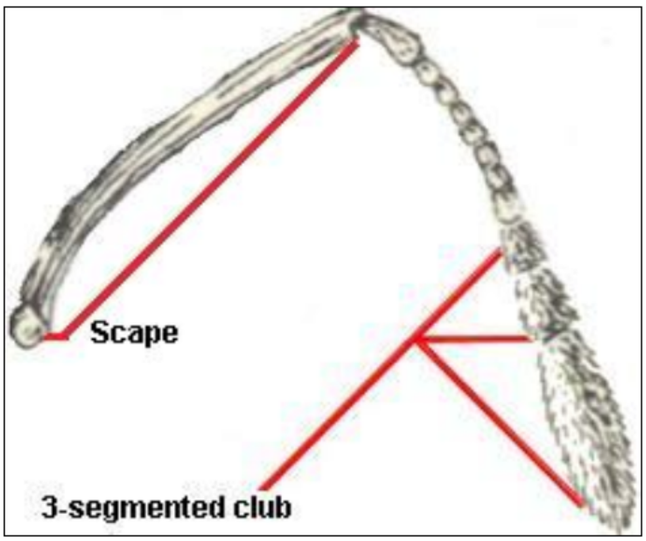
One-node ant



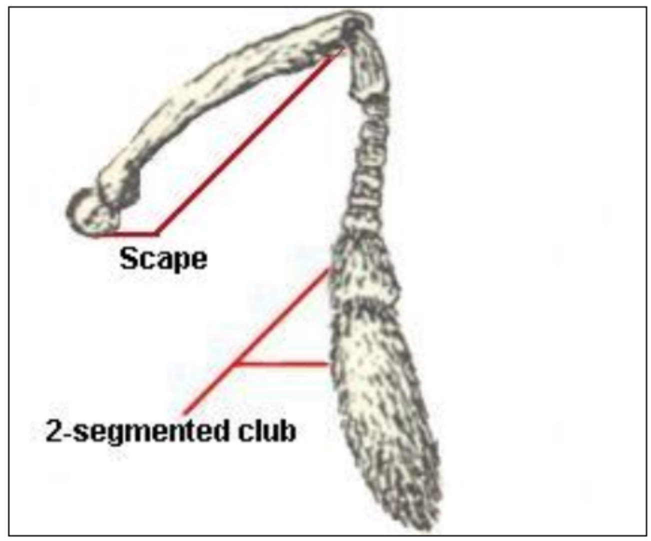
Two-node ant

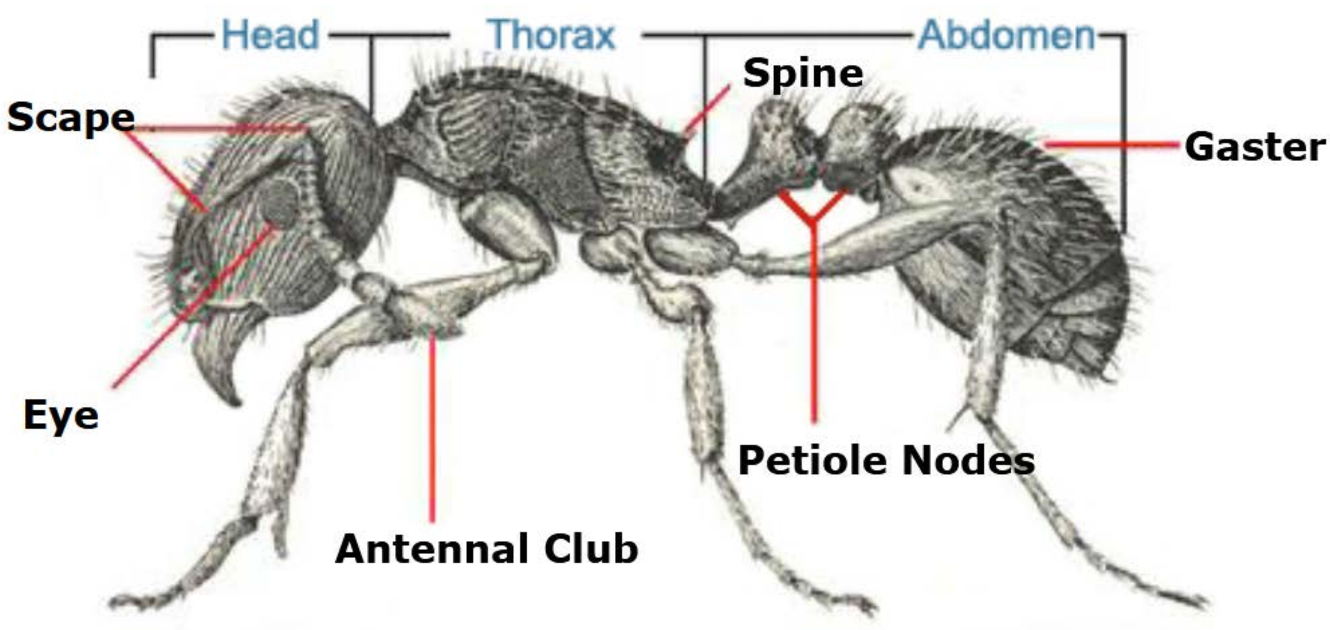


12-segmented antenna with a 3-segmented club



10-segmented antenna with a 2-segmented club





Source: Key to Identifying Common Household Ants. UC Statewide IPM Program. https://ipm.ucanr.edu/TOOLS/ANTKEY/antid2.html

Field characteristics of common ants in CA orchards and vineyards

Common name	Size	Color	Worker size	Trail-forming	Nest
Argentine	medium	deep brown	uniform	yes	inconspicuous or as disorganized craters
Field or Native gray	large	reddish-brown and dark grey	variable	no	holes with scattered soil, at base of trees/vines
Field	large	reddish-brown and dark grey	uniform	no	in topsoil or under rocks/debris
Pavement	Small	dull, blackish brown	uniform	yes	scattered entrances appearing as small volcanoes
Dark rover	Tiny	light to dark brown	uniform	no to weak	Inconspicuous
Bicolor pyramid	medium	red and black	uniform	yes	small cone-shaped mounds
Pyramid	medium	dark reddish brown	uniform	no to weak	small cone-shaped mounds
High noon	small	orangish	uniform	yes	inconspicuous, or with small disorganized soil craters
Pharaoh	small	amber	uniform	yes	inconspicuous
California harvester	large	reddish	variable	no	partial volcano with central hole that enters at an angle
Carpenter	large	dark	variable	yes	in live or dead wood
False honey	medium	brown or black	variable	no	deep in soil, inconspicuous
Southern fire	Medium	shiny red, and black	variable	weak	scattered entrances appearing as small volcanoes
Red imported fire	medium	dark reddish-brown	variable	some-times	have appearance of gopher mounds
Thief	Tiny	yellow to light brown	uniform	yes	inconspicuous, or within mounds of other ants

Argentine Ant:
Linepithema humile


Photo by: April Nobile, AntWeb

Photo by: www.alexanderwild.com


Photo by: Mark Hoddle


Photo by: www.alexanderwild.com

Identification

- 3 to 4 mm in length
- Deep brown to light black
- Single node petiole
- 12 segmented antennae
- Uniform worker size
- Multiple queens per nest
- Move rapidly in distinct trails

Behavior

- Significant structural and agricultural pest, displace native ants
- Feeds on liquid diets with a preference for greasy and sugary liquids
- Shallow nests
- Large super-colonies of millions of ants and thousands of nests

Field or Native Gray Ant: *Formica aerata*


Photo by: April Nobile, AntWeb


Photo by: www.alexanderwild.com


Photo by: www.alexanderwild.com

Identification

- Large ant: 4.0-7.5 mm
- Reddish-brown head and thorax, dark gray and shiny abdomen
- Single node petiole
- 12 segmented antennae
- Worker size can vary
- Move in irregular patterns; do not trail

Behavior

- Forage when above 50°F
- Predominant field ant species in the Central Valley
- Prefers to feed on sugar, but also eats protein
- Nests appear as holes ringed with scattered soil, often at the base of trees or vines

Field Ant:
Formica perpilosa

Identification

- Large ant: 4.0-7.5 mm
- Reddish brown head and thorax with dark brown abdomen
- Single node petiole
- 12 segmented antennae
- Worker size uniform
- Move in irregular patterns; do not trail

Behavior

- Found mainly in irrigated lands in deserts
- Predominant field ant species in the Coachella Valley.
- Forage on both honeydew and insect carcasses
- Nest in topsoil or under rocks and debris

Pavement Ant: *Tetramorium immigrans*

Photo by: April Nobile, AntWeb


Photo by: www.alexanderwild.com


UC Statewide IPM Project
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Photo by: www.alexanderwild.com

Identification

- Small ant: 2 to 3 mm
- Dull, blackish brown
- Two node petiole; pair of spines on the the thorax
- 12 segmented antennae with 3 segmented club
- Grooves on head
- Workers uniform size, one queen per colony

Behavior

- Found in urban and agricultural areas
- Moves relatively slowly, forms trails, but is not easily disturbed
- Generalist foraging habits and feeds on insects, honeydew, nuts, and fruit
- Builds nests near water

Dark Rover Ant:
Brachymyrmex patagonicus

Photo by: April Nobile, AntWeb

Photo by: www.alexanderwild.com

Photo by: D. Haviland

Photo by: www.alexanderwild.com

Identification

- Tiny ant: 1 to 2 mm
- Light to dark brown
- Single node petiole
- 9 segmented antennae
- Workers uniform size
- Multiple queens per nest
- Does not trail, or forms very weak trails

Behavior

- Foraging ants can invade and nest in structures
- Colonies in soil, bases of trees, leaf litter, wood piles, structures
- Feeds on honeydew
- Relatively new invasive species in California

Bicolor Pyramid Ant:
Dorymyrmex bicolor

Photo by: April Nobile, AntWeb


Photo by: www.alexanderw


Photo by: wildaboutants


Photo by: www.alexanderwild.com

Identification

- 2 to 3 mm in length
- Red with black abdomen
- Single node petiole with pyramid-like projection on top rear of thorax
- 12 segmented antennae
- Workers uniform size
- Fast moving and usually travel in trails

Behavior

- Workers forage in morning or afternoon
- Feed on honeydew and insects
- Nests appear as small cone shaped mounds

Pyramid ant:
Dorymyrmex insanus


Photo by: April Nobile, AntWeb


Photo by: www.alexanderwild.com

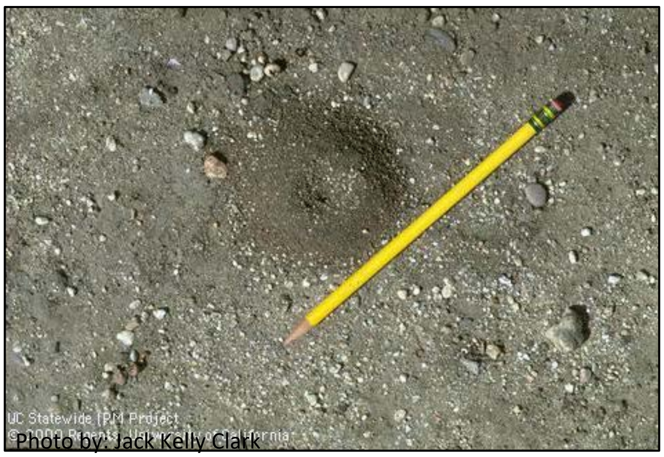


Photo by: Jack Kelly Clark


Photo by: www.alexanderwild.com

Identification

- 2.5 to 3 mm in length
- Dark reddish brown
- Single node petiole with pyramid-like projection on top rear of thorax
- 12 segmented antennae
- Workers uniform size
- Single queen per nest
- Does not trail

Behavior

- Nicknamed “crazy ant” due to sporadic movements
- Active in extreme heat
- Feed on honeydew and other insect carcasses
- Nests appear as small cone shaped mounds

High noon ant:
Forelius pruinosus

Identification

- Small ant: 1.8-2.5 mm
- Orangish color
- Single node petiole
- 12 segmented antennae
- Workers uniform size
- Multiple queens per nest
- Uses foraging trails
- When crushed emit odor resembling rancid butter

Behavior

- Active in extreme heat
- Thrives in hot and dry conditions
- Feed on honeydew and tend honeydew-excreting insects such as aphids, scale, mealybugs
- Nests are found in soil and under rocks

Pharaoh Ant:
Monomorium pharaonis

Identification

- Small ant: 1.5 to 2 mm
- Amber in color
- Two node petiole
- 12 segmented antennae with 3 segmented club
- Uniform worker size
- Multiple queens per nest
- Forms trails

Behavior

- Feed on honeydew and living and dead insect
- Common pest in residences, bakeries, factories, hospitals, office buildings
- Nests near sources of food and/or water
- Colonies are very mobile

California Harvester Ant: *Pogonomyrmex californicus*

Photo by: April Nobile, AntWeb

Photo by: www.alexanderwild.com

UC Statewide IPM Program © 2003 Regents, University of California

Photo by: www.alexanderwild.com

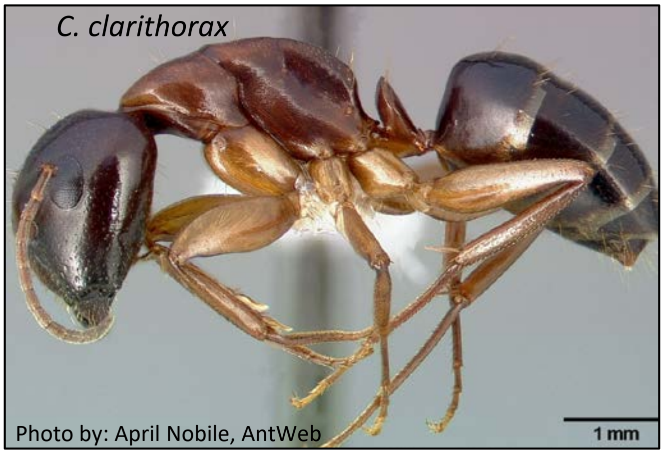
Identification

- Large ant: 5.5 to 8.7 mm
- Red in color
- Two node petiole
- Has long hairs under head for carrying sand grains
- Workers variable sizes
- One queen per nest
- Does not trail

Behavior

- Diurnal and will forage all day
- Forages mainly on seeds and dead insects
- Seed casings, detritus, and loose soil found around nest hole
- Hole at nest entrance enters at an angle

Carpenter Ant:
Camponotus spp.



Identification

- Large ant: > 6mm long
- Dark color with smooth, rounded thorax
- Single node petiole
- Worker size variable
- One or more queens per nest
- Forms trails
- Several species in CA

Behavior

- Workers most active at dusk and night
- Generalist scavengers and predators
- Typically nest in live or dead wood
- Does not sting, but can bite and spray formic acid that causes a burning sensation

False Honey Ant:
Prenolepis imparis

Identification

- 2 to 4 mm in length
- Light to dark brown or black, shiny
- Single node petiole
- Hourglass-shaped abdomen
- Worker size variable, one queen per colony
- Does not trail

Behavior

- Forage in cool weather (below 68^{o}F), and estivate during hottest months
- Feeds on honeydew
- Nests deep in the soil
- Common in humid environments at low and medium elevations throughout California

Thief ant:
Solenopsis molesta

Identification

- Tiny ant: 1.3 to 1.8 mm
- Yellow to light brown
- Very small eyes
- Two node petiole
- 10 segmented antennae with 2 segmented club
- Workers uniform in size
- Multiple queens

Behavior

- Primarily feed on proteins
- Indoor and outdoor pest
- Habitually steal food and brood from other colonies

Southern Fire Ant: *Solenopsis xyloni*

Identification

- 2 to 4.5 mm in length
- Shiny red head and thorax; black abdomen
- Two node petiole
- 10 segmented antennae with 2-segmented club
- Variable sized workers
- One queen per colony
- Weak at forming trails

Behavior

- Urban, turf, and ag pest
- Primarily feed on proteins, esp. seeds and insects
- Scattered nest entrances with appearance of small volcanoes
- Swarm when disturbed, aggressive workers that bite and sting

Red Imported Fire Ant: *Solenopsis invicta*

Photo by: April Nobile, AntWeb

Photo by: www.alexanderwild.com

Photo by: www.alexanderwild.com

Photo by: www.alexanderwild.com

Identification

- 1.6-5 mm in length
- Dark reddish-brown
- Two node petiole
- 10 segmented antennae with 2-segmented club
- Wide range in worker size
- One queen per colony
- Can form trails

Behavior

- Invasive species
- Extremely aggressive, attacks in large numbers when disturbed
- Painful bite and sting
- Feeds primarily on proteins
- Nests have the appearance of gopher mounds

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