

KM AntPro®

**2025 Grower's Farm & Garden Guide
To Environment-Friendly Biological
Control of Ants, and Enabled Pests Insects**



Without ants present to provide protection camouflaged green lacewing larvae sneaks up onto citrus flush to feed on Asian Citrus Psyllid eggs and nymphs while adult psyllid is present laying eggs.

Overview

Nonindigenous invasive super organism tramp ant colonies thrive by first defeating and dislocating local indigenous ant species.

In the past, the presence of ever-increasing ant populations in fruit, nuts, vegetables, and ornamental crops was viewed as a separate and or additional insect control problem. Ants, including inadvertently introduced super colony tramp ant species such as the Argentine ant, yellow crazy ant, big-headed ant, cocktail ant, white-footed ants, red imported fire ant, little fire ant, tawny crazy ant, and a substantial additional list of socially organized communities of invasive tramp ant species, farm, manage, relocate and protect plant damaging insects (order name "*Hemiptera – suborder Homoptera*"). Ant workers systematically harvest these insect's sweet fecal excrement, a complex combination of amino acids & carbohydrates commonly referred to as honeydew.

Many plant piercing-sucking insects, estimates in excess of 32,000 species are well known to various growers worldwide by common names passed on from person to person. Most commonly encountered are various kinds of scale insects, mealybugs, aphids, psyllids, leafhoppers, and whitefly. The physical damage to plant life caused

by Homopteran insects feeding represents just part of the problems they create. Many of these insects are vectors, carriers of a bacterium, viruses, and fungal pathogens comprising more than 80% of all insect-transmitted plant diseases. Homopteran insects are widely considered to be the most destructive insects of both food and non-food crops.

Important, Please Note; ants also engage in a exchange for food protection and grooming relationship with “*Lepidoptera*”, a large order of vegetation eating, chewing insects consisting of 180,000+ species of winged insects, which includes a considerable number of butterfly and moth larvae. Their larvae being commonly referred to as caterpillars. Many species of these insects during their most physically exposed, constantly feeding and growing stages of life have adapted various lure capabilities including scents and sugars to attract ants to groom and protect them. A form of mutualism exists between numerous ant species and caterpillars that have developed the ability to recruit ants to protect them.

Objective

Initially deployed in California crops by growers, and then as an active participant in USDA-CSREES funded University of California super organism Argentine ant depopulation research studies in commercial USDA Certified Organic Fruit, citrus and grapes, the **KM AntPro® Insect Activated Bait Dispensing System** consistently destroys ants, their queens and their colonies, not just foraging ants. Its deployment and systematic use in commercial agriculture and personal property management greatly reduces feeding pests damage and losses of mixed plants and mono crops leading to increased pollinating activity, harvest yield, and profits to growers.

For the purposes of this guide, we will reference the Argentine ant “*Linepithema humile*” as our primary example subject ant species. Widely considered to be the most successful globally invasive tramp ant species the Argentine ant is having a profoundly negative impact on human commerce in food and other commercial crops on six continents and numerous islands. Conventional insecticide products have failed to control these insects. Its use has and is inadvertently helping to accelerate the Argentine ant and other exotic tramp ant species’ global distribution, population growth and expansion.

When ant populations are eliminated or greatly reduced the homopteran insects are exposed to nature’s ultimate pest & disease controllers, the beneficial predators. A wide variety of lady beetles, parasitic wasps, assassin bugs, big eyed bugs, syrphid flies, Tachinid flies, lacewings, predatory mites, spiders and numerous other beneficial arthropods provide nature’s own effective biological insect control, and a crop healthy environment.



(Left) Fallbrook California; Argentine ants farming and protecting Homopterous, plant piercing, sucking insects on citrus tree. (Right) Nokomis Florida; Compact carpenter ant, recently introduced from Cuba, harvesting honeydew from aphids on grape vine.

The ant activated **AntPro** insect bait delivery system employs natural amino acids and carbohydrates in a low-toxicity liquid ant attractant bait as a target-specific replacement for continuous applications of expensive broad-spectrum soil-damaging insecticides. Thus, providing a viable means of protection for beneficial insect predators while manipulating and depopulating targeted ant colonies.

When beneficial predators are not readily available in significant numbers they can be easily introduced, encouraged and maintained on-site. It has become an exceptionally effective practice for farmers to introduce, promote and accommodate the increase and especially the diversity of beneficial predatory insects and spider populations through the use of farm scaping, conservation buffers and now “CBPR&D” Concentrated Beneficial Predator Retention & Dispersal. A means of accommodating and maintaining cost-effective diverse populations of generalist and specialized beneficial predators feeding and reproducing continuously on-site, or what comprises an in excess of adequate populations within a given managed ecologically viable biological environment.

Background

In the mid 1990’s USDA researchers discovered boric acid when greatly reduced down to 1% of a liquid bait (Klotz and Moss 1996, Klotz et al. 1997) **“The delayed activity of boric acid promotes a thorough distribution of the active ingredient within the nest, leading to death of the entire colony.”** More recent, studies conducted by research scientists from the University of California in organic & conventional grape and citrus crops utilizing the AntPro System® employing an attractant liquid bait with the active ingredient Disodium octaborate tetrahydrate “DOT” at use rates as low as 0.5% were successfully documented as an effective method of destroying Argentine ants and their nests.

Researchers found in strengths above the 1% level the “DOT” killed the ants too fast, not allowing adequate time for recruitment of additional ants to transport the toxicant bait back to their nests to feed their queens, brood and colony members.

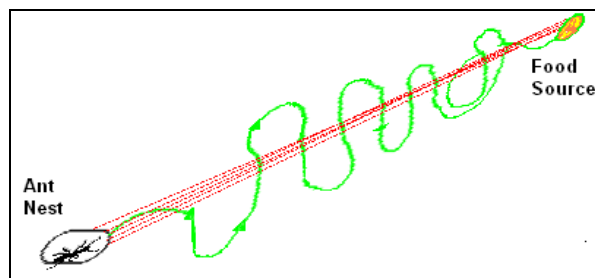


Argentine ants following recruitment pheromone trail from right to left are carrying honeydew in their social stomachs back to their nest (enlarged rear end, the last segment of ants moving from right to left as compared to ants trailing left to right). Each ant is carrying enough liquid in their social stomachs to feed as many as 9 queens and other nest members.

Before the introduction of AntPro's patented weather-sheltered insect activated dispenser, baits would evaporate, degrade and become inedible. In addition the continued application of conventional insecticides including broadcast baits can cause ant nests to “bud” divide and spread at an accelerated rate.

Delivery and Bait Preservation System

AntPro's patented air restricted 562 ml. liquid capacity reservoir can preserve **KM approved baits** (1% Disodium octaboric tetrahydrate to .5% when diluted with water) for several months. Foraging ants activate the dispenser's patented liquid surface tension stress ducts providing liquid bait flow from its air-restricted reservoir into the feeding pool. The ants have continuous 360-degree access to the pool perimeter, capable of feeding in excess of 300 average 3.5 mm ant foragers simultaneously. The foragers share bait samples with other foragers they encounter accelerating the recruitment process to the dispensers. They establish pheromone recruitment trails while carrying the bait in their crops, (ant's second social food storage stomach) back to the colony where they feed their queens and colony the attractive bait toxicant.



Green, represents a scout ant's random search path for food;
red, represents the recruitment trail.

Target specific, the bait is not applied to food crops, nor come in contact with earth surfaces. Foragers feed their colony's member population by *trophallaxis* (exchanging food by regurgitation). Each milliliter of bait feeds 3300 ants inside the dispenser. Depending on the distances covered, the foragers make up to several trips to and from the dispensers to their nests feeding an average of 9 ants per visit. “3300 x 9 = 29,700 ants inside the nest fed per milliliter of bait consumed. The ant foragers eventually unknowingly succumb to the toxicant “approximately 40+ to 50 hours” after

their initial feeding and their repeated transfer of the toxicant to the nest, queens, brood and colony members.

Argentine Ant Field Strategy

The differences that make super organism unicolonial ants so successful when competing against other ant families makes them even more receptive and vulnerable to the dispensing system's unique 24/7 continuous insect activated bait feeding delivery system's methodology.

The following Argentine ant traits are important considerations when planning your strategy;

1. *Budding of the colony, Argentine ants have **traveling queens** with accompanying workers that forage and establish new nest locations, thus expanding their territories and populations with actual immediately functioning nests.
2. They will randomly forage as far as 200 feet establishing pheromone trails to food sites. **Please note:** During a 2006 study UCR researcher Dr. Les Greenberg recorded Argentine ants foraging and bait recruitment over 400 feet traveling irrigation lines from untreated control plots to AntPro® dispenser baited test plots.
3. Follow the water; most ant species are always foraging in greater numbers near and around water sources, especially in irrigated areas.
4. You will rarely find ants feeding in brightly lit and full direct sunlight areas.
5. They have been observed carrying, relocating and maintaining hemipteran insects and their eggs underground in their nests, within the roots of grape vines, citrus trees and other plants.

Agricultural Ant Management Baiting Program

Spring/Summer Dispenser Deployment. The ant population increases rapidly during these two seasons. Square acres heavily infested with Argentine ants should initially have approximately 12 to 16 dispensers installed; each dispenser placed approximately 55 x 65 feet apart (Please see image below) in staggered deployment pattern. Fifteen AntPro dispensers deployed per acre are consistently capable of destroying over 200 million ants within the first two weeks deployed.

Note; the number of dispensers deployed for active ant infestations should be based on the invasive ant species present, and their food harvesting environment. Example, a fruit tree, nut or row crop heavily infested with fire ants generally requires the initial deployment of 4 to 6 KM AntPro dispensers contiguous acre.



The left side of this 36 acre vineyard is being actively treated for Argentine ants and Vine mealybugs. The right half of the vineyard previously treated shows several dispensers have been removed leaving the balance of dispensers in a preventive monitoring mode. One exception, the units deployed in a standard staggered active deployment pattern on the far right side along the property line bordering a neighboring untreated vineyard.

Agricultural ant management baiting program continued;

Important facts about ant baiting to remember.

1. Baiting is a Trojan horse methodology; it is about feeding and destroying the ant colony's queens and brood. Without their queens to reproduce the foragers and other colony workers have no purpose.

2. In University of California KM AntPro studies in citrus, beginning in 2005 Argentine ant populations were consistently reduced by over 70% in the first two weeks and in excess of 80% by the end of the third week.

Why, did the number of ants destroyed during week three not match the over 70% destroyed over the initial first two-week period?

Ants nesting and feeding in the baited areas were for the most part destroyed. Tramp ant species such as Argentine ants have young traveling queens emerging from there birth nests with great numbers ants accompanying them in trail. These new queens randomly forage exceptional distances for food sources, and their new nest sites. Ant foragers also proceed their queens and recruit them to newly discovered food sources, especially insects to farm for their honeydew. It is a simple matter of colony expansion from outlying surrounding areas. It is also important to treat as many contiguous acres as practical, simultaneously. Based on the exceptional foraging range of these ants the dispensers are depopulating outlying areas as well.

Fall/Winter deployment: In coastal and warmer areas, non-hard freeze zones such as Southern and central California, South Texas and North central Florida on South baiting active ant infestations can provide excellent results with less dispensers and bait deployed per acre. During the cooler months ants tend to forage during the warmest hours of the day. Much less bait is required to destroy their reduced queens and brood populations that otherwise would be rapidly reproducing and expanding their queens & colony populations when Spring arrives. “Where weather permits this is the ideal time to deploy”.



The AntPro Sentinel Insect Bait Delivery System is successfully destroying ant colonies and targeted carbohydrate and protein feeding insects in a wide variety crops providing natural predators the ability to achieve nature's natural insect control while protecting human health and our shared environment in several countries and islands.

Ant populations are present in vegetable, fruit, nuts and other crops. As the ant population declines, less bait dispensers are required and can be put to good use at other locations. The remaining AntPro System dispensers require less bait while performing as sentinels, monitoring, and activating only when new foraging ants with their highly developed keen sensory smell capabilities discover them, preventing ant re-infestation.

Please note - Our biological companions section of this guide [“Encouraging and Retaining Diverse Populations of Nature's Natural Predators”](#) is currently being updated and expanded. We hope to have it added and posted by May 2025.

***pheromones:** Chemicals released by an organism to communicate. Ants use pheromones to create marked trails to find food sources for other ants to follow and enhance. They release alarm pheromones to warn of danger. Pheromones provide numerous instructions and have a specific and unique signature identifying each colony's members.

***budding:** Groups of worker ants usually carrying larvae, including one or more queens leave a colony to begin a new one. Argentine ant queens are much more sophisticated than most other ant species. They have numerous young females called traveling queens. These reproductive females randomly forage for food before establishing their new nests. This trait offers more female reproductive ants, or traveling queens a better chance of survival, colony distribution and nest placement.

***Homopterous :** is a sub-order of Hemiptera, which represent a broad variety of over 32,000 piercing sucking, all plant-feeding insects. Many of these insects are well known to growers by their common pest names as aphids, whiteflies, psyllids, scale and mealybugs.

Working Together

Our intention is to work closely with KM system providers and you the end user to assist with your **AntPro®** system planning and deployment strategy. Call, or contact us for a no cost assessment of your system needs including our development of a satellite-based deployment plan custom fit to meet your specific needs. We will do our best to work with you to reach your goals, and increased profits for your business, together with healthier more bountiful crops and environment.

Sincerely,



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