

# KM Message to Growers

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## AntPro in Citrus

**The *KM AntPro* Insect Control System will assist you in reducing your crop damage and losses and increasing your business profits (1).**

If you have Argentine ants or other similar invasive ants, together with scale, mealy bugs, aphids, psyllids or other Homoptera on your property, *AntPro* will eliminate the ants that are protecting and farming these crop-damaging insects for their honeydew. Also, increasingly, these insects are the vectors for the transmission of virus and other crop destroying diseases. Once the ants are removed, the ladybugs and other beneficial insects provide nature's own control.

The *AntPro* System reduces the on-going need for broad-spectrum insecticides that contaminate your crops and our environment. In the process, these toxic chemicals kill the beneficial insects that control the Homoptera and destroy the bacteria and other organic matter in your soil thus requiring more fertilizer and water irrigation. Even the pollinating honeybees are placed at risk by the use of these chemicals.

At first sight, it might appear that spraying of pesticides might be eliminating the ant problem, but in fact, it is increasing it. Only a small percentage of the ant colony is assigned the task of foraging for food, and those are the ants killed by the toxic chemicals. The death of these foragers causes the balance of the colony to go into stress and repopulate.

The *AntPro* System with its 1% or less boric acid solution allows the foragers to repeatedly return to feed the queen and the balance of the colony without

detection; and thus within a few months eliminate the entire ant problem. AntPro does not interfere with the beneficial insects so after the ants are eliminated, it remains as a sentinel to prevent a re-infestation.

(1) **Contact us** for full deployment strategy and details as to how the *AntPro* System will significantly increase your business profit.



**AntPro in Wine Grapes**



**AntPro in Table Grapes**

# The Problem

## Ant/ Homoptera Mutualism

The Argentine ants and many ants species protect and farm the mealy bugs, scale, aphids and other crop damaging Homoptera for their honeydew.



## Argentine Ant Farming and Protecting Scale

[\(click for video of ants farming aphid\)](#)

## The Solution



[\(Click here for video of ants feeding\)](#)

### The KM AntPro System Solves Growers' Ant Control Problems

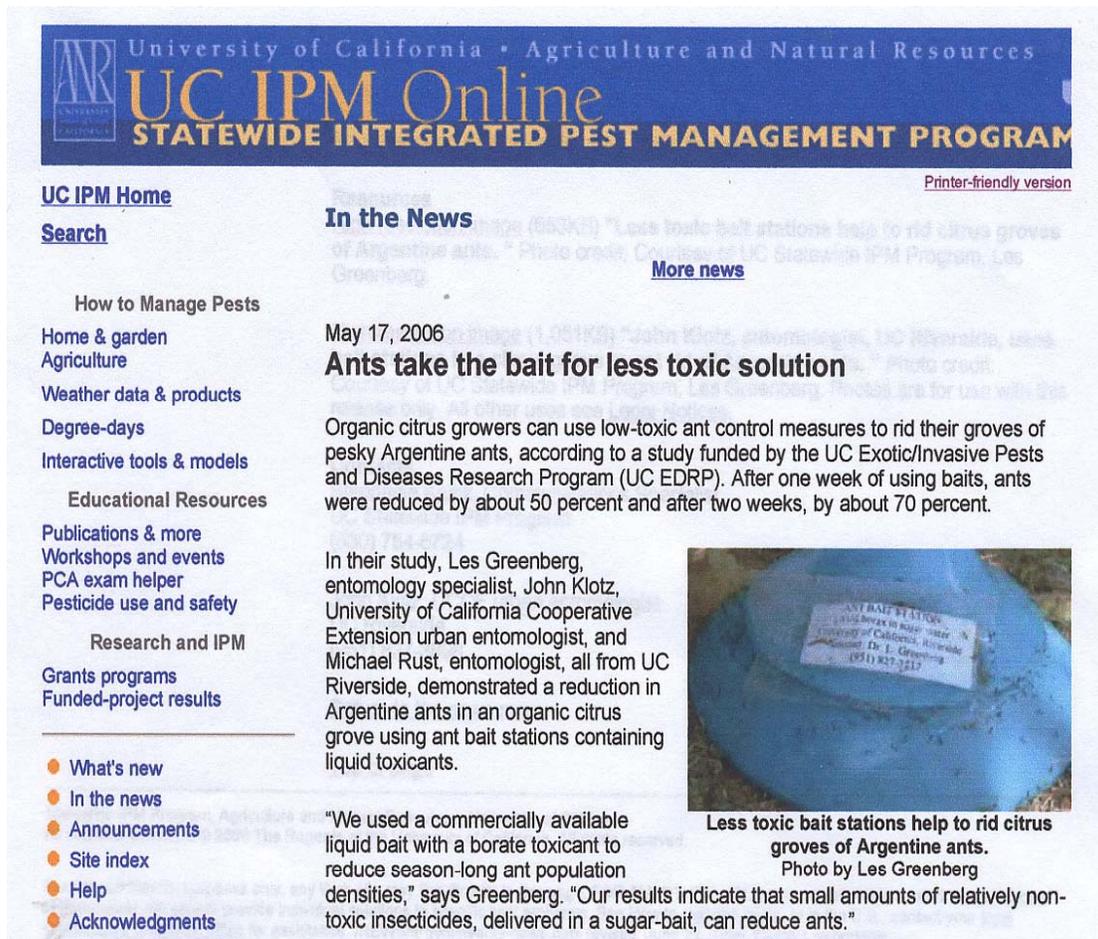
“Ant Pro Works!” states **Rich Hart, President of Rainbow Valley Orchards**, “The bait station formula combination, that KM AntPro has perfected, gives our company the answer to what was an annual infestation of major proportion.”

To quote **Matt Witman from Witman Ranch in Escondido California**, “Your bait and bait stations have been the answer for us in our organic orange groves. This is a good system that will ultimately save us money and solve our ongoing ant problem.”

**Bruce Rucker, owner of Rucker Homestead of Palm Desert**, and who is well know for his Flame variety table grapes, raves about the AntPro System and how in one season “eliminated his gray ant infestation and allowed the beneficial insects to feast on the mealy bugs that had been causing very costly crop loss and crop damage”

## The KM AntPro System is Endorsed by Scientific Community

### University of California Studies



The screenshot shows the UC IPM Online website. At the top, it says "University of California • Agriculture and Natural Resources" and "UC IPM Online STATEWIDE INTEGRATED PEST MANAGEMENT PROGRAM". There is a "Printer-friendly version" link. On the left, there is a navigation menu with categories like "How to Manage Pests", "Educational Resources", and "Research and IPM". The main content area is titled "In the News" and features an article dated May 17, 2006, titled "Ants take the bait for less toxic solution". The article text states: "Organic citrus growers can use low-toxic ant control measures to rid their groves of pesky Argentine ants, according to a study funded by the UC Exotic/Invasive Pests and Diseases Research Program (UC EDRP). After one week of using baits, ants were reduced by about 50 percent and after two weeks, by about 70 percent." To the right of the text is a photograph of a blue bait station with a white label. Below the photo is a caption: "Less toxic bait stations help to rid citrus groves of Argentine ants. Photo by Les Greenberg". A quote from Les Greenberg is also present: "We used a commercially available liquid bait with a borate toxicant to reduce season-long ant population densities," says Greenberg. "Our results indicate that small amounts of relatively non-toxic insecticides, delivered in a sugar-bait, can reduce ants."

“Liquid bait with 1% borate toxicant reduces ants numbers by 70% in 2 weeks & 80% after 4 weeks.”

University of California – Riverside - Mike Rust, John Klotz, & Les Greenberg

The **KM AntPro System** with **Gourmet Liquid Ant Bait** has been tested by University of California Statewide Integrated Pest Management Program and is now being recommended to all California Master Gardeners in an ongoing series of workshops.

UC –Davis website video:

“Refillable bait stations”

<https://breeze.ucdavis.edu/p44098269/>

## Beneficial Insects Provide Nature's Insect Control



**Ladybug attacking scale.**

Once the ants are removed, the ladybugs and other beneficial insects provide nature's own control.

*AntPro* does not interfere with the beneficial insects so after the ants are eliminated, it remains as a sentinel to prevent a re-infestation.

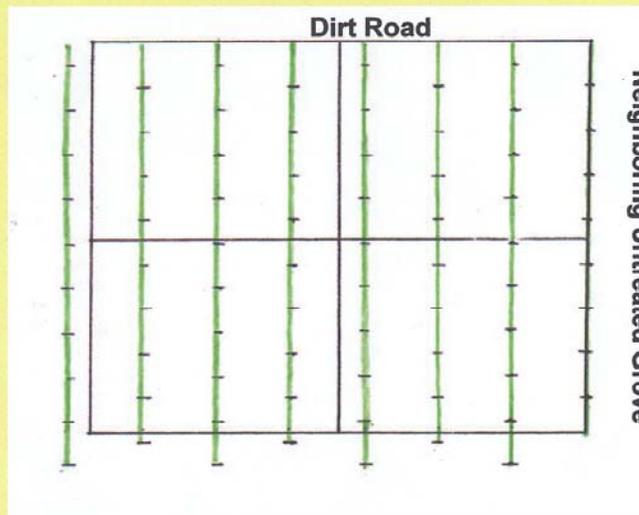
**(click for video of ladybug eliminating aphids)**

## ***KM AntPro Advantages***

- Uses only low toxic, environmentally sound bait ingredients that are designed to eliminate the queen and the total ant colony and not just foraging ants that represent a small percentage of the colony and are easily replaced if killed.
- Bait is stored within dispenser reservoir and pool where insects feed, so bait is not exposed or broadcast over wide areas.
- Target insects have 360-degree access to feeding pool (have observed estimated 90 imported fire ants feeding at one time).
- *AntPro* System provides around the clock, season-long control and monitoring, and not limited to one or two broadcast spray treatments that are dissipated by the sun and rain.
- Using target-specific attractant and bait with dispenser access limited to ants and other small insects. Ladybugs and other beneficial including pollinating bees can be present without being exposed to harm.
- The *AntPro* System reduces the on-going need for broad-spectrum insecticides that contaminate your crops and our environment.
- Dispenser made of polypropylene plastic with UV protection added for an extended operating life.

## Applied Argentine Bait & Monitoring Methodology!

#1  
Dispensers  
deployed  
55ft. X 50ft  
apart.



Average  
16.9  
dispensers  
per acre.

Proposed initial dispenser placements for  
contiguous acres heavily infested with ants.

## Deployment Strategy

The number of *AntPro* dispensers required per acre varies based on type of crop, degree of insect infestation in targeted and contiguous acreage and several other factors.

Dispenser deployment is best planned by completing a Crop Survey ([click here](#)) and a studied assessment of the relevant factors. The above diagram outlines an initial requirement averaging 16.9 dispensers per acre.



Napa Valley Wine Grapes



### **Pauma Valley Citrus**

As the ant population is reduced and the ladybugs and other beneficial insects return to an area, the number of dispenser employed can be reduced and moved to another problem location.

This redeployment of dispensers is shown in the above Napa Valley plan. The field to left was the initial targeted area, and now shows this reduction. The field on the right is the present focus.

*AntiPro* does not interfere with the beneficial insects so as the ants are eliminated, it remains as a sentinel to prevent a re-infestation.

# **KM Agrico's Grower's Guide To Ant & Crop Insect Control**



## **Overview**

The **KM AntPro®** dispenser, together with a low-toxicity liquid ant bait, provides the key components for a specific, bio-rational methodology employed for the purpose of first controlling, then eliminating and finally functioning as a stand alone 24/7 monitoring **sentinel system** against re-infestation by offensive ants.

## **Growers' Guide**

To read complete Growers' Guide, PDF file ([click here](#)).

## **KM System Financial Justification**

**The *KM AntPro* will assist you in reducing your crop damage and losses and increasing your business profits.**

The *AntPro System* operates to reduce your crop damage and losses by removing the ants that protect the mealy bug, scale, aphids, psyllids and other crop-damaging insects. Once the ants are removed, the ladybugs and other beneficial insects return to control these problem insects.

Therefore as a first step, it is most important to define and quantify this problem by recognizing the several factors relating to these ants and problem insects that are contributing to your current crop damage and crop losses. Is there sooty mold on the fruit; direct insect damage to blossoms, fruit, foliage & roots, ants interfering with pollinating bees, etc.? Are these insects current or potential vectors for virus and crop destroying diseases?

Also, with spraying of insecticides, recognize the time and expense necessary for their repeated use and for the additional fertilizer to replace organic nutrients in soil destroyed by these chemicals. Is the loss of water holding capacity of organic matter in soil requiring more irrigation & mulching?

Obviously, potential savings and related production costs vary between each grower's kind of crop & insect problem, degree of infestation and other environmental problems. A financial justification needs to be tailored to your conditions, and that is part of our on-site or satellite-based insect control plan.

For crop survey form ([click here](#)).

## Example of Profit Improvement Potential

A business computer model developed for California Citrus shows how a reduction in crop damage and loss increase profits.

Assume existing sales revenue of \$7,000 per acre; labor & equipment and their maintenance, fertilizer and other fixed costs of \$2,000; and harvest cost 47% of sales, resulting in a profit contribution ratio of 53% (100%-47%). This revenue/cost profile produces a net profit of \$1,710 per acre (\$7,000 less harvest cost of \$3,200 & fixed costs of \$2,000)

Now, assume improved insect control produces 10% increase sales revenue over the existing \$7,000 per acre, and creating a dramatic improvement in profit. That is, \$371 per acre ( $\$7,000 \times 10\% = \$700 \times 53\%$ ) or \$.53 additional profit for each dollar of increased revenue; and a 22% increase in profit ( $\$371 / \$1,710$ ) due to greater crop output or better quality product.

The power of this profit multiplier is demonstrated for pecans by a recent ARS study:

**"Organic Pecans: Another Option for Growers"** was published in the **November/December 2008** issue of *Agricultural Research* magazine. New ARS studies in Weslaco, Texas, are showing that it may be possible for growers to boost their revenue further by growing pecans organically.

“Contrary to conventional growers’ expectations, the ARS organically treated test site outyielded the Geberts’ conventionally managed, chemically fertilized orchard in each of 5 years. The best ARS treatment surpassed the Gebert control by 18 pounds per tree - 44.10 pounds compared to 25.85 pounds - in 2005 and by 12 pounds per tree - 45.09 pounds compared to 33.39 pounds - in 2007. Because pecans are an alternate-bearing tree, both orchards’ yields were very low in 2004 and 2006” (71% increase in 2005 & 35% in 2007).

To see entire article link to:

<http://www.ars.usda.gov/is/AR/archive/nov08/pecans1108.htm>

## KM System Environmental Justification

It is easy to understand from reading the EPA required label for each broad-spectrum insecticide spray that their use contaminates your crops and our food supply and environmental, and kill the beneficial insects that control the Homoptera. Also, these chemicals destroy the bacteria and other organisms in your soil thus requiring more fertilizer to replace this loss. It places our children, pets, honeybees and all living beings at risk. Their use is discussed and approved in terms of an assumed risk/ reward, but not being free of these concerns.

Use low-toxicity, organically approved 1% boric acid bait and beneficial insects as the catalyst in adopting environmentally sustainable insect control and “A Whole-Farm Approach to Managing Pests”.

Your adoption will generate increased awareness by the government, other growers and the public that there are more bio-friendly and profitably methods of insect control, and in this process provide increased leverage for obtaining water-use and farm bill money allocation and participation in many other related initiatives.

**AntPro System meets standard** for use by organic growers. It is United States Department of Agriculture (USDA) certified National Organic Product (NOP) organic food crop compliant.



**KM Agrico LLC**  
**Environmentally Sustainable Insect Control**

**Insect Control Survey**

Upon your request, we will produce a free on-site or satellite-based insect control plan for the deployment of our system and the strategy for its use; together with an outline of its cost reducing/profit improvement potential. To obtain Ken's recommendations, complete this survey and send it to our address below. (Please fill out site-specific surveys for crops at independent geographical locations.)

Survey by Grower:

Business Name: \_\_\_\_\_

Contact: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_

Telephone #: \_\_\_\_\_ Email: \_\_\_\_\_

Crop (s): \_\_\_\_\_ Acreage: \_\_\_\_\_ (organic) \_\_\_\_\_ (conventional)

Insect Problem:

Homoptera: Scale \_\_ Mealybugs \_\_ Aphids \_\_ Psyllids \_\_ Other \_\_\_\_\_

Ants: Argentine ant \_\_ Other \_\_

Comments: \_\_\_\_\_

Estimated Percentage Crop Loss: \_\_\_\_\_

Other Comments: \_\_\_\_\_

Send Survey to:

Ken Kupfer  
P.O Box 967  
Nokomis, FL 34274  
[kjkufer@comcast.net](mailto:kjkufer@comcast.net)

Tel: (941) 445-4252

Fax: (941) 445-4253

KM Survey Form - 20209

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# *KM Agrico's* **Grower's Guide To Ant & Crop Insect Control**



## **Overview**

The **KM AntPro®** dispenser, together with a low-toxicity liquid ant bait, provides the key components for a specific, bio-rational methodology employed for the purpose of first controlling, then eliminating and finally functioning as a stand alone 24/7 monitoring **sentinel system** against re-infestation by offensive ants.

Of the estimated 8,800 to 12,000 ant species inhabiting the planet just a very small group of them cause problems for human kind. The industrial age rapidly extended commerce around the globe providing many of these ant species the opportunity to spread, originally by cargo ships and most recently air travel. In many instances they have thrived, establishing new populations wherever the environment has been conducive to colonize. This small group of very successful ants share worldwide common group name “Tramp ants” depending on just how bad they can be, whether in terms of health and commerce they are listed as invasive ants. Although some of these ants share the same opportunistic bad traits, there are differences that allow them to become the dominant specie in a given environment. The Argentine ant “*Linepithema humile*” is without a doubt the most successful invasive tramp ant worldwide and the primary focus of this control guide. The treatment strategy for many tramp and native ants in many cases is the same, or similar. Currently we are finding what are considered to be native formica ants in direct competition with Argentine ants occupying areas within the same crops in Southern California.



Argentine ants following recruitment pheromone trail from right to left are carrying honeydew in their fully extended crops back to their nest. Each ant is carrying enough liquid to feed as many as 12 colony members including queens.

Argentine ants may appear as only a nuisance infestation in crops where they are present in significant numbers, but it is their collective uniqueness acting as a super organism that constitutes the problem. They farm, protect and spread piercing, sucking insects "*Homoptera*" that cause crop damage, reduce yield and are vectors of an ever growing variety of diseases.

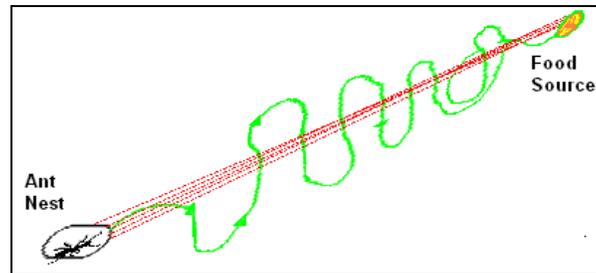
**AntPro** uses low-toxicity, liquid ant bait as a replacement for the continuous, year after year, spraying of expensive and soil-damaging insecticides as a means to eliminate ants that are enabling the crop damaging disease-carrying insects. Once the ants are removed, the homoptera are exposed to nature's control; that is, the beneficial predator insects (ladybugs, parasitic wasps etc.)

## Background

In the mid 1990's USDA researchers (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.**" discovered that boric acid when greatly reduced, down to 1% and even less (recent research studies as low as 0.5%) of the total consumable bait volume was an effective tool for eliminating ants. It has been well documented probably for centuries that boron kills insects, but researchers found that in strengths above the 1% level the compound would either kill the foraging ants (only 15% of colony) too quickly, not allowing them to carry the toxicant back to their queens and other colony members, or simply act as a repellent making them ill too soon. Before the introduction of **AntPro's** weather-sheltered insect activated dispenser, baits would also degrade and become inedible. Like other animals including humans, stress inducing events cause an automatic acceleration in ant populations. Colonies expand rapidly, divide and in greater numbers; the continued application of conventional insecticides and broadcast baits has had, and is having this same stress induced \*budding of the colony.

## Delivery and Bait Preservation System

**AntPro's** patented air restricted reservoir is capable of preserving **Gourmet® Liquid Ant Bait** (1% boric acid solution) for several months before it begins to degrade to the point ants no longer find it attractive. Foraging ants activate the dispenser's liquid surface tension stress ducts providing liquid bait flow from the air-restricted reservoir into the feeding pool. The ants have 360-degree access to the pool capable of feeding in excess of 100 Argentine ant foragers, simultaneously. The foragers share bait samples with other foragers they encounter accelerating the recruitment process as they establish pheromone



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

trails while carrying the bait in their crops, (the ant's second storage stomach) back to the colony where they feed the queens and several colony members the attractive toxicant. Foragers feed the colony's population by *trophallaxis* (exchanging food through regurgitation).

Depending on the distances covered, they can make up to several trips to the colony feeding an average of 9 ants per visit before succumbing to the bait's toxicant.



Argentine ants farming mealybugs on citrus leaf.

## Argentine Ant Field Strategy

The differences that make Argentine ants so successful competing against other ant families makes them even more receptive to the dispensing system's unique 24/7 continuous long term bait feeding delivery on their demand.

**The following Argentine ant traits are important considerations in planning your strategy:**

1. \*Budding of the colony, that is, Argentine ants have **traveling queens** with accompanying workers that forage and establish new nest locations, thus expanding their population.
2. They will randomly forage as far as 200 feet establishing pheromone trails to food sites. **Please note:** During a recent 2006 study UCR researcher Les Greenberg, PhD. recorded Argentine ants foraging and bait recruitment over a distance of 300 feet traveling irrigation lines from untreated control plots to AntPro® dispenser baited test plots.
3. Follow the water; Argentine ants are always foraging in greater numbers near and around water sources.
4. You will rarely find them feeding in brightly lit and full direct sunlight areas.
5. They care and maintain mealybugs underground within the roots of grape vines and some citrus.

### **Agricultural ant management baiting program:**

**Spring/Fall deployment.** The ant population increases rapidly during these two seasons. Square acres heavily infested with Argentine ants should initially have approximately 11 to 16 dispensers installed; each dispenser placed approximately 55 x 66 feet apart.

**Fall/Winter deployment:** In coastal and warmer areas baiting active ant infestations is showing results prior to spring increase of insect populations.



The AntPro Sentinel insect bait delivery system is successfully controlling Argentine ants and numerous other carbohydrate and protein feeding insects.

**Ants are present only when they have purpose:** Argentine ants and other ant species are present in citrus, grapes, nuts and many other crops for one purpose - food. These ants are farming and protecting crop damaging scale, aphids, mealybugs, whitefly, psyllids and other piercing, sucking and chewing insects to harvest their honeydew. As the ant population declines, less interior dispensers will be needed. The remaining dispensers require less bait and perform as sentinels monitoring against ant re-infestation. Beneficial insects will return and

prosper feeding on the damaging insects in numbers eventually sufficient to balance the groves ecosystem. **It may be prudent for some growers to consider hurrying the process by introducing commercially available predator insects.**

When the ant populations within the interior of the treated crop areas have been greatly reduced or decimated, perimeter control is the most **important next step**. Other than some ants being transported into areas as stowaways, the Argentine ant is grounded without nuptial flight reproduction capability. Having bait stations deployed providing a perimeter defense will limit traveling queens from returning with thousands of accompanying workers, to re-infest the previously cleared areas. The number of dispensers with bait deployed on interior acreage can also be greatly reduced.

### Working Together

Our intention is to work closely with you, the end user, to assist with your **AntPro** system planning and deployment strategy. Call us, at no charge, for help in assessing your system needs and our developing a satellite-based deployment for your property. We will do our best to work with you to reach your goals; increased profits for your business, together with healthier, more bountiful crops and environment.

Sincerely,



Ken Kupfer

**KM Agrico LLC**

Ofc. 941-445-4252

Fax. 941-445-4253

P.O. Box 967

Nokomis, FL 34274

**\*pheromones:** Chemicals released by an organism to communicate. Ants use pheromones to create marked trails to found 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 and nest placement.

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