

WHAT YOU SHOULD KNOW ABOUT ANT BAITS



Innovative
Pest Control
Products

How Ants Feed

Most pest ants have large colonies and use a 'mass recruitment' strategy to secure food for the colony (Beckers et al., 1989). In mass recruitment, foraging workers locate food, return to the nest and subsequently direct other workers to the discovered food with the aid of trail pheromones. This food source can be floral nectar, seeds or 'honeydew'.

Honeydew is the largest source of nutrients for the colony. It is the excretion from plant-sucking insects (like aphids). The honeydew excretion is an important natural liquid, high-sugar food source for ants. Ants are naturally adapted for collecting, transporting and sharing a liquid diet.

Bait Attractiveness

Ant baits should mimic natural food sources, so that the ants will feed on them more readily and for a longer period of time.

In general, ant baits have two components, an attractant and a toxicant. The attractant can be a simple carbohydrate, protein or fat, or it can be a more complex mixture of components and preservatives. Bait with only one attractant may be limited in its attractiveness to various species of ants or may be limited in the time that it is attractive as the needs of the colony changes.

Gourmet Liquid Ant Bait® [GLAB] is a complex mixture of attractants that mimics honeydew.

The toxicant used in the bait needs to have sufficient solubility in water, so that it stays in solution over the life of the bait, and it needs to work slowly enough that it can be distributed throughout the colony by the workers and kill the queen. Tests done by Hooper-Bui and Rust in 2000 showed that of the active ingredients [AI] tested only boron and fipronil were 100% effective at killing the workers and the queens, and only boron had sufficient solubility to remain in solution for prolonged periods of time without additional additives. Boron is the only toxicant available in ant baits that has no demonstrated resistance and is of sufficiently low toxicity to be approved for large volume baiting systems.

Boric Acid Repellency

Boron as an AI is available in three forms: sodium tetraborate decahydrate (borax); disodium octaborate tetrahydrate [DOT]; and boric acid. The choice of which form of boron to use is determined by the pH of the bait matrix and noted repellency to the target pest. The strength of these AI's is measured in Boron Equivalents [BE]. In relative terms, the BE of borax is 1, the BE of boric acid is 1.8 and the BE of DOT is 2. So, a 1% solution of borax has only half the killing power of a 1% solution of DOT (when in a water solution, DOT breaks down into borax and boric acid and can stabilize the solution at a near neutral pH).

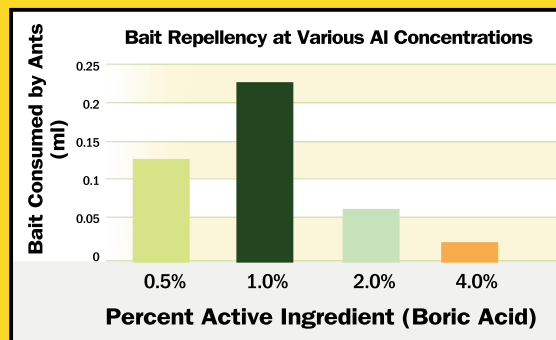
Diluting an ant bait can reduce its strength to a point where it is no longer effective. If the bait is not specifically formulated to be diluted, the preservatives in the bait can become ineffective and it will mold quickly. **GLAB** is specifically formulated to be diluted 1:1 with distilled water, or other food grade materials, and remain effective and mold free for up to six months.

Doctors **F.J. Sola**, and **R. Josens** from Argentina report in their tests:

"Our results showed that there is a clear difference in intake of boric acid solutions compared to borate (borax) solutions. Ingestion times, volumes and rates, and acceptance were similar for the control sucrose solution and the boric acid solution, but all three were significantly lower for sucrose solutions containing sodium borate. Mortality was positively related to amount of boron ingested. These results suggest that boric acid baits would be more effective than borax baits.

Consumption of sucrose water was significantly higher than consumption of the > 1% boric acid solutions indicating unpalatability of boric acid at 2% and 4%. Therefore, to avoid repellency in liquid baits with boron compounds as an active ingredient, formulation should be $\leq 1\%$ (John H. Klotz, Les Greenberg, Christopher Amrhein and Michael K. Rust).

Our studies with sucrose water containing boric acid for control of household ant pests demonstrated that low concentrations ($\leq 1\%$) of boric acid are slow-acting and non-repellent, thereby enhancing long-term ingestion (Klotz and Moss, 1996; Klotz et al., 1997). From these studies it can be inferred that the 5.4% borax commonly found in liquid ant baits is not the best choice for ant control.



WHAT YOU SHOULD KNOW ABOUT ANT BAITS *CONT'D.*



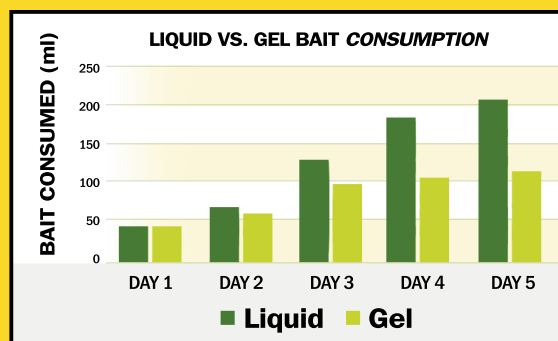
Bait Viscosity Matters

Studies show that the consistency of the bait affects ants' ability to use the bait as a food source. For example, Argentine ant workers are physically unable to ingest solid bait but can readily transport liquid baits and share the bait with up to nine other colony members.

April, Silverman and Roulston from the Department of Entomology, North Carolina State University, in their article, *Gel and Liquid Ant Baits*, state:

"We recorded significantly higher mortality in worker cohorts exposed to liquid versus gel compositions of equivalent concentrations."

They also note that ants consume only about 50% of gel bait as opposed to the liquid bait they feed on over the same period of time.

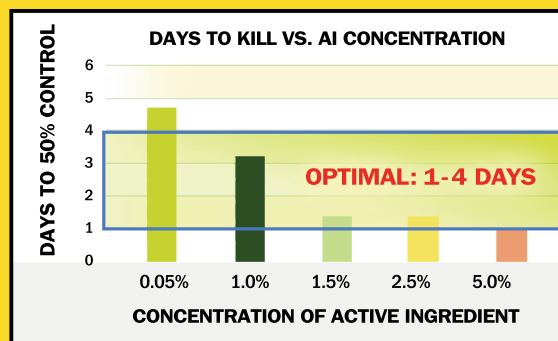


Delayed Toxicity

The primary mission of baiting is to destroy the ant colony. In order to accomplish this mission it is necessary to destroy the reproductives in the ant colony. Many of the invasive ant species have multi-queen colonies; therefore, it is essential to get the toxicant used in the bait distributed throughout the colony. In addition, the action of the toxicant should be delayed so as to maximize feeding, trail following and mass recruitment. Fast-acting toxicants kill the foragers and reduce establishment and maintenance of the trail. (Klotz and Moss, 1996; Klotz et al., 1997)

Stringer in 1964, and Klotz in 1996, demonstrated that the delayed toxicity of boric acid promotes a thorough distribution of active ingredient within the nest, leading to the death of the entire colony. In 2000, Klotz demonstrated that workers must survive long enough to repeatedly return to the colony with the toxic bait. Rapid kill effectively prematurely extinguishes foraging. Klotz also found that the lethal time of boric acid was directly related to the amount of the boron in the bait and that the action of the toxicant should be delayed so as to maximize feeding, trail following and mass recruitment.

The delayed toxicity of boron, its solubility in water and low mammalian toxicity have made boron the most widely used AI in liquid and gel ant baits for the control of ant colonies.



Safety & Liability

Boron, the active ingredient in **GLAB**, is an element that occurs naturally in soil and coastal areas and can be found in many fertilizers. It is also an essential micro-nutrient for plants. The soil concentration of boron can be 3 to 5 times greater than the concentration found in **GLAB**. The acute oral and dermal toxicity for **GLAB** is > 5,000 mg/kg (female rat) and > 5,000 mg/kg (rabbit) respectively. **Based on these toxicity numbers it is considered non-hazardous.**

Placing **GLAB** in an approved bait station will protect the bait from contamination and exposure to non-target animals such as pets, birds, fish and other vertebrates. It will also protect the environment from accidental contamination, limiting liability and acting as a visible sign to your customer that you are providing 24-hour-a-day protection 365 days per year!

Gourmet Liquid Ant Bait®

Gourmet Liquid Ant Bait® is a 'colony killer' and the only liquid ant bait effective enough to be used to control ants for commercial agriculture. We have many years of test data to show that:

- Our bait matrix has the right ingredients and is the correct viscosity to consistently work on the widest variety of ants and roaches.
- The active ingredient we use is effective at *eliminating the queen and the colony*.
- The active ingredient we use can be diluted 1:1 without losing its effectiveness or shortening its useful life.
- When used with the proper bait dispensers, **Gourmet Liquid Ant Bait®** can provide area-wide control of even the toughest invasive ants.

Gourmet Liquid Ant Bait® is the cost effective solution to controlling invasive ants. Don't settle for a less effective ant bait and baiting program. Demand **Gourmet Liquid Ant Bait®** for your baiting program.



Visit our Web site for additional information on all of our products:
www.antcafe.com, or call

1.877.483.4997