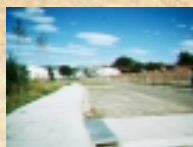


INTRODUCTION

Since the pavement ant; *Tetramorium caespitum* L., initially expanded its range into Colorado about 30 years ago, populations have increased dramatically to the point where it currently dominates many urban areas. Thriving in disturbed areas, these ants can be found colonizing edges of sidewalks, driveways, street curbing, and building foundations, displacing native species. On occasion, foragers travel inside residential homes in search of food, earning them nuisance status from homeowners as well. Traditional controls have included reducing free water, restricting food sources, sealing gaps and cracks used as entrances, applying powder barriers, and using toxic baits.



Typical area chosen for feeding trials

However, pavement ant has proved difficult to control. Therefore, studies were initiated to better develop means for its management. This included evaluations of different foods for acceptance as potential baits, evaluations of bait acceptance when combined with insecticides, and evaluations of the potential for baking soda generated CO2 to increase visitation to traps.

Food Preference - Methods & Materials

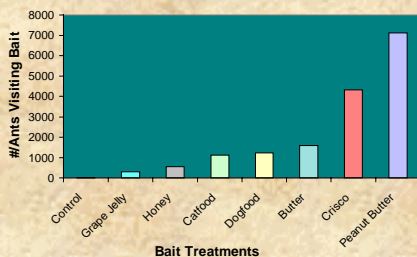
The basic design for food preference trials involved use of 10 Sentricon Termite Bait Stations placed along a sidewalk area. The inserts were modified with 8 Petri dishes drilled with 3/32-in holes to allow access by *T. caespitum* and restrict larger species. Traps were placed at 35-ft intervals.



Subsurface sentricon tube

Into the Petri dishes were placed samples of seven sample foods (plus an unbaited control): peanut butter (Creamy Jif), butter, Crisco shortening, grape jelly, moist cat food, honey, and dry dog food. A sample of each food was provided in bait station, establishing a choice test arena. Data were taken approximately 5 times per week in daylight hours and numbers of ants visiting each food source were recorded. These experiments ran from 1 July through 13 October 1999.

Food Preferences



Food Preference - Results

Peanut butter was the most consistently foraged food, attracting 7117 of the 16,235 total ants (43%) counted in this study. The second most actively foraged food source was Crisco shortening (fat) with 4,322 visits. Together, both of these fatty food sources attracted over 70% of ants foraging at the bait stations. Butter, another fatty food source, was the third most attractive food, attracting 9%.



Ants feeding at bait stations



Feeding inserts

Use and Seasonal Acceptance of Baits to Control Pavement Ant

Greg Walker, Whitney Cranshaw,
Elisa Bernklau, Erich Fromm, Lou Bjostad
Colorado State University



Pavement ant larvae and adult

Comparison of Bait Station Acceptance - Methods and Materials

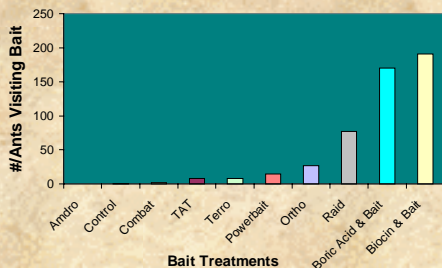
A study was conducted to evaluate relative visitation to baits. These included various commercially available bait stations as well as experimental bait mixtures, prepared based on results of previous baiting trials. The latter were prepared in portions approximately equal to that found in the commercial baits.

All baits were presented in a choice test using a 24 inch cardboard doughnut with 10 Petri dishes glue. The "doughnut" of traps was then placed either over the entrance hole of a pavement ant colony or immediately adjacent to it and covered to prevent desiccation from sunlight but which still allowed equal access to all treatments. There were six replications. The study was conducted in a field during August 4 and August 12, 1999. Treatments included: 50/50 mixture of peanut butter (Creamy Jif)/Crisco + 5% boric acid; 50/50 mixture of peanut butter/Crisco + 5% Biocin; Amdro; Combatbaitstation; Ortho bait station; Powerbait bait station; Raid bait station; TAT bait station; Terro bait station; an empty check (negative control).

Bait card with dishes containing treatments



Bait Comparisons



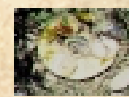
Bait Comparisons - Results

Of the 499 foraging ants observed visiting the bait stations during a 9 day period, the greatest number (N=191, 38%) visited the mixture of 50/50 peanut butter/Crisco combined with Biocin; the 50/50 mixture of peanut butter/Crisco also attracted a high number of foragers (N=170, 34%). Raid bait stations were third most commonly observed to be visited, attracting 15% of foragers. Relatively very few ants were attracted to the Ortho, Powerbait, Terro, and TAT traps. Combat traps showed no more visitation than the unbaited control and no ants visited Amdro.

Bait Acceptance/Boric Acid Combinations - Methods & Materials

In a field trial combinations of bait, baking powder and boric acid were evaluated for acceptance by pavement ant. The basic presentation of baits involved use of a modified "doughnut" with three petri dishes attached that contained the test bait. These were placed around the entrance of a pavement ant nest. In addition, a modified Eppendorf tube, of the design described above, was placed in the center of the nest entrance, to see if it may affect foraging at the various baits. This resulted in a combination of treatments that involved both the Eppendorf tube bait and the primary bait provided in the petri dishes. There were 4 replications. Treatment combinations included:

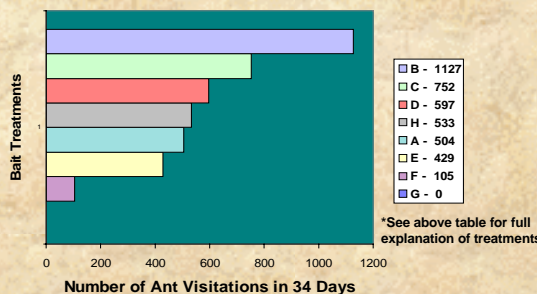
Treatment	Top of tube/Bottom of tube	Petri dish bait
A.	FB + BA/BP	FB + BA
B.	FB/BP	FB
C.	FB/Empty	FB
D.	FB + BA/Empty	FB + BA
E.	FB + BA/BP	FB
F.	FB/Empty	Empty
G.	Empty/Empty	Empty
H.	FB + BA/BP + BA	FB + BA



Bait card with dishes containing treatments

FB = Food bait (Creamy Jif peanut butter/Crisco, 50/50); BA = Boric acid; BP = Baking powder

Evaluations were made by counting all ants visiting bait stations. The course of this experiment ran from August 23 to September 26, 1999.



*See above table for full explanation of treatments

Bait Acceptance/Boric Acid Combinations - Results

Of the 4047 total visits observed in this experiment greatest numbers of pavement ants were observed to visit a peanut butter/Crisco food bait when an inserted food bait/baking powder bait was placed at the entrance of the colony (Treatment B). Among the eight treatments, 1127 (27%) were captured at these bait stations.

This was 50% greater number of ants than were observed to visit comparable bait stations (Treatment C) that differed only in that the bait inserted into the colony entrance lacked baking powder. This suggests that baking powder, or its CO2 generated products, can increase visitation to baits.

The addition of boric acid, in 5% concentration, appeared to reduce slightly the visitation of pavement ants to baits. (Comparison of Treatment C vs. Treatment D.) The addition of baking powder into the petri dish mixture of peanut butter/Crisco bait with boric acid did not result in a significant increase of visitation to the bait stations. (Comparison of Treatment D vs. Treatment A.)

Baking Powder Attractant - Methods & Materials

The effect of baking powder, activated by moisture from CO2 generation, was evaluated to see if it would increase recruitment to baits. Baits were applied in Eppendorf tubes drilled to allow entrance of the ants and modified so that they were 2-chambered, with the food bait being placed in the upper chamber. They were inserted together into the soil within modified Sentricon bait station tubes and placed at intervals adjacent to a sidewalk. There were 10 replications.

Treatments included: 1 gr 50/50 peanut butter/Crisco + 1 gr baking powder (moistened); 1 gr 50/50 peanut butter/Crisco; and empty tube (negative blank).

Treatments were evaluated by counting the number of ants visiting each site (top, bottom) from July 28th to August 29th, 1999.



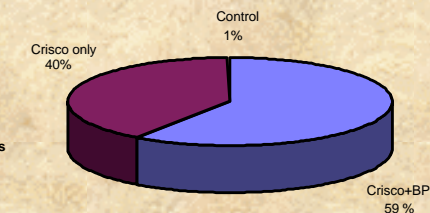
Two chambered bait station



Baking powder insert

Baking Powder Attractant - Results

Of the 803 recorded visits to the baits, 59% occurred at bait tubes that were combined with baking powder versus 40% visiting baits without the baking powder. In tubes with the combination of baking powder and food bait 53 (6.6%) were observed in the bottom of the device, tunneling within it.



CONCLUSIONS

Pavement ants overwhelmingly preferred fatty foods (Creamy Jif peanut butter, Crisco shortening, butter) over cat food, dog food, honey, or grape jelly.

In comparison of six commercial bait stations to two 50/50 peanut butter (Creamy Jif)/Crisco combinations with toxicants (5% boric acid, Biocin), foragers preferred to visit these latter mixtures over the commercially bait stations. Some bait stations showed no attraction to pavement ants.

The addition of baking powder combined in a bait station appeared to increase pavement ant recruitment to baits.

Addition of 5% boric acid caused slight reduction in observed visitation to baits.