

Laboratory Assay of Effect of Instant Grits and Malt-O-Meal for Imported Fire Ant Control

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Use of instant grits or similar products has been a home remedy for attempted red imported fire ant control throughout the Southeastern United States. The practice has become fairly common and those using the technique have reported good results so frequently that the practice has become recommended by certain organic gardeners and practitioners (H. Garret. 1993. Texas Organic Gardening Book. Gulf Publishing Company. Houston, Texas. (p. 140) 245 pp.). This laboratory study was undertaken to develop some scientific data regarding the effects of instant grits and Malt-O-Meal in fire ant colonies.

Filtering capacity of ants. “Solids are inevitably consumed by worker ants during grooming as well as foraging, but are excluded from the ants’ liquid diet before food is ingested. The unique filtering capability is facilitated by two structures that have evolved to become integral parts of the ants’ alimentary tract. The buccal tube (BT) is a narrow passageway, lined with setae (hairs), leading from the oral cavity to the pharynx. Particles that are too large to pass through the BT are retained within a ventral infolding of the oral cavity, the infrabuccal pocket (IBP). If particles of a specific size are fed to an ant and the number of particles recovered from its IBP is divided by the total number of particles recovered from both the IBP and the crop, the resulting ratio provides an estimate of the ant’s filtering effectiveness at that particle size. Matrix-bound, micro-encapsulated, or microbial control agents whose delayed mode of action requires ingestion would be unlikely candidates as potential formicides for ant species who could, due to particle size, exclude them from their diet.” The red imported fire ant workers are extremely effective at excluding 82 percent of 0.2 μ m diameter microspheres from a sugar water solution. At diameters of 0.5 and 0.75 μ m, workers filtered 98 and >99 percent of microspheres, respectively. No microspheres with a diameter of 1.0 or 1.8 μ m were recovered from the crop of any worker (From: John M. Petti. 1997. “A comparison of food filtering efficiency in workers of the red imported fire ant, Pharoah ant, and Florida carpenter ant”, pp. 97-98, *in* Proceedings of the 1997 Imported Fire Ant Research Conference”, Gainesville, FL).

Materials and Methods

This trial was initiated on November 15, 2000, when twelve red imported fire ant colonies were dug from field locations into 5-gallon plastic buckets. The inner surfaces of the buckets and shovel handle had been liberally dusted with baby powder to prevent ants from climbing up the vertical surfaces to escape. Colonies were placed in the laboratory and maintained at room temperature throughout the duration of this trial. After colonies in buckets had been given a day to establish in the bucket, four colonies each were given either instant grits, Malt-O-Meal or nothing (untreated control). Colonies were monitored 1, 2, 5, 7, 11, 19 days (Nov. 16, 17, 20, 22, 26, Dec. 4) following treatment to determine if colonies were active and surviving.

Results and Discussion

By using this laboratory assay method, results are replicated (4 times), and were conducted at room temperature to overcome cooler outdoor conditions at that time of year which would have reduced ant foraging on the “bait” treatment particles. In addition, ant colonies could not migrate or move away from the treatment site, which is a problem in field trials when determining if a colony perished or merely re-located. Field studies, however, during warmer climactic conditions should be conducted to confirm these laboratory observations.

Examination of colonies at the five-day inspection confirmed that the two replicates of colonies dug in an area of heavy black clay soil were all very weak and small. They were each provided a tube of water. Each colony was given two seafood-flavored seafood pellets (Tender Vitals®). Ants from colonies dug in sandier soil continued to actively move soil, building up “mounds” housed in buckets.

On Nov. 26, ants in one bucket treated with grits, collected from black clay soil, appeared to have declining activity. All colonies dug from that substrate (2 replicates) showed less activity than ants collected from sandier soil. At the end of the trial, ant colonies in buckets were returned to the field and soil was examined for presence of ants and developing stages (larvae and pupae). All twelve colonies were found to be alive and were producing at least some brood. However, food particles were found throughout the soil profile, indicating that, indeed, the foraging worker ants retrieved the particles and brought them into the nest. Because no colony was eliminated by either treatment, no statistical analysis was conducted on these data.

Results of this no-choice, laboratory study do not support use of instant grits or Malt-O-Meal as an effective treatment for eliminating colonies of the red imported fire ant.

Table 1. Red imported fire ant colony survival after receiving 1 cup Malt-O-Meal, instant grits or no treatment (1 = live colony).

Treatment	Date	
	Nov. 15 (0 days)	Nov. 16, 17, 20, 22, 26, Dec. 4 _____
	(1, 2, 5, 7, 11, 19 days) _____	
Malt-O-Meal	1,1,1,1	1,1,1,1
Instant grits	1,1,1,1	1,1,1,1
Untreated	1,1,1,1	1,1,1,1
