

Evaluation of Potential Attractants for the Red Imported Fire Ant

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The red imported fire ant, *Solenopsis invicta* Buren, is an omnivore, feeding on many organic substances. Foraging workers are also attracted to sources of moisture and fragrances. This laboratory assay was undertaken to determine the attractiveness, if any, of oil-based materials to foraging ants.

Materials and Methods

On January 13, 1992, tests were conducted to determine the relative preference of the red imported fire ant for the following products:

T.L.C.[®] Massage cream (TLC)
Soothe and Cool[®] Massage cream (SC)
Mineral Oil (MO)
Glycerol (GL)

Test One was performed using five, freshly collected (January 10, 1992), multiple-queen, fire ant colonies. The colonies were collected from moist soil in five-gallon plastic buckets lined with talcum powder to prevent ant escape. The ants were immediately supplied with food and water. The preference test was conducted in the buckets and initiated at 9:30 a.m..

Test Two was performed using four colonies that had been collected in September, 1991 and kept in laboratory boxes. The ants were deprived of food and water from January 10 until the time of the test. The preference test was conducted by placing the test set-up in the colony boxes and was initiated at 9:30 a.m..

Test Three was identical to Test Two, but was initiated at 5:30 a.m., January 14, 1992 to take advantage of the fire ants' increased foraging activity at night.

The methodology for all tests involved placing a six inch square of 3/4 inch thick board in each colony to provide a level, stable base. A five by seven inch clear plastic lid was placed on top of each board to prevent the products from soaking into the wood. The materials tested were painted onto glass scintillation vials and one vial of each material was placed on the plastic lid in each colony.

A fourth test was conducted to determine the attractiveness of the material in question versus known food sources. Four plastic weighing boats containing 0.5 milliliters of the following substances were placed in each of the five fresh colonies at 5:45 a.m., January 14, 1992:

Soy bean oil (Soy)
1:4 Honey:water
T.L.C. ® massage cream (TLC)
glycerol

The attractiveness of the materials in all tests was evaluated by estimating the number of worker ants associated with each treated vial. Evaluations were made at fifteen minute intervals for two hours and fifteen minutes. The second set of tests were conducted in a darkened laboratory with a minimum of indirect light for set-up and evaluation.

Results and Discussion

In tests conducted with no known fire ant food source (Tests One through Three), glycerol attracted larger numbers of ants than other treatments. Intensified nocturnal (night-time) foraging was demonstrated by the relatively larger numbers of ants associated with this treatment in Test Three versus Test Two.

These results indicated that glycerol, an ingredient in the massage oils, attracted relatively more foraging fire ant workers than the oils themselves. Apparently additional ingredients such as fragrances, cause these products to be less attractive. Conversely, when known fire ant food sources (honey water and soybean oil) were offered to ant colonies, glycerol and massage oil were shown not to be attractive in Test Four.

In conclusion, results from Test One, Two, and Three indicate that T.L.C. ® massage oil was only slightly attractive to foraging fire ant workers. Test Four indicated that, in the presence of a known food source, the massage cream is unattractive. Even after 24 hours, it was noted that the massage cream remained unattractive in the test colonies even though the ants had been starved since the test was initiated.

Summary of Test Results - Average number of ants associated with treated vials and food sources

Test One - Daylight, Fresh Colonies

Material

<u>Elapsed Time</u>	<u>TLC</u>	<u>S & C</u>	<u>Min. Oil</u>	<u>Glycerol</u>
0:15	2.2	1.0	1.0	6.6
0:30	2.2	1.8	1.0	7.8
0:45	1.4	1.0	0.8	5.6
1:00	1.2	0.8	1.0	4.2
1:15	1.6	2.0	0.6	2.4
1:30	1.2	1.0	0.8	4.2
1:45	0.8	0.6	0.8	2.0
2:00	0.8	0.2	0.8	2.4
2:15	1.2	1.2	0.2	1.6

Test Two - Daylight, Water-stressed Colonies

Material

<u>Elapsed Time</u>	<u>TLC</u>	<u>S & C</u>	<u>Min. Oil</u>	<u>Glycerol</u>
0:15	9.75	1.0	0.5	6.0
0:30	3.5	3.75	0.0	5.0
0:45	3.0	2.0	0.5	6.75
1:00	1.5	2.5	0.0	9.75
1:15	2.25	1.0	0.25	7.75
1:30	2.0	1.75	0.75	11.75
1:45	3.25	1.25	0.5	8.0
2:00	1.0	0.5	0.25	5.75
2:15	1.75	1.5	0.5	10.25

Summary of Test Results, continued - Average number of ants associated with treated vials and food sources

Test Three - Night, Water-stressed Colonies

Material

<u>Elapsed Time</u>	<u>TLC</u>	<u>S & C</u>	<u>Min. Oil</u>	<u>Glycerol</u>
0:15	3.75	1.75	0.25	20.75
0:30	4.5	5.25	0.0	32.0
0:45	3.0	3.5	0.0	28.25
1:00	1.5	3.0	0.0	17.75
1:15	4.75	3.25	0.0	15.25
1:30	2.0	2.25	0.0	12.25
1:45	2.75	3.75	0.0	10.75
2:00	2.5	3.5	0.0	12.5
2:15	3.4	1.75	0.0	12.0

Test Four - Night, Fresh Colonies with known food sources

Material

<u>Elapsed Time</u>	<u>Soy</u>	<u>Honey-water</u>	<u>TLC</u>	<u>Glycerol</u>
0:15	9.4	18.4	0.2	0.0
0:30	20.8	37.6	0.0	0.8
0:45	50.0	75.2	0.0	1.0
1:00	51.2	80.0	0.0	0.2
1:15	62.2	90.0	0.6	0.4
1:30	63.2	Consumed	0.6	2.8
1:45	65.0	Consumed	0.4	0.8
2:00	86.0	Consumed	0.0	1.2
2:15	86.6	Consumed	0.0	2.4