SOUTHERN FOREST EXPERIMENT STATION

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TOWN ANTS CONTROLLED WITH MIREX BAITS

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SOUTHERN FOREST EXPERIMENT STATION

In exploratory tests in central Louisiana,[1] colonies of town ants, *Atta texana* (Buckley), have been destroyed with an experimental bait containing mirex, a chemical used for controlling the imported fire ant. The bait was formulated as small pellets and placed on the surface of the ground. It is safe to handle, requiring only the use of rubber gloves. The chemical compound is dodecachlorooctahydro-1, 3, 4-metheno-2H-cyclobuta [cd] pentalene.

The town ant, sometimes called the Texas leaf-cutting ant, is a serious pest of pine seedlings in central Louisiana and east Texas. The insects damage trees by cutting off needles, bark, and buds, which they carry to underground gardens for the culture of a fungus that they use for food. Complete control of the ants for 4 or 5 years is essential to success in planting or seeding forest trees. Fumigation with methyl bromide or carbon disulfide is at present the only known control, but it is not fully effective at all seasons and the volatile materials require very careful handling.

Fourteen colonies, ranging in size from 1 to more than 500 surface mounds, were treated with the bait in an initial test during the fall of 1963. The pellets were placed around feeder holes, which surround the central nest and connect it with foraging trails. For small nests without outlying feeder holes, the bait was placed directly on the mounds. Dosages were heavy: 14 grams of bait per entrance, with 10 to 100 feeder holes baited, depending on nest size.

Worker ants immediately carried all the pellets into the nest (fig. 1). Normal foraging ceased in 5 to 10 days, and all colonies were dead within 30 days.

Similar results were observed in February 1964, when 18 colonies were treated. They ranged in size from 50 to 100 mounds. Bait was applied at the rate of 2.8 grams per visible mound, and was distributed around 10 or more entrance holes. For example, a colony having 100 mounds in the central portion of the nest received 280 grams.

In each test, the foraging ants exhibited toxic symptoms in 3 to 5 days. Their mandibles were spread apart, they reared backwards, and shortly before they became immobilized they drew their abdomens up under the thorax.

[1] The research was done with the cooperation of Allied Chemical Corporation.

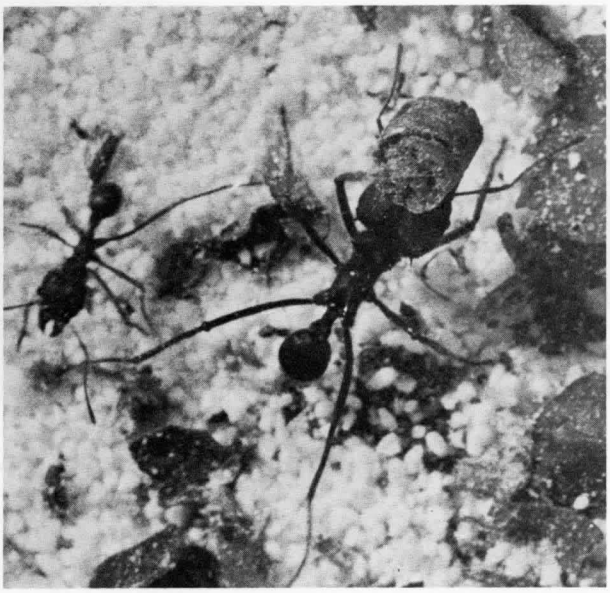

FIGURE 1.—*Foraging ants carried pelleted bait to their underground chambers.*

Twelve nests were partially excavated after all surface activity had stopped. All ants in them were dead, and the fungus gardens were in an advanced stage of deterioration and covered with foreign fungi. Follow-up examinations for a 6-month period disclosed no new activity.

Laboratory tests were made to learn how a colony utilizes the bait. Small, one-mound nests were excavated and placed in clear plastic containers that were connected to additional containers holding bait and accessible to foraging workers. Though the workers seldom moved the pellets into the fungus garden, the colonies were affected in the same way as those in the field: workers were dying within 3 days and the colonies were destroyed in 6 days.

It has usually been thought that the fungus gardens are the ants' sole source of food, but laboratory studies with dyed bait showed that the workers were feeding outside the gardens. Microscopic examinations revealed dye throughout the digestive tract and concentrations of it in the post-pharyngeal glands, which are associated with the digestive system (fig. 2). Similar concentrations of dye occurred in the nonforaging workers, indicating that there was a direct food transfer between individuals.

The bait promises to reduce costs, give consistent control, and extend the season in which colonies can be treated. Additional studies are in progress to determine minimum dosage and the feasibility of simple broadcast application.

Mirex bait developed specifically for use on town ants is not yet available commercially. It may be marketed during 1965, after current studies are complete and hazard to wildlife has been evaluated.

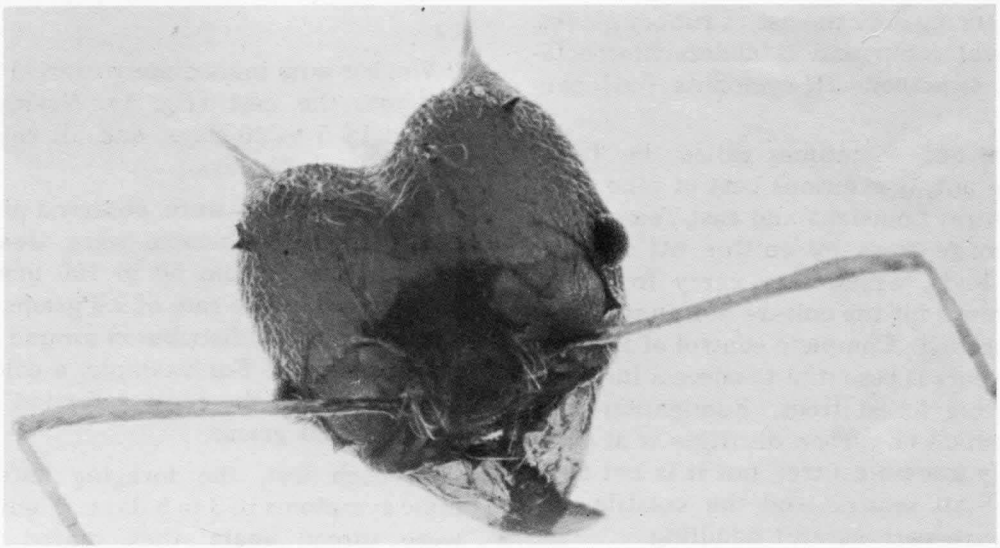

FIGURE 2.—*Head of a town ant that has eaten mirex bait; dye from the bait has accumulated in the post-pharyngeal glands, which are located above the antennae.*