

Bureau of Entomology and Plant Quarantine. Although the field work in connection with this campaign is being directed by officials of the State Plant Board of Florida, the activity is distinctly cooperative. State funds have been supplemented by federal funds derived through the Bureau of Entomology and Plant Quarantine. Two large federal trucks equipped with Fitzhenry Guptill power spray units, as well as a smaller Bean power spray outfit, have been supplied by the bureau, and the bureau now has one of its entomologists stationed at Key West studying insect conditions with special reference to West Indian fruit fly.

State and local administrators of the FERA have since the beginning of intensive eradication measures manifested the keenest interest in the project and have rendered valuable aid in contacting and consulting with local residents, as well as with allotments of money and labor.

**Conclusion.**—After several years of observation and biological investigations, and eighteen months of intensive eradication activities, it is felt that progress has been made towards its goal—eradication of fruit flies from Key West. Realizing fully, and much more so than can anyone not familiar with local conditions, the many difficulties to be overcome before the task is completed, we feel that, barring the unforeseen, eradication is possible without prohibitive cost and at a comparatively early date.

## CONSIDERATION OF THE FIRE ANT *SOLENOPSIS XYLONI* AS AN IM- PORTANT SOUTHERN PEST

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Although the common name "fire ant" is applied to a number of species and their variants of the genus *Solenopsis*, the common Gulf coast form *Solenopsis xyloni* is the most important throughout the south. To the average individual they are generally known either as "red ants" or "stinging ants." As the ants are polymorphic and their major workers distinctly red, whereas the minor workers are much darker, people often get the impression that there are two distinct species troubling them. In size, these forms range from 1.6 to 5.8 mm. The formicologist or entomologist recognizes the worker of this species by its two-segmented antennal club, toothed clypeus, lack of epinotal spines, two-segmented petiole, shining body, etc.

The species *S. xyloni* occurs within an area bounded on the north approximately by the 35th degree of latitude and extending from the Atlantic to the eastern boundary of Arizona, with the exception of most of Florida, where it is replaced by the tropical fire ant *S. geminata* and its subspecies. It is especially abundant and troublesome in the Gulf coast region.

Careful checks by the writer of the abundance of colonies of these ants on blocks in various Mississippi towns have shown a range from five to

fifty per cent of the total ant colonies, with a general average of 20.5 per cent. If the density per block were based on the number of individuals rather than colonies, the density would be much greater for the fire ant because of its unusually populous colonies. The density in the rural areas is apparently equally as great. While no careful counts have been carried on to determine the population of various fire ant colonies, excavations of approximately 80 colonies by the writer and an assistant have shown that most colonies must be estimated in the thousands. In one nest, actual count of the dead ants in a single chamber totaled 2360 workers, and this conservatively was probably not more than one-tenth of the entire nest.

Generally the nests are in freely exposed soil areas, but the ants also nest in the soil under debris, such as boards, stones, cow chips, etc., or often around or beneath clumps of grass, strawberry plants, shrubbery and other plants. They often nest in rotten wood, and on many occasions they were apparently nesting in masonry work. Many times nests are found in greenhouses or beneath residences, especially around fire hearths where, due to the artificial heat, their colonial activities go on uninterrupted the year round. The common form of nest architecture in the soil is that of multiple craters often scattered over areas of amazing extent. One large nest was approximately 10 by 24 feet; the average, however, is probably not over two to four feet square. An experienced person can recognize the craters or piles of earth made by fire ants by the shape of the soil particles and the generally loose or fluffy manner in which the earth is piled. If one steps on a nest or jars it by design, there is an outpouring of angry ants, stinging viciously.

A tabulation of the data secured during the Argentine ant survey conducted by the United States Bureau of Entomology in sixteen states showed that of the 75 species found troublesome, exclusive of the Argentine ant, the fire ant *S. xyloni* was responsible for 15.7 per cent of all complaints.

In Mississippi, the fire ant has only one close competitor as an economic species—the Argentine ant, which is more important as a house pest but does not perhaps have as wide range of injurious habits as the fire ant. In Mississippi, with the exception of the tropical fire ant and Florida harvesting ant *Pogonomyrmex badius* Latr. there are no other ants that have the ability to inflict any really painful stings. On people with tough skins, although painful or uncomfortable, the stings have no appreciable after effects. On babies or small children, they can often leave sores. Workers in the garden, lawn, orchard or field may be subject to the attack of these ants at any time. On numerous occasions they have been reported as destroying poultry and quail at the time of hatching.

The fire ant is also a most general and annoying house pest. Although omnivorous in its feeding habits, the ants show a distinct preference for meats, grease, butter, nuts and other greasy foods. So far as the writer knows, the Argentine ant never gnaws holes in clothing, table linen or bed linen. That the fire ant does this is an established fact. The writer has seen many silk, woolen, linen and cotton articles with small holes gnawed in them by the ants. Apparently soiled articles are more attrac-

tive to them, but clean clothes are also attacked. In greenhouses and vegetable gardens the ants often cause poor stands through their habit of stealing seeds from the beds, this being particularly true of the smaller seeds. They assiduously attend a large number of species of mealybugs, plant lice and scale insects; in some instances not only are cartons built over certain mealybugs, but the ants resist attempts to remove the mealybugs from their host. It is common knowledge to nurserymen and others that the ants often girdle young nursery stock, such as citrus and pecan. The writer has also seen the ants gnawing into the buds of okra and althaea, the stems of dahlias, and the base of the fruits of eggplants. Irish potato tubers are often scarified or gnawed into as well as strawberries. Entomologists rearing insects frequently lose many specimens because of the predatory fire ant. In many instances, fire ants destroy serious insect pests, such as immature stages of the boll weevil, the sorghum midge and others, yet these beneficial habits will hardly offset their many and serious economic injuries.

Although the fire ant has probably as many natural enemies as most ants, these do not seem to exert any appreciable control. On several occasions the writer has seen chickens feeding on the ants at the time of their nuptial flights when their activity and abundance on the soil was especially noticeable. Several phorid flies belonging to the genus *Plastophora* parasitize them, but no one has yet worked out the biology of these parasites, so it is not known exactly how they operate on the ants or the amount of reduction they cause.

The writer's observations and experiments over a period of years apparently indicate that fire ants cannot be successfully poisoned with a sweet bait, such as the Argentine ant poison. Limited experiments with poisoned baits of greases, meats and nuts, in which arsenicals or tartar emetic have been incorporated, have shown slightly beneficial results, but not enough to be entirely satisfactory. At this time, experiments in the fumigation of nests (where accessible in the soil) have shown very promising results in which effectiveness, low cost and other desirable features are combined. Occasionally, nests are located in houses inaccessible for treatment, and here the only recourse is a poisoned bait. The importance of the fire ant in the south would justify a great deal more research on its habits and control than is now being given to it.

## NOTES ON PINK BOLLWORM SEPTICEMIA

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In the summer of 1932 a disease was observed among pink bollworms used in rearing parasites at the laboratory of the Division of Cotton Insect Investigations, Presidio, Tex. The disease was observed only under laboratory conditions and has not been noted in the field. Inasmuch as the disease interfered with the breeding of parasites by destroying the host insects and caused additional labor in the operation of the