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**THE SMALL FIRE ANT *Wasmannia* IN CITRUS GROVES—
A PRELIMINARY REPORT**

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During 1935 and 1936 reports began to come in of annoyance to citrus fruit pickers by small stinging ants. These complaints have increased in number since then, and late this spring there were at least two instances on the East Coast of Florida where picking crews had literally been driven from their work by these ants.

The species concerned, *Wasmannia auropunctata* (Roger), was described in 1863 in a German publication (1)¹. In 1929 M. R. Smith reported its presence in the United States from specimens sent to him from Miami, Fla. (3). Later in the same year, W. M. Wheeler (4), in commenting on this report, said that in 1924 he had received specimens from the Fairchild place in Coconut Grove, Miami, with the information that the stings of the species were painful. He stated that *Wasmannia* is a very common ant throughout Central America, northern South America, the West Indies, and warmer portions of Mexico, and that in Puerto Rico it is a pest in coffee plantations and coffee pickers are seriously annoyed by it. By that time it had also become well established in the Kew Gardens in England.

¹Numbers in italics in parentheses refer to Literature Cited, page 14.

In Puerto Rico the ant *Wasmannia* is called the "albayalde". During 1935 and 1936 the "albayalde" was studied there by M. R. Smith (6)² in connection with coffee insects. He found these ants feeding on honeydew produced by the hemispherical scale (*Saissetia hemisphaerica* (Targ.)), the green scale (*Coccus viridis* (Green)), the aphids *Toxoptera aurantiae* Boyer, *Sipha flava* (Forbes), and *Pentalonia nigronervosa* Coq., and the mealybugs *Pseudococcus brevipes* (Ckll.), *P. sacchari* (Ckll.) and *P. virgatus* (Ckll.). He quoted a statement by another worker, R. H. Van Zwaluwenberg, that the "albayalde" often kills out or displaces colonies of the ants called "hormiguilla" (*Myrmelachista ramulorum* Whlr.) in coffee groves.

RECORDS FOR FLORIDA

In time that could be spared from other work a survey of Florida has been made and infestations of *Wasmannia* have been found in citrus groves or nurseries in the following places:

<i>Florida East Coast</i>	<i>Central Florida</i>	<i>Florida West Coast</i>
Homestead	St. Cloud	Naples
Perrine	Orlando	Arcadia
Coconut Grove	Winter Park	
Miami	Apopka	
Miami Beach	Auburndale	
Fort Lauderdale		
Fort Pierce		
Cocoa		
New Smyrna		

It is probable that the ant is present in many other places in the lower two-thirds of Florida, but even with the records we now have, we can say that there are many small infestations well scattered through that part of the State.

DISPERSAL

It is probable that these local spot infestations will enlarge slowly each year unless checked. The rate of spread in one city infestation was about 50 feet in one year, and this was by enlargement of the colony's ground network. Although the queens have wings, no flight has been observed, and in the formicary there is no tendency of the queens to fly, but they crawl about wherever the workers go. In a Miami nursery a thriving colony,

²Also unpublished reports on investigations of coffee insects, 1935-36, by M. R. Smith, Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture.

with queens and brood, was found 6 feet above ground level in the V-shaped angles on a coconut palm leaf where the green leaf parts are attached to the leaf stem. There is much danger of artificial spread from palm or citrus nurseries, as the ants nest around the bases of the trunks and even under leaf bases and in crevices and depressions located well above ground, and many of these nursery plants are transplanted in a ball of soil in which the ants may be nesting.

DESCRIPTION

Wasmannia is a small golden-brown ant, one of the smallest we have in Florida. The workers may be distinguished easily from other grove ants by their small size, their distinctive color, and especially by their slow, deliberate rate of movement, in broad trails up trunks and branches to the leaves. According to M. R. Smith,³ workers of *Wasmannia* may be separated from those of the fire ant (*Solenopsis geminata* (F.)) by the antennal club being 3-jointed instead of 2-jointed, by the presence of two spines on the posterior dorsal part of the thorax, and by the absence of teeth on the clypeus. Usually, after a few encounters, it is not necessary to see if the suspected small ant stings severely. This is, however, another sure means of identification, since no other small grove ant stings as severely as the *Wasmannia*. The queens are large compared with the workers, being one-fourth inch long.

NESTING HABITS

Most ants dig definite nest tunnels into the ground, and these may have one or several entrances. The small fire ant is unusual in its nesting habits, as it has no definite nests. It may live between tree trunk and soil at the surface level or just below; often a few queens, brood, and worker masses take possession of holes and decayed places in the tree trunks several feet above the ground. Another favorite place is under leaf bases of palms or palmettos in natural growth adjacent to the groves. Between the trees flat pieces of wood or stones or partially decayed masses of cover crops may be nesting places, and a heavily infested uncultivated grove soon becomes one huge nest network, with foci of queens and brood every 6 or 8 inches and trails of workers connecting these reproduction centers. The presence of moisture and slight shelter for the queens and

³Personal communication.

brood seem to be the only essentials for nesting, and it is seldom that the ants go deeply into the ground for these.

NATURAL FOOD

Honeydew from insects is the most important food of *Wasmannia* in Florida citrus groves. In the spring the usual outbreak of the green citrus aphid (*Aphis spiraecola* Patch) curls the new-growth terminals and provides an abundance of honeydew. The tiny ants may be found in the curled leaves attending the aphids and returning down their trails with distended abdomens. *Aphis gossypii* Glover and *Toxoptera aurantiae* (Boyer) are also visited for food. The citrus whitefly (*Dialeurodes citri* (Ashm.)), the cloudy-winged whitefly (*D. citrifolii* (Morg.)), and the woolly whitefly (*Aleurothrixus howardii* (Quaint.)) also produce honeydew. The honeydew from the first two drips down on leaves below the ones infested, and the ants take up the sweet material there, rather than from the insect bodies. The cottony coverings over the woolly whitefly larvae catch some of the honeydew, and the ants crawl over the groups of larvae to take up the food. As the season advances, aphids become fewer and whiteflies more abundant; then soft scales appear, such as the green scale, the Florida wax scale (*Ceroplastes floridensis* Comst.), and the cottony cushion scale (*Icerya purchasi* Mask.). These furnish food, too. The citrus mealybug (*Pseudococcus citri* (Risso)) is especially abundant at times in grapefruit trees, and it furnishes much honeydew during an outbreak. In Florida there is seldom a time during the year when honeydew-producing insects are completely absent.

In addition to these natural sources of food, the ants have been observed feeding on carcasses of land crabs and small animals, and on dead insects. They also congregate under ripe orange and avocado fruits that have broken open in falling to the ground and eat the sweet juices or oils.

OTHER FOODS

Feeding tests made in groves and in a formicary have demonstrated that the small fire ants will eat dry cane sugar, cane sirups, and other sweet sirups, but they show a special fondness for cooked fat meats, such as crisp bacon or fat beef, and also for vegetable oils, such as olive oil and the cottonseed oil from cans of cheap sardines. Milk may be eaten to some extent, but the ants will leave it for sirups or fats.

Wasmannia is a serious problem in households near outdoor infestations; it contaminates foods, is attracted to dirty and sweaty work clothing, and even infests beds and stings severely when rolled upon or touched. The problem of *Wasmannia* as a household pest is under investigation by the Division of Insects Affecting Man and Animals of the Bureau of Entomology and Plant Quarantine, under the local leadership of W. V. King.

STINGING HABITS

Wasmannia does not sting readily. Individuals may wander about over the uncovered skin for some time and cause no inconvenience. They may be made to sting by pressing them down to a tender spot of skin. In the grove they are all over the leaves, eating honeydew, and when the pickers clip fruits, some of the ants are dislodged and crawl about over the clothes. Sooner or later they get between collar-band and neck, or under the shirt or belt, or even between socks and ankles, and then, when pressed, they sting sharply and severely. A single ant may sting three or four times before it can be dislodged. Each stung place gets red and swells, and finally a spot larger than a silver dollar is affected. It may become whiter than the normal skin, or redder. For some people a few stings give only slight passing discomfort, but for others the sting lasts for three days, aching painfully at first, and later itching intensely by spells. If stings are numerous, say a dozen or two within a short time, the victim gets pale and becomes "shaky" and unnerved, and when a picker reaches this stage he quits work. Premiums have to be paid in wages now to get picking done in some of the groves having fire-ant infestations.

RELATION TO OTHER ANTS AND TO BENEFICIAL INSECTS

Wasmannia is more deliberate and much slower in its movements than other ants infesting citrus groves, and has not been observed chasing them or fighting other species. It probably could not catch them. Ants which often visit the same food plants around the edge of a nest network seldom can be found feeding on the same leaves with the small fire ants. Anywhere within the network of a heavy infestation other ant species are conspicuous by their absence. Whether the other ants are put to death by *Wasmannia*, or are repelled by the odors of that species, or are starved out, is not clear at present. But like the Argentine ant, *Iridomyrmex humilis* Mayr., the *Wasmannia* prevails over other species.

The small fire ants do not prevent ladybeetles, such as the vedalia (*Rodolia cardinalis* (Muls.)), from breeding and preying on host insects; the ants and ladybeetles have been found on the same host several times. But it seems that infestations of the cottony cushion scale thrive unusually well in ant-infested groves in spite of the vedalias. Usually, with no fire ants, vedalias clean up such a scale infestation quickly and completely. *Wasmannia* workers have been observed carrying very young cottony-cushion scales in numbers down their trails toward the ground nests. It is almost certain that they deliberately spread this insect from branch to branch and from tree to tree.

CONTROL EXPERIMENTS

(1) DESTRUCTION OF NESTS.—Some species of ants may be controlled by the introduction into the nest of a fumigant such as carbon disulfide or hydrogen cyanide. This is hardly possible with *Wasmannia*, because of the character of the nest network, which covers the ground and even extends up into the trees. Without doubt, harrowing or shallow cultivation of a grove would limit the suitable nesting spots to undisturbed ground around the trees and would help control the ant and slow up its spread into uninfested areas. However, there are large districts in the State where such cultivation is not practiced. To reduce the number of nesting places above ground, old leaf bases should be removed from palms, and wounds and rotten places in citrus trees should be cleaned out and treated.

(2) BARRIER BANDS.—For temporary protection of the pickers and to cut the ants off from their food in the trees, a barrier which is safe for the trees yet effective against *Wasmannia* would be very useful. In preliminary trials, whitewash containing crude carbolic acid and whitewash with bichloride of mercury were ineffective, as they broke up the ant trails on the tree trunks for only a few hours. A home-made sticky band, composed of rosin two parts and castor oil one part by weight, heated until homogeneous (5) was quite effective as long as tree branches did not touch the ground or weeds touch the tree. Citrus trees banded with a 2-inch ring of this mucilage soon had a red ring of ants above the band from up in the tree and another below, trying to get past the band. Eventually the ants above the band dropped off, one by one, and the top of the tree became free of ants. However, before this banding can be recommended it must be tried out on a larger scale and its safety

to the trees demonstrated with all principal varieties and in all types of weather.

(3) PROTECTION OF PICKERS.—To lessen the stinging of pickers and of men who prune the trees, some growers try to do the work on cold days, when the ants are not active. But when the ants become more widely distributed, the few cold days that occur will not be enough to do a fraction of the picking, even of those varieties which ripen during cold weather. Some growers provide pyrethrum fly spray, and cloths sprayed with this and tied around the neck repel some of the ants. Elimination or reduction of the ants would be far better protection than either of these expedients.

(4) POISONED BAITS.—Seventeen different poisoned baits have had preliminary trials and three have been used in large-scale grove experiments on control. Baits with sodium arsenite or tartar emetic as the poison are eaten greedily for several days, but after that the ants go back to their natural food, honeydew. Many of the ants drown in the liquid baits, and the presence of these dead individuals in the liquid probably is one factor that causes the ants to leave the bait. To avoid this, 1 percent of agar by weight was incorporated in two formulas, and this gave a semisolid bait that the ants ate longer; but still, after a time, they went back to their honeydew diet. A bait made up like the Argentine ant sirup (2), but containing tartar emetic instead of sodium arsenite, is taken readily by the ants and is promising. It would be favored by growers who are opposed to placing arsenic near their trees. When derris or pyrethrum was used as poison in baits the ants were definitely repelled and plugged up the holes in the bait cans with mud.

In a citrus grove near Fort Pierce bait cans have been hanging on 100 tree trunks for two years, and from time to time fresh Argentine-ant bait has been added. The trees have been sprayed regularly for control of scale insects, whiteflies, and rust mites, and this has restricted somewhat the natural food that has been available. A "high water" during this time, lasting only a day or so, drowned many of the ants between the tree rows. This high water, the spraying for insect control, and the ant bait, working together, have reduced the number of ants greatly, so that there was no great inconvenience to pickers of the last crop. However, a few of the ants can still be found, and eradication cannot be claimed.

A heavily infested and neglected citrus nursery at New Smyrna has also had bait cans of Argentine-ant bait for two years. When first seen, soft scale, whiteflies, and aphids were very abundant, and the ants were thriving. The second year a thorough spraying with oil emulsion reduced the natural food supply and thus forced the ants to take the bait, and they were reduced to about one quarter the number present the previous year.

It is very clear from the work so far that poisoned baits can be fully effective only when the natural food supply is cut off. This might be accomplished by the use of barriers around tree trunks, by baiting during the winter months when natural food is scarce, or by thorough spraying to reduce the number of honeydew producers.

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SUMMARY

The small fire ant (*Wasmannia auropunctata* (Roger)) has interfered with picking and pruning operations in infested citrus groves by stinging workers severely. A survey has disclosed a number of infestation spots of limited area in the middle and lower East Coast section of Florida, in central Florida, and on the lower West Coast of the State. Normally, the ants feed on honeydew from scale insects, whiteflies, mealybugs, and aphids, which attack citrus trees, and also eat dead animals and insects, and juices from fallen fruits. They nest on the ground under slight protection, and in trees; heavily infested groves contain a vast network of scattered breeding foci with interconnecting trails which extend up tree trunks and branches to the leaves, where the honeydew is obtained.

Preliminary work on control indicates the advisability of reducing natural food supplies by thorough spraying for control

of honeydew producers. Banding of tree trunks may bar the ants from access to trees and lessen the number of stings for fruit pickers. The use of a can of Argentine ant bait on each tree trunk has reduced the numbers of ants in groves to levels at which pickers are not seriously inconvenienced, but, even with two years of baiting, complete eradication has not yet been attained.

LITERATURE CITED

1. ROGER, JULIUS. 1863. Die neu aufgeführten Gattungen und Arten meines Formiciden-Verzeichnisses. Berl. Ent. Zeitschr. 7: 131-214. Berlin.
2. BARBER, E. R. 1920 (revised 1925). The Argentine Ant as a Household Pest. U. S. Dept. Agr. Farmers' Bull. 1101.
3. SMITH, M. R. 1929. Two Introduced Ants Not Previously Known to Occur in the United States. Jour. Econ. Ent. 22 (1): 241-243. Geneva, N. Y.
4. WHEELER, W. M. 1929. Two Neotropical Ants Established in the United States. Psyche 36 (2): 89-90.
5. DUNHAM, GEORGE C. 1930. Military Preventive Medicine. U. S. Army Medical Bul. 23, 1,051 pages (see page 740). Carlisle Barracks, Pa.
6. SMITH, M. R. 1936. The Ants of Puerto Rico. Jour. Agr. Univ. Puerto Rico 20 (4): 819-875.

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