

Nursery Digest

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Multiple Queen Fire Ants, A New Threat From An Old Adversary

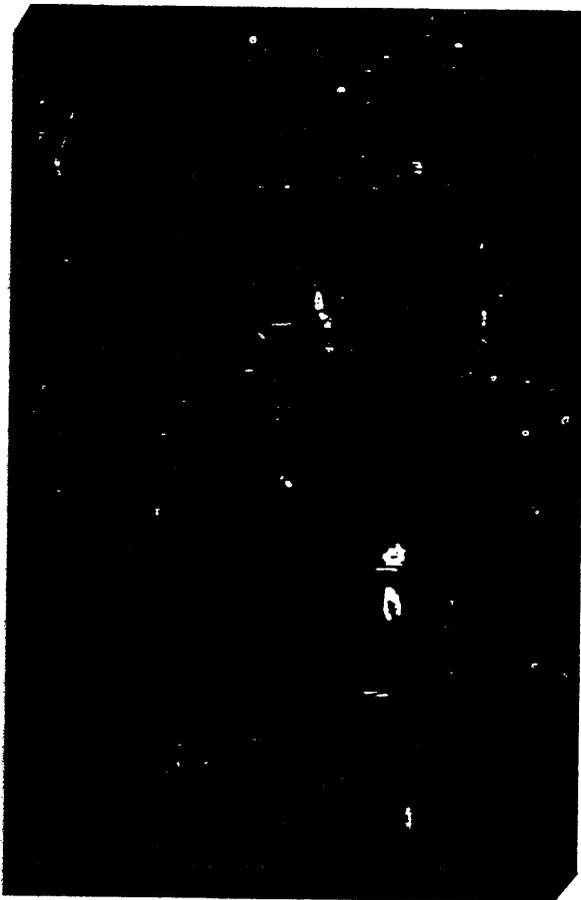
The Use Of Small Claims Courts

Sharing Information With Employees

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USDA Studying Possible Suspension Of Granular Dursban For Use In Control Of Imported Ants

Spider Plant



*Mother queen of imported fire ant colony.
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Multiple Queen Fire Ants, A New Threat From An Old Adversary

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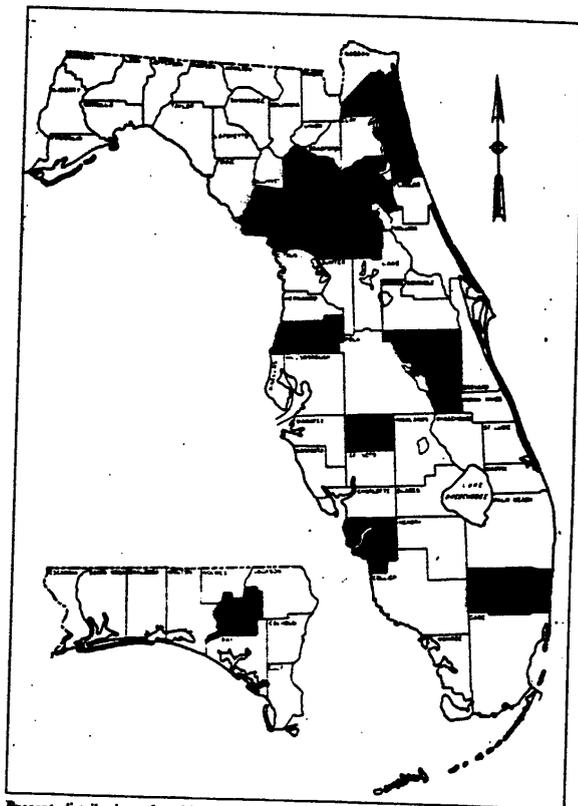
The effects of being bitten by multiple fire ants.

The first imported fire ants to become established in the United States, the black fire ant, *Solenopsis richteri*, arrived at Mobile, Alabama from South America around 1918. It was not until its near relative, the red imported fire ant, *Solenopsis invicta*, arrived, also at Mobile, some 20 to 25 years later, however, that problems with these aggressive, stinging ants really began. The red fire ants found the Mobile area to their liking and quickly made themselves right at home. As the ants became more numerous in the Mobile area they invaded the horticultural nurseries, building their nests in potted plants and around the base of larger shrubs and trees. Although fire ants spread naturally by mating flights, they are very adept at hitchhiking and the principal means of their spread throughout the south has been inadvertent movement by man. Surveys conducted in the late 1940s and early 1950s showed that movement of

Left top: Artificial nest containing several queens surrounded by worker ants.

Left bottom: Typical small mound built by multiple queen colonies.

Right bottom: Mound distribution of multiple queen population in central Florida pasture.



Present distribution of multiple queen fire ants in Florida, counties with confirmed multiple queen infestations are shown in red, counties with suspected multiple queens are shown in blue.

infested plants from Mobile to nurseries in other states was responsible for much of the early spread of the fire ants. The Federal quarantine on imported fire ants and the use of the chlorinated hydrocarbon insecticides in nurseries essentially stopped the movement of fire ants in nursery stock, until recently.

Large-scale control programs in the 1960s and 70s provided temporary relief

from the ants but did little to provide a long-term solution. Indeed, the name for the red species, "*invicta*" meaning "invincible" or "unconquered" is very appropriate because the ants are more widespread and numerous than ever despite efforts of the USDA and state agriculture departments to do them in. Although the black variety remains limited to a small area in northwestern



Typical mound of single queen colony.

many years, considered to have only one queen. In excavating hundreds of colonies, during the 1960s and early 70s, we never found more than one. Research studies showed that, although many new queens clustered together to begin a colony, all the queens but one were killed by the first workers that emerged so that large colonies wound up with only one queen. Sometime during this period, it is

Alabama and northeastern Mississippi, the red species, *S. invicta* has spread to more than 250 million acres in 11 southern states and Puerto Rico. Recently, isolated infestations, although quickly eliminated, have shown up in Arizona and California. Northward spread of the ants has been limited by cold weather, yet they are now found farther north than was believed possible. They have been able to survive the cold temperatures by building their nests under concrete slabs, roadways, embankments, and even in shopping malls. It appears unlikely that the colonies discovered in colder climates can produce mating flights or that colonies founded by new queens would survive the first winter; however, doubting the ability of fire ants to adapt and survive is risky. Although westward movement of the ants has been slowed by the dryness of the southwest, the recent infestations in Arizona and California shows that they can leapfrog the desert as stowaways in commerce carried by trucks and other conveyances. Eventual establishment of the ants in Arizona and California appears inevitable. Once established in California, they will likely infest much

of the western seaboard.

Fire ants maintain their populations in already infested areas and spread short distances to infest new areas by mating flights that occur frequently throughout the summer months, usually a day or two after rainfall. The ants mate at 500 to 800 feet in the air. After mating, the males fall to the ground and die. The new queens, depending on the wind, may fly a mile or more or may land nearby. After landing the new queens burrow a short distance into the soil to begin a new colony. The queen, who may live 6 to 7 years, begins to lay eggs within 24 to 36 hours after mating and at maturity is capable of producing over 2,000 eggs in 24 hours. The first workers emerge in 30 to 35 days and begin to care for the queen, search for food, enlarge the nest, and defend the small colony. The colony continues to grow and within one year can easily contain more than 100,000 workers. These workers, all sterile females with a stinger, provide the maintenance and defense of the colony, and quickly and efficiently scour the area for food. The workers, depending on their size, live 1 to 6 months.

Imported fire ant colonies were, for

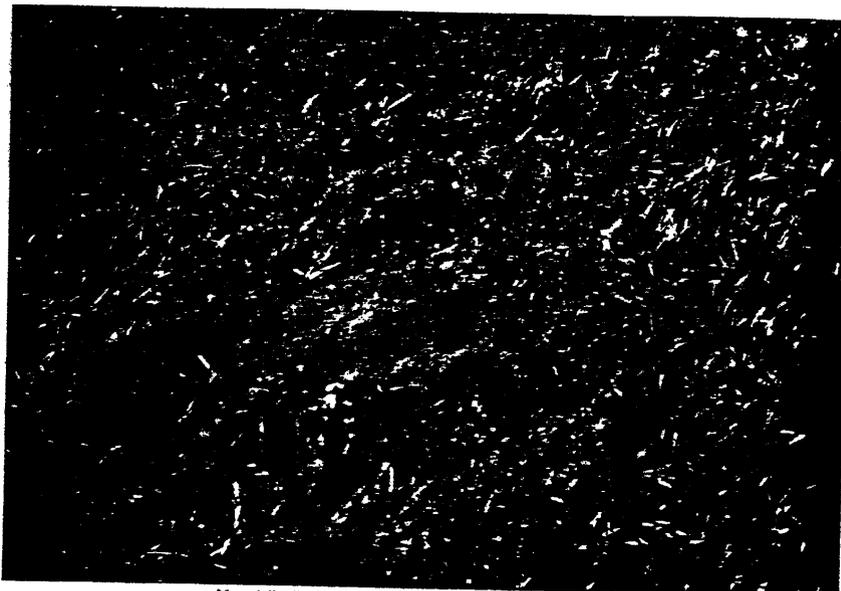
not yet understood when or why, a change occurred and mature colonies that contained many fertile queens began to appear in areas once occupied only by single queen colonies.

The first multiple queen colonies were discovered near Hurley, Mississippi in 1973 by Dr. Michael Glancey, a scientist with the Agricultural Research Service of the U.S. Department of Agriculture. His finding initially appeared to be little more than an oddity since multiple queen colonies had not been seen anywhere else in the fire ant infested area. Within one year, however, multiple queen colonies were discovered in eastern Texas and in a relatively short time it became apparent that a major change had occurred in fire ant behavior when multiple queen colonies were also found in Alabama, Georgia, Louisiana and Florida. By 1987, the presence of multiple queen colonies had been confirmed in 8 of the 11 infested states. Multiple queen colonies have almost replaced single queen colonies in parts of Marion and Alachua counties in north central Florida.

What difference do multiple queen colonies make? Several, all of which

appear, at present, to be bad. First, multiple queen colonies are enormous, containing more than 500,000 workers, as compared to 100,000 to 200,000 workers in mature single queen colonies. Secondly, while mounds of single queen colonies are usually large and easily seen and average 20 to 30 per acre, multiple queen colonies may have a series of small, inconspicuous mounds that are very close together and may number 500 or more per acre. In some cases, multiple queen colonies may have no mound; queens, workers, and immatures may cluster under pieces of cardboard, tin cans, rocks, etc. Thirdly, single queen colonies are very territorial towards other fire ants.

While worker ants from single queen colonies will kill new fire ant queens landing in their area and will fight with workers from neighboring fire ant colonies, multiple queen colonies will readily accept new queens and workers from neighboring mounds into the colony. This results in many more colonies, that may become interconnected, in a area. In many multiple queen areas, it is impossible to distinguish between colonies. In fact, we suspect that many areas may be occupied by one or a very few "super colonies". So many multiple queen colonies are found in some improved pastures in north central Florida that one can literally step from mound to mound across the entire field. Finally, multiple queen colonies are more difficult to control. The sheer numbers of ants that must share bait toxicants or be contacted by drenches requires more insecticide. The



Mound distribution frequently seen in multiple queen populations, larger parent mound surrounded by smaller satellite mounds.

hundreds of queens present in the multiple queen colony must be killed or made incapable of reproducing, because any are capable of sustaining the colony. The significance of multiple queen colonies is unknown, but has the potential to be tremendous. Beneficial insects, spiders, rodents and other small animals, and the young of ground nesting birds, will be reduced in number because fire ants will kill and devour almost anything that cannot move quickly enough or is helpless. The number of ants in multiple queen areas insures that little else will be able to survive. Very heavily infested areas may become virtually an ecological desert with few species, other than the ants, surviving. The effect on crops on which fire ants feed, such as okra, potatoes, soybeans and citrus, will also be heavy. Multiple queen fire ants caused a loss of more than \$30,000 in 1984 in one 25 acre field of Irish potatoes near Hastings, Florida.

The hazard of spread is greatly increased because of the increased number of queens in any given area. The tendency of fire ants to invade potted or balled-burlaped plants is well-documented and the establishment of

multiple queen colonies in nursery environs increases the chances of infestation of plants and movement of the ants in interstate commerce. The present fire ant quarantine certification treatment for potted nursery stock requires incorporation of chlorpyrifos into the potting media. This treatment will prevent fire ant infestation if the chlorpyrifos is thoroughly mixed at the proper rate with the potting media, however, it is not as effective nor as long-term as was chlordane. Treatment of nursery environs at 6 month intervals with one of the fire ant baits, such as Logic or Amdro, will prevent the development of heavy infestations of single or multiple queen fire ants and decrease the chances of further spread of fire ants by infested plants.

