

The Control of Ants

Facts about the dominant family of insects that at times infest golf courses. How to get rid of them without injury to the turf

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Read before the second annual convention of the National Association of Greenkeepers of America at Detroit

THE present time has been termed the "Age of Insects," and of all insects the Formicidae, or Ants, are the dominant family. Not only do they outnumber in individuals all other terrestrial animals, but their colonies often defy enumeration.

Ants, technically classified, belong to the Hymenoptera Order of Insects along with Bees and Wasps. Ants, themselves, form the family of Formicidae. We find wonderful development of instinctive powers in this order and an outstanding character of social development.

The great number of ants and their wide distribution render them one of the most familiar of all insects. They may be found from the Arctic regions to the tropics, from the timberline to the sand dunes and seashore, and from the dampest forests to the driest deserts. A technical description, I believe, is hardly necessary. However, it will be well to devote a few minutes to discussion of some of their outstanding characteristics and qualities.

Ants Are Social Insects

ANTS are social insects. There are no solitary species. Each colony consists of three castes, the males, the female or Queen, and the workers. As with the social bees and social wasps, the workers are all modified females. In most species the males and females are winged but the workers are wingless; the wings of the female, however, are deciduous. The presence of these castes is not always uniform varying both in form and duties they perform.

In primitive species, there is not much indication of caste development and colonies are made up of only a few dozen numbers; but in the more highly specialized forms a colony may consist of hundreds of thousands of members and exhibit an elaborate polymorphism. The different species of ants also differ in their nesting habits. However, in the profession of greenkeeping, we are principally interested in those colonies which build large mounds in the ground.

Nests Do Not Contain Cells

THERE is a striking difference between the nests of ants and those of wasps and bees in that the nests of ants do not contain permanent cells for their brood. The eggs, larvae and pupae are stored in chambers of the nest and are moved from one to the other to take advantage of changes in moisture and temperature conditions. It will suffice to state that during the mating

season among most species there are provisions which prevent too close interbreeding.

Large swarms of winged ants usually indicate the nuptial period. After mating, the males usually soon die and the female proceeds to form a new colony, if she is not captured by workers of a colony already established, or finds her way into one. This indicates the migratory habits of the ant.

How An Ant Colony Is Founded

THE method of founding a colony follows: the female breaks off her wings and seeks or makes a small cavity in the ground. She closes the entrance and remains for weeks, without food while the eggs in her ovaries are developing. During this period there is a histolysis of the large wing muscles the products of which are assimilated as food. When the eggs are mature they are laid and the larvae that hatch from them are fed and cared for by the Queen ant till they are ready to pupate.

The adults that develop from the first brood are workers, but due to the limited amount of food that they have received, they are abnormally small, the form known as worker minors. They open the chamber and venture forth to collect food for themselves and their Queen and care for the second brood which are known as the worker majors, due to the fact that they have had a more abundant food supply. Thus the colony continues to grow and a few years later numerous males and females are developed, which at the proper time leave the nest for their nuptial flight.

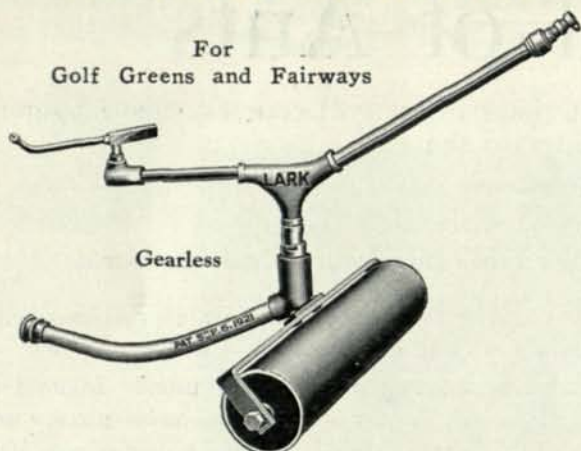
Feeding Habits Differ Greatly

THE feeding habits of ants differ greatly in different members of the family. Some of the primitive forms are strictly carnivorous while others add vegetable substances to their diet. Many feed on the sweet fluids, as sap exuded from plant stems, the nectar excreted by extrafloral nectar glands and honey dew produced by aphids and other insects. Still others termed leaf-cutting ants cultivate fungi upon which they feed. I believe that there is here an opportunity for considerable research work.

From the discussion so far, the proposition of developing a satisfactory control presents itself as a huge problem. To determine a control for any insect it is imperative to first know its life history or metamorphosis. Such a study exhibits the most economical point

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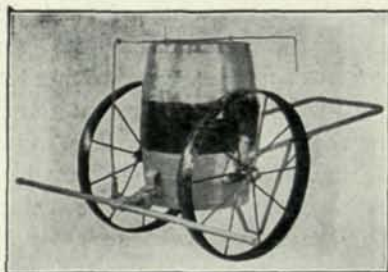
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of attack for control measures. In the case of ants, the most plausible stage is the adult period.

Only Two Possible Methods of Control

THERE are only two possible methods of control in this adult period. They are contact and internal controls. Carbondisulphide, lime, pepper and cyanide compounds are examples of the contact methods now in use for exterminating ants. Due to the highly developed instinct of ants, these control measures suffice only in forcing them to move to some new location.

When trapped, cyanide may exterminate some of them, but a 100% kill is difficult and usually the effectiveness of the exterminator is directly proportional to damage or injury to turf or soil. Paris-green, arsenate of lead and copper sulphate are examples of poisons used in internal poisoning given them as an ingredient in their food. However, there is a hazard in the use of these materials. Using them strong enough to be effective often results again to injury or damage to the turf or soil.

An Internal Control Exterminator

THE exterminator which I introduced in the Detroit District late last summer is of the internal control type. The preparation is in a heavy paste form and contains organic materials. There is absolutely no danger of injury to turf, or soil chemical reaction. Small portions or balls from $\frac{1}{8}$ to $\frac{1}{4}$ of an inch in diameter are placed near the ant hill or mound on the green.

Nature then comes to our assistance and heat from the sun produces a liquid film on the outside of the ball. Within a few minutes the ants literally cover the sample and feed ravenously. It is desired to produce this liquid film as the ants feed mostly by sucking. They do have biting mouth parts but they are not developed for chewing. For some time after feeding they show no effects.

Extermination Complete in 36 Hours

THERE is a purpose, though, for this condition. As I have related before, ants are characteristically highly socialized and made up of castes. It is essential that the workers return to the nest and feed those whose duties keep them within the nest. It takes from twenty-four to thirty-six hours before activity ceases and extermination is complete. Due to lack of care, which I have previously emphasized, the eggs, larvae and pupae cease in their development.

However, due to their migratory habits it is impossible to keep a green once treated free from future infestations. It is a good policy, therefore, to keep the area near the green free from infestations and this will greatly tend to keep out future invasions. One pound of this exterminator will practically clear up the heaviest invasion of an ordinary green and often is sufficient for several greens on the course.

Further information or a trial sample may be had by addressing your correspondence to M. A. Daniels, greenkeeper, Pontiac Municipal Golf Club, Pontiac, Michigan.