

Control of Ants

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Ants have always been a nuisance in such well-kept turf as bowling greens, golf course greens, grass tennis courts and lawns. They are also often troublesome in wood used at or below the surface of the ground and in buildings.

Until quite recently, most ant insecticides, such as those containing arsenate of soda, tartar emetic, calcium arsenate, sodium arsenite or thallium sulfate as the lethal principle, have been relatively slow killing agents intended to be carried by the worker ants to the nest and there fed to the young and queen, thus destroying the colony at its source. The workers also died, of course. The two recently developed chlorinated insecticides discussed here, Chlordane and Octalene (formerly known as Compound 118) have been found superior, in our tests, to any of the above.

Chlordane¹ and Octalene² act as both contact insecticides and fumigants, as has been demonstrated in our experiments conducted in soil and turf for control of Japanese beetle grubs and related species. Their vapors are heavier than air, and settle rapidly. They kill but do not repel, hence cause no scattering of infestation. Ants will cross an area treated with the insecticides and thus pick up a lethal dose.

ANT CONTROL IN TURF

Perhaps the most persistent species of ants in soil and turf in Connecticut is the cornfield ant, *Lasius niger* Linn. var. *americanus* Emery. In fine turf, especially lawns, golf course greens and other highly specialized greensward, it is encountered more frequently than all other species.

This is a small brown ant that builds little mounds in open soil and turf, surmounted by small single or clustered craters. The mounds may be constructed at any time of the day or night, most commonly, however, during the latter when the air and soil are coolest. Unless the colony suffers irreparable injury, mounds will be rebuilt as often as they are destroyed.

For control of the cornfield ant and other soil and turf-inhabiting species, two methods of treatment have given excellent results in our experiments.

¹ 1,2,4,5,6,7,8,8-octachloro-4,7-methano-3_a,4,7,7_a-tetrahydroindane.

² 1,2,3,4,10,10-hexachloro-1:4,5:8-dindomethano-1,4,4_a,8,8_a-hexahydronaphthalene.

The cover illustration shows the cornfield ant, *Lasius niger* Linn. var. *americanus* Emery. This species is frequently a pest in well-kept turf, especially golf course greens. Drawing made by Robert A. Cushman of the United States National Museum.



Crater-surmounted mounds of the cornfield ant.

Spot Treatment of Individual Ant Nests

The first method, advisable where colonies are not abundant in lawns, greens or open soil, consists of treating individual ant nests separately. One-eighth of a teaspoon of Chlordane 40 or 50 per cent or Octalene 25 per cent wettable powder, placed in the crater of each anthill and watered in with a sprayer or sprinkling can, will destroy the colonies completely. A portable pressure sprayer with the spreader removed from the nozzle or a watering can with sprinkler removed may be used. Following the treatment, additional and perhaps somewhat more rapid penetration of the insecticide may be achieved by thorough soaking of the infested area with water.

Another method of treatment would be to apply 9.5 teaspoons of Chlordane 40 per cent or 8 of the 50 per cent wettable powder per gallon of water in a pressure sprayer. With the spreader removed from the nozzle, the suspension should be directed into each ant nest until the nest and crater are filled. Octalene 25 per cent at the rate of 8 teaspoons

per gallon of water may be used in the same way. When the toxicants are used as 48 per cent emulsions, they may be applied as above at the rate of 8 teaspoons of either in one gallon of water. A gallon of finished spray should treat 150 to 200 ant nests of average size craters (one to two inches in diameter). The importance of thorough watering following treatment cannot be over-emphasized. Where no water or small amounts are used, the effect of the insecticides may be short-lived. Long immunity from reinfestation results when generous applications of water succeed treatment.

A small quantity of 5 per cent Chlordane or 2.5 per cent Octalene dust directed into the gallery of an ant colony by means of a hand-operated pressure duster has given good results when the center of the colony is not too far below the surface of the ground. Dusts or wettable powders applied dry to craters, in excess of proper dosage, will injure grass severely.

Complete Turf Treatment

In extensive areas of turf, such as bowling and golf course greens, where ant colonies are frequently numerous, the complete turf treatment method has given best results. Applying the insecticides to every square foot of turf or soil in one operation destroys existing colonies and also antproofs uninhabited intervening areas.

When Chlordane is the insecticide employed, 4 ounces of the 40 or 50 per cent wettable powders should be applied to each 1,000 square feet of turf, respectively, in 50 to 75 gallons of water. Octalene 25 per cent wettable powder may be used at the rate of 4 ounces in the same quantity of water per 1,000 square feet. Chlordane and Octalene 48 per cent emulsions may be applied at the rate of 8 tablespoons of either in 50 to 75 gallons of water per 1,000 square feet. A 100 or twin 50 gallon mechanical sprayer will prove satisfactory for the application of insecticides to extensively infested ground areas. Pump pressure maintained at 60 to 100 pounds is desirable. A common one-inch garden hose and nozzle ("Boston" type), with the latter opened as wide as possible, providing a coarse rather than a fine or mist spray, should be used to apply a treatment.

Complete turf or soil treatments must be supplemented by thorough watering of the area to assure maximum penetration of the insecticide, accelerated destruction of all ant colonies present and assurance of reasonably long protection from reinfestation. When directions are followed, freedom from ant troubles may be expected for several months. It will in all probability be unnecessary to employ the complete turf treatment procedure twice in the same season. In the event an occasional ant crater does develop, the colony may be eliminated by one of the spot treatment methods.

Five per cent Chlordane or 2½ per cent Octalene dusts applied at the rate of 10 and 5 pounds, respectively, per 1,000 square feet of heavily infested turf or soil will give slower but satisfactory control. Almost all of the ant colonies will be destroyed, but some are inactivated only temporarily, recovering in time. A fertilizer distributor may be used to apply the dust. To prevent clogging the equipment, a difficulty sometimes encountered, especially in humid weather, the insecticide may be mixed with fertilizer or dry finely sifted sand as a diluent. Such a mixture adds more bulk, thus assuring more uniform distribution of the insecticide.

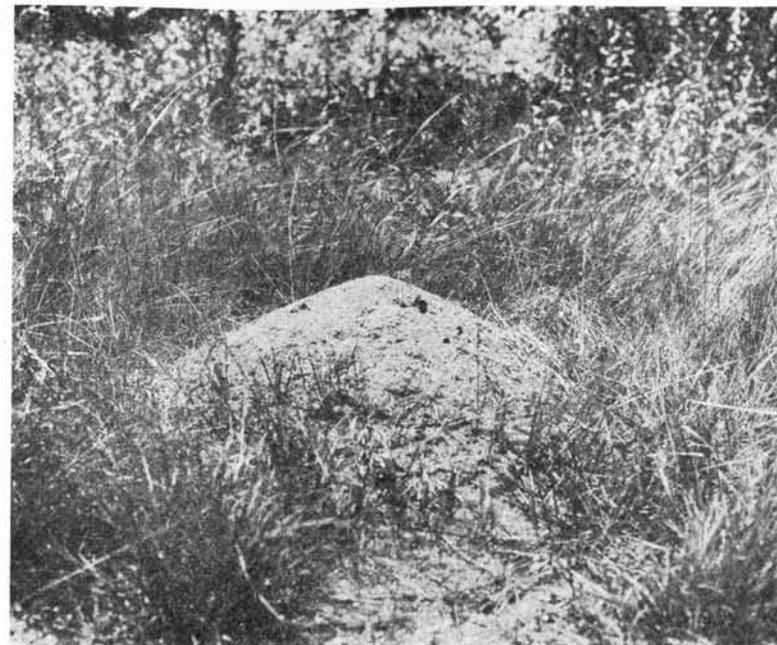
MOUND-BUILDING ANTS

The mound-building ant, *Formica exsectoides*, may occasionally be troublesome in parks, pasture, recreational areas, picnic groves, along roadsides, and in young pine plantations. Old established colonies frequently split up to form new ones in a limited area. This usually makes the species unduly bothersome. In pine plantations the loss of young trees will be serious if a colony is allowed to persist.

Mounds are found more often in gravelly or sandy soil than in other locations. They may vary in size from a few inches in diameter and an inch or so in height to eight feet or more in diameter and 12 to 14 inches in height. Although most mounds appear to be more or less round, they actually vary considerably in this respect. As judged by the rather uniform size and general appearance of certain mounds from year to year, their respective colonies have in all probability remained more or less static for a long time. On the other hand, one roadside mound was observed to attain a diameter of eight feet in two years.

Chlordane and Octalene are remarkably effective insecticides for control of the mound-building species. Used respectively as 50 and 25 per cent wettable powders at the rate of 2 ounces of the former per every 2 feet of mound diameter or 1 ounce of the latter per each 5 feet of mound diameter, the insecticides will destroy the colonies completely in one to two days. Because the amounts used are small and it is difficult to spread them over the surface of a large mound, it is desirable to mix the toxicant with a diluent to increase its bulk and facilitate distribution. Either one pound of sawdust or one-half pound of dry sand per mound makes an excellent carrier. Following application, the insecticide may be scratched an inch or two into the surface of the mound. Watering is not necessary.

Chlordane acts somewhat faster than Octalene. When first applied, both toxicants cause extreme agitation and scattering of the workers. This is more noticeable when Chlordane is used. The scattering ants will not, however, establish new colonies. Without a queen this would



Mound of the common mound-building ant.

be impossible; furthermore, the workers will have come in direct contact with sufficient quantities of the toxicant or its potent vapors to paralyze them in 10 to 15 minutes and cause death in 3½ to 4½ hours.

Additional Species of Soil-Inhabiting Ants

The ant species, *Formica pallida fulva* Latr. subspecies *nitidiventris* Emery, may occur in turf in many colonies in intimate proximity to one another, covering an area of a square yard or more. Individual craters are larger and coarser than those constructed by the cornfield ant.

Another soil-inhabiting species, *Formica fusca* Linn. var. *subsericea* Say, habitually excavates numerous galleries in unprotected soil. Frequently their activity occurs at the base of shrubs, small trees or other plants, especially those recently set. This may result in serious injury to the vegetation, usually most noticeable during protracted dry spells in summer.

These, as well as closely related species, may be controlled by dusting the infested area with Chlordane 40 or 50 per cent or Octalene 25 per cent wettable powder. It is not necessary to water a treatment into the turf or soil to gain maximum insecticidal efficiency. The practice does, however, help to speed up the action of the toxicants in destroying the

colonies below the surface of the ground. Emulsions of 48 per cent used at the rate of one to two teaspoons per gallon of water and applied to an infestation by means of a watering can may be substituted for the wettable powders.

CONTROL OF ANTS TENDING ROOT APHIDS

The ant species, *Lasius niger* var. *neoniger* Emery, is frequently responsible for aphid populations developing on the roots of various annuals, biennials and perennials, notably hardy chrysanthemums (some strains more than others), asters and certain varieties of Helianthus. In return for the protection given them, the aphids provide their benefactors with a sweet secretion known as honeydew. Rapid increase in injurious aphid populations on their roots will stunt the growth of plants, and when the condition is permitted to continue, they may die. Consequently, it is necessary to destroy both the ants and aphids to assure healthy plants.

Chlordane 40 or 50 per cent or Octalene 25 per cent wettable powder may be used for the purpose, the former at the rate of 6 or 4 ounces and the latter at 4 ounces in 50 gallons of water applied to 750 linear feet of plants in rows or 750 square feet of plants in beds. A hydraulic sprayer similar to the ones suggested for the treatment of turf (see "Complete Turf Treatment", p. 5) may be used for the work. Pump pressure of 50 to 60 pounds will be satisfactory. A single nozzle spray gun delivering a coarse rather than a fine spray is desirable. For best results the spray nozzle should be held close to the base of the plants to assure maximum penetration of the spray to their roots and a better kill of both ants and aphids. When only a few plants are to be treated, 1 to 2 teaspoons of the wettable powders or $\frac{2}{3}$ to 1 teaspoon of 48 per cent emulsion per gallon of water may be employed. A shallow depression should be formed around the base of the plants to be subsequently filled with the spray mixture. As soon as the soil has absorbed the first application, repeat the treatment once. When the soil dries, replace the dirt which was removed prior to treatment.

CARPENTER ANT CONTROL

The carpenter ant, *Camponotus herculeanus* Linn. subsp. *pennsylvanicus* De Geer, frequently invades cavities in old fruit and ornamental trees. Telephone poles, fence posts and other wood items in and at the surface of the ground, as well as timbers in buildings, are quite often damaged by this insect.

One quarter to $\frac{1}{2}$ ounce of 5 per cent Chlordane or 2.5 per cent Octalene dust or wettable powder (mentioned heretofore) puffed into crevices, cracks or other openings that may occur at or near where the ants are located will destroy the colony. Usually one treatment is all that is necessary for successful elimination of the pests.