1-1-1973

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Chemicals for Argentine ant control

by C. F. H. Jenkins, former Chief, Biological Services Division, and P. N. Forte, Senior Entomologist

The Argentine ant is one of the most serious ant pests in the world and as such, has been the subject of large-scale control campaigns in several countries.

The native home of the ant is believed to be either Brazil or the Argentine, although the pest is found in several other parts of South America. The ant was introduced into the United States in about 1888 and reached Hawaii in 1941. In Australia it was first recorded in Victoria in 1939. This was followed by Western Australia in 1941, New South Wales in 1950 and two separate outbreaks in Tasmania in 1951 and 1972.

Early control measures against the Argentine ant in Western Australia involved quarantine of infected areas and the use of arsenical baits, based mainly on the so-called U.S. Government formula. In 1945 DDT became available and water emulsions were used effectively to protect houses and orchard trees from ant infestations. The residual action of DDT made barrier spraying possible and offered the first chance of success in a major control campaign.

In 1950, eradication of the ant from the City of Fremantle was attempted by blanket spraying with DDT using a 2 per cent water emulsion of insecticide applied at the rate of 900 litres per hectare (80 gallons per acre). The treatment greatly reduced the ant numbers and prevented serious household invasions for a long time, but the results did not suggest that eradication was possible by this means.

The success achieved with DDT and the advent of even more potent insecticides, such as chlordane and dieldrin (Forte and Greaves, 1956), began a new era in Argentine ant control, and in December 1954 the Argentine Ant Act came into force making possible a major control campaign with annual funds of $210,000. The campaign was supervised by the Department of Agriculture, in close collaboration with the Department of Public Health and Local Government Authorities.

From 1954 to 1973, about 57,000 acres were sprayed for ant control, involving most of the city and suburbs and many country areas. The results have been so successful that the ant has ceased to be a major nuisance. Criticism of the Government for lack of action against the pest has been replaced by mounting opposition to the methods used, particularly to the widespread application of dieldrin.

Many of the undesirable side effects of chlordane and dieldrin, at least in the short term, were realised when spraying began and extreme precautions were taken to protect householders, sprayers, livestock, fish, domestic pets, garden plants, etc. Observations were also made of the effects of ant spraying on birds, beneficial insects, frogs and other creatures but although deaths occurred, particularly amongst frogs, reptiles and various insects, the long term effects have not been serious.

There is absolutely no evidence to support the theory that the Willie Wagtail population was depleted by the ant campaign and although whoop frog numbers have not completely recovered, native ant, ladybirds and various other insects have made a good recovery (Jenkins, 1961, 1969).

Without dieldrin the present degree of ant control would not have been possible and despite current opposition to all organo-chlorine pesticides, the results obtained suggest that the action taken was fully justified.
Search for alternative chemicals
Throughout the campaign, efforts have been made to find more effective and less dangerous substitutes for dieldrin, but with limited success. Mirex bait (Stringer, Lofgren and Bartlett, 1964) was tried on several occasions but as with earlier baiting trials (Jenkins, 1948), the ants showed only spasmodic interest and control was not satisfactory.

Heptachlor granules and sprays gave useful results, but as they have much less residual action than dieldrin and still come within the organo-chlorine group, they cannot be accepted as satisfactory substitutes.

In 1972 diazinon and endosulphan were tested for the first time, and diazinon showed considerable promise. Endosulphan gave only moderate ant control and because of its extreme toxicity to fish (a small fish-pond was situated in the experimental area) it was discarded.

The test area consisted of 20 suburban houses covering about 2 ha (5 ac) and included extensive areas of lawn and garden beds, fruit trees and grapevines. The method of application was comparable to that normally used for dieldrin and chlordane (Jenkins, 1968), but the grid pattern was based on 0.9 m (3 ft.) rather than 3 m (10 ft.) squares and any dense undergrowth was thoroughly drenched. The application rate was 720 litres per hectare (64 gallons per acre).

Following the success of this household treatment, two dairy properties at Margaret River were sprayed with diazinon and although there were survivors, the results were encouraging. The situations included 4 ha (10 ac) of pasture with scattered trees, a farm homestead and outbuildings, a small orchard, a fowl yard and a dirt road lined with thick undergrowth and tall gum trees.

Shortly after spraying, the road area was extensively disturbed and some of the sprayed surfaces were covered with dust. This reduced the efficiency of the spray residue and allowed some ant nests to persist. A homestead survival was traced to an unsprayed pot plant on a verandah which had contained a nest and had permitted some re-infestation of the surroundings.

Despite some survivals, the trials showed that with thorough treatment diazinon could be used to control extensive and severe ant infestations, and that stock paddocks could be treated without serious residue problems and with minimum danger to grazing animals.

References


