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New insecticides for the control of the Argentine ant in Western Australia

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NEW INSECTICIDES FOR THE CONTROL OF THE ARGENTINE ANT IN WESTERN AUSTRALIA

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THE Argentine Ant (Iridomyrmex humilis Mayr), has been the subject of much investigation in Western Australia. Jenkins (1943), Jenkins and Forte (1946, 1951), Jenkins (1948) and Forte (1949) have reported results of extensive work on the control of this pest. The results of the investigations have shown that effective control can be obtained by the use of DDT sprays but that large scale eradication was not possible with DDT.

As soon as the results of tests in New South Wales indicated that chlordane was very effective against the Argentine ant (Pasfield and Greaves, 1951) it was thought desirable to duplicate the work in Western Australia. Accordingly, in February, 1951, a co-operative project by the C.S.I.R.O. and the West Australian Department of Agriculture was begun, to compare chlordane with DDT, and later, to test the newer insecticides—aldrin and dieldrin.

The first experiment was carried out, using single household blocks as plots, and, at the same time, an attempt was made to eradicate the ants from a group of houses by the application of 2 per cent. chlordane spray; neither area was protected against re-invasion by the ants. Later, a second experiment was carried out, using a group of contiguous household blocks protected by a buffer area, as each plot. In addition a comparison was made of chlordane, aldrin and dieldrin for the control of Argentine ants.

FIRST EXPERIMENT

This experiment was begun in February, 1951, at Shenton Park, W.A.

Treatments.

The four treatments compared in this experiment were:—

1 per cent. chlordane.

2 per cent. chlordane.

1 per cent.chlordane plus 1 per cent. DDT.

2 per cent. DDT.

Design.

Two groups, each containing twelve houses bounded by streets, were chosen for this experiment. A randomised block design for six replications of each treatment was used, each plot was a single household block.

Procedure.

The insecticides were applied as barrier sprays by a modification (Pasfield and Greaves, 1951) of the method described by Jenkins (1948). An average of 60 gallons per acre was applied under hot dry conditions.

Fig. 1.—Barrier sprays being applied along back fence and lane.

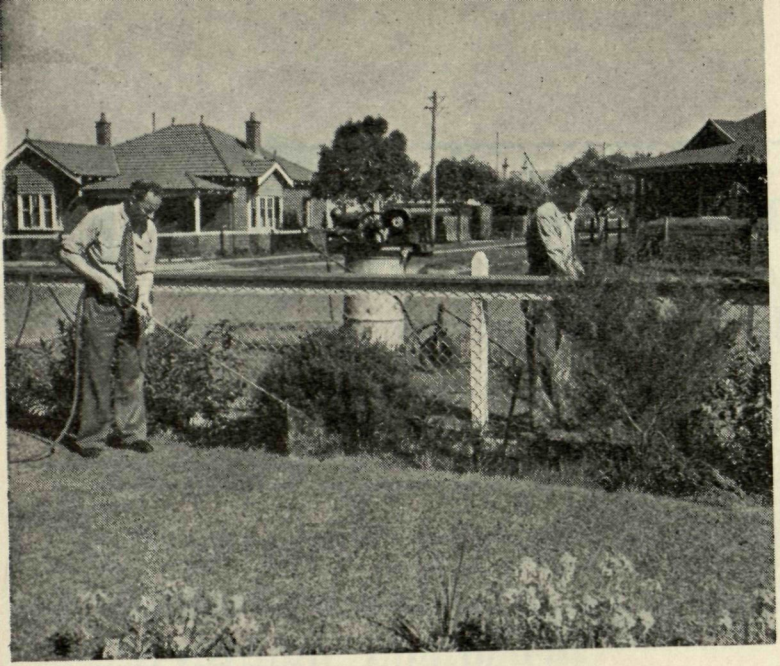

Fig. 2.—Applying barrier sprays along lawn edges and front footpath.

Sampling.

The effectiveness of the treatments was measured by a sampling method used by Pasfield and Greaves (1951)—that of rating the number of ants in trails in standard positions.

Results.

Failure to use a treated buffer area around each plot to prevent ants entering from untreated or ineffectively treated areas permitted re-invasion, and so affected the results of this experiment. Although the differences between the treatments were not significant, the general indications were that the three treatments containing chlordane were superior to the 2 per cent. DDT. The experiment was not continued after May, 1951.

An Attempt to Eradicate Ants at Shenton Park.

A block containing nine houses and a bakery surrounded by tarred roads was chosen for the study of the effectiveness of 2 per cent. chlordane in eradicating ants from an area. The block, including the bakery yard which contained a stack of 50 tons of firewood, was heavily infested with ants.

The 1.74 acres contained in the area were sprayed with 2 per cent. chlordane at the average rate of 60 gallons per acre in February, 1951. The presence of ripe grapes on large vines prevented the operators from making as thorough application of spray as was considered necessary. However, the whole area was free of ants by July, 1951, although one colony persisted in a large vine attached to a house until 5th May, 1951.

By August, 1951, Argentine ants had invaded the edges of the area from adjacent infestations, but no Argentine ants occurred in the central portion of the area. The invaded areas were then treated with 2 per cent. chlordane and buffer strips of 2 per cent. chlordane were sprayed around the area in August, 1951, November, 1951, and March, 1952. The area was free of ants in March, 1952.

SECOND EXPERIMENT

The failure to obtain significant differences between treatments in the first experiment at Shenton Park resulted in a change of design. In addition, the observed quick kill and immediate reduction in ant numbers with 2 per cent chlordane made it possible to change the aim of the experiments from "control" to "eradication".

To prevent invasions of ants on to a plot, a treated buffer area was necessary. It was decided to increase the size of each plot to that of a block of houses surrounded by tarred roads or lanes, which would permit the use of several parallel barriers as a buffer area around the whole experimental site and between each plot.

The efficiency of the buffer areas was not envisaged as being repellent to Argentine ants, but in view of the observed persistent effect of 2 per cent. chlordane, this insecticide was used in the buffer area.

Treatments.

The six treatments which it was desired to compare were:—

1 per cent. chlordane.
2 per cent. chlordane.
1 per cent. chlordane plus 1 per cent. DDT.
2 per cent. DDT.
2 per cent. chlordane (simplified treatment).
1 per cent. chlordane plus 1 per cent. DDT (simplified treatment).

Design.

As the plot size was a block of houses and the smallest blocks available contained about 12 houses, the randomised block design had to be restricted to two replications of six treatments. The selected areas were in the suburbs of Subiaco, an old suburb with houses 35-70 years old, and in Hollywood, a more recent suburb with houses 15 to 25 years old.

Procedure.

A total of 146 houses plus buffer areas were sprayed involving a total area of over 30 acres.

TABLE 1.

Argentine Ants present on Blocks after First Application of Barrier Sprays at Subiaco and Hollywood, W.A., August, 1951.

Treatment.	Spray applied (gallons per acre) at first application.		Mean percentages of sites infested (B. C. D) at the end of			
	Subiaco.	Hollywood.	2 weeks.	6 weeks.	14 weeks.	26 weeks.
1% chlordane	32·9	36·0	59·7	43·0	37·5	45·8
2% chlordane	37·4	26·8	58·0	30·2	11·3	22·3
1% chlordane plus 1% DDT	45·6	24·4	49·2	57·2	48·0	70·0
2% DDT	40·0	30·2	52·8	73·3	79·5	100·0
2% chlordane (simplified)	34·6	22·4	73·2	54·0	26·2	42·0
1% chlordane plus 1% DDT (simplified)	29·1	19·2	66·5	61·7	67·3	76·7

Minimum difference between treatments for significance at the 5% level for any date = 25·8.

The sprays were applied as a late winter spray in August 1951. They were applied to foundation walls of all buildings, the posts and rails of all fences, edges of all kerbs, paths, garden beds, trunks of trees and shrubs, grape vines, etc., and all compost and rubbish heaps. All lawns, drives, etc., were gridded with the barrier sprays into approximately 10 ft. squares. The amount of spray applied for each treatment varied from 24-26 gallons per acre, according to the condition of the garden. No clearing of vegetation or removal of rubbish was done before treatment.

In the simplified application of sprays the number of edges of paths sprayed was reduced and the grids over lawns, etc., were extended to 15 ft. squares. However, in some gardens, containing small beds of plants, it was not possible to simplify the method to any great extent. The amount of spray applied in the simplified treatments was 19-35 gallons per acre (see Table 1).

Buffer Area.

The buffer areas comprised the street kerb, street plantation and footpaths on the opposite side of the street around the periphery of the experiment; at street corners the sprays were continued around the corner for a distance of 10-15 yards and included the first street tree where practicable.

Within the buffer areas all street trees were sprayed to a height of 6 ft. and sprays applied to the street kerb, both sides of the footpath with cross sprays every 10 ft. to form a grid.

Sampling.

The method of assessment in the initial trial was not satisfactory in view of the high percentage of sites with no trails, but with ants nevertheless occurring on the block. For this experiment, assessment was based on presence or absence of ants. Each household block was divided into four areas, viz., A, B, C, D (see Diagram I).

When a survey was made, ants were recorded as present or absent in each of these situations for all houses in the plot, but an accurate record of the activity or numbers of ants seen was not kept. This was a critical method, for, whereas there were many thousands of ants in each situ-

Fig. 3.—An untidy vacant block which was treated with chlordane. Obviously a block of this nature requires a much larger quantity of spray than the occupied block shown in Fig. 4.

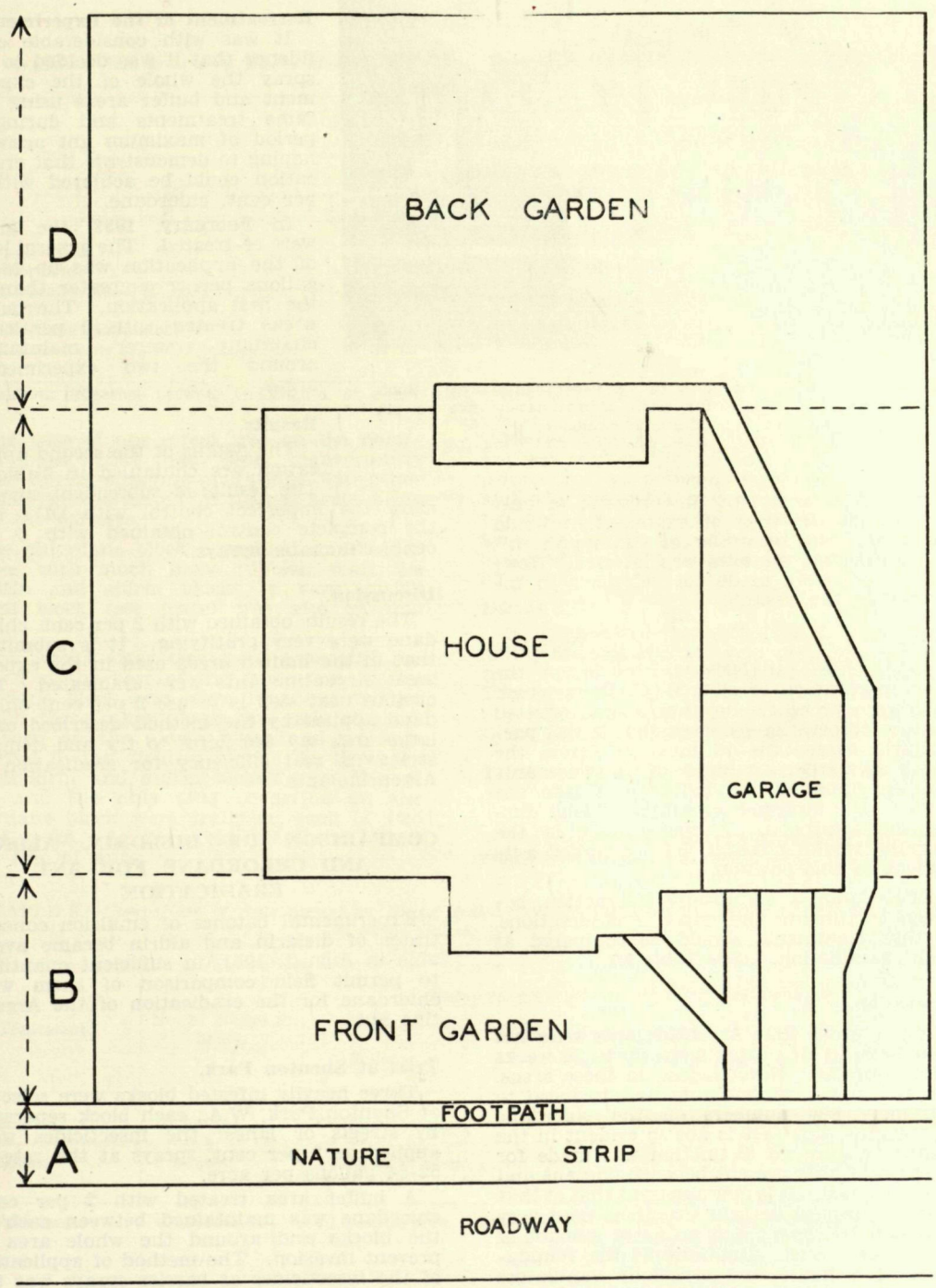

Diagram 1.—Positions in household lots examined for presence of ants. A—area between street, kerb and front fence; B—area between front of house and front fence; C—area on both sides of house; D—area between back wall of house and back fence.

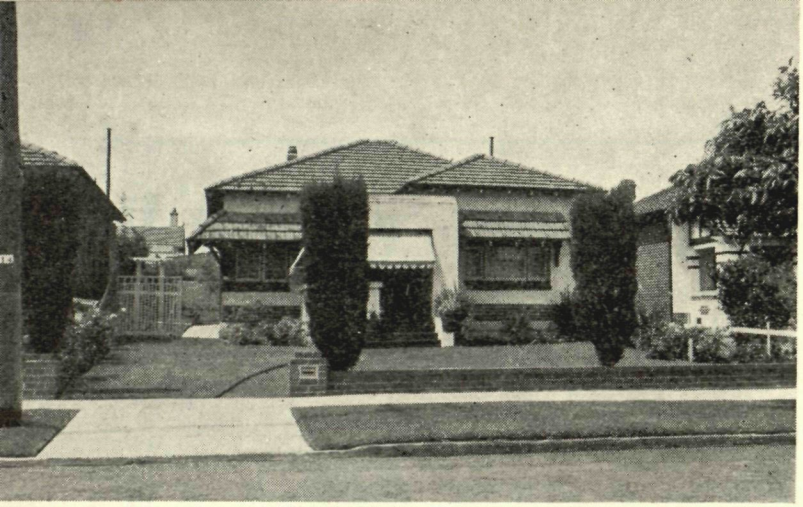

Fig. 4.—A well kept residential block in the experimental area. Such blocks can be sprayed successfully with approximately five to six gallons of 2% chlordane emulsion.

ation before treatment the presence of only one ant at the time of examination would necessitate the recording of "ants present", indicating that the area was infested. However, notes were made for reference in interpreting the results.

Results.

A statistical analysis was made on the mean percentage of sites B, C, D on which ants were present. Position A was omitted because observations showed that it was particularly susceptible to invasion across the buffer area. On a number of occasions ants observed crossing the buffer area into the plots in the morning were found dying during the afternoon. A count made in the morning would, however, have recorded ants present in this position.

There was a significant interaction between treatments and dates of observations, so that treatments should be compared at each examination. (See Table 1.)

Discussion.

It is obvious that Argentine ants were not eradicated in this experiment up to 26 weeks after spraying. Nevertheless, in these areas, sprayed in the winter, ants were reduced to extremely low numbers on the chlordane treatments (this fact is not so evident in the results because no distinction was made for a record of ants present between one ant and a nest or trail.) It is now apparent that at that time of the year certain situations need very thorough treatment and an extra amount of insecticide. Such situations as the foundations of a house and especially ventilators near the ground come into this category. Particular attention must also be paid to spraying hanging baskets in any situation at this time of the year.

Retreatment of the Experiment.

It was with considerable confidence that it was decided to respray the whole of the experiment and buffer areas using the same treatments and during a period of maximum ant activity, hoping to demonstrate that eradication could be achieved with 2 per cent. chlordane.

In February, 1952, the areas were re-treated. The general level of the application was up to 20 gallons per acre greater than in the first application. The buffer areas treated with 2 per cent. chlordane were maintained around the two experimental areas.

Results.

The details of the second application are contained in Table 2. The results of subsequent surveys show the imperfect control with DDT and the complete control obtained with 2 per cent. chlordane sprays.

Discussion.

The results obtained with 2 per cent. chlordane were very gratifying. It is submitted that in the limited areas used in the experiment Argentine ants were eradicated. The obvious next step is to use 2 per cent chlordane applied by the method described on a large area say 640 acres to try and demonstrate its real efficiency for eradication of Argentine ants.

COMPARISON OF DIELDRIN, ALDRIN AND CHLORDANE FOR ANT ERADICATION

Experimental batches of emulsion concentrates of dieldrin and aldrin became available in August, 1951, in sufficient quantities to permit field comparison of them with chlordane for the eradication of the Argentine ant.

Trial at Shenton Park.

Three heavily infested blocks were selected at Shenton Park, W.A., each block separated by streets or lanes; the insecticides were applied as 2 per cent. sprays at the rate of 52-54 gallons per acre.

A buffer area treated with 2 per cent. chlordane was maintained between each of the blocks and around the whole area to prevent invasion. The method of application of the insecticides as barrier sprays was the same as for the Subiaco-Hollywood experiment. In Table 3 it will be seen that a few colonies occurred on the treated areas three days after treatment. They included a colony

TABLE 2.

Argentine Ants present on Blocks after Re-treatment at Subiaco and Hollywood, W.A., February, 1952.

Treatment.	Spray applied (gallons per acre) at second application.		Mean percentages of sites B, C, D, infested 8 weeks later.	B, C, D, 8 months after second application.
	Subiaco.	Hollywood.		
1% application	52·0	34·0	13·8	5·5
2% chlordane	48·7	28·4	0·0	0·0
1% chlordane plus 1% DDT	45·0	35·2	23·5	13·8
2% DDT	54·2	36·8	50·8	81·2
2% chlordane (simplified)	42·5	28·8	0·0	1·5
1% chlordane plus 1% DDT (simplified)	37·8	28·8	31·0	28·5

Minimum difference between treatments, at either date, excluding 2% chlordane, at the 5% level = 14·5.

at the base of one street tree on the chlordane block that had been inadvertently missed during spraying operations. The other colonies were situated in deeper nests away from the barriers.

The chlordane block contained some older houses with much more rubbish than the dieldrin and aldrin blocks; a very untidy vacant block (see plate) was also on this block.

Nine weeks after treatment ants still remained at the base of the street tree in the chlordane block and were invading on the kerb in three other places, but only one ant was seen on the aldrin block and no ants occurred in the dieldrin block. At 13 weeks the dieldrin and aldrin blocks were free of ants and the only ants occurring on the chlordane block were trails on each of two street trees. At 21 weeks all three blocks were free of ants.

Eleven months after treatment only one ant was seen in the dieldrin block, ants were present in two positions in the aldrin block, and odd ants were present near the kerb in two positions on the chlordane block. At the time of this examination it was not to be expected that the insecticides would be still effective.

Discussion.

It is apparent from this trial that both aldrin and dieldrin are very promising insecticides for use in controlling Argentine ants. Therefore, they should both be tried at lower concentrations and it is proposed to do this when further supplies are available.

THE EFFECT OF THE ARGENTINE ANT AND THE CHLORDANE TREATMENT ON NATIVE ANTS

The Argentine ant cannot live in hot dry conditions away from water and in the Perth

TABLE 3.—*Comparison of Ants present on Blocks treated with 2% Dieldrin, 2% Aldrin or Chlordane at 52–54 Gallons per Acre.*

Treatment.	No. of houses in block.	Notes on presence of ants after treatment at			
		3 days.	9 weeks.	13 weeks.	21 weeks.
2% dieldrin.	10 houses.	3 colonies present	No ants in block	No ants.	No ants.
2% aldrin.	7 houses.	3 colonies present	1 ant only in block on kerb.	No ants.	No ants.
2% chlordane.	10 houses.	10 colonies present.	Ants present at base of untreated tree and at three places along kerb.	Ants trailing along Herbert Rd., avoiding barrier, and trailing on two street trees.	No ants.

Fig. 5.—A general view of portion of the Taylorina swamp area at Albany, W.A.

area it is found to invade native bush away from home gardens or other artificially watered areas only 50 to 100 yards; however, large infestations do occur in some swampy areas and in market gardens adjoining swamps. Before the Argentine ant invades residential areas in the suburbs of Perth, W.A., three species of native ants are most common:—

Melophorus turneri s. sp. perthensis Wheeler.

Iridomyrmex perthensis Forel.

Iridomyrmex suchieri Forel.

The invasion of the Argentine ant results in the disappearance of most native ants, including *I. sucheri,* which are killed out by the invaders; however, *Melophorus sp.* and *I. perthensis* are able to persist in a few special situations. In the dry sandy areas in the unimproved plantation (the area between the street footpath and the kerb) *Melophorus sp.,* and to a lesser extent *I. perthensis* are found; however, when the nature strips are watered to encourage lawns the Argentine ant is able to invade and is the only ant present. A second situation favoured by *I. perthensis* is the bitumen roadway of quiet streets. Under the high temperatures of these situations the two native species persist but are by no means common.

After the areas were treated with chlordane for the control of the Argentine ant, the populations of *I. perthensis* increased rapidly and at the final examination of the Hollywood-Subiaco areas in October, 1952, *I. perthensis* was common along street footpaths. *Melophorus sp.* had increased in number but not to the same extent as *I. perthensis. I. suchieri* was absent from the treated blocks.

A study of the habits of *I. suchieri* showed that this species favours the same situations as the Argentine ant and competes for the same foods and nest sites; on the other hand *Melophorus* and *I. perthensis* do not trail in the same situations or to the same extent as either the Argentine ant or *I. suchieri* and thus avoid the chlordane treated areas or barriers.

INVESTIGATIONS ON THE CONTROL OF THE ARGENTINE ANT IN THE TAYLORINA SWAMP AT ALBANY, W.A.

When the present series of investigations was planned it was realised that investigations into the complete control of the Argentine ant in cities must be given preference. However, it was apparent to the authors that other situations would require separate investigation and possibly some modification of the chlordane barrier sprays that were to prove so successful in household blocks.

A special infestation, and what was thought to be the most difficult, was an extensive swamp area north of Albany which carries a dense growth of an introduced leguminous shrub *(Psoralea pinnata L.)* commonly called "Taylorina". This plant flowers over many months of the year and produces large quantities of honey, it also supports a large population of mealy bugs and scale insects, thus providing an ideal habitat for the Argentine ant.

The application of insecticides to the dense growth of Taylorina would necessitate the cutting of paths and an experiment was planned to study at what distance apart these paths could be made through this area from which 2 per cent. chlordane could be sprayed into the bush to eradicate the ants.

Design.

A randomised block design (Figure 2) using four replications of a number of treatments was used, each replication contained two ¼-chain, two ½-chain, one ¾-chain and one 1-chain strips; each strip was two chains

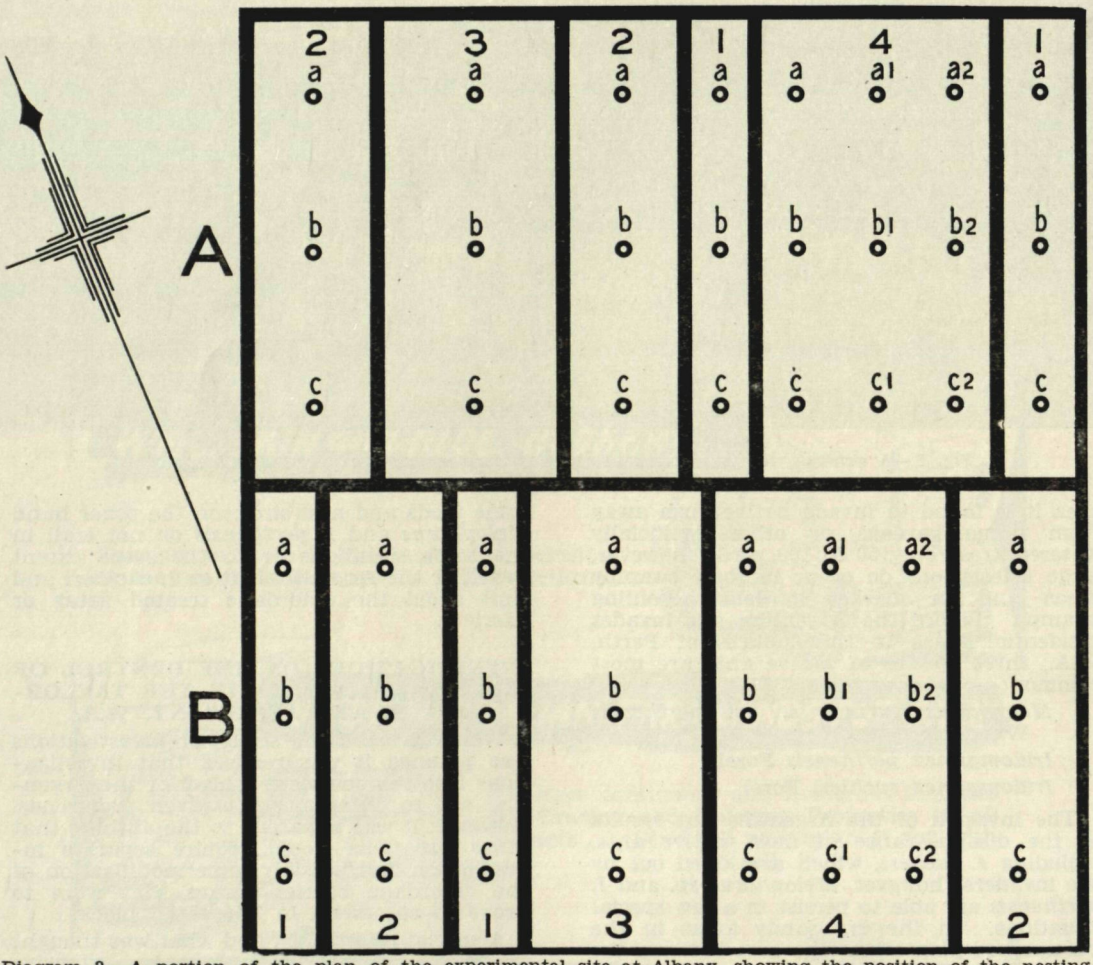

Diagram 2.—A portion of the plan of the experimental site at Albany, showing the position of the nesting sites (indicated by small circles). These artificial nesting sites were used for sampling. Plots numbered 1 are quarter-chain; 2, half-chain; 3, three-quarter chain; and 4, one chain in width.

long. Each plot and block had a 3 ft. path cleared around it.

Down the centre of each plot concrete slabs 2 ft. x 1 ft. were placed (see diagram and photo), and the effectiveness of each treatment was assessed by the presence or absence of ant nests under the concrete slabs. (Previous observations had shown that under the Taylorina swamp conditions the Argentine ant would nest readily under any cover provided.) Slabs placed in position after the paths were cut were accepted by the ants as nest sites.

Procedure.

The 2 per cent. chlordane spray was applied at the rate of 2½ gallons per chain length of each side of each plot, i.e., in the 1-chain width plots 5 gallons was applied from each side of the plots which is equivalent to 50 gallons per acre, at which rate the Argentine ant can be eradicated from household blocks. The same amount of chlordane was applied to the paths of all plots, viz.:

1-chain plot— 50 gallons per acre.
¾-chain plot— 67 gallons per acre.
½-chain plot—100 gallons per acre.
¼-chain plot—200 gallons per acre.

Half the spray was applied as a vertical barrier spray along the edge of the paths, and jetted from a height of 6 in., the other half was sprayed horizontally into the plot from a height of 2 ft. from the ground to give maximum penetration of the undergrowth. The boundaries of all blocks were sprayed with 2 per cent. chlordane to prevent ants raiding into the end of the strips.

Results.

The sprays were applied on 25th and 26th January, 1952, and examinations made at 3 days, 7 days, 3 weeks, 10 weeks and 10

Fig. 6.—This photograph of one of the paths cut through the Taylorina swamp indicates the height and density of the growth.

months after treatment. On each examination ants were found nesting under the majority of the concrete slabs.

Discussion.

The result of the 2 per cent. chlordane spray even when applied to the ¼-chain plots at the rate of 200 gallons per acre (100 gallons sprayed into the plot and 100 gallons applied as a barrier) was very surprising and after the final examination of the experiment on 4th November, 1952, observations were made to explain the failure.

A careful study of the trails within and around the treated blocks was made and it was found that within the dense growth of Taylorina the Argentine ants do not trail to the same extent as in areas where trees are less dense. Further, when isolated Taylorina shrubs were examined the ants formed longer trails.

The length of a trail of the Argentine ant is in direct relation to the nest-food association; within the dense growth of Taylorina the occurence of food, other than the sap-sucking mealy bugs and scales, would necessitate random searching. However, the abundance of food resulted in a contiguous nest system and the longest well defined trail seen in the dense growth was three feet long from a nest to a large dead earthworm. Shorter trails were seen from nests to dead beetles, moths, etc.

GENERAL DISCUSSION

The authors feel that the experiments described have shown that carefully planned it is possible to obtain reliable information on the use of insecticides for controlling Argentine ants.

Two per cent. chlordane was shown to be the best insecticide used and it did eradicate Argentine ants.

As this substance is becoming readily available people who are troubled with Argentine ants can make full use of the published information.

Used with reasonable care and not inside the house, chlordane should not present a very great hazard to the operator.

It was found that using 2 per cent. chlordane applied by the barrier spray method, between 5-15 gallons are necessary for a ¼ acre household block.

Although considered to be more toxic than DDT, chlordane can be used with little risk to the operator if some elementary precautions are observed. These are as follows:—

No parts of the body should be unnecessarily exposed. In other words, overalls or long trousers must be worn and a hat. On no account wear shorts.

Protect hands by using a barrier cream. This assists in preventing penetration of the chlordane through the skin.

Avoid all contact of the concentrated chlordane with the skin. If this occurs without barrier cream being

present on the part concerned, wash it with soap and water as soon as possible.

Avoid spraying up in the air or into the wind if there is a chance of spray contacting you.

Do not smoke while spraying.

It is necessary to observe the following points when spraying to avoid any loss to the householder:—

As chlordane is almost as toxic to fish as DDT, cover goldfish ponds with bags and spray carefully and sparingly around them.

Avoid spraying pets' food and feeding bowls; the latter should be turned upside down.

Children's playthings should be picked up and on no account sprayed with chlordane.

When spraying poultry yards turn over water and food dishes and do not allow spray to contact the birds unnecessarily. Where grapes are present on vines or fruit on trees avoid spraying the fruit as much as possible. The householder is advised to wash all fruit carefully before eating. When spraying vegetable gardens avoid spraying those parts of the plant which are eaten, for example, lettuce, spinach, tomato fruits, etc. Unless the beds are extensive the ants should be controlled by spraying the edges of the beds.

It has also been found unnecessary to do any extensive clearing up before chlordane spraying for Argentine ants.

The next logical step is to try and eradicate the Argentine ant from a large area, say a square mile, and we are pleased to say that this will be done during the summer of 1952 in Western Australia. Much valuable information should be obtained from this project. At the same time the special problem of Argentine ant control in swamp areas needs attention and experimental work is planned in this direction also. Under the dense Taylorina swamp conditions at Albany the Argentine ant does not trail extensively owing to the abundance of food and favourable nesting sites. The successful treatment of swamp areas may involve the clearing of the vegetation before treatment or a complete cover spray. Finally, more experiments are needed to see if lower concentrations of aldrin and dieldrin are as effective as 2 per cent. chlordane and, if so, the costs of each insecticide must then be considered.

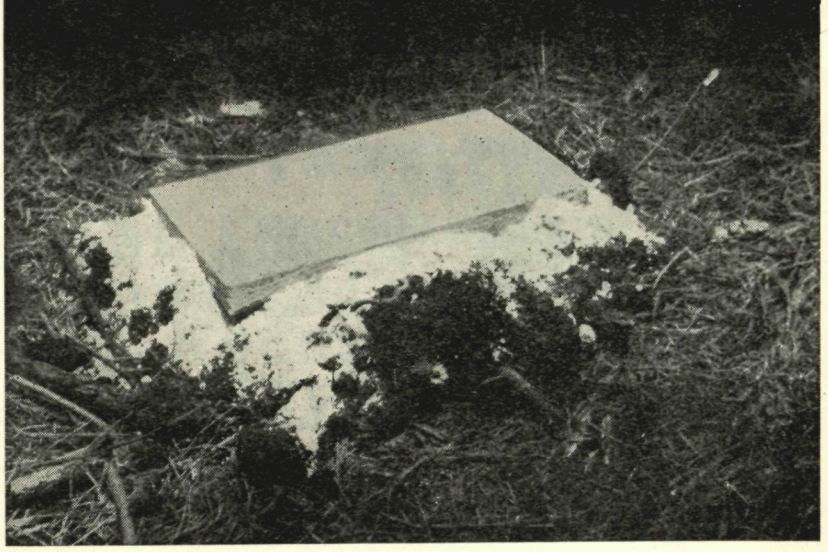

Fig. 7.—One of the concrete slabs placed on the experimental area at Albany and used as nesting sites by the ants.

SUMMARY

A series of experiments were carried out in Subiaco and Shenton Park, suburbs of Perth, W.A., to compare chlordane sprays at two concentrations with DDT sprays and a spray containing DDT and chlordane for the control of the Argentine ant *(Iridomyrmex humilis* Mayr).

The insecticides were applied as barrier sprays on a grid pattern.

The first experiment at Shenton Park, W.A., failed to provide significant differences between treatments, due to the invasion of Argentine ants into the treated areas from outside, and the unsatisfactory method of assessment.

An application of chlordane spray at less than 40 gallons per acre as a late winter spray did not eradicate the Argentine ants. However, it was shown that DDT was significantly inferior to chlordane for the control of Argentine ants.

When this area was re-treated in mid-summer, 1952, the 2 per cent. chlordane sprays eradicated the ants and the application of DDT resulted in imperfect control.

One application of dieldrin, aldrin and chlordane as 2 per cent. barrier sprays at 52-54 gallons per acre in early summer resulted in complete control of the Argentine ants from blocks of houses which were previously very heavily infested.

It is proposed to use 2 per cent. chlordane on an area of at least a square mile to attempt to demonstrate that eradication of the ant in such a suburban area is practical.

Interesting observations have been made on the native ants present in Argentine ant infested areas before and after treatment.

Although very effective against the Argentine ant in household blocks, 2 per cent. chlordane sprays did not eradicate this ant

from heavily infested swamp areas at Albany, W.A., containing a dense growth of "Taylorina" (*Psoralea pinnata* L.).

ACKNOWLEDGMENTS

The authors wish to thank the Government Entomologist (Mr. C. F. H. Jenkins) for his continued interest in this work.

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The diagrams were drawn by Mr. L. A. Marshall, C.S.I.R.O.

REFERENCES

Forte, P. N. (1949)—J. Dept. of Agric. Western Australia, 25 (Second Series): 29-32.

Jenkins, C. F. H. (1943)—J. Dept. of Agric. Western Australia, 22 (Second Series): 101-107.

Jenkins, C. F. H. & Forte, P. N. (1946)—ibid., 23: 311-312.

Jenkins, C. F. H. (1948)—ibid., 25: 245-258.

Jenkins, C. F. H. & Forte, P. N. (1951)—J. Dept. of Agric., Western Australia, 28 (Second Series): 324-335.

Pasfield, G. & Greaves, T. (1951)—Agric. Gaz. N.S.W. 57, 634-639, 642.

PRICKLY PEAR

Declared Noxious Weed

MANY householders and orchardists seem to be unaware of the fact that the Prickly Pear has been declared a primary noxious weed for the Armadale-Kelmscott, Darling Range, Mundaring and Swan Road Board districts.

The Chief Weed Control Officer (Mr. G. R. W. Meadly) states that Prickly Pear has proved of greatest significance as a weed in areas having a summer rainfall. In Australia, this plant is usually associated with Queensland and Northern New South Wales where it presented a problem over very extensive areas until a high degree of control was obtained with the Cactoblastis insect.

Although plants are already growing on wasteland and roadsides in the West Australian road districts mentioned, the main concern is not associated with the risk of any rapid natural spread but the fact that the fruits of the Prickly Pear serve as a host for the fruit fly. Single plants soon develop into thickets which are very difficult to penetrate and which do not permit of satisfactory control measures being taken.

The restricted and separated areas involved at present, do not lend themselves to control by the Cactoblastis insect.

In most cases, however, grubbing will be a practical method, making sure that the grubbed plants do not regenerate due to being left in contact with the soil. The plants can be killed by spraying with a solution containing 3 lb. of arsenic pentoxide per gallon of water, but care must be taken when using this highly toxic chemical.

WILD DOGS

THE Agricultural Protection Board has again pointed out that the time being spent by the Government doggers in hunting individual wild dogs in farming areas was seriously hampering the more important work of destroying dogs by large-scale poisoning and trapping in their outback breeding areas.

In view of the severe shortage of suitable trained men for this work the Board decided that the men must concentrate on the destruction of dogs in the breeding areas, leaving farmers and pastoralists to destroy individual dogs causing losses of sheep on their own properties.