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CONTROL OF PRODENIA LITURA ON COTTON IN THE NORTH OF WESTERN AUSTRALIA

By P. N. FORTE, B.Sc. (Agric.), Senior Entomologist and D. G. SHEDLEY, B.Sc. (Agric.), Entomologist

COTTON is subject to considerable insect attack at the new Ord River irrigation area in the East Kimberleys of Western Australia.

Although a long list of insects have been recorded as damaging cotton in this area there are two which have proved so far to present the biggest problem. These are Heliothis punctigera and Prodenia litura.

The first of these can be controlled by weekly spraying with a mixture of 4 ozs. of Endrin and 8 ozs. of D.D.T. per acre. This spray mixture serves quite well to control Prodenia litura in the 1st and 2nd generations, but has little effect on the later generations in any one season. This phenomenon has also been observed in the U.S.A. on both Heliothis species and the Boll Weevil but no satisfactory explanation has been put forward for it.

In the later generations it is therefore necessary to change to a more effective insecticide and the one so far proved and recommended is Dipterex.

Many other new insecticides have been tested and are under test and results of extensive work in the field and the laboratory where more than 50 insecticides or combinations were tested, showed that very few were in any way effective in controlling Prodenia.

Dipterex at 2 to 2¹/₄ lb. per acre gave good control of most cotton pests. However, several new insecticides look as if they could be very useful for the control of Prodenia itself but have little effect on the other cotton pests.

A field trial conducted on the 1963-64 summer crop of cotton at Kununurra and using a new organic phosphate compound American cyanamide No. 43064 showed such promise in controlling Prodenia that it was decided to make a further trial with it on a winter crop of cotton.

This article describes this trial and shows the other insecticides used. Two appear to be as good as or better than Dipterex but further large scale trials should be conducted before firm recommendations can be given.

TECHNICAL NOTES

September Trial
A 50-acre second cycle cotton crop at Kununurra showed a heavy infestation of Prodenia larvae following a moth flight and egg laying in late August.

Plots 1 chain square were selected in this area.

The insecticides were applied—
(1) Using a power operated pump and hand lance at the volume of 80 gallons per acre.
(2) Using a power operated air blast knapsack and blower at the volume of 6⁵/₈ gallons per acre.

Owing to the late stage of growth of the crop and staff and equipment problems it was not possible to carry out a replicated experiment or to test the effect of repeated spray applications.
Insecticides Tested

The materials tested and amounts of active ingredients per acre were as follows:

43064—1 lb., 0.5 lb., 0.25 lb.
Dipterex E.C.—2 lb., 2.5 lb.
Dipterex S.P.—2 lb., 3 lb.
Bidrin—15 oz.
Bayer 5080—2 lb.
Thiodon 2 lb.
Heptachlor—2 lb.
Phosdrin 10 oz.

Plots treated with the last four insecticides listed were little if any better than untreated plots. Dipterex S.P. at 3 lb. and 5 lb. was applied mainly as a test of phytotoxicity. No serious harmful effects were observed on the plants.

Sampling

The plots were sampled by moving a 20 in. square tray along between two rows and knocking larvae off the cotton plants onto the tray. A 50 ft. length was sampled each day and the insects were returned to the row from which they were taken after counting. At least three days elapsed between counts on the same rows.

Comparison between the above sampling technique and direct counts of Prodenia on 50 ft. of row showed that counts were higher with the tray technique. (Table 1).

Results

Results for the first seven days of the most effective treatments are shown in Table 2. Counts on some plots were continued for a further 10 days. There was no increase in numbers of insects on the 43064 and Bidrin plots.

Discussion

The results indicate that large field sprayings should be conducted to compare these three insecticides for effective control of Prodenia under farming conditions. It should not be overlooked that both 43064 and Bidrin are highly toxic organic phosphate compounds but that

<table>
<thead>
<tr>
<th>Days After Spraying</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Average of 4 plots</th>
</tr>
</thead>
<tbody>
<tr>
<td>43064 1 lb.</td>
<td>14</td>
<td>6</td>
<td>4</td>
<td>1-5</td>
<td>0-75</td>
<td>1</td>
<td>0-5</td>
<td>&quot; &quot; 2 plots</td>
</tr>
<tr>
<td>&quot; ½ lb.</td>
<td>21</td>
<td>22</td>
<td>7</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>&quot; &quot; 1 plot</td>
</tr>
<tr>
<td>&quot; ⅙ lb.</td>
<td>14</td>
<td>22</td>
<td>7</td>
<td>10</td>
<td>13</td>
<td>6</td>
<td>5</td>
<td>&quot; &quot; 3 plots</td>
</tr>
<tr>
<td>Dipterex EC 2½ lb.</td>
<td>17</td>
<td>12</td>
<td>14</td>
<td>7</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>&quot; &quot; 2 plots</td>
</tr>
<tr>
<td>&quot; 2 lb.</td>
<td>16</td>
<td>21</td>
<td>8</td>
<td>5</td>
<td>6</td>
<td>8</td>
<td>4</td>
<td>&quot; &quot; 1 plot</td>
</tr>
<tr>
<td>Bidrin 15 oz.</td>
<td>18</td>
<td>20</td>
<td>10</td>
<td>5</td>
<td>10</td>
<td>1</td>
<td>4</td>
<td>&quot; &quot; 2 plots</td>
</tr>
<tr>
<td>Control</td>
<td>31</td>
<td>54</td>
<td>43</td>
<td>29</td>
<td>27</td>
<td>17</td>
<td>14</td>
<td>&quot; &quot; 3 plots</td>
</tr>
</tbody>
</table>

Table 1.—Live larvae per 50 feet of row on 10/9/64

Table 2.—Number of live larvae
they could remain effective longer than Dipterex.

There seemed to be little difference between the results from the high and low volume applications.

For identification the three chemicals concerned are as follows:

1. Dipterex manufactured by Bayer = Dylora = Trichlorphon.

2. 43064 is American Cyanamid experimental insecticide formula 2-(Diethoxyphosphino Thioylimino)-1.3 dithiolane.

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* Test figures obtained using 60 ft. 3 in. discharge hose.