5-1953

Insect pest - The black beetle

C F.H Jenkins
Department of Agriculture

Follow this and additional works at: https://researchlibrary.agric.wa.gov.au/journal_agriculture3

Part of the Entomology Commons

Recommended Citation
Available at: https://researchlibrary.agric.wa.gov.au/journal_agriculture3/vol2/iss3/7

This article is brought to you for free and open access by Research Library. It has been accepted for inclusion in Journal of the Department of Agriculture, Western Australia, Series 3 by an authorized administrator of Research Library. For more information, please contact jennifer.heathcote@agric.wa.gov.au, sandra.papenfus@agric.wa.gov.au, paul.orange@dpird.wa.gov.au.
THE BLACK BEETLE

The black beetle (Heteronychus sanctae-helenae Blanchard) is a native of South Africa which seems to have first gained a footing in Australia in about 1930, for it was then recorded as a pest of maize in New South Wales. (Gurney 1934). The first reports of the beetle in Western Australia came from Albany in 1938 when some damage to potatoes was experienced. Since that date the beetle has gradually spread and it is now common in the metropolitan area where it infests golf greens, tennis courts and similar turf areas. It is also gradually increasing in importance as a market garden pest, especially where crops are grown on river flats and other areas favourable to the build-up of beetle populations.

The adult beetle is a typical cockchafer, glossy black in colour and measuring about five-eighths of an inch in length. Although possessing wings, the beetle spends most of its time on or under the ground and is very sluggish in its movements. Massed flights on warm sultry nights have been recorded in New South Wales (Wallace, 1946a) where populations of up to 30 beetles to the square yard of grassland have been observed, but flying swarms have not been reported locally.

LIFE HISTORY

Eggs are laid in the spring and early summer and these hatch into larvae known as “white grubs” or “curl grubs”. When fully fed these grubs measure about one inch in length and are whitish in general colour. The head, however, is light brown and the hind end is blackish, due to the transparent nature of the outer covering. The description is typical of many cockchafer grubs, some of which are popularly known as “bardies”, although this name is more correctly applied to the wood-boring larvae of the Longicorn beetles.

The spring adults cause damage to crops and turf playing areas, but after egg-laying has been completed their numbers decline. The brood resulting from the spring eggs appear in late summer and cause further damage. With the approach of winter the late summer beetles become sluggish and spend the colder months in a dormant or semi-dormant condition.

Owing to varying conditions in different localities and the artificial environment produced by the watering of summer crops and lawns, some beetle activity can usually be seen throughout the summer but the spring and late summer peaks are usually quite evident.

FEEDING HABITS AND TYPE OF INJURY

The main breeding-grounds of the black beetle are moist river flats, lawns, golf courses and other areas carrying a
good growth of couch or pasture grasses. The white grubs are entirely subterranean in their habits and feed among the roots of grasses, etc. The adults spend much time underground, but may often be seen crawling on the ground surface and sometimes flying around lights.

The adult beetle (enlarged).

A wide range of plants may be attacked, and usually the injury occurs at ground level or just beneath the soil surface. The main shoot or root may be grossly injured, causing the plant to wilt and later to collapse. Seedlings and young plants are more liable to damage than the more mature stages so that particular efforts should be made to protect newly planted susceptible crops.

Although the chief economic loss is experienced where damage is done to cultivated crops, beetle activity causes great concern to bowlers, golfers and greenkeepers, owing to the turf damage caused and, more important still, the irregularities produced by the burrowing of the beetles and the presence of numerous bodies on the prepared turf.

CONTROL MEASURES

Cultural Measures.—Reference has already been made to the beetle's preference for undisturbed grassland. When such areas are turned in and planted to susceptible crops, beetle damage often occurs. Similarly, when small areas of cultivated land are surrounded by infested pasture paddocks, migration into the crop may take place. Instances of this are not unusual in potato swamps where heavy damage may occur to the outer rows due to infiltration from grazing lands.

Where it is necessary to plant on beetle-infested soil, the ground should be worked thoroughly and kept weed-free for as long as possible. This will tend to starve out insects already present and for this purpose summer fallow is likely to be the more effective.

The preservation of a clean fallow strip between likely sources of infestation (river frontages, pasture paddocks, etc.) and the cropped area will tend to retard beetle migration. Such a cleared strip will also facilitate baiting and other control measures should beetles attempt to cross the barrier.

Crop Preferences.—Damage locally has so far been reported mainly from potatoes, tomatoes, and maize, but cabbages, cauliflowers and vine cuttings have also been attacked. Legumes are not generally attractive to the beetle and lettuce and silverbeet appear to be safe crops. Pumpkins and melons may be attacked but do not usually suffer heavy damage.

As the pest is by no means universally established in the market garden areas, it is not possible to list crops in order of susceptibility under local conditions. The accompanying table based upon New South Wales experience, however (Wallace 1945a), is included as it may serve as a useful guide in the absence of more exact information.

Sprays and Dusts.—DDT and BHC (Benzene-hexachloride or Gammexane) have both proved toxic to the black beetle and have been used successfully in its control. The success which can be achieved, however, depends greatly
been attempted and they involve impregnating the soil with DDT or BHC. Dust preparations worked into the soil have given promising results and water mixtures forcibly jetted into the soil around plants to be protected have also proved helpful (Wallace 1945b, 1946b, and 1946c). Both these methods, however, require much more detailed investigation, as certain plants such as tomatoes may react adversely to high concentrations of DDT in the soil and soil dressings of BHC have been known to taint certain root crops.

New South Wales experiments showed that where 2% DDT dust was worked into the soil at the rate of 1 lb. to the gallon of soil and the mixture was used to fill dibble holes as seedlings were planted out, the plants were protected for several weeks. A similar dust worked straight into the planting rows at about 1 lb. per chain also caused a heavy beetle mortality.

Likewise when open rows were sprayed prior to planting of maize seed and the surface ground was liberally jetted after the seed had been planted and covered the young maize were protected for a long period. The jetting fluids used were 0.1% DDT emulsions or 0.05% gamma isomer of BHC at the rate of about 1 gallon to every 1½ chains of row.

**Turf Area.**—Quite a large proportion of the local complaints about the black beetle come from sporting bodies where beetles are causing concern on tennis

<table>
<thead>
<tr>
<th>Outstandingly Liable</th>
<th>Liable</th>
<th>Not favoured for attack, resistant or immune</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tomatoes, Cauliflowers, Cabbages (young transplants)</td>
<td>Sweet Potatoes (ripe tubers)</td>
<td>French Beans</td>
</tr>
<tr>
<td>Potatoes (tubers and stalks)</td>
<td>Swede turnips</td>
<td>Broad Beans</td>
</tr>
<tr>
<td>Strawberries (fruit)</td>
<td>Pumpkins</td>
<td>Silver Beet</td>
</tr>
<tr>
<td>Rhubarb</td>
<td>Rockmelons</td>
<td>Peas *</td>
</tr>
<tr>
<td>Dahlias</td>
<td>Begonias</td>
<td>Lettuce (sown in the field)</td>
</tr>
<tr>
<td>Petunias</td>
<td>Phlox</td>
<td>Lucerne</td>
</tr>
<tr>
<td>Marigolds</td>
<td>Sweet Corn</td>
<td>Clovers</td>
</tr>
<tr>
<td>Maize</td>
<td>Young Grape and Passion Vines</td>
<td>Larpins</td>
</tr>
<tr>
<td>Paspalum (P. dilatatum)</td>
<td>Grasses—Couch, Carpet, Summer, Kikuyu</td>
<td>Asters</td>
</tr>
<tr>
<td></td>
<td>Young Fruit Trees in nursery rows</td>
<td>Snapdragons</td>
</tr>
<tr>
<td></td>
<td>Lettuce (transplanted into the field)</td>
<td>Chrysanthemums</td>
</tr>
</tbody>
</table>

* Late crops of untrellised green peas occasionally lose a fraction of their spring or early summer pickings when black beetle damages those pods which are in contact with the ground.
courts, bowling greens, etc. On such areas general treatments with DDT and BHC have proved effective when applied as follows:

1. 0.1% DDT at the rate of 1 gallon to the square yard.
2. 1 ounce of 50% water dispersible BHC powder to the gallon applied at the rate of 1 gallon to 3 sq. yards.

Lawns should be thoroughly watered and cut before treatment so that the insecticides will penetrate the soil and so that material will not be shortly removed by mowing.

Recent tests have shown that chlordane (Anon 1952) may prove useful for black beetle control and reports from the U.S.A. (Shenefelt 1952) indicate that this material may also prevent the growth of crab grass. The possibility of chlordane playing a dual role in the treatment of turf areas is therefore a project worthy of further consideration.

The present recommendations for this material are three ounces of pure chlordane to every thousand square feet of lawn. Proprietary preparations should be diluted with sufficient water to make convenient the distribution of three ounces of actual chlordane to the prescribed area.

**Baiting.**—Normal bran-Paris green baits used for cutworms have proved ineffective against the black beetle but crushed maize (Wallace 1948) has proved quite attractive. The maize should be coarsely crushed and mixed with BHC dust at the rate of 3 lb. of 10% BHC dust to 1 cwt. crushed grain. The bait should be scattered over cultivated ground before planting and during a period of beetle activity at the rate of about 30 lb. per acre.

Where beetles are migrating into cultivated patches from adjacent paddocks, a fallow strip can be periodically baited and the maintenance of a deep vertical-sided furrow or trench between the crop and the source of infestation will prove helpful.

**SUMMARY**

1. The black beetle was first recorded for Western Australia in 1938.

2. It is troublesome to market garden crops, especially potatoes and tomatoes and will damage fodder crops such as maize.

3. It breeds prolifically in moist river flats and other areas carrying luxuriant growth of couch, paspalum, etc.

4. Beetle infestations in bowling greens and other turf areas cause considerable annoyance in Perth and its suburbs.

5. Weed-free fallow will help to reduce black beetle injury to subsequent crops.

6. Three lb. of 10% BHC dust to 1 cwt. of crushed maize may be broadcast on infested land at 30 lb. of mixture per acre.

7. DDT, BHC and chlordane used as soil impregnations and surface treatments are effective under varying conditions.

8. Infestations in turf may be treated with 0.1% DDT solution at 1 gallon to sq. yard; 1 oz. of BHC water dispersible powder to 3 sq. yards or 3 ozs. of chlordane to 1,000 sq. ft.

**REFERENCES**

Anon, 1952, Agric. Gaz. N.S.W., LXIII, p. 118.
Gurney, W. B., 1934, Agric. Gaz. N.S.W., XLV, p. 452.
Wallace, C. R., 1946c, ibid., p. 543.
Since using "Methoxone" 30 I have saved -

£££'

Freight bills are now reduced by two-thirds -

All this means a big saving in time, money and labour and provides greater profits -

SAFE AND ECONOMICAL

'METHOXONE' 30 WIPES OUT -

- WILD TURNIP
- WILD MUSTARD
- WILD RADISH, ETC.

W.A. Distributors:
ELDER, SMITH & CO., LIMITED, 113 St. George's Terrace, Perth
WESTRALIAN FARMERS' CO-OP. LTD., 569 Wellington Street, Perth

DEPENDABLE PLANT PROTECTION PRODUCTS

IMPERIAL CHEMICAL INDUSTRIES OF AUSTRALIA & NEW ZEALAND LIMITED

Please mention the "Journal of Agriculture, W.A." when writing to advertisers
A TASK FORCE in itself

with 6 WAY POWER that makes light of any job!

First cost is last cost when you invest in a Nuffield Universal Tractor. Completely equipped with (1) Power take-off; (2) Swinging drawbar; (3) Belt pulley; (4) 3-Linkage Hydraulic lift, and (5) and (6) 2-lever control hydraulic power unit, enabling front and rear mounted implements to operate independently, plus 5 forward speeds and full electrical equipment, the Nuffield Tractor is a "Task Force" in itself. It has all the power of a 10-horse team, and amazing versatility. Top speed is 18 m.p.h. and average fuel consumption only 1½ gallons per hour! This is the tractor for you—

It has everything!
It does everything!

THE NUFFIELD

THE UNIVERSAL TRACTOR

The last word in efficient Tractor design

Distributors for Western Australia:

PARK LANE MOTORS PTY. LTD.
926-928 HAY STREET, PERTH
(TEMPORARY PREMISES)

NuFFIELD PRODUCT

On-the-job Service, Genuine Spare Parts and Implements are available from authorised Nuffield Dealers throughout the Commonwealth.

NUFFIELD (AUSTRALIA) PTY. LTD., VICTORIA PARK, ZETLAND, N.S.W.