

EXPERIMENTS FOR CONTROL OF GRASS-GRUB

were stripped of foliage by the feeding insects. The concentration of the beetles on these hedges was considered to offer a good opportunity for the use of D.D.T. as a spray in effecting a heavy enough kill of the insects to reduce materially the further infestation of the pastures.

1947 Trial

A heavily-infested farm near Te Roti was selected for the first trials with D.D.T. in 1947. About 800 gallons of spray at the rate of 1.4lb. of wettable D.D.T. (25 per cent.) to 100 gallons of water was applied by power sprayer to boxthorn hedges on November 24 and 25, just before the main flight of the beetles. Orchard trees, garden plants, and hawthorn were hand sprayed.

On sprayed plants beetles became stupefied, dropping without hovering. Many died, but others, though unable to burrow into the ground, were still alive next day. On the lee sides of boxthorn hedges and around fruit trees, where infestation was heaviest, counts of affected beetles ranged from 100 to 500 on horse covers by the next morning. Few kills were found out in the paddocks, as stupefied beetles apparently drop fairly close to hedges. Night spraying on heavily-infested plants resulted in beetles dropping within 10 minutes; all had dropped within an hour.

Birds increased considerably in number in the vicinity of sprayed hedges and the orchard. Neither birds nor poultry which fed on affected beetles were harmed by the insecticide. No dead bees were found anywhere on the area; that is not surprising, as boxthorn, unlike barberry, flowers most in early autumn, not in spring.

1948 Trial

As the spray obviously killed the beetles in large numbers, further spraying was undertaken on a more extensive scale in November, 1948. The main area of heavy infestation had shifted to a block of 1000 acres on the Fraser Road. Here about 15 miles of boxthorn hedges, several plantations, and home orchards were sprayed between November 10 and 18. Because of the terrain and the presence of native bush and plantations, host plants of the beetle could not be covered completely with spray. Trouble with unsuitable hosing and rain falling on 4 days during spraying prolonged operations unduly.

Six thousand gallons of wettable D.D.T. (25 per cent.) was applied at the same rate as in the 1947 trial to both sides of boxthorn hedges and partially to plantations. Speed of application, including filling time at farm water troughs, was about 240 gallons per hour. A sprayer of 300 gallons capacity at a working pressure of 600lb. per square inch was operated from the power take-off of a tractor. A standard orchard spray head of 7 nozzles screwed on to the end of an 8ft. pipe and pivoted for easy manipulation was attached to the back of the machine.

Boxthorn hedges were adequately covered with up and down brush-like strokes by the operator, who could spray from ground level up to about 20ft. if required. Only the tops and part of the sides of hedges require spraying. The tractor was driven at



Above—Ninety per cent. damage by grass-grub in pasture on a Taranaki property.



This pasture on the same farm was oversown with ryegrass and white clover after being attacked by grass-grub and had recovered to this extent by the following spring. It had already been grazed once when it was photographed.