BARBERRY CONTROL

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We all know the value of barberry (*Berberis vulgaris*) as a shelter plant on our farmlands. However, over the past few years barberry growing as a hedge-escape has become a menace on rolling to hilly land in many parts of the country. In the Bay of Plenty and particularly in the Whakatane district it has become a real weed and farmers are concerned about its insidious spread throughout their hill country.

It is found growing in gullies in relatively dense masses, while on slopes the plants are more widespread, but generally it occurs under cover of and in association with manuka and similar scrub plants. In this latter respect it has invaded such areas that were once burnt, sown down to pasture, and then allowed to revert to secondary growth. Cutting and burning of such scrub including the barberry does not rid the land of this latter weed.

METHOD OF SPREAD

It is fairly easy to understand just how this weed has become established. From the hedged farms birds have carried seeds to higher country and focal points of infestation have grown up, for example, at the heads of gullies where some scrub has been left standing. The spots can now be recognised by the presence of a relatively few very large barberry trees surrounded by numerous medium bushes. From here the more open country and the margins of manuka covered areas have become invaded.

USUAL METHODS OF CONTROL

It is only recently that farmers have woken up to the fact that barberry has become established as a weed on their hill country. Such as it is, their methods of control have generally been grubbing by hand or uprooting of bushes by mechanical means. Both these methods tend to be expensive, the former entails much labour and time and the latter method is not always practicable. The procedure is not satisfactory, as fresh batches of seedlings infest the gaping holes left by this drastic treatment. In any case the resultant debris has yet to be disposed of and this appears to be one of the worst features of these control measures.

CHEMICAL CONTROL

Weedicides employed in trials at Whakatane have been:—

- Butyl ester of 4-C
- Polyethylene glycol ester of MCP
- Ethyl ester of 2,4-D
- Butoxy ethanol ester of 2,4,5-T
- Polyethylene glycol ester of 2,4-D
- Atlacide
- CMU

STAGE OF GROWTH

The trials were laid down when the barberry was in flower and at the berry stage and this was over the period October to November. Plants treated were of a mixed population ranging from a height of 18in. to

at least 8ft. and where the limbs were 3in. in diameter at the bases. From the point of view of growth, weather conditions following the treatments were good; regular falls of rain accompanied warm conditions.

METHODS OF APPLICATION

The five hormone weedkillers were mixed with dieselene in the proportion of 1 of hormone to 20 of dieselene. The CMU was mixed with water and the Atlacide was applied neat. The weedicides were applied by four different methods. The hormone-dieselene mixtures were applied to the stumps of freshly cut bushes and also they were sprayed on to the butts of uncut bushes. The CMU and the Atlacide were applied to the bases of uncut plants, while in addition Atlacide was also applied to the bases of cut plants when the regrowth was some 12in. high.

RESULTS OF TRIALS

(a) Stump Treatment, Hormone-dieselene Mixtures

In this treatment the aim was to apply the mixture at two different rates, at 1 fl. oz. per stump and at 5 fl. oz. per stump. In practice it was difficult to do this, as the stumps were of variable diameters. The rates are best regarded as a light dose and a heavy dose.

All treatments at the heavy dose gave a good kill, ranging from 82 per cent. to 98 per cent. of treated stumps being killed. The ethyl ester of 2,4-D gave an almost complete kill, while following equal in second place with about 90 per cent. kill were polyethylene glycol ester of 2,4-D, butyl ester of 4-C, and butoxy ethanol ester of 2,4,5-T.

The best kill at the light dose was butoxy ethanol ester of 2,4,5-T with an 80 per cent. kill. At no stage did the now killed stumps give rise to any regrowth and tissue decay continued well into the roots. Although this method of control is a reliable one, a considerable amount of labour is involved in cutting and disposing of top growth first.

(b) Spray Treatment, Hormone-dieselene Mixtures

Ethyl ester of 2,4-D and butoxy ethanol ester of 2,4,5-T were used and the hormone-dieselene mixture was sprayed on to the butts only of uncut bushes. The 2,4,5-T mixture gave the most consistent results in the three trials with from 50 per cent. to 90 per cent. of treated bushes being completely killed. The remaining plants had a small percentage of living branches and this was apparently due to incomplete cover by the spray. Results were rapid, deterioration spreading over the whole of the top growth in a short period and then later continuing to the crown and roots. The ethyl ester of 2,4-D mixture was not always so consistent, although somewhat comparable results to 2,4,5-T were obtained in two trials.

(c) Atlacide

This material was applied neat to the base of uncut plants at the rate of $\frac{1}{2}$ lb. per plant. Results were indefinite and not very promising. In one trial about half of the bushes were killed and in another trial where trees 8ft. high were treated only slight damage resulted.

Atlacide, also at $\frac{1}{2}$ lb., applied to the bases of stumps with regrowth gave a complete kill. In a short time the regrowth had died back and there was no recovery in the following spring. Regrowth on the control stumps was in the form of a vigorous mass of shoots.

(d) CMU

Possibly the most interesting results have been from the CMU. Although relatively slow to act, this treatment appears to be one of the

most promising methods of controlling barberry. Plants about 7ft. high were treated at the rate of 8 grammes. Sixty per cent. of the plants were completely killed and with one exception the remainder had only a small percentage of live limbs. The CMU was spasmodic in its action on individual bushes. At first the leaves dropped off, then there was a rapid but short-lived regrowth. This was repeated at intervals, but with less vigour each time until the top growth had died back to the crown.

At the rate of 3 grammes and 5 grammes the results were not so promising and this appeared to be mostly due to incomplete coverage of the ground about the bases of plants.

COVERAGE

When spraying with the hormone-dieselene mixtures adequate coverage of the butt of each plant is necessary. Any limbs arising from the crown that are not sprayed will continue to live in spite of the fact that the remainder of the bush is dead.

Each limb appears to be a separate entity and there is no connection between adjacent limbs arising from a common crown. Examination of partly killed bushes shows that the living tissue continues as a longitudinal section to the end of the relevant root. Similarly it is important that when CMU is used it should be fairly evenly spread about the ground so that each root absorbs some of the weedicide.

COSTS

Calculations of the cost of materials for spraying medium-sized barberry plants at the rate of $\frac{1}{2}$ pint of the mixture gives the following results:—

- Ethyl ester of 2,4-D + dieselene = $3\frac{3}{4}$ d.
- Butoxy ethanol ester of 2,4,5-T + dieselene = 5d.
- Basal treatment with Atlacide at $\frac{1}{2}$ lb. = 8d. per plant.
- Basal treatment with CMU at 8 grammes = $8\frac{1}{2}$ d. per plant.

Thus the 2,4-D - dieselene mixture is the cheapest, but it has not proved to be as reliable as the 2,4,5-T mixture.

EXTENSION WORK

Farmers who have already used the 2,4,5-T - dieselene mixture have generally obtained satisfactory results. They prefer this treatment to that of grubbing or similar methods. The former method has not proved successful though in the case of very large barberry trees. It appears that the spray does not penetrate the spongy bark on the limbs and either repeat treatments will be necessary or else the spray will have to be applied at a higher level where the bark is clean. The advantages of spraying bushes as compared to cutting and treating stumps or grubbing are twofold, the bushes die and rot while standing, there is little or no debris to dispose of, and there is much less labour involved.