PRELIMINARY STUDY ON THE CONTROL OF RED CESTRUM

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Summary

Red cestrum (*Cestrum fasciculatum*), a Solanaceous weed, has been responsible for some stock deaths in New Zealand and overseas. This paper introduces some of the aspects of this weed and reports a simple trial to evaluate herbicides for its control.

INTRODUCTION

The *Cestrum* genus belongs to the Solanaceae and contains approximately 150 species of climbers, soft woody shrubs and small trees. All are natives of Mexico and other Central American areas. As might be expected from its family the genus has toxic properties. A full description of the poisonous members of the genus and their effects, is given by Connor (1977). Red cestrum is a slender-branched evergreen shrub about 2 m (or more) in height; leaves ovate - lanceolate 7.5 - 12.5 cm long, nearly half as wide; flowers crowded in terminal clusters 5 - 7.5 cm across, colour deep rosy carmine, 2 cm long and pitcher shaped (Halliwell pers comm).

Cestrums were introduced into New Zealand as garden shrubs and are now found in gardens throughout the country. The fruits of all cestrums are succulent and readily eaten by birds. As a consequence, much seed is spread by birds, with plants most commonly appearing in scrub, bush margins and waste places. Numbers of these garden escapes have been noted in Gisborne, Auckland, Papatoetoe and Westland (Healy 1958).

An appreciable number of poisonings have occurred from cestrums over the years, in New Zealand (Healy 1958) and overseas; Australia (Hurst 1942; Everist 1974), Africa (Watt and Breyer-Brandwijk 1962) and South America (Dobereiner *et al* 1965; Barros and Dobereiner 1968). More deaths have been recorded in cattle than sheep (Connor 1977) and these have occurred not only from the consumption of wild material but also by browsing bushes over garden fences and eating shrub clippings.

Concern has recently been expressed by Ministry of Agriculture and Fisheries Advisory Services Division, citizens and the Council of Waikohu County over the spread of red cestrum as a wild plant. It has caused a number of stock deaths in the last few years at Whatatutu (Gisborne area) and has been noted growing wild on several sites. The Noxious Plants Advisory Council, at the request of the Hastings Regional Noxious Plant Committee, has been asked to place red cestrum on the Class "A" Noxious Plant List as it is felt that the plant fulfils clause 18, (5) of the Noxious Plant Act (1978). The numbers and locations of plants in the Whatatutu area have not been fully established but known infestations occur mainly as strips some 2-5 m wide along bush margins penetrating into more open areas of the bush, where canopy closure is incomplete. Odd plants occur in open pasture. The terrain on which the plants occur is steep to very steep.

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Scrub Weeds

The nature of the cestrum infestations at Whatatutu makes foliar applications from the ground by gun sprayers the most practical method.

Until 1978 no research on control measures had been conducted in New Zealand on any of the cestrum genus. In Victoria, Australia, however, green cestrum (*Cestrum parqui*) is a scheduled noxious plant and several control methods have been devised, the most successful being bulldozing and burning. Any roots left in the ground will regrow but establishment of strong pasture helps to reduce subsequent re-infestation by seedlings. The alternative to this control measure is the use of herbicides on established bushes, seedlings or regrowth. Amitrole plus ammonium thiocyanate (amitrole T) at one part to 125 parts of water or 2, 4-D plus picloram at one part to 100 parts of water applied as an overall spray to wet the plants is recommended in Victoria (Popay pers comm). The chemicals should be applied before flowering.

METHODS

Due to constraints of terrain, site, the County eradication programme, and number of materials to be screened it was not possible to replicate the trial, but at least four plants per plot were treated. Chemical treatments (see Table 1) with the exception of granular material were applied as foliar sprays to the point of run off by a "Solo" knapsack sprayer fitted with pressure gauge, orchard lance, twin nozzle head and Delevan 25-3 cone nozzles. This sprayer configuration was designed to approximate gun spraying technique. Treatments were applied on October 31st 1978 to plants up to 2 m high prior to flowering. The granular material was applied to the base of plants at a rate of 1 g/plant (approximately 1 g/m²). Candidate herbicides were selected on the basis of overseas experience and current scrub and brush weed materials used in New Zealand.

RESULTS AND DISCUSSION

Treatments were assessed visually on three occasions (Table 1).

Table 1. List of chemical treatments applied October 31st 1978 and results of visual assessments on 1 - 5 scale*.

	Rate g/100 litres water	8.12.78	1.2.79	4.4.79	Mean
picloram granules	1**	5	5	4	4.7
2,4,5-T	360	5	5	5	5.0
2,4,5-T + picloram	200+50	5	5	5	5.0
2,4-D + picloram	200+50	5	5	5	5.0
triclopyr	480	4	3	3	3.3
amitrole + ammonium thiocyanate	200 + 183	4	3	1	2.7
glyphosate	360	5	3	2	3.3
fosamine	420	2	2	1	1.7
karbutilate	800	3	3	3	3.0
hexazinone	900	3	4	5	4.0
ethidimuron	700	3	4	3	3.3

* 1 = no visible treatment effect

5 = complete brown off

** rate in g/m²

Six weeks after treatment, picloram granules, 2,4,5-T,

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2,4,5-T/picloram, 2,4-D/picloram, glyphosate, amitrole T and triclopyr all gave 100% brown off. Hexazinone, ethidimuron and karbutilate showed 50% brown off with remaining leaves chlorotic and fosamine resulted in leaf discolouration over 20% of individual plants.

On the same site the District Noxious Plants Authority eradication scheme was operating. Their technique was to cut and treat basally with sodium chlorate. In December 1978 this treatment looked promising, but by April 1979 stumps showed 80-90% regrowth and plants had attained a height of over 1 m in some instances. On the trial site 2,4,5-T, 2,4,5-T/picloram and 2,4-D/picloram treatments appeared 100% effective as no regrowth had occurred and dead material was starting to break down. Hexazinone and ethidimuron plots showed some recovery in February but by April hexazinone had resulted in secondary tip die back and no new shoots were evident. Ethidimuron allowed some regrowth to occur. Picloram granules were 95% effective whilst vigorous regrowth was occurring with the glyphosate, karbutilate, amitrole T and triclopyr treatments. Fosamine was completely ineffective and allowed plants to flower and set seed.

Whilst results from one non-replicated trial in one season cannot be seen as conclusive at least these early results have indicated possible treatments that can be used on a potentially dangerous weed. Currently the cut over regrown area treated originally with sodium chlorate have been resprayed with 2,4,5-T/picloram and results look encouraging. It is not known at this stage whether changes in rates or timing of application would affect the efficiency of any of the materials used. Further work will be necessary to establish this. The site will be monitored for seedling establishment in the coming season.

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