CONTROL OF OLIVE, *OLEA* SPP.

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Summary. *Olea* spp. can be controlled and selectively removed from eucalypt parkland by the application of a mixture of triclopyr and distillate as either a basal bark, or cut stump treatment.

INTRODUCTION

Olive, *Olea* spp. is recorded as one of the earliest plant introductions to Australia. *O. europaea* was planted by John Macarthur at "Elizabeth Farm" Parramatta in 1805 and this original planting survives today as one of the oldest exotic trees in Australia (4, 7). In "Catalogue of Plants Cultivated at Camden" (1) published by Sir William Macarthur, American olive, *O. americana*, and *O. europaea* (six varieties), appear amongst the comprehensive listings.

In the last decade, olive, has asserted itself as a major invading species of grazing parkland in the Camden/Campbelltown districts 50 km south west of Sydney. We have also observed it spreading in the Windsor district west of Sydney.

Olea species. The *Olea* spp. present in the trial site at "Camden Park" appear to have a wide variation in both leaf form and colour, and in the size and shape of fruit. The National Herbarium, Sydney, has identified two *Olea* spp. in the trial area. Both *O. europaea* and *O. europaea* ssp. *africana* have been identified in the trial area. However, Jacobs and Pickard (5) state that *O. africana* only occurs on the North Coast and Central Coast botanical subdivisions, while *O. europaea* occurs on the North Western Slopes and Central Western Slopes of N.S.W.

The spread of olive is attributable to birds (2, 3), and seedlings often appear in large numbers under mature trees. Also, changes in grazing management enable olive seedlings to establish. In the Adelaide Hills of S.A., *O. europaea* has spread following the removal of grazing livestock (6). *O. europaea* could be contained by re-introducing livestock.

Due to the close proximity of olives with other desirable trees, control by conventional herbicide and mechanical means is difficult and generally impractical. Consequently, alternative methods of control are needed.

In South Australia *O. europaea* was readily controlled with herbicides applied as cut stump treatments coupled with direct seeding of kangaroo grass, *Themeda australis* (6).

METHODS

The trial was located in a paddock with heavy infestations of olive, under mature narrowleaf ironbark, *Eucalyptus crebra*, stands.

Various rates and types of herbicides (Table 1) were applied as both a basal bark application and a cut stump treatment on 15 and 16 May 1985. Glyphosate was applied at two application rates mixed with water while triclopyr was applied at one rate mixed with distillate. At application the olives varied from 3 to 25 cm in basal diameter and 1 to 7 m in height. The basal bark

herbicide treatment was applied with a low pressure hand-held pneumatic sprayer to the base of the stems (from ground level to 30 cm). The cut stump treatment involved cutting the stumps as close to ground level as possible, and immediately swabbing the cut stump with the herbicide mixture. Soil moisture was excellent at time of treatment.

Table 1. Effect of herbicide and method of application on control (% mortality) of *Olea* spp. at 13 and 20 months after treatment.

Herbicide	Dilutent	Rate kg a.i./L	Method of application [a]	Control[b] June 1986	Feb. 1987
Glyphosate	Water	0.120	cs	41 b	13 c
Glyphosate	Water	0.120	bb	55 b	68 d
Glyphosate	Water	0.033	cs	0 c	0 c
Glyphosate	Water	0.033	bb	15 c	13 c
Triclopyr	Diesel	0.044	cs	100 a	100 a
Triclopyr	Diesel	0.044	bb	100 a	98 a
Untreated			cs	0 c	0 c
Untreated			bb	0 c	0 c
l.s.d. (P=0.05)				19	17

[a] cs = cut stump; bb = basal bark technique
[b] values followed by same letter do not differ significantly (P=0.05) as determined by Duncan's Multiple Range Test.

There were four replications for each treatment. Results were assessed by recording percentage mortality at 13 and 20 months after treatment compared to the control plots.

RESULTS AND DISCUSSION

The triclopyr and distillate mixture was outstanding in controlling olive as both a cut stump and basal bark application treatment regardless of size. Glyphosate gave unsatisfactory results (Table 1).

The basal bark treatment, is very simple to apply and is the most cost effective treatment. Although the cut stump treatment using triclopyr and distillate gave comparable results, it requires the stems to be cut, and disposing of the plant material is a considerable disadvantage.

In the control plots, regrowth of the cut stump treatment after 20 months was 1 to 2 metres high.

The 0.12 kg a.i./L rate of glyphosate gave a higher degree of control than the 0.033 kg a.i./L of glyphosate. Although regrowth on the cut stump glyphosate treatments was severely stunted and deformed, all plants were still alive 20 months after treatment.

In all treatments, there was no observed affect on the adjoining desirable species. Using a mixture of triclopyr and distillate as a basal bark or cut stump treatment, olive can be selectively removed from stands of narrowleaf ironbark.

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