

The effect of slashing on Chinese scrub

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SUMMARY

The effect of slashing on the control of Chinese scrub (*Cassinia arcuata* R. Br.) was investigated in an experiment at Bendigo in northern Victoria.

Survival of Chinese scrub plants after either October or March slashing, or both, showed a steady decline under the dry conditions which prevailed during the experiment.

The size of the Chinese scrub plants at slashing was shown to be important. Large plants above 1 m high were more severely affected by slashing than smaller plants.

Practical implications of these results are discussed.

INTRODUCTION

Chinese scrub (*Cassinia arcuata* R. Br.) is a perennial native shrub which grows to about 2 m high, and is widespread on auriferous country throughout southern Australia (Willis, 1972).

It has been declared a noxious weed in Victoria (Parsons, 1973) and it can become sufficiently dense in pastures to reduce herbage production and thus severely limit stock carrying capacity.

Growth can be very rapid during warm weather but is slow in winter. The plants are shallow rooting and are prolific seeders. Dense germination of scrub commonly follows clearing of infested areas.

In the early 1970s the economics of improving Chinese scrub infested land were not good. This was mainly due to the high fertilizer input required to correct deficiencies present in the poor soils commonly supporting scrub, together with the relatively low stocking rates and low animal production possible from these areas (average annual rainfall below 500 mm). However, the advent of "hobby farmers" and subdivision into smaller blocks has increased the demand for improved Chinese scrub control measures and pasture improvement on this class of country.

Mature scrub plants are relatively tolerant of herbicides, so cultivation followed by pasture improvement is recommended for most farm infestations (Whittet, 1962). However, Chinese scrub infests large areas of low quality stony land where normal cultivation and preparation of seedbeds are not practicable.

To produce a vigorous subterranean clover stand which will compete very strongly with Chinese scrub in this type of country, the density and vigour of the scrub need to be reduced to give

oversown clover a chance to establish.

The tractor drawn slasher is a sturdy low cost implement that can be used on rough scrub infested country. This paper describes an experiment which examined the effect of slashing on the control of Chinese scrub plants.

MATERIALS AND METHODS

A dense Chinese scrub stand in a paddock near Bendigo was selected for the experiment. Plot size was 2 m x 40 m in a randomized block design with 4 replications.

Treatments were:

1. Control - no slashing
2. Slashed October 1976
3. Slashed March 1977
4. Slashed October 1976 and March 1977.

In each plot, 10 plants in 3 selected size groups were marked.

The size groups were:

1. Plants less than 50 cm tall
2. Plants between 50 cm and 1 m tall
3. Plants more than 1 m tall.

A tractor driven rotary slasher, set to a cutting height of 10 cm, was used. Marked plants were counted in December 1976, and again in March, July and October 1977. Plants showing any green regrowth were recorded as survivors. The plots were not grazed during the course of the experiment. Rainfall data were obtained from Bendigo, the nearest recording station.

RESULTS

1. Rainfall - Below average rainfall occurred in both 1976 (402 mm) and 1977(319 mm to the end of November). As a result, soil conditions were dry for most of the experiment period.

2. Effect of time of slashing on survival of Chinese scrub plants - There was a decline in the number of surviving plants during the period following slashing (Table 1), for both single slashed treatments.

In the repeat slashing treatment, the decline showed a similar trend to that in the single slashed treatments.

The count taken six months after the single slashing treatment in March was not different from the corresponding count following the October slashing.

3. Survival following slashing of Chinese scrub plants in three size groups - Data for the October slashing are presented in Table 2. Similar results were obtained with the March slashing.

Table 1. The effect of time of slashing and repeat slashing on relative Chinese scrub survival (initial count = 100) for the period October, 1976 to October, 1977

| Time of count | Time of slashing | | |
|---------------|------------------|----------------------|------------|
| | October 1976 | October 76, March 77 | March 1977 |
| October 1976 | 100 | 100 | - |
| December 1976 | 54 | 70 | - |
| March 1977 | 25 | 28 | 100 |
| August 1977 | 19 | 22 | 58 |
| October 1977 | 11 | 15 | 39 |

Table 2. Relative survival of Chinese scrub plants (initial count = 100) in three size groups during a 10 month period following an October slashing

| Interval after slashing (months) | Less than 50 cm | 50 cm - 1 m | Above 1 m |
|----------------------------------|-----------------|-------------|-----------|
| Initial 0 | 100 | 100 | 100 |
| 2 | 76(1.062)* | 63(0.912) | 20(0.465) |
| 5 | 42(0.705) | 23(0.497) | 4(0.210) |
| 10 | 36(0.639) | 8(0.280) | 1(0.096) |

Differences for significance

| | | |
|------------|--------|-------|
| Interval | P=0.05 | 0.295 |
| | P=0.01 | 0.423 |
| Size group | P=0.05 | 0.262 |
| | P=0.01 | 0.358 |

* Statistical analyses were performed on the data transformed on an arcsin $\sqrt{\text{proportion}}$ scale (in parenthesis).

When the data were transformed for analysis on a log proportion scale, there was no significant interaction between observation interval and size group. On the re-transformed means, the effects were as follows.

In the group with plants above 1 m tall, there was a significant decline in the number of surviving plants two months after slashing. There was a further significant decline until only 1% of plants were surviving 10 months after slashing.

In the intermediate size group (50 cm - 1 m tall) there was a similar but a more gradual decline in survivors compared with the taller plants, and 8% survived after ten months.

The smallest plant size group (less than 50 cm tall) showed an even more gradual decline compared with the taller groups, although the decline was still significant. After ten months 36% of the plants were still surviving.

DISCUSSION

Both 1976 and 1977 were very dry years, so that the effect of slashing on Chinese scrub plants may have been more severe than it would have been in higher rainfall years.

The effect of slashing was most severe on large plants more than 1 m tall. Slashing not only cut off the stem, but also had a "shattering" effect on the plant, often splitting the stem and loosening the shallow roots from the soil. As a result, any regrowth from these plants was very weak, and in most cases the plants soon died. It may be expected that, if soils were moist at and after slashing, there would be less disruption to the root system, with a resulting better survival. However, even under moist soil conditions, larger plants would still be more severely affected by slashing than smaller plants.

There was no advantage apparent in this experiment in a particular time of slashing, or in repeat slashing. Some practical suggestions can be made from the results of this study.

1. Under the normal seasonal conditions of northern Victoria, with a winter rainfall and summer drought, slashing in late spring or early summer could be recommended.
2. Most effective control of Chinese scrub could be expected where plants more than 1 m tall were slashed, although a considerable reduction in the numbers of smaller plants could be expected.
3. Following slashing, it has been shown that it is important to establish a vigorous subterranean clover based pasture to provide competition to regrowth of the Chinese scrub plants (Curnow and Jones, personal communication). Various oversowing techniques (e.g. Campbell and Dowling, 1974) are now available for situations where cultivation is not possible.

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