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USING GOATS FOR THE CONTROL OF BLACKBERRIES IN NORTH-EASTERN VICTORIA

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Summary The effectiveness of fibre goats in controlling a severe blackberry infestation in the Ovens Valley of Victoria is described. The site had two parts: 70% was steep (rising 60 m), wet, lightly forested and covered with an impenetrable infestation of blackberries and the remainder was flat with pasture, blackberry thickets and other weeds.

After 18 months blackberry thickets on the flat land had been reduced to trash and old canes, and pasture was reinvading cleared areas. On the steep land most blackberries had been defoliated and many had been eaten. Little damage to other vegetation was observed and new plants were establishing.

Goats destroyed an unmanageable and expanding infestation of blackberries on a steep hillside in north-eastern Victoria. Constructive comments based on experiences of those involved in the project are made to assist others wishing to undertake similar projects.

INTRODUCTION

The devastating effect of goats on blackberries (*Rubus fruticosus* L. s.lat.) has been known for many years. With the expansion of the fibre goat industries some farmers have used goats to clear extensive infestations of blackberries in the tablelands of New South Wales such as in mountainous regions of Coolah, average rainfall 850 mm (Arnott 1983). Goats have controlled blackberries around Carcoar, Chaffey and Windemere water supply reservoirs in New South Wales where the use of herbicides is restricted.

Previous research at this Institute demonstrated that blackberry leaves and young stems provide highly digestible forage with high energy, nitrogen and ash levels, suitable for livestock of all physiological states. The nutritive value of heavily defoliated blackberries, where only the older stems remain, was significantly lower, suitable only for maintenance of mature non-breeding livestock (McGregor 1992).

Significant areas of north-eastern Victoria are infested with blackberries and few land managers are presently utilizing goats in control programs. In 1991 the Victorian Farmers Federation, Pastoral Group, Goat Section decided to establish a project to demonstrate the effectiveness of fibre goats in controlling severe blackberry infestations in the Ovens Valley of Victoria.

This report describes the observations I made of the

effect of the goats on the site. Constructive comments based on my experiences and those of others involved in the project are made to assist those who wish to undertake similar projects.

MATERIALS AND METHODS

Location The site (146° 47'E, 36° 36'S, elevation 230–290 m, annual rainfall 1000 mm) was 7 km east of Myrtleford adjacent to the Ovens Valley Highway with a predominantly south-westerly aspect. The 8 ha site was chosen because of its high visibility from the highway. It had been grazed by cattle.

Approximately 30% of the site was flat land sown with perennial pastures of white clover (*Trifolium repens* L.) and rye grass (*Lolium perenne* L.) which had been invaded with rushes (*Juncus* spp.), reeds (*Phragmites australis* (Cav.) Trin.), paspalum (*Paspalum* spp.) and approximately 40% of the flat land was covered by blackberry thickets. The remainder of the site was steep, rising 60 m in approximately 250 m. This steep land had over 80% blackberry cover and was lightly forested with silver wattle (*Acacia dealbata* Link), broad-leaf peppermint (*Eucalyptus dives* Schau.), red stringybark (*E. macrorhyncha* F. Muell. ex Benth.), native cherry (*Exocarpos cupressiformis* Labill.), tree violet (*Hymenanthera dentata* R.Br. ex DC.) and various native and exotic grasses and herbs.

Design The site was split into a grazed treatment and an ungrazed control.

Fencing Fence alignments were cleared by bulldozer. Originally it was proposed to erect seven wire electric fences 1.05 m high but the local managers and land holders preferred prefabricated mesh. Hinge Joint® mesh (8–115–30), with seldedge plain wires at the top and bottom of the mesh, and a high tensile barbed wire 15 cm above the mesh were erected giving a height of approximately 1.3 m. Star steel posts were placed at approximately 4 m spacings depending on the terrain. After about six months an electric offset wire (solar powered) was installed 30 cm above the ground and 15 cm from the mesh fence.

Animals Prior to grazing, adult female cashmere goats (n=50) provided by a farmer, were inspected by a

Department of Agriculture Veterinarian and no evidence of footrot, lice or internal parasite infections was observed. The goats grazed the site from late December 1993 until removed at the end of June 1994. Cashmere goats (n=110) were reintroduced in December 1994 and removed in early April 1995.

Observations On the flat land 14 identified separate blackberry thickets were measured and volumes calculated assuming thickets were equivalent to a half cylinder ($0.4 \times \text{width}^2 \times \text{length}$). On the flat land 11 photographic points were established (with steel stakes) to record the identified thickets and other vegetation. On 10 rapidly growing blackberry canes, a red ribbon was attached 0.5 m from the growing point. On the steep land 11 photographic points were established. Observations made in April and June 1994 and in May 1995 are reported for the effects of the goats on marked plants, ground coverage and vigour of blackberries.

RESULTS

Climatic conditions Rainfall during 1994 was average but drier conditions prevailed in late spring 1994, summer and autumn of 1995.

Vegetation along fence lines Clearing the fence lines with the bulldozer left all fence lines bare. In April and June 1994 parts of the fence lines were being used as tracks and all the bulldozed areas remained bare. By May 1995 grass had regrown along most of the cleared fence lines except where tracks were being used.

Vegetation on the flat land The volume estimates of some blackberry thickets measured in December 1993 are given in Table 1. By April 1994 goats had eaten blackberry leaves around the edges of all thickets below 1 m in height and most individual long canes projecting out from the thickets had been consumed. Green grass availability was more than 2000 kg dry matter ha⁻¹. Little changed between April and June. Essentially the expansion of the thickets had been halted. The reeds were reduced in height from 2.5 m to >0.3 m by April 1994.

Table 1. The volume of some of the measured blackberry thickets on flat land grazed by goats.

Blackberry thicket	Volume (m ³)	Volume (m ³)
	December 1994	May 1995
A	105	0
B	60	0
C	520	0
D	130	0
E	>700	3

By May 1995 almost all the thickets had been reduced to ground level with only a small amount of trash and old dead canes remaining. Grass had reinvaded the ground where thickets had been and with a few thickets bracken and other pre-existing plants were revealed. The only thicket where blackberry remained was over 2.5 m in height, and a small clump remained entangled in a tree violet, out of reach of the goats. No visible damage to the tree violet was evident.

The rushes appeared untouched. One 1.3 m high red gum sapling (*E. camaldulensis* Dehnh.) had been killed.

Vegetation on the steep hillside By June 1994 the goats had consumed most blackberries and projecting canes below 1 m in height. By May 1995 the hill side had been transformed from a green mass of entangled blackberries to a site of light brown defoliated and dead blackberry canes and exposed soil. While many canes remained only a few canes had any leaves. Tracks crisscrossed the hillside and it was now possible to walk across the site, albeit with some difficulties in maintaining balance, whereas it had been impossible to walk through the entangled mass of blackberries 18 months previously. Following rain in autumn 1995 germination of grass occurred across the hillside.

The goats had demolished several very large blackberry thickets at the top of the hill, one over 2.8 m in height. St. Johns wort (*Hypericum perforatum* L.) plants which were flowering during 1994 had been eaten by May 1995. A small clump of native tussock grass (*Poa* spp.), whose leaves were over 30 cm in length in December 1993 and which were ungrazed in June 1994, had been grazed to a height of 12 cm by May 1995. Five red stringybark and silver wattle saplings about 1.3 m in height had been killed by May 1995. One small red stringybark which had a large fresh rub mark and exposed inner trunk in June 1994 had recovered significantly by May 1995, and very few other rub marks were seen.

Management of the goats and fences The goats preferred to camp near the highest area of the grazed plot. This area was also the furthest from the road and the area which received the most exposure to the sun.

During 1994 the goats experienced foot problems owing primarily to the swampy conditions and very lush vegetation on the flat land and the inability of the small number of goats to keep effective grazing pressure on the pasture. Foot bathing became necessary in May and it was decided to remove the goats by June. As there was a huge availability of feed and the site had been ungrazed for six months the grazing pressure of goats was increased from December 1994. By April 1995 the

availability of herbage was becoming limiting, mainly as a consequence of grazing but partly due to low plant growth rates from the dry conditions, and it was necessary to remove the goats.

Within days of commencing this trial a large tree flattened the fence between the control and the grazed plot requiring urgent repairs. By April 1994 the goats had eaten sufficient blackberries to have cleared several mounds of rock, soil and branches which proved suitable launching pads for jumping the fence into the control plot. Once inside the control plot they could not jump back. It took several weeks to identify this problem which was then easily rectified. As feed became more limiting goats pushed under the fence into the control near rocky outcrops where the tension was slacker or where the fence was more than 8 cm above the ground surface. These periodic invasions into the control plot destroyed the blackberry thickets and canes which were being measured but provided further evidence of the high regard in which blackberries are held by goats. One wombat trail allowed several goats to escape despite the fence in this area being reinforced with very low electric outriggers. These goats were removed.

DISCUSSION

Goats destroyed a severe unmanageable, impenetrable and expanding infestation of blackberries on a steep hillside in north-eastern Victoria. Prior to grazing by goats the site was unable to be controlled by aerial spraying owing to the light forest cover and was inaccessible to a person with a spray backpack. Following grazing, the area which had been covered by blackberry was being naturally revegetated with grass. Continued grazing with goats or spraying with a backpack would be necessary to maintain control of the blackberry on the hillside.

The initial grazing placed some pressure on the blackberries but was insufficient to result in rapid reduction in the biomass. However it was considered unwise to increase grazing pressure during the normally wet and very cold winter experienced in this district. Allen *et al.* (1993) provide additional suggestions regarding grazing and burning practices for blackberry control.

Management issues The following issues had to be managed or were of importance at some time during this work and are listed to assist others who may wish to use goats in this type of environment:

- Need a strong commitment from the support group.
- The support group must be in close proximity to the site for ease of management and cost efficiency.
- Need competent stock person(s) nearby who can monitor and attend to health and management needs and round up all animals.

- Preference should be given to sites with permanent occupancy.
- Potential entrapment of goats in blackberries requires regular site inspections.
- Regular grain feeding will make mustering easier.
- The fencing alignment in this study was to provide control and treatment plots easily visible from the road. The rough terrain reduced fence security which resulted in a compromised control treatment. Fences along more level and secure alignments would reduce workload. Visibility of the site was later considered to be of lesser importance.
- Fencing work must be undertaken by 'goat wise' experienced contractors.
- Goats do not appreciate being confined to areas on the colder, shaded face of hillsides.
- An effective system of handling escaped goats is necessary. In steep country where visibility is hampered this issue assumes greater importance.
- Yards with wing fences built near the natural camping site will reduce work.
- A clean water supply must be guaranteed and available at all times of the year.
- Non-breeding goats are necessary.
- Shearing of goats is possible but in very wet and cold districts requires excellent management to prevent hypothermia.
- Districts with high rainfall and weed problems often have soils with mineral deficiencies. Goats have high mineral requirements and need appropriate mineral supplementation.
- A revegetation (aerial sowing?) or management plan should be developed as part of any weed control project.
- Dynamics within and between the support groups can change during the planning and implementation stages and may significantly alter the available resources.

Benefits arising from project

1. Demonstration to local landholders that goats can be an effective control agent against blackberries.
2. Direct benefit to the landholder by clearing the hillside of blackberries.
3. Publicity of the effect of goats on blackberries in the region by local newspapers (Beemster 1993, 1994), field days and by television (Courtney 1995).
4. A stronger local farmer group which has attracted new keen members.

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