tuberosa, and *Dactylis glomerata* experienced a setback, whereas 'weed' grasses such as *Holcus lanatus*, *Bromus* spp. (mostly *B. mollis*), *Vulpia bromoides* and *Poa annua* were well controlled. *Trifolium fragiferum* and *T. subterraneum* were also susceptible but *T. repens* was quite tolerant. In northern New South Wales *Axonopus affinis* was one of the major pasture species, but only a transitory effect was noted. Bracken fronds physically protect under-storey plants and mitigate the effects of a 4.8 kg a.c. rate.

Where the areas of treated bracken had been slashed 6 weeks post-spraying, and the cut area hand-dressed with *Lolium perenne* and *Trifolium subterraneum* cv. Mt Barker, no effect on the germination or subsequent growth of the ryegrass was noted and only a slight difference occurred in the germination of the subterranean clover.

Trials had not become involved in detailed land management recommendations due to considerable variations in individual requirements which would have made this task impracticable. The use of cleared land for improved pasture will help to maintain the long-term control of the bracken and avoid infestations of other weed species.

HOREHOUND CONTROL IN MARGINAL GRAZING LAND

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Horehound (*Marrubium vulgare*) occurs in non-agricultural areas and pastures throughout Victoria. Stock will graze seedlings, but generally avoid older plants unless grazing pressure is severe. At Swifts Creek, in east Gippsland, the plant is dominant over large areas of marginal grazing land with shallow, rocky, sedimentary soils. In these areas, control is practically difficult and economically marginal. Spraying with 0.2% a.i. 2,4-D in autumn and/or spring has been recommended for control in the past and, generally, gives good kills of established plants. However, subsequent germination and establishment of horehound seedlings on sprayed areas is prolific in the absence of other pasture and stock management adjustment. Observations at Swifts Creek

indicated horehound seedling establishment was suppressed by heavy grazing, low soil P, and establishment of a perennial species such as phalaris.

In early 1972, a trial was commenced at Swifts Creek to investigate the control of horehound using herbicides, pasture improvement, and grazing management. The herbicide treatments were 2,4-D (2 kg a.i./ha), paraquat (0.01 kg a.i./ha), and glyphosate (0.007 kg a.i./ha) applied in various combinations in autumn (22 May 1974) and spring (30 October 1974). Sulphur (375 kg/ha) was applied to one 2,4-D (autumn) treatment at the beginning of the trial, and Australian phalaris (6 kg/ha) was broadcast by hand on one 2,4-D + glyphosate (autumn) treatment on 4 June 1974. Superphosphate (9.4% P) with molybdenum (0.05%) was applied at two rates (0 and 125 kg/ha) in May 1972, 1973 and 1974. Sheep were continuously grazed at two stocking rates (3.4 and 6.8 sheep/ha) from the beginning of the trial on all treatments except where phalaris was sown. On this treatment, plots were not grazed until 12 May 1975.

Observations of ground cover (%) and available herbage dry matter (kg/ha) of the various pasture components indicated that the best control of established horehound, the most suppression of horehound seedlings, and the highest production from grasses and legumes were achieved with 2,4-D + glyphosate spraying in autumn and establishment of phalaris. Generally, grazing pressure and superphosphate application had little effect.

Phalaris establishment was excellent on the areas sown with this species and was, no doubt, enhanced because the 2,4-D + glyphosate had removed competition from other species. Ground cover of phalaris was 23% and 29% on 6 November 1974 and 20 August 1975, respectively, and herbage production was 1200 and 1300 kg/ha on 10 December 1974 and 12 May 1975, respectively. However, it is doubtful whether such a measure to control horehound in this marginal grazing country could be economically justified.