

## Pasture Management and Weed Control Using Goats

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The presence of weeds in pasture greatly reduces the short- and long-term profitability of pastures (Auld *et al.*, 1987). Traditional methods of weed control are cultural, biological, chemical, mechanical or grazing. However, not all these methods are necessarily effective nor environmentally sustainable. Successful pasture management requires an understanding of the grazing component. The integration of goats into grazing systems to control weeds, can assist traditional methods in providing efficient sustainable pasture management.

### Integration

All animals have dietary preferences, the consequences of which are observed by the different weeds seen in specialist horse, sheep or cattle paddocks. Goats have been observed to eat a variety of undesirable plants and shrubs that are not fully utilised by either sheep or cattle (Holst, 1980; Lambert, 1986).

Uncontrolled plants (*eg.* thistles) located around trees and along fencelines or weeds that have germinated early or late and were not affected by herbicide, will be grazed by goats at some stage when palatable. By this action the source of the weed seed is reduced. Similarly, degraded non-arable country with woody and other weeds may be re-claimed by goat grazing. Holst (1980) considered that when goats are integrated with sheep or cattle, they bring about the control of weeds by:

- Prevention of flowering and seed dispersal
- Preferentially grazing the weed and so placing it at a disadvantage, allowing desirable species to proliferate
- Ringbarking or physically breaking branches, structurally weakening some shrub species

The major control process is ecological where the weed is placed at a competitive disadvantage. In this system pasture seed and/or nutrients may be required and adjustments will be needed to the ratio of goats to sheep or cattle depending on the density of pasture and weeds.

### Importance of Plant Palatability to Stock Ratio

Dietary preference of animals is largely affected by palatability and this knowledge can be used to determine

what numbers of sheep and goats can be added to a paddock to utilise the existing pasture and to control the weeds.

For example, blackberry (*Rubus* spp.) is highly palatable to goats (Holst, 1980) and forms a large part of their diet from spring to autumn. In winter goats continue to eat light canes but in the absence of foliage they will compete with sheep or cattle for the available grasses and to a lesser extent the clovers. Thus goats can be introduced to areas of blackberry from spring to autumn without reducing sheep or cattle numbers. Another example is the common thistles which are eaten by goats at flowering (Figure 1) but not by sheep. In a thistle infested pasture goats that are set stocked will be competing with other livestock when thistles are young and there would need to be a reduction in the number of sheep or cattle to accommodate the introduction of goats (Lambert, 1986). Alternatively, strategic grazing may be implemented; grazing with goats at a time when they select the target weed (*eg.* at flowering) and not grazing when the goats compete with other animals. Knowledge of changes in palatability with stage of plant growth allows the flexibility of either set stocking or strategic grazing.

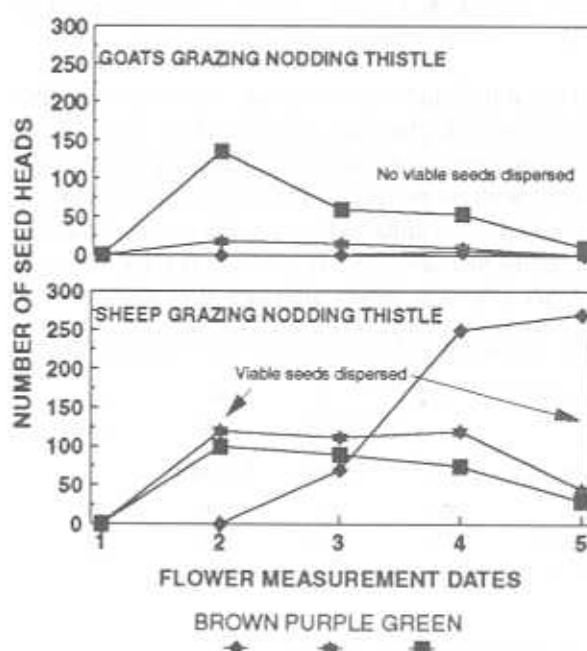


Figure 1: Nodding thistle seedhead production in pasture grazed by goats and sheep.

### Advantages of Utilising Goats for Weed Control

The inclusion of goats offers savings in the cost of chemical, labour, time, machinery; high sustained efficiency levels for control; returns from goat products and environmental acceptability. At all stages of a weed control program, the producer maintains control; able to decrease or increase grazing pressure depending on prevailing seasonal conditions.

### Management Recommendation

The principle role of the goat is to *place the weed at a competitive disadvantage* to the surrounding pasture. This is achieved by selective grazing, reducing stored reserves and occasionally inflicting physical damage. In most cases it is important to have the base pasture competitive, not limited by nutrients or seed, so that it can overcome the weed and colonise bare areas. Since fresh clover is not preferentially grazed by goats it is an effective competitor of weeds and should be a major component (30%) of the pasture. If phosphorus is limiting, superphosphate should be applied at the commencement of the weed control program.

In some instances the weed infestation may be too great and require too many goats to effect control. Conventional control (eg. burning, slashing, cultivation, spraying) may be required prior to goat grazing. The procedure of "Spray grazing" (sub-lethal rate of herbicide) thistles in the late vegetative/early stem elongation phase will assist in reducing the number of maturing thistles. In dense infestations of woody weeds such as

blackberry, scotch broom or gorse, paths may need to be slashed through the infestation to allow greater access for goats.

The impact of goat grazing on weeds needs to be monitored to ensure there is sufficient pasture for the animals and for the pasture to be competitive with the weeds. With thistles, for example, if some mature seed-heads are present after the first month of flowering, then the number of goats needs to be increased. Alternatively, if the flowers are being eaten but the pasture is limiting then reduce the number of goats.

Weed control is achieved by preventing seeds from replenishing reserves in the soil and eradication only achieved after the exhaustion of this seed bank. The variable effectiveness of traditional weed control may be enhanced by the integration of goats. Goats will increase the efficiency and reliability of weed control.

### Acknowledgment

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### References

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