

DELETERIOUS EFFECTS OF WEEDS ON GRAZING RUMINANTS

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One aim of this Conference is 'to review and evaluate... the significance of weeds in primary production'. The harmful effects of some weeds on sheep and cattle may cause quite serious financial losses. However, this topic has not attracted the attention it appears to deserve. Two probable reasons for this neglect are: (a) the great diversity of the problems, and (b) the difficulty in obtaining acceptable estimates of financial losses incurred.

Much research on diseases of phytogetic origin has been directed to those associated with sown pasture species (e.g. subterranean and red clovers - infertility; phalaris and ryegrass - stagger syndromes; lucerne and clovers - bloat; lupins - lupinosis). Under certain conditions, some of these species (or cultivars of them) may assume the status of 'weeds'.

In addition, a very large number of native and introduced species have been incriminated as toxic plants. Everist (pers. comm.) is completing the first comprehensive documentation of these species ('Poisonous Plants of Australia').

The toxic principles of these plants are numerous; the best known are oxalate (inducing tetany and nephritis), cyanogenetic compounds (releasing HCN, an inhibitor of cellular oxidation), nitrate (forming the toxic nitrite by reduction in the rumen), fluoracetate (producing inhibition of the tricarboxylic acid cycle), selenium compounds, goitrogens, hepatotoxins (especially the pyrrolizidine alkaloids), photosensitizing agents (e.g. hypericin; photosensitization, as a secondary effect of liver damage, can be induced by phylloerythrin, a metabolite of chlorophyll), neurotoxins (most of the active principles are still unknown), alkaloids (with a variety of pharmacological effects), glycosides, saponins, toxalbumins, essential oils, and lysergic acid derivatives. For many species the toxic principles have not yet been indentified.

Prevention of disease due to a known toxic plant may prove very difficult. For example, although a great deal is known of the sheep disease caused by heliotrope, satisfactory methods of control have not been devised. In many cases, a great deal of additional information will be required before adequate recommendations can be made for successful management of the problem presented.

During recent years, there has been a great increase in knowledge of digestive functions in ruminants. Several examples are now known where microbial activity in the rumen reduces the harmful effects of toxic substances in the ingesta; *per contra*, relatively harmless substances may be converted to toxic products. Techniques are now available for quantitative measurement of digestive processes; these offer promise for fruitful application to the study of the fate of toxic substances in the gut.

In addition to toxic effects, plants may be responsible for a variety of mechanical injuries to animals or to fleece wool. Grass seeds may interfere with feeding or cause injury to the eyes of sheep; some seeds can even migrate through the skin into muscles, thus rendering carcasses unfit for human consumption. The most serious source of loss is through the so-called 'vegetable fault' in wool; some material (e.g. medic burr) is readily removed from wool during textile processing, but other plant fragments are extremely difficult to remove and may pass through all processes and appear in the woven fabric. The view has been expressed (M. Lipson, pers. comm.) that the presence of plant fragments is a major defect in wool as a natural fibre in competition with synthetic fibres.

A REVIEW OF THE STATUS OF SOME PLANTS AS ANNUAL PASTURE WEEDS IN SOUTH-EASTERN AUSTRALIA

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Most plants, at some time or other, are condemned as weeds. The term is now used rather loosely and the meaning is varied and often obscure. This attitude has led to an overemphasis on the value of herbicides in managing annual pastures.

Pastures in the annual pasture zone of south-eastern Australia are based mainly on subterranean clover and Wimmera ryegrass. These provide high-quality stock forage and will persist and produce well at low stocking rates. However, under higher stocking rates Wimmera ryegrass, and to a lesser extent subterranean clover, are lost from the pasture. The common volunteer annuals in these pastures, *Vulpia bromoides* (silver grass), *Hordeum leporinum* (barley grass),