The prevention of potential spread of this cactus to more valuable country has been the justification for Government expenditure that exceeds potential returns. With the effective cactus control techniques now available, it has become practicable to contain Harrisia cactus within its present limits.

Hopefully, biological control could eventually balance the budget and release funds for other work.

ALTERNATIVES TO HERBICIDE FOR INTRODUCTION OF IMPROVED PERENNIAL GRASSES ON NON-ARABLE LAND

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In New South Wales there is approximately 4M ha of non-arable land receiving medium-high rainfall on the tablelands, which can only be developed aerially. On these areas, where pasture improvement is attempted, legumes such as white and subterranean clovers have been successfully introduced into the existing sward. However, the introduction of sown perennial grasses has proved to be more difficult and the use of herbicides as a prerequisite to aerial sowing has been shown to be the most satisfactory technique for overcoming this problem.

In some countries herbicides have recently come under closer scrutiny from legislators concerned with the danger of pollution. In addition, use of some of the more promising herbicides is being restricted, due either to non-registration or to long qualifying periods in the registration process, e.g. paraquat for aerial use and atrazine on range in some of the western States of the U.S.A. In Australia, increases in the cost of herbicides makes their use as a means of increasing productivity (particularly if the end product is wool or beef) a less attractive proposition.

The role of herbicides in an aerial sowing is to reduce the competition (from the existing sward) experienced by the sown seedlings and this factor is particularly critical over the first spring-summer period after sowing. Therefore it is imperative that if production costs are to be kept to a

minimum, other methods of reducing competition from the less desirable species must be found.

Possible alternatives include burning, grazing and fertilizer management. Burning has been employed in New Zealand and the U.S.A. where considerable woody material is present. Considerable amounts of ash are left and this provides a satisfactory seed bed, but under conditions in the tableland areas of New South Wales this method is unlikely to have wide application since the protective litter cover would be removed, and because of the practical problems associated with burning in difficult terrain. Use of livestock to control competition and allow satisfactory survival of sown species may be a practical low-cost alternative to herbicide. Livestock have been used in New Zealand for this purpose but the technique has not proven entirely satisfactory for the introduction of improved perennial grasses. Application of superphosphate, particularly in association with grazing management, looks promising since a field study on the Northern Tablelands in 1973 has indicated that strategic timing of superphosphate application in a grass over-sowing where the legume is already present, may prove beneficial in improving the success rate of an aerial sowing.

The grazing management imposed should look at the effect of frequency and intensity of grazing, length of grazing period and the timing of such grazings on survival of sown seedlings. Because of the variable effect of season on both resident sward and sown seedling performance, these studies would have to be done over a number of years.

A major problem with this type of research is that it is tedious, long term and expensive. Because of the possibility that public opinion in this country will follow that in the U.S.A. and because increasing costs of herbicides will restrict their use, research funding bodies need to be made aware of the importance of fully exploring all alternative methods of herbicide replacement in controlling competition.