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# PROCEEDINGS

## PASTURE MANAGEMENT, PERSISTENCE AND UTILIZATION FOR BEEF AND DEER FARMING

## FIELD MEETING—JUNE 19, 1981

This meeting was organized at "Oakwood", the property of Mr. Ian Hart of Upper Kandanga, Mary Valley, Queensland. In 1969 the Society visited "Oakwood" where the first improved pastures had been sown in 1956. As pasture persistence is a major factor in maintaining better levels of animal production, the area was revisited to learn how successfully the persistence of Mr. Hart's pastures had been over a period of 12–25 years. The property was originally a beef breeding and fattening enterprise. In recent years Mr. Hart has incorporated deer farming, in which area he is a pioneer, into his farming system

## INSPECTION OF OLD PASTURES

MR. IAN HART

"Oakwood", Upper Kandanga.

The current year has been one of the driest on record and the last four summers have had below average rainfall. As a result the areas have been more heavily grazed than is desirable and weeds are becoming a problem in some places.

The first area inspected had been planted in 1964. It was old cleared scrub country that carried weak Pioneer Rhodes grass (*Chloris gayana*). It was ripped with a chisel plough and planted to 3 kg $ha^{-1}$ Tinaroo glycine (*Neonotonia wightii*) and 1 kg $ha^{-1}$ Siratro (*Macroptilium atropurpureum*). Mostly no grass was planted and these areas now have a weed problem but in parts green panic (*Panicum maximum* var. *trichoglume*) was planted and this has combined well with the legumes and strongly resisted weed invasion. In some other areas Nandi setaria (*Setaria sphacelata* var. *sericea*) was planted but has not kept out the weeds any better than the re-establishing Rhodes grass.

Since planting these areas have never been spelled. However the paddocks contain both hills and flats and the cattle tend to concentrate on the flats in summer. On these white clover (*Trifolium repens*) has volunteered strongly with the fertilizer applications that have accompanied the sowing of the pastures since 1964. This naturally spells the tropical species on the hills over summer and they are then heavily grazed in winter. The whole paddock, flats and hills, was planted to the tropical legumes but they have disappeared from the flats, being replaced by the white clover. This clover was planted prior to 1954 but was not conspicuous until the fertilizing of the tropical pastures commenced in 1964.

Since 1964 this paddock has received 3.6 tonnes of fertilizer per hectare, mainly

superphosphate with molybdenum at planting and again after several years. Nothing has been applied since the cattle prices dropped in the early 1970s.

The main weeds, where present, were wild tobacco (*Solanum mauritianum*) and stinking roger (*Tagetes minuta*).

A second area inspected was a year younger, planted in 1965, and based on Nandi setaria, Greenleaf desmodium (*Desmodium intortum*) glycine and Siratro. This was a more open stand, due to recent over-grazing, and more weedy.

Both areas are continuously grazed with breeders. Steers are turned off at two years of age at more than 450 kg liveweight. Of the grass species used *Panicum maximum* has been more successful, in both areas, than other grasses and has given a more stable pasture.

## INSPECTION OF DEER TRAP

MR. IAN HART

"Oakwood", Upper Kandanga

"Oakwood" was more or less forced into deer farming as the deer run wild in the hills behind the property and were heavily grazing 1600 ha of sown and fertilized pasture. In 1977, it was estimated that some 500–600 deer were invading "Oakwood" pasture and winter forage crop areas.

After inspecting deer farming methods in New Zealand and enclosing suitable areas at Oakwood with strong, high fences, the first red deer were trapped in July 1979. Red deer feel the heat and have to be caught in winter. They are attracted into the trap area by planted areas of oats, both inside and outside the trap. The trap is several hectares in area with a wide drop down gate that is radio controlled from a distance and is closed at daylight or earlier.

Once enclosed, the deer can be slowly moved into a hessian shaded area for loading into trailers for transport to the deer farm proper.

## MANAGEMENT, INTEGRATION AND PERSISTENCE OF SOWN PASTURES

P. E. LUCK

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In any area of sown pastures there are invariably differences in soil type and topographic situations to which the different species and cultivars planted are differentially adapted. The integration of these differing areas is more an art than a science that has to be practiced by the manager to produce an economic product be this beef, milk, venison or antler velvet.

### *Persistence*

Perennial pasture does not last forever but should last as long as possible. Over the last 20 years possibly the greatest area of pasture sown on the Near North Coast are tropical legume-grass plantings. Possibly 80% of these have deteriorated to some degree, yet there are some areas as good as when they were planted up to 20 years ago. Factors common to most of these stable areas are that they (i) are located on warm frost free hillsides, (ii) have well drained soils, (iii) receive high rainfall, (iv) have been heavily fertilized particularly with superphosphate and Mo, (v) have stocking rates controlled not to exceed 1 cow $ha^{-1}$ year round, (vi) were sown with Tinaroo glycine as the main legume although Greenleaf desmodium and Siratro may also show fair persistence, (vii) had guinea, green panic and molasses—but not setaria—as companion grasses, and (viii) were on properties where the managers are astute farmers and know when to reduce grazing pressure on the pasture.

Legume adaptation is therefore important to pasture persistence and we as yet do not have legumes adapted to all situations or have not widely planted more grazing tolerant legumes such as lotononis, (*Lotononis bainesii*), hetero (*Desmodium*

*heterophyllum*), Safari Kenya white clover (*Trifolium semipilosum*) or Bargoo joint vetch (*Aeschynomene falcata*).

Lack of moisture over recent years has also played a part in pasture deterioration. In particular Greenleaf and Silverleaf desmodium stands have suffered from successive dry summers and low rainfall rather than inadequate fertilization has probably been the most important recent factor. There has rarely been sufficient summer rain to judge adequacy or otherwise of fertility in a number of plant nutrition trials in the district.

Grazing pressure is also important especially on the viny legumes where available evidence suggest 1 adult beast $ha^{-1}$ $year^{-1}$ is an ideal stocking rate in this district. Certainly at an excess of 1.7 beast $ha^{-1}$ the viny legumes will be quickly lost.

*Integration*

There are some soils in the district on which tropical pastures have never done well. The tropicals are best kept for the warmer slopes and more cold and stock tolerant pasture for the lower slopes and flats. Cattle will tend to graze these correctly—flats in summer, slopes in winter—but may need some management to ensure they do so. There should also be pastures that can be flogged in stress periods to relieve the pressure on glycine, Siratro and desmodium at critical times of the year.

*Renovation*

When faced with a run down situation what can be done about it? Lines of action can include: *(i)* plough and encourage better species to thicken up, *(ii)* plough and include a cash or forage crop, *(iii)* renovate and sow additional legume seed if soil seed reserves are inadequate, *(iv)* plough out and plant better species, and *(v)* close the paddock off for a lengthy period to encourage legumes to thicken up their stand.

All these actions work in different situations but for the legumes it is important to know that they have had a chance to seed down periodically in the past. Once set the legume seed will last in the soil for a long time.

*Discussion*

If starting again at "Oakwood" things would be done much as before except setaria would be omitted. Ian Hart would use green panic and possibly Callide rhodes grass all over. His main worry now would be costs for both seed and fertilizer. In 1964 fertilizer was $33 per ton air spread. Now it is $134. He would still develop all of the property. Three quarters of it is ridge country and so frost free. Developed it is the best winter country.

Some of the most stable pastures on the Near North Coast were amongst the first planted. They had two things in common, they were located on the better quality soils and had green panic and glycine as the major species. They have provided the most stable pastures.

*Trifolium semipilosum* (Kenya white clover) could have a major role in the district as seed supplies improve and price decreases. Its one weakness is a failure to spread from where it is planted. Maybe this is a *Rhizobium* problem and spread will occur in time as the specific *Rhizobium* invades the soil area of the extending stolons.

## DEER FARMING IN NEW ZEALAND

P. FENNESSY

Invermay Agricultural Research Centre, New Zealand

Deer are possibly 2½–3 times more profitable than other meat producers in New Zealand and in spring red deer can be very efficient at turning grass into meat. However they can have problems in winter when they can have a high feed requirement to overcome the cold.

Deer have a very seasonal pattern of growth. It is very slow in winter and fast in spring and suits the New Zealand feed supply pattern but they are very susceptible to

cold stress in winter especially the stags and need a lot of feed at that time. Actually, sheep suit the feed supply pattern better with a dry ewe and low feed requirement in winter and lambing in spring and the lamb marketed in autumn. Deer are more like beef cattle and calve in December. A drought then can cause trouble. They are less selective in their diet than cattle, more like sheep. They thrive on white clover-rye grass pastures.

Currently there are about 150 000 deer on farms in New Zealand. Of these 130 000 would be red deer and the closely related Wapiti and 20 000 fallow deer. The fallow, mainly used for meat production, is in the North Island around Auckland. The red deer occur all over the country, and so far have been traded live with antler velvet as a speculative by-product. New Zealand however is now heading towards a venison market and deer will be classified as game not stock for meat inspection and slaughtered in game packing houses.

The industry is fairly heavily serviced by the New Zealand Deer Farming Association which has 1000 of the 1500 deer farmers as members. The industry was started in the 1960's and 1970's by shooters hunting wild deer for a venison market in West Germany. Many shooters then began deer farming for venison but about this stage velvet production became profitable, and they changed emphasis to this. However, the market for venison is again becoming the more important one.

Antler velvet is used mainly in medicines in Korea, China and Russia. Most of New Zealand's production is marketed in Korea but China and Russia, the other major velvet producers, can unsettle the market. As a result prices are volatile, but a hind, which equals two stock units, can return up to $250 per acre per stock unit, and compares very favourably with sheep at only $20–25 per acre per stock unit, although this can be offset by the high capital investment of deer farming.

Venison production is for a lean meat market and requires careful timing for slaughter. Stags killed before the rutting season are fatty. Young males are not castrated as this reduces growth rate by 20% and causes fat production. Castration before puberty also prevents antler growth.

Management of deer is not complicated. They have a long reproductive life of up to 20 years. Usually 85% of females raise calves and there is some twinning. Stock should not be worked after the end of February as they become difficult to handle in autumn. They are quiet and easy to work in spring when the velvet is growing. Most problems and highest mortalities occur in winter due to cold stress, especially wind and rain, because deer are poorly insulated animals. Deer suffer from tick attack and a few internal parasites. The latter are controllable with modern drenches.

## BOOK REVIEWS

*Nitrogen Cycling in West African Ecosystems*—Ed. T. Rosswall (1980). ISBN 91-7190-007-1 (SCOPE/UNEP International Nitrogen Unit, Royal Swedish Academy of Sciences) 450 pp. $US15.

This book reports the proceedings of a workshop arranged by the SCOPE/UNEP International Nitrogen Unit in collaboration with MAB (NESCO) and IITA and held at the International Institute for Tropical Agriculture, Ibadan, Nigeria, December 1978. The content of the book includes invited keynote papers (one in French), contributed papers, (five in French), reports of work group discussions of present knowledge of nitrogen (N) cycling in three major ecosystems in West Africa (savannas, forests, and agro-ecosystems) a report on research priorities and future cooperation, and a bibliography on N cycling in West African ecosystems.

The keynote papers begin with an overview of N cycling in terrestrial ecosystems (T. Rosswall), followed by the role of atmospheric chemistry in N cycling (R. Söderlund). The other keynote papers discuss N cycling in the various types of ecosystems, with most emphasis on the agro-ecosystems and savannas. Most of these