ECOLOGICAL IMPLICATIONS OF GRAZING SYSTEMS:

ADAPTING PASTURES AND CROPS TO CHANGING TIMES - TABLELANDS

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"Tunbridge Wells", Four Mile Creek, Orange, NSW.

Abstract. On our property we have followed the recommended development path of clearing, sowing of pastures and use of fertiliser. We also conserve fodder to supplement autumn/winter feed. However, these practices have not magically solved our problems, and we have had to grapple with weed invasion, acid soils, bushfires and falling farm income. Despite the lack of economic incentives, we have continued to experiment with alternative fertilisers, pasture management, fodder crops, new methods of weed control and tree planting. However, we maintain that these innnovations will be meaningless unless the underlying cost/price pressures in our agricultural industries are addressed.

Tunbridge Wells is a 1200 ha grazing property on the south side of Mount Canobolas at Orange in central NSW. The property is now in the 3rd and 4th generation of family ownership. We lease a further 600ha with grazing rights. This country is currently in the process of mining exploration with the distinct possibility of mining in the next couple of years. Altitude varies between 750 and 900 m and rainfall is 760-915 mm and, with a southerly aspect, the property has a cool temperate climate. Soils vary from white/grey volcanic ash to brownish loam with slate-shale ridges and various intrusions.

The enterprises consist of 7500, 21/22 μ, self-replacing merinos, 400 Hereford x Red polls (180 breeders) and 1200 crossbred ewes producing lean lamb. Cropping with oats and triticale is used to produce extra feed.

History

"Tunbridge Wells" was originally covered with heavy timber. Initially it was stocked with dry cows and a sawmill set up to log the stringybark. Over the next 20 years there was considerable cutting up and burning of treeheads together with digging out of rabbits. It was during this stage that merinos were introduced, wethers only for some years. Small areas were cropped using oats, and fertiliser was used for pasture establishment.

In the early 1950s aircraft came into their own and some areas were sown with subclover/ryegrass and topdressed annually with 125 kg/ha superphosphate. Over the years this accumulated to over 5 t/ha (the Super Bank!). Didn't the Accountant just love superphosphate - Have tax, buy super! He still sings the same song, only now its super-annuation!

I entered the farming scene in 1965 and everything had to change. During the next ten years we developed 400 ha and, little by little, problems developed. Nitrophilous weeds were on the march! Out came the chemical drum - aircraft operators loved us. But the Tax Man was winning, so out went more super!

By the mid-1970s we were convinced that the assistance of Dr Phalaris (Malcolm Campbell) was necessary. We embarked on a program to upgrade pastures and converted 70% of the property to phalaris-based pastures using the well-proven aerial sowing technique.

By the late -970s the lack of response to annual topdressing with super was quite evident, so we stopped. 1979-1983 was a major drought. The usual post drought response of P release occurred in autumn 1983. This only further confirmed that we needed to know what was happening to our soils. A major soil testing program was carried out. The results showed a wide range in pH (3.8-5.6) with similar range in Aluminium (5-25% of exchangeable cations). By coincidence, we had done some liming back in 1976 on one paddock. The half not limed tested 3.8 while the limed area was 5.3 and the production was like chalk and cheese. On-going testing of limed areas has shown a steady decline in pH over subsequent years, and these areas were re-treated in 1988.

Since 1989, with catastrophic falls in farm income (in the order of 2/3 on average), all lime and fertiliser use has ceased. As well, labour has not been replaced, maintenance is at a standstill, with pastures, fences, *etc.* on hold. This is a disaster not only for the individ-

ual but for agriculture and the nation.

Current strategies

Fertiliser

Despite the lack of economic incentives, we have been playing around with limited trials of Bio-soil (sludge) and Organic Fertiliser (poultry manure). Results are not documented but visually interesting if not a little on the nose! On the non-arable country we have used dicalcic phosphate on several occasions with extremely pleasing results, to the point where we are blending our own mixes to suit specific problems. This has been taken up in the district on a fairly large scale as other producers have also achieved good results.

Management

One now needs to ask, "How do we manage all this?" We have learnt to stock more heavily in the spring to allow the legumes to set seed. The cause of the drop-off in legumes is two-fold; autumn lambing/calving and soil acidity with resultant low N levels. Grazing management is done on an *ad hoc* basis using the "gumboot method" to determine the amount of pasture present. A side-effect of our management system is a higher fire risk level in some paddocks for a short period in January due to the surplus spring growth.

Additional fodder

In the spring we use a contractor to conserve 300-400 round bales of mixed pasture/cereal to use in the autumn/winter. We also harvest or buy grain which is stored in silos. Dr Phil Holmes is not too keen on this practice, but he does not have to look after unthrifty, spring-drop, Merino lambs going into a dry summer autumn! In the future we plan to establish a couple more paddocks of lucerne for green feed for finishing in the summer/autumn.

One technique we use in our lucerne paddocks is to direct drill oats in the late summer/autumn to provide extra bulk for grazing through winter, then cut for hay in spring. This increases dramatically both the volume of hay cut and its acceptability to stock as dry feed. To offset the mining effect on the soil we feed these paddocks; eg this year 4 cubic metres/ha poultry manure. Other years it has been mixed blends of N, P, K, S, Mg and Lime.

Weed control

Our weed control system has not changed, just adapted to new sprays and technology. For example, Grazon/Brush-Off is applied to woody weeds using Gas Guns. MCPA is used for horehound and other broadleaved weeds. We also use sheep in spray-graze methods, and spray-topping in the spring to control seeding for a following autumn sowing. Gramoxone is used effectively to control saffron thistles that have come to head in Dec/Jan/Feb. Aircraft are not used now due to two factors: a marked reduction in broadleaved weeds over the last few years, and damage done to the trees by the use of MCPA applied from the air. MCPA is deadly on trees. We are now using 4-wheel bikes with boom and trailer (with the occasional crocodile roll! - safety in hill country has to be watched).

Ecological issues

Native grasses have made somewhat of a comeback in our pastures, but we value these, particularly *Danthonia* and *Microlaena*. Red grass provides good summer feed and, while there is not as much bulk as say Phalaris, it is a lot better than Paterson's Curse. Barley grass we are happy to have, as it is as good as oats during the winter. With a spring shearing we can avoid the grass seed problem.

Trees are of paramount importance. We commenced planting out wind breaks in 1976, mostly *Pinus radiata* (70%). Native trees are not planted with the pines. Between 1976 and 1985, we achieved a considerable planting each year. However, bushfires in 1985 wiped out 90% of plantings. The benefits of the trees lost was felt in the following winter. Lambs took longer to finish, pasture was slow to respond to the rain showers, etc. We have started again with a dominance of natives this time, but we feel one needs to be open-minded about species selection for each situation.

Conclusions

On the ideal property, weed invasion is controlled with well established pastures suitably fed with fertilizer that is appropriate to paddock needs. However, this can only occur when commodity prices allow. Cost price pressures will ultimately have to be addressed by this nation if we are to have a healthy, productive and vibrant agricultural sector.