PROFITABLE ESTABLISHMENT OF PHALARIS ON ACID SOIL COUNTRY

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Introduction

This paper is a summary of our 26 years of experience in establishing phalaris in two different locations on the South West Slopes on varying types of acid soils. Out first 20 years experience was at Tumbarumba, in a 900 mm rainfall area at 760 m altitude. The soil types were granite and basalt with a pH of 5.0 (in water or about 4.5 in $CaCl_2$). The last six years have been at Holbrook, 80km further west in a 700 mm rainfall area at 300 m altitude. The soil types are red and yellow earths with a pH of 4.0 - 4.2 ($CaCl_2$).

Methods used at Tumbarumba

We worked country in late summer and sowed early oats for winter feed. This was grazed out and a seedbed prepared in early spring. Australian phalaris at 2 kg/ha was mixed with lime/super and dropped on top of the ground and rolled with a rubber tyre roller to ensure good contact between soil and seed.

Spring sowing suits that climate with its reliable spring rain and cool summers, combined with the spring cultivation which controlled the main competing weeds (barley grass and brome).

Although the pH was 4.5, I did not have reason to suspect aluminium toxicity, because establishment was generally good and seedlings, once germinated continued to grow stongly.

Move to Holbrook

Six years ago we moved to Holbrook and have 1050 ha of flat to undulating country. our enterprises are stud and commercial Hereford cattle and prime lamb production using Border Leicester cross ewes and Poll Dorset rams.

The property, when we took it over, had very little permanent pasture but had a good cover of sub. clover, Wimmera ryegrass and other annual grasses. There had been very little super. applied during the previous six years and phosphate levels were low.

Our first priority was to raise the phosphate level and since then, all the country has had 625 kg/ha including one application of molybdenum.

Since livestock is our source of income, it is important that they receive the best available feed we can produce. Our next priority was to establish as much permanent pasture as possible to enable us to even out some of the feed gaps that annual

pastures have.

In the autumn of 1980, we sowed a paddock using the same technique we had used at Tumbarumba. Two particular things occurred with this sowing which we had not experienced before. The first was that after a good strike of phalaris the seedlings did not thrive at all and lots of them died despite having plenty of moisture. The second was the vigour and competition provided by Wimmera ryegrass.

Dissatisfied with the results, we grazed the paddock hard that spring to stop the ryegrass seeding and worked it up for another attempt. We waited until after the autumn break germinated the annual grasses and sprayed the area with Grammoxone before sowing to Sirosa phalaris. This time we had good germination and very little competition and I believed a good stand would result. However, this was not to be. The seedlings did not thrive and gradually a large percentage died. It was at this stage that we enlisted the help of our District Agronomist, John Sykes, to come up with some answers.

Soil tests

John carried out a series of soil test and these showed that the soils were very acid,in the 4.0-4.2 range, but in addition, we had very high soil aluminium levels of between 18-25% as a percentage of base elements calcium, magnesium, potash, sodium and aluminium. This explained why the phalaris, which is sensitive to aluminium toxicity was being poisoned whereas the ryegrass, which is tolerant, was growing so well.

A typical soil profile showed:

Soil depth	pH	Al	N	P
0-10 cm	4.2	16-20%	60	8-10 ppm
10-20 cm	4.0	16-20%	-	-
20-30 cm	4.4	10-15%	10	5 ppm
30+ cm	3.8	16-20%	-	5 ppm

It was obvious that if we wanted to establish good strong stands of phalaris on this country, then lime would have to be applied.

Economics of liming

Lime in our area at that time was $54/tonne delivered, hire of spreader $6/tonne and $4/tonne to spread, a total of $64/tonne on the ground. Applying 2.5t/ha, working the ground up, sowing 2.5 kg/ha Sirosa phalaris and 3 kg/ha sub. clover, estimated costs were $222/ha.

Land values were $100 and more per dse and we believed if we got a good stand established we would certainly gain at least an increase of 2.5 dse in carrying capacity per hectare. I did not altogether agree with the theory being promoted at that time of

"get big or get out" and believed we were better to improve what we had rather than buying more land.

There had been a number of trials carried out within our area relating to lime application and growth of sub. clover, and these showed 20-30% increase in yield from 2.5 tonnes of lime/hectare. I recently inspected one of these sites and five years after liming differences were still very apparent between the areas that had 7.5 tonnes and 2.5 tonnes/ha and those which had 1.25 tonnes and no lime.

Establishment of phalaris after liming

Having made the decision to lime, we went back to the same paddock as our previous two failures. The soil test showed pH 4.2 and exchangeable aluminium percentage 23%. We applied 2.5 tonnes/ha and incorporated this with one offset discing and two tyne cultivations. After the autumn break we sprayed with Roundup and then sowed 2 kg/ha Sirosa phalaris and 3 kg/ha of sub. clover in the third week of May.

The germination was very good and the seedling vigour was noticeably better. The seedlings kept growing and look a healthy colour all through winter. The paddock was lightly grazed in late August and stocked heavier from mid October. Since that time, ie. October 1982, it has carried 11.9 dse/ha. The adjoining paddock of similar soil type and with similar super. history, but with annual pastures, has carried in the same period 7.9 dse/ha.

Not only do we have an increase in carrying capacity of 4.0 dse/ha but the paddock never gets as bare in the autumn as the annual pasture, makes some use of summer storms and comes away much quicker in autumn.

A recent soil test in this paddock shows the pH is now 4.8, up from 4.2, but significantly the aluminium percentage has dropped from 23 to 7%. As the pH rises, we also get the beneficial effect that most of the major and minor elements needed for plant growth also become more available.

The following year another paddock was treated the same way. The pH was 4.2 and aluminium 21%. The result was very satisfactory although we had two more problems.

Red-legged earth mites were very severe particularly on clover seedlings and we had to spray with Le-mat.
We had a very wet period in the winter which encouraged a weed called toad rush. This has a very severe smothering effect and it required spraying with Igran.

A recent soil test has shown that the pH in this paddock has risen from 4.2 to 5.2, and the exchangeable aluminium percentage has dropped from 21% to almost nil.

We were sufficiently satisfied from these two initial results to continue with this programme and have now limed in excess of 240 ha and the intended rate is 80 ha per year.

Most of our work has been done without any prior cropping and we try to limit weed competition and improve our seed bed by cutting hay in paddocks we intend sowing the following year. We can cultivate then over summer following rain and be ready to sow soon after the break. The earlier the sowing, the more growth made before winter.

Summary

The following points are the factors that, after initial failures, have enabled us to profitably establish phalaris on our acid soils:

1. Soil test for Ph, phosphate and exchangeable aluminium.
2. Ensure adequate phosphate present at sowing.
3. Lime acid soils that have high exchangeable aluminium.
4. Spray or otherwise control weeds before sowing.
5. Sow good high germinating seed.
6. Check for pests and weeds after sowing and control, if necessary.
7. Maintain super. applications to established pastures.
8. Stock these pastures adequately.