

PASTURE IMPROVEMENT OF HILL COUNTRY INFESTED WITH
POA TUSSOCK USING AERIAL SPRAY-SOW TECHNIQUES

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Our property has an area of 1500 ha (3600 ac) of undulating to steep grazing land on the Paterson River in the mid Hunter Valley, 40 km up river from Gresford.

Soils are medium fertility podsols testing typically as follows:

Phosphorus	4 -10	ppm (Bray test)	- fairly low
pH	4.5-5		- acidic for Phalaris
Aluminium	1.5 %		- fairly low for acid soils

The altitude is approximately 500 m above sea level and the country was originally all hardwood forests which have been hand cleared over the last 100 years.

The average annual rainfall is 1000 mm (40 in.) of mainly summer dominance although with greater winter effectiveness.

Naturalised and native grasses are paspalum (*Paspalum dilatatum*), red grass (*Bothriochloa macra*), spear or wire grasses (*Aristida spp.*), couch grass (*Cynodon dactylon*), kangaroo grass (*Themeda australis*) and weeping grass (*Microlaena stipoides*).

Naturalised white clover, ball clover and yellow suckling clover grow to a limited degree in season.

Our biggest weed problems are poa tussock (*Poa labillardieri*), blady grass (*Imperata cylindrica*), bracken fern (*Pteridium esculentum*), carpet grass (*Axonopus affinis*), fireweed (*Senecio madagascariensis*), and fleabane (*Conyza bonariensis*).

THE LIVESTOCK OPERATION

Traditionally, graziers in our area employ set stocking of native pastures with some use of aerial topdressing and clover seeding on "front-country". They either sell store cattle or else grow cattle out and fatten to 2-3 years old for the export market with some vealer production from topdressed paddocks.

We run over 400 Devon Shorthorn cross breeders + calves and replacements. Our carrying capacity varies from 1 cow + calf to 2 ha (5 ac.) on "front-country" to 1 cow + calf to 4 ha (10 ac.) on "back-country". Our average across the property is 1 cow + calf to 3.5 ha (8.5 ac.).

We calve all the year round and vealers are either fattened on improved pasture whilst on their mothers or those from the "back-country" are weaned and lot fed on the property for the local trade.

Marketing is done through our own two butcher shops acquired during recent years to maximise returns by selling direct to consumers.

THE AIMS

Using the aerial spray-sow technique we aim to achieve the following:

1. To control poa tussock and other weeds, particularly in rough "back-country", and convert this to productive phalaris based pastures. Currently, to get any value out of this tussock country, we have to burn in summer for autumn and winter feed. This is only a short term measure which eventually increases the tussock problem, encourages other weeds and destroys organic matter which could build up soil fertility.
2. To achieve better year-round pasture production by sowing winter growing perennials in an area which is normally dominated by summer grasses.
3. To carry our cattle in better condition year round and sell most of them straight out of the paddock instead of lot feeding which is more expensive. Lot feeding would still be used as a management tool in bad seasons to avoid undue grazing pressure on new pastures and to maintain a constant throughput of finished local trade cattle.
4. To increase productivity in the face of fairly static beef cattle prices and increasing costs of production. We intend to double our carrying capacity over 8-10 years, to run 800 cows and 200 replacement heifers, selling all progeny as local trade cattle.

THE AERIAL SPRAY-SOW TECHNIQUE

We plan at least 12 months ahead. We kill out timber regrowth, renew fences and upgrade stock watering facilities and access tracks. Paddocks treated need to be "shut-up" for virtually 12 months during the first 2 years so we ensure there is room to accommodate these cattle elsewhere on the property.

We soil test representative areas of target paddocks to assess fertiliser requirements and to assist in determining the pasture seed mix. We are only interested in stable long term perennial pastures and don't wish to ever repeat the operation on any paddocks.

We have settled on the following seed mix:

Sirosa phalaris	6 kg/ha
Kangaroo Valley Ryegrass	2 kg/ha
Currie cocksfoot	1 kg/ha
Subclover	2 kg/ha
Haifa white clover	0.5 kg/ha

Effective sowing rate is actually less than this because our 65% average slope gives an increase of some 20% over surveyed areas. Our country is supposed to be too acid for phalaris and of doubtful fertility however, it establishes well and grows strongly on our tussock country - the bigger the tussocks, the better the phalaris.

We shop around for low prices on herbicide and seeds and make arrangements with aerial operators to do the work. You must note the viability of seed (or germination percent) when comparing prices - particularly for phalaris.

We graze the paddock heavily during the previous summer and early autumn and eradicate any rabbits. Then we spell the paddock for 2-3 weeks before spraying to allow it to "freshen-up".

Roundup CT^R herbicide is applied by helicopter boom spray at the rate of 2.5 l/ha in 50 l of good clean water. This occurs from early May to mid June depending on season.

Aerial sowing of seed and superphosphate together is then carried out within 7 days of spraying.

Clover seed is inoculated and lime pelleted and all seed is treated with Coopex^R (permethrin 25%) insecticide to reduce ant theft. We have all the seed prepared, mixed together in the right proportions and bagged to suit plane loads, being 1 tonne of superphosphate in this case. For each plane load, the seed is mixed thoroughly with the superphosphate by the loader.

Fertiliser used is 250 kg/ha of Mo superphosphate at sowing and 250 kg/ha of single superphosphate each autumn for the next 3 years.

Seed spreads only about half the width of superphosphate, so the aeroplane pilot is directed to fly at half the normal swath width (i.e. 8-10 m) with gate set at 125 kg/ha.

Rain is needed after this operation for germination and then great patience because establishment is very slow. We keep the paddock unstocked right through spring and summer then crash graze in early autumn for about 6 weeks to remove litter and ground cover. Then we shut the paddock up again to allow germination from last years seed set, and apply 250 kg/ha of single superphosphate.

Management after this depends on pasture establishment and growth. If weak, the paddock will need further nursing, if strong the paddock may be stocked again from mid winter.

DRAWBACKS AND DISAPPOINTMENTS

- a) We had a strong germination of annual weeds following application of the herbicide and no chance of controlling them. They competed very strongly with establishing seedlings of improved grasses. However, in the second season of the new pasture, these weeds were down to only 10% of their first year's population and continue to diminish.
- b) We've had very little germination of phalaris in successive years despite managing specifically for this. Ryegrass and clover have both greatly increased their population but not phalaris for some reason. This is why we now use the highseeding rate of 6 kg/ha to get the maximum number of established plants in that first year, following herbicide application.
- c) We've had a disturbing germination of some weeds in late summer during phalaris dormancy, because of our high summer rainfall. This does not apply to poa tussock, however, which is our main enemy.
- d) Don't expect a pure phalaris stand, because many of the native grasses regenerate (particularly weeping grass) and help to provide a better balance of year-round feed.
- e) The improved species really accentuate the poor patches of soil across a paddock. Pasture establishment is very weak on these areas and conversely weed growth is strong because of limited competition. It is then very difficult to establish new pasture on these patches in succeeding years. This problem may be overcome only by fertiliser applications for 2-3 years prior to aerial spray-sow.

ECONOMICS

Costs of the aerial spray-sow technique are currently as follows:

	<u>\$/ha.</u>
Hire of helicopter for spraying	10
Roundup CT ^R at 2.5 l/ha	45
Mo superphosphate at 250 kg/ha (includ. all cartage and spreading costs)	50
Seed (includ. inoculating + lime pelleting of clovers)	45
Coopex insecticide seed treatment	<u>5</u>
	<u>\$155/ha (\$65/ac)</u>

This is not cheap, but there are no short cuts to defeating poa tussock! We justify this expenditure in two ways:

- Our "back-country" is worth about . . . \$250/ha (\$100/ac)
By spending \$155/ha (\$ 65/ac)

This country has cost us \$405/ha (\$165/ac)

and is then more productive than our "front-country" worth about \$750/ha (\$300/ac). The rougher the country and the worse the Tussock, the better the economics.

- Our "back-country" carries 1 cow + calf/4 ha
After aerial spray-sow it will carry. . . 1 cow + calf/1.5 ha
or 2.7 cow + calf/4 ha

That is an extra 1.7 cow + calf/4 ha

Each calf is worth about \$250 net to me
x 1.7

\$425/4 ha OR \$106/ha extra return

Returns should overtake expenditure after 4 years on our property and then accelerate because fertiliser applications reduce to every second year and pasture production is increasing all the time.

	<u>Spent \$/ha</u>	<u>Extra Returned \$/ha</u>
Year 1 Aerial Spray-Sow (includ. fertiliser)	155	0
Year 2 Topdress 250 kg/ha of Super	50	106
Year 3 Topdress 250 kg/ha of Super	50	106
Year 4 Topdress 250 kg/ha of Super	<u>50</u>	<u>106</u>
TOTAL	<u>305</u>	<u>318</u>

In practice, results are often better than this because these treated paddocks are used as finishing paddocks and greatly improve the overall throughput of the property.

SUMMARY

I would greatly encourage anyone with heavily infested poa tussock country, to at least try this technique on a small paddock and judge the results for themselves. In the last 3 years we have treated $70 + 70 + 300 = 440$ ha (1000 ac) of our property. I consider it a very worthwhile long-term pasture investment, particularly for graziers intending to hold their properties indefinitely, as we are.