

SUCCESS IN DIRECT DRILLING PASTURES ON THE SLOPES

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INTRODUCTION

I would like to relate our experiences with the establishment of improved and semi-improved pastures on our property "Dalblair", which is located on the North West slopes and plains, 27 km due west of Tamworth.

Our family has been farming this area since 1920. The direct drilling technique and the technology involved in establishing truly productive pastures represents an important recent breakthrough from our traditional pasture practices and will in future be the main focus of our pasture improvement programme.

In this paper I propose to give a brief rundown on the property, its physical characteristics and the enterprises we run, then outline our experiences in direct drilling pastures in our environment.

AREA OPERATION

"Dalblair" is a mixed crop and livestock operation of 3,500 ha, running 7,500 merino sheep and 300 breeding cows and has the capacity to crop up to 700 ha.

LIVESTOCK

The country is not ideal for sheep production. Even though classed as safe country, the grass seed and wool fault problems are major disadvantages.

Shorthorn cattle perform very well on our natural pastures maintaining condition and improving adequately; however, for fattening and milk production, nothing can equal an improved pasture.

Wheat and grain sorghum are our main winter and summer crops.

CLIMATE

Rainfall: The region is predominantly summer rainfall (approximately 60%) averaging 680 mm per annum over the last 20 years. Hail and floods are not very common but always do some damage when they occur, on average about once in five years.

Temperature: Temperatures have a mean maximum of 35-38°C in summer and a mean minimum of 5-6°C in winter.

TOPOGRAPHY

The front part of the property is flat to undulating and is basically used for farming and improved pastures. The back part of the property is divided by two small ranges. The valleys are farmed while the steep country is in natural pasture. Much of this country is the area to be improved.

The air strip which is central to the property is 433 m above sea level but the highest point goes up to 945 m. The country's aspect is determined by the Peel range which runs in a south west direction.

SOILS

The soils are a basaltic based yellow podsollic with some chocolate-grey, self-mulching clay and hard-setting red clay.

VEGETATION

The property is timbered with white box, white cypress, apple box and kurrajong with a number of acacias such as spring bush, Australian black thorn and wattle.

NATIVE GRASSES AND LEGUMES

The main grasses include varieties of plains grass (Stipa aristiglumis), red grass (Bothriochlora macra), windmill grass (Chloris truncata), wiregrass (Aristida ramosa) and wallaby grass (Danthonia spp). All are summer seeding except wallaby grass which is a valuable feed and needs to be encouraged in our improvement program.

Our native legumes include many trefoils and medics such as burr medic, woolly burr medic, suckling clover and haresfoot clover. However we feel they do not have the production of the new introduced varieties.

WEEDS

Our most serious weed problems are summer growing wool contaminates such as Bathurst burr, wiregrass and corkscrew grass (Stipa scabra).

The second group of problem weeds, which I regard as pasture competitive, are variegated and saffron thistles. These are winter growing and compete with all types of winter pasture.

I would now like to relate our earlier topdressing pasture improvement work on "Dalblair" and our more recent trials with direct drilling.

INITIAL PASTURE IMPROVEMENT WORK ON "DALBLAIR"

We commenced topdressing in 1963 with SF25 fertilizer at a rate of 56 kg/ha. During 1965-67 we increased this rate to 112 kg/ha.

In 1968 a swing back to single super was made using a rate of 90 kg/ha and, until the drought in the early 1980s, we have swung between these two fertilizers.

During the super drops, pasture cultivars such as Wimmera and Kangaroo Valley ryegrass and Clare subclover were spread with average to poor results. Most died from hot summer weather and resident competition.

Attempts were also made at rough ploughing and combine drilling Clare subclover, but with mixed results due to climate.

Much of the earlier sown legume seed was not lime pelleted or inoculated, which had adverse effects on long term survival.

There was a general opinion that, other than Hunter River lucerne on a prepared seed bed, pastures were out in our area.

MORE RECENT ATTEMPTS AT PASTURE IMPROVEMENT

In 1980 we decided that, with some of the new varieties of pasture, it would be worth attempting again to see if they could survive in our climate.

In June that year we sowed a 3.8 ha (8 acre) irrigation block using a conventional seed bed on our Wallamore Road property on the outskirts of Tamworth.

This paddock was sown with Sirosa phalaris at 1 kg, Maxidor lucerne at 2 kg and Haifa white clover at 2 kg/ha. This proved successful, the pasture surviving right through the 1980s drought period with only partial watering.

The lucerne thinned out a little, however the phalaris and clover indicated that under normal dryland conditions they could survive our climate.

As we faced problems in cultivating country for pastures or crops due to the poor terrain and to weed infestations which were initially prolific, we needed a new way to insert these improved varieties into our soil with:

- * minimum disturbance on all types of terrain;
- * minimum moisture loss to encourage the survival of the small seeds;
- * minimum competition to allow young pasture to establish, a factor which I think is 80% of the battle.

Right through the 1980's NSW Agriculture and Fisheries has been doing trial work on direct drilling and we used much of their experience for our work.

In autumn 1982 we hired a Duncan triple disc seeder and sowed a 5 ha paddock. This particular paddock had no fertilizer history, was very rough with tight red soils and natural vegetation was sparse; however it was a convenient paddock. Needless to say we had a small strike and nothing survived out of a phalaris, subclover and lucerne mix.

Some possible reasons for this failure may have been

- * failure of the herbicide;
- * glazing of soil leaving small seeds exposed - covering harrows were not used.

In 1985, following departmental recommendations, we attempted a 12 ha paddock again using a Duncan triple disc. The paddock had much heavier soil than the first paddock attempted; in our first attempt, we used a set of upturned harrows to cover the seed lightly with a little soil.

We had planned more carefully and, having sprayed the paddock with 2,4-D at 1.5 l/ha in the spring of 1984, we felt confident that the broadleaf

weed carry over would be reduced in the following autumn. We also used grazing to reduce the ground cover.

Roundup was applied at 1.5 l/ha prior to sowing to reduce grass competition and any broadleaf weeds still left.

We then sowed a mixture of Sirosa and Sirolan phalaris at 1 kg/ha, CUF lucerne at 2 kg/ha and Nungarin and Seaton Park subclovers at 2 kg/ha. D.A.P. was applied at sowing at 80 kg/ha.

Time of sowing was very important. We found that one can direct drill in quite rainy conditions, using a disc implement; however, due to a dry winter we did not get our drilling done until it rained in late July. Fortunately a good season followed us otherwise establishment problems from late sowing may well have occurred (i.e. spring weed and summer growing grass competition and hot weather.)

We obtained a good strike, but grazing the paddock too early thinned out the phalaris and lucerne. This was because we thought that some early grazing would help establish the pasture. We now believe that all young pastures should be left ungrazed, until the first seeding of all introduced grasses and legumes occurs.

In autumn 1986 good rains were received and the subclover thankfully established and spread in the second year.

We have supered every year and the results are very pleasing.

Our most recent attempt at direct drilling occurred last year when we drilled a total of 30 ha to phalaris, subclover and lucerne.

The fertilizer application at sowing was 80 kg/ha of D.A.P. followed in April this year by an application of 200 kg/ha of Mo super.

We refrained from a spring 1987 spraying of 2,4-D for this program. A heavy application of Roundup at 1.5 l/ha was given just prior to drilling. This had the effect of knocking down most grasses and broadleaves. However some reinfestation occurred in our light country. The soil type was light clay resulting in some glazing; however our upturned harrows were again sufficient to cover the seed. The remaining country was heavy soil which proved excellent for direct drilling.

Again we were fortunate to have good moisture during and after sowing. Direct drilling results can be marginal if conditions are not quite right.

In all, our establishment results were quite pleasing and heeding our first experience in 1985, we let the pasture completely seed out in the first year. It can be grazed lightly this year. We look forward to future direct drilling with anticipation after learning from our trials.

In the following table I have listed the cost and returns of our direct drill program over a five year period. We still have a long way to go but these developments are most exciting and could be the turning point for pastures to be established on a large scale at "Dalblair".

COSTS AND RETURN OF PASTURE DEVELOPMENT OVER FIVE YEARS using DSE/ha at a value of \$30/ha.

COST PER HECTARE

Herbicide

2,4-D in spring \$4.25/l @ 1.5 l/ha	6.37
Roundup in autumn \$15.50/l @ 1.5 l/ha	23.25
Cost of boomspraying \$6.00/ha x 2	12.00

Seeding and Fertilizer

D.A.P. \$0.45/kg @ 80 kg/ha	36.32
Phalaris \$7.00/kg @ 1 kg/ha	7.00
Subclover \$3.95/kg @ 2 kg/ha	7.90
Lucerne \$4.50 kg @ 2 kg/ha	9.00
Tractor & Implement \$15.00/ha	15.00
Seed Inoculum & Misc.	5.00
Total cost:	\$121.84/ha

Yearly Maintenance

Spreading of single super \$0.24/kg @ 200 kg/ha	\$48.00/ha
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Cash Flow

	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5
Stocking Rate/DSE	0	2	4	8	10
Return/ha @ \$30/DSE	0	\$60	\$120	\$240	\$300
Establish & Maint. Cost/ha	\$122	\$48	\$48	\$48	\$48
Return less Cost	(\$122)	\$12	\$72	\$192	\$252
Cash Flow	(\$122)	(\$110)	(\$38)	\$154	\$406