

PROBLEMS IN RETURNING TO PROFITABLE PASTURES
IN MARGINAL CROPPING COUNTRY

David Fleming,
'Ulah'
Walgett NSW

Introduction

The subject matter I believe, is the establishment of pastures in the west of the State.

Well, I can tell you how to establish green panic at Theodore, buffel grass at Mitchell or lucerne in the Hunter Valley but I can't tell you how to establish pastures in the Western Division of NSW. Nor can anyone else!

Until recently so called native pastures had been considered good enough, and little attempt had been made by station owners to improve pastures, either native or introduced by re-sowing. Probably due to lack of demand little or no research had taken place, the relative departments seemingly being more interested in the higher rainfall areas.

The Western Division consists of one third of the state of NSW and one misapprehension is that it is all the same. The Western Division is bound by the same variations of latitude as the rest of NSW and rainfall varies from around 475mm in the north-east corner of the Division to around 100mm at Coopers Corner. It would therefore make just as little sense to treat pasture establishment by the same methods at these extremes as it would be to try to grow bananas at Bega. Because of this wide climatic variation and because of extremes of soil types, I propose to limit my remarks to the area around Walgett and in particular to the County of Finch which is part of the Western Division, although not geographically so.

Also because of the lack of experience in establishing pastures in the area I would prefer to talk about the measures we are taking to tackle the problem rather than suggest that we know the answers.

First a brief description of the area. Finch consists mainly of Darling River flood plain, grey cracking clay soils, not as fertile as the Moree or Quirindi black soils, but more fertile than the red brown earths which many of you would be familiar with in the Central and Eastern Divisions.

Much has been said by uninformed publicity seekers about the fragility and degradations of the west. Their quest for publicity led to a parliamentary enquiry whose members moved from a pre-conceived idea to a pre-determined conclusion. Far from being fragile, the west has proved to be highly resilient, surviving the ravages of overgrazing in the early days of settlement when lack of knowledge of the area led to land abuse

- be it unintentioned - surviving drought and flood, to become a stable farming and grazing contributor to the national income, doing its part in keeping all Australians in a standard of living which many of the western lands lessees themselves would like to attain. It is precisely the resilience of the country which has in the past led to a lack of research of both natural and introduced pasture species.

Following a restructuring of the Department of Agriculture the long overdue appointment of a district agronomist was made at Walgett three years ago. At around the same time Finch District Council and Walgett District Council of the LGPA decided to form the Upper Darling Agricultural Research Council to bring pressure for the appointment of a research agronomist and thanks largely to the progressive and sympathetic attitude of the Regional Director of Agriculture, Dr. Bill Bellotti was appointed to this position eighteen months ago.

Why, after 150 yrs. has research suddenly become necessary.

Several factors collectively and singularly are involved. The most obvious has been the necessity for graziers to turn to farming to remain viable. District average wheat yields over a ten year period have been 1 tonne/ha despite the severe drought in the early eighties when no wheat was grown. This reasonable yield coupled with the small amount of workings necessary due to a combination of soil type and climatic conditions and hence a lower unit cost than many other areas, has injected much needed cash into the local economy and brought about a start to long overdue improvement to many properties. The "what to do" after some years of wheat is probably the prime obvious reason for research. Let me stress however that wheat growing is a young industry and from a post farming point of view there is no panic to find a solution given the fertility of the soils involved, the modern methods of cultivation and crop rotation, and technical advice now available from a vastly improved Department of Agriculture.

Less spectacular but far more important than post farming is the economic importance of improving the carrying capacity of the grazing industry. In large areas the old stand-by Mitchell grass has disappeared. Nobody knows why. Is it flood? Untimely high pressure grazing? Drought? Seasonal change? Bugs? Or perhaps a combination of all. This is one problem that has to be addressed. Perhaps Mitchell grass needs to be replaced by some other species. Only research will find the answer.

On the more frequently inundated portion of the flood plain, inedible Black Roly Poly (*Sclerolaena muricata*) covers a large portion of Finch. As a result of this, carrying capacity of these highly fertile soils is a ridiculously low sheep to 1.6 ha. Due to thick eucalypt, mostly black box (*E. largiflorens*) and Coolabah (*E. microtheca*), and weeds, mostly lignum (*Muehlenbeckia cunninghamii*), the only economic method of

heading towards decent pastures is via clearing and cropping. It is fortunate that this, when cleared, is some of the better wheat country and at least until the last few months was an economic method of preparing for eventual pasture establishment although costs of preparing for farming can run into upwards of \$148/ha. This country grows a large volume of trefoil (burr medic, *Medicago polymorpha*) in good winters and practically nothing of use during the summer. A summer grass is therefore of the utmost importance to an increase in production and if a suitable grass could be established by non-tilling methods this of course would be an added bonus to those who do not wish to enter a cropping phase.

The third type of country which is only a small portion of the Walgett district is the red soils as found around Lightning Ridge and Cumborah. Originally timbered with mostly scattered pine, these areas now contain pine so thick that the underlying soil cannot support enough grass cover to fuel a burn. While of minor importance (on a whole district basis), they are none the less of major importance to the individual people trying to make a living from them. It is known that buffel grass (*Cenchrus ciliaris* cv. American, Gayndah) does well particularly on the sandier red pine country, but the economics of timber treatment and sowing immediately to pastures without the economic benefit of a cropping phase is extremely doubtful.

Government intervention

Clearing and cropping in the whole of the Western Division is strictly controlled by the NSW Government through the Western Lands Commission. This of course has resulted in regulation and legislation by people with little or no knowledge of practical station management who bow to political pressure groups - who it would seem are hell bent on the industrial sabotage of Australia's rural industries - while ignoring advice from practical and progressive Western Lands Lessees, many of whom have had four and five generations of experience to call upon.

Clearing is prohibited 300 metres from a boundary fence or 100 metres from an internal fence while areas cleared may not exceed 142 ha without another nature strip of 100 metres between. An alternative to nature strips is to leave 25% of an area uncleared. While these regulations cause no problems in many instances, they are enforced without regard to individual cases and hence the nature strips remain a breeding area for precisely some of the plants which the area is farmed to eradicate e.g. lignum, darling pea (*Swainsona spp.*) etc. It can be readily seen that when these farming areas are returned to pasture, there will be a constant battle against reinfestation from the nature strips

With the problems outlined above, the establishment of pastures - whether native or improved, is some years down the track from the initial decision.

Pasture species

Major native summer growing species are Mitchell (*Astrebla lappacea*), Blue grass (*Dichanthium sericeum*), Coolah grass (*Panicum prolutum*) and Neverfail (*Eragrostis setifolia*) together with Tarvine (*Boerhavia diffusa*) and Yellow vine (*Tribulus terrestris*).

Mitchell has the advantage of being high quality feed and is undoubtedly the pick of the native species. It is a high protein, top quality fattening feed for cattle and good wool production. Its disadvantage is that it is a slow starter, requiring high temperatures so will not produce much feed before late October at the earliest.

Both Blue grass and Coolah grass will come away much earlier in the spring. Both are excellent feed in the young stage, but their usefulness drops off rapidly as the plant matures and as standover feed into the winter are almost useless. There is some thought that Coolah grass should be managed, grazing wise, as a crop rather than a grass and this merits some consideration.

Neverfail grows only on heavy Warrambool country, and when in early seed stage is an excellent cattle fattener. Apart from that, it is not preferred by stock, particularly sheep, but is useful in a dry time when all else fails.

All of you would be familiar with Tar Vine and Yellow Vine with their disadvantage of being highly poisonous to hungry sheep.

Minor summer species include Button grass (*Dactyloctenium radicans*), Box grass (*Paspalidium spp.*), Five Minute grass (*Tripogon sp.*) and Sugar grass (*Eriochloa sp.*), and all these have their place in the nutrition chain being quick to come away after rain which keeps stock off the major species while they get away. Unfortunately they are just as quick to go.

Winter species of native grass are almost non-existent. Within the last few years quite large areas of barley grass (*Hordeum leporinum*) have appeared and while it has undoubted qualities in its early stages, it will present us with a major problem in the seeding stage. While the seeding stage can probably be managed in smaller areas with high stocking rates, one can imagine the problems on a property of 8,000 ha stocked at the set stocking rate of a sheep to 1.2 ha.

It must be remembered that the area is a merino wool growing area and the addition of barley grass seed to a wool clip already carrying large quantities of trefoil burr is totally unacceptable.

By far the most important winter active feeds are the medics, Trefoil (*Medicago polymorpha var. vulgaris*) and woolly burr medic (*Medicago minima*) being the most common. Many a year sheep have survived a dry summer on trefoil burr left over from the

previous winter, and even cattle can be seen licking burr from around logs and other protected spots. In suitable years trefoil can start after rains in March and provide green feed right through until late October and good residue until the next winter. It also provides a large source of nitrogen, aiding both crops and grasses. It has some disadvantages. Being a spiny burr it mats into wool, drastically reducing wool prices. Discounts for wool carrying over 2% burr would be well known to you all. Sheep carrying matted burr also run the risk of increased fly strike in a wet summer. Another problem with trefoil is that it is subject to aphid attack which seems to be worse in big trefoil years.

Other summer and winter feeds are red burr (or copper burr Sclerolaena spp.) and salt weed, both of which are feeds of last resort.

Perhaps the most interesting of the minor species is a horrible, hard looking, spikey, spiny plant called goat head (Sclerolaena spp.). This is a grey salt bush coloured plant which at a glance could be confused with galvanised burr. It has been around, and largely ignored, for a long time. It seemed to thrive and spread during the dry period in the early 80's and sheep not only survived on it but did extremely well. There are several species of goat head all with a seed pod not unlike a cat head and just as uncomfortable to sit on. It is well worth further investigation.

Establishment or re-establishment of pastures is made extremely difficult by a highly unreliable rainfall pattern. Perhaps 750mm one year, 200mm the next. Wet winter, dry summer, or perhaps wet summer, dry winter. However it is no use establishing a plant in a kind establishment season only to find it will not persist in a dry time and this adds a further hurdle to the problem.

Accordingly Dr. Bellotti has begun a series of persistence trials using drip irrigation in the early stages of establishment and then letting nature take its course to see if the species will persist. Once persistence is proved then establishment procedures can be looked at.

So far only summer grasses have been looked at and amongst the most promising, although in the very early stages, are Purple Pigeon Grass (*Setaria incrassata*) [*Syn. S. porphyrantha*] Curly Mitchell Grass (*Astrebla lappacea*), Buffel Grass (*Cenchrus ciliaris*), Sabi Grass (*Urochloa mosambicensis*), and Bambatsi Panic (*Panicum coloratum*). Winter growing species (mainly the annual medics) are under also trial.

The ideal plants

What do we need? The ultimate in summer grasses would be to:

- a) Set large quantities of seed immediately it was stressed (in the same manner as barley grass).
- b) Be an early starter i.e. August onwards.
- c) Have a winter carry over value which is at least able to sustain stock.
- d) Produce a large body of feed in a good summer.
- e) Be reasonably drought tolerant.

For winter feed trefoil only just misses out on the three counts of wool contamination, aphid susceptibility and it could do with a months longer season.

The ideal would therefore be:

- a) A medic.
- b) The seed/burr of which would not contaminate wool.
- c) Aphid resistance.
- d) Will hang on until late October by which time our "new" grass will have grown a body of feed.

I believe that a breakthrough could occur any time but could also take many years.

I would also stress that from a point of view of a post farming pasture there is no panic. With modern farming techniques we can mark time by legume cropping rotations and no land degradation will take place.

Establishment

Establishment methods is a subject you may notice I have ducked! The reason is that establishment methods are unknown. Suggested methods in need of research are:-

- a) Time of sowing.
- b) Seed placement.
- c) Seed pelleting.
- d) Aerial seeding.
- e) Under sowing.
- f) Seeding in strips.
- g) Seeding into receding floods, after burns, into wheat stubble.

Any sowing methods must be geared towards fully using the few favourable rainfall events we receive in any one year. This means thorough forward planning and preparation and decisive action once a sowing chance is realised.

Crop-pasture rotations

As with most other productive agricultural areas of the world, it would seem reasonable to assume that no single enterprise can be sustained indefinitely and still maintain optimum production. Probably even more so in a highly variable rainfall. I can well imagine that any introduced grass will meet the same fate as Mitchell grass and disappear or become unproductive after a series of mishaps. Both from an economic point of view and also to maintain fertility it is reasonable to assume that some form of pasture/crop rotation will need to be put in place, certainly not on a regular basis such as in practice in countries like the British Isles, but more on an "as needed" basis. It will therefore be necessary as development takes place to be flexible enough to halt new pasture establishment if necessary and back track to a cropping phase, should pasture become unproductive, before continuing the whole process once again. The ultimate aim must be to develop the country through cropping to pasture but be able to go back to cropping in order to prepare country for the re-sowing of pastures. This must be purely a management decision made by the individual station manager and unfettered by bureaucratic regulation. It is imperative that once started that enough country is retained through rotation to justify the retention of large plants capable of farming big areas quickly.

Conclusion

We are in a lucky position. We have a young enthusiastic District Agronomist and a young enthusiastic Research Agronomist both of whom have the respect and support of a largely progressive district.