

GETTING IT ALL TOGETHER:

INTEGRATED ENTERPRISES ON A SUMMER PASTURE SYSTEM

Jock Coupland

"Boolcarrol Station", Wee Waa, NSW, 2388

SUMMARY: "Boolcarrol" has had rather unsustainable practices over the years. These practices may not be that dissimilar to practices currently used on many farms throughout the NSW north west. Being unsustainable, the property had large profitability differences from year to year, mainly due to the extreme seasonal conditions and poor commodity prices. We have had to adjust the properties direction and become more sustainable. We have moved to a perennial summer grass based system and how we are moving to a more integrated whole farm approach. By adopting such an approach we will improve farm income by producing a less variable and more reliable product.

Boolcarrol is a company owned property of 25708 ha, situated approximately 20 km north of Wee Waa. It has an average annual rainfall of 500 mm which seems to have little seasonal pattern, however, typically December, January and February are the wettest months.

Boolcarrol is a large grazing and mixed cropping property. It comprises 19000 ha of arable country of which only 4000 ha is farmed annually, the balance of this arable country (15000 ha) is non-cropped native pasture. There are 6008 ha of non-arable grazing country and 700 ha of irrigation (watered from 2 bores). Soil types are predominantly self mulching heavy black clays, however there are large areas of grey clays with high sand content and some small areas of red clay loams.

Present farm enterprises consist of;

- A Santa Gertrudis and Hereford based breeding and steer fattening herd
- A depot for back grounding company bred and externally purchased traders for our northern feedlot
- Merino wethers for wool production
- Irrigated small seeds production (Bambatsi panic and Purple pigeon grass).

The Past Problem

The properties farming areas have had a continuous cereal cropping phase for over 30 years. Farming practices during this phase were conventional and somewhat untimely, this has resulted in very

low soil organic matter levels, soil compaction and soil nutrient decline.

Producing wheat with protein levels above 10% has become impossible under the current farming system. The extreme seasonal conditions enables us to either produce a huge crop with protein levels below 10% or no crop at all. This erratic farm performance is not sustainable and needed change with the aim to produce a premium product consistently and reliably.

Droughts, floods and the need to increase stock numbers have changed our traditional perennial summer grass native pasture to an annual based pasture dominated by summer and winter weeds. In our case the native pastures are dominated by wild turnip, variegated thistle and medics in the winter and yellow vine and soft roly poly in the summer.

Droughts have therefore had a larger impact on carrying capacity due to the inability of these annual species to provided suitable bulk carry over feed for the dry periods. We have therefore had to dramatically de-stock the property during droughts selling at low prices and restocking post drought at higher prices. We have also had to purchase quantities of fodder at drought inflated prices.

Solving the Problem

Our aims on Boolcarrol are to produce high protein wheat, produce a steer with a live weight and composition suitable for the various feedlot trades (whilst increasing the carrying capacity), and to improve the fertility of our No 1 breeding herd.

We have therefore needed a system of pasture improvement via a cropping rotation which gave us the ability to improve our soils, give us the protection against the extreme weather conditions, together with a system that enabled us to increase stock numbers and obtain better cattle weight gains and potentially improve wheat protein levels.

An integrated summer grass pasture improvement program has been therefore adopted. Purple pigeon grass (*Setaria incrassata* cv. Inverell.) and Bambatsi panic (*Panicum coloratum* var. *makarikariense*) were the two species that have been selected to satisfy this program. These two species were selected because of their drought tolerance, their ability to withstand flooding and continuous inundation, and their ability to support higher stocking rates while obtaining better than average weight gains on our soil types.

Our idea is to sow bambatsi and purple pigeon grass into the old cropping country. Once adequate areas are established we will farm and crop selected native areas with cereals. After the second year of establishment of the improved pasture grasses it is our aim to introduce a winter legume with varieties such as Sephi barrel medic and Caulif barrel medic being trialled.

We have been sowing the species as a mix into old wheat paddocks. The idea was to establish the perennial grasses in these paddocks as they produced only very low protein wheat and in some cases have structural problems. We will continue to farm virgin country to chase the high protein wheat and in doing so establish a rotational program of improving our wheat returns and improving the native pasture lands.

Irrigated seed production unit

We established an irrigated seed production unit on "Boolcarrol" in 1991 to supply Purple pigeon grass and Bambatsi panic to our various company properties. The seed unit which now supplies seed on a commercial basis has maintained a high level of seed quality that is of good germination, purity and supply.

Establishment and Management

The two species were sown at 1-2 cm deep in separate blocks into a conventionally prepared seedbed at 4 kg/ha. Logran® at 30 g/ha was used as pre-emergent herbicide and in the second year of production Atrazine was used at 2.5 L/ha in the winter giving us residual control of mainly black

oats and wire weed together with many other broad-leaf weeds.

The seed blocks are harvested twice over the summer (December and March). After each seed harvest, hay is made from the remaining stubble yielding on average 12 M t/ha for the two cuts. The hay is satisfactory for maintenance drought feeding for both sheep and cattle. Over the winter we have been grazing the seed blocks with sheep to clean the stands. This winter anhydrous ammonia will be applied at 30 cm depth at a rate of 200 kg/N/ha. High nitrogen inputs are needed to achieve high yields continuously, rates of up to 300 kg of N/ha applied in split applications are common.

Harvesting Seed

The blocks have been harvested with a conventional harvester up till now, however, this summer we will be using an air assisted brush harvester with the aim to increase seed yield and improve seed quality. Windrowing prior to harvest is a technique yet to be tried on "Boolcarrol". This technique allows the seed to be harvested at low moisture contents that does not require manual spreading.

The seed is of high moisture content when harvested conventionally (up to 60 % moisture content), it is therefore needed to be spread out very quickly over a shed floor or the like to dry down and prevent over heating. The germination result of the seed can be dramatically reduced if the seed gets too hot.

Yields to date have been encouraging with the purple pigeon grass yielding up to 300 kg/ha clean seed and the bambatsi yielding up to 100 kg/ha clean seed.

All seed is graded and treated with Ficam® ant treatment.

Broadacre pasture sowing

A conventionally prepared seedbed is used in all cases. Direct drilling and flying seed onto country without preparing a seedbed will dramatically reduce the chances of establishment.

Sowing rates

The purple pigeon grass is sown at 2 kg/ha and the bambatsi panic at 1 kg/ha as a mix. All seeds is treated with Ficam ant treatment.

Sowing dates

Sowing of the grasses is started and completed during September, however, successful sowings are achievable in Autumn.

Sowing Depth

Seed is sown into 1-2 cm of dry soil, preferably with sub-soil moisture.

Sowing Method

Sowing is done by contractors using a conventional Flexicoil airseeder with coil packers.

Herbicides Used

Logran® is used as a pre-emergent residual at 30 - 35 g/ha. Ally® at 5 - 7 g/ha can be used as a short term residual and rates between 3 - 5 g/ha gives exceptional results as a post-emergent control on yellow vine. 2,4-D Amine, Dicamba and MCPA can be used during summer and winter time for the control of various broadleaf weeds.

No stock are introduced until the secondary root system is developed. This may happened as early as December/January.

Table 1. Cost and estimated returns in first and second year for broadacre grass establishment.

Costs	
<i>Seed:</i>	
2 kg/ha Purple pigeon grass	\$ 10.00
1 kg/ha Bambatsi panic	\$ 12.00
<i>Seedbed preparation:</i>	
Cultivate	\$ 9.00
Cultivate (incorporation of Logran®)	\$ 9.00
<i>Herbicides:</i>	
Fallow - Roundup® at 300 ml/ha	\$ 3.00
Fallow - MCPA at 300 ml/ha	\$ 3.00
Pre-emergent - Logran® at 30 g/ha	\$ 14.00
Post-emergent - Dicamba at 500 ml/ha	\$ 6.00
Post-emergent - Ally® at 5 g/ha	\$ 6.00
Applications X 3	\$ 13.50
<i>Sowing:</i>	
Contract	\$ 15.00
Total	\$100.50
Income¹	
<i>1st Year - (Based on trial data March - June)</i>	
Stocking rate - 0.64 beast/ha (350 - 450 kg liveweight)	
Average daily wt. gain - 0.8 kg/hd/day	
Days on feed - 120 (during trial period only)	
Sale value - \$1.25/kg	
Income /ha (Over the 120 days) - \$ 81.00 /ha	
<i>2nd Year - (Predicted)</i>	
Stocking rate - 1 beast/ha (350 - 450 kg liveweight)	
Average daily wt. gain - 0.8 kg/hd/day	
Days on feed - 180	
Sale value - \$1.25/kg	
Income /ha (Over the 180 days) - \$ 190.00 /ha	
¹ No allowance has been given for purchase of traders as they are property bred; ² It is expected that there will be an annual average stocking rate of 6.63 DSE/ha or approximately 0.66 beast/ha.	

Cost of broadacre grass establishment

Cost of pasture establishment and indications of likely income in the first and second year income are given in Table 1.

Livestock performance

The following are some trial results undertaken at Boolcarrol looking at weight gain and stocking rates of steers.

- Area of Paddock: 437 ha
- Date stock in: 3/3/94
- Date stock weighed: 14/6/94
- Days on pasture: 102
- Stocking rate/ha: 0.64 hd/ha or approx 5.76 DSE/ha
- Number of steers trialed: 34
- Average empty live weight in: 412 kg/hd (1 steers = to approximately 9 DSE).
- Average empty live weight out: 498 kg/hd (Trialed steers).
- Average total live weight gain: 86 kg/hd (Trialed steers).
- Average daily gain: 0.8 kg/hd.

Dry matter cuts were taken every month between July 93 and June 94 (Figures 1 and 2). Taking into account pasture utilisation an annual average stocking rate of 6.63 DSE/ha could be achieved. The accepted stocking rate of similar country is between 2.5 and 3 DSE/ha.

Conclusions

In conclusion, there are many advantages by adopting a sub tropical perennial pasture grass rota-



Figure 1. Dry matter production (kg/ha)



Figure 2. Stocking rate (DSE/ha)

tion on "Boolcarrol". Following are some of these advantages:

- Rejuvenate our soils by providing valuable organic matter, breaking up hard pans, im-

prove infiltration and improve soil water holding capacity;

- Increase wheat protein levels;
- Achieve higher stocking rates and improve weight gains;
- Maintain stock numbers during droughts and remain somewhat drought proof;
- Make considerable dryland fodder if the need arises;
- Improve the fertility of the No 1 breeding herd and improve calving percentages by providing the breeding herd with a higher quality pasture more reliably;
- Produce a reliable grass fed beast consistently from year to year.