Perennial Pastures in the Cropping System

Neville Thompson

"Marnoo", Temora. NSW. 2666

Abstract: Lucerne and cocksfoot based pastures compliment our cropping system. We currently crop over two thirds (69%) and stock less than one third (31%). This means a shorter rotation in the pasture phase and a longer rotation in the cropping phase. The cropping is strictly rotated and mostly zero-tilled with some stubble retention.

The family properties of "Marnoo", "Eromross" and "Woorayl" are on undulating country 22 km southwest of Temora and consist of 2406 ha, less the admin area and 50 ha of shelter timber, leaving 2356 ha for cropping and grazing. Soils are a red-brown earth with 530mm of annual rainfall with an elevation of 300 m above sea level. Sheep numbers this year are 4,450 wethers and cropping areas of 1621 ha comprises: wheat 747 ha, barley u/s 52 ha, canola 616 ha, lupins 126 ha, and peas 80 ha.

Pastures

Currently our pastures are Aurora lucerne and Currie cocksfoot perennial based pastures with some annual content (*eg.* Dalkeith subclover and grasses). The cocksfoot helps to slow down the re-acidification and use more of the nitrogen in the profile. Using these pastures is the only way we can lift our organic carbon, particularly with the use of the cocksfoot. Our organic carbons are lifting by more than 1%, up to our best readings of 2.4%, from lows of around 0.9%. In the cropping phase, at best, we can only hold our carbon levels or lift them marginally. An increase of 1% in organic carbon equates to a one tonne increase in yield of crop.

Establishment

Pastures are established with barley or canola as cover crops. Wheat, lupins and peas can equally be used as long as the important details of cover crop seeding rates are reduced, *ie.* the cover crop is not to be competitive, the lucerne seed to be innoculat-ed, Apron treated and lime pelletted. Seeding rates of pasture are: Aurora lucerne @ 4 kg/ha: Dalkeith subclover @ 4 kg/ha and Currie cocksfoot @ 0.5 kg/ha

Grazing Management

Newly sown pastures are grazed after harvest, then left until we have suitable rains or the autumn break occurs, before grazing again. Established pastures are managed more aggressively, *ie.* we increase grazing up to 100dse/ha (increasing mob size from 1,000 head to 3,000 or 4,000 head or more) in the winter and spring to manage our pastures better by controlling weeds and manipulat-ing pastures species. There are a number of benefits that flow from this cell type grazing, *eg.* less V.M. and grass seed in the wool, "red gut" in sheep is easier to manage, paddocks have longer recovery period, weeds kept to a minimum by not being allowed to set seed or as much seed as would other-wise be. Our management system does not include hay or haymaking. Hay removal can be the most acidifying thing we do. We use grain oats for long term drought reserve. Our business strategy is to de-stock in drought periods. We reduced sheep numbers last August because of the forecast "El Nino" event. By making an early decision, manage-ment was more flexible because the sheep were in good order and very saleable while the remaining sheep had adequate pasture to take them through the summer without requiring supplementary feeding. We did the same in 1994 leading up to the drought, reduced sheep numbers and sold some of the oats at $250 per tonne.

Liming

Since 1988 all of our country has been limed and some country we are treating for the second time. Originally we started applications at 1.25 t/ha, the idea being to cover as much country as possible. We then lifted our rate to 2.5 t/ha, and our experience was that the low rate gave us five years before re-acidifying, while we expect to get ten years out of the higher rate. The second time round with lime certainly gave us some vigour and benefits we had not known about, *eg.* growth of lucerne, the evenness of crops, and there is less difference between top and bottom paddocks. Our lowest soil ph was down to 4.3 pH in $CaCl_2$, where we now have paddocks up to 6.3 pH in $CaCl_2$. The aluminium toxic-

ity is removed in the year of liming. Gypsum is also used as a form of sulphur, at rates of 300-600kg/ha in the cropping phase, particularly for canola.

Cropping

The first crop coming out of a pasture phase can be either canola or wheat. Our experience has been that where the pasture paddock averages 150 kg of nitogen/ha, then that paddock is well suited for wheat as the first crop, followed then by canola. We start up to twelve months before planting, noting and recording previous weeds and disease, removing grasses and perennials, particularly lucerne, so the profile can restore moisture levels and mineralise nitrogen in time for the first crop. We make sure crops are pushed to potential yield and use up moisture in the profile to greatest depth. This is done with the use of deep soil tests and monitoring plant populations to establish achievable target yields for every paddock. We then balance the nutrient requirements of the crop to reach these target yields. By setting up a nutrient spreadsheet, we can put together the various amounts of nitrogen, *ie.* what was measured in a 60cm deep soil probe, calculate nitrogen that was mineralised, what nitrogen was available with the planting fertiliser and then total all this nitrogen to see how this measures up against the target yield that we have set. If we target a 5 tonne wheat crop at 11.7% protein, it will need 206 units of N, but if the calculations only total 176 units we will need to topdress the wheat with 65 kg of urea (46% N) to give the crop 30 units of N. Since our liming programme commenced, the nine year average for wheat is 4.09 t/ha, while the eight year average for canola is 1.90 t/ha. The current rotation is over seven years with canola/wheat/canola/wheat/canola/wheat and an odd break of lupins or peas.

Most of the cereals are zero-tilled into the canola and lupin stubbles, while the canola is zero-tilled into a "cold burn" cereal stubble. The only full cultivation being done is to incorporate lime or initially breakup country coming into crop out of pastrure. We do not see the need to be cultivating country as much as we used to.

Marketing

We have a strong marketing focus. It is the one thing that can lift our bottom line more than any other single thing we do, *ie.* agronomically, genetically or by management. Marketing is developing relationships and maintaining a strong communication link with the people we trade with. We have had to be innovative in responding to market changes with deregulation of the grains industry, as well as the removal of the wool floor price scheme.

Our wool is very describable and predictable. The wethers have a long term average wool cut of 7.14kg from Haddon Rig blood line with a 21.6 average micron and an average wool strength of 39.5 N/kt, an average yield of 63.5% and V.M. average of 1.3% and these are nine year averages. In three out of the last four years, our wool was sold by forward contract for above average prices. We have no problem locking in a price and taking a position in the market, because of our pastures and management we know our strength and micron will fit within the contracts limits. When the wool is contracted, we have an added responsibility to be sure we deliver the clip, this also allows us to prepare the wool the way the buyer requires it, *ie.* skirting ratio, number of lines, and line identification.

Marketing grain has to be a real challenge and is very rewarding. There are numerous strategies and marketing plans available these days and we need to be able use and work with them all. Our canola crops are forward contracted on various spikes in the market. As well as taking a position on Canadian Winnepeg Futures and Options, we expect to average the price up as we go into the season. The soft wheats are forward contracted on fixed tonnage and firm price with an act-of-God clause at planting or before. The hard wheats are hedged by using SFE Futures, Chicago Board of Trade Futures and Options, and fixed grade contracts. We aim a securing a premium and averaging our price upwards as the crop matures. During harvest, wheat is warehoused and then allocated to the various markets according to grade and protein on completion of harvest.

Management

Farming is a business for us, in that we are resource managers and we do our best to make the greatest use of these resourses in increasing and improving our nett worth. We use the services of a farm management consultant . This allows us to develop budgets and farm programmes with the best enterprise mixes and together we have valuable discussion time about where we are and where we are going. We call upon and buy numerous other physical and information services, *eg.* NSW Agri-culture, weather, marketing, agronomic, and wool. Contracting services for harvesting and sheep work are also employed.

Conclusions

Scale of operation is starting to work for us, ie. the turnover allows us to reinvest in plant, improvements and property expansion. By buying the best advice and using best practice, I feel very confident about the future of farming.