

Wool production & biodiversity Case Study working together for Tim & Karen Wright

Fast facts

Location

'Lana': 24 km west of Uralla, New England Tablelands NSW, Gwydir River Catchment

Property size

'Lana' 3350 ha
'Kasamanca' 780 ha

Paddocks

'Lana' 240
'Kasamanca' 24

Average annual rainfall

769 mm or 30 inches ('Lana')

Main enterprises

Fine wool (15.5-17.5 micron)
Beef cattle

Stock numbers

7000 Merino sheep (8800 DSE)
650 breeding cows (9750 DSE)

Stocking rate

4.5 (winter) - 6.0 (summer) DSE/ha

Main soil types

'Lana' - coarse and fine granites

Vegetation types

Open partly cleared woodland of Blakely's red gum, yellow box, rough-barked apple and apple box on the undulating flats and drainage plains, mountain gum and white gum along the sandier watercourses, and stringybark open forest on the higher granite hills and outcrops

Elevation

800-1000 m above sea level



Left: Tim and Karen Wright at their property "Lana". Photo courtesy of Karen Forge.

Tim and Karen Wright's philosophy is all encompassing and relates not only to their land, but to their lives as a whole. Their 'holistic goal' is summarised as follows:

"We aim to develop and maintain our property as a pleasing, ecologically balanced environment. We also aim for a chemical-free product. By doing this we believe our wool and meat production enterprises will be healthier and more cost efficient. In turn, we believe this will lead to healthier profits for the future, as well as improving human health. We endeavour to expand the horizons and the opportunities for both ourselves and the community."

This booklet details Tim and Karen's management history, resource issues and enterprises. It goes on to demonstrate the techniques and tools the Wrights use to achieve their holistic goal.

Biodiversity is the variety of all living organisms, including plants, animals, fungi and microbes. Biodiversity is necessary for productive, resilient ecosystems.

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Enterprises & management history

Tim and Karen breed easy-care, low-cost Merino sheep of good constitution based on fine to superfine Merryville and Lorelmo (poll) bloodlines.

The breeding flock on ‘Lana’ in the early 1970s was Fonthill, to which Tim introduced Lorelmo superfine wool rams in 1980. This continued in most years until the late 1990s. So before Soft Rolling Skins came along, the Wrights were breeding that type of wool anyway.

“Now we are using different bloodlines, and have bought in Merryville, Kyabra and Alfoxton rams during the past five years,” says Tim.

The wool is free-handling and locky, as they are steering away from deeper crimping fleeces with too much colour, and sticking to whiter, brighter more free-growing spinning wools.

“We are after very easy-care sheep – the ewes and wethers never get jetted – and we only drench once or twice a year. This means the cost of production is very low. We get a 78 per cent wool yield, on average. The hoggets cut 15.5 micron and the adults average 17.5 micron,” says Tim.

The ewes cut about 4 kg of wool/head, the wethers 4.5 kg/head, and the weaners 2.5 kg/head.

Tim’s father, Peter A. Wright, took over Lana in 1952 when it was customary to stock New England country with wethers from the Western Division of NSW.

“According to one old-timer, this country used to run a quarter sheep to the acre and most of those died during the winter,” said Tim. “This was when the country was burnt annually”.

In the mid-1960s, Peter began pasture improvement. About 20% of the property closest to the homestead and woolshed was cleared or thinned and sown (ploughed or drilled) with pasture during the 25 years to 1990.

The whole property was aerially superseeded and seeded from about 1960.

“We sowed fodder crops of oats under-sown with vetch or a cocktail of pasture species including sub and white clover, fescue, phalaris, ryegrass and red clover,” said Tim.

“Using pasture improvement like this, we lifted our stock numbers from 7000 DSE in 1980 to 20,000 DSE in 1991. We used to slowly rotate stock: two months in, two weeks rest, then back in again,” he said.

Resource issues & problems

The problem was that this form of management barely broke even over 5 years after ‘improving’ a paddock, and in some ways things went backwards.

“After the 1981 and 1994 droughts, the lowest yielding paddocks were the sown paddocks, and the land suffered,” said Tim.

Under the old management regime of annual spring burning for green pick, wiregrass or speargrass (*Aristida ramosa*) flourished, and it continued to be a problem in the uncultivated country. Pasture problems such as pinrush (*Juncus* spp) increased in the 1980s, as the country was more intensively used. The sown country all reverted back to native species; in retrospect, this was a blessing.

By 1990, Tim and Karen decided that something had to change. They were motivated by two key considerations:

1. costs of production, especially labour, but other inputs as well, had to come down.
2. grazing management needed to change to better utilize the grazing animal to transfer nutrients off sheep camps, and reduce weeds and worms; in effect, to use livestock as the farm machinery for slashing, fertilising, sowing pasture, and so on.

Below: Sheep at ‘Lana’ in the height of the 2002 drought. Photo courtesy of Nick Reid.



Below: Cattle on ‘Lana’ in spring 2004. Photo courtesy of Karen Forge.



Solution:

Planned grazing

Tim experimented with cell grazing between 1991-93, and then moved to planned grazing in 1995.

With planned grazing, stock numbers on both 'Lana' and 'Kasamanca' (their 780 ha property near Enmore, 50 km to the east) have been maintained between 15,000 and 22,000 dry sheep equivalents (DSE), with only one-third the fertiliser inputs of the 1980s.

Figure 1 illustrates total stock numbers and rainfall since 1980.

Planned grazing based on Holistic Management guidelines involves intensive grazing with a high stock density for short graze periods followed by long rest periods:

"We manage the whole ecosystem, using the livestock as 'tools' – no farming is practised! We use 'strategic rest from grazing' to enhance the environment: 95 per cent of the property is in recovery mode at any one time," says Tim.

During fast pasture growth, the livestock are moved faster and during slow growth periods (e.g. in winter or drought), the animals move more slowly which enables a longer rest period for plants to recover.

According to Tim and Karen, there are several advantages of planned grazing:

- It is strategic and flexible
- Planned grazing allows you to suit conditions to livestock and plants and innovate with the grazing sequence of herds and flocks. Decisions to move stock and buy and sell are based on the seasonal production cycle (Figure 2).
- You use feed budgeting to plan ahead.
- In the *open plan* from winter to summer (with steadily increasing production in each paddock), you have to decide when to move stock for maximum livestock performance and pasture spelling (Figure 2).

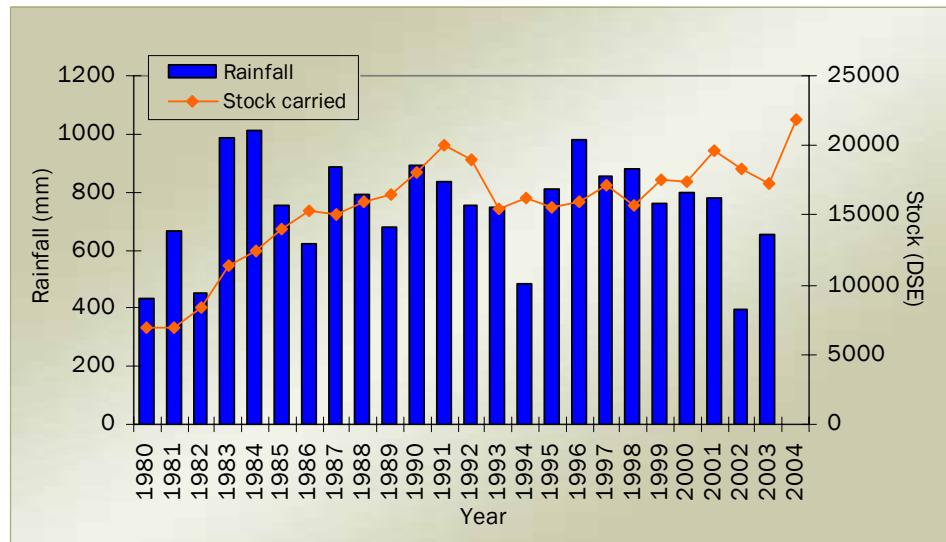


Figure 1. Rainfall at 'Lana' and total stocking rate (average of summer and winter stock numbers) on 'Lana' and 'Kasamanca' from 1980 to 2004.

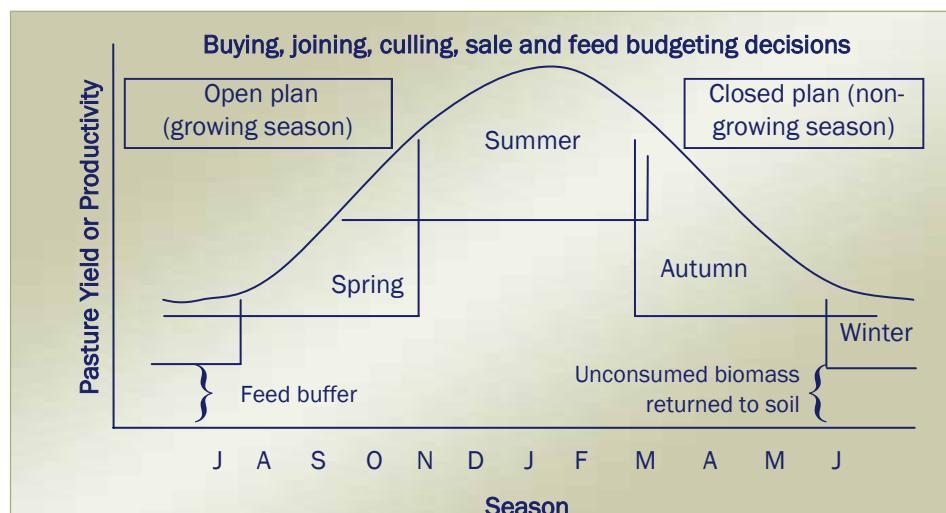


Figure 2. Open and closed plan phases of the planned grazing approach, based on prediction of pasture carrying capacity on a 3-monthly basis, and retention of a suitable pasture buffer to return organic matter and litter to the soil. The open and closed plan is an Alan Savory concept.

- In the *closed plan* from summer to winter after pasture production has peaked and is declining to a minimum in winter, you have to plan your stock numbers and assess your pasture production to be able to get through to the next time when growth is going to come again.
- Planned grazing works on the desired rest period, that is, the amount of rest you want for the pasture.

Farmlets

In order to accommodate planned grazing, Tim subdivided 'Lana' into 240 paddocks (generally 10-25 ha each) organised into five main cells or 'farmlets': Grass Tree, Sandy

Mountain, Junction, Creek and Tilses (Figure 3). The rams and bulls run in a sixth small farmlet around the Woolshed, and the heifers calve there too.

Paddock planning is important – paddocks must have approximately the same effective grazing area to allow the leader-follower system to work.

Each paddock gets an average of 8 days grazing per annum, or 2 days grazing in each season (summer, autumn, winter and spring). The more paddocks, the more rest the pasture gets with added grazing flexibility.

Tim adds, "You can miss a paddock to get a seeding event if you want—you don't need to use machinery to sow a pasture".

Stocking rates

About 15,000 to 22,000 DSE are run in winter and summer, respectively, across the two properties:

"One year, we ran up to 24,000 DSE by backgrounding steers which we can do as another option if conditions permit. 7000-9000 DSE are sheep, and the balance is cattle.

"In 2002 with the drought, we kept all the breeding stock and sheep, and destocked by selling some heifers and cast for age cows (amounting to a 10 per cent destock).

"We pregnancy test and the heifers that don't fall pregnant are sold.

"In terms of stocking rate, we are well understocked most of the time. We like that buffer."

Planned grazing with sheep and cattle

Tim has learned that sheep and cattle are generally best grazed separately:

"We keep sheep and cattle separate to get the right balance between finance, livestock and range condition. Cattle always do better if they are on their own. They also open up the pasture for the sheep and reduce the worm

burden. Cattle and sheep generally don't mix, they don't like each other. Sheep are more selective, and would otherwise take good feed away from the cattle. The two together didn't work in the first year."

Sometimes, Tim will deliberately run the cattle in with the sheep to stop the cattle getting too fat, and to reduce the risk of bloat if there is too much clover. The flexibility of planned grazing makes it work.

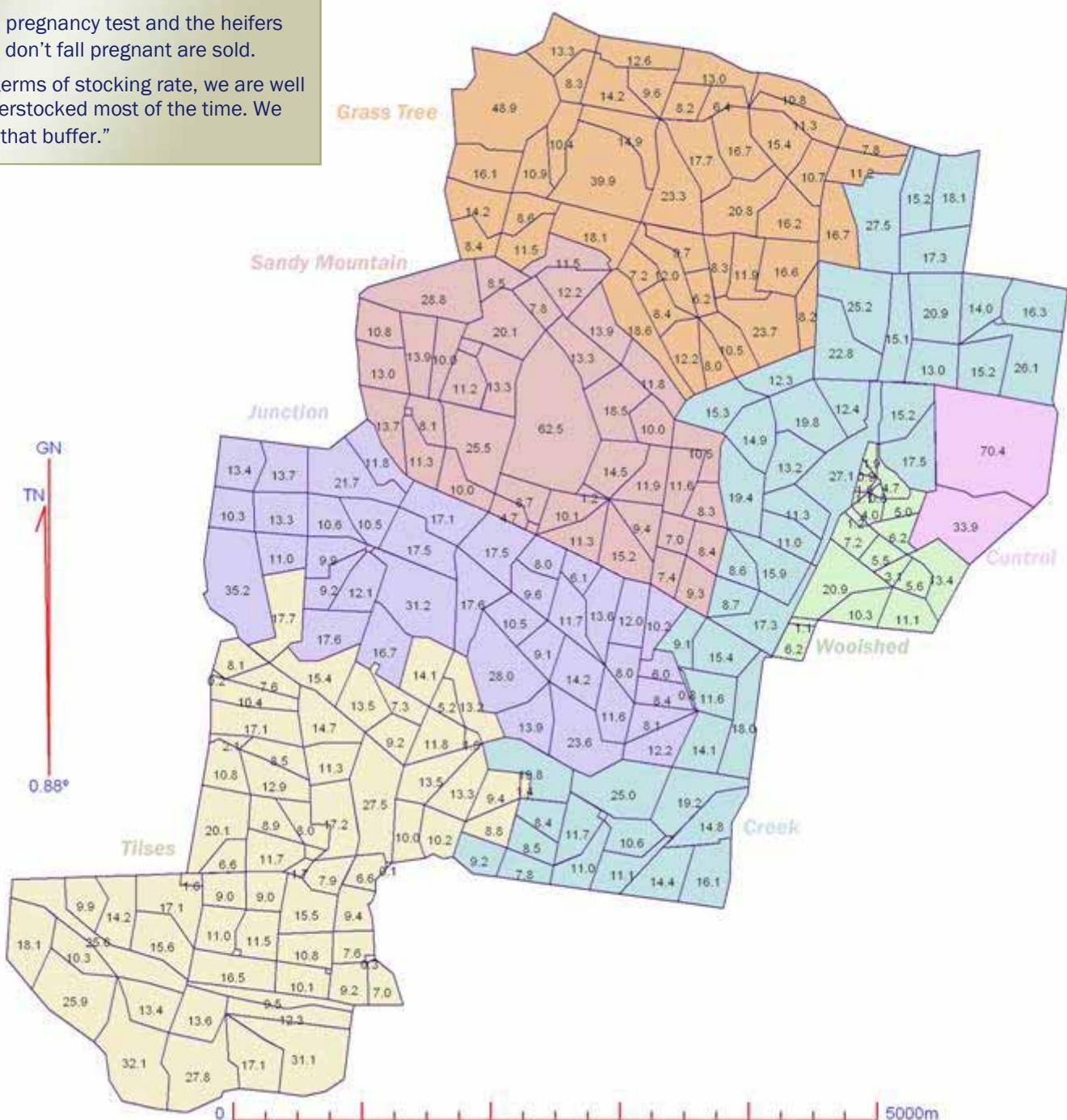


Figure 3. 'Lana', with paddock layout and paddock areas (hectares) in September 2004. The paddock layer was prepared in Practical Systems' FarmMap software. Datum: AGD Australian Geodetic Datum of Australia, Grid: MGA94 (GDA94) Australian Map Grid.

Leader followers

Tim employs the ‘leader-follower’ system:

“In a leader-follower system, cattle run two days ahead of the sheep. This solves the worm burden problem. For the leader-follower system to work, you’ve got to have the same size paddocks, 10-15 hectares of grazable land in our case. Cattle get two days then sheep get two days so that the paddock experiences a four-day graze period at each rotation.”

The moves are sped up in summer and slowed down in winter.

“It’s only a half to one day difference between seasons so it averages out, with a minimum of 70-80 days rest, irrespective of season—never less, even in good times,” he said.

“If the grass is growing well, more litter is going into the soil, so you are being generous. In a less ‘brittle’ environment such as Dorrigo, you could go for a shorter rest period.”

Split leaders

For special stock purposes, Tim also employs a ‘split-leader’ system:

“I sometimes run the first calf heifers ahead of the main mob of younger hoggets as a split leader. You can only do this in cells with lots of paddocks. You have the young heifers (maybe 20 per cent of the DSE in the farmlet) half way around the cell ahead of the

main mob in a 12 o’clock-6 o’clock fashion.

“I only run the split-leader system when the pasture is growing, so that you get recovery of the pasture during the time between the young heifers and the main mob. I also use this for fattening special stock for market – it worked very well even in the last drought.

“Alternatively, you can get young maiden stock cycling prior to joining. It’s a case of knowing what you want: the 20 per cent don’t take enough from the paddocks to upset the long rest afforded the pasture between visits from the main mob. I might have 500 DSE in the split leader, and 2300 DSE in a main mob of wethers.”

Numbers and types of stock

Tim and Karen vary the number and type of stock in each farmlet with country and class of livestock:

“We run about 850 ewes in a farmlet because you get less mis-mothering than with larger mobs. It’s also a better number in terms of lamb marking and labour. You can mark 700-800 lambs in a day.

“I run the wethers in Tilles (the least developed, most native country), the weaner sheep as a separate mob and have three mobs of 800 ewes in the other three main farmlets.”

Below: Open flats and drainage plains on ‘Lana’ are lightly timbered with a healthy amount of regenerating trees as a result of planned grazing. Photo courtesy of Nick Reid.



Animal behaviour

Animal behaviour is an important part of planned grazing:

“All we are doing is being a shepherd – doing what the stock want to do – opening and shutting gates for them. All the ewes and cows are trained, all were born on the place, and they know exactly what’s going on.”

According to Tim, the odd rogue does jump a fence, but it’s all permanent fencing, so it’s not a problem.

“If you judge it wrong and there is only one day’s graze, not two in a paddock, they will hang round the gate carrying on, waiting for you.”

The work load

Tim and Karen are often asked if their form of management is a lot of work, tying them to the farm.

“When we go away, we ensure someone does the moves,” said Tim.

“Lambing is another issue. Lambs might drop during a three week period, so I open up three paddocks at a time and let them drift to reduce mis-mothering. It would be a serious mistake to start planned grazing at a time like lambing – you need the stock trained, so they know what’s happening.”

Holistic Management

Tim and Karen practise Holistic Management and weigh up all their decisions against their *holistic goal*.

Their holistic goal encompasses their social, environmental and economic priorities as a family and as a business and is expressed in a summarised form on page 1.

The *Holistic Management and Grazing for Profit* schools that Tim and Karen attended in the early 1990s had a large influence on their management of ‘Lana’, which these days, is based on three tenets:

1. all decision making is guided by Tim and Karen’s holistic goal
2. planned grazing
3. the importance of questioning everything they do, and taking on board new ideas.

Solution:

Fencing & water

The change to planned grazing on 'Lana' necessarily involved a new fencing and stock water plan with some major outlays:

"I installed permanent fences – suspension fencing, four barbs, steels 15 metres apart, one dropper between and steel end assemblies – for \$800 per kilometre including labour back then. Today, the cost is \$1,100 per kilometre including labour.

"We made our own end assemblies. My workman and I could do one kilometre per day, so it was pretty cheap. Each subdivision involved about three quarters of a kilometre of fencing, so eight paddocks meant seven to eight kilometres of fencing," he said.

The re-fencing program was funded by reducing other costs, such as fertiliser and hay, and abandoning pasture sowing and renovation. The bulk of the fencing was done over 6 years. Tim aimed for and achieved a 100% return on capital over 2 years, through the reduction of vegetable matter in the wool. The cost of fencing and water per acre was about the same as a hundred weight of superphosphate, with a much better return.

"We try to fence parallel to the slope, on the contour, not up and down. That way you get stock to move nutrients off the old camps.

"Twelve months ago, we fenced the western paddocks like this, we've seen a big change in 12 months already. A year ago, the pasture looked dead. Those areas are now running three to four times the stock they used to.

In terms of fencing, the whole place is a laneway system.

"If you've got a big mob to move, you leave the gates open, so one person can move them. On the main tracks, you tend to leave the gates open most of the time, so there's not too many gates to worry about. There's a shire road running through the place, so it's only ten minutes from the homestead to out the back," says Tim.

New stock water sources were developed progressively:

"In the first and second years at Tilses, the water was already there in the creeks and dams. Since it was just the sheep and heifers, it wasn't a big drain on the water supply. In the third or fourth year, we put in a tank system to water the new paddocks.

"The dams were already here but we went to troughs. The cleaner the water, the better. There's proof from Nebraska feedlot research that cattle do better on cleaner water. Stock can lose half a kilogram per day on muddy water in a dam."

"The stock tend to draw to the troughs. We don't need troughs in wet seasons, but they are a good drought standby. A mix of dams and troughs gives us the best of both worlds.

"Troughs are also good for the leader-follower system when the cattle muck up the dam water. Dams on granite soils don't pug up as much as on the other soil types."

The advantages of planned grazing

Tim and Karen recount many positives about planned grazing along Holistic Management guidelines in terms of finances, lifestyle and the farm environment.

Finances

Tim does his own wool classing and has seen the quality of the whole 'Lana' wool clip improve with planned grazing:

"The wool yield in the 1980s was only 73-74 per cent, now its 78-80 per cent.

"Strength was down to 40 N/ktex without feeding in the 2002 drought, but strength has generally gone up. Since the late 1990s, the hoggets have regularly cut 15.5 micron."

Tim has seen planned grazing reduce the amount of wiregrass and vegetable matter in the wool during the last 15 years, a phenomenon most noticeable in the skirtings in drought years when the sheep are forced to graze the wiregrass. Figure 4 illustrates this.

While the vegetable matter in the fleece lines has stayed constant at about 1.5%, the skirtings have fallen from 9% vegetable matter to 2% vegetable matter since 1982.

The reduction in vegetable matter has enabled Tim and Karen to decrease the amount of skirtings:

"The ratio of skirtings to main lines has gone from 1:3 to 1:5 with time, and since the skirtings are worth only half the value of the main fleece lines, the value of the overall wool clip has increased. The broken lines have also increased in value with the reduction in seed."

While wool income has increased, costs of production have decreased when compared to costs during pasture improvement:

"We operate a low-input system now. Our main inputs are fencing and the labour involved in general maintenance.

Lessons Learnt

Decision-making—Good management follows from making decisions in relation to your goal: ask yourself, "Am I treating the symptom or the cause? What is the weak link? Is it my grazing plan or something else?"

Managing land and livestock is a balancing act—having a good balance depends on you being constantly in tune with your grazing plan and your goals.

Fencing and water points—appropriate fencing and water points can significantly increase the effectiveness of livestock and pasture management.

Animals can be your machinery—combining time and livestock enables you to use animal impact and herd effect to change the nature of pastures and improve land and livestock production.

"We used to have two full-time employees on 'Lana' up until the 1980s, then one full-time after that. We also used to have a lot more casual employees during the early 1980s."

"Twenty years ago, one person managed 6000 DSE. Now, one-and-a-half people are managing 22,000 DSE (winter levels) or 14,600 DSE per labour unit, excluding office time" says Tim.

"We now use contract labour only two days per week, we are not drenching as much, we are not sowing pastures or ploughing anymore, and we're not spraying weeds as much. We've kept the chisel plough for bushfires only, and the animals are our farming tools."

Interestingly, the least developed parts of the property have generated the best returns. They are producing at about the same rate as the more developed parts of the property and have had the least investment:

"Tilse has only received a fraction of the investment of other parts of the property. There was some thinning 20 years ago, but it hasn't had as much fertiliser as the rest. Given the amount of *Aristida* in the unfertilised country, I only ever used to run heifers over there in autumn and winter."

"With planned grazing, I was able to leave the wethers there for the whole year and I doubled the number of stock from 2 DSE/ha to 5 DSE/ha."

"We have spent \$40/ha on fencing and water for more subdivision, and it was repaid in two years."

The financial success of Tim and Karen's operation is evident in their gross margins during the past three years (Figure 5). Even in the drought year of 2002, the Wrights achieved healthy gross margins, within the range expected based on NSW Department of Primary Industries published figures on their website.

"After the 1981 drought, we were indebted to our stock for four years and so was the land."

"After the 2002 drought, we were not indebted to our stock at all."

*Figure 4. Vegetable fault in the skirtings of the 'Lana' wool clip in drought years when the wiregrass (*Aristida ramosa*) seed burden is severe.*

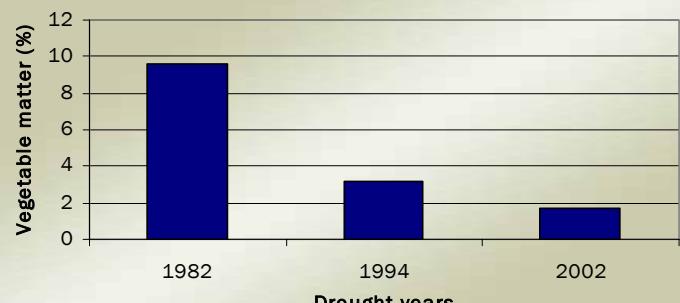
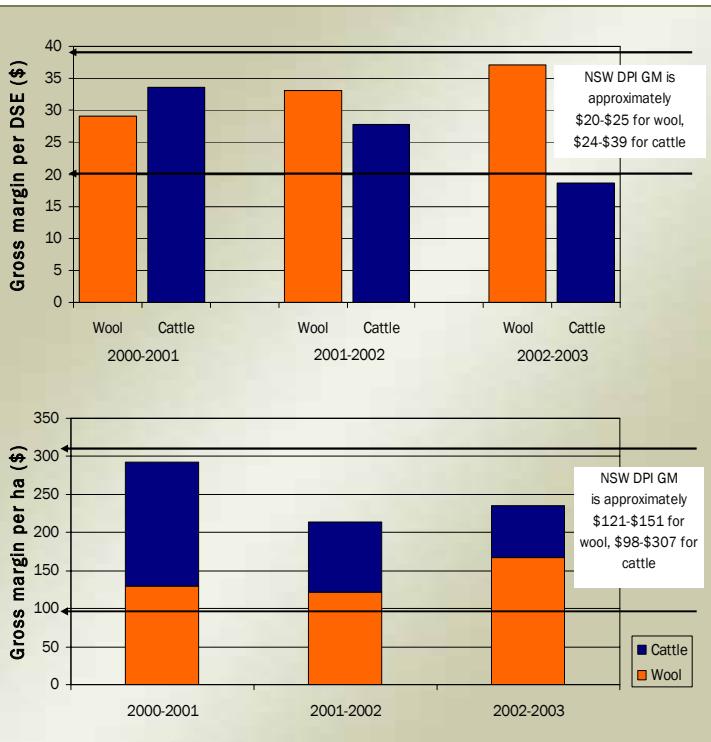


Figure 5. Gross margins per hectare and per DSE from 2000-01 to 2002-03 on 'Lana'. These are average results (i.e. all farmlets combined).

In the second chart, the wool and cattle gross margins per hectare have been added because sheep and cattle graze the same areas of pasture under the leader-follower system.



The land

"In 2002, we had 15.6 inches [398 mm] of rain, the lowest rainfall on record. 1902 was the next lowest rainfall, yet the stock we have been able to carry has been phenomenal. And the biggest winner has been the land. There's more groundcover in these old sown paddocks than there was after sowing them."

"The sheep camps used to be pinrush and thistle. Now the grasses beat the weeds."

Dr Christine Jones (Botany, UNE) monitored the cell grazing trial on 'Lana' in the early 1990s and documented a shift in pasture composition from undesirable to desirable species (Figure 6).

"In Christine's work, she recorded 30-50 species on transects. During the study period, more perennials

appeared including cool-season perennials that we had never seen before. These carried the stock through the last drought."

Valuable species include tussock poa, wheat grass (definitely more of this now), *Dichelachne*, speargrass, weeping rice grass, a bit of wallaby grass, a fairly insignificant plant around here) and even silver grass or rat's tail (*Vulpia*).

"*Vulpia* is good for this country as it creates a huge amount of biomass and litter. We have learnt to manage it well. It is quite useful in July and August as sheep feed, and the cattle chase it in late August-September. It fills the feed gap well. We no longer spray *Vulpia*: we dismantled the boom spray! It's not as abundant as it used to be because the winter-active perennial grasses out-compete it now. It's not a problem as seed burden, because the cattle in the leader-follower system eat it and knock it down."

"The poa was always dry and moribund because it was never grazed. Now the animals bash it down, causing the tussocks to re-sprout with new leaf."

The biggest winner from the more productive, nutritious winter feed has been the cattle breeding enterprise.

"Sheep do well on short winter feed anyway. But cattle have to have good feed. Calving has probably increased 10 per cent over the past 15 years due to the higher protein levels in the winter pastures and the better animal nutrition. All we do is provide organic mineral blocks," says Tim.

Flock management

The ewes are joined in late March or early April and shorn in mid July, 1 month before lambing in early August. Frosts occur, but cold winds are less likely at that time of the year.

The wethers and hoggets are shorn in September. Lambs are marked in late October and weaned in late December to early January. Crutching occurs 4 months before shearing.

"For the last few years, we have maintained a flock of 6000 sheep, consisting of 2300 ewes, 2500 wethers and the balance hoggets. However, these numbers could increase by 1000 in the near future.

"We normally have 80-90 per cent lambing including the maiden ewes, but in 2002 it was only 76 per cent due to the drought.

"We haven't had to jet sheep for 15 years, although we jet the hoggets occasionally," said Tim.

Livestock supplementation

Tim and Karen have saved money on purchased feed in recent years. No hay or grain was fed during the 2002 drought, although all stock had access to minerals.

Tim provided cotton seed meal pellets for cattle and supplementary nuts for the ewes to ensure they were lactating sufficiently.

"From mid July to the end of August,

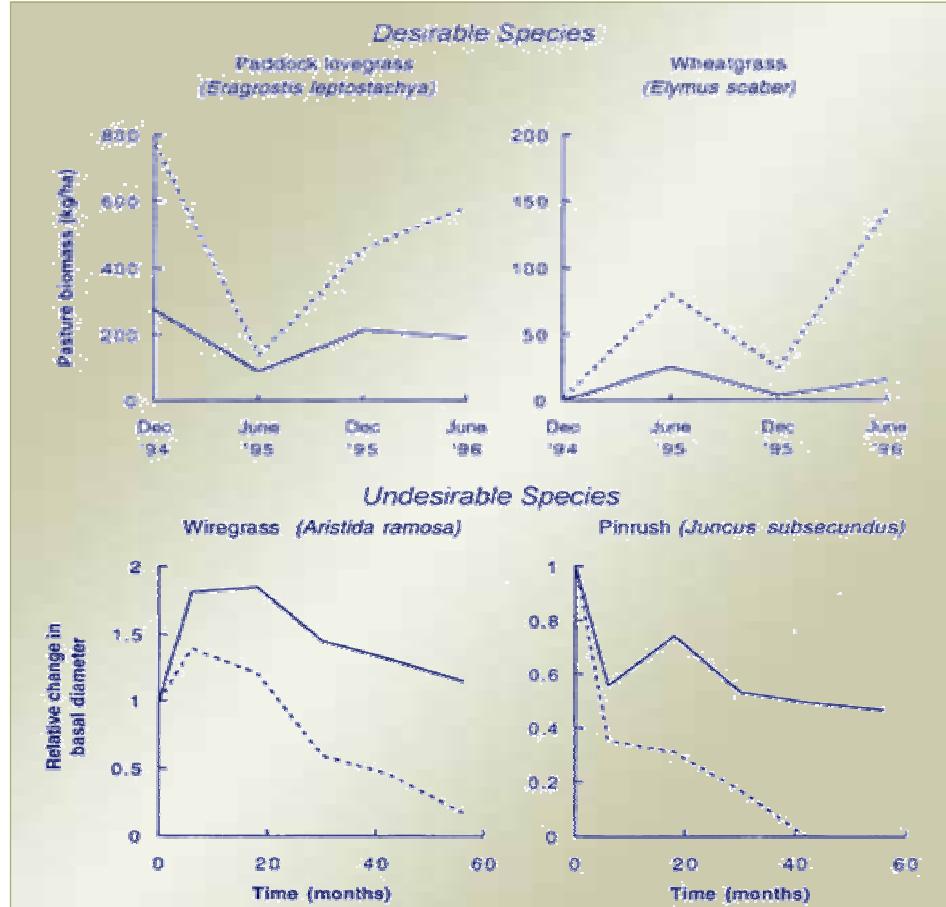


Figure 6. Changes in desirable and undesirable species of grass and pinrush in plan-grazed (dotted line) and set-stocked transects (continuous line) at 'Lana'. Source: C. Jones.

I fed the lactating animals during the lambing and calving period.

"The ewes got 0.5 kg of bypass protein each, every time they moved, which maintained body weight with Superior® organic mineral blocks.

"We took the cattle through on about \$25-30 per cow-calf unit over the whole of the drought, and supplementation of the sheep cost about 80 cents per sheep, including labour.

"The regular movement stimulates the animals to eat. During the drought, they didn't need bulk – that was there in the pasture. Lactating animals just needed added protein and minerals for a month or two."

The ecological principles

The *Grazing for Profit and Holistic Management* courses that Tim and Karen undertook in the 1990s taught them about the importance of the ecosystem foundations or building blocks—the mineral and water

cycles, energy flow, and plant community dynamics.

They learned how to read their land and to recognise healthy water, mineral and energy cycles, and the different pasture and other plant species.

Tim appreciates that a lot of the primary production in their pastures returns to the soil as litter:

"Litter is money in the bank—it's not a waste of pasture. It provides a good microclimate for fungi and bacteria. Last autumn, there were thousands of mushrooms and toadstools. Fungi like lots of litter."

Lessons Learnt

A flexible grazing plan—leads to better long-term management of your livestock, pastures, biodiversity, and personal well-being.

Using your animals as tools—can enhance your land as well as return an income: the slasher is up front in the teeth, the plough is in their feet, and fertiliser equipment is at the rear!

Pest animals

The rabbit menace is by far Tim and Karen's biggest pest problem.

"We don't touch any timber in the hills, but we have to destroy some of the harbour out in the open.

Otherwise, we leave the dead timber where it falls as habitat. I rip, burn, fumigate and shoot as often as I can but it's an ongoing problem because of the nature of the country.

Myxomatosis takes its toll on the rabbit population more than anything else," says Tim.

In addition to the rabbits, kangaroos, wallaroos, foxes and feral cats are controlled using professional shooters. 1080 poison has not been used for 15-20 years.

"To control the rising 'roo population, we are licensed to take 100 eastern grey kangaroos and 50 wallaroos annually. We like to have the kangaroos and wallaroos in balance."

Pest plants

The principal weed problems are briars and blackberries. Thistles like saffrons are chipped.

"We still get the odd patch of Bathurst burr from feeding grain way back. But, in general, the weed problem is not as severe as it once was, due to the increase in competitive grass and pasture species."

Mistletoe

Tim and Karen have been concerned about the loss of Blakely's red gum and yellow box trees to box mistletoe for 20 years. In the 1980s, they cut mistletoe out of heavily infested trees and experimented with pollarding (the removal of the crown) as a control technique.

"The drought has encouraged mistletoe in the last two years, and I am still worried about the problem."



Left: A pollarded red gum showing crown recovery after mistletoe control. Photo courtesy of Karen Forge.

The value of biodiversity for the Wrights

Tim and Karen believe in the importance to the business of a healthy natural resource base and of the native vegetation across 'Lana':

"Native vegetation is 100 per cent important—'Lana' is a rangeland.

"We manage for biodiversity because it gives us a better balance – more is good. There are lots of indicators. Our groundcover has improved (Table 1). By working with the soil biota and laying down litter, we are building soil through the composting effect. The abundance of mushrooms in the last few years is a good indicator of healthy living soils.

"The increase in abundance and diversity of cool season perennial grasses has given us more even feed production through the year. Clean water in the rivers and dams is valuable for stock, and we have a diversity of birds for pest control," says Tim.

Pastures

Tim and Karen have no inclination to sow any more pastures.

"We are not interested in sowing exotics, or natives for that matter, in the traditional sense of sowing. What we've got is what we're meant to have. In about 1993, I sold most of my farming gear, and spent the money on fences and water points," says Tim.

"Sub clover is an exotic and was abundant in 2003, but this was the first year in ten that we have had clover to this extent. We usually only get small amounts—and never more than 15 to 20 per cent cover."

Meanwhile, the grass species have been changing for the better so it begs the question, just how important is clover?

"The stock are healthy without it. Fescue and clover hang on in swamps so they are valuable plants in

those situations. There are more native legumes (like *Glycine* and *Desmodium*) than there used to be. Sheep prefer native legumes to many other plants.

"Having a range of pasture species means that you always have something seeding. Cattle manure is full of seed, so the seed gets transported around the paddocks. Under set stocking of improved pastures, phalaris and white clover dropped out of the pasture—the natives out-competed them."

Timber

One-third of 'Lana' consists of belts of dense timber and forested hills. Tim and Karen value the extensive timber across 'Lana'—it is valuable for winter stock shelter and is an important part of the carrying capacity of 'Lana'.

"Trees are important for stock shade and shelter. The shade is very important to reduce stress in summer, and the milder temperatures beneath trees in winter keep the grass green."

"Some of our best winter-active grasses like *Microlaena*, occur in the timbered areas. The grass grows up to the base of all the trees, although some more than others."

"Rough-barked apple is a valuable tree to have—clover, *Microlaena* and mushrooms all do well beneath it. We don't lose much grass to trees—and it's probably made up for by the shade and shelter effect.

"Trees are an integral part of the ecosystem. The insect and bird life that live in wooded areas affect everything, including pest control.

"We are lucky to have a diversity of trees – like the grasses, we have a range of trees suitable for different soil types."

Table 1. Plant basal area (%) in planned grazing trials at 'Lana'. Source: C. Jones and J. Earl.

	Dec 1994	Dec 1995	Jun 1996
Planned grazed	18.0	17.4	16.7
Conventional grazed	16.1	12.3	12.9
LSD (5%)	1.2	1.1	1.1

The mineral cycle & fertiliser management

Fertiliser use is another area in which Tim and Karen have been able to save money with planned grazing:

“Christine Jones helped us look at our mineral cycle in the grazing trials in the 1990s. She found a four to five times increase in available phosphorus in areas that hadn’t been fertilised over a three year period, along with increases in total nitrogen and potassium. We asked ourselves ‘why?’

1. “The rest factor – the pasture roots grow deeper, drawing up the nutrients. Christine did some root work, looking at rooting depths, and found the roots went deeper than they had before.”
2. “The pasture is in recovery phase 95 per cent of the time, meaning more litter is being laid down, enriching the topsoil with organic matter.
3. “The transfer of nutrients off the sheep camps. A lot of this comes back to fencing design and grazing management to transfer nutrients away from sheep camps. It takes about ten days for nutrients to pass through the animal. If you are moving stock every two days, you are moving nutrients from paddocks with sheep camps into the next four paddocks without.”

“It’s challenging, but the fact is you can make nutrients: if you are building soil, you are increasing nutrient levels in the topsoil.

“These three factors make a big difference to the fertiliser bill. We’ve been able to reduce fertiliser applications by 70 per cent. I never really stopped applying fertiliser, I have just done bits here and there in recent years. I employ patchy applications of superphosphate and other fertilisers where country needs ‘sweetening’.”

Christine Jones’ results showing an increase in soil nutrients under planned grazing are shown in Figure 7.

Figure 7. The increase in nutrients under planned grazing at ‘Lana’. Source: C. Jones.

Managing with nature at ‘Lana’

Corridors & timber management

Tim and Karen are interested in maintaining and developing corridors right across ‘Lana’.

“Corridors are primarily important to us for shelter. They also increase the value of the land, and help the wildlife move to all parts of the property. It’s part of the holistic approach – thinking of everything. By allowing corridors to develop using natural regeneration – as opposed to planting trees – the trees come up where they should be. Otherwise you run the risk of planting the wrong tree in the wrong place.”

The large timber areas in the centre and east of the property are still stocked, but Tim and Karen don’t put as much pressure on those areas.

The property is designed around the main watercourses and the timbered hills as wildlife corridors which connect up. The cleared area in the centre of the property (the airstrip) is a result of past development. Regrowth is coming up in other areas, and it is being used to link the watercourses and timbered hills corridors.

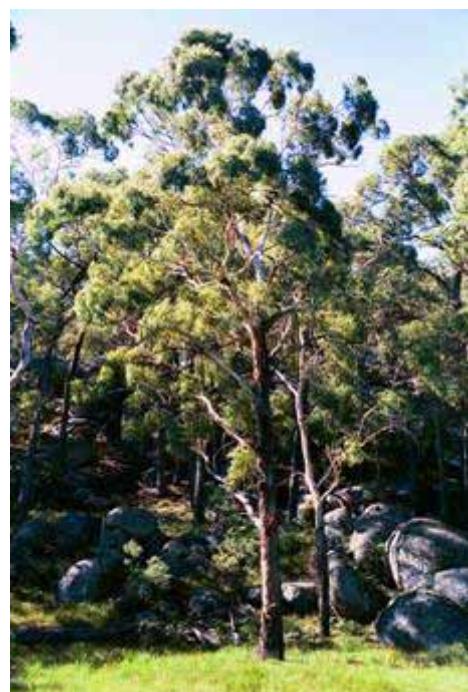
Tim and Karen are especially pleased about the natural regeneration occurring across ‘Lana’ because the lack of forest and woodland

regeneration on farms is a major conservation concern elsewhere in southern Australia.

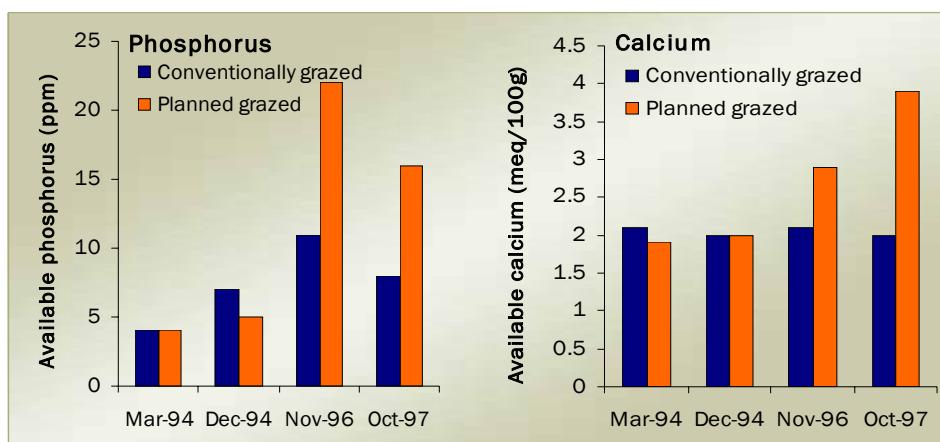
“The regrowth trees are good to see. We have a lot more trees than when we started. It’s quite encouraging really, because it means we don’t have to plant trees or build fences to protect plantings and remnants. We are just doing it with planned grazing.

“Obviously, it’s not the high-intensity stock pressure that prevents the trees from regrowing, it’s the way that stocking pressure is managed.

“‘Time-controlled grazing’ is not a bad name for it because I have controlled lots of eucalypt regeneration with an extra half day or overnight period of high density grazing. The extra grazing has allowed me to bring a potential woody weed problem under control. During the drought some of the regrowth was trimmed up nicely.



Right: The well-timbered hills are structurally and floristically diverse, and are useful for valuable pasture species that occur beneath the trees. Photo courtesy of Karen Forge.



“Regrowth is even coming back on old ploughed country which would surprise many people.”

Tim’s approach to timber management on ‘Lana’ has changed with time.

“We used to get a timber miller in, but they got most of the big trees years ago, so we don’t allow this any more. The more diverse the tree species, the more bird species, and birds are predators of insects in the pastures. I’m quite happy leaving the timber the way it is now.”

Despite the abundance of millable timber and useful fencing timber species (like box and stringybark) on ‘Lana’, Tim and Karen do not cut fencing timber for on-farm use.

“We don’t think it’s good for the scrub. Steel end assemblies have been the way to go for us for the last 35 years, especially when you take into account the cost of time and labour, and the fact that the tree is not free.”

Riparian zones, wetlands

Planned grazing has had a positive effect on the vegetation in riparian zones fringing watercourses and dams on ‘Lana’.

“The important thing is the rest that the riparian zone gets most of the time. Even though we run high stock densities, the planned grazing is helping the riparian zone recover, allowing vegetation to grow, erosion to heal and water quality to improve.

“The streambank erosion in Roumalla Creek is healed. Tilses Dam is an old irrigation dam that we use for stock water, and it’s like an artificial wetland now, with reed beds and fringing dense cover, as the stock are not in there long enough to damage it.

“The rotation of stock is good because the sheep and cattle don’t get the chance to hang around dams. That means you don’t get dung around the dams, nor as many nutrients ending up in the water.”

Wildlife

Tim and Karen have maintained the ‘Wildlife Refuge’ status of ‘Lana’ that Tim’s father obtained in the 1960s.



Above: Molong Creek under planned grazing. Note the well-vegetated drainage line, riparian zone and the regrowth red gum on the banks. Photo courtesy of Nick Reid.

“The whole property is a wildlife refuge—it’s basically all natural, except for an area cleared for the airstrip.”

Tim and Karen are proud of the wildlife on ‘Lana’:

“Both our creeks have platypus, and there are water rats 200 metres below the crossing in Roumalla Creek. Tests indicated that Roumalla Creek has high quality water.

“We also have abundant birdlife, some koalas in the mountain gums, and a few wallabies up in the hills.

“There are a few brush-tailed possums in this area all the time, although not as many as in the past. We think it is because of the foxes. We were also probably a bit too hard on hollow trees in earlier days—clearing them because of the rabbit harbour.

“The straw-necked ibis come for the flying grasshoppers. We used to get big invasions of mature grasshoppers on sheep camps when they were grazed short, but not anymore. The ibis came back in January 2003 chasing the grasshoppers that were in the longer grass.

“There are three or four wedge-tailed eagle nests on the property and we have plenty of snakes, echidnas, bats, frogs and lizards, too.”

The triple bottom line

Tim and Karen Wright’s success with Holistic Management is a wonderful example of how wool growers can produce quality fine wool and healthy profits while looking after and restoring their natural resource base.

“The *Holistic Management and Resource Consulting Services*’ courses had a huge impact on us. *Holistic Management* helped us sort out our decision making and put the jigsaw puzzle together. It’s not only about grazing but biodiversity and ecology, as well. Some of the other programs don’t go as much into ecology or goal setting,” says Tim.

With planned grazing, biodiversity and ecosystem function have improved, along with wool and beef profits. Tim and Karen have made more time for social obligations and community service, in addition to caring for their four children.

Lifestyle

Whenever possible, the family are involved in helping in some way, from which there are many benefits. It is a good feeling to be able to enjoy a walk to view the property from the hill and swim in the clean river.

Tim is an active member of the local Balala-Brushgrove Landcare Group,

Ten principles for working with nature

Tim and Karen have ten principles, which they call 'Working with Nature' to guide their farm operation. They:

1. developed a holistic goal that takes into consideration their personal values, the resource base, and their available finances
2. match their enterprises to the environment (not the other way around)
3. match stocking rate to the assessed carrying capacity of the land, and revise their assessments frequently (e.g. quarterly)
4. manage for the full range of plant species and the whole ecosystem, not just individual species
5. think of livestock as tools (e.g. stock density, the herd effect, and rest from grazing are as much tools as is a plough)
6. design paddocks to suit the topography and the land
7. use a flexible grazing plan and monitor the water and mineral cycles, energy flow, and the plant sward to ensure their plan is on track
8. supplement stock with minerals but don't feed substitutes (e.g. hay)
9. test all decisions against their goal: "We assume we could be wrong, for example, we ask ourselves if we are targeting the weakest link in the production chain, and are we treating the cause or simply a symptom."
10. believe that
 - their highest return on capital comes from education, not regulation
 - what looks good in the paddock is not necessarily good on the balance sheet.

These *Working with Nature* principles work for Tim and Karen, but they don't suggest they will suit everyone: "It depends on your own holistic goal and the resource base you are dealing with."

and 'Lana' has hosted many of the Group's trials during the last 15 years. The Group won a Silver Landcare Award for the research they conducted during a 5 year period, much of it on 'Lana'.

Tim was also an active producer member in Meat and Livestock Australia's national R&D program, *Sustainable Grazing Systems*, and toured widely in promoting practical research on sustainable grazing management and adoption.

Tim and Karen's operation at 'Lana' is an excellent example of how wool growers are achieving the triple bottom line (i.e. economic, social and environmental success): through Holistic Management and planned grazing, they have made more time for family, friends and community; their business profitability is improving; and they are working with nature to enhance their farm ecosystem's productivity and biodiversity, and restore its natural resource base.

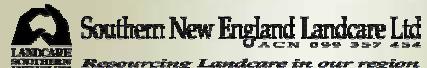
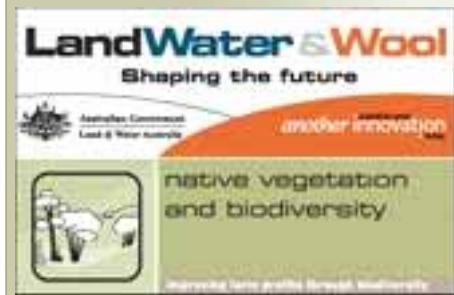
The future

Tim and Karen aim to always ask questions and they value learning. They hope that all land managers will one day appreciate the need for life-long learning and demonstrate an astute awareness of the importance of sustainable land management.

According to Tim and Karen, "This would help to reduce the burden of expensive regulation and legislation for future generations.

"We would like to know more about soil biota—to assess the amount, activity and value of the organisms in our soils. How do you measure a healthy soil? We need more research and advisory services in this area.

"We would also like to focus on tissue testing of the animals leaving the farm as a check on the system's health – to check for chemical residues from the point of view of organic farming and to check for deficiencies. We would like to start a monitoring program with the idea of perhaps moving into organic farming or some form of certified, environmentally clean production."



This project has been funded by the national **Land, Water & Wool** program—a joint initiative of Australian Wool Innovation Limited and Land & Water Australia. The Native Vegetation and Biodiversity sub-program of Land, Water & Wool aims to work with wool growers to show that biodiversity has a range of values, can add wealth to their business and can be managed as part of a productive and profitable commercial wool enterprise.

The **Land, Water & Wool Northern Tablelands Project** is led by Associate Professor Nick Reid of the University of New England, in collaboration with Southern New England Landcare Ltd and the Centre for Agricultural and Regional Economics (CARE). A project steering committee of local landholders and technical experts directs the project.

Disclaimer—the information provided in this booklet is general in nature. Practitioners should seek professional advice on their own situation before making decisions. The project leader, collaborators and steering committee will not be held responsible for the misuse of this information.

More information

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This brochure is part of a series belonging to the **Land, Water & Wool Northern Tablelands Project**. From 2004 to 2006, a number of extension materials will be developed as a part of this project, including posters, brochures, booklets, and fact sheets. Field trips and tours to the Case Study Farms can also be arranged.

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