

MAINTAINING PROFITABLE FARMING SYSTEMS WITH RETAINED STUBBLE

Sinclair Partnership



PHOTO: SARAH CLARRY

A new angle on stubble management

The lessons of the millennium drought have produced a new suite of innovations, centred around farming for moisture conservation.

Until the millennium drought, stubble management on Michael Sinclair's Temora property had been something of an ad hoc affair. Michael and his wife Edwina, along with Michael's parents Graham and Lorraine, run a 3300-hectare mixed farming property 10km east of Temora. They crop wheat, barley and canola, and run 2200 breeding ewes, predominantly Australian Whites, along with several hundred South African Meat Merinos (SAMM), on a separate lease block.

In the early 2000s, the pressing need to preserve soil moisture and prevent wind erosion focussed their attention on maintaining some cover during those dry years.

Although sheep feed was in short supply, they took them off the stubble. Then, at the end of 2007, the property received a lot of rain.

"We baled all our canola that year and we were harvesting three-bag wheat crops," Michael said. "But we had a lot of summer rain and all these weeds were growing at harvest time. We were actually spraying as we were harvesting."

"We'd waited this long to get rainfall and it was the wrong time of the year, but we still wanted to make sure that moisture was available for next year's crops. We realised we couldn't let this happen again."

The decision to begin intensive stubble management coincided with glyphosate hitting \$12 a litre, which was a hard pill to swallow.

Michael says, "It was really expensive, but we did it, and it's paid off in subsequent yields. From that time on we realised we just had to manage the summer fallow."



PHOTO: SARAH CLARRY

Michael and Edwina Sinclair

SNAPSHOT

Property: Caithness

Owners: Graham and Lorraine, and Michael and Edwina Sinclair

Location: Temora, New South Wales

Farm size: 3300 hectares (owned/leased)

Annual rainfall: 520mm

Soils: Red loam with some red clay loams

Soil pH: 5.2

Enterprises: Wheat, barley, canola, field peas, perennial pastures, 2200 Australian White breeding ewes, 400 South African Meat Merino (SAMM) breeding ewes.

Typical crop sequence: Canola, wheat, wheat, canola, then wheat and barley (either undersown or back into rotation). Field peas are used in problem paddocks for weed management.

Equipment: New Holland 340, New Holland 275, John Deere S670 10.5m harvester, 12m Flexicoil seeder, 31.5m Croplands sprayer.

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This period – 2002 to 2009 – marked a fundamental shift in thinking for Michael, who had always subscribed to the belief that they farmed in a rain-fed system through winter and spring.

“The drought made us better managers of moisture, and I realise now that we are moisture farmers. We have to turn whatever rainfall we get into yield.”

Around 2008, after completing a stubble retention course, Michael received a Catchment Management Authority grant to purchase press wheels. This precipitated a move to wider row spacing, so they bought another machine with RTK 2cm guidance on 30cm spacing and put the press wheels on, planning to inter-row sow.



PHOTO: SARAH CLARRY

Michael's background as an agronomist complements his father Graham's focus on livestock in the Sinclair's mixed farming operation.

15° ANGLE SOWING

By 2010, the drought was over and they were starting to harvest some big crops. They found they were faced with a problem they hadn't seen for many years: big stubble loads and the associated problems they bring at sowing.

“We were trying to inter-row sow but our machinery just wouldn't allow us to do a consistent job in the heavy stubbles,” Michael says. “The air seeder kept wanting to go back into last year's seeding row. But by then we had pre-emergent herbicides out so it was too late to burn – we just had to persevere.”

Although a disc seeder was an option, Michael wanted to avoid the expense of purchasing new machinery. He remembers having seen the concept of sowing on an angle in a magazine, so decided to try it, and the results were immediately rewarding.

“It was an under-sown paddock: barley with lucerne and clover underneath. So it was a risk because the seed is expensive and can be fickle,” Michael says. “It established really well though, and I thought I'd try canola the following year.”

They found they were able to move through the stubbles much easier, and no longer had the problem of blockages and slipping, but getting the angle right was crucial.

“We tried different angles, but found 15° works best,” he says. “Greater than 15° and it gets too rough, less than 15° and

the seeder is pulling back into last year's stubble again.”

Sowing on a 15° angle takes slightly longer, because essentially every side of the paddock becomes a headland, but he has found the advantages it affords sowing into thick stubbles easily outweigh the disadvantages. They now sow about 25 per cent of their cropping area on an angle.

A few years before they adopted 15° angle sowing, they also invested in a set of disc coulters, and although they have provided additional flexibility, Michael is not convinced they are right for all situations.

“They are a bit hit and miss. They work very well on canola stubble – the thicker and harder the stalks, the better they will work,” he says. “They are also great on brown manured field peas, which form a thick mat.”

However he has found that on softer stubble such as wheat and barley, and on soft soils, they don't do the job as well.

“The 15° angle sowing alleviates more problems for us than the disc coulters ever did. That said, they do help with sowing because they break the surface of the soil and the tynes don't then throw as much soil. That helps us get through sowing quicker and we don't have the issues with chemical burn on the emerging crops.”

PHOTO: MICHAEL SINCLAIR

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The 2015 harvest, taking off a 4.5t/ha wheat crop that was sown on a 15° angle.

PHOTO: MICHAEL SINCLAIR

GRAZING STUBBLES

Around the time they introduced their new seeding strategies and the disc coulters, livestock were becoming profitable again. Michael says it was a juggling act to control weeds, manage the summer fallow and turn off as many sheep as possible.

Between 2008 and 2013 CSIRO, FarmLink and the New South Wales DPI ran a GRDC-funded trial on a neighbour's property, looking at the impact sheep have on stubble paddocks.

The trials examined three scenarios: complete stubble retention (no sheep); grazing stubbles; and grazing crops over winter as well as grazing stubbles.

One of the goals of the study was to ascertain whether compaction caused by sheep on a paddock was limiting yields in subsequent seasons, but the results were surprising.

Michael says, "John Kirkegaard (from CSIRO) told me that many people worry sheep will damage a paddock with their feet, but they are actually doing the damage with their mouths."

"What they found was that compaction from sheep is only shallow and transient. The subsequent working of the soil at sowing gets rid of that. The greater concern was what they were

removing from the paddock with their eating. You can't allow them to graze it down too hard."

The trial results showed that if summer weeds were controlled and 70 per cent of stubble cover was maintained, those paddocks where stubble was grazed yielded as well or better than those where no sheep were present, and grain protein levels were comparable.

Michael believes this is due to a reduction in nitrogen tie up.

"We're finding that nitrogen cycling is starting to work," he says. "The sheep knock a lot of stubble over and breakdown then occurs when it comes in contact with the ground. Where we have sheep, they're feeding the soil microbes with urine and manure."

"I've been surprised at the results of our soil tests this year (2016). We had some pretty good crops last year, and we would have removed a lot of nitrogen, but in the paddocks where we have livestock, there's around 20kg of nitrogen that I didn't think was there."

In response to the findings from the trials, Michael now works to preserve 70 per cent stubble cover after grazing. This is the level that provides optimal fallow efficiency in the form of reduced erosion and increased water infiltration.

"We found you don't need a lot of cover to preserve soil moisture, and in fact, having a massive bulk of stubble creates more problems at seeding time. We can extract value from that stubble through the sheep and remove biomass to a manageable level, while maintaining cover and preserving moisture," he says.

Although he works to maintain stubbles where possible, Michael won't shy away from burning if he thinks it's necessary.

"Our decisions are agronomic, not idealistic, so if necessary, we will burn it. This year we had some Gregory stubbles I knew we wouldn't get through and there were weed issues as well," he says.

"We didn't get an early knock down this year because we didn't have the rainfall. As a result we were really reliant on our pre-emergents and we sowed dry. Because of this I wanted to get trifluralin with Sakura on some of those paddocks, so we burnt them."

STUBBLE MULCHING

To make sowing easier on some heavier stubbles, Michael now uses his cousin's Gason stubble mulcher straight after harvest to cut the stubble down to a manageable height: from 500 to 600mm down to 200-300mm.

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“Cutting the stubble low with the header consumes too much time and fuel, and the ability to spread the trash evenly across the width of the header is reduced, even with a Powercast tailboard. With some varieties, particularly Gregory and Suntop, we just can’t seem to get through it successfully when it is standing at full height.”

“We cut it soon after harvest and get the sheep on there. They trample the trash into the ground and get it starting to break down. It gets that nutrient cycle going,” Michael says.

They do lose some feed value by mulching, because the trash that hits the ground is then lost to the sheep as forage, but as Michael says, “The addition of the stubble to the whole system is too valuable to burn.”

Michael no longer grows Gregory because of the stubble management issues he has experienced. They now grow Lancer and Gauntlet. “Gauntlet yields well and has a good harvest index,” Michael says.

La Trobe barley has come to the fore as an important crop for the Sinclairs, on the back of excellent water use efficiency and gross margins. This year he has planted his highest area yet: 330 hectares. The risk of growing too much barley is

that it doesn’t meet specifications for malt, and it has to be stored on farm for later sale. But La Trobe has been a consistent performer, giving him the confidence to increase the area sown.

“Barley used to be sown last, and under-sown because the lucerne and clover established well under it. But since these new varieties have come out and we’re getting consistent results with malt, year in, year out, it’s our best gross margin,” he says.

He is trialling a direct selling arrangement to some customers in Wollongong who have set up a small distillery. With a neighbour who has bagging and seed-grading facilities, he has been able to supply a small amount of barley to the fledgling operation.

Michael’s future plans are now focussed on the consolidation of their new country.

“We’ve just gone through a bit of an expansion over the past five or six years,” he says. “We’ve turned some leased country into owned country on the back of good interest rates and the opportunity to buy where we could. We will also be converting from our incomplete 10.5m system to a full 12m cropping system next year. So I’m pretty comfortable with where we are now.”



PHOTO: EDWINA SINCLAIR

Michael with his children (L-R) Cate, Finn & Angus.

MORE INFORMATION

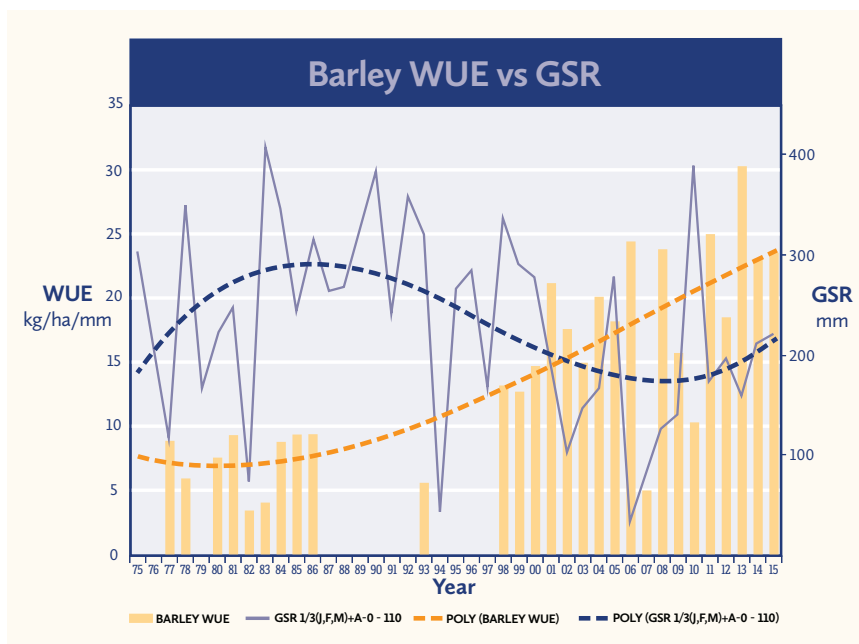
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YouTube:

Grazing Stubbles and Water Use Efficiency
<https://youtu.be/GCn7M45gh5k>

GRDC Project:

CSP00174 – Maintaining profitable farming systems with retained stubble in NSW south-west slopes and Riverina



Despite highly variable growing season rainfall, Michael has been able to achieve excellent water use efficiency gains in his cereal crops, barley in particular. Canola gains have proved harder to come by.

COURTESY: MICHAEL SINCLAIR



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