

Smart learning from Nuffield!

MIKE ROBERTS

When Ryan Smart, at age 20, decided to dedicate himself to farming he identified a Nuffield Scholarship as a means of developing skills and a network base that would help him succeed in his farming career.

He was eventually awarded a 2012 scholarship and is now applying aspects of what he learnt during his overseas study tour on the two family properties he manages and in the wider SMARTGROUP family business.

Overseas perspectives stimulating management change

Weed management, crop monitoring and grazing are just a few of the areas in which Akeringa manager Ryan Smart is changing his management after his 2012 Nuffield scholarship study tour.

One of the changes he has made in the 30 months or so since his return from overseas to the Keith property is to keep cover, including summer weeds, on his soils for as long as possible.

Australian growers are encouraged to eliminate summer weeds at all costs, but farmers Ryan encountered in Europe and the US stressed the importance of soil health and keeping cover on the ground, even if it was mainly weeds, he said.

“Summer weed control is important in our environment, but if the weeds are easily managed and can be retained for an extended period without becoming a management issue there’s a real bonus in terms of biological activity that benefits the soil and the root systems of crops.

“And above-ground vegetation has a positive shading effect on the soil.

“Good ground cover protects the soil by dissipating much of the sun’s energy; up to 90% in some conditions. That’s like switching off the light and shading the soil over summer, which helps retain moisture and maintain microbial activity. It comes back to managing the summer weeds to harvest the benefits.”

Ryan is very aware of the potential for carry-over of insects and diseases on ‘green bridge’ vegetation over summer and regularly monitors pest insect numbers; spraying out weeds if pest numbers exceed pre-determined action thresholds.

In addition to retaining growing vegetation for as long as possible over summer he is also leaving cereal stubbles



RYAN SMART WITH A SMARTGROUP TRUCK USED TO TRANSPORT INPUTS SUCH AS FERTILISER AND PRODUCTS LIKE GRAIN AND LIVESTOCK.

Allowing the lucerne to develop a good root system before hay cutting sets it up for optimum seed production.

much taller than a few years ago, providing extra soil shading.

“We have done trials where we cut stubble at three different heights and assessed the performance of the following crop. Without a doubt, the areas with more shading have better moisture retention and in a tough year the difference really shines out.

“In some places last year, if we had been using our old management practices with not much stubble cover and heavy grazing we wouldn’t have had a crop.”

Cell grazing

His overseas observations have also prompted a significant change in grazing

management, with the focus now on high stocking rates for short periods of time.

This approach allows the roots of pasture plants to grow to their full potential, minimising damage to the soil and the crowns of the pasture plants and enabling the plants to get a ‘second wind and push out again for another graze later on’, Ryan said.

UK farmers he met had increased flock numbers by 30% after changing to this grazing model but he feels a more conservative approach is required with the South-East soil types and climate.

He sees more positive pasture management as an extra benefit of this time-control or cell grazing approach because it enables him to better predict future grazing, which assists forward planning.

“We are also able to maintain high levels of feed availability and intake for our prime lambs, a recipe for consistent health and growth that produced excellent yields in tough conditions last year.”

Akeringa

Akeringa, one of three SMARTGROUP properties, is based at Keith but its 3,915ha are spread over 20km, with soils varying from sand to heavy loam, both over a limestone clay base. Annual rainfall is typically 500mm.

It carries a 4,000-head self-replacing Merino flock for prime lamb and wool production, with irrigated lucerne grown for seed and fodder production supporting high stocking numbers through winter.

A 2,500ha cropping program of beans, wheat, canola, barley and oaten hay for export and local markets rounds out a diversified enterprise.

Machinery

The main seeder on Akeringa is an Ausplow DBS machine that works well in their country, giving precise control of seeding depth, moisture harvesting and creating an even furrow. The Smarts have been using these tined machines, which have a parallelogram setup, since Brenton introduced one from WA almost 20 years ago.

“We also have a Great Plains disc seeder that we use for sowing lucerne in irrigated paddocks, where we don’t want to disturb the laser-levelled flood irrigation set up,” Ryan said.

GPS guidance with 2cm accuracy is used for sowing and spraying, resulting in considerable savings by avoiding overlap and excess wheel-tracking. That is particularly important on high gross margin lucerne-seed paddocks requiring multiple passes in a season. Ryan says that if he ever gets time, he wants to get his helicopter license with the idea of going to aerial application.

The spray rig is a 36m self-propelled John Deere 4940 and a high-capacity tank mixer. “There’s a lot of down time with filling, and sprayer resale value is based on total engine hours, so they can devalue quickly. It’s not like a harvester where the resale value is based on rotor hours. If you fill up your sprayer using its inbuilt pump you basically double your engine hours and halve the life of your sprayer. We do all the agitation and mixing in the mixing tank, pump the spray mixture into the spray tank with the engine off, then start it up and drive away. That makes a huge difference to the work efficiency of the unit.”

CHANGE OF DIRECTION

Nuffield scholar Ryan Smart set out to study farm energy use and how to maximise energy efficiency but his focus changed as a result of what he saw during his overseas scholarship study tour.

“When I was planning my tour people around the world were grappling with energy costs and efficiencies and how to handle carbon but as the trip progressed carbon and energy use became less of a focus.

“I came across things I had no idea about that I just thought were absolutely amazing and had potential to change the way we farmed and diverted down that path.”

He still sees energy consumption as an issue, but less of a priority, and is waiting for carbon sampling technology to become cheaper and more accessible before implementing carbon monitoring on a regular basis.

Ryan’s Nuffield travel began in February 2012 with a six week global focus program that took him to New Zealand, England, Mexico, Brazil, Canada, California and Washington DC, followed by the Contemporary Scholars Conference in the Netherlands for Nuffield Scholars world-wide.

“The conference was an amazing snapshot of a range of businesses from around the world,” he said. “We looked at things as diverse as fishing and tobacco farming.”

Ryan returned home for seeding before embarking on his 12-week study tour of Europe, Canada and the US.



FULL TO THE BRIM. A HEADER BOX FULL OF AKERINGA LUCERNE SEED.

Ryan runs AirTech induction nozzles which give good droplet control and coverage, even in quite breezy conditions. “We have invested considerable time in researching how to maximise spraying efficiency and we can apply a rate of 120L/ha at up to 35k/hr, which with the 36m boom means we can spray 105ha in an hour.”

Cropping rotations

Lucerne seed stands generally have a life of six years and are followed by one or two years of annual grain crop, often canola then wheat, which makes good use of the soil nitrogen remaining after the lucerne is removed. Growing a broadleaf crop followed by a cereal also provides good weed control opportunities if the

paddock needs to be cleaned up following the lucerne. During the grain phase the Smarts watch the market for the most profitable opportunity for a specialty seed crop such as mustard, phalaris or clover to sow after the wheat. They have also trialled quinoa and chia.

Lucerne seed is harvested in March, after which the plants reshoot from the crown and reach 30cm within four weeks. That's when lambing ewes are introduced to take advantage of the excellent nutrition and shelter provided by the easily-managed lucerne paddocks. They remain there until weaning, when they are shifted onto renovated pasture country.

When the stock are removed the stand is cleaned during winter by spraying out broadleaf and grass weeds. It is then set for hay that is cut when the lucerne is 5-15% in flower, by which stage the



CANOLA IS AN IMPORTANT PART OF THE AKERINGA CROPPING PROGRAM.



WATER DISTRIBUTION ACROSS THIS FLOOD-IRRIGATED LUCERNE STAND IS CLEARLY EVIDENT IN THIS AERIAL IMAGE FROM A DRONE-MOUNTED CAMERA.

plants have developed a large, vibrant, healthy root system. After the hay cut the paddock is irrigated and the stand set for seed production.

“Allowing the lucerne to develop a good root system before hay cutting sets it up for optimum seed production,” Ryan said. “It’s a good risk management tool for us.”

Marketing

SMARTGROUP places high priority on marketing its quality produce including

lucerne hay and has significant contracts to supply hay for export and hay and grain for the strengthening domestic dairy market.

“We have been working hard for the past five years to develop good relationships with our contract customers and aim to deliver a consistent quality product at a price that benefits the buyer and seller.

“It’s something you have to continually work at and it all comes back to management. We make sure we spend the money and the time to get everything right so when we deliver the product we know the quality is there. That might mean spraying lucerne at the right time with the right chemicals to get rid of barley grass and broadleaf weeds. I guess it’s just called good farming!”

PiMapping

One of the management tools Ryan discovered during his Nuffield study and is keen to use on Akeringa is Pixel Intelligence Mapping (PiMapping), which can be used to measure crop performance on a weekly basis.

The technology, which can provide information on crop growth, moisture levels, minerals, nutrients, stressors and potential yield, was developed in the Netherlands and is currently used in Canada, Poland and Ukraine but is not available in Australia.

“I’m looking forward to using PiMapping once it is available at an affordable rate,” Ryan said.



A STAND OF LUCERNE UNDER CENTRE PIVOT IRRIGATION.

“Our irrigated lucerne crops are heavily reliant on good water management and this technology will improve efficiency by helping us better manage fertiliser and water applications.”

The technology uses infrared imagery and satellite photography and is able to imbue each square-metre pixel in an image with information from more than 45 data sources to create a ‘smart pixel’ containing composite data relevant to that location in the paddock.

Farmers Ryan encountered in Europe and the US stressed the importance of keeping cover on the ground, even if it was mainly weeds.

The main parameters measured by PiMapping are:

- Growth: including biomass in kg/ha, CO² intake, leaf area index as a measure of foliage density and vegetation index indicating crop vitality.
- Moisture: evaporation, evaporation against precipitation and evaporation compared with crops known to have sufficient water.
- Minerals: nitrogen levels in the above-ground parts of the crop.
- Yield: uses up to 10 growth parameters to determine actual yields for crops including potatoes, cereals, sugar beet and corn.

“Imagine having the ability to place your cursor on a particular position in an image of a centre pivot or dryland crop and find out how much rain has actually fallen there and the transpiration rate of that particular metre-by-metre pixel.

“PiMapping will create a zone map of rainfall weekly, which is like having a rain gauge every metre around your farm. You could use the PiMap information to manage different parts of your farm differently, with how you do that depending on climate, crop type, crop requirements, fertiliser practice, seeding rate and so on.

“It could help decide when and how to harvest, how much money to invest on the crop and whether to cut your losses by making hay or take the crop to grain. You could essentially make more money

LETTING GO KEY TO GOOD GOVERNANCE

Brendon Smart attributes the continuing growth of the Smart family’s SMARTGROUP business to a decision to stop being the boss and adopt a corporate governance model.

That change, which included formation of a board with an external chairman and external directors filling knowledge gaps has, he says, enabled the business to ‘harvest the intellectual capacity’ of employees and other family members.

And the board meetings provide a controlled environment for reasoned and logical discussion of issues that might otherwise have threatened personal relationships within the family.

“The introduction of focused human resource management and the board costs nothing, yet has given a greater return than some of our investments in technology,” said Brendon, who provides business and strategic management guidance in his role of Business Development Manager.

“We have focused on mixed enterprises at different geographical locations for risk management with the aim of developing a viable, sustainable business with a clear path for future succession.”

SMARTGROUP operates three major properties totalling about 6,475ha. Ryan’s brother Damien runs a property at Kingston while Ryan manages properties at Keith and Victor Harbor.

by micro-managing.”

Ryan has signed up to an offshore PiMapping service that supplies data every 16 days – ‘a long time between drinks!’ – and expects to be able to access high-frequency PiMapping in the next three to five years.

And while he doesn’t yet have a helicopter licence, he is using a drone equipped with cameras to get aerial images of the property from which he can identify stressed areas in paddocks.

“I can use the drone to check irrigation performance. Some things you don’t see from the land or the sprayer are very evident from 200m in the air. With the drone I am able to pick weed burdens, insect and machinery damage, variations in seeding rates or unevenness in fertiliser applications during the growing season while there is still time to take action to address some of them.

“It’s leading me into the information I want but I think that when PiMapping becomes easily available the drone will become outdated.”

Livestock scanning

He is also keen to use Computerised Tomography (CT) scanning on his sheep.

This technology, developed in the 1970s for human medicine, is now being used

to assess meat to bone ratio, dressing percentage, meat to fat ratio, area of eye muscle, soundness of the reproductive system and a range of other carcass traits in livestock.

Ryan saw it being used to assess rams in the UK during his Nuffield study tour and would like to be able to use it to scan his lambs for meat/bone and meat/fat ratio with the aim of identifying which rams are siring lambs with the best market characteristics.

CT scanning for livestock is just beginning to be used in Australia and when it becomes available at a scale and price that make it accessible to large commercial producers, Ryan plans to be on board.

Sperm sorting

Using lasers to sort livestock sperm is another development that attracted his interest while he was overseas.

This technology can separate X and Y-chromosome sperm, enabling managers to control the gender of livestock with up to 90% accuracy.

“There are ethical issues around the use of this technology with humans but it has huge potential in the livestock industry because it means the producer does not have to spend feed and energy raising and managing animals of a gender that is not required,” he said.