

AHEAD OF THE PACK

Jigsaw Farms Manager Mark Wootton will host 10 innovative young farmers touring Victoria on the 'Carbon Bus', a national agriculture initiative aimed at addressing climate change. **Anna Game-Lopata** writes

Carbon sense makes economic sense. That's the mantra of sheep and cattle farmer Mark Wootton, who is Principal and Manager of Jigsaw Farms near Hamilton in Victoria.

"I get frustrated people see carbon management and financial viability as opposites to each other when I don't think they are," he says of the issue he has carefully made his life's work.

Made up of 13 farms across 16,500 acres (6,677 hectares), Jigsaw Farms is a reflection of the efforts of Mark and his wife, Eve, to build a flexible, highly economic enterprise integrating a variety of approaches to the reduction of carbon emissions, in particular methane, which the Woottons have calculated comprises the bulk of their carbon footprint.

Originally a geography teacher, Mark Wootton started working on farms when he was 18. He and Eve, who he met at school, tried their hands at teaching in Africa and sustainable building back in Melbourne, but always nurtured a passion for the agriculture and production lifestyle. While still teaching in Gippsland, their farming experience began with a 6ha vealer operation.

Together they now preside over a little more than 90,000 dry sheep equivalents (DSE), which equates to nearly 60,000 sheep and lambs, as well as close to 1,000 head of calving cows, breeding cattle and calves.

Wootton believes the measures he has taken to combine high input, modern production methods with a calculated plan for emissions reduction has been the key to the strong output of Jigsaw Farms.

FACING UP TO CLIMATE CHANGE

Wootton practises what he preaches. He was instrumental in the creation of Australia's Climate Institute, and is currently its Chair. He and Eve decided to set up the body to advocate for an informed, active response to the issue of climate variability and change to honour the wishes of Eve's brother who died in 2005 leaving them a substantial estate to disburse.

While Wootton says he was influenced by some pretty tough seasons in the 1990s, it was the "irrefutable science" revealing the need to do something about climate change that transformed his "healthy scepticism" about the role of natural variability versus the role of a human-induced climate change.

With members such as former CSIRO atmospheric scientist Graham Pierman, AFL chief Andrew Demetriou, and even ex-Labor and Liberal politicians Wootton says the Climate Institute board is a very diverse group.

"In an odd way, that's why I'm engaged," he says. "I think the solution to the issues around climate change will require a multi-faceted approach. There won't be one solution and therefore you need a range of skills and backgrounds."



Mark Wootton

By choice, however, it's the farm which makes up 90 per cent of Wootton's life and focus.

"I mainly farm," he says. "For example, all morning we've been organising our stud program and we've been preparing our ewes for artificial insemination in a couple of weeks, so I'm very much hands-on."

“Methane is a bugger of a gas because it has a larger impact.”

WOOD FOR THE TREES

Modest and down to earth, Wootton says there's nothing he does on Jigsaw Farms that other farms don't do. But he does say the differences probably lie in the way he integrates each of his strategies into a holistic system on a large scale.

For a start, just shy of 1,200ha of Jigsaw Farms, or 20 per cent, is trees and wetlands. A little over half of this is permanent revegetation while slightly under half is an agro-forestry plantation. The Woottons have developed this land specifically as a

carbon offset for their emissions, but also to enrich biodiversity and protect their lambing ewes and calving cows.

"When we first got here there were 50 species of birds now there are 159, as an indicator of biodiversity health," Wootton says. "The carbon offset planting is all direct seeded, the wattles are designed to die after about 10 or 12 years, and then they'll fall and provide habitat for all the creepy crawlies."

Based on the added belief Australia will commence some form of carbon trading scheme, some of the Wootton's plantations have been subsidised by Telstra, which calculates an average car in Melbourne driving 15,000km per year requires 17 biodiversity-rich plantations to offset the resulting carbon emissions. With this deal, a total of 268 tonnes of carbon per hectare must be offset before the extra transfers to the owner as carbon credits they can sell to third parties if they wish to.

FEWER SPRING DEATHS

Apart from the carbon offset, increased biodiversity for its own sake and a reduction in salination, Wootton says the biggest benefit of the plantations is the creation of critical shelter belts for the animals in spring.

"The protection means a decrease in wind chill and an increase in the soil temperature which enables more grass to grow. As a result, we have a lot fewer deaths because our biggest killers,

wind chill rate and low body weight, are substantially reduced."

On the south-west of the higher paddock the agro-forestry plantation *Corymbia maculata*, or Spotted Gum as it's commonly called, also provides protection for the lambing ewes and calving cows while the saw logs produced are a substantial source of extra income.

"As they grow more quickly than the permanent revegetation plantation, they actually offset more carbon," Wootton says. "We have an overseas buyer who wants every one of our standing trees."

Once they reach about 25 years old or 6m in length, the saw logs will be harvested for speciality and structural timbers such as boats, high-quality floor boards and furniture. Of the 1,000 planted per hectare at Jigsaw Farms, 220 will be harvested. Gaps in the forest show where the trees with bad form have been removed.

Again, Wootton is hoping Australia will decide to participate in the Kyoto scheme, which enables benefits for 'locking up' carbon through the production and sale of end product such as fancy dining room tables, for example.

"Both the current and previous Federal governments are keen on a carbon scheme which incorporates this kind of thinking," Wootton says.

"So a lot of work is being done on that."



MANAGING WATER

In addition, the Wootton's system incorporates deep water management including riparian protection with creek areas all fenced off. Deep water dams and troughs are regularly refilled using an innovative air compressor and pressure valve system, which pushes water from lower dams to nine 'turkey nest' dams holding approximately 2.5 megalitres of water each across the highest points of the farm.

"We have 300 paddocks, so the system has to be bullet proof because we can't check the water all the time," Wootton says.

"It's complicated and it uses a lot of power even at night rates, so we're about to change over to photovoltaic arrays on the roofs of the pump sheds. Moving water is the farm's biggest electricity outlay."

Wootton also takes care with energy efficiency overall such as unnecessary usage of vehicles and equipment. A review of the hot water at his properties incorporating solar energy he says will cut electricity bills by 24 per cent.

ALL IN THE GENETICS

Interestingly, Wootton maintains

control of the genetic side of the business delivers greater carbon management gains and saves more costs than any of the other efficiency measures.

"If you have higher fecundity levels with more lambs off the one ewe or more calves off the one cow it lowers your methane footprint dramatically," he says.

"So we're very keen on having our own merino stud and we do all our own animal husbandry. We do a lot of work on twinning, particularly on the sheep side of it — that's a real profit driver for us.

"I'm secretly optimistic we might have struck some pretty handy genetics we can probably commercialise in three to five years on a true Merino dual-purpose sheep that will give the cross breeds a serious run for their money.

"I'm optimistic, but I'm only in year three of the program so I'm being cautious. That could be a serious breakthrough.

"If we have faster growing animals that turn off quicker from a protein point of view or produce more wool we're actually lowering our footprint per kilogram of product."

NOT ORGANIC

When all is said and done, Wootton says grass and feed production is the success generating the most interest in Jigsaw Farms.

“When we first got here there were 50 species of birds now there are 159.”

"Our drivers are reproduction," he asserts. "If we get higher lambing percentages, we have a lot more of either wool or protein to sell."

As a result, while Jigsaw Farms is carbon positive, it isn't organic.

"We produce double the amount of feed and fodder that was produced on the same land before us, even though we take out 20 per cent for trees," Wootton says. "We've taken our best country for pasture and we've left the worst country for the trees. To be profitable we have to get more out of the country we haven't taken out for trees,



Critical to the Jigsaw Farms grazing business is the storage of barley as supplementary rations for livestock

ABOVE: Revegetation undertaken by the Woottons has grown the number of bird species at Jigsaw Farms in Hamilton from an initial 50 to 159; RIGHT: The Woottons have developed just under 1,200 hectares of their land as a spotted gum plantation, which delivers a carbon offset, protects lambing ewes and calving cows and provides the farm with a robust extra income through the sale of high-value timbers

“We’re just glorified grass growers.”

which is the reason we use a high input system.

“We use quite a lot of fertiliser, basically in terms of a soil indicator. Our Olsen peas are in the high teens and we keep fertilising until we get to that level. Is that sustainable long-term? At the moment it is, but if the cost of fertiliser became prohibitive or supply was short, we’d have to review what we do.

“At the moment there isn’t an organic product which can compete with what we use cost wise, so that’s the compromise we make. To be carbon positive we need to plant the trees to suck up the methane we are producing. We couldn’t do that with a low input system; we just couldn’t get that balance.”

GLORIFIED GRASS GROWERS

Jigsaw Farms uses modern southern European cultivars, predominantly Holdfast Phalaris as in Wootton’s experience it produces the most feed in the winter.

“Winter is our biggest production crisis period because our lactating or pre-lactating ewes need a lot of energy,” he says. “They need to eat more so we have to manage that.

“Phalaris performs down to 4C or 5C soil temperature so we can still get growth in the winter when perhaps



others can’t. It has a deep root, so it can protect itself when it goes dry, unlike rye grasses, which will be eaten out and the plant will die if you don’t get your management just right.

“We require very rigorous pastures,” he adds.

“We’ve got to be the McDonalds of farming. We look for persistence in the pastures, they need to last for 10 to 12 years, and we’re generally getting the best paddocks here running at 30 to 32 DSE through the winter, compared to the district average of 10.

“Our average carrying capacity here is 20 to 22 and our other farms 10 minutes further north are 18. We’re well over double the district average using Holdfast Phalaris and if the pastures start to thin out we’ll then go across with a rye grass and Variety 2 sub-clovers.

“We have a periodic feedlot which we use just to finish lambs on for three to four months of the year, which is again intense feeding and you try to finish them as quickly as you can before they get to killable weights.”

LEARNING FROM OTHERS

In addition, Wootton makes it his business to learn from as many sources as possible.

“We’ve adopted pasture management tools and ideas from the dairy industry,” he says. “Using the big vertical mixing wagon is an example.

“Dairy farmers know how to grow grass so we looked at what they do in terms of pasture and rotational grazing techniques. We’ve adopted from other industries as well for the feed nutrition side of it.

“It’s very significant for us to understand nutrition to the nth degree. We make our own ‘haylage’ that is nearly silage nearly hay. We test all the hay and grain so we know what we’re actually feeding out both in terms of energy and protein levels and we keep adjusting our mixes on that basis.”

Wootton says working this way delivers enormous cost savings because stock never gets too run down.

“We do a lot of work with Lifetime Ewe Management, a service provider which helps us develop a technical understanding of the nutrition levels ewes require.

“We’re just glorified grass growers.

Perhaps we grow more than others and we have four-legged creatures, which are a little genetically better at converting it to produce wool or meat.”

FEEDING THEM UP

Having been involved in a variety of reference bodies for the Department of Primary Industries (DPI), Wootton takes every opportunity to ‘bend the ear’ of university academics and researchers about developments in methane efficiency.

“In the dairy industry they’re introducing tannins and oils to feeds, which is lowering the footprint and making the conversion of feed more efficient,” he says. “Well there’s no reason we couldn’t actually do that other than we don’t do it yet. We use high-protein syrup that is a methanol by-product in our feedlot. It is environmentally very positive but it was introduced first and foremost for economic reasons.

“We’re constantly looking [for ideas],” Wootton says. “I just read an article on the possibility of using algae from the ocean in lambs’ feed which will put more Omega 3 in the meat. If there was a market demand it would be relatively easy for us to put that in to finish off our lambs in the last eight or 10 weeks. It’s fantastic: that’s why we do farming. There’s just so much you can do.”

ADAPT OR DIE

Although sheep and cattle are the staple at Jigsaw Farms, Wootton

MEAT AND GREET

The Victorian Carbon Bus tour is part of the national ‘Future Farmers and Carbon Farming Futures’ initiative devised by Sefton & Associates in partnership with the Future Farmers Network and funded by the Australian Government.

To be selected, primary producers and agribusiness professionals aged from 21-35 just need to apply. www.futurefarmers.com.au. Applications close Friday, July 4.



ABOVE: Jigsaw Farms has adopted many pasture management tools and innovations also used in the dairy industry, including vertical mixing wagons

says some opportunist cropping is undertaken, including oats, canola and red wheat.

“We’ve cropped over time as a tool where the pastures were too dirty to start with the pasture species, but we haven’t cropped now for over three years,” he says.

Should adaptation strategies be required because of climate change, Wootton is open to the challenge.

“If we can’t graze we’ll have to do more and more cropping in this area,” he says.

“This is 27-inch [68.6cm] rainfall country; we’ve actually got too much rain. We’ve got neighbours who are doing raised bed cropping which allows them to keep the plants dry and that’s a strategy we, or perhaps the children, may well look at in the future.”

Wootton says the two main challenges building Jigsaw Farms came down to knowledge and capital.

“We constantly have to battle for the money to invest in the next level and that’s a positive thing,” he says.

“We’re not shy about taking risks but we’re lucky we purchased here; the land was relatively cheap so from a capital appreciation point of view we’ve done very well.

“Presuming you have access to the resources, you’ve got to be a bit cautious and make sure you understand what you’re actually

looking for. At the very beginning we headed off a bit too strongly in one direction with the agro-forestry and it’s probably only in the last two thirds of the plantings we really got it sorted out.”

Wootton also says he feels lucky Jigsaw Farms is a preferred employer.

“That may sound big-headed, but when we advertise for a job a lot of people apply,” he says.

“We have housing, good pay and conditions, so our people are good, they’re rippers.

“They all work, they don’t look at the clock and you like them. I don’t want to work with people I don’t like. I can choose that.”

LEGACY FOR THE GENERATIONS

In terms of the legacy of Jigsaw Farms, Wootton says he’d like his four children to have the choice of continuing the management of the plantations either from a carbon perspective or for harvesting high-value timbers.

“Hopefully the permanent revegetation will just become a self-generating forest,” he says. “I think that’s a lovely gift to leave if you can.”

He is equally keen to impart the need for farmers to understand how the carbon cycle works and the impact of what they do on farm.

“They should know what their footprint is and get an idea of the challenges they might have in the

future,” he asserts. “There are some really handy tools online they can easily access.

“The Australian Farm Institute has put one out now called the ‘carbon accounting toolbox’. This is a very farmer-based organisation, it’s not partisan, no one but you reads it; it’s just a good simple audit.

“Whenever I talk to farmers who’ve done it they say they get it, that’s where my problem is. That’s how we know we’re carbon positive with the trees. We identified methane is our main exposure — it’s the livestock. Methane is a bugger of a gas because it has a larger impact in terms of climate change compared with carbon dioxide which is slower acting.”

Wootton argues if you’re a good farmer, you’re a good risk manager.

“If you’re not aware of the risk of climate change, an increase in climate variability or the policy impacts you’re vulnerable,” he warns.

But when the Carbon Bus calls in September, Wootton hopes the 10 young farmers on-board will be inspired by the achievements of Jigsaw Farms.

“Above all, if they left here thinking they’re ahead of the pack and there are prospects for them by engaging with us, I’d feel pretty good,” he smiles.

“If they leave with a mindset of looking for opportunities then that would be positive.” ●