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Reds soils in Mato Grosso do Sul state

BRAZIL
A BOLD VISION FOR A MISUNDERSTOOD COUNTRY?

Kate Scott is a Director on the Board of Nuffield International. In this article she shares her findings from a recent trip to Brazil looking at what we might learn for New Zealand agriculture.

The land of untapped potential?

For many years, Brazil has been thought of as the large-scale, beef-producing, Amazon deforesting nation of the South Americas, but is this really the case or simply stereotype?

Is Brazil, on the other hand, the land of untapped potential? A misunderstood country with a bold vision for the future? A rising agricultural powerhouse with a farmer-centred approach to change? These are all questions that came about as a result of a visit to Brazil in March 2024.

My trip started in Campo Grande, the capital of Mato Grosso do Sul state, which is located on the very western edge of Brazil, abutting Paraguay. The state has a population of approximately 2.8 million people, a humid tropical climate and an average rainfall of about 1,470 mm p.a. One of the most striking features of Mato Grosso do Sul is the vibrant red soil, which is used to grow a magnitude of crops, including soy, corn, sugarcane, cotton and livestock farming.

Mato Grosso do Sul as a state covers an area of 357,145 square kilometres, which is approximately the size of Germany, or roughly 24% bigger than New Zealand. It has an economy that is largely reliant on agriculture. The state's largest trading partner is China, with 42.1% of its export products destined for that market. To put Mato Grosso do Sul in context as an agricultural producer, if it were a country it would be the fifth largest oilseed producer in the world.

When discussing Brazilian agriculture many people have a perception that the country is comprised only of very large-scale farms. While they do have some very sizeable farms by world standards, including the world's largest privately-owned family farming business, Bom Futuro, most of the farms in Brazil are less than 10 ha in area, with the average size being around 63 ha. Large farms, defined as being

greater than 500 ha or more, are significantly outnumbered by smaller-sized farms, although unsurprisingly the largest farms are the most productive by volume.

Historical background

To understand farming in Brazil, it is worthwhile looking at this background:

- One of the key drivers for early agricultural expansion was to provide for national food security. Whereas historically Brazil was a net importer of agricultural products, it is now a top five producer of 34 commodities and is the largest net exporter in the world
- The Brazilian Agricultural Revolution and diversification of farming is widely known to have started in the 1960s and 1970s and continued through until the 1990s
- Brazil is known as being the home of zero till and conservation agriculture, after British agronomist, John Landers, introduced these in the early 1970s as soil conversation techniques to enable Brazil to address soil erosion while also farming sustainably
- Zero till/conservation agriculture is known as being the most important technological revolution in the history of tropical agriculture in Brazil
- Factors driving Brazil's transformation include substantial investment in agricultural research, as well as in production technologies, which have increased global demand for food and animal feed. However, one of the most important factors is Brazil's ability to harvest two to three crops a year in the same plot of land, which makes it unique compared with most other countries.

A focus on rural training and extension

The opportunity to visit the Embrapa Campo Grande Research Facility provided an interesting update on the scale of science and extension being undertaken within Brazil. Embrapa, also known as the Brazilian Agricultural Research Corporation, is similar to AgResearch and Manaaki Whenua in New Zealand and it focuses on:

- Scientific excellence in agricultural research
- Quality and productive efficiency in crops and livestock
- Environmental sustainability/conservation agriculture
- Social aspects of agriculture
- Partnerships with the production sector.

A key focus of Embrapa's sustainable production systems is on integrated farm systems. Mato Grosso do Sul is the Brazilian state with the largest area dedicated to integrated systems in agricultural and livestock production. There are more than 3.1 million ha with Integrated Crop-Livestock-Forest (ILPF) in different configurations, combining two or three crop components in the production system (including short rotation eucalyptus), which are used for fuel (biomass) purposes alongside cattle grazing.

Integrated Agro-Forestry Research Facility, Embrapa

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Another area of increasing focus in the agricultural/energy space is the production of sugarcane for ethanol, which is quantified as an advanced biofuel due to it producing substantially less greenhouse gas emissions compared to traditional ethanol production. Biomass (or bioelectricity) currently comprises around 9% of electricity production in Brazil.

One of the field visits also included meeting with the Brazilian National Rural Learning Service (SENAR), whose primary function is to provide courses, training, technical and managerial assistance, and education to growers. The training is usually free and targets both rural professional training and what is known as social support. This support has a particular focus on small-scale farmers to help families generate income and expand their businesses, including the introduction of sustainable agricultural techniques.

(Left): Dulche de leche sweets; (Right): Newly installed processing plant, Sidrolandia, Brazil

One example was a small-scale dairy farm we visited where the local farmer had less than 10 cows. He was producing very small-scale 'dairy sweets' in the form of dulce de leche that were sold to a local domestic market. The local farmer shared their journey of acquiring farm ownership, which began with the unauthorised occupation of 14 ha of land. Eventually, the farmer obtained land rights through legal channels.

In recent years, the farm's development has been bolstered by a partnership with SENAR and the Ministry of Agriculture, Livestock, and Supply (MAPA). This collaboration has enabled the family to establish a small business. They supply dulce de leche sweets, as well as vegetables grown on the farm, to local schools as part of the food in schools programme which is funded by the local government.

Environmental regulation

Perhaps the greatest misconception about Brazilian agriculture concerns the environmental impacts of farming. The rhetoric associated with farming in Brazil is one based on deforestation of the Amazon, and the substantial impact that agricultural expansion is having on the environment.

While it is true that there has been a substantial expansion of agriculture in Brazil over the past 30 years, and undoubtedly there have been some significant effects on the environment as a result of becoming self-sufficient in food production, the same can be said of most other agricultural nations in the world, including New Zealand.

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What becomes clear on further investigation is the degree of environmental regulation that is in play in Brazil, including specific rules relating to deforestation. For example, if you are a landowner in the Amazon Biome, the maximum area of land which may be cleared is no more than 20% of your landholding. Also, if more than 20% of your landholding has been deforested, then you are required to plant your land in native vegetation to meet the 80% vegetated land requirement.

Similar land clearance rules apply elsewhere in Brazil, and this was evident in the Bonito area of Mato Grosso do Sul, where agri-tourism and eco-tourism appear to have reached a mutually beneficial co-existence with more traditional farming approaches. Here there are open-farmed landscapes, especially cattle and soy, but they are next to substantial areas of native vegetation. An 'integrated mosaic landscape approach' would likely be the term used in a New Zealand context to describe how the land is being farmed.

Governor Eduardo Riedel (a cattle rancher and beef geneticist prior to entering politics) addressed the Nuffield Farming Scholarship Contemporary Scholars Conference (CSC) that was part of the trip. He outlined his government's focus on sustainable agriculture, including agroforestry, conservation tillage and integrated livestock farming. For me, compared to New Zealand standards, this was a refreshingly positive focus on the importance of agriculture in achieving a future of environmental sustainability.

A bold vision for the future

Under the guidance of the Governor, Mato Grosso do Sul state has set itself a lofty goal of being carbon neutral by 2030. Throughout the presentation he outlined that his approach was based on four major pillars: 'a green, digital, prosperous and inclusive government'. He also explained that the state's goal of being carbon neutral by 2030 is based on the preservation of biodiversity, the implementation of policies on climate change, and the United Nations 17 SDGs (Sustainable Development Goals). The actions required by farmers include a focus on practices that promote soil health, biodiversity conservation and carbon sequestration (e.g. regenerative agricultural practices including minimum tillage and cover cropping, integrated agroforestry and other production forestry).

It was uplifting to feel the energy of those we met valuing the contribution of farmers, and from my observations very much seeing the farmers as part of the solution to environmental challenges in farming rather than the problem. Outwardly this was not only a bold vision for the state, but a case of it also putting in place some robust measures to support reaching this goal, using both research and incentives to encourage participation.

A farmer-centred approach to change

One example shared with us that highlighted a farmer-centred approach to environmental change is the payment for ecological services initiative known as the Environmental Services Programme (PSA). While still in its infancy, the purpose of this approach is to direct efforts to restore and protect ecosystem services associated with biodiversity, climate and carbon stocks within the Formoso, Prata, Betione and Salobra River Basins.

Owners of rural properties in the basins who are carrying out sustainable management of the landscape are eligible for the payment. Management practices include restoration and conservation of forests and other existing natural vegetation, as well as the productive conversion of pastures and degraded lands for alternative land uses with greater carbon storage. This includes agroforestry and production forestry, as well as the development of integrated farming systems such as integrated crop-livestock-forestry.

In essence, these property owners are required to meet a minimum standard of environmental stewardship prior to gaining entry to the scheme, including meeting certain requirements for farm plans and supporting evidence-based evaluation of environmental gain that will be occurring as a result of the environmental services the farmer is proposing to undertake. At this point there is a pathway for payment from the government in recognition of the environmental stewardship. Discussions around this topic suggested that the farmers saw this approach as recognising their efforts to farm sustainably and it therefore motivated their participation.

Transparency and traceability also seem to be an important part of the programme, with audit and compliance obligations undertaken by an independent party to ensure the robustness of the scheme. The only part of the puzzle that was not apparent was from where within government the funding for the payment scheme was being sourced, and how the funding of this scheme is itself sustainable in the long term.

Lessons for New Zealand

Brazil has provided a good reminder to take the time to look behind the loudest narrative because sometimes what you hear and what you see are not the same thing. There is so much value in being open-minded – sometimes we don't have all the answers, and looking broadly may well lead us to new or innovative ways to solving some of the challenges we face. I found this to be a great reminder from the visit.

The work that is being undertaken in Brazil around agroforestry, energy and integrated farm systems is well advanced, and providing a sustainable future for on-farm diversification that New Zealand could certainly learn from.

The example of Mato Grosso do Sul state's audacious goal for carbon neutrality by 2030 speaks volumes to the value of a shared purpose and vision creating a movement that enables change. There is so much potential for the New Zealand food and fibre sector – we just need to have a shared vision and purpose.

One key takeaway from the visit was the confirmation that transparency and traceability are essential if we are to capture value from farmer-delivered environmental services.

While the success of the PSA in Mato Grosso do Sul and its long-term viability remains to be seen, it was also refreshing to see a 'public good'-based approach where the government is looking for win-win with farmers and the environment. It will be interesting to follow the progress of the PSA in the future to understand if there are any opportunities for a similar approach in New Zealand, and how this might link beyond just the likes of a biodiversity credit approach to a public good approach for environmental services.

Finally, I believe there is great value in being able to connect with farmers, rural professionals and experts from around the world. Doing this serves a reminder about the value of networks and surrounding ourselves with positive people, and looking beyond our traditional spheres of influence to find innovative and novel approaches to solving some of New Zealand's most pressing challenges.

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