

# CASE STUDY - MULTI-SPECIES CROPPING AND REGENERATIVE FARMING STRATEGIES

**Property Name:** Lonesome Duck

**Location:** Katherine

**Annual Rainfall:** 967.2mm

**Agro-Climatic region:** Tropical Savanna

**Property size:** 950 ha

**Elevation:** 120 m

**Enterprise type:**  
Cattle

**Soils:** Katherine  
Loamy Red Kandosol



Jeremy Trembath and his family live on their property “Lonesome Duck” roughly 10 minutes north-west of Katherine. The region is dominated by extensive pastoral production based on grazing native pastures, with some areas of integrated farming systems incorporating improved pastures or crops.

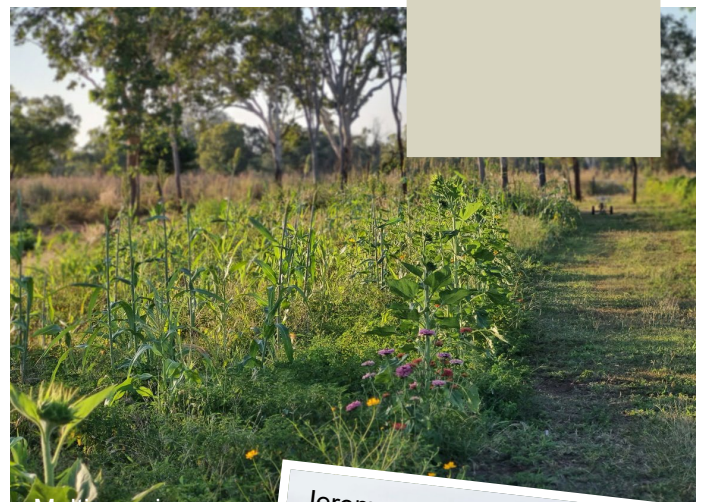
The Trembath’s grazing system and multi-species cropping system, ‘Insync Grow and Graze’, was inspired by their time working in the farming regions of New Zealand that rely heavily on intensive rotational grazing. They took the practices they learnt there and applied them to the Northern Territory in almost exactly the opposite way!

This management practice focuses on a rotational grazing schedule that essentially destocks native pasture paddocks from the first rainfall of the Wet Season until approximately one month before the rain finishes. By destocking the native pasture during its vital growing and seeding phase, the Trembath’s have returned the natural regenerative Wet Season cycle to their property.

By allowing this natural cycle to thrive, the native pasture improves and regenerates, creating a yearly cycle that incorporates cattle sustainably and provides benefits to the soil. While resting the native pasture during the Wet Season, all livestock are then moved into the improved and/or irrigated pasture paddocks closer to the homestead.

Using mostly organic and regenerative practices, these paddocks have been prepared during the Dry Season, growing multi-species crops such as; legumes, grasses, brassicas, cereals and flowering plants.

Jeremy has been working on ways to improve his soil health both with irrigated multi-species cropping/pastures and Wet Season spelling of his native pastures. His aim is to increase soil health while producing a cash crop and improving pasture for their livestock.



Multi-species pasture in all its glory

Jeremy using a minimum tillage planter



## Key messages

- Importance of ground cover above and below the soil surface
- Importance of using grazing in soil health
- Soil health as a function of biodiversity
- Evolution of farming practices
- Wet Season resting of paddocks

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The property plan and layout incorporate a number of fundamental concepts of regenerative agriculture, namely:

## Promotion of biodiversity through:

- Plant cover crops and multi-species pastures
- Crop rotations
- Wet Season resting of paddocks
- Adaptive grazing practices

## Elimination of or decrease tillage through:

- Strategic tillage (only ploughing when absolutely necessary)
- Use of zero-till planter
- Strip tillage

## Reduction of the use of artificial fertilisers through:

- Use of soil testing to ensure appropriate nutrient requirements
- A more holistic approach to soil health to promote nutrient mineralisation through microbes rather than applied nitrogen
- Foliar sprays

## Regenerative grazing management for livestock through:

- Regenerative grazing systems that mimic the natural grazing patterns of animals and the ecology of the native vegetation
- Time control grazing to ensure that both rangeland native vegetation and improved pastures have sufficient time to regenerate between grazing periods



Cattle hard at work



Jeremy checking out the mulch on freshly sown multi-species pasture



Getting excited about Sun Hemp cover crops

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## Multi-Species Pasture System (MSP)

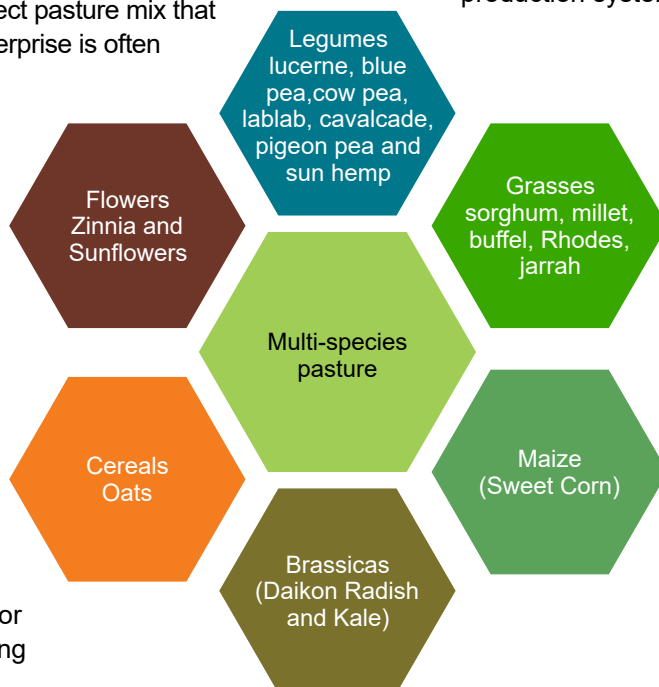
The role of a multi-species pasture is to create diversity. Diversity creates resilience, which increases the ability of a farming system to adapt to variability, whether this be climatic, edaphic, or socio-economic, in turn, fostering productivity. Some benefits of having a MSP include -

**Above ground:** Amongst other things, pastures have higher biomass, different species mature at different rates, effectively staggering grazing nutrition, and livestock have a greater selection of fodder.

**Below ground:** The varied root profiles create improved soil structure. This enables more real estate for soil microbes to live and help with nutrient mineralisation, meaning that there is a healthy balance within the rhizosphere, preventing disease outbreaks and decreasing reliance on synthetic fertilisers. In a nutshell, your soil is healthier and as a result, you have increased nutrient availability and stronger plants.

## Key methods/messages

- Jeremy has formulated his multi-species pasture paddocks into three-metre wide beds. This was to align with his machinery and irrigation set-ups.
- Initially, Jeremy ploughed his land to establish his pasture seedbeds. With subsequent seasons, Jeremy has used strip tillage and direct drill as his planting method. As the soil profile builds, Jeremy is finding that plants are either recruiting, or he has the ability to harvest seeds like sun hemp and sweet corn giving him the options to keep or sell.
- Choosing the correct pasture mix that works for your enterprise is often quite daunting. In Jeremy's case, he chose seed that was available and selected ratios based on his own experiences and research.



A typical pasture mix for Jeremy looks something like this.

## Grazing

Sustainable grazing management maintains ground cover and improves soil health – resulting in a series of interconnected and positive outcomes including:

- Nutrient cycling
- Foraged plants develop a more extensive root system
- Improved soil structure that allows root and water penetration of the entire soil profile
- Maintaining ground cover reduces erosion

The Trembath's have an adaptive grazing philosophy across their property continuously monitoring and managing cattle mobs to ensure paddocks are not over-grazed.

Jeremy grazed his MSP with the aid of hot wires, which ensures maximum grazing efficiencies. This encourages grazing of all plant species by minimising selective grazing of the most desirable plants only (grazing the icecream only!) while still ensuring over-grazing does not occur. Once a strip is grazed, animals are moved onto the next strip.

In their native pastures, Wet Season Resting is practised, and cattle mobs are managed carefully over the Dry Season to ensure overgrazing doesn't occur.

Jeremy has recently added chickens to his grazing system to further enhance nutrient cycling across his production system.

When looking at a pasture you should visualise the belowground root structure.

By having a varied plant species you build a variety of root structures.

Organisms will colonise within different root structures fostering greater overall biodiversity.

Resulting in an overall healthier and more productive/resilient system.

For more information:

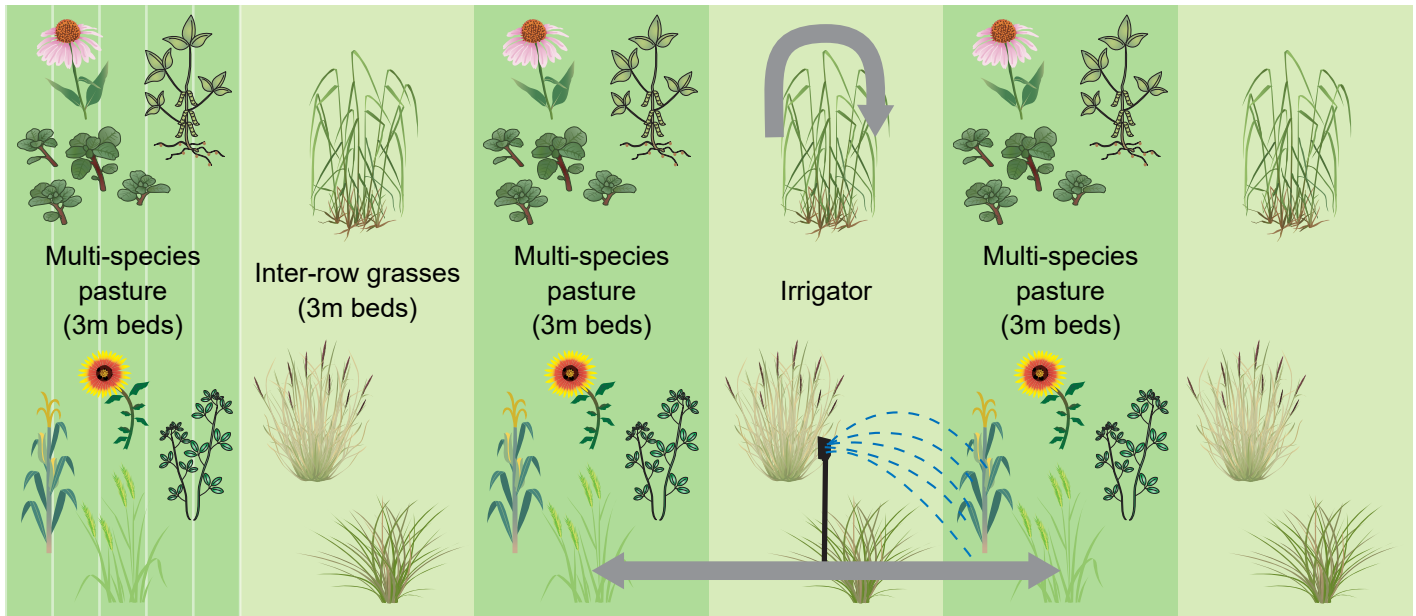
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Lay out of Jeremy's Multi-species pastures



Symbols courtesy of the Integration and Application Network, University of Maryland Center for Environmental Science ([ian.umces.edu/symbols/](http://ian.umces.edu/symbols/))

## Why did he do it?

The 'Insync Grow and Graze' strategy is about minimising contribution to climate change, and adapting to its effects, through building resilience on the farm to combat erosion and drought. This is done by allowing the native species to recover and regenerate from Dry Season grazing by reducing selective grazing pressure during the grass seeding and growing phase over the Wet Season. Jeremy has been able to mitigate weed competition through a more competitive native pasture stand and greatly reduce the amount of chemical use. He has seen a decrease in *Sida* species, which has been replaced by grasses that are more desirable. This is great for not only Jeremy's bank account but also for soil health and climate-smart agriculture through reduction of pesticide in the farming system. The increased ground cover also reduces erosion, protects the soil from solarisation, high soil temperatures and surface crusting, and facilitates improved soil organic matter.

Other advantages of this production system mean that when Jeremy's family bring their cattle in for the Wet Season, they put them onto improved pasture paddocks, which have much higher nutrition values than native grasses. Jeremy has found his cattle consequently have much lower supplement (e.g. mineral block) requirements due to the higher plane of nutrition. Jeremy also has greater control over his breeder herd because he can watch them more closely during their calving period. This has led to better calving percentages, quieter cattle, and increased awareness of reproductive performance of his herd, while also sustainably improving the land.

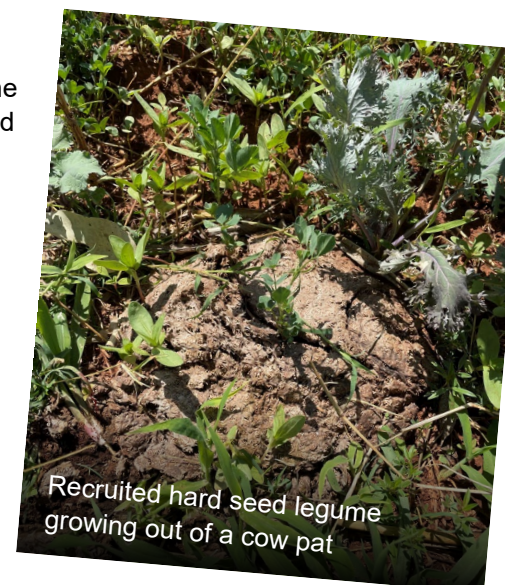
## The aim of the game is to protect soils through ground cover.

Adaptive grazing away from set stocking, rotational spelling of paddocks over the Wet Season, building additional infrastructure to control grazing, and planting improved pastures to use over the Wet Season to spell native pastures are tools for protecting soil and vegetation health. Jeremy has developed and adopted these tools to contribute to resilience in his farming system.

## Test Yourself

A critical and often overlooked aspect of testing new production techniques on properties, is starting small scale first. If you have something that you want to try, do it at a small-scale, iron out the problems, perfect it and then implement it.

The most important message from all of this is to have a go and have fun with it. Find something you are passionate about that will work within the framework of your production system and try it.



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