

ILC2018 Poster and Producer paper*

Leucaena production in the Fitzroy River catchment, central Queensland, Australia

Producción de leucaena en la cuenca del río Fitzroy, Queensland central, Australia

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Background

My wife and I own Sunland Cattle Co. Pty. Ltd., which operates 2 central Queensland cattle properties, Old Bombandy and Ten Mile Stations. Old Bombandy is situated on the Isaac River near Middelmount (11,308 ha) and Ten Mile is positioned on the Mackenzie River near Duaringa (6,868 ha). We are first-generation primary producers operating a Wagyu Stud and selling many fullblood Wagyu bulls. From our Wagyu breeding operation, we sell steers (400–450 kg) to feedlots and retain females to upgrade our herd (more than 10,000 fullblood and purebred Wagyu). We carry out numerous embryo transfer (over 1,150 embryos this year) and artificial insemination programs each year. Currently, we have a surplus of Wagyu females as we have reached our required breeding number. Another property was leased recently to increase cattle numbers. Our aim is to continue to improve our herd genetics. An area of 6,000 ha of leucaena spread over the 2 properties has proven to be an integral part of our beef business (Figure 1).

Our leucaena history

We became interested in leucaena in the early 1960s when we observed cattle near our home town of Rockhampton doing well on leucaena that was growing wild. We collected some seeds, planted them and this developed into a small patch. While the stand grew thickly but not very tall, a couple of isolated leucaena plants grew to about 8 m high. Our observations had shown that plants growing wild along roadways or creeks usually do not reach that height, potentially due to high plant populations and competition for moisture. By the late 1970s we had

planted a small area of leucaena on a 900 ha property north of Rockhampton. While the leucaena established and grew, it was not impressive owing to the infertile soil type and frost incidence.



Figure 1. Leucaena at Sunland Cattle Co.

In the early 1990s we planted cultivar Tarramba leucaena at Old Bombandy and later at Ten Mile using seed treated with boiling water to improve germination (today all seed is mechanically scarified). A good plant population was achieved but the seedlings gradually died off and disappeared. This was due to wireworms and false wireworms chewing the roots underground, while other insects attacked the seedlings above the ground. Establishment success improved after a row of navy beans (white *Phaseolus vulgaris*) was planted each side of the leucaena rows as a decoy crop for the insects and worms. Beetle baits are now routinely used at planting to kill worms and insects that attack the small plants. Initially, we ploughed strips in the paddocks and planted single

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rows of leucaena, but subsequently switched to ploughing whole paddocks and planting leucaena in twin rows (1 m apart; 6 m inter-row). While we are satisfied with this inter-row spacing, opinions vary on the optimal spacing for varying conditions. In a dry climate, we consider wider inter-row spacing is preferable so leucaena can obtain sufficient moisture for maximum growth.

Establishment ‘best bets’

Overall, while planting leucaena in summer with good soil moisture has proved successful, with good seed germination, heat wave conditions at this time can burn off seedlings. Spring planting is preferred so seedlings can grow and become established, being less affected by summer heat waves. Frost is common in the area and a couple of bad frosts followed one planting in early July. We expected the planting to be a failure, but fortunately the seeds had not germinated before the frosts and warmer weather which followed resulted in good germination and establishment. We spray with Spinnaker® (700 g/kg imazethapyr) as per label across a 3 m strip (leucaena and 1 m either side of the grass) when planting to suppress grass growth in the leucaena strips and treat seed with chemical to deter insects. Grass is not sown in the inter-row spacing as grass seed germinates naturally when the effects of Spinnaker® decline. The grass varieties grown are: buffel (*Cenchrus ciliaris*), green panic (*Megathyrsus maximus*; syn. *Panicum maximum* var. *trichoglume*), Bambatsi panic (*Panicum coloratum* var. *makarikariense*), Urochloa (*Urochloa mosambicensis*) and Rhodes Grass (*Chloris gayana*) (Figure 2). To determine if soil phosphorus levels were adequate, we applied superphosphate fertilizer at 250 kg/ha to a couple of rows and observed no production benefit in the leucaena. Soil tests have been conducted since then, which revealed that there was considerable variation in fertility between paddocks, and fertilizer will be applied to more paddocks to test possible further production responses.



Figure 2. Grass inter-row between the leucaena rows.

Leucaena in our business

We aim to manage the leucaena by matching cattle numbers to carrying capacity of paddocks to consume the leucaena rather than having to use mulching to control it. In very good seasons around 1,300 steers from Old Bombandy (in addition to the current cattle grazing the leucaena paddocks) have been introduced on to Ten Mile to manage leucaena height. When significant areas of our leucaena reached heights and stem diameters above those which private contractors could successfully mulch to the desired height with their machines, we designed and employed engineers to build a large mulcher (Figure 3) to reduce the height to what we desired. This has been quite successful. We also purchased a small leucaena cutter to mulch our smaller leucaena. Our current aim is to manage the height of leucaena so cattle can access all of it and prevent it from seeding. My philosophy is: ‘When cattle eat the leucaena, we make money but when we have to mulch it, it costs us money’. If our cattle eat 100% of the leucaena produced during times of high growth and grow well, it can eliminate mulching.



Figure 3. The mulcher we designed and had built for mulching Tarramba.

At Old Bombandy an area of about 5,000 ha is fenced and managed using ‘cell grazing’ (high intensity-short duration grazing) including the leucaena paddocks. We consider that cell grazing is an effective management strategy which provides a rest or spell for pastures so that lush feed is available when cattle next return to a paddock. We plan to extend this management system to more areas on both properties. Leucaena has boosted cattle weight gains and increased the carrying capacity of our operation. Wagyu cattle assessment and price rely on a high marbling score and weight; our Wagyu cattle grown on leucaena are sought after for these characteristics. All categories of cattle graze leucaena pastures on our properties but sale cattle have priority to enable earlier turnoff. We graze our steers on

leucaena pastures to reach target weights quickly and reduce age of turnoff (Figure 4). Similarly, young heifers graze leucaena pastures to reach 300 kg (the desired mating weight) so they reach puberty and breed early, preventing them being carried over to the following breeding season. Cull females, bulls, cows and calves all benefit from time spent grazing leucaena.

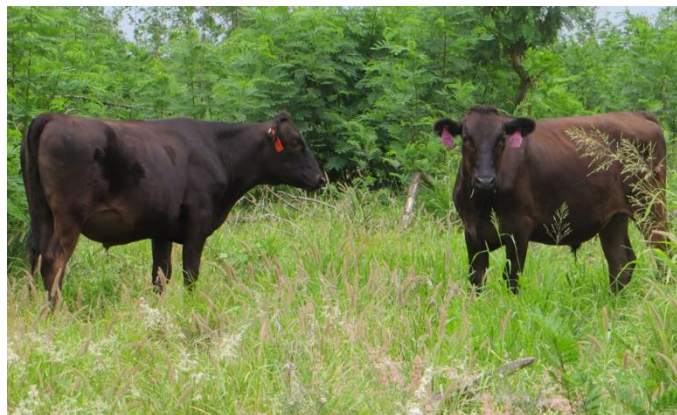


Figure 4. Wagyu cattle at Sunland Cattle Co.

The results achieved have been impressive and leucaena is now an integral part of our production system. Initially, some cattle on leucaena did display symptoms of mimosine toxicity but after dosing animals with the 'rumen bug' (*Synergistes jonesii*) the problem was resolved and cattle grew well. Since then we have dosed only a small number of cattle with rumen inoculum. Subsequent tests have shown that cattle do carry mimosine-degrading organisms in their rumens naturally but we continue to sample animals periodically to confirm that this situation continues.

Limitations

There is potential on our property to more than double the area of leucaena planted. However, we are limited by our capacity to manage it in accordance with The Leucaena Network Code of Practice. While we possess the mulching equipment required to prevent the plant from flowering and setting seed, it is preferable to control it through grazing pressure rather than mulching. We have experienced 2 psyllid (*Heteropsylla cubana*) infestations since we began growing leucaena. Aerial spraying was considered to control the infestations but after a period of cold weather the insects disappeared. Climatic conditions on our properties are normally sufficiently dry to prevent psyllid infestations being a significant problem.

Future leucaena development options

We are satisfied with the economics of planting and grazing leucaena as it is profitable and greatly increases our carrying capacity and rate of turnoff. While it has been planted on our property for only a limited time, we intend to plant more at Old Bombandy Station. With increased cattle numbers and appropriate machines we can control the plants effectively and intend to plant more areas to leucaena. Almost all of our leucaena is cultivar Tarramba as this was the latest and best variety at the time of planting. However, Tarramba has a tendency to grow tall, which presents management issues, so future plantings will involve a different cultivar. We have the soils, climate, equipment, staff and the know-how to establish much more leucaena but will not proceed until we are confident we can contain the plant. Leucaena is essential for our operation and we are interested only in new properties that have suitable soils for leucaena production.

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