

ILC2018 Poster and Producer paper*

Pioneer of leucaena development in Queensland, Australia: Nyanda, Carnarvon Gorge

Pionero en el desarrollo de leucaena en Queensland, Australia: Nyanda, Carnarvon Gorge

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Background and history of leucaena production

We (John and Del O'Neill; Figure 1) first planted leucaena (*Leucaena leucocephala*) on our property 'Nyanda' in 1982 and these original paddocks still look green and lush after summer rain, with no sign of nutrient deficiency (Figure 2). We were part of a small group of original innovative graziers supported by Department of Primary Industries extension champion John Wildin. The group were the pioneers of commercial use of leucaena in Australia.

Nyanda is 15,200 ha, much of it mountainous. A total of 600 ha on the more arable areas was planted with variety Peru. We would plant more if we had suitable areas and intend to plant 20 ha of Redlands when seed becomes available. Some graziers in the Carnarvon area have planted Tarramba but it is not popular as it grows too tall. To date we have not tried Wondergraze.



Figure 1. John and Del O'Neill with Max Shelton in 2017.



Figure 2. 30-year-old leucaena, recovered from burning, now under-grazed and about to be frosted.

Environment

The Carnarvon location is excellent for leucaena with deep soils, especially on the creek flats, where soil phosphorus levels can reach 120 ppm. No leucaena has ever been fertilized on Nyanda.

Frost is an issue and most paddocks are frosted every year. The degree of damage varies from leaf fall to stems being frosted to ground level, which has a major influence on the amount of available leucaena in spring. With severe frosting it can take a few months for a significant amount of regrowth to occur from the base of the plants. After 25–30 years of frosting the leucaena plantations are still productive.

Establishment and management

We have observed that, to ensure establishment success, it is best to plant into fully cultivated paddocks in December–January.

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We tried planting directly into a grass paddock but the resulting leucaena growth and production were very poor. We plant leucaena in single rows only and inter-row cultivate during the first summer. Initial plantings were at a row spacing of 4.5 m but later we increased the spacing to 6 m. We spray a 1 m wide band of a mixture of herbicides [Basagran® (bentazone) and Fusilade® (fluazifop-P) at 2 kg a.i./ha for each herbicide], directly over young leucaena rows for control of broad-leaf weeds and grass. This was effective on both emerging leucaena, where young weeds were killed, and on older leucaena (up to 75 cm tall), where weeds were not fully controlled, but their growth was arrested, allowing the leucaena plants to gain advantage in uptake of water. If leucaena plants are sufficiently advanced at the end of autumn, we feed the area off before winter as leaf will be lost from frosting anyway.

Height management

I, John, consider that leucaena should be cut while still at a manageable height when the contractor's machines can travel through at a reasonable speed. These contractors were not around when we started and the leucaena became virtually out of control in some areas. In those cases, excess height of leucaena was controlled by driving along the rows with a bulldozer every 5 years. A neighbor of ours pulled a heavy scrub chain over some of his leucaena paddocks to reduce the height and in subsequent years followed up with mechanical cutting.

Burning

Some paddocks have been burnt accidentally with varying outcomes. While most recovered quickly, one paddock, which carried a large amount of tall frosted grass and lots of old dead branches, received a very hot burn. The bases of the leucaena plants were burnt to 2–3 cm below ground level and plants took about 3 years to recover.

Inter-row grasses

For the initial plantings we planted green panic and buffel between leucaena rows. However, competition from the highly vigorous growth of leucaena and the heavy stocking rates employed have weakened the grass.

Psyllids

In some years infestations of the leucaena psyllid (*Heteropsylla cubana*) are quite bad and their sticky secretions reduce the palatability of the plant to cattle. For

the first 15 years after planting, infestations of psyllids were severe every year, but recently infestations have been greatly reduced owing to a succession of dry years.

Weed leucaena

Leucaena plants have spread between rows but we control them by blade-ploughing. Some spread has also occurred to lane ways, as well as to Consuelo creek, where green panic and leucaena protect creek banks.

Animal management and marketing

Plants in most paddocks have been frosted every year, but not over-grazed, and are still productive after 25 years (Figure 3). We recognize the need to spell leucaena each year to allow recovery after heavy grazing or frosting.

One paddock has deteriorated dramatically as a result of overstocking at 2.5 animals per ha almost all year combined with annual frosting. Plants in this paddock have woody bases with leafy regrowth coming out like a bonsai plant, but have lost vigor (Figure 4).



Figure 3. Well-grazed 30-year-old leucaena.



Figure 4. Heavily-grazed 30-year-old 'bonsai' leucaena.

We use a rotational grazing system (one block having 5 cells and others 2 cells), which gives all paddocks 6–8 weeks of recovery. The original leucaena is still in good condition, but perhaps not quite as good as in the beginning. Water points are fenced off and spear traps are used to muster cattle.

Toxicity

Leucaena toxicity was an issue initially but the frequency of occurrence seems to have lessened. In the past, when steers first grazed leucaena in December, they would all lose hair from their tail and sheath, prior to being sent for slaughter. At that time, there was only a small area of leucaena, which was quite lush. However, no cases of hair loss have been seen since cattle were first inoculated with *Synergistes jonesii* in 1984–85.

On more than one occasion young maiden heifers were joined with bulls while grazing on fresh leucaena and conception rates were very low. A neighbor also experienced low calving percentages in heifers. Our current policy is to grow heifers on leucaena after weaning followed by grazing in a grass paddock for 6 months prior to joining. We keep bulls on leucaena right up to mating with no observed negative effects on their fertility. Calves are weaned in May and grazed on

leucaena, when it is often frosted and therefore not so much leucaena leaf is available.

Target markets

We target the 'Jap Ox' market with steers at 30–33 months old, usually ranging from 340 to 360 kg dressed weight, often closer to 360 kg, with 70% of animals having a maximum of 2 permanent incisor teeth. However, in 2017 and 2018, average dressed weight was 375–380 kg with 70% of animals showing milk or 2 permanent teeth. Some are down-graded at the abattoir for having more than the optimal subcutaneous fat cover on the rump (P8 fat maximum 22 mm).

For the past 9 years, we have developed a small-scale Droughtmaster stud (a stabilized Brahman × Shorthorn cross). While leucaena pastures can be used for all classes of cattle, we consider that leucaena is best used for fattening, although we put our weaner heifers onto leucaena before moving them onto grass prior to joining.

Concluding statement

Leucaena has been a major factor in the viability of Nyanda and we would be delighted to have more areas suitable to plant more leucaena!

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