# NORTHERN TERRITORY
# Best Management Code of Practice
# Establishing and Managing Leucaena Pastures

*"Promotes the responsible establishment and management of combined leucaena grass pastures"*

## Preamble

Leucaena *(Leucaena leucocephala* subspecies *glabrata),* when planted with improved grass species has the capacity to provide a sustainable and profitable forage grazing system in northern Australia. Leucaena has been grown commercially across parts of Australia since the late 1970s. It is recognised that Leucaena is a valuable forage when managed properly, but it constitutes a threat to the natural environment if not contained in those areas in which it has been planted or controlled in those areas that it has invaded. This document is based on the "Code of Practice for Managing the Weed Potential of Grazed Leucaena Pastures" first developed in Queensland in 2010. It has been adapted for Northern Territory conditions.

## Weed Potential

If Leucaena is ungrazed or unmanaged there is potential to form dense thickets over time. The current environmental impacts come from **both** ungrazed 'common' Leucaena (*L. leucocephala* subsp. *leucocephala)* and commercial cultivars of the subspecies *L. leucocephala* subsp. *glabrata.* Mature plants in these situations can produce a quantity of seed which has a dormancy period (that can be many years) before germination occurs. Leucaena seed can be unintentionally spread multiple ways including via wind, birds, grazing animals, and water flow if near waterways. Leucaena seed has the potential to stay viable in the soil for many years and if established in dense thickets, can be difficult and time-consuming to eradicate.

## Common Leucaena

The common Leucaena (*L. leucocephela subsp. Leucocephela*) has been naturalised in coastal and urban areas of northern Australia for more than 100 years, long before the release of commercial cultivars for grazing. In the Northern Territory, Leucaena is commonly referred to as Coffee Bush and is typically found in peri-urban, disturbed, and roadside areas.

## Cultivated Leucaena

It must be noted that commercial cultivars of the subspecies *L. leucocephala* subsp. *glabrata* are managed on-farm for productive purposes. Nevertheless, where unmanaged it also has a similar weed potential to the common Leucaena. The Leucaena Network actively promotes this **Code of Practice** for responsible management of commercial Leucaena varieties.

Commercial Leucaena pastures **must not** be allowed to contribute to a weed problem beyond the extent of the Leucaena plantation or property boundary.

## Commercial Benefits

Leucaena presents an opportunity for Northern Territory beef producers to diversify their grazing operations. Once Leucaena is established, it can be used to significantly improve animal productivity compared to unimproved native pastures, mainly through superior live weight gains for the breeding herd and for finishing steers. Grazing trails in established Leucaena areas have demonstrated at least 50 kg/hd/year live weight gain benefit for Leucaena over grass only pastures. Preliminary desktop analysis for the Katherine and Victoria River District indicates an increase in gross margin per steer of approximately $150 when Leucaena is used.

## Environmental Benefits

The effects of Leucaena-finishing of cattle on greenhouse gas emissions, production, and profitability at the whole farm level has also been modelled using the Beef Greenhouse Accounting Framework. Finishing steers on Leucaena has been shown to effectively increase animals carried and live-weight turnoff by 15% and 31%, respectively, compared to grass pastures. The National Livestock Methane Program determined that average methane output (g/kg live weight gain) was 28% less on Leucaena – grass pastures compared to grass (Rhodes) only pastures.

In addition, Leucaena enhances nitrogen (N) supply to the soil which improves grass growth and groundcover, and enhances soil reserves of organic matter which in turn stimulates soil biological activity and improves the soil structure.

## Recommendations for Producers

In order to promote the sustainable and long-term economic benefits of Leucaena, it is essential that the risks of weed spread are mitigated by the adoption of the Code of Practice (NT) by all landowners who have Leucaena planted on their properties.

The Leucaena Code of Practice (NT) is actively promoted by The Leucaena Network in the Northern Territory and provides clear guidelines to minimize the environmental risk of unmanaged Leucaena in regional and rural areas.

The use of Leucaena for any purpose other than as a highly managed and well contained forage crop for animal production is **not** supported by industry bodies and Government agencies and should be discouraged.

## Aims of the Code

- Limit the unplanned spread of Leucaena through responsible planting strategies
- Minimise seed set in grazed stands
- Minimise the risk of seed dispersal
- Control escaped plants from grazed stands

# NT LEUCAENA CODE OF PRACTICE PRINCIPLES

**Plant Leucaena *ONLY* if you intend to manage it and are prepared to accept responsibility to control Leucaena that establishes outside the planted area on your property. Under this Code of Practice, it is necessary to implement *ALL* the following management practices in order to mitigate the risk of Leucaena spreading from planted areas.**

a) Fully fence Leucaena plantations to manage grazing operations and avoid the risk of stock spreading seed.

b) Maintain a Leucaena-free minimum separation distance between Leucaena plantation fencing and the property boundary, in accordance with corresponding property boundary buffer widths recommended in the Northern Territory Planning Scheme Land Clearing Guidelines (NTPS Guidelines) (see **Table 1**).

**Table 1** - Minimum separation distance between property boundary and Leucaena fencing

| Property size (ha) | Minimum distance from property boundary to Leucaena fence (m) |
|---|---|
| <8 | 25 |
| 8 to 20 | 50 |
| 20 to 100 | 100 |
| >100 | 200 |

c) Maintain a Leucaena-free minimum separation distance of 250 m between Leucaena plantation fencing and the boundary of NT and Commonwealth National Parks, Conservation Reserves, and private Conservation Reserves.

d) Only plant Leucaena in areas where rivers, creeks, floodways and other sensitive drainage features cannot disperse or collect seed. Maintain a minimum Leucaena-free separation distance between Leucaena plantation fences and the outer edge of the features described in **Table 2**.

Stream order can be determined from a topographic map of an appropriate scale (generally 1:100,000 or 1:50,000) (see **Figure 1**). A stream order spatial dataset is also available on NR Maps https://nrmaps.nt.gov.au/nrmaps.html. Use this dataset as a guide only and field verify the location of riparian areas prior to planting.

e) Establish and maintain a minimum 10m wide Leucaena-free buffer of vigorous grass-pasture between Leucaena plantation fences and Leucaena plantations.

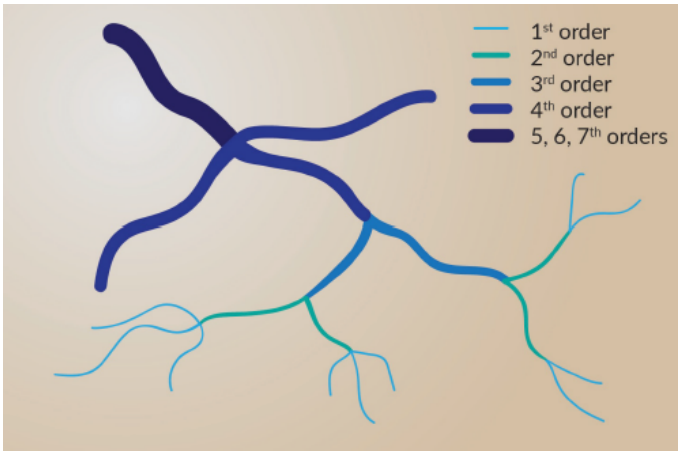


**Figure 1** – Stream orders (NTG, 2019).

**Table 2** – Minimum separation distances between Leucaena plantation fencing and drainage features (adapted from the NTPS Guidelines)

| Drainage feature | Stream Order | Minimum separation distance (m) | Measured from (see Appendix 1) |
|---|---|---|---|
| Drainage depression | Not applicable | **100** | The outer edge of the drainage depression, which is the extent of the associated poorly drained soils and associated vegetation |
| Intermittent Streams and Creeks | 1st, 2nd, 3rd, and 4th | **100** | The outer edge of the riparian vegetation or levee (whichever is the greater). If braided channels are present, the edge of the outer-most stream channel. |
| Rivers | 5th or higher | **250** | |
| Low/Medium Value Wetlands and Groundwater Dependent Ecosystems | Not applicable | **100** | The outer edge of areas that are dominated by plants adapted to seasonally saturated and/or inundated conditions |
| High Value Wetlands and Groundwater Dependent Ecosystems | Not applicable | **250** | |
| Sinkholes | Not applicable | **100** | The outer edge of the sinkhole perimeter. |

f) Establish and maintain vigorous grass-pasture in the Leucaena plantation inter-rows to:
- provide competition to minimise establishment of volunteer Leucaena seedlings
- minimise the risk of seed being transported during heavy rain events
- productively utilize fixed nitrogen that the legume-based system produces
- maintain groundcover and prevent soil erosion.

g) Graze or cut Leucaena to a height of less than 3 m to keep it within the reach of cattle and to minimise flowering and seed set.

h) Monitor for Leucaena spread by regularly inspecting buffer zones, drainage areas, watercourses and property boundaries to detect and control Leucaena seedlings and plants. Control Leucaena plants found within buffer zones or outside of paddock or property boundaries. Chemical control is recommended in these areas. Refer to the Northern Territory Weed Management Handbook for recommended chemicals www.nt.gov.au/weeds.

i) Report the location and control of any Leucaena plants that have escaped from dedicated grazing paddocks to areas outside Leucaena plantation fencing to the Northern Territory Weeds Management Branch of the Department of Environment, Parks and Water Security (DEPWS) on (08) 8999 4567 or email weedinfo@nt.gov.au.

j) Register Leucaena plantations with The Leucaena Network

k) Promote the responsible management of Leucaena in accordance with this Code including communicating the requirements of the Code to new managers and/or owners of the property.

l) Keep abreast of developments in best management practices for Leucaena and adaptively manage related operations according to any changes or developments.

m) Remove any Leucaena plantations on your property that you do not intend to manage in accordance with the requirements of this Code.

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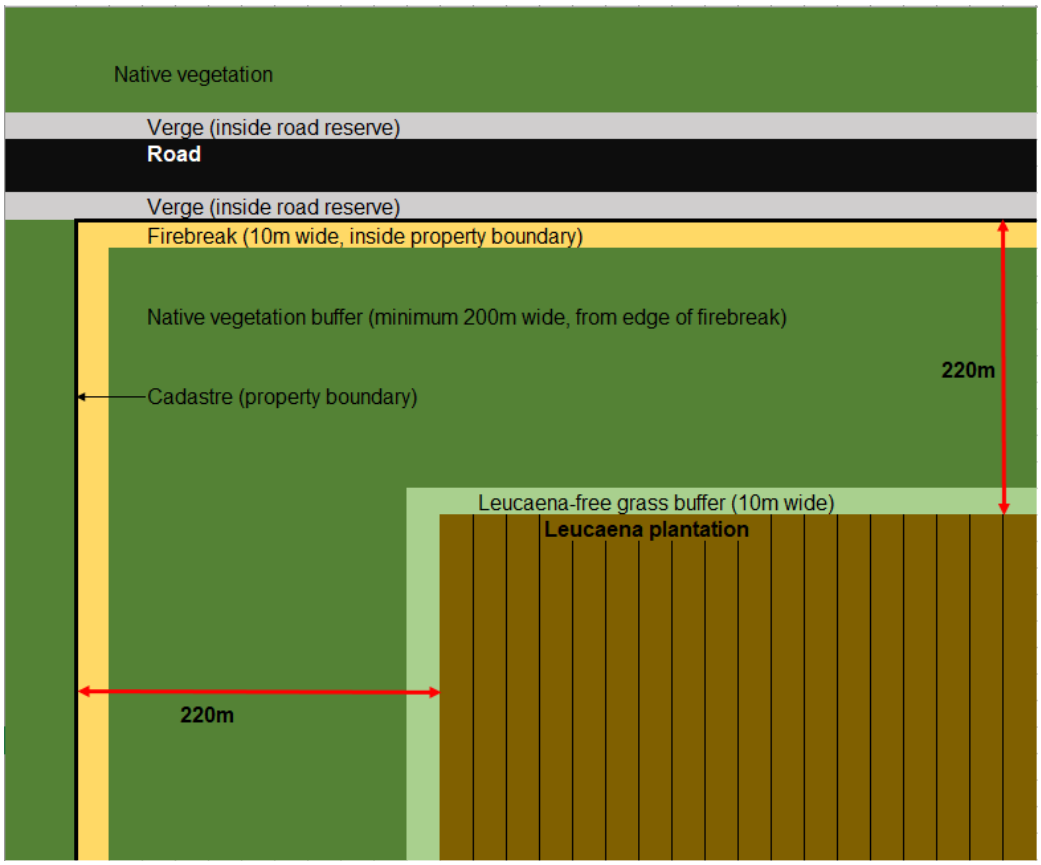
The Northern Territory Leucaena Best Management Code of Practice was developed in consultation with the Department of Environment, Parks and Water Security and Northern Territory grazing representatives. The following organisations endorse the adoption of the Code of Practice to maintain a sustainable and profitable beef industry using Leucaena pastures:

NT Department of Industry, Tourism, and Trade
NT Farmers
Northern Territory Cattlemen's Association

**Appendix 1. Examples to assist interpreting the NT Leucaena Code of Practice in relation to NT Land Clearing Guidelines**

**Example Scenario 1:**

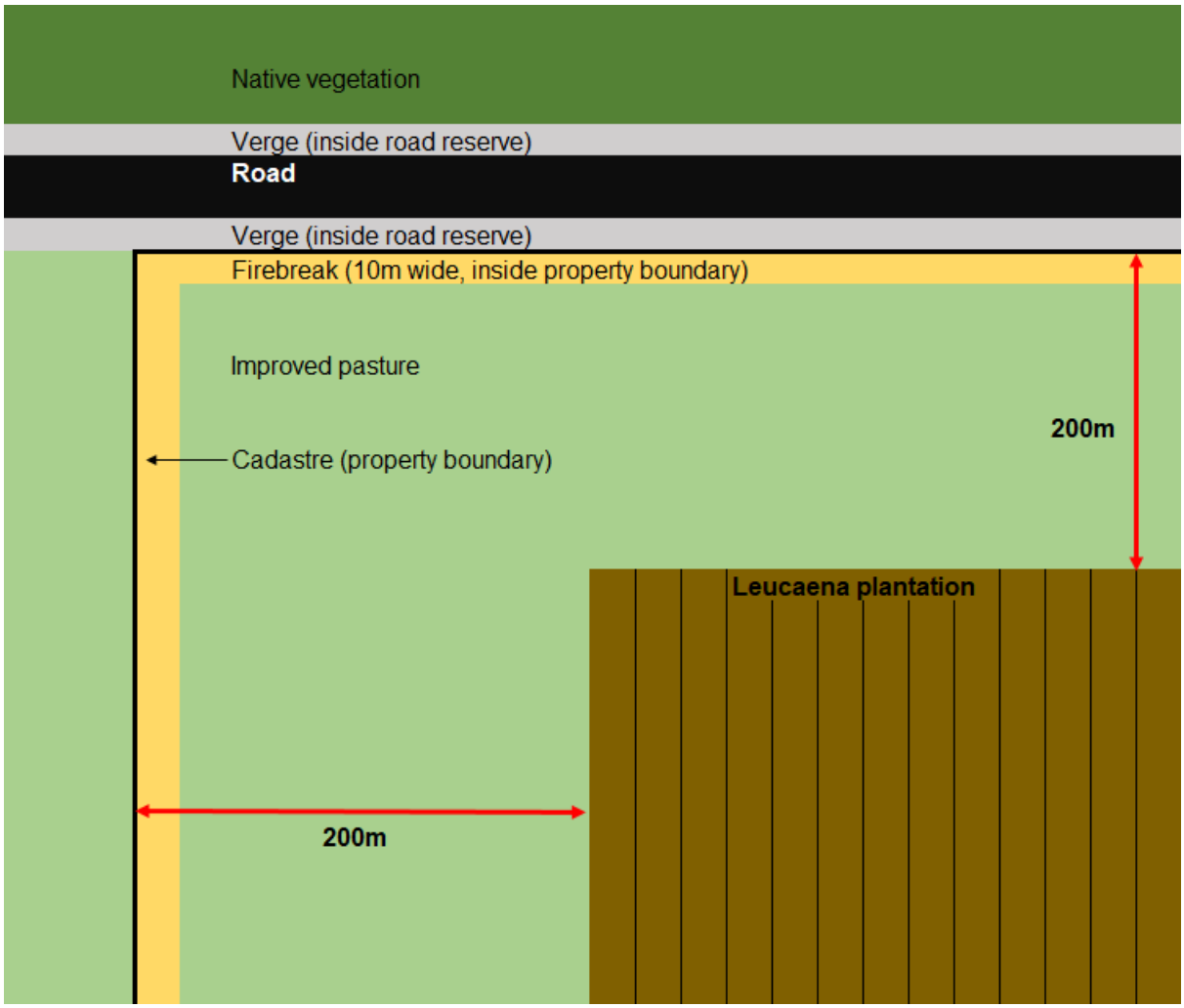
*Typical example for pastoral lease or unzoned freehold property where new clearing of native vegetation in accordance with an approved permit will be required in order to establish a Leucaena plantation.*




- ✓ Property is >100 ha and cadastre (property boundary) is fenced.
- ✓ Area surrounding Leucaena plantation is characterised by native vegetation and has not previously been cleared.
- ✓ A land clearing permit has been approved for the Leucaena plantation under the relevant legislation.
- ✓ As per the Code and in accordance with the NTPS Land Clearing Guidelines, a native vegetation buffer with a minimum width of 210 m (including a 10 m wide firebreak) has been retained along the cadastral boundary.
- ✓ As per the Code, the Leucaena plantation has been fenced. The property boundary fence line acts as part of the Leucaena plantation fence line; and as per the Code, a (minimum) 10m wide Leucaena-free grass buffer has been retained adjacent to the Leucaena plantation. The total distance from the cadastral boundary to the external edge of the Leucaena plantation is a minimum of 220 m.

**Example Scenario 2.**

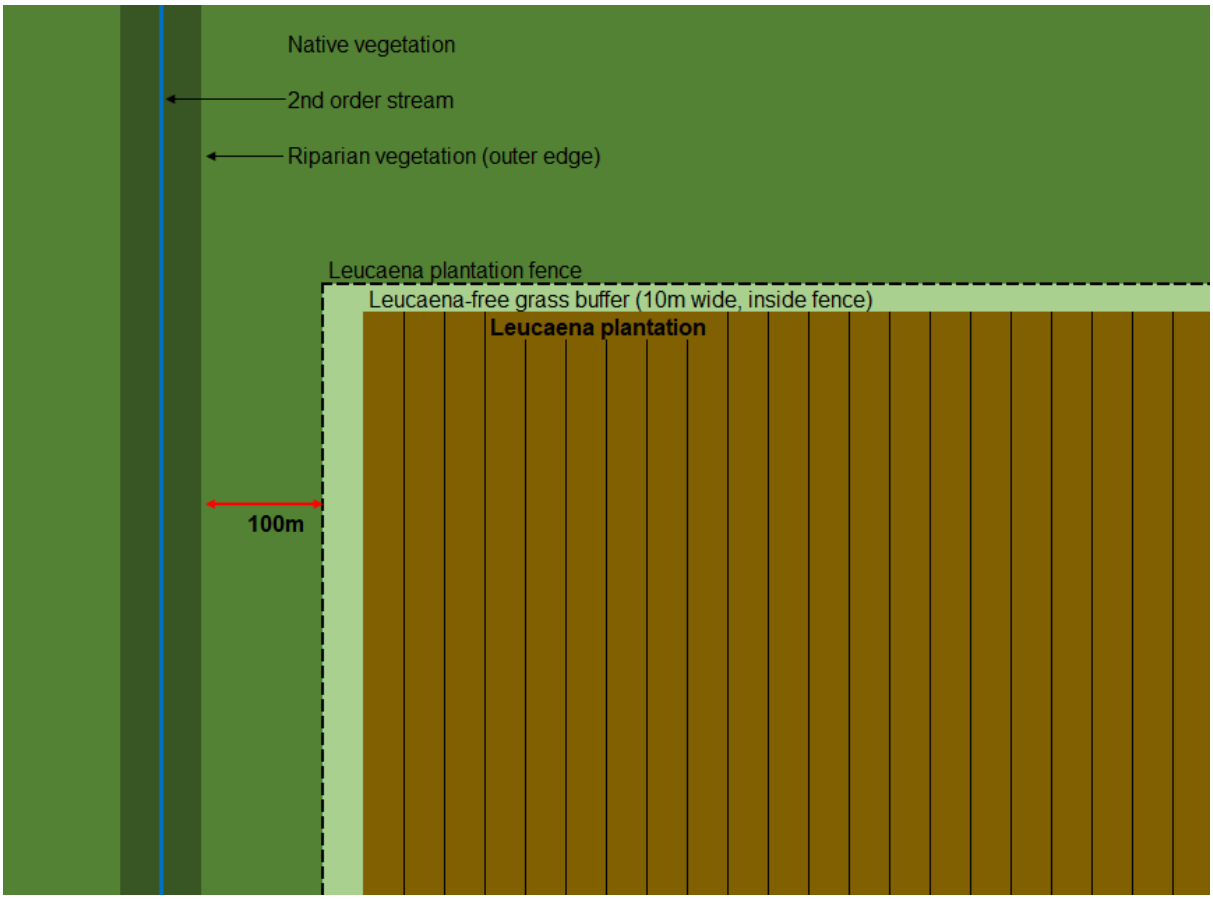
*Typical example for pastoral lease or unzoned freehold property where clearing of native vegetation has previously occurred and has been maintained free of native vegetation to date.*




- ✓ Property is >100 ha and cadastre (property boundary) is fenced.
- ✓ Native vegetation has previously been cleared within the property, to the cadastral boundary.
- ✓ **Note: Before planting Leucaena, contact DEPWS for advice regarding whether a new clearing permit or variation to an existing permit is required.**
- ✓ As per the Code, a minimum separation distance of 200 m (including a 10 m wide firebreak) has been retained along the cadastral boundary.
- ✓ The property boundary fence line acts as the Leucaena plantation fence line; and as per the Code, a (minimum) 10m wide Leucaena-free grass buffer has been retained inside the fence line.
- ✓ The total distance from the cadastral boundary to the external edge of the Leucaena plantation is a minimum of 200 m.

**Example Scenario 3:**

*Typical example for pastoral lease or unzoned freehold property.*




- ✓ Leucaena plantation is within proximity of a second order stream.
- ✓ A land clearing permit has been approved for the Leucaena plantation under the relevant legislation.
- ✓ The NTPS Land Clearing Guidelines requires a native vegetation buffer with a minimum width of 50 m to be retained along second order streams, from the outer edge of the riparian vegetation.
- ✓ As per the Code, a 100 m wide native vegetation buffer has been retained from the outer edge of the riparian vegetation to the Leucaena plantation fence line.
- ✓ As per the Code, a 10 m wide Leucaena-free grass buffer has been retained between the Leucaena plantation fence line and the external edge of the Leucaena plantation.

## References

NTG (2020). Land clearing guidelines Northern Territory Planning Scheme, Department of Environment and Natural Resources, Darwin. Available at: https://nt.gov.au/__data/assets/pdf_file/0007/236815/land-clearing-guidelines.pdf