pastures australia

A collaboration between AWI, GRDC, MLA, RIRDC and Dairy Australia

Leucaena

Scientific name(s)

Leucaena leucocephala

Strengths

- Very high nutritive quality for ruminant livestock.
- Highly productive on suitable soils.
- Extremely drought tolerant
- Retains leaf during dry periods.

Limitations

- Poorly adapted to acid-infertile soils.
- Poor growth at low temperatures and is susceptible to frosting.
- Relatively weak in seedling stage and slow to establish.
- Can cause problems in non-ruminant livestock

Plant description

Plant: Shrub or tree up to 18 m tall if not checked, branching strongly when cut.

Stems: Young stems are soft and green; older stems and the trunk have greyish bark.

Leaves: Feathery leaves (bipinnate), comprising 4 - 9 main branches, each with 11 - 22 pairs of small, dark blue-green "leaflets".

Flowers: Small and white, clustered into a round head (c.f. wattle flowers) mostly 2 - 3cm diameter.

Pods: Brown and flexible; usually about 15cm long and 2cm across, carrying up to 20 or more seeds.

Seeds: Flat, brown and shiny, 6 -10 mm long.

Pasture type and use

Usually grown in single rows (or double rows 70 - 90 cm apart), with 4 - 10m between rows; inter-row may be left as native pasture or sown to improved pasture. Inter-row width is increased as average rainfall declines.

Where it grows

Rainfall

Leucaena is mostly sown in subhumid areas (600 - 800mm annual average rainfall), but will grow well under much higher rainfall conditions.

Soils

It prefers fertile, well-drained, neutral to alkaline soils, but will grow on acid soils if aluminium levels are low.

Temperature

Leaves are "burnt" by light frosts, and although stems are killed back to ground level by very heavy frosts, mature plants mostly recover.

Establishment

Companion species

Grasses:

- brigalow scrub soils: buffel grass, creeping bluegrass, green panic, rhodes grass.
- heavier clay soils: Bambatsi panic, purple pigeon grass, Floren bluegrass
- more humid areas: humidicola, pangola grass, sabi grass, signal grass.

Legumes: burgundy bean, butterfly pea, caatinga stylo, desmanthus.

Sowing/planting rates as single species

It is normally sown at 1.5 to 3 kg/ha, depending on row spacing. This is roughly equivalent to a seed every 5cm. Seed should be scarified before inoculating and sowing, to reduce the high level of hard seed.

Sowing/planting rates in mixtures

Other species should be sown once the leucaena plants are well established. Careful cultivation or chemicals are used to control weeds after sowing.

Sowing time

Leucaena should be sown as early as possible in the growing season, because it is very slow to establish

Inoculation

It requires special inoculum, either CB 3060 or CB 3126.

Fertiliser

If soil analysis indicates available soil phosphorus to be below about 10 ppm, phosphorus fertiliser should be used at sowing, either broadcast, or more efficiently banded under the seed. Since leucaena is sensitive to sulphur deficiency, it is wise to use superphosphate (10% P, 10% S) if soil sulphur levels are low or unknown. Lime banded below the row is beneficial on acid soils.

Management

Maintenance fertliser

Since leucaena is mostly grown in fertile soils, maintenance fertiliser is generally not necessary.

Grazing/cutting

Plants should be grazed lightly when they reach about 1.5m tall to promote branching. It is best to restrict more mature plants to a maximum height of around 2m, using a combination of rotational and continuous grazing. It may be necessary to slash at 1m height if trees "get away".

Seed production

Leucaena flowers throughout the year where moisture and temperature are suitable, with peak flowering from February to April, in central Queensland. Trees may not flower in the first year. Seed production is strongly moisture dependant and producers report minimal seed set in dry years. Seed yields of 250 kg/ha are common from mechanically harvested, dryland crops, but widely spaced, manually harvested trees under irrigation can produce up to 2 t/ha.

Ability to spread

Leucaena seed is readily moved by surface flow of water, or by passing through cattle. However, it normally does not spread much under grazing as cattle relish young seedlings. Some thickening up of grazed stands has occurred where leucaena is left ungrazed during the growing season for provision of autumn feed. Advice on minimising spread is incorporated into a Code of Practice, developed by the Leucaena Network, and in a Queensland Government Policy (see "Further Information")

Weed potential

Leucaena produces large amounts of hard seed that can be moved by water or livestock.

Dense thickets can form if the seed reaches ungrazed areas. The weed threat has been reduced somewhat by the appearance of flower-eating caterpillars and bruchid beetles. However, the best risk-minimisation approach is to abide by the above-mentioned Code of Practice.

Major pests

The most important pest of leucaena is the psyllid, a small aphid-like sucking insect that attacks in large numbers, significantly reducing productivity (see "Cultivars"). Seed production can be reduced by the flower-eating larvae of a moth and by three species of seed-eating bruchid beetles.

Major diseases

There are no serious diseases of this species in Australia.

Herbicide susceptibility

Leucaena is susceptible to triclopyr (240 g/L) +picloram (120 g/L) e.g. Access® as a basal bark treatment, or triclopyr (300 g/L) and picloram (120 g/L) e.g. Grazon DS® as a foliar spray.

Animal production

Feeding value

Feeding value of leaves and young stems of leucaena is roughly equivalent to that of lucerne.

Palatability

Extremely palatable.

Production potential

Steers on rain-grown leucaena plus grass can gain about 260 - 280 kg liveweight a year at a stocking rate of a beast to 1.5 to 2 ha. Under irrigation, and with a higher stocking rate (1 beast/0.8 ha) liveweight gain/ha/year can be doubled.

Livestock disorders/toxicity

The alkaloid, mimosine, is high in young vigorous growth of leucaena. It can cause hair loss in non-ruminants, and reduced productivity in ruminants if leucaena comprises more than about 30% of the animal's diet. In such cases, it is best to drench 10 - 20% of the herd with rumen fluid containing the detoxifying bacterium (Synergistes jonesii). The bacteria then spread quickly to other animals in the herd. A few inoculated cattle should be retained in the leucaena paddock to pass the bacterium on to new stock entering the paddock.

Cultivars

Cultivar	Seed source/Information
Peru	Australian Herbage Plant Cultivars
Cunningham	Australian Herbage Plant Cultivars
Tarramba Φ	-

Φ Denotes that this variety is protected by Plant Breeder's Rights Australia

Further information

Tropical Forages database (SoFT) - Leucaena
The Leucaena Network

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Author and date

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