



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

Centro

Scientific name(s)

Centrosema molle (*Centrosema pubescens*)

Strengths

- Productive in the humid tropics and sub-tropics
- High quality feed (high protein and moderate-high dry matter digestibility)
- Persistent under high stocking rates
- Combines well with tussock grasses and dominant grasses such as signal grass
- Roots down strongly at the nodes
- Moderate shade tolerance
- No anti-nutritional factors
- Reliable seed production

Limitations

- Slow to establish from seed
- Requires specific Rhizobium inoculum
- Requires moderate to high fertility
- Stems become woody as they mature
- Twining habit may be a problem in certain situations

Plant description

Plant: Perennial, twining and trailing legume which will climb associated grasses and fences. Individual plants can spread 1-2m from the strong taproot.

Stems: Width to 3 mm, green and soft at the tips tending to brown on top and woody as they mature. Roots down vigorously at the nodes on moist soil.

Leaves: Comprise three slightly hairy leaflets. Leaflets are egg-shaped with obvious veins. The middle leaf is usually largest, to 4 cm wide and 6 cm long.

Flowers: 3-5 pale lilac (almost white) flowers attached to each flowering stalk. Flowers are roughly circular when viewed from the top, 3-4 cm across.

Pods: Flattened and straight or gently curved with an obvious lengthwise groove and curved point, 5-17 cm long and 6-7 mm wide. Contains up to 20 seeds. Green when immature, brown when mature, forming an open spiral on shattering.

Seeds: Plump, squarish and slightly flattened, 5 mm long, 4 mm wide and 2 mm thick. Pale 2 mm x 1 mm scar with a mid-brown centre on one edge. Mid-brown and shiny with black mottles, often in rough lines. Smooth. 45 000 seeds/kg.

Pasture type and use

Legume for permanent pastures for beef-finishing and dairy production in the humid coastal and elevated tropics and humid sub-tropics. 'Cardillo' is not recommended for hay production.

Where it grows

Rainfall

Best growth in humid, high rainfall conditions (> 1500 mm/year), but will provide wet-season growth in lower rainfall environments (> 1000) with 4-5 month dry seasons.

Soils

Requires fertile soils for long-term persistence and production. Grows best on well-drained soils, but is also a useful component in mixtures on poorly drained sites. Some tolerance to acid soils.

Temperature

Production is best under humid, tropical conditions. 'Cardillo' was selected for cold-tolerance and is productive in higher rainfall zones in the sub-tropics and elevated tropics to approximately 800 m above sea level. Survives mild frosts.

Establishment

Companion species

Grasses: Clumping grasses such as Guinea grass and setaria and running grasses like Rhodes grass. 'Cardillo' was selected for its capacity to grow with signal grass.

Legumes: Pinto peanut. 'Greenleaf' desmodium and 'Shaw' vigna in cooler environments.

Sowing/planting rates as single species

Not generally planted as a single species, except for seed production when 4-6 kg uncoated seed/ha is recommended. Seed should be of high physical purity (>95%) and viability (>80% total germinated + hardseed). Seed should be tested and treated for hardseed dormancy.

* coating can considerably increase the weight of uncoated seed and this varies between coatings. Sowing rates for coated seed need to be adjusted based on the coating used.

Sowing/planting rates in mixtures

2-4 kg/ha of uncoated high-quality seed as above, either at planting with companion species or direct-drilled into pasture. Rates may be reduced if other companion legumes are sown.

Sowing time

Best results are achieved if sown during wet summer months. Plant before seasonal rainfall and ensure a moist soil profile for 10-14 days after sowing if possible. Avoid lower soil temperatures.

Inoculation

Inoculate with specific 'centro' strain inoculum within a few hours of planting.

Fertiliser

Apply sulphur, phosphorous (~200 kg single superphosphate/ha) and molybdenum (0.5 kg/ha sodium-molybdate) at planting to overcome deficiencies and encourage vigorous nitrogen fixation.

Management

Maintenance fertiliser

Apply ~30 kg phosphorous every 2 years and sulphur, potassium and calcium if deficient on soils in the humid tropics. Nitrogen fertiliser is not usually required in well-managed centro-grass pastures.

Grazing/cutting

More tolerant of heavy grazing pressures than many other legumes, but less so than pinto peanut. Relatively slow to establish from seed; avoid heavy grazing until plants are well-established (first 6 months). Use grazing management to favour a legume component of over 30% in coastal environments and 40-50% in elevated environments in the humid tropics. Spell pastures after the wet season to encourage regrowth and lengthen spelling into the cool season (at least 30 days). Suited to rotational grazing.

Seed production

'Cardillo', the only variety grown for seed, is an excellent seed producer. Seed is grown by

specialist growers in north Queensland under contract. 'Cardillo' flowers during winter months and is harvested mechanically in late winter/spring. Flower and pod eating insects must be controlled. Seed crop development is poorly synchronised and pods shatter when mature and dry. However, seeds are mostly protected from shattering because they are within the leaf canopy and very high yields (up to 1500 kg/ha) can be achieved with a combine harvester. Harvested seed contains a high proportion of hardseed, requiring scarification to improve germination rate.

Ability to spread

Excellent capacity to spread through seed (if spilled from grazing) and above-ground runners which root down vigorously at the nodes. Individual plants can colonise over 2 m from the base if growth is unchecked.

Weed potential

Low. Possibly a minor nuisance in ungrazed areas because of tolerance of shade and the climbing growth habit.

Major pests

Few serious pests in pasture. Red spider mite has caused leaf loss in dense stands over winter. Bean fly during establishment and caterpillars and green vegetable bug during flowering and pod development can affect seed crops.

Major diseases

Relatively unaffected by diseases. Some minor damage in pastures by leaf spot and anthracnose. In seed crops *Rhizoctonia* leaf blight can damage seedlings, and a bacterial wilt can cause leaf loss.

Herbicide susceptibility

Selective control of broad-leaved weeds: Tolerant to pre-emergence application of imazethapyr. Does not tolerate acifluorfen or hormone herbicides such as 2,4-D and 2,4-DB. Tolerant of grass-active herbicides, such as trifluralin applied at planting.

Animal production

Feeding value

Excellent feeding value. Moderate to high dry matter digestibility (45-65%), highest for young leaf and stem. Crude protein levels are relatively high for a tropical pasture legume and range from 17-26%, again highest in immature forage.

Palatability

Readily accepted by cattle when grown with grasses. Preferentially grazed to grasses during the dry season.

Production potential

Can produce 7 T DM/ha/yr in ungrazed stands without grass and 2-4 T DM/ha/yr in a well-managed centro-grass pasture in the humid tropics. Excellent animal production when combined with a well-adapted grass (signal grass) and high stocking rates in the humid tropics; up to 900 kg liveweight gain/ha/yr. These pastures commonly produce long-term liveweight gain of 500 kg/ha/yr when stocked at 2.5 beasts/ha.

Livestock disorders/toxicity

None known.

Cultivars

Information in this sheet largely relates to 'Cardillo', the only commercially available cultivar in Australia. 'Cardillo' has a slightly different growth habit from that of common centro and is more widely adapted.

Cultivar	Seed source/Information
Cardillo 	Southedge Seeds

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

Further information

Bishop, H. (2007) Pastures: Mackay Whitsunday region. A guide for developing productive and sustainable pasture-fed grazing systems. Department of Primary Industries and Fisheries, Brisbane.

Tropical Forages database (SoFT) - Centro

Additional resources

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Jones, R.M. (2001) Evaluation of legumes and grasses in coastal south-east Queensland. *Tropical Grasslands* 35, 85-95.

Kirkbride, J.H. and Wiersema, J.H. (2005) Proposal to conserve the name *Centrosema pubescens* (Fabaceae) with a conserved type. *Taxon* 54(1), 209-210.

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Acknowledgements

Kevin Shaw and Bernie English (DPI&F), Mareeba, for advice on beef production, and Howard Smith (Dairy Farmers), Malanda, for advice on dairying, in north Queensland.
John Hopkinson (retired), Atherton, and Bernie English for seed production reports.
Bruce Cook (retired), Brisbane, for advice on production in south-east Queensland.

Author and date

Kendrick Cox

December 2008