



## Summer pasture legumes

### Technical Note F17

Management level	★★★★★
Yield	★★★★
Quality	★★★★★★
Water use efficiency	★★★★
Reliability	★★★★
Versatility	★★

Where ★★★★★ is the highest rating.

## Species

Various species have been introduced or bred.

**The twining tropical legumes (TTL);** siratro, glycine, desmodium

The twining tropical legumes differ in their needs for soil type and rainfall, but all grow well with companion grasses in their respective niche if fertilised adequately. Stocking rate must be kept low to maintain productivity as heavy grazing removes growing points and severely weakens the legume component.

**Shrubby legumes (SL);** Wynn Cassia, joint vetches

Shrubby legumes are more drought tolerant than twining legumes and less sensitive to high stocking rates, but have lower productivity and variable production from year to year.

**Ground running or rhizomatous (GRL);** Arachis, Shaw creeping vigna, lotononis

The ground running or rhizomatous legumes are suited to high stocking rates, but require high rainfall and have modest levels of production.

**Tree legumes (TL);** Leucaena

Tree legumes have high productivity once established, but land has low output during the long establishment phase and there are practical difficulties in managing the forage system.

Overall, each group has strengths and weaknesses, but no group has yet proved to be suited to widespread adoption by dairy farmers in the subtropics.



*Vetch and Prairie grass*

## Establishment

Two methods of establishment.

- Usually a fully cultivated seedbed is prepared, seed is broadcast, harrowed lightly and rolled. Heavy rolling is essential, except on soils which crust badly. Almost always planted with a companion grass.
- In an established grass pasture strips are sprayed with glyphosate and seed direct drilled into these strips. This is the usual method for leucaena and can be used for other legumes, though establishment is much slower.

There is no ideal planting time as success depends on follow up weather conditions. Spring plantings have a high risk as probability of follow up rainfall is usually low. Despite high rainfall during summer hot conditions can dry and kill seeds within a few days. A compromise is late February and March plantings, when soil moisture is adequate, temperatures are falling and ground is warm enough for germination.

Obtain seed with certified viability and purity, free of weed seed. Seed must be inoculated. Pelleting of seed has advantages in establishment, add an inoculant and top dress with nutrients if necessary. Graze lightly in the

first year to enable establishment of the legume. Leucaena may require 2 years for establishment.

## Seeding rates and companion grasses

**Twining:** 2 - 3 kg legume seed and 1 - 3 kg grass seed/ha. Wide selection of grasses, based on rainfall and soil type.

**Shrubby:** 1 - 3 kg of legume and grass seed such as green or Gatton panic, Rhodes grass, and digitaria.

**Ground running:** 1 - 3 kg /ha Shaw creeping vigna. Arachis varieties can be planted using pieces of rhizomes and stems, by spreading, discing into a prepared seedbed and rolling. Arachis is typically planted from December to the end of February at 10-20 kg/ha approximately 20 - 30 mm depth into moist soil. Ideally plant with a modified Coventry plate direct drill or air seeder. Low impact machinery to avoid mashing the seed. Inoculation is required. Seed is expensive due to limited availability and is slow to establish taking 2 - 3 years to fully establish. Short, running grasses preferred, e.g. kikuyu, signal grass (*Brachiaria decumbens*), digitaria grass at 1 - 3 kg/ha.

**Trees:** 3 kg/ha leucaena. Wide selection, based on local experience. Use existing grass if strip sowing.

## Water use

These pastures are almost always dryland and species are sensitive to rainfall zone. With high quality soils legumes can grow in lower rainfall zones. Arachis has persisted as the summer component of an annual, irrigated ryegrass pasture. Once established it is oversown each autumn with ryegrass.

**Twining:** Desmodium and glycine suited to higher rainfall, 1200 – 2000 mm, siratro 800 – 1200 mm/year.

**Shrubby:** 800 - 1200 mm/year.

**Ground running:** 1200 - 3000 mm/year.

**Trees:** 600 - 3000 mm/year.

## Soil fertility

All the summer legumes prefer high quality soil, though the tolerance of medium quality soil varies.

**Twining:** Glycine requires deep, volcanic soils, while siratro is more tolerant of forest and

shallow soils. Desmodium grows in both these soil types, but requires high rainfall.

**Shrubby:** Tolerant of forest and shallow soils.

**Ground running:** Tolerant of soil type provided rainfall is high. Arachis prefers light soils, even sandy.

**Trees:** Requires deep, friable clay soils. Grows on poorer soils but much less productive.

All legumes require high P and K availability at establishment, and recommended to apply 250 kg superphosphate and 125 kg KCl/ha at planting on all soil types. Molybdenum is added to the seed pellet in high rainfall areas.

Maintenance applications of superphosphate are based on soil tests taken every 3 years, with continuing applications where P is less than 30 ppm (Colwell). Molybdenum super can be used each 3 to 5 years in areas of molybdenum deficiency (usually high rainfall zones). Maintenance applications of K are usually not needed. Lime is generally not required.

## Growth and grazing

Usually legumes are slow to respond in spring, and may be less palatable at this time (siratro, arachis), and make their main contribution to grazing in late summer and autumn. They are ideal standover pasture for late autumn and winter.

The average stocking rate is critical for legume-grass pastures.

**Twining:** A low average stocking rate is essential (1 cow/ha Atherton Tableland, 0.5 cows/ha Brisbane Valley). Efficiency of grass harvest is much less than for pure grass pastures, but diet quality is higher and forage is available in late autumn and winter.

**Shrubby:** More robust with periodic heavy stocking, average approximately 0.8 cows/ha in the Brisbane Valley. Seed set is important before winter grazing.

**Ground running:** Need to be heavily stocked (2 cows/ha in the Brisbane Valley) to remove shading and encourage spread, especially the arachis varieties. Milking cows may require additional forage areas of other pasture types, such as pure grass, to obtain sufficient bulk.

**Trees:** Normally “crash” grazed after extended spelling periods to remove most leaf and small branches. Leucaena dies from continuous grazing. If machinery is available, often plants are “slashed” at approximately 1.5 m height after grazing.

All tropical legumes are frost sensitive. If likely to be frosted forage needs to be grazed before winter.

Pasture yield and milk yield are directly related to legume yield, as the legume is nutritious forage and provides nitrogen for the grass. Legume and grass mixed pastures supported 2 L milk/cow/day more than grass nitrogen pastures.

## Weeds

During establishment the preferred method of weed control is slashing or light grazing. Once established a vigorous pasture should be almost free of annual and biennial weeds. Shrubby weeds such as groundsel and lantana are often physically removed or treated by spot spraying.

## Animal health

There are few animal health problems with tropical legume and grass mixed pastures. Mimosine in leucaena can cause hair loss and poor digestion in cattle. To prevent this cattle are drenched, either naturally from other animals in the herd or by drenching, with bacteria from the rumens of adapted cattle. These cattle have rumen bacteria that can break down mimosine.

## Silage and hay

There is difficulty in cutting and drying these pastures for hay or silage and it is not usually done. Also they are often grown in paddocks not suited to mechanical harvesting. In some situations arachis is grown as a specialist hay crop.

## Further information

Contact the DAFF Customer Service Centre by Phone 13 25 23, or  
Email [callweb@daff.qld.gov.au](mailto:callweb@daff.qld.gov.au)

More technical notes can be found at:  
[www.dairyinfo.biz](http://www.dairyinfo.biz)

Humphreys and Partridge (1995) A guide to better pastures for the tropics and subtropics.

Lowe and Hamilton (1985) Dairy pastures in the Australian tropics and subtropics.

Walker (2003) Amarillo: Grazing peanut for subtropical dairying.

Callow et al. (2013) Successful Dairy Production in the Sub-Tropics

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