Improving native pastures

Native pastures are moderately productive when managed well. The nutritive value of young speargrass is as good as that of any other grass for 4–6 weeks—until the plant runs out of nitrogen and phosphorus because of the infertile soil.

The concentration of nitrogen in the leaf becomes diluted from about the middle of February; by mid-March, available soil nitrogen has run out and, although the leaf is still green, there is no new growth. Even green speargrass may not provide enough protein or minerals for cattle to grow well. Quality begins to drop further once flowering is initiated.

This declining quality means that the herbage cannot be broken down quickly in the grazing animal's rumen; the animal eats less and production falls.

Quality of grazing can be improved and extended into autumn by sowing legumes into the existing pasture.

Native grasses are moderately productive for a short time

What is the main benefit from legumes?

The animals benefit through improved diet from higher levels of protein and minerals, and from the better digestibility of the legume leaf. The benefit is an extra 40 kg of gain to a steer each year at about the same stocking rate.

The hardy legumes usually have little or no effect on the growth of grass unless they are fertilised.

Hardy stylos improve protein and digestibility levels in grazing

Which are the best legumes for my country?

You need well-adapted species which will naturalise and spread over your paddocks; the DPI recommends different legumes for different soil types, so seek local advice.

The main legumes are the shrubby stylos (Seca and Siran) and the Caribbean stylos (Verano and Amiga), with Wynn cassia in the higher rainfall regions.

The shrub legume, leucaena, may have a place as a permanent high-quality fodder on sites with deeper, more fertile soils than those supporting speargrass. Leucaena needs special care during establishment, should be planted in the same way as a crop, and may need irrigation.

Wynn cassia behaves as a free-seeding and fast-growing annual

How useful are the native legumes?

There are many native legumes in speargrass pastures; some of them are illustrated here, others can be identified in *A Guide to Herbaceous and Shrub Legumes of Queensland* and in *Plants of central Queensland.*

'Abingdon clover'– a native desmodium on black basalt soils

The most common species (native glycines, rhyncosia, and desmodiums) are eaten by stock and are probably beneficial. However some may contain alkaloids—Birdsville indigo (*Indigofera linnaei*) can cause Birdsville disease in horses.

Native legumes rarely comprise more than about 10% of the total herbage, but even that amount may help to produce some of the relatively good growth rates of cattle on speargrass.

What are the risks from growing legumes?

Any risks arise from management rather than the legume. The higher quality of the legumes allows the cattle to eat more grass when its quality has fallen in autumn; this might encourage more stock to be kept over the critical winter period. Do not increase stocking rates above 3–4 ha/beast.

Use legumes to put more weight on each animal rather than to greatly increase the stocking rate—unless you fertilise or sow a grass.

Which country should I improve first?

Improve your best country first. 'Better country' for oversown legumes has soil with at least 4 ppm of available soil phosphorus, and a loose soil surface.

How should I sow the legume seed?

In this region, oversowing after a burn generally gives reliable establishment on soils with a loose surface. Some form of cultivation is needed on hard-setting soils.

Oversowing works well because, once the wet season starts, it usually continues with humid conditions ideal for seedlings.

Sow in October–November with hard seed or scarify it for later plantings

Do not destock oversown paddocks as grazing will reduce competition from the grasses

Plant a good seed rate on a small portion (say a tenth) of the paddock and allow stock to carry the seed over the paddock. Although only 30% of the seed in dung is viable, there will be a large amount of seed to spread. Putting a few kg of seed in molasses-based supplements can be a waste of time. At that time of year, most of it ends in cattle camps when and where seedlings cannot survive.

Urochloa sown with stylos improves pasture stability

Do I need fertiliser?

The hardy legumes may not need fertiliser to establish and survive, but will grow more vigorously and set more seed with it, and so will spread more quickly.

Some phosphorus should be applied where the soil phosphorus levels are below 4 ppm as both plants and animals then need extra phosphorus. The extra nitrogen from the legume increases the animal's demand for P.

If the soil phosphorus levels are between 4 and 8 ppm, the legumes will grow well and will provide the animals with protein. However, phosphorus levels may still be too low for the animals and supplements are needed.

If the soil is above 8 ppm, there is enough phosphorus for both plant and animal.

Fertiliser will always give better animal growth rates and carrying capacity than direct supplements, but it is rarely economical on extensive pastures.

Develop the best country first, but apply fertiliser if soil is below 4 ppm P

What about feeding phosphate supplement?

Feeding supplement P is the only practical way to supply phosphorus on extensive properties with large paddocks.

Phosphorus feeding systems are well described in the DPI book *Phosphorus nutrition of beef cattle in northern Australia.*

Supplement requirements and expected steer weight gains

Soil P (ppm)	Supplement phosphorus	Carrying capacity (ha/steer)	Annual LW gain (kg/steer/yr)
Legume in native pasture under live trees – 800 mm rainfall			
4	yes	5	130
6	yes	4	140
8	no	3	150
10	no	2.5	150

What nutrients are deficient in speargrass country?

Generally speargrass soils are very low in nitrogen, low in phosphorus. Sulphur may be deficient in some soils, for example granodiorite and basalts, and extra sulphur can be mixed into a supplement. Check local advice.

When should supplements be fed?

Phosphorus supplement is needed on low P soils during the wet season when the animals are growing, and when there is adequate nitrogen from sown legumes.

Feed P supplement during the wet season when cattle are growing

During the dry season, stock need less phosphorus, but more nitrogen so that they can use standing dry herbage. This nitrogen may be fed as non-protein-nitrogen (urea) or in protein form as, for example, cotton seed.

What problems arise from dry season supplements?

Dry season supplements are now part of routine stock management in the region although they are needed less with early weaning or lower stocking rates.

Dry season supplements allow an animal to increase its intake by 30–40% over the dry season, equivalent to keeping 30% more stock and so putting excessive pressure on the native pastures.

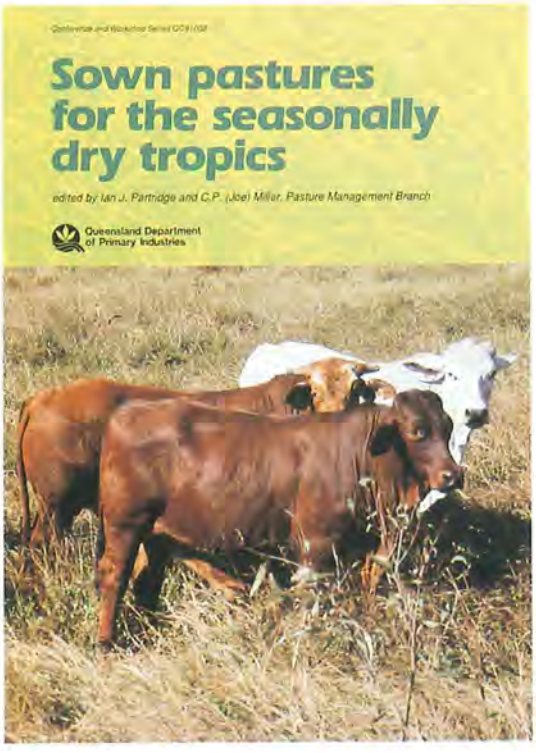
Allow sown legumes to drop plenty of seed before grazing heavily or burning

Will fire damage my sown legumes?

New plantings of legumes must be allowed to drop good seed before the first fire.

After this, stands of most hardy legumes can be rejuvenated by a fire, even if the top growth is killed. Seca and Verano stylo and Wynn cassia can drop masses of seed, and new seedlings will establish. The legumes may also shoot from the base or crown.

Sensibly used, fire can help maintain a good balance of grass and legume. Over-optimistic stocking rates and lack of fire could lead to legume dominance and lower pasture stability.



What about fodder crops?

Some forage sorghums can give a great bulk of feed, allowing speargrass paddocks to be rested. However, they are hungry for soil nutrients, should be planted only on cropping-type soils, and they need farming machinery.

What about fully sown pastures?

Fully sown pastures are more versatile than fodder crops. They provide better feed for more of the year and will last longer provided you plant well-adapted species and manage them properly. Urochloa and buffel grasses are the most commonly planted species, but Bisset creeping bluegrass and the recently released Jarra digit grass have shown promise on poor country.

Fully sown pastures with improved grasses and legumes are outside the scope of this short book on native pastures, so seek local advice.

Plenty of good information is available in the DPI book ***Sown pastures for the seasonally dry tropics***.