Agnote

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Pasture Improvements on Barkly Stations

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INTRODUCTION

The primary reason for sowing improved pasture species is to improve the quality and quantity of the existing pasture base. There is little value in sowing new pasture species into an already healthy stand of grass. The best areas for pasture improvement include holding paddocks, where heavy grazing pressures have run the native grasses down, in ponded areas and where erosion is reducing native pasture productivity.

Pasture improvement is not for the entire Barkly District. In many cases, native grass pastures that are relatively unproductive will respond well to a spell from grazing over the wet season. Improved pastures should be reserved for small, special purpose areas.

SELECTING THE RIGHT VARIETY

The first step in pasture development is to select the variety (or cultivar) best suited to your soil type and average rainfall. There are several species which are well adapted to red soils. There are fewer species suitable for black soils in the low rainfall zones. Perennial species are better for the Barkly region, as they will persist in the paddock for a number of years. Grass/legume mixes provide a more balanced pasture, leading to higher yields than a grass-dominant pasture.

The following is a list of legume and grass species that may improve pasture quality and quantity on the Barkly.

LEGUMES

Stylos (*Stylosanthes* spp) have dominated the legume choice for Northern Australian improved pastures for many years. They range from herb to shrubby types, and are noted for staying green for a longer period than many native species, and for being particularly hardy. Stylos are of considerable benefit in areas of low rainfall and poor soil fertility, where they can provide additional protein and enhance the digestibility of animal diets on native pastures. The following stylo cultivars may be suitable as special purpose Barkly pastures, such as holding paddocks.

Shrubby stylos (*Stylosanthes scabra*) cultivars Seca and Siran

These shrubby stylos are hardy perennials that can reach a height of 2 m. They are adapted to a wide range of soils from gravelly ridges to loamy clays. Both varieties are thick-stemmed and produce small, dark green leaves that are sticky to the touch. Both the leaf and thin stem produced by these plants are palatable and nutritious. Seca stylo has established successfully in red clays and deep red sands on Barkly stations. See Agnote E4 *Shrubby Stylos.*

Verano and Amiga Caribbean stylos (*Stylosanthes hamata*)

The Caribbean stylos are herb legumes which form dense carpets of leaf and stem up to 75 cm tall. Although both are annuals or short-lived perennials, Amiga stylo is more perennial than Verano in drier environments. Both varieties are likely to act as annuals in the Barkly region. These cultivars will grow on sands and clay loams, but not on clay soils. Good quality hay can be made from green, leafy stands of Caribbean stylo. Verano is commonly observed growing in table drains along the Stuart highway as far south as Barrow Creek. See Agnotes E7 *Verano- A Pasture Legume for the Katherine District* and E3 *Caribbean Stylo*.

Seca and Amiga stylos established well at a site in the Barkly region which had 440 mm rain during the establishment year and considerably less in the following years.

GRASSES

This is not an exhaustive list of grass species with potential for pasture improvement. Practical options are limited for the Barkly region, and these species have most chance of success in the area.

Buffel grass (*Cenchrus ciliaris*)

Deliberate buffel grass introductions have been made since the early 1960s, and it is now naturalised in many locations. It has a high demand for nitrogen and phosphorus and may not establish well on some soils.

Buffel grass is a tussocky productive persistent species. However, characteristics attributed to its success, have also emerged as potential downfalls. Its drought tolerance and persistence under grazing gives it the potential to form monocultures. Monocultures are not necessarily desirable as there is evidence that production is higher when cattle graze a more varied pasture. Buffel grass is now regarded as an environmental weed in some areas, as it may displace native species. Please keep this in mind when selecting species for pasture improvement.

American and Gayndah buffel grasses are short to medium height varieties. They grow only from seed and are well adapted to the lower rainfall areas. They produce less feed than other taller varieties and are naturalised in many areas across the southern NT. American buffel grass is more palatable than Gayndah buffel grass and may be selectively grazed out of a paddock. Seed of both varieties is readily available at an affordable price.

Biloela buffel grass is a tall, robust variety that can spread by runners to some extent. It is better suited to higher rainfall areas. It is less drought-tolerant than the shorter buffel types, and also tends to be less palatable. This species was sown on red sand and red clay soil types in the Barkly region, where it germinated but did not establish.

Birdwood grass (*Cenchrus setigerus*)
Birdwood grass is a close relative of buffel grasses. It is a slender, tussocky perennial grass which can spread from seed or from underground runners. This grass species is well suited to sandy, lighter soils with very low rainfall. It is slightly more palatable than the other buffel grasses, and produces high quality green feed and fine, dense, purple seed heads soon after rain. Along with the buffel varieties, birdwood grass is largely naturalised throughout the Barkly region. Seed of this species is usually easy to obtain.

Native millet (*Panicum decompositum*)
This native grass species establishes and grows well on the heavier clay soils (red and black) of this region. In its natural state, it is found spread throughout the pasture, only occasionally forming thick stands. It produces large quantities of forage after summer flooding or heavy rain, and tolerates heavy grazing. It is usually less palatable to stock if it is allowed to grow tall and rank. In trials in the Tennant Creek Region, it has established successfully and produced well on the heavier red soils. It occurs naturally in mixtures with Mitchell grasses (*Astrebla* spp) on the black soil plains. Seed of this species is difficult to track down, but *Greening Australia* may be able to supply small amounts to interested pastoralists.

Bull Mitchell grass (*Astrebla squarrosa*)
Many people are familiar with this native species. It is a coarse perennial grass with tall stems, found naturally on the black and grey clays of the Barkly region. Bull Mitchell grass has germinated successfully in red clay soils behind ponded banks. Further work needs to be conducted to enable the successful establishment and persistence of Mitchell grass for pasture improvement. *Greening Australia* currently has bull and barley Mitchell seed for sale. Favourable seasons for seed harvesting will determine the availability of more seed.

BUYING SEED

To avoid introducing weeds into the pasture, it is important to buy clean seed from reputable seed merchants. Seed should be of high quality and free of contamination. Much of the available pasture and forage seed comes from interstate and contaminated seed may introduce weeds into the Barkly region. Quantities of seed available from merchants may be limited and orders should be planned well in advance of intended sowing dates.

SOWING RATES

Sowing rates will vary with the method of sowing and the type of pasture sown, e.g. a pure stand, a mixed sward or over-sowing into existing pasture. Sowing rates are available from seed merchants and in DPIFM Agnotes.

A lower sowing rate will result in the pasture taking longer to reach its full grazing potential. It is false economy to cut costs by using less seed, because there is a good chance that lightly-sown pasture will be unable to compete with weeds. Failure doubles the costs, by making you sow the paddock twice, or by extending the establishment phase of the pasture.

TIME OF SOWING

Sowing time is very important. Just before the wet season in late December/January is the best time to sow a pasture. This means the seed is in the ground before the rain, but not for so long that ants and termites harvest the bulk of it. It would be ideal to sow into a moist seedbed but, on the red and black clay soils of the Barkly, this is almost impossible. Although a good season is never assured, if the pasture is established over the wet and protected from grazing during the first dry and second wet, it should establish successfully.

METHOD OF SOWING

There are a number of conventional methods of establishing pasture including mechanical seed bed preparation, broadcasting seed into ash and aerial seeding. A cheap and simple method of pasture establishment has been described by John Rains of SouthEdge Seeds in Queensland. His "Pilot Pasture Scheme", mainly for introducing legumes into grass pasture, is outlined below.

The scheme is based on sowing around 100 ha of a suitable legume - grass mix in a fenced area of the paddock. After the fenced pasture has established and set seed, cattle are allowed to graze the small paddock and move the seed around the larger paddock in their dung. This has been particularly successful for introducing stylo varieties to pastures, as a large percentage of stylo seed can pass through an animal's system undamaged. This is a simple, effective method of establishing improved pasture in large paddocks, which continues for years to come.

FERTILISER

Sow your new pasture with fertiliser to make sure each seedling reaches an adequate size before the onset of the dry season. In the case of the pilot pasture scheme, fertiliser applications are strongly recommended. Pelleting of pasture seed (coating the seed with a fertiliser mix) is not recommended, as there have been many establishment failures with pelleted seed in the Northern Territory.

GRAZING

Do not be tempted to put cattle on what looks like a well-established pasture during or immediately after its first wet. Cattle could easily pull the young plants up, thinning out the pasture and making it less productive in the long term. Preferably, a new pasture should not be grazed for at least two wet seasons. This delay will pay off in the future, with the improved pasture still healthy and productive after several years.

WARNING

Pasture plants have the potential to become weeds in certain situations, particularly if allowed to establish in ungrazed areas. To prevent this, ensure that pasture seed and/or vegetative material is not inadvertently transferred to adjacent properties or roadsides.

FURTHER READING

Sown Pastures for the Seasonally Dry Tropics (1991). Ed. Partridge, I. and Miller, C. DPI&F, Queensland.

Stylos for Better Beef (1996). Partridge, I., Middleton, C. and Shaw, K. DPI&F, Queensland.

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