

Improving beef production through persistent and productive legume pastures

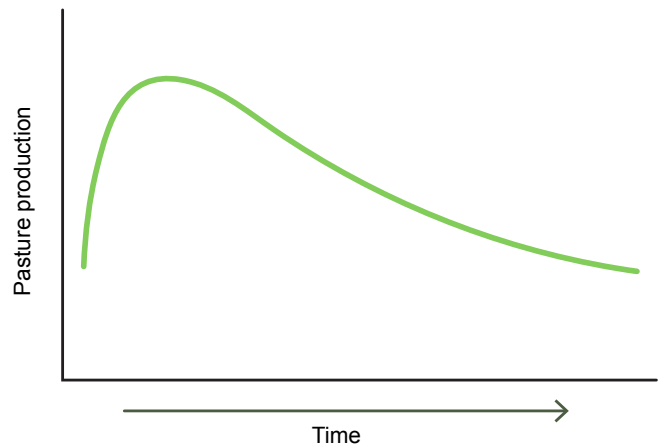


The Brigalow Belt bioregion is an important and highly productive beef producing region spanning, in Queensland, from Dirranbandi and Goondiwindi in the south, through central Queensland to Townsville in the north. Favourable climate and fertile soils support large areas of highly productive sown pastures, with buffel grass being the most dominant grass species. However, productivity of these pastures has declined over time due to the continual tie-up of plant-available nutrients (mainly nitrogen) into organic matter. This phenomenon is known as ‘pasture rundown’. Incorporating perennial and productive legumes into these pastures has been demonstrated to be the most economic and sustainable method to restore long-term productivity.

Despite more than 50 years of sowing legumes across this region, there are very few paddocks with adequate legume proportion to mitigate against pasture rundown and maximise animal response. Research demonstrates there are legumes that will persist in sown pastures in this region, so a change is needed to improve the reliability of establishment to sustain long-term production.

What is pasture rundown?

Pasture rundown is the gradual reduction in pasture growth and quality over time due to the continual tie-up of plant-available soil nutrients (mainly nitrogen) into organic matter. The eventual decomposition of this organic matter, and the release of nutrients, is too slow to support high-yielding grass pasture. Pasture rundown affects all grasses when sown into a prepared seedbed or when the paddock was first cleared or after cropping. The solution is to increase nitrogen supply, and research has demonstrated the best economic option is to incorporate a persistent and productive legume into the pasture.



The impact of rundown on pasture productivity over time.

Why are legumes the best option?

Once established, legumes contribute a moderate amount of nitrogen year-in year-out for companion grasses to use and improve productivity. The initial cost to establish legumes is then followed by many years (decades) of minimal to no costs with moderate to high cattle performance. Alternatively, a nitrogen-based fertiliser can be applied; however, regular application will be needed to maintain nitrogen supply and this incurs significant on-going costs.



Cattle grazing buffel grass and caatinga stylo pasture in central Queensland.

Why don't all paddocks in the Brigalow Belt bioregion have legumes?

Despite the availability of productive and persistent legumes for the clay soils in the Brigalow Belt bioregion and decades of planting by graziers, there are very few paddocks with an adequate legume component (20–50 per cent of total pasture biomass production) to maximise productivity.

Generally, the main reason for low legume content in pastures is that low-cost establishment practices are most commonly used, which typically provide unreliable results. The exception in this region is leucaena, where good agronomy practices have delivered reliable establishment results, which will flow on to long-term productivity benefits. The adoption of these practices has turned leucaena from being very unreliable to establish to very reliable. These same practices now need to be adopted for other legumes in this region (such as butterfly pea, desmanthus, and caatinga stylo) to improve establishment reliability.



Leucaena sown into cultivated and sprayed strips in existing sown pasture.

How can legumes be reliably established in the Brigalow Belt bioregion?

The Brigalow Belt bioregion is a challenging environment to establish legumes due to highly competitive grasses in a climate that doesn't have a distinct wet season and, therefore, has a low reliability of germinating rain closely followed by additional rain. As a consequence, the methods developed in more monsoonal districts to the north or higher rainfall areas do not work in the Brigalow Belt.

Graziers need to choose the right legume for their situation, remove existing grass, store adequate soil moisture before planting, then ensure weeds are controlled after planting to maximise legume growth. Following these principles will not only ensure reliable establishment but also shorter timeframes to full establishment and utilisation through grazing, improving economic return on the investment.



Desmanthus sown into cultivated and sprayed strips in existing sown pasture, ready for grazing.

How do I get more information?

The Department of Agriculture and Fisheries (DAF) sown pastures team is engaging with graziers in the Brigalow Belt bioregion through extension and on-farm activities. Specifically, legume establishment and management workshops will be delivered across southern and central Queensland, where graziers will learn about key techniques to improve establishment reliability and persistence. Field days and other information events will be held at specific times to extend findings to industry and graziers. These activities will be delivered through a joint DAF and Meat & Livestock Australia project titled 'Best management practices for legume establishment in the Brigalow Belt bioregion'. This project started in 2017 and will conclude in 2022.

For more information contact the sown pastures team on (07) 4529 4282 (Toowoomba) or (07) 4843 2605 (Rockhampton) or stuart.buck@daf.qld.gov.au. Alternatively, contact DAF on **13 25 23** within Queensland or +61 7 3404 6999.