

# FEED TROUGH



Your Levy at Work

## SUMMER LEGUMES IN THE SOUTH WEST

Tammy Negus, Agronomist & Regional Feedbase Coordinator

In WA crops like soybeans are often more associated with products for human consumption rather than fodder for cows. This summer (2013/2014) some WA dairy farmers are experimenting with interesting summer legume crops of soybeans, lablab, cowpeas and burgundy beans under irrigation to see whether they have a place in their dairy feedbase system.

Cowpeas (*Vigna unguiculata*), Lablab (*Lablab purpureus*) and forage varieties of soybeans (*Glycine max*) are fast growing annual summer legumes that can produce high biomass, support a high carrying capacity and grow quality fodder. As well as being good for milking cows they can significantly improve soil nitrogen levels by nitrogen fixation. Lablab shows good tolerance to trampling as part of a grazing system, recovers well after grazing and can grow well into the late autumn.

Burgundy beans (*Macroptilium bracteatum*) are a persistent perennial plant. They have a robust root system and a low grazing crown that can continually produce new shoots. Once established they can be used in areas to prevent erosion and are often used in systems as an alternative to Lucerne. They can be grazed or cut for silage or hay.

The Regional Feedbase Development Group (RFDG) have set up a demonstration using lablab, cowpeas and burgundy beans along with sorghum as a complimentary forage at Negus Enterprises near Busselton. Planting the legumes with sorghum or millet can add some real benefits; adding nitrogen to the system for increased yield, providing a more balanced ration for grazing and adding quality to conserved fodder cuts through increased protein content. The mixes will be directly harvested by grazing and assessed for yield and feed quality.

Rodwell farms at Boyanup in conjunction with Les Bekker (Dardanup Rural Services) are growing lablab, cowpeas and soybeans which will be lightly grazed and then ensiled. Fodder beat with the impressive large tuber development is also being grown at this site and will be assessed at harvest.

The biggest challenge on both farms has been the competition with summer weeds, especially the common *Portulaca oleracea* (pigweed). The herbicide knockdown and weed control prior to seeding is very important due to the limited post emergent options. Even with good weed control at seeding the delayed and later germinations of summer weeds can be aggressive and detrimental to the crop growth.

Both farms are irrigating the crops using centre pivots and grow both maize for silage and millet as part of the feedbase system. In addition to the production benefits these summer legumes may have a good fit as a rotational tool and used as a maize 'break crop' every second year.

For more information on these crops and the demonstrations being grown please contact Tammy Negus 0448 532 028 or Les Bekker (Dardanup Rural Services) 0409 149 176. Information has also been sourced from the Department of Primary Industries NSW [www.dpi.nsw.gov.au/agriculture/broadacre/forage-fodder](http://www.dpi.nsw.gov.au/agriculture/broadacre/forage-fodder)



*Dairy farmers Brynley Jenkins and Oscar Negus Jnr discuss fodder varieties and management with Agronomist David Wisewould at January's Regional Feedbase Development Group meeting*

# Making the Most of Summer and Autumn Feed

Rob La Grange, WA Dairy Industry Specialist

A variety of summer diets are fed to dairy cows in Western Australia. Irrigated farms will have a level of grazed fodder in the diet and supplement this with conserved fodders and concentrates. Dryland farms will depend on conserved fodders and concentrate mixes. No matter what the system is, allocating feed to maximise return is important. Key factors include:

## Planning

Most farmers will be aware of what their summer feeding program will involve. Knowing what feed is required and what is available on-farm will determine what feeds need to be purchased. The key issues to address are the levels of nutrients required to achieve targeted production and the relative cost of these. Nutritionists will design a recipe to balance the ration for production and to ensure that there is no threat to the animal's health. Farmers can do this with software packages and DAFWA's Rumen8 program is a farmer friendly and practical tool to help formulate a ration. Having a well-planned feeding program is like flying at night with good radar where you can influence the horizon rather than where it influences you.

## Feed quality of purchased and conserved fodders

Rations can be formulated on accepted industry values for the nutrient content of common feeds but the risk is that the actual feeds being used in the diet differ in quality from industry figures. The 2013/14 grain harvest in WA has seen record yields but there are indications that the CP (crude protein) content of some barley, wheat and lupins is lower than industry average figures. This is particularly important in the case of lupins where the protein content is critical. It pays to have each new batch of cereal/legume grains tested for their nutrient values so as to have a ration that achieves what is it intended to do. This is more important when it comes to silages and hays because of the degree of variability in quality with these feeds. Besides energy and protein content these fibre feeds will impact on total DM (dry matter) intake because of their NDF and ADF (neutral and acid detergent fibre) content. Having these tested will take out some of the guesswork when designing the ration. It is recommended that silages and hays be sampled according to the batches in which they are made. Paddocks cut a similar stage and time should be reasonably consistent in quality and so a representative sample will be sufficient. Some research has shown that good quality hays can be included in the ration at lower levels without a significant impact on production and good quality hay could be more beneficial than poor silage.

## Grazed fodders

Common grazing pasture in summer will be kikuyu, perennial ryegrasses, legumes, herbs, cocksfoots, fescues and mixes of these. The grazing management practices will be a key determinant of quality eaten. Kikuyu grazed on a short round will have a higher ME (metabolisable energy) than if left to become stemmy and mat-like and even at its best, a ME of 10.5 MJ/kg DM is about the maximum. Perennial ryegrass under irrigation in summer will not generally have the ME content that is seen in spring but a feed test will give a better indication of quality. Legumes and herbs have good protein and energy levels. Chicory is worth looking at on WA dairy farms. Whilst it can be a sensitive crop to establish with 2-3 year persistence, chicory sends down a deep tap root and can survive better than other forages where water is limiting. It grows well through summer as Figure 1 below shows.

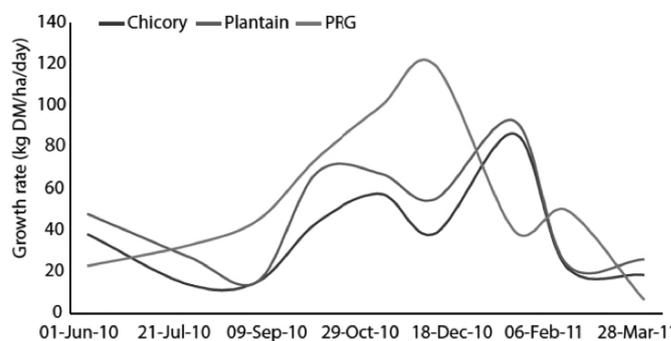


Figure 1. Growth rate of chicory, plantain and perennial ryegrass (PRG) at Terang, 2010/11

(Source: 3030 Project Milestone Report Phase 2 (2011))

Grazing herbs aims to maximise leaf production and minimise stem production without affecting persistence. They are low fibre crops and so care needs to be taken to ensure that the cow gets sufficient daily dietary fibre where these herbs make up a fair portion of the diet. At high levels of inclusion, there can be issues with taint.

For more information on feeds and on Rumen8, please contact Rob La Grange at [rob@westerndairy.com.au](mailto:rob@westerndairy.com.au) or 0448 939 344.

## Save The Date Dairy Innovation Day

Friday May 2, 2014  
Mucca Dairy, Keysbrook

*The home of WA's first installed milking robots!*

# UNLIMITING THE LIMITED: AMINO ACIDS AND MILK PRODUCTION

Dr Bronwyn Edmunds (PhD) | Dairy Research Officer, DAFWA

Identifying the amino acid/s (AA) responsible for limiting milk production may not be as difficult as initially expected, which is great news for dairy farmers.

The results of a recent study investigating changes to the AA profile of forages after they have spent time in the rumen, suggest that the AA composition of rumen-undigested material is similar between forages. This knowledge could bring scientists a step further in developing a tool to help farmer's precision feed protein.

Precision feeding protein will allow a diet lower in crude protein to be fed without negatively affecting production. Benefits of this may be reduced ration costs, improved cow health, reduced nitrogen losses to the environment and overall improved nitrogen efficiency on dairy farms.

Amino acids are digested in the small intestine of the cow and used to make proteins for maintenance and milk production. Proteins are composed of 20 different AA, nine of which cannot be made by the animal and must be continuously supplied through the diet. These are called 'essential' AA.

The profile of digestible essential AA entering the small intestine is the single most important factor affecting the efficiency of protein utilisation for most farm animals. This is also true for the high-producing dairy cow and the production of milk and its components is often restricted by the 'first limiting AA' - that is the AA in shortest supply.

Scientists have identified several AA as 'limiting' in high-producing dairy cow diets, namely lysine, methionine, threonine, histidine and

leucine. It is difficult to identify exactly which AA is limiting and by how much because the AA composition of feed changes in the rumen.

When feed reaches the rumen it is broken down by microbes. The microbes also break down feed protein into smaller components, AA, and then into ammonia which they use to build their own protein. Which feed proteins are broken down depends on how accessible they are and this depends on their rumen degradability. A number of factors can affect rumen degradability, including species, maturity, method of conservation and nitrogen fertiliser application and feeding level.

The study, which completed in Germany and funded by the University of Bonn and international animal nutrition company Adisseo, investigated commonly eaten forages, mainly ryegrass-based, from which degradability was expected to vary based on one of the previously mentioned factors (species, maturity, conservation). It was found that the AA composition was very similar between samples after rumen exposure. These findings could assist greatly in reducing the number of feed samples required to be analysed, saving time and money in terms of research and bring scientists one step closer to creating effective tools that farmers can use to improve precision feeding of protein to dairy cows.

This article is part of Bronwyn's entry for the 2014 Feed Central Young Scientists Awards at the Australian Dairy Conference in Geelong. For more information on amino acids and milk production please contact Dr Bronwyn, Edmunds (PhD), Dairy Research Officer 0468 456 755 [www.agric.wa.gov.au](http://www.agric.wa.gov.au)

## Soil Testing for the 2014 Season

Ralph Papalia, Agronomist Summit Fertilisers

Soil tests and their interpretation by accredited advisors are an extremely useful tool to use for the fertiliser budget on most farms. Soil testing interpretations should cater for yield expectations for the farm, should consider the cost of fertiliser and the returns from applying fertiliser.

Whole farm testing has become popular in the past few seasons as there has been government funding available to do such testing. Like all testing, these whole farm analyses should be compared to historical tests for the farm and also, if tissue testing was recently conducted, this information should be used in conjunction with the soil test to develop a fertiliser strategy for areas of your farm.

Make sure that the soil tests that you do and the results you receive are calibrated for Western Australian growing conditions and that any plant growth models used to work out recommendations are relevant for your situation. For instance, what is the composition of your pasture (clover Vs grass) and how much dry matter can potentially be grown? This will affect the amounts of Macro elements (Phosphorus, Potassium, Sulfur and Nitrogen) recommended.

### Soil testing CHECK LIST:

- Soil test to the right depth (this is usually 10cm) and make sure that this depth is attained and that all soil is retained from this depth. Testing too shallow or too deep will skew the results and lead to poor recommendations.
- Deeper soil testing may be relevant if plant roots feed from deeper than 10cm but calibration models for deeper testing of pastures usually don't exist so recommendations will therefore be a bit of a guess. Deeper testing can, however, give you an idea of chemical restraints to plant root growth (lower pH levels and higher Aluminium may reduce root growth at depth). Deeper testing is generally more relevant for crops than pastures.
- Take a good representative sample of your paddock/s. This may mean you have to test to soil type if a particular soil type dominates the paddock. If you are having a particular problem with plant growth on parts of your paddock, soil test only those areas where the problem exists so that the soil tests relate to the problem area.
- Take at least 30 cores (at 10cm) and combine these. Make sure that you account for variability in the paddock

by testing in a zigzag pattern. If you do this, you will have at least 90% confidence that the soil tests you are taking are representative of the soils in the paddock. Keep away from atypical areas like corners (where the spreader may overlap) and make sure you are sampling soil and that dung does not enter the sample as this will be analysed.

- Try and test the soils at similar time of the year, between years, and make sure that the soil is dry or if the soil is damp, send to the soil to the laboratory immediately.
- Fill in your paddock histories and how much legume history the paddock has. This is important especially if you are cropping the paddocks with cereals.

Soil tests can give you information on the physical (soil structure and texture) chemical (Nitrogen, Phosphorus, Potassium, Sulfur), pH, Salt levels(EC), Organic Carbon, some Trace elements, Cation Ratios and biological components of your soil. You can use this information, along with the knowledge in your head to come up with a fertiliser strategy that will work for you.

For further information on soil testing and fertiliser strategies contact Ralph Papalia 0427 766 535

# Autumn Seeding Checklist

Tammy Negus, Agronomist & Regional Feedbase Coordinator

As we move into 2014 and towards the end of summer we need to start planning our seeding regime for crops and pastures this season. The famous quote used by both world leaders Benjamin Franklin and Winston Churchill "If you fail to plan, you are planning to fail", can be used in the context of growing pastures on a dairy farm. The seeding and establishment of crops and pastures is a very important step in pasture production and fodder investment.

A checklist is a great way to remind yourself of what you need to think about and prepare for in your seeding program to get autumn off to a good start. The weather can play a large part in seeding and can make the seeding operation and also the season a challenge. Some aspects of seeding we have more control over than others.

Aspect	Comment	Check
Timing of seeding	Most farmers wait until after the season breaks before seeding. Dry seeding prior to rainfall can be an option. Consider risk assessment of early false break or if late break, date you must sow dry?	
Size of seeding program	How many hectares require seeding? What is involved in terms of time, cost, machinery, inputs and staff? Do we need to organise a contractor?	
Species and variety type	Make sure the characteristics will match the site and the purpose of the pasture or crop (Grazing, silage or hay?)	
Length of season	Be aware of the maturity dates of the variety and the ideal sowing window dates. This will have an impact on the pasture growth, quality and harvest date.	
Seed quality	Whether it has been grown on farm or bought in – Is it clean, pure, contain weeds or contaminants, certified, germination percentage?	
Seed supply	Talk to your retailer about availability. Often shipments need to come from other states and quarantine can be an issue. Early bird offers and discounts may apply.	
Soil Type	Is the soil sandy, loam or clay. Soil type will impact on moisture retention and drainage. Seed areas early that may get very wet and waterlogged	
Depth of seeding	Seed needs to be deep enough to have adequate moisture but not so deep that it will fail to germinate and reach the surface, especially with smaller seeded varieties	
Row spacing	This is generally machine dependant. Benefits have been shown from cross sowing, however it is time intensive	
Soil temperature	If it is too warm or too cold for some varieties the germination may be delayed and poor plant establishment a result	
Established seed set	Does the paddock need re-seeding? Check existing seed set from last season, quantity and viability	
Seeding rate	Full rate or a top up? Seeding rates can be variety or seed germination percentage dependent	
Legumes	Require inoculant to effectively grow and fix nitrogen into the soil. Some seed comes coated, some is bare and needs coating	
Insect protection	Pasture seed can come coated in insecticide and offer protection in the growing seedling from some pests	
Ground preparation	Is cultivation required or will you direct drill the seed, does lime applied need incorporation?	
Stubble management	Last season's pasture growth may need to be grazed, burnt, raked? Can your seeding equipment cope with the 'trash'?	
Seeding machinery	Has the machine been maintained? Don't wait until the last minute to pull the machine out and check it is operational	
Fertiliser at seeding	Some seeding equipment can drill fertiliser with the seed which ensures good placement of nutrients to the growing plant. With early break delay N fertiliser until after first grazing as generally sufficient N mineralisation, with late break apply N at germination	
Weed Burden	Are you expecting weeds present that are going to affect pasture establishment? If so, delayed seeding and a herbicide knockdown will be required.	

For more information on seeding and pasture establishment contact your agronomist, retailer or contact Tammy Negus 0448 532 028 or [tammy.negus@gmail.com](mailto:tammy.negus@gmail.com)

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