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# CO BEEF

*Information for rural business in Central Queensland*

## Indian couch invasion

why we need to know more!

## Use forages for profitable beef production in the Fitzroy

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# Welcome to CQ Beef 27

Welcome to the first issue of the CQ BEEF feature for 2016.

**Biloela-based beef extension** officers Carly Harris and Jo Gangemi organised a series of National Livestock Identification System (NLIS) Database workshops in January. These proved popular particularly for those who wanted to reconcile devices registered to their PICs. If you're interested in a NLIS Database Workshop or any of our other workshops please register your interest with your local Department of Agriculture and Fisheries beef extension officer.

Accelerated Grazing Best Management Practice workshops (GBMP) around the region have also been popular. We are looking for producers who completed the GBMP modules prior to 2014 to re-sit the modules so we can identify changes to businesses. If this is you and you'd like to see how you are addressing and improving your management changes, please contact your local beef extension officer.

We are hosting another Nutrition EDGE Workshop in Emerald on 10–12 May. Nutrition EDGE is great course for those trying to make economical and nutritionally sound supplementation decisions and improve their nutritional management. If you want better production while spending less on supplements, please contact me for more information about the course.

We are also set to host more High Output Forages Field Days, due to high demand. These will be held at Wandoan on 19 April, Biloela on 20 April and Emerald on 21 April. For a full list of upcoming FutureBeef events and registration details, please visit [futurebeef.com.au/events](http://futurebeef.com.au/events)

*Byrony Daniels*  
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4983 7467



# Indian couch invasion: why we need to know more!

## Key points

- Rapid spread and invasion of Indian couch (*Bothriochloa pertusa*) into Queensland's pastures is continuing. Widely reported in north-eastern Queensland, it is now also taking hold in other, more productive areas.
- Producers in central Queensland have ongoing concerns about Indian couch invasion into pastures and the threat to feed supply and animal production.
- Producer feedback revealed strong indications that a combination of grazing pressure and seasonal conditions are drivers of Indian couch invasion.
- Indian couch produces less biomass than native grasses, has a short growing period and low drought tolerance as it is quick to disintegrate under drought conditions.
- Testing ways to reduce or halt, eliminate, or live with the impact of Indian couch dominance in pastures will be important for developing case specific management guidelines.
- Indian couch invasion in pastures is an important issue that needs to be addressed before further spread occurs.

## Background

**Indian couch**, not to be confused with green couch, is an exotic *Bothriochloa* species that has become naturalised in many parts of Queensland.

Early introductions of Indian couch into Australia took place in the 1930s and again in 1950. Many early plantings were for lawn purposes.

The least desirable strain, Bowen, spread rapidly in the Bowen and Collinsville areas of north Queensland. Compared to other strains Bowen is early to seed and is less vigorous. However, it is a good coloniser of bare ground.

Indian couch tolerates heavy grazing and has competitive advantages such as its prolific seed production and growth by runners, that allow it to persist. Today, it is widespread in the Upper Burdekin Catchment.

Increased dominance of Indian couch in pastures may actually be a symptom of a range of issues such as overgrazing, drought and reduced soil fertility. The fact that Indian couch invasion is taking place on more productive

landscapes, or under different grazing pressures, is interesting.

Adding to our lack of understanding of drivers of Indian couch invasion is that there are no specific management guidelines available to producers on options or actions for either learning to live with Indian couch or for reducing or eliminating it in pastures.

This has led to a lot of interest amongst scientists and extension staff to develop a research and development (R&D) project on Indian couch. Fundamental to such development is producer engagement and feedback.

## Is Indian couch really a problem?

Indian couch is a double-edged sword: it is moderately palatable to cattle, tolerates heavy grazing pressure and holds soil together. So it provides some carrying capacity and provides good ground cover on soil that would otherwise be prone to erosion.

Notwithstanding these benefits, it is also opportunistic and invasive, not as productive as other tussock grasses and can form monocultures. An adage 'turns good country bad and makes bad country better' might very well apply!

There is major concern surrounding the ability of Indian couch to invade and dominate pastures when the opportunity arises, and subsequently alter the feedbase and undermine otherwise productive systems.

## Work in progress: a joint venture

In November 2015, the Department of Agriculture and Fisheries (DAF) funded a small project focussed on developing an R&D proposal to address the loss of productivity in pastures invaded by Indian couch. A key aspect of the work has been consultation with producers and agency staff.

Grazier workshops have been held in north and central Queensland and are planned for the Burnett-Mary.

## Producer feedback – Central Queensland

In December 2015, two workshops took place in Middlemount and Moura, providing an opportunity for producers in the Fitzroy to



Indian couch growing in forest country in central Queensland. Photo courtesy of Stuart Buck.

express their views on Indian couch invasion and what it means to their business.

The workshops highlighted that invasion is taking place in both native and sown pastures. Producers also consider Indian couch is an unwanted, invasive pest species that will, if not addressed, have a major effect on their bottom line.

In central Queensland, the invasion has been within the past 10 to 15 years, with a more noticeable increase taking place over the last five years. Invasion is occurring and expanding across different soil types. Heavily grazed areas are more prone to couch invasion.

Producers indicated a possible link between Indian couch and country that is either lower fertility or old cultivation. Such a nexus may simply reflect this plant's ability to colonise poorer or run-down pastures.

Periods of heavy rainfall may be a factor in some areas, as buffel grass suffers and becomes less competitive when soils are water logged.

Feedback also indicated that Indian couch reduces carrying capacity by around 50 per cent or more on buffel pastures. Managers had to halve stocking rates to achieve the same liveweight gain as that obtained before invasion.

Indian couch also increased lick usage/consumption and affected market opportunities, as a result of cattle not meeting the targeted market specifications and then being held for another six months on property and directed to other, less desirable markets.



# Are your cattle P-deficient and you don't know it?

Most black soils and certain vegetation types were previously considered to be phosphorus (P)-adequate. There has been considerable testing on properties in these areas which has now shown that this is not always the case.

**Ask yourself** these questions:

- Have you ever had your soil P levels tested?
- Have you had the P status of your cattle tested during the wet season?
- Are your cattle not gaining as well as they should be during the wet?

Depending on the severity of the P deficiency, the productivity losses can include 30-40 kilogram weight gain in weaners over the wet season and 10-30 per cent decrease in weaning rates.

There are other signs such as broken bones, bone-chewing and depraved appetite (chewing odd things such as stones, wood, poly pipe) that most people are familiar with. However, the absence of these signs does not guarantee that a phosphorus deficiency doesn't exist.

## When to test for phosphorus status

The most accurate analysis of P status is during the wet season. During the dry season, most nutrients will become deficient and phosphorus in the pasture declines as protein declines.

During the wet season, the phosphorus level in plants should be at its peak. If it is marginal or marginally deficient when the nutritional value of the pasture is at its peak, then the phosphorus deficiency must be managed for.

## Why it is especially important to test this wet season

For properties that have been dry or droughted for several years, the first wet season produces pasture that is very high quality, with particularly high protein levels. Growth rates are also often very high following a drought. If phosphorus is limited in the diet, then the production response by supplementing phosphorus will be even greater.

A phosphorus analysis during the wet season provides you with an indication of whether the cattle are phosphorus-deficient as well as the magnitude of the deficiency.

Phosphorus not only has to be adequate in the diet but it also must be balanced up with protein and energy. When protein and energy

levels increase, such as in the wet season, then the demand for phosphorus will also increase.

If you really don't know the phosphorus status of your cattle, test your cattle now. If the test indicates that phosphorus is adequate, then at least you can rule it out as a primary limiting nutrient to production, and explore other avenues for improving production if your cattle aren't performing as well as expected.

## How to sample?

### Soils

Soil P levels can be tested but the correct procedures must be followed for collecting the samples, and the samples taken in a paddock must represent all soil types in the paddock where the cattle are grazing.

Often, soil P levels can be marginal. This means that strategies for P management of cattle need to be carefully developed to ensure that there is a return on investment with supplementation without compromising animal productivity.

Management decisions should not be based purely on soil P analyses unless P levels are deficient to acutely deficient. This is because the pH of the soil will also influence the amount of phosphorus that is available to the plants and this then obviously influences how much phosphorus is available to the animal.

### Blood

Blood samples must be taken at the end of the wet season but in order for them to be accurate, they must be taken from non-lactating animals. The results from a blood analysis will be very accurate, however, it may be impractical to muster in cattle, and to collect and process the samples.

### Faeces

If you have never had an accurate assessment of the phosphorus status of your cattle and you have a paddock of green feed, now is a good time to do your sampling. The best time to get an accurate analysis is midway through the wet season, and preferably when your cattle have run out of phosphorus supplement for 7-14 days.

All classes of cattle can be tested for P status through faecal analysis. The faecal phosphorus test analyses the P status of the animal and when done in conjunction with a diet quality (F.NIRS) test, the balance between phosphorus and protein can be determined.

If you would like more information on phosphorus management or faecal P testing, please contact me on 46 583 254 or contact your local DAF beef extension officer. (Desiree Jackson has been working closely with DAF staff on a revision of EDGEnetwork® – Nutrition EDGE Workshops).

*Desirée Jackson*

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There was also concern that Indian couch dominance would translate in reduced equity and land value.

There was clear support from central Queensland producers for research into Indian couch control and to identify cost effective ways to reinvigorate grazing lands. New grasses and the incorporation of more legumes were identified as possible strategies for combating Indian couch in the future.

The prolific seed production of Indian couch will pose a challenge to its control, whether that be seed already on the property, that carried onto the property via animals and vehicles, or the fact that seed may be present in the surrounding area, such as along roads.

A key research question is how to reduce the Indian couch seed bank before land is prepared for re-seeding with more desirable species.

## Where to next: Plans for an Indian couch project

Consultation with producers and numerous agency staff on the issue of Indian couch in pastures has revealed a lot of enthusiasm for addressing this problem. The next step is to attract funding so that research focussed on Indian couch and applicable to industry needs can commence. Major priorities are a better understanding of the geographical extent and rate of spread of Indian couch in pastures, quantifying its impact on both landscape function and pasture production, and testing different methods and developing guidelines for managing Indian couch. These will need to be tailored to the different circumstances that exist, such as learning to live with Indian couch where it is dominant versus options for reducing/halting invasion versus options to completely remove it on cultivated land.

Lastly but most importantly: Thank you to the producers who gave up their time. Their awareness, experience and cooperation means R&D is targeted to meet the needs of the wider beef industry.

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Grazing Land Management (scientist)  
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# Leucaena rumen inoculum report available

**Producers grazing cattle** on leucaena pastures will know about the inoculum provided by the Department of Agriculture and Fisheries (DAF) which allows their animals to safely eat leucaena.

What they may not know is that a Meat & Livestock Australia (MLA)-funded project investigating the inoculum has just been completed and the final report is now available.

The inoculum has been produced by DAF for over two decades and the aim of the project was to define the bacterial composition of the inoculum, determine if there had been any major changes in inoculum composition over the last twenty years and to determine the survivability of *Synergistes jonesii* along the

supply chain (production, storage and transport to the producer).

Dr Athol Klieve's team found that only small changes in the bacterial composition had happened over the twenty years of producing the inoculum.

Team member Dr Carl Davis identified that there has actually only been one strain of *S. jonesii* (the bacteria that breaks down the toxin) in the inoculum since fermentor-based production started.

In going back and testing historical samples, the team found that the levels of *S. jonesii* in the inoculum had remained stable over the entire time of production.

When different production chain scenarios were tested it was determined that cryo-protecting and storing at -20 °C had little effect on the viability of *S. jonesii* and its ability to degrade the toxins 3,4-dihydroxy pyridone (3,4-DHP) and 2,3-dihydroxy pyridone (2,3-DHP).

Allowing the frozen inoculum to thaw and keeping it at 2 – 8 °C for 30 hours had little effect on the survival of *S. jonesii* and it was still able to effectively break down 3,4 and 2,3 DHP.

These findings suggest that reductions in *S. jonesii* viability due to conditions along the supply chain are unlikely to impact on the overall ability of the inoculum to establish and maintain its activity in the animal's rumen.

The project final report is available from the MLA website (<http://bit.ly/1SDjZlr>).

*Diane Ouwerkerk*  
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## It's never too early to plan for the next dry season...and now is the perfect time to start

**Adjusting stocking rates** to meet current feed supply, animal requirements, and ground cover targets is considered best management practice within a grazing business.

Best management practice in the grazing industry is about implementing grazing fundamentals that are most effective at achieving a productive, profitable and sustainable grazing business.

Getting organised now means you don't miss anything, and will not leave the job of calculating your forage budget and adjusting paddock stocking rates too late.

The things you can do now include – mapping your paddocks and understanding how they are being utilised by stock, considering how water distribution and land type differences are affecting stock grazing patterns and deciding what areas are priority to do a forage budget on first.

Other considerations to think about now are deciding which stock to sell or move first and which stock might be kept and sold later in the year.

A forage budget will help you decide if it is safe to carry more stock, to carry the same number for longer, or if there is not enough pasture to safely carry the number you have for the length of time you want.

Safely carrying more stock for longer can help boost profits. On the other hand, calculating that you will run out of feed early can help to minimise expensive supplementary feeding and assist in preserving land condition.

For example, a forage budget may indicate that between May and December you can carry 400 adult equivalents (AE) in a particular paddock based on the total pasture yield. If the paddock historically carries 300 AE, then you have identified an opportunity to increase your stock numbers safely.

A forage budget also allows for the opportunity to devise a targeted sell-off plan if grass growing rain is not received during the planned grazing period. This means you could sell your cattle earlier than those who decide to hold stock and are taking the risk that seasonal conditions won't deteriorate further and result in a decline in animal condition.

To help you with your forage budgeting and land condition management, the Department of Agriculture and Fisheries' (DAF) FutureBeef team, with support from Meat & Livestock Australia, has developed a best mate for the grazier in the paddock.

The FutureBeef Stocktake Plus app is a grazing, monitoring and management decision support

tool for graziers and advisors predominantly located in northern Australia. It does have some useful functionality for producers located in other regions.

It has a forage budgeting tool to determine the appropriate balance of stock to available pasture – perhaps one of the most important things for a grazier to manage.

Graziers can set up their own properties and paddocks and the app will then produce reports, based on pasture estimates, including long-term carrying capacity and land condition benchmarks. It will help you to plan for wet season paddock spelling to improve land condition and take better care of your pastures.

As a grazier once said... *'I look after my pastures, the pastures look after my cattle and my cattle look after me.'*

The app's mobility allows users to capture data whilst in the paddock and later securely synchronise their device (via Wi-Fi or 3G access) and upload the data to their personal account. This permits users to:

- capture important production data for analysis
- manage property resources
- understand their property environment over time

- view and export data through a personal and secure portal.

If you have an Apple or Android device you can download the Stocktake Plus app from - [www.stocktakeplus.com.au](http://www.stocktakeplus.com.au)

Fact sheets on how to use the Stocktake Plus app can also be found on this website.

For more information or to learn more about forage budgeting and how to use the Stocktake Plus app, or express an interest to attend a Stocktake workshop, please contact Kiri Broad (DAF Longreach), [kiri.broad@daf.qld.gov.au](mailto:kiri.broad@daf.qld.gov.au) or mobile 0428 102 841. You can also check out the range of events on the FutureBeef website events calendar [www.futurebeef.com.au](http://www.futurebeef.com.au)



The DAF team using the Stocktake Plus app to monitor land condition at 'Wandovale'.



## Grazing BMP hosts NLIS Training Workshops across the Fitzroy

### Key points

- Four NLIS Training Workshops were held between November 2015 and February 2016 in Biloela, Clermont, Rolleston and Moura.
- Registrations for the workshops exceeded expectations with 95 producers attending.
- Presenters included George Basha and Alison Lonnon from the NLIS Helpdesk in Sydney and Doug McNaught from Biosecurity Queensland.
- Feedback from attendees was very positive.

Central Queensland producers, keen to improve their on-farm management practices, recently attended one of four National Livestock Identification Systems (NLIS) Training Workshops held across the Fitzroy region.

The workshops were organised as part of the Department of Agriculture and Fisheries commitment to assisting industry-wide adoption of the Grazing BMP program. The Fitzroy is also a priority Reef Plan catchment for the Australian and Queensland Governments, assisting land managers to achieve best practice to benefit water quality flowing to the Great Barrier Reef.

DAF colleagues in Biosecurity Queensland co-hosted the training workshops, which focused on providing producers with the skills to better manage their NLIS database records.

NLIS underpins premium market access and Australia's biosecurity response system. For producers looking to maximise their returns and reduce their risk, having a good understanding of how to manage their NLIS records is imperative. NLIS can be a handy tool for production management, and workshop attendees learnt how to apply this to their own business situation.

Feedback from the 95 producers who attended the workshops was extremely positive, with all improving their confidence and understanding in using the NLIS database.

*Jo Gangemi & Carly Harris*  
 FutureBeef extension officers  
 Department of Agriculture and Fisheries  
 Biloela  
 4992 9178



## Strong support for graziers committed to Grazing BMP

**Graziers who commit** to following Grazing Best Management Practices (BMP) Program through to accreditation are rewarded with one-on-one support for the grazier's business.

This includes confidentially drilling down into the finances, mapping, stock monitoring and looking at the full extent of a grazier's business to ensure best-management practice on-farm for long term viability and sustainability.

Sue and David Walmsley, of Walm-ley, south of Injune, are working to join the 30 existing grazing businesses in Queensland who have completed certification as Grazing BMP Accredited Producers.

Since purchasing Walm-ley in 2009, the couple has worked closely with Fitzroy Basin Association Inc. (FBA) and their local delivery partner Dawson Catchment Coordinating Association (DCCA) to improve its condition, step by step.

'As a land owner, we have a duty of care to ensure that the land and animals are looked after correctly for the future and manage for the business's longevity business and resources that we have,' Mrs Walmsley said.

Having completed Grazing BMP, the Walmsley's are preparing for a Grazing BMP Audit with the help of a personalised, one-on-one property visit from an FBA grazing land management officer. This visit was supported by FBA through funding from the Australian Government's National Landcare Programme.

The independent property audit is the third and final stage of Grazing BMP so they can achieve Grazing BMP Accreditation.

Mr and Mrs Walmsley welcomed the personalised approach. 'Post-Grazing BMP, the tools and support provided by FBA has been invaluable in helping us achieve best practice in the other areas that we were not proficient,' Mrs Walmsley said.

For more information about Grazing BMP and accreditation phone Lyndal Rolfe at FBA on 0429 992 820 or visit [www.bmpgrazing.com.au](http://www.bmpgrazing.com.au)

### Key points

- Grazing BMP is a voluntary, industry led process offering graziers the opportunity to get up to speed on information and

legislation required to operate a successful grazing business.

- The program is supported by the Queensland Government, AgForce and Fitzroy Basin Association.
- One-on-one property visits are on offer to graziers by natural resource management groups involved in the program and Department of Agriculture and Fisheries (DAF) beef extension officers who follow the process through to accreditation.
- Accreditation is an independent endorsement, certifying that a grazing enterprise meets industry best practice benchmarks.
- One-on-one property visits are designed to support landholders to implement specific actions they identified in Grazing BMP modules, such as preparing for accreditation, mapping property infrastructure or shifting from paper-based monitoring systems to the Stocktake Plus app, developed by DAF and Meat & Livestock Australia.

*Lyndal Rolfe*  
 Fitzroy Basin Association Inc.  
 Injune  
 0429 992 820



## Field days to help graziers solve erosion problems

- Erosion from gullies is considered one of the greatest risks to the health of the Great Barrier Reef.
- Fitzroy Basin Association staff, a soil conservation consultant and project landholders will share their knowledge and experience at demonstration field days across the Fitzroy Basin in April.
- Field days will allow more graziers to see the benefits of erosion mitigation activities and learn how they can implement changes on their property.
- Upcoming field days:
  - » Tuesday 12 April – Brussels, Ogmore
  - » Wednesday 13 April – Eton Vale, Clermont
  - » Thursday 14 April – Moorang, Taroom.

**Demonstration field days** will be held across the Fitzroy Basin in April 2016 to help graziers fix gully erosion problems to help reduce sediment flowing to the Great Barrier Reef.

Through funding from the Australian Government's Reef Programme, Fitzroy Basin Association Inc. (FBA) has worked with six landholders across different locations and soil types to implement gully mitigation works.

It is part of a joint commitment between the Department of Agriculture and Fisheries, FBA and AgForce to promote the industry-wide adoption of Grazing Best Practice Management (BMP).

Three of these projects at Ogmore, Clermont and Taroom will be used as demonstration field day sites for the benefit of surrounding landholders.

All six projects were located in high-risk sediment areas and chosen due to their different soil types.

By doing this, FBA was able to gain the greatest outcomes for landholders and share significant learnings with graziers in the surrounding regions as well.

Initiatives including leaky weirs, silt traps, diversion banks and earthworks have been used to slow flow and trap sediment, redirect water flow and reduce slopes of creek banks. Many of these initiatives will be showcased at the field days to help other graziers reduce erosion and keep their soil on-farm.

FBA staff, a soil conservation consultant and the project landholders will share their knowledge and experience at these field days. This will allow more graziers to see the benefits of erosion mitigation activities to maintain their grazing lands while reducing the amount of sediment that reaches the Great Barrier Reef.

To book your spot at one of the field days, email [johnelle.stevens@fba.org.au](mailto:johnelle.stevens@fba.org.au) or call 4999 2832.

*Johnelle Stevens, Fitzroy Basin Association Inc.*  
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# How can you use forages for profitable beef production in the Fitzroy?

The DAF High-Output Forages Team has the resources you need.

## Key points

- **Feeding Forages in the Fitzroy**, a free best practice guide for producers can be found on the FutureBeef website ([www.futurebeef.com.au](http://www.futurebeef.com.au)) – High Output Forage page, or contact Kylie for a hardcopy.
- **Maximising beef production and profits with high quality forages** is a 54 minute Beef Connect recorded webinar.
- **Maximising beef production and profits with high quality forages** is an 18 minute Future Beef video.
- Forage gross margin calculators, free Microsoft Excel spreadsheets to calculate your own forage gross margin, can also be found on the FutureBeef website – Beef Business Tools page.

Come along to one of the free forage workshops being held in April to learn how to utilise high quality forages for profitable beef production.

These workshops address the overwhelming interest in the High-Output Forages Project since the extension of project results began in May 2015 and will be the last offered by the Department of Agriculture and Fisheries (DAF) forage project team.

The DAF and MLA co-funded research project, 'High-output forage systems for meeting beef markets – Phase 2' is currently in its final phase of industry engagement and extension.

Field research was conducted from 2011 to 2014 to benchmark the forage, animal and economic performance of the most common forage options for fattening and finishing cattle in the Fitzroy Basin.

These included: perennial legume-grass forage options, such as leucaena and butterfly pea; as well as the annual forage crops, oats, forage sorghum and lablab. Perennial grass-only pastures were also studied as a baseline for comparison. The project final report was submitted in March 2015 and since then, the project team have been extending the findings and recommendations to producers across the Fitzroy Basin.

In May 2015, the DAF ruminant nutritionist and project leader, Maree Bowen, hosted a free Beef Connect webinar to communicate project results with online attendees from around Australia. Seventy-two people tuned in for the webinar and the recording has since had 396 views on YouTube.

Forage Field Days were held in Clermont, Moura and Taroom in June 2015, where a total of 47 people attended.

The days featured detailed learnings from the forage data sets including agronomy and grazing management, cattle diet quality and nutrition, and forage costs and profitability. Feedback from the days was overwhelmingly positive, with one attendee recording on their feedback sheet that it was *'Probably the best field day I've been to!'*

Starting in October 2015, the DAF Fitzroy Grazing BMP team incorporated a short, 20 minute summary of the High-Output Forage Project, into Accelerated Grazing Best Management Practices (BMP) workshops as an accompaniment to the Animal Production and People and Business modules.

More than 140 attendees over seven workshops have heard the forage findings, with participants rating the usefulness of the 'key messages' an average of 5.6 out of 7.

Due to popular demand, the forage days will be back in 2016. The DAF forage team will partner with Grazing BMP to deliver three free forage workshops in Wandoan, Biloela and Emerald on 19, 20 and 21 April, respectively. These days will not only cover the results of the High-Output Forages Project, but how to best utilise forages in your business for profitable beef production.

Attendees will hear from the project nutritionist, agronomist, economist and technical staff. For more information on the High-Output Forages Project, or the upcoming forage workshops, please contact Kylie Hopkins.

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# Water on the land

The Bureau of Meteorology has recently launched the **Australian Landscape Water Balance** website ([www.bom.gov.au/water/landscape](http://www.bom.gov.au/water/landscape)).

Queensland landowners can now access data through this interactive website to analyse the current and historical water balance on their land and compare it to other areas.

The water balance is simulated using a mathematical model and observations of rainfall, air temperature and sunshine. Water outputs from the model have been compared with many observations of soil moisture, streamflow and evaporation across Australia, including soil moisture measured on the ground with probes and also remotely via satellites.

Clicking on or searching for a locality or catchment will show the daily time series of the root zone soil moisture, evaporation or rainfall for the current year (up to the day before) and this can be easily aggregated to monthly or yearly timescales, downloaded, and compared to the daily data at that point for the past ten years.

The website shows root zone soil moisture for today, last month and last year as a percentage of available water content in the top one metre of soil that is spatially comparable across different parts of Australia. It also shows root zone soil moisture percentiles that rank that daily or monthly soil moisture against the historical record (1911 to now).

For example, a grazier near Roma could compare the current root zone soil moisture with that of January 2015 and see that the soil moisture has dropped from 70 per cent to 7 per cent in just 12 months.

The grazier could also see how widespread the dry conditions were in Queensland in any particular month, for example October 2015.

The website provides nationally consistent modelled data on soil moisture, runoff, evapotranspiration, deep drainage and precipitation at a spatial resolution of 25 square kilometres (a 5x5 km grid). The information is updated daily and is available in near real-time at daily, monthly and annual timescales.

Information is sourced from a model known as AWRA-L, which simulates the flow of water through the landscape from rain to the movement of water through the vegetation and soil and then out through evapotranspiration, runoff or deep drainage to groundwater (Figure 1). This model has won the Research Innovation Award in the Australian Water Association's ACT Awards for 2015.

The data variables available include:

1. Soil moisture – percentage of available water content in the soil profile:
  - » Root zone soil moisture – 0–100 cm
  - » Upper soil moisture – top 10 cm
  - » Lower soil moisture – 10–100 cm
  - » Deep soil moisture – 100–600 cm
2. Deep drainage – an estimate of the water that drains from the bottom of the deep soil layer (6 m) into the groundwater stores.
3. Actual evapotranspiration – an estimate of the combined evaporation and transpiration from vegetation, soil and groundwater.
4. Potential evapotranspiration – maximum possible evaporation that would occur under given meteorological conditions from a continuously saturated surface.
5. Runoff – the water expected to run off the landscape and into the rivers.
6. Precipitation – total rain, hail and snow.

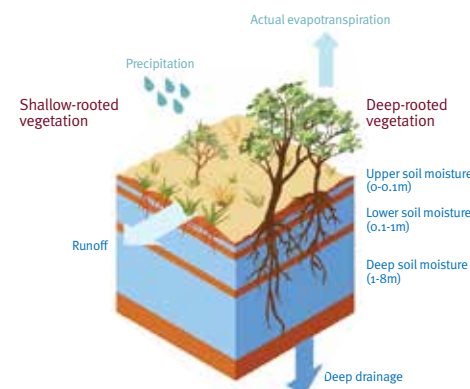


Figure 1: The AWRA-L model

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