

TGAS news & views

about pasture development in the tropics and subtropics

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DPI&F renews interest in sown pasture RD&E

The value of primary production to the State of Queensland is dominated by saleable livestock commodities. Queensland Government projections indicate that of the \$4.47 b provided by livestock and livestock products, \$3.41 b will be derived from cattle and calves, \$260 m from dairy products and \$180 m from sheep, lambs and wool. Of this, more than \$1.2 b is from livestock products derived from grazing sown pasture.

Hence, it is somewhat incongruous that the RD&E capacity of our major relevant Government agencies, DPI&F and CSIRO

has diminished significantly during the past 15 years, associated at least partly with the limited external investment provided by the RIRCs (apart from GRDC) for prioritised sown pastures RD&E.

In 2007, DPI&F recognised that there was under-investment in RD&E for sown pastures for the beef industry, and it has developed an integrated, strategic, sown pastures RD&E process across Business Units, that should improve capacity and

garner investment from both within DPI&F and from the Rural Industry Research Corporations.

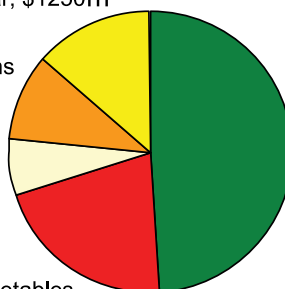
The new pastures 'unit' will focus on issues relating to the incorporation of pastures in mixed farming systems, grass pasture rundown (particularly buffel grass), pasture establishment, maximising the benefits of high quality legume and legume based pastures to livestock, pasture and livestock management, new pasture for targeted needs and weed management in sown pasture/crop systems. This is envisaged within a strong extension and climate change framework.

Other field crops incl. cotton, sugar, \$1250m

Cereal grains \$880m

Amenity horticulture \$605m

Fruit and vegetables \$1940m



Livestock \$4474m

The success of the initiative will depend firstly on the ability to transfer investment priorities

from within DPI&F. A new pasture position for an agronomist has been created in central Queensland to encourage the use of leucaena; there is a significant need to invest at least equally in southern Queensland. If this new strategic focus is realised, there will be a stronger case for gaining external investment, particularly from MLA.

David Lloyd, DPI&F Toowoomba

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Date claimer

Tropical Pasture Conference 2009

at Goondiwindi on 18th and 19th March 2009

We are definitely aiming this conference at producers rather than at the usual more scientific paper level.

There are two sub-themes to the conference:

1. Growing beef on pasture

– with talks and discussion on finishing cattle off pasture and fodder and on backgrounding stock for feed lots.

2. Soil repair and soil carbon

– with talks and discussion about the integration of pastures into cropping systems to repair the decline under decades of cropping and on soil organic matter and carbon sequestration.

This part of the conference will involve a number of short talks from scientists and producers with plenty of time for discussion.

There will be a conference dinner in the evening with a **lecture under the Harry Stobbs Memorial Fund** and given by **Dr Myles Fisher**. Myles is an Australian pasture researcher and ecophysiologicalist who has been working at CIAT in Colombia. He has published widely on carbon sequestration under pastures, and was Lead Scientist for the CGIAR InterCenters' Working Group on Climate Change and attended Expert Workshops under IPCC.

The second day will be devoted to tours of pasture production systems in the Border Rivers region.

Full details of the conference will be given later but please pass the word around and make an entry in your diary.

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45th Annual General Meeting and Field Day

The 45th Annual General Meeting will be held on Thursday 27th November 2008

at 5 p.m. at the Toowoomba DPI&F Training Centre, 203 Tor Street

4.30 p.m. Arrival and smoko

5.00 p.m. Annual General Meeting

Agenda

1. Apologies
2. Minutes of the 44th AGM held at St Lucia
3. Executive Committee Report
4. Treasurer's Report
5. Journal Editor's Report
6. Newsletter Editor's Report
7. Harry Stobbs Memorial Fund report
8. General Business
9. Award of TGS Fellowship
10. Election of Office Bearers
11. Presidential Address

We are planning to finish with a BBQ in the DPI Training Centre. This will cost you only \$5 but we do need to know numbers, so please RSVP to Ian Partridge (see opposite page for phone or email).

Tour on eastern Darling Downs on 27th November

TGS is running a field trip on the eastern Darling Downs on the day of the AGM. We will start with a visit to the NAPCO Wainui feedlot near Bowenville and then visit various pasture paddocks.

Attendees from the eastern regions can meet at the DPI&F complex carpark in 203 Tor Street, Toowoomba at 9.30 am while those from the west can go direct to NAPCO Wainui carpark at Bowenville at 10.30.

We are investigating taking a bus from Toowoomba to Bowenville, and then taking it on the field tour before returning to Wainui.

At Wainui, we will visit the feedlot complex and pasture and tree replanting on the property under the guidance of the Wainui manager, Mr Geoff Cornford.

Which pasture paddocks we will visit to the north of the Warrego Highway will be decided closer to the day when we have checked it all out — but some excellent leucaena stands are on the list.

There will be no charge for the bus ride but we do need a good idea of number so as to hire a suitably-sized vehicle. We will organise a cut lunch (away from the feedlot!) for a nominal cost, and will bring that from Toowoomba.

Please advise George Lambert or Ian Partridge (contact details on the opposite page) if you are coming – for bus seats and catering purposes).

**Check on the TGS website
(www.tropicalgrasslands.asn.au) for any updates**

Aus and NZ Societies of Animal Production Joint Conference

Kevin Lowe, DPI&F Mutdapilly

This was the first time that the Australian and New Zealand Societies of Animal Production have held a joint conference. Held at the University of Queensland at St Lucia in the third week of June this, the conference was attended by more than 250 delegates. The participation of the Kiwis contributed to the event's success and everyone is looking forward to reciprocating in New Zealand in the future.

Biotechnology

Professor Beth Woods opened the conference on behalf of the Queensland Minister for Primary Industries, and this was followed by three talks on aspects of applying gene technology to animal production systems. These included the Underwood Lecture by Graeme Attwood of New Zealand and papers by Isabelle Casser-Malek of France and Jeff Firkins of USA.

Plenary sessions

Other plenary sessions were: 'Smart Foods'; Climate change; Feed-base systems in mixed farming enterprises; Reproductive inefficiencies and

opportunities in beef and dairy cattle; In-utero effects on livestock muscle development and body composition; Development and integration of animal welfare standards into company quality assurance programs into the meat industry; and Methodologies by which to study and evaluate welfare issues facing livestock systems.

Harry Stobbs Memorial lecture

There were also three other presentations: The Harry Stobbs' Memorial Lecture by Grant Edwards gave a New Zealand perspective on a subject dear to Harry Stobbs' heart of manipulating dietary preference to improve animal performance; The 2008 Landcorp Farming Lecture by Paul Kenyon reviewed in-utero environmental effects on sheep production—in my opinion, the pick of the lectures; The McClymont Lecture by Bill Winter and Peter Doyle, was presented by Bill Winter who entertained the audience with his experiences in dealing with farmers of smallholder crop-livestock systems in developing countries.

Publications given at conference

The concurrent and poster sessions covered all aspects of livestock systems in Australia and New Zealand, with a few others from South-East Asia and the Middle East. The 90 papers and 115 posters presented during the conference are contained in three publications: the plenary papers and Australian 4-page papers are published in the Australian Journal of Experimental Agriculture 48, 695-1051; the Australian 1-page abstracts are contained in Animal Production in Australia, Proceedings of the 27th Biennial Conference of the Australian Society of Animal Production 27, pp. 1-115; and the New Zealand contributions are published in the Proceedings of the New Zealand Society of Animal Production,



Feedlot cattle at the new CAAS (Centre for Advanced Animal Studies) complex at Gatton

68th Conference, University of Queensland, Brisbane Australia 68, 1-193. The Australian articles are also available on ASAP's website: www.asap.asn.au.

Dairy and beef tours

The third day of the conference was dedicated to two tours looking at beef and dairy production in sub-coastal, south-east Queensland.

The dairy tour visited Mutdapilly Research Station and Dave, Gwen and Paul Roderick's dairy farm near Harrisville to hear about the R,D & E

programs conducted by DPI&F called 'Forage Plus' and 'Accounting for nutrients'.

The Beef tour took in a farm with leucaena near Blenheim and a property doing tropical pasture development and a feedlot, both near Coominya. Both tours visited the new CAAS facility (shared by DPI&F and UQ) at The University of Queensland's Gatton campus which will house state of the art beef feeding and behavioural studies in low, medium and high security housing.

The social events were well attended and included a welcome cocktail party at Emmanuel College, a dinner at the Legends Room at the 'Gabba and a B B Q at Emmanuel College. Floodlights were kept on at the Gabba ground which was a magnificent sight through the windows of the dining room. At the dinner, presentations of ASAP Fellowships were made to Peter Doyle, Adrian Egan, Hugh Dove, David Coates and Chris Oldham.



Farm tour of dairy pasture work at Mutdapilly (above). John O'Shea and Max Shelton describe the use of leucaena for fattening cattle off pasture.



Coominya feed lot (above). David Illing describes pasture development in the Lockyer region (right).



Pasture seed – mix species or straight?

Brian Johnson, DPI&F Toowoomba

There has been currently considerable discussion by farmers and agronomists about the proportions of different grass species to sow in pasture mixtures. There are some guidelines.

The first is to select the right species for the particular soil type or types in the paddock and for the rainfall of the area. The second point relates to the proportions of each species in the mix.

Minimum of 20% in mix

In pasture workshops, we have been suggesting that the minimum proportion of any one species in a mix should be 20%. This is to ensure that all species sown establish enough plants to contribute quickly to production, and for the most persistent to recruit from seed to fill the gaps. Low populations of establishing species resulting from sowing low proportions will inevitably struggle to contribute to productivity. If the proportion of seed of a single species in the mixture is as high as 80%, then why not sow 100% to that species?

When sowing a bluegrass cultivar such as Bisset, Hatch or Floren in a mixture, it is important to use at least 20% of each as they produce seed late in the season and, in dry seasons, set little seed. On the other hand, species that flower throughout the growing season will invariably set large quantities of seed and have a larger bank of seed in the soil.

Beware of dominance

The proportions of different species and cultivars should be chosen to ensure that any one of them does not dominate the stand. Species that establish and spread quickly will dominate the stand, providing intense competition for slower establishing species. These should be sown at low rates. If dominance is required then sow that species alone.

Cattle select palatable species

Grasses vary in their palatability. Where palatable and less palatable species are sown together, the least palatable will generally have the greatest opportunity to set seed. Such mixtures require astute grazing management to maintain and perhaps increase the proportion of the palatable species in the pasture.

Pioneer species

Pioneer species are sown to provide early production with the expectation that they will reduce in plant numbers over time. There must be enough of the other components in the mix to maintain the productivity in the long term. Low initial proportions of the long-term components will result in gaps that may never or take years to be filled by the more persistent components, as we have seen happen in drier environments. The pasture will regress to become weedy and less productive until the more persistent components spread and colonise. The pioneer species that provides the early production also uses the nutrients that are available after sowing, particularly into a well prepared seedbed.

Mixtures can fit our suite of pasture grasses to soils that vary so rapidly across paddocks in the woodland and some clay soils of the brigalow belt. On uniform soils, the argument for mixtures is more difficult to sustain.

If the cost of seed of a particular species influences the species mix then it would be better to sow half the area and sow more of the species that will persist in the long term.

If adaptation cannot take preference over price, be prepared for a short phase of high production.

Irrespective of the composition of the pasture, try to treat it as you would a crop during the establishment phase to reduce the risk of failure.

And include one or more legumes in sown grass pastures.

Less Rhodes if global warming?

If global warming delivers hotter and drier summers with extended dry periods as predicted, then selection of species with drought resistance will become even more important. The species that this will impact on the most in southern inland Queensland is Rhodes grass, our least drought-tolerant species. In recent times, mixtures have been sown with high proportions of Rhodes grass owing to the availability and low price of seed. This grass invariably thins owing to dry conditions, grazing pressure and the rundown in soil available nitrogen.

White clover in Brisbane lawns

– what has this to do with pastures?

Dick Jones

With the good rains received in coastal SE Queensland since the beginning of winter, I have noted quite a few lawns, in the area of Brisbane where I live, with very vigorous white clover growth. It would be easy to say that this is due to seedling recruitment with the good June-July rains, but I am sure this would be quite wrong. There was no such rapid growth following the good winter rains of 2007. Furthermore, there is no possible way that white clover seedling recruitment in a lawn in early June could have resulted in flowering plants by the end of June. So what has gone on?

Dry autumn killed grass

It probably was initiated by the extremely dry autumn in 2007. This autumn was so dry it killed out blue couch plants, not just topgrowth, in lawns on dryer sites. If blue couch plants died, it is reasonable to assume that white clover stolons also died.

When the good cool season rains started, conditions were good for seedling recruitment – the very dry autumn had reduced grass cover and this, together with the dry conditions, would have aided hard seed breakdown. The seedlings which established grew slowly during winter/spring, but growth was not very noticeable.

Clover survives cool summer

So why did stolons survive so well over the 2007/2008 summer/autumn? The key may lie in the mild summer temperatures – it was a consistent topic of conversation during the 2007/8 summer and 2008 autumn that people did not need to use air conditions as much as usual – certainly not a quantitative measure of temperature but a good biological one!

Some rather simplistic regression analyses I did some 30 years ago suggested that stolon survival over summer was inversely related to summer maximum temperatures. Hence



some stolons persisted over summer/autumn 2008 and were able to respond quickly to the June rainfall and produce flowers within a month.

White clover persistence

What has this unverifiable conjecture to do with pastures? Directly, it only relates to white clover in coastal south-east Queensland and northern NSW – but white clover is probably still the most useful and widespread dryland legume in these areas. By looking at its persistence pathways, we can at least partially understand why years with similar cool season rainfall can produce quite different white clover growth.

In more general terms, it illustrates how an understanding of persistence mechanisms can contribute to an understanding of the interesting changes in botanical composition that are such a common feature of pastures.

Finally, why is that most lawns in Brisbane, like mine, don't have white clover in them? The reasonable assumption is that they have never contained clover; I know mine has had none for the last 36 years - so therefore there is no seed bank to germinate no matter what the cool season rainfall is.

Chopping back tall leucaena

Leucaena, and especially the vigorous tree-type variety of Taramba, can quickly grow tall. Mature cattle such as breeding cows can straddle the tall stems and ride them down to get the leaf but the stand is still too high and woody.

Like with roses in the garden, a good pruning will generate new growth and vitality. With this reasoning, we constructed a leucaena chopper to reduce the old woody growth on our own leucaena which had grown out of reach of the cattle. We then decided to offer our machine for contract chopping.

By May 2008, we had chopped around 2500 hectares of leucaena in Central Queensland. We have cut old stands and leucaena that was only 3 years old but had got out of hand.

Shattering, – not saw-ing

Leucaena needs chopping with a shattering-action as opposed to a saw-action. We have seen the results of both methods on our own property. When cut with a saw-action, leucaena re-shoots from the top of the stalk whereas, when shattered by a chopper, it re-shoots all the way down the stalk, giving more new shoots per plant.

Cattle can help to control the height of the plant by breaking off some of the tall branches, but it is the main trunk that needs chopping back to really rejuvenate the plant to its full potential. We chop at a metre high so that the root system is not badly affected, and the plant can respond quickly.

More new shoots

University of Queensland researchers tell us that a new young branch of a plant can produce a leaf as often as every 2 weeks whereas a mature branch may only produce a leaf every

8 weeks, particularly when in the flowering stage. Chopping also delays flowering.

Thus chopping back the plant can give a big increase in production of leaves— but only when there is good sub-soil moisture and the leucaena is not under attack by psyllids.

Brings back youth and vigour

Young leucaena looks healthier. When greyish patches appear on the stems and, in extreme cases, scale insects, the plant loses its vigour. We have found that chopping can break the build-up of scale and so improve leucaena health.

Chopping the plant helps to rejuvenate the grass between the rows by increasing light penetration and mulching old growth. This enables either tynes or offsets to go between the rows to cultivate if grass needs to be re-planted.

With the high value of good established leucaena land, we need to treat it as a crop and not just a grazing paddock.



Chopping tall leucaena, and regrowth after 6 weeks



Chop every 5 years?

From my observation of the regrowth, I would say that leucaena in Central Queensland needs chopping at least every 5 years. The energy reserves in the root system will result in more rapid regrowth than the original growth after establishment.

Keeping the leucaena plant young and growing around 2 to 2.4 metres in height helps:

- cattle growth rates
- grass growth between the rows
- leaf production of the leucaena
- reduces pests in the leucaena.

“Do you want to grow timber or feed for the cattle?”

David Alsop, Leucaena Chop, Biloela

Tel: 07 4992 1448

Chopping leucaena isn't for the faint hearted



Too tall and too heavy for cattle to pull down easily

Hard wood, thick stems and large areas call for heavy machinery



Flails shatter the stems giving more shoot sites than after a clean cut with sawing, and leave a mulch rather than a tangle of fallen branches.

Vigorous leafy growth 6 weeks after chopping



Forage for cattle in south Vietnam

John Rains, Southedge Seeds, Mareeba

Anh Phu (near Cu Chi, 60 km west of Ho Chi Minh City) had been a State farm running beef cattle and intensive poultry and pig units. When the central Government liberalised, the state farm became a corporation and a dairy unit of 100 head was added.

The beef cattle were *Bos indicus* Nelore breed imported from Cuba and Australian Droughtmasters while the dairy cows were Holstein Friesian from Australia.

I became involved in 2001 when I joined with expat Neil Schultz to establish a 10 hectare trial of irrigated grass for the 'cut and carry' feeding system.

Heat and hunger

Production from both beef and dairy cattle was extremely low; the Holsteins were severely stressed by poor nutrition and the heat. The Nelore beef cattle were unproductive but, being a gift from Cuba, could not be culled; the Droughtmasters were suffering from the same stresses as the Holsteins.

The animals were kept in feedlot-type sheds and were fed chopped over-mature elephant grass contract grown by local landholders. Twice a day, the animals were spot grazed on paddocks of Ruzi grass (*Brachiaria ruziziensis*) and a guinea grass of Cuban origin but these were productive only during the monsoon season.

New forage system

Ten hectares were limed, sown to a mixture of signal grass, setaria and milanjiana (*Digitaria milanjiana*), fertilised with chicken manure



John Rains at the forage demonstration site

and irrigated with a sprinkler system using underground water and supplying soluble inorganic fertiliser.

The forage was first cut 50 days after sowing and thereafter maintained to a strict cutting height of 15 cm by cutting every 30 days. Fertiliser was applied every two weeks throughout both rainy and dry seasons.

Good quality feed

The old system of cutting the elephant grass every 60 days gave high yields but low quality feed. This 30-day cutting interval maintained excellent forage quality of 10–14 % crude protein and, because of more frequent cutting, similar annual yield. This trial plot so impressed the management that the farm now has 100 ha of irrigated forage, which supports 2000 head or 20 AE per ha.

Potassium levels have been carefully monitored and K applied regularly with N and P. The use of cow manure has helped maintain the P levels of the soil.



From heat-stressed Holsteins in 2003 to contented Brahmans in 2005

Live imports

In 2004, Southedge Seeds became involved in a live shipment of high-quality, adapted Brahman breeders and bulls to become the nucleus of a livestock distribution network. But we stipulated adequate facilities and forage supply, and this has been provided.

Today

The operation at Anh Phu is still going after 7 years with the original forage plot still in production. Because fertility, especially potassium levels, has been maintained and the 'cut and carry' eliminates selective grazing, varietal integrity has been maintained.

The forage production concept demonstrated at Anh Phu has been duplicated in many parts of Vietnam; in the elevated areas and in north Vietnam, where winter temperatures are lower, milanjiana was replaced in the mixtures by rhodes grass (*Chloris gayana*).

Some observations

Vietnam, like some other South-east Asian countries, has a research elite that maintains rigorous opposition to change and this can be a serious impediment to progress.

Some Australian livestock exporters have sent unsuitable poorly adapted cattle to Vietnam with no assurances that the animals would be adequately fed and catered for. Almost all of one shipment of Holsteins died because of inadequate nutrition along with heat and insect stress in the Mekong Delta in 2002. This did little for Australia's reputation. The tropical and subtropical landscape in South-east Asia is littered with the remains of



Original forage plot after four years: signal and Jarra milanjiana 34 days after cutting.

failed dairy projects. These have often been developed on advice from dairy experts from temperate regions of Australia, New Zealand, Europe and Canada and who have no concept of tropical and subtropical forage production and animal adaptation.

I have resisted the request to mechanise the forage operation in Vietnam and other South-east Asian countries where there is a village labour structure. The socio-economic consequences would be profound if mechanisation is totally replaced that most efficient, energetic and enthusiastic of labour force—the village ladies.



Hand harvesting stylo 184 (*S. guianensis*)



When you are paid by the kg, why wait for the tractor and trailer?

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