



# TGS news & views

about pasture development in the tropics and subtropics

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## Easter at Emerald

The conference in Emerald was a great success. Despite the timing between the long weekends of Easter and ANZAC Day (which could not be avoided), and a week of Beef 2000 before, about 140 people attended. This was spot-on a capacity crowd for the main lecture theatre of the Emerald Ag College, so we are pleased to be able to say that we had them sitting in the aisles.

The weather was unfortunate for the organisers, but not for the local farmers. After months of dry conditions, it started to rain the week before, and this continued for the first day's field trip. However, the clouds cleared slightly and sun shone for the second field trip.

Our congratulations must go to the conference organiser, Maurie Conway, and to his bunch of willing local helpers. Maurie has carried this conference on

his shoulders since last year, organising the venue, the speakers and the field trips—a monumental task on top of all his normal DPI work.

### **Bush poet a bonus**

Highlights of the conference obviously included the speakers' presentations and field trips but also John Major, the Bush Poet, on Wednesday night.

The disappointments were the weather and the fact that we did not attract more farmers and graziers—to whom we had biased the talks. However, we did have about 20 producers, who gave positive feed-back about the conference.

*Stuart Coaker (left), winner of the TGS-MLA Pasture Award for 1999, checks his paddock of Milgarra butterfly pea with Conference Organiser, Maurie Conway.*

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# Society News

## Our Internet address

email: [tgs@tag.csiro.csiro.au](mailto:tgs@tag.csiro.csiro.au)

Home page: <http://www.powerup.com.au/~tgsaust>  
for membership forms, the book list and conference details.

Keep a check on this site. We are putting the 'Contents' pages of the newsletter and the journal on the net, along with Practical Abstracts of the journal papers.

*Final papers will be published in the Tropical Grasslands journal; meanwhile we do have some spare books of the working papers available at \$15.*

*Cam McDonald's stall for the TGS Bookshop received good interest and sales at Emerald. Check our Web site for the full list of books available.*

## Jos Boonman

It is our sad duty to report that Joseph Boonman, a TGS member and correspondent, tragically lost his life to an unidentified gunman in Nairobi in February this year. Jos was born in the Netherlands but, from 1966 to 1979, worked at Kitale, Kenya, on seed production in setaria and rhodes grass. This resulted in his Ph.D. from Wageningen University.

After leaving Kenya, Jos returned to the Netherlands and later established himself as a consultant, working in particular at Volgograd and Moscow in Russia. He was in Kenya on a World Bank mission concerned with funding support for the Kenya Agricultural Research Institute when he was murdered.

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## Wanted

Keen amateur journalist/editor to produce newsletter. Must have passionate interest in pastures and grassland and knowledge of new developments in the field. Must be able to write articles and edit copy, and preferably to scan photos and compose layout up to printing stage using desk top publishing packages.

### Help!

I have been newsletter editor for the TGS for the last eleven years and have greatly enjoyed doing it. I would be happy to continue but feel that I am becoming unable to fulfill my obligations to the Society.

I am finding it difficult to produce the News & Views every two months because: my DPI workload seems to increase each year (probably along with everyone else's) Toowoomba is not the centre of tropical and subtropical pasture development I have less and less contact with the fewer and fewer people working with tropical pastures.

Anyone interested — or anyone got any articles for the next issue, **pleeeeeease?**

*Ian Partridge*

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# Letters to the Editor

## Chewing over the baccy

Dear Ian,

Let me introduce myself. I am the Product Marketing Manager for Dow AgroSciences Woody Weed products including Grazon\* DS Herbicide.

I was reading the latest TGS News & Views (Vol. 16 No 1) article titled the 'Woody Weed Advisor' on page 5 and wanted to clarify one point mentioned related to Grazon\* DS Herbicide for the control of Tobacco tree / Tobacco weed.

Grazon DS is registered for the following using the high volume spraying technique.

- Tobacco tree at 300 mL/100L water when actively growing in NT, Qld and WA only. Add a 100% concentrate non-ionic surfactant (e.g. BS-1000) at 100 mL/100L of water for best results.
- Wild tobacco tree at 350 mL/100L water from spring to autumn up to 2 m tall in ACT, NSW and Qld only.

Hopefully this clarifies the uncertainty the readers, Woody Weed Advisor users, and yourself have. Feel free to clarify this point in the next TGS News & Views publication.

**Tony Gellen**

Dow AgroSciences Australia Limited  
*And tobacco weed is a forb, not a woody. Ed*

## Herbage Plant Register on Web

I've put part of the Register of Australian Herbage Plant Cultivars on a web site at: [www.pi.csiro.au/ahpc](http://www.pi.csiro.au/ahpc).

Would it be possible to advertise this website in Queensland through the Grasslands Newsletter? It could be described using the introduction on the first page i.e. "The Register of Australian Herbage Plant Cultivars contains registration statements that have been published in the Australian Journal of Experimental Agriculture since 1990. Information is provided on the origin and development of each cultivar, a full morphological description, and referenced information on the agronomic uses and merits of the cultivar."

If you would prefer to expand this to a short article on registration that compares its aims with those of Plant Breeders Rights, I could send this to you. Either way would be helpful.

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## Joe's Ode to Emerald

Wet and green was Emerald town  
They came from near and far  
To swap ideas and stories  
At smoko, lunch and bar

Maurie and his helpers  
Did us mighty proud  
Rearranging field trips  
Neath the rain and cloud

Speakers mostly thoughtful  
Looking some years hence  
Some provoking smiles and nods  
Occasionally things got tense

A great idea on Wednesday night  
Poetry of the bush  
Songlines of our spirit  
Far from the Sydney push

But the Sydney push need to know  
How beef gets on their plate  
Let's find a champion who can persuade  
Before next meeting date

Hooroo for now, sheilas and blokes  
Go forth with hope, not fear  
We can make the future bright  
If we keep our brains in gear.

*© Joe Miller, April 2000*

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# Turf science racing ahead

In our September '99 issue of News & Views, I mentioned the opportunity that research and extension into turf grasses offered to TGS. Dr John Wilson has been my source of information. He recently attended a talk by James Beard (Professor Emeritus of Turfgrass Science at the Texas A&M University) given at the Indoorpilly Golf Club.

## Turf in the USA

John tells me that some telling points from the USA are:

- US industry provides a lot of money and equipment for turf research
- more than 50% of graduates from Crop Science Departments now major in a turf stream
- these graduates are in demand and can attract high salaries
- turf is not just lawns and fairways, but also for reclamation and environmental purposes
- little of the USA research is targeted towards the specific needs of the tropics.

## Exciting future

The main points of Prof. Beard's talk about the future for research in turf include:

**New turf species and cultivars.** For the tropics, blue couch or sarangoongrass (*Digitaria didactyla*) and tropical carpet grass (*Axonopus compressus*) as low maintenance species. The greatest need will be for improved resistance to stress with transgenic cultivars likely to play an important role.

**Pest management.** The amount of pesticide used should decline with better management practices, better cultivars and more sophisticated physiological modifiers and enhancers.

**Weeds.** Weeds are a major problem but can be lessened with proper mowing and better adapted cultivars. New computerised highly selective herbicide applicators could be developed.

**Diseases and insects.** New species of both are likely to arise, and target-specific pesticides will be developed.

**Energy.** Fuel-efficient mowers, efficient vehicle routing, low-pressure irrigation, grasses that grow sideways more than upwards and recycling are some of the opportunities.

**Water.** Ever-dwindling supplies mean that water use must become more efficient, with better designs of irrigation equipment and management systems, more reclaimed water, cultivars with more efficient evapotranspiration rates and better drought resistance, and better original design of turf sites.

**Fertiliser.** Fertiliser use with controlled release carriers, foliar application, nutrient management plans and super applicators with radiation-controlled sensors.

**Physiological and growth regulation** to reduce the growth of certain parts of the plant and between species and to enhance tillering, colour or stress-tolerance.

## Computer-integrated applications.

Models can be used to predict the need for irrigation or cultural practices or pest outbreaks.

**Root zone stabilisation.** Stabilisation techniques using interlocking mesh matrixes could overcome soil compaction on intensively trafficked turf.

These challenges sound enormously exciting. When was the last time you pasture agronomists heard a wish list like that and with the thought of a profitable market?

Sure to the person on the land, the thought that amenity and luxury pastures are worth more than those for honest animal production must hurt—the same as the thought that the other turf industry (horses racing) is bigger (has more value?) than the dairy industry. But we have to accept that wealth is accumulating in the cities and declining in the country, and so to seek the opportunities that are flowing from that wealth.

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# Weedbug works on woeful turf

The quality of parks in south-east Queensland is declining because of the increase in undesirable grasses and the inability of the naturalised turfgrasses to compete.

The Brisbane City Council has been interested in converting degraded parkland dominated by Bahia grass (*Paspalum notatum*) to softer turfgrasses—mainly blue and green couch (*Digitaria didactyla* and *Cynodon dactylon*). Bahia grass is not a bad turf grass and is certainly hard wearing. However, most of common types seed prolifically and almost constantly over summer; this contributes significantly to the untidiness of parkland and increases mowing costs.

## Weedbug technology

The Weedbug is a commercial wick-wiper applicator for glyphosate. Whereas most wick-wipers hope to apply enough herbicide from a single straight movement of the wick; the Weedbug uses a rotary head of wipers to get better coverage.

In a trial on council land in Ashgrove, the park averaged 31% turf couches grasses in November 1996 before the Weedbug was tested. Some 15 BOTANAL assessments were made over the next three and a half years to see how well one or two Weed-bug applications per year worked. By June 1999, the couches had increased to 80% while the controls remained at 35%.

## Rollo Waite, Samford

Two Weedbug treatments per year trended to better results, and this was confirmed by the rapid decline in the percentage of couches when one application had to be deferred. The control of Bahia grass might have to be an ongoing process.

Unfortunately killing the Bahia grass created favourable conditions for broadleaf weeds to establish and these increased by 25%—along with some weed grasses, particularly crowsfoot (*Eleusine indica*); these would need further control. The most troublesome broadleaf weeds are swine cress, milk thistle and clover which come in with good growing conditions in the winter-spring period. Weed invasion is minimised if the bare areas are colonised quickly by couch.

Bahia is tough. Even when its stolons appear to be dead after treatment with glyphosate, they can recover to re-colonise; blue and green couches are unable to compete with this re-invasion.

However, the double-treated turf needed less mowing to keep it tidy, with half the number of cuts compared to the control and two thirds the number compared to a single treatment each year.

In another trial at Samford, strips of Bahia grass were eliminated by wick-wiping with glyphosate and were vegetatively planted with other creeping couches, Bahia was dominant again one year later in all plots except those planted to 'Aussieblue grass' (*Digitaria didactyla* var. *swazilandensis*).

It seems that better turfgrasses, particularly in new park plantings, would be beneficial.

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## Easter at Emerald<sup>continued</sup>

The conference started a general introduction and a look at the future for grasslands and pastures by Joe Miller and John Hopkinson. The issues they perceived to be foremost for attention were the welfare of the land and the socio-political climate that surrounds grazing industries. Pastures have an increasing role in the restoration of soil fertility; on the Atherton Tableland, loss of soil structure has been seen as more important than loss of nutrients, so grasses have been sown rather than legumes.

The environmental movement and producers need to cooperate (or co-exist) once the extremists on both sides have been marginalised. Technical and economic issues no longer predominate, but have been displaced by community issues with associated implications.

The next talk, by John Burgess on soils and their effect on the potential for animal production, had probably the most 'professional' presentation with pictures and messages on a well-integrated Powerpoint display.

After this, Mike Gilbert spoke about some of the problems of rehabilitating mined land, also suggesting that some graziers should be careful when throwing stones at miners despoiling landscapes. And is there a market selling holes in the ground to cities to fill with urban rubbish?

### Field trips

For the afternoon field trips, one bus went to see a cell grazing site on Queensland blue grass downs, the other to see Stuart Coaker's pigeon pea and leucaena plantings. Both suffered from the drizzly wet conditions; I don't think the bus drivers were gladdened by the sight of centimetres of black soil stuck to the soles of our boots and shoes.

Fortunately for many who wanted to visit both the legumes and the cell grazing, the bus trip to the mines had to be cancelled due the wet conditions, and a second trip to the Coorabelle cell grazing site was arranged for Thursday.

Morning sessions on Thursday were concurrent, so I could attend only the session on grazing, but I heard excellent reviews of John Doughton's talk on pastures on cropping land.

The grazing management talks generated considerable interest. Mick Quirk said that, although there was still plenty to learn about how grazing lands work, we should think critically about any recommended grazing systems. 'Continuous grazing' is no more the answer than cell grazing. A scientific approach would ensure some rigour and discipline to the assessment and evaluation of ideas and theories—maintain a healthy scepticism and beware of pseudoscience that wants to provide all the answers.

Terry McCosker's reply was that if cell grazing is pseudoscience, he was proud of it because it works, and gave examples, backed by the next two speakers.

I missed the cell grazing visit on the first day (which I heard became a bit acrimonious), but the second day was informative.

Some messages that I took to heart were —'You have to be really committed and a top manager to make cell grazing work' from Terry McCosker; 'My pastures have improved greatly under cell grazing and I can now afford to employ

*Prof. Norman Rethman from South Africa inspects leucaena in the drizzly conditions.*

*Cell grazing exponents, Paul Martin (left) of Coorabelle Station, Springsure and Terry McCosker of RSC in front of cattle grazing a cell of Queensland bluegrass pastures.*

*Harry Bishop, one of the new TGS Fellows, looks impressed with the Queensland bluegrass at Coorabelle.*

especially with Norman Rethman's experience from South Africa.

The dinner talk given by John Taylor of CSIRO was about the past and future of the northern grazing industry. The accent has moved from production, to economics, to environment over the past decades—economically sustainable development with a shift from short-term thinking to long-term. Whatever, the future for the grazing industry seems fraught with difficulties for graziers.

a full-time cell grazing manager to assess available pasture feed' – from Paul Martin; 'Not all the benefits to pasture have been from the cell grazing; extra water has made more land available' – from Kerry Martin; 'Cell grazing management has given me a whole new interest in cattle raising' from Robin Sparke. The enthusiasm has to be admired; all DPI pasture agronomists wish we could inspire producers (in the face of such odds!)

David Orr spoke about the benefits and problems on sowing legumes, in particular the potential to acidify soils of low base status—basically those to which the stylos are best adapted. Management practices to reduce potential acidification were described, but not the considerable extension effort that has already gone out to graziers on this subject.

I found Prof. Whalley's talk on the need to view animal production systems as an integrated ecosystem to be fair enough, but it seemed to apply more to the higher rainfall areas of temperate grazing. Northern graziers don't regard grass as a crop to be harvested.

Another disappointment for the organisers was the lack of interest from the many local mining companies in the mine rehabilitation section. Apparently they felt that the conference was for agriculturists—with mining tacked on.

We certainly had plenty of expertise on revegetation and land-use to offer,

*John Rains of Southedge Seeds, Mareeba, became a Fellow of the TGS for his services to seed production and promotion of pasture improvement. John Hopkinson read the citation.*

## Other things seen at Emerald

Peter Larsen noticed that the seed of a leucaena tree in the car park at the Ag College had been attacked by the bruchid beetle. There are numerous native bruchids but the leucaena bruchid is an import that may reduce the 'green' opposition to leucaena. It attacks the seeds in the developing pods and greatly reduces production of whole, viable seed.

The adult beetle makes a minute insertion in the green pod to lay its eggs. The only sign of attack at this stage is a very small 'weep' of sap, but the eggs hatch into larvae that eat the developing green seed (one per seed?). When the pods ripen and brown off, the emerging adult cuts a neat circular hole out of the seed and through the pod case opposite each seed. The result is a row of neat little holes about 2 mm in diameter along the pod casing.

*Bruchid beetles, exit holes from leucaena pods (left) and seed (below).*

## Qld blue leaf hoppers

Many of the seed heads in the paddock of Queensland blue grass at Coorabelle were covered with small black leaf hoppers. Well, to me they looked like black aphids but they could hop vigorously so I'm calling them hoppers. Nearly all the seed heads where we were standing were heavily infested—which must reduce the amount of viable seed.

*Infested seed head of Queensland bluegrass at Coorabelle, near Springsure*

*This slow-moving brown snake must have been trampled by cattle at the cell-grazing water trough.*

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# Grasses and legumes for S.E. Asia

The Forage for Smallholder Project has produced one of the best little books on forages available in the world. While specifically written for local animal production extension workers in the region, it is a prime example of good extension material and is suitable for any of us too.

Sub-titled *How to select the best varieties to offer farmers in Southeast Asia*, this 80-page, full colour booklet has chapters and sub-sections on:

## **1. Before you start**

What are forages?; Why the booklet is needed?

## **2. How to evaluate forages with farmers ...**

Understand the farmers' needs

Choose suitable ways of growing and using forages

Choose forages that are best adapted to the climate and soil

Offer the best varieties to farmers, not any variety of a species

Offer a basket of choices

## **3. How to select the best forages ...**

Suitability of forages for different uses

Adaptation of forages to climates and soils

Special considerations

## **4. More about each species ...**

Grasses

Legumes

Other potentially useful forages

## **5. Appendices**

Origin and identification of recommended forage varieties

Where can we get planting material of these varieties?

## **Participatory research**

The Forage for Smallholder Project has been run by Peter Horne (based in Laos) and Werner Stur (based in the Philippines), and has been strongly involved in participatory research. Instead of their project collaborators in all the countries involved telling farmers what to plant, they distributed a range of selected genetic material from CIAT and CSIRO. Farmers were invited to plant a 'basket of choices' and to work out for themselves what suited their systems of farming and soils.

The final choice of species for the booklet includes several of our Australian cultivars but also many new to Australian eyes. These come from South America and from Africa, and are adapted to higher rainfall and acid soils.

Details of the useful characteristics, limitations and general information are given for each species. Colour illustrations show the material being used in a local production system, as a plant and also as a close-up for identification.

Editions will be printed in Thai, Lao, Vietnamese and Indonesian but, in Australia, you can obtain copies of the English edition through TGS Book Sales for \$10.

*Sample from a double-page spread for Gliricidia*

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# Practical Abstracts

from Tropical Grasslands Vol 33, No. 3 (September 1999)

**Mineral content and nutritive value of native grasses and the response to added phosphorus in a Pilbara rangeland** — by Muhammad Islam and Mark Adams, on pages 193–200.

Variations in mineral content and nutritive value of native grasses and forbs due to seasons were far greater than the variation due to the application of P. This reflected the cycle of rapid new growth after rain followed by slower senescence. The effect of added P occurred during active growth. In dry months, the protein and digestibility of the dominant grasses, buck wanderrie and hard spinifex, were below those for animal maintenance; even with added P, P levels were still too low. Phosphorus supplements need to be fed to cattle.

***Pyricularia grisea* causes blight in buffel grass (*Cenchrus ciliaris*) in Queensland, Australia** — by Ross Perrott and Sukumar Chakraborty, on pages 201–206.

The fungus *Pyricularia grisea*, which causes buffel blight in the southern US and northern Mexico, has now been found in Australia. In the US and Mexico, the fungus infects millions of hectares of their commercial buffel cultivar—known as ‘American’ in Australia.

Since 1993, a die-back of buffel grass, often called ‘ill-thrift’, has been reported in central Queensland. Symptoms of ‘ill-thrift’ are the thinning of plants with reddish-bronze leaves, commonly seen in patches 1–10 metres across, with some of the large patches bare of buffel. We have found *P. grisea* in association with ‘ill-thrift’ in the Baralaba and Banana regions of central Queensland. On young leaves, symptoms appear as elliptical or eye-shaped spots with light brown centres and dark red to dark brown borders. On more mature leaves, symptoms can be confused with drought or other stresses as leaf death can quickly follow infection. Under controlled conditions, one strain of the fungus caused severe damage on American buffel, while other strains caused severe damage on cultivars Gayndah, American and Biloela. More extensive research is needed to establish the extent and severity of this disease, its possible links with ‘ill-thrift’ and its economic significance.

**Effect of nitrogen on production of *Paspalum atratum* on seasonally wet soils in north-east Thailand** — by Michael Hare, W. Suriyajantratong, P. Tatsapong, C. Kaewkunya, K. Wongpichet and K. Thummasaeng, on pages 207–213.

Applying nitrogen to atrata pastures on seasonally waterlogged soil low in nitrogen will improve grass production and slightly increase crude protein. Nitrogen applied at 20 kg/ha every 30 days throughout the wet season increased yields by up to 250%. Nitrogen applied as compound NPK was more effective than urea, but yields could be further increased by adding cow manure.

**Effect of N rate and time of application on atrapaspalum** — by Rob Kalmbacher and Frank Martin, on pages 214–221.

Although atrapaspalum has been persistent under grazing, is leafy, palatable and relatively digestible, it grows well only in summer and has relatively low protein. Nitrogen fertiliser should be applied close to the start of the rainy season (May in Florida) rather than in March. With intensively managed atra, 112 kg/ha N in late May, followed by 56 kg/ha in early July and September would improve yield and distribution of growth. Maintaining crude protein above 7% in 35-day old atra needs more than a single application of 56 kg/ha N in summer. Forage legumes or supplements may be needed to improve protein in the diet.

**Forage legumes for improved fallows in agro-pastoral systems of subhumid West Africa** — by Lambert Muhr, S.A. Tarawali, M. Peters and R. Schultze-Kraft, on pages 222, 234, 245.

A short-term improved fallow using legumes could enhance soil fertility and provide dry season feed for livestock. Up to thirteen legumes were compared against the natural fallows at two sites.

**I. Establishment, herbage yield and nutritive value of legumes as dry season forage**

Only a few legumes yielded more than the natural fallow, but most had considerably higher protein levels. *Stylosanthes guianensis*, *Centrosema pubescens* and *Aeschynomene histrix* produced most herbage and regenerated well after a maize crop.

## II. Green manure production and decomposition after incorporation into the soil

Following 4-month regrowth of green manure crop after a dry season harvest, *Flemingia macrophylla* yielded the most green manure dry matter and nitrogen, followed by puero and centro. The incorporated plant material has a half life of 2–8 weeks, and N release after 3 months ranges from 20 to 90 kg/ha N. Rapid rates of decay mean that incorporation must be synchronised with the requirements of the following crop.

## III. Nutrient import and export by forage legumes and their rotational effects on subsequent maize

Up to 120 kg N, 10 kg P and 135 kg K per ha were removed as dry season herbage and, after 4 months of regrowth, up to 144 kg N, 18 kg P and 140 kg K per ha were accumulated to incorporate as green manure. Increases in yields of maize ranged from 0 to 147 depending on the site.

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## Some forage and ley legumes for southern Africa

Antony Whitbread and Bruce Pengelly, CSIRO, St Lucia

Farmers throughout the tropics need ley legumes to improve soil fertility for crops and to feed their livestock during their dry season. We have been testing several species of stylo to improve the heavily grazed velds in resettled communal areas in Northern Province of South Africa and in Zimbabwe.

At Tarantaaldraai in the Northern Province of South Africa, a small group of dairy farmers run a cooperative to produce milk for the local community. The area is semi-arid with an annual rainfall of 450–600 mm, and has light sandy loam soils. Although Seca stylo does not spring to mind as a dairy forage, the extremely dry environment and high grazing pressures limit the choices. Seca stylo has successfully established and will be assessed as a cut and carry feed supplement.

In Zimbabwe, we are working with the Grassland Research Centre at Marondera and the highly motivated communities of Wedza and Dendenyore. Here 800 mm of rain falls mostly between November and March, the altitude is 1000 m, and soils are sands to sandy loams from granite.

An interesting success story is the persistence of fine-stemmed stylo since the early 1980s on communal grazing land near Dendenyore. Heavy communal grazing resulted in a pasture almost devoid of other species—including grass. However, after an area was fenced off late in 1999, it transformed into a pasture with vigorously growing native grasses and at least 3 tonnes of dry matter per hectare of fine-stem. With more conservative grazing management, this area will become more productive and be a useful fodder

bank for the dry season.

Farmers in the area have also successfully grown Rongai and Highworth lablab, yielding more than 7 t DM/ha. The suitability of lablab as a conserved fodder is being tested by ensiling it with low-quality grasses and maize stover, or by drying and storing it as hay until the dry season. Farmers are also planning to harvest the seed produced to extend their plantings or to sell to neighbours. The use of lablab to fix nitrogen in a ley farming system is being investigated. After a long history of growing maize, soil nitrogen and organic matter has been severely depleted in these inherently infertile soils.

*Local farmers and extension officers pose in a good crop of Highworth lablab.*

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# A–B C of Grazier Guides

The DPI has produced another guide for managing native pastures. *Managing grazing in the semi-arid woodlands: a graziers guide* covers the semi-arid woodland area in inland Queensland from north of the Central Highlands to south of the Maranoa.

To pasture agronomists used to the native pasture communities of Queensland, the semi-arid woodlands are the *Aristida–Bothriochloa* communities, but this is not a term commonly used by graziers. Most graziers with mixed farming/grazing properties call it their forest country, but, to ecologists, a forest is much more dense than our open woodland with a grassy understorey.

Weston's maps and regional assessments used the broad grouping of *Aristida–Bothriochloa* to cover the diverse pasture units that did not fit into one of the other more discrete communities such as Mitchell grass or speargrass. The result is a range of sub-groups from wire grass under cypress pine to bluegrass under poplar box; however, there are guidelines that have universal application to the region. The extensively managed far northern A–B country (around and north of Croydon) is better covered in *Managing grazing in northern Australia*.

This guide has the same layout and style as the previous graziers guides, making it easy to read and attractive to graziers who might receive it unexpectedly in the post.

The various sections are:

## **An introduction**

describing wiregrass and bluegrasses, the region, its climate, the various local pasture units and some basic ecology of the changes in pasture under heavy grazing

## **Managing your grazing**

covers stocking rates, moving stock around and spelling, burning, clearing or thinning, controlling weeds and improving grazing.

## **Monitoring pastures**

covers the need for monitoring, estimating feed or fuel in the paddock and recognising the important grasses.

Like all good booklets, the guide has a centre fold which describes, graphically, the causes and effects of management on the pastures.

Copies have been posted to all commercial graziers in the relevant regions, thanks to funding from the Meat and Livestock Australia, which also funded production of the book. Extra or other copies are available at \$10 each from the DPI or TGS Book Sales.

Other guides in the series are the general *Managing native pastures*, and specific ones for *Southern speargrass*, *Northern speargrass*, *Mitchell grass*, *Mulga grasslands*, *Grazing in northern Australia*.