Tropical Grassland Society of Australia Inc.

TGS news & views

about pasture development in the tropics and subtropics

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Freedom of information

What a funny impasse. Governments claim to support freedom of information about their activities but often seem to hold back slightly when actually in power. Information about political activities may be one thing; factual information about scientific matters should be another.

I have a site about pasture species on the World Wide Web; this is an adapted version of the book *Better Pastures for the Tropics and Subtropics* by myself and Ross Humphreys. The book is published by NSW Agriculture but is part of the Queensland Department of Primary Industries Internet offering; it is also accessible directly through the Tropical Grassland Society address. The site provides factual information about a number of species, giving the good and the bad about each and other notes about their use. It also carries warnings about undesirable characteristics that could make that species an 'environmental weed' in certain situations.

Deleted facts

I was thus dismayed to find that the DPI had pulled all references to one species (*Hymenachne amplexicaulis*) off my site, without refering to me, following a beat-up article in the Courier Mail. Never letting the truth get in the way of a good story, the paper claimed that the DPI was recommending 'environmental weeds' because they were listed on the Web site.

The species mentioned in the article were *Hymenachne* and *Leucaena*.

Now *Hymenachne* may be invading disturbed wetlands and growing bounteously in water storage areas in central Queensland. Fishery biologists say it tends to stagnate water and reduce oxygen levels and thus affect fish populations. It's said to clog waterways thus impeding flow; it is also now a weed of sugarcane crops. However, other users of seasonal wetlands claim it is growing in harmony with cattle and wildlife.

One also wonders whether its vigorous growth is not at least partly due to the high level of nutrients coming off heavily fertilised arable land. And one wonders whether impeding flow so that rivers deposit their loads of silt and clay before they reach the Barrier Reef might not actually be a 'good thing'. It's creating more wetland and saving the reef!

It may well be that the drawbacks are greater than the benefits, and that it should be classified as an environmental weed. That's not the point. This is that the warning about the potential as 'environmental weed' given on the Web page should have been emphasised, rather than the whole section removed. After all, the World Wide Web is worldwide and people from other states and

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Don't delete useful factual information

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Society News

Our Internet address

e-mail: tgs@tag.csiro.au

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

Keep a check on this site. Although I said that we are putting the 'Contents' pages of the newsletter and the journal on the Net, along with Practical Abstracts of the journal papers, we have progressed one stage better.

Newsletter on the Net

We put the entire May issue of the newsletter on our home page as a pdf file. This was in two forms, one without any of the 16-odd photographs and another with the photos at lower screen resolution. The edition with photos took too long to download so John Hodgkinson zipped it. Readers could download the zip file at leisure (!), and then open it. This worked well for readers in Columbia, South America who despair of receiving the mailed copy. We will have to consider using the Internet for the newsletter for overseas subscribers because the cost of mail has increased again and could exceed the newsletter subscription rate of $20 a year.

Once we have the system working, we may find that we have to issue a password to members so that it is not free to the world. Also we are investigating ways to put the journal on the Net, but again with password access.

Fellow time

It is time again to call for nominations for Fellows of the Tropical Grassland Society. These should be for members worthy by their research or services to the field of pasture science or development.

Nominations should be forwarded to the Secretary of the Society (Dr A. Whitbread, c/- CSIRO, PO Box 102, Toowoomba Q4350 in a sealed envelop marked 'Nomination for Fellow'.

Still 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 (and now write pdf files using Adobe Acrobat Distiller).

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 elses)
- 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?

Ian Partridge

Thanks for the kind words from Zimbabwe, John. And thanks, contributors, for the articles and photos.

Continued from front page

indeed many other countries access the information. And something regarded as an environmental weed in Queensland may not be one elsewhere.

Fortunately, the DPI did not demand that my printed book be burned at the stake; instead they have sensibly inserted a useful printed note illustrating the potential problems with this species. In that, they provided more information for people to make decisions, not less.

Leucaena on the hit list

As for the damnation of leucaena as an environmental weed, this is covered in other articles in this issue. Weedy 'Hawaiian' leucaena has been naturalised around tropical coast lines for centuries; its declaration as a weed in places such as Port Moresby and Darwin is due more to its presence in gardens and waste land than from upsetting the natural ecosystem. DNA testing is showing that the 'improved' forage leucaenas are not those that have naturalised. While there is no need for complacency in managing sown leucaena, its value (throughout the tropical world) has been immense.

Who's right?

I quote extracts from another viewpoint in the Courier Mail. 'They [the greens] really know how to generate unnecessary public alarm', 'Their push … has been far more by the desire to demonise than the urge to provide accurate information', and 'It is okay for greens to exaggerate the dangers and ignore the potential benefits of things they dislike.'

Striking a balance

It is reasonable that the past one-sided leverage for agricultural production should be balanced by concern for the environment. At the moment, the pendulum has swung to the extreme for conservation; in ten years time, it might swing back to a more reasonable balance. Let's hope there will still be some pasture agronomists around then so that we don't have to reinvent the wheel.

I was at the Grassy Landscapes Conference in the NT recently where the audience seemed very heavily weighted against the grazing industry One academic declared that pasture plants were the major source of environmental weeds and that no more forage species should ever be introduced. No mention of noxious weeds still available in urban nurseries, or of the very strict 'Weed Assessment' criteria needed for pasture introductions nowadays. Maybe using discredited papers to illustrate a point helps to create controversy and discussion but is this good science?

At least the conference resolved to listen to and accept both sides of the production/conservation argument.

A voice of reason

I also quote from an article in the National Geographic magazine (July 2000) describing Australian ecological disasters. Neville Nicholls (the Australian 'father' of El Niño) balanced the finger of accusation against Australian farmers by saying, 'There's no way that Australian farmers are stupid, and they weren't stupid last century. It's not just Europeans coming in and doing something to destroy the environment. They brought in land management practices that they thought were appropriate at the time. But they didn't know about El Niño.' Thank you , Neville.

"There's no way that Australian farmers are stupid, and they weren't stupid last century."

It is time we moved on from the currently popular notion of agricultural development all bad, environment all good.

A resolution was passed at the Tropical Pasture Conference to the effect that the grazing industry should fight back against the biased negativity which attracts all the attention of the popular press, and that this Society should be proactive in supporting its case. Let's have some more good news articles about graziers and farmers who have always done the right thing.

Ian Partridge

These views are the personal opinion of the author and may not represent the offical view of any other organisation.

Signal grass and sensitive sheep

Chris Gardiner, JCU, Townsville

The humid tropical climate (3200 mm AAR) in West Java, Indonesia is ideal for grass species such as *Brachiaria*. However, both sheep and goats have developed symptoms of photosensitisation when grazing signal grass (*Brachiaria decumbens*).

On the research station at Jonggol, cattle, buffalo, Javanese thin tailed sheep and the local peanut goats graze on signal grass (*Brachiaria decumbens*), humidicola (*B. humidicola*) and para grass (*B.mutica*) as well as *Setaria splendida*, guinea grass, King grass and the legumes stylo, puero and calapo.

Worse with light haired, light skinned animals

Only sheep and goats

Over several years, we have seen that the sheep—and sometimes the goats but none of the other livestock—grazing signal grass developed symptoms of photosensitisation. They had no ill effects on the other pastures.

Fertilised signal grass grows very vigorously and has a large amount of leaf litter on the soil surface. Cattle gained good weight. Sheep, on the other hand, would often loose weight and become photosensitised. If removed at the early signs, the affected animals often recovered; if not removed, they died.

Peeling ears

Affected animals appear lethargic, standing with drooping heads and with lesions on the ears and nose. These lesions become necrotic, crusty and peel.

The cause?

Photosensitization occurs when UV rays can reach the skin in parts of the animal's body with little hair or wool (nose, mouth and ears). A photodynamic agent such as phylloerythrin absorbs the energy; this is passed on to the surrounding cells which then break down. Phylloerythrin is a normal metabolite produced in the rumen and is expelled in healthy animals through the bile duct. However, phylloerythrin cannot be excreted if the liver is damaged and the bile ducts constricted by, for example, the toxin sporidesmin. Sporidesmin may be produced by the fungi *Pithomyces chartarum* in temperate pastures but we don't know whether this is the cause in tropical *Brachiaria* because of the bulk of leaf litter.

Peeling ears and nose in sheep on siganl grass

In other sheep with photosensitisation and jaundice in Java, crystals have

Lesion over the less protected white-haired part of a goat's body

been found in the animals' bile ducts, kidney tubules and other cells.

Not seen in Australia

Photosensitisation of cattle has occurred on *B. decumbens, B. brizantha, B. humidicola* and *B. radicans* pastures in Brazil, and on cattle on signal grass in Papua New Guinea, but there are no records of it in tropical Australia.

Gospel according to St Leuc

Leucaena (*Leucaena leucocephala* subspecies *glabrata*) has the highest nutritive value of all tropical forages, and is grown as a forage in most tropical and subtropical countries.

It has been grown commercially in Queensland since the early 1970s, and is now widely used in broadacre-grazing systems. These systems are being adopted internationally.

The plus side

The attributes that make leucaena so special as a forage plant are:

- Extremely high nutritive value (very high protein and mineral content, palatability and digestibility) leading to high liveweight gains of growing cattle, a reduction in turn-off age resulting in improved meat quality.
- High nutrition for breeding stock giving increased branding rates and weaner performance.
- Flexibility in feeding enabling graziers to target all domestic and export markets.
- Reduces the winter/dry season 'trough' in feed supply
- Acts as a drought reserve as it is deep rooted
- Fixes nitrogen and restores soil fertility
- Low risk of causing soil acidification on fertile clay soil
- Prevents erosion when combined with a vigorous grass
- Lowers watertable and prevents salt from coming to surface
- Accumulates C in its woody stems and roots and helps our greenhouse gas budget
- Susceptible to flower- and seed-destroying insects which limits production of viable seed and reduces weediness
- Represents a highly productive and long-term sustainable pasture system for cattle producers in northern Australia.

*Fantastically productive broad-acre Leucaena (*subsp. *glabrata) planted on the clay soils of central Queensland (above)*

*Ages-old thickets of naturalised Leucaena (*subsp. *leucocephala) as found on most tropical coast lines, here in Fiji (below).*

The minus side

However, leucaena has some weed potential, particularly for disturbed areas where livestock do not have access. The most significant weed trait of leucaena is its potential to produce large quantities of hard seed that can stay viable for several years. If leucaena escapes to inaccessible, previously disturbed areas, it can form a dense thicket that can out-compete other plants. The 'common' leucaena—a different subspecies–has been present in many rural and urban coastal areas long before the release of commercial cultivars for grazing.

Don't give ammunition to the opposition through careless management.

While there is little evidence that the commercial forage plantings (*Leucaena leucocephala* subspecies *glabrata*) have contributed to the current weed status of the 'common' variety (*L. leucocephala* subspecies *leucocephala*), we should be vigilant.

Although the major environmental threat is from the 'common' leucaena naturalised in coastal areas, inappropriate use of commercial leucaena could add to the current problem. As a result, leucaena growers in central Queensland have developed a Code of Practice.

Follow the 10 commandments and let others see the light.

Code of Practice

The Code targets those features of leucaena that pre-dispose it to weediness and advocates management to limit their impact. The Code aims to:

- limit leucaena planting adjacent to areas where it can cause weed problems
- reduce seed production in grazed stands
- limit the risks of dispersal of viable seed
- control plants that escape from sown pasture areas.

Features of the Code

Recognised around the tropical world as a valuable fodder—growing here in Myanmar.

If you are planting leucaena for pasture, keep to the following guidelines:

1. Only plant leucaena if you need it and are prepared to manage it.
2. Do not plant leucaena near creeks or major waterways. Maintain a dense grass buffer between the leucaena and the high water mark of the creek bank.
3. Control unwanted seedlings/plants that establish outside your paddock or on public roadsides, creek banks and other adjoining areas where cattle do not normally have access.
4. Plant it in a fully fenced paddock so that the very small chance of stock spreading ripe seed is avoided. Keep leucaena at least 10 m away from external fence lines.
5. If the original establishment within rows was sparse, allowing the leucaena to drop ripe seed will not correct the problem. Either maintain it as it is or replant.
6. Graze or cut leucaena to keep it within reach of animals.
7. Graze leucaena in summer so as to minimise flowering and seed set.
8. Maintain a vigorous grass component in the inter-rows. This will provide ground cover to prevent erosion and to compete against the chance of seedlings establishing.
9. Do not plant leucaena in pure stands without grass as this system will be more prone to erosion. A pure stand on light-textured soil may make the soil more acid over time.
10. Assist your local government to identify any stands of escaped leucaena so that action can be taken to control it.
11. Give a copy of this Code to your leucaena-growing neighbour.

[This Code of Practice has been prepared by the Steering Committee of the Leucaena Growers' Association of Queensland in April 2000]

For more details about the Leucaena Growers' Association, contact:
Tim Larsen, Cedars Park, Banana 4702
Phone (07) 4995 7287.

This leuc sitting pretty

Jim Kernot, Mareeba

Concerns about leucaena as a weed have been centred on coastal areas of northern Australia where naturalised leucaena (*Leucaena leucocephala* subspecies *leucocephala*) has been present over the last 100 years. Although leucaena may have weed potential in ungrazed situations, there is only limited likelihood of problems arising under grazing.

Long-term evidence to support the view that continual grazing prevents weed outbreaks of leucaena comes from the Mt Garnet region of North Queensland.

No escape without trial

Peru leucaena was planted by the DPI at Meadowbank Station in 1963 as part of trial to evaluate various legumes. Today, the original plants remain in a small fenced plot. No mature plants have established outside the fenced area in the last 37 years. The few seedlings growing outside the plot are grazed to the ground.

These leucaena plants have not become environmental weeds in nearly 40 years.

Wobble Creek discreet

A number of leucaena trees were planted on the banks of Wobble Creek just upstream of the Burdekin River at the site of the original Valley of Lagoons homestead.

The exact year of planting is unknown but these trees were present in 1964 when Alan Atkinson purchased the property. Our recent survey revealed that the original trees are still present but again there was no evidence of leucaena becoming a weed. Seedlings were growing at the base of the trees, but these were effectively 'bonsai' under the influence of continual grazing. Helicopter surveys did reveal a few isolated plants as far as 1.5 km downstream but no clumps or patches of leucaena.

No expansion of plants from these Peru leucaena trees established nearly 40 years ago.

Plants of north-west Queensland

Jenny Milson has added two new books to her publishing output, which includes *Plant identification in the Arid Zone.*

Pasture Plants of north-west Queensland and *Trees and Shrubs of north-west Queensland* are two magnificent volumes that illustrate and describe nearly 450 mostly native species.

In *Trees and Shrubs,* (330 pages) each of the 150 species has a 2-page spread with great photos of the flowers, leaves and whole plant, along with text briefly describing the plant, where it grows and any potential value or poison.

Pasture plants (350 pages) has 1-page per species for 115 grasses, 12 sedges and 169 forbs of nutritional and aesthetic value—even water lilies.

These books should be on the shelf on anyone interested in plants, whether they be producers, conservationists or land managers. At $40 each, they are not expensive for the quality; this low price is due to generous financial sponsorship from mining and developmental companies as well as the Main Roads Department.

Interestingly, at the recent Grassy Landscapes Conference in Katherine NT, *Trees and Shrubs* well out-sold *Pasture Plants*. Is the word 'pastures' an anathema to conservationists?

Two 'must-haves' for anyone working or living north of Rockhampton, and 'should-haves' for the rest of us.

Letter to the Editor

Susceptibility of buffel grass cultivars. Severe leaf spots on leaves of 'American' buffel on the left; clean leaves of cv. Viva on the right.

Buffel blight saviours?

I refer to the paper of Ross Perrott and Sukumar Chakraborty in Tropical Grasslands on *Pyricularia grisea* blight of buffel grass.

I enclose a photograph taken in the Chaco of Paraguay showing common buffel grass (Texas-4464) on the left side and buffel cv. Viva on the right.

I believe that the disease on the leaves of common buffel is *Pyricularia*, but we found so far that the relatively new cultivars, Viva and Bell, are completely free of this disease.

Dr Albrecht Glatzle
Waldachtal, Germany

Let grass lovers and tree lovers unite

Harry Bishop, DPI, Mackay

An agroforestry project in the Isaac-Connors catchment of the Nebo-Broadsound Shires is looking at ways to increase the viability of beef producers on freehold country. It also aims to help balance both sides of the current vegetation management debate by furthering sensible management of native forest areas on river frontage country, while investigating options for establishing plantation hardwood timber.

6000 trees planted for hardwood

This year, around 6000 timber trees were planted on five properties to give a total plantation area of 7 ha. Tree species/provenances (eucalypt, acacia, tipuana and albizia) were recommended by Queensland Forestry Research Institute staff plus local forestry experience.

Planting in April/May ensures a full profile of moisture and avoids heatwaves around Christmas time. This year, unseasonal rainfall in late April, May and June was good for the tree seedlings but presented some unplanned-for weed problems. Heavy frosts caused some tip burn (worst on lemon scented/spotted gum) but did little real damage.

As cattle will eat eucalypt seedlings during winter (scented/spotted gums were the least palatable) we recommend a three barb or (minimum) two wire electric fence with steel posts maximum 5 m apart, around the plantation sites.

Blue gums on river frontage

Managing native (blue gum) timber areas on frontage country will be a priority this coming year (2000/01). We have selected sites at 'Cardowan' (Connors River), 'Saltbush Park' (Funnel Creek) and 'Langley' (Isaac River), and are looking for sites higher up the catchment in Nebo Shire.

Suitable sites contain areas of moderate to dense blue gum regeneration. The aim is to manage this regeneration to maximise the yield of millable logs, mainly using selective harvestings and thinning (of poor form trees). Fire, grazing and weed management may also be part of the management plan. The market or on-property use options for non-mill logs also has to be considered when developing a management plan.

Foresters and landowners work out a sawlog management plan for regenerating bluegum on river frontage in Broadsound Shire.

Practical Abstracts

from Tropical Grasslands Vol 34, No. 1 (March 2000)

(Apologies. The last newsletter has the wrong heading; the abstracts were from Vol. 33, No. 4. December '99, not No. 3.— beware of using old issues as a template!)

Growth and nitrogen fixation of *Leucaena leucocephala* and *Mimosa caesalpiniaefolia* in a saline soil of the Brazilian semi-arid region as affected by sulphur, gypsum and saline water — by Newton Stamford, J.T. Araujo Filho and A.J.N. Silva, on pages 1–6.

Salinity is a worldwide problem in semi-arid regions. Sodium can be replaced from the soil particles by applying large amounts of gypsum or by using elemental sulphur oxidised with *Thiobacillus*. The resultant sulphuric acid replaces sodium ions and reduces soil pH.

Sulphur inoculated with *Thiobacillus* was more efficient than gypsum for reclaiming the soil. Leucaena was not affected by applying gypsum but growth was reduced when it was irrigated with saline water; sulphur depressed plant height when applied at more than 600 kg/ha.

Mimosa height was reduced by gypsum only when plants were irrigated with salty water whereas sulphur tended to increase plant height.

Leucaena is more tolerant than mimosa to salty conditions but less tolerant of the acidity produced from elemental sulphur.

Effects of nitrogen fertiliser rate and cutting height on leaf appearance and extension in bahia grass (*Paspalum notatum*) — by M. Hirata, on pages 7–13.

In the humid subtropical climate of southern Japan, the rate of appearance of new leaf was highest in April (spring), decreased in May, levelled off until October before declining in late November (autumn). It was reduced only by very low cutting but increased slightly with nitrogen fertiliser. Leaves extended while they were the first to third youngest leaves; this was highest in June–August and lowest in November. They extended faster with less severe cutting and nitrogen fertiliser.

Primary production and soil carbon dioxide emission in the semi-arid grazing lands of Madurai, India — by Meenakshi Sundaravalli and Kailash Paliwal, on pages 14–20.

The carbon balance of an ungrazed black speargrass (*Heteropogon contortus*)/ forb pasture was estimated as the difference between the input of C via litter and root production and the output of carbon dioxide C through soil respiration. The total net production of the grazing land was just over 16,000 kg/ha/yr and occurred mainly during the rainy season. About a third of the total net production occurred below ground. The carbon budget showed the annual inputs of carbon through litter was equivalent to 1100 kg/ha and that due to root production was 2650 kg/ha.

Sown pastures in subcoastal south-eastern Queensland: pasture composition, legume persistence and cattle liveweight gain over 10 years — by Dick Jones, Cam McDonald, Bob Clements and Gary Bunch, on pages 21–37.

Five tropical legumes (Siratro, Seca/Fitzroy shrubby stylo, finestem stylo, Wynn cassia and Bargoo joint vetch) were grown with buffel grass in the southern speargrass zone. Over the ten-year trial period, six consecutive years received well below average rainfall. Siratro did not persist and there was very little finestem left at the end of the dry period; however, Wynn cassia, shrubby stylo and Bargoo survived to comprise 10–40% of the pasture at the end of the trial. Wynn survived partly because it sets large amounts of seed, whereas shrubby stylo and Bargoo set seed but also survived better as individual plants. Management of pasture to control the grass–legume balance and to aid legume persistence is discussed. Pastures stocked at a weaner on 1.4 ha never had to be destocked despite the run of dry years.

Meringa cowpeas (*Vigna unguiculata* cv. Meringa) improve liveweight gain of cattle in late summer-early autumn in south-east Queensland — by R.K. Holzknecht, D.P. Poppi and J.W. Hales, on pages 38–42.

Cattle grazing cowpeas at low or high levels of utilisation grew twice as fast as those grazing pangola grass; they also maintained higher rumen ammonia levels. Primary growth of the cowpea was high at 74 kg DM/ha/day and comprised 50% green leaf, 45% stem and 5% dead material with digestibilities of 64%, 59% and 63% respectively. The stem was readily eaten. Meringa cowpea did not regrow adequately over the autumn period.

Botanical composition and nutritive value of forage consumed by sheep during the rainy season in a Sudano-guinean savanna (central Benin) — by B. Michiels, S. Babatounde, M. Dahouda, S.L.W. Chabi and A. Buldgen, on pages 43–47.

From March to May (just after the first rains), the sheep selected feed with high nutritive value—mostly from young regrowth of grasses and sedges. During the late rainy season, the sheep ate less grass but more forbs and woody dicots. Despite great selectivity, the digestible crude protein levels fell although metabolisable energy was maintained.

Effect of season and concentrate feeding on the eating behaviour of sheep grazing a mixed pasture of *Panicum maximum* var.C1 and *Brachiaria ruziziensis* — by B. Michiels, S. Babatounde, F. Lihounhinto, S.L.W. Chabi and A. Buldgen, on pages 48–55.

When West African Dwarf sheep grazing guinea grass and ruzi grass were supplemented with cassava peels and cotton seed during the short dry season and short rainy season (July–October), they spent less time grazing. Feeding supplement did not alter the quality of the diet selected, but crude protein levels of the diet were higher in the morning than in the afternoon and higher in the short dry season than during the short wet. The sheep spent more time grazing ruzi grass than on guinea grass.

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Multilocational agronomic evaluation of selected *Centrosema pubescens* germplasm on acid soils — by G. Keller-Grein, R. Schultze-Kraft, L.H. Franco and G. Ramirez, on pages 65–77.

Twenty-three new entries of *Centrosema pubescens* were tested on acid soils at 18 locations in tropical America and 1 in tropical China. Common centro did not grow well on the acid soils but the CIAT 15160 accession was outstanding across all sites and was selected for advanced testing. A number of other entries will also be tested.

Measurements of nutritive value of a range of tropical legumes and their use in legume evaluation — by Dick Jones, Harry Bishop, Bob Clem, Maurie Conway, Bruce Cook, Kerry Moore and Bruce Pengelly, on pages 78–90.

The quality of leaf and of stem differed more than differences between species although *Aeschynomene villosa, A. americana, Desmanthus virgatus* and *Clitoria ternatea* had the best quality leaves. However, the amount of leaf that is accessible and acceptable to grazing animals is more important. Differences in the concentrations of minerals were minor but leaves of Seca stylo and *Indigofera schimperi* were higher in sodium. Measuring nutritive value should not be a high priority in preliminary evaluation trials.

Relative responsiveness of some tropical pasture legumes to molybdenum — by Tina Schwenke and Peter Kerridge, on pages 91–98.

Relative responses were measured through the nitrogen concentrations in plant tips. Seca stylo was the least responsive; siratro, Glenn jointvetch, Bargoo jointvetch and Wynn cassia were intermediate; Tinaroo glycine and Desmanthus was the most responsive. Amarillo pinto peanut has large reserves of Mo in the seed but might respond when these have been depleted. Flowering and seeding of the jointvetches and siratro, but not of Wynn cassia, were delayed by low Mo.

Relative persistence of a range of lespedeza (*Kummerowia)* accessions, *Aeschynomene falcata* cv. Bargoo, and other legumes in two long-term trials in southern Queensland — by Dick Roe and Dick Jones, on pages 99–102.

Forty legume accessions, mostly of annual Korean lespedeza, were sown along cultivated strips in undisturbed native grassland. The best lespedeza cultivars persisted well for some three years but had virtually died out after 5 years, probably because they failed to regenerate in a grazed grass sward. Siratro was the best legume after 3 years but had disappeared after 30 years whereas Bargoo jointvetch was still persisting and had spread.

Associative effects of tree legumes and effect of cutting height on the yield and nutritive value of *Panicum maximum* cv. Guinea — by Thakshala Seresinhe and K.K. Pathirana, on pages 103–109.

Guinea grass was grown in a pure sward and with gliricidia and *Erythrina lithosperma. Erythrina* increased the yield of grass and the nitrogen level in the soil. The highest total yields came from grass with gliricidia and were lowest from pure grass. Fibre levels in the grass were lower when grown with legumes and so digestibility was enhanced.

The response of *Panicum maximum* to a simulated subcanopy environment. 1. Soil X shade interaction — by Peter Durr and J. Rangel, on pages 110–117.

Guinea grass was grown under different levels of artificial shade in pots with soil from under the canopy of a large leguminous 'rain tree'. Compared to soil from the open grassland, that from under the tree had high fertility and produced three

times the yield of grass when grown without shade and twice the yield under dense shade.

A novel technique for measuring biomass loss in a diseased tussock grass — by Graham Farrell, S.A. Simons and R.J. Hillocks, on pages 118–124.

A current outbreak of smut (*Ustilago kamerunensis*) on napier grass is reducing grass yields in Kenya by 25–45%. A damage class (based on the percentage of inflorescences infected) was compared to the weight of the whole grass stool. Models were derived from the weight and damage class to estimate losses in stands of differing heights and hence total losses in fields. It is assumed that the healthy parts of the plant will still be fed to livestock, although calculations are provided to indicate yield reduction if diseased plants are totally lost.

Germination and viability of mesquite (*Prosopis pallida*) seed following ingestion and excretion by feral pigs (*Sus scrofa*) — by B.C. Lynes and Shane Campbell, on pages 125–128.

Pigs seek sources of high protein food such as mesquite seeds, and can pass these through them after 14–16 hours. As pigs can travel up to 28 km in 24 hours, they can spread seeds of mesquite to new areas. An average of two viable seeds of mesquite was found in 38 dung samples collected from an infestation at Hughenden, north Queensland, with 19 seeds in one sample.

AGM date claimer

Please make a note of the proposed date for the Annual General Meeting.

Thursday, 23th November

at the

Golden Grove Winery

Ballandean, south of Stanthorpe

The proposed programme:

11 a.m. AGM at the Golden Grove Winery, Ballandean

12.30 p.m Gourmet BBQ lunch at Golden Grove (Cost $13.20 per head)

2.00 p.m. Field trip

We have not finalised the field trip yet because it is still desperately dry in the region. But we trust that it will rain and produce some green herbage by November.

Grasses of interest in the Granite belt include the new Brunswick grass (*Paspalum nicorae*), Premier digitaria and Swann forest blue grass. Legumes are mainly winter-growing types like subclover and Serradella so there will not be much to see of these.

If it doesn't rain, we may have to organise a more interactive winery tour.

How to get there:

Ballandean is about 20 km south of Stanthorpe; the Golden Grove Winery is about 2 km along Sundown Road to the west of Ballandean.

The winery is signposted at the main road. If coming from Stanthorpe, turn right at the school, then turn left at the crossroads.

Follow the signs, and don't stop at the other wineries until after the serious business of the AGM.