Editorial – Issue 36

Top Paddock is a quarterly newsletter published by the Top End staff of the Pastoral Production division of DPIFM. It targets anyone with an interest in the Northern Territory livestock, cropping and horticulture production sectors and contains news, project summaries, research reports, technical notes and updates.

There are normally 12 to 15 articles in each edition, totalling to about 20 to 25 printed A4 pages. While contributors are generally from within DPIFM, articles from other agencies will be included if they are relevant. This newsletter will have a new format from previous editions, being web-based to save on printing costs. However, each edition will be in a “print-friendly” format so printing at home will be quite easy. A printed copy will be available in most libraries.

The editors are always looking for content so if anyone has anything they would like to contribute, please contact them

SMARTtrain and CHEMCERT

by James Gorrie, SMARTtrain Trainer – CDU

CHEMICAL USER TRAINING PROGRAMS

For those of you looking at renewing your Chemical accreditation certificates (which expire after 5 years), Charles Darwin University (CDU) no longer deliver the ChemCert course and have changed over to SMARTtrain. James Gorrie from CDU has supplied some information on this new chemical accreditation program below.

CHEMCERT PROGRAMS

Peter Murphy from Murphy media now facilitates the delivery of ChemCert courses in the Northern Territory. His details are:

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SMARTtrain CHEMICAL TRAINING PROGRAMS

James Gorrie is the trainer for the SMARTtrain program in the Northern Territory.

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Please Note: All programs now consist of on-the-job skills based assessment prior to issuing or re-issuing of accreditation.

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Can Lucerne be Grown Successfully in the Top End?

By Fergal O’Gara - 8999 2233 or 0416 235 734

The short answer is yes, but only for a short period. There are limitations to lucerne production in a tropical environment and the crop will not persist as it does in southern Australia.

Lucerne is one of the most important fodder crops in the world. Its nutritional properties, palatability and productivity make it a popular hay which is always in demand as a stock feed. As a result, many farmers in the Top End have attempted to grow lucerne commercially, but with limited success. This article may help explain why.

Lucerne originates from Iran. It is essentially a desert plant adapted to cold winters and hot, dry summers, and does not persist in hot, humid environments. Lucerne also undergoes a "dormant" or resting phase in winter. This allows the plant to store energy in its crown and root system for regrowth and production in spring and summer. This dormancy phase gives lucerne its longevity and ability to persist for over 10 years in temperate climates.

The dry season in the Top End is ideal for irrigated lucerne production. The warm, sunny weather allows good levels of fodder production. However, the wet season presents several problems. The hot and humid weather, combined with periods of waterlogging, promotes crown and root diseases. Insect and weed invasion also causes management problems.

One of the issues for lucerne persistence in the Top End is that there is no dormant phase due to the hot conditions throughout the year. The crop is continually trying to grow and does not get the opportunity to "rest" and build energy reserves. Plants gradually "run out of steam", succumb to disease and die, leaving a depleted and non-productive stand.

Lucerne has been evaluated in various trials at Douglas Daly Research Farm (DDRF) and Katherine Research Station (KRS). At DDRF, lucerne has been assessed in a semi-commercial trial over three years. The objective was to determine potential hay production and persistence of irrigated lucerne in the Daly region. The trial provided useful information on potential yields and the management of a lucerne crop in a tropical environment.

In the first year of establishment the lucerne produced a total of about 8.0 t/ha over five harvests. The average yield was 1.7 t/ha per harvest. In the second season the crop grew well and was harvested nine times for a total yield of 20 t/ha, which is comparable some areas in southern Australia.

As the stand got older, there was a progressive reduction in population and many plants exhibited symptoms of "little-leaf". This is a condition in which plants become stunted and unproductive. Leaves and stems are miniaturised and eventually the plant dies. The disease is a result of a Mycoplasma-type organism which is transmitted by leaf-hoppers.

Leaf-hoppers are tiny insects which move quickly when disturbed and are hard to detect in a crop. They are present all year and spread the disease as they continually feed on the crop. Little-leaf is probably one of the biggest limitations to lucerne production in the Top End. Chemical control is unlikely to be successful in the long term due to the invasiveness and fecundity of leaf-hoppers.

Despite the severity of the disease and the loss of plants, there was a possibility that a third year of production at a reduced level could have been achieved. However, magpie geese invaded the area and ruined the trial.

The trial indicated that lucerne has the potential to yield viable quantities of forage in the second and possibly third season. However, insect, disease and environmental constraints will reduce the prospects of lucerne persisting as viable stands for more than three years.
Update on the Daly River Management Advisory Committee (DRMAC)

DRMAC was established in 2006 by the NT Government to advise on options for the sustainable use and conservation of natural resources within the Daly River Catchment. The Committee includes landholders and representatives from the major stakeholder groups, including the NT Cattlemen’s Association, the NT Horticulture Association, the Katherine Region Tourist Association, the Amateur Fishermen’s Association, the Daly River Aboriginal Reference Group and the Environment Centre of the NT. The Committee also includes NT Government representatives from relevant agencies to ensure DRMAC has access to the information and tools it needs.

The Chair of DRMAC is Mr John Childs. John is a Director of a Bush Business Consulting firm, Deputy Chair of the Board of Land and Water Australia and a member of the NT Pastoral Land Board. From 1997 to 2002, John was Director of the Tropical Savannas CRC.

The major issues that DRMAC will initially address include land clearing, water management and subdivision. DRMAC will also advise on the development of an adaptive management framework to assist in decision-making and balancing the needs of development and conservation when considering these issues.

Adaptive Management involves:

- Putting in place performance indicators and monitoring systems to measure changes in the Daly such as the availability of fish and to water flows;
- Establishing flexible arrangements for the use of the Daly’s resources;
- Taking small steps in the use of the Daly’s resource to test whether adverse changes occur;
- Using the knowledge gained to adjust use of the Daly’s resources.

DRMAC has held 3 meetings with the most recent held in Katherine from Wednesday 28 February to Friday 2 March 2007. The major focus of this meeting was land clearing and water management.

As part of its work, DRMAC will consult widely and draw on the advice of its subcommittees, such as the recently established Katherine Water Allocation Committee, and stakeholder groups. DRMAC has also received for consideration major papers on adaptive management and conservation and development of the Daly by the NT Cattlemen’s Association, the Daly River Aboriginal Reference Group and the Environment Centre of the NT.

For further information on DRMAC visit www.nt.gov.au/drmac or contact the Executive Officer DRMAC at the Department of Natural Resources, Environment and the Arts on 8999 3448 or by emailing drmac.nreta@nt.gov.au

Annual Review of Sabah Government Farms

by Barry Lemcke and Phil Hausler

In July 2006, Barry Lemcke and Phil Hausler travelled to Sabah on the island of Borneo to conduct the 3rd annual review of Sabah Government Cattle and Buffalo Farms since the 2003 Breeder Training Course held at Tawau. The government farms receive shipments of Australian cattle for distribution to farmers and it is
important to demonstrate best practice management on these farms. This best practice management can then be used as an example for extension services and cattle farmers, as well as ensuring duty of care for imported stock.

A total of seven farms were inspected between the 12th and 19th of July 2006. The review consisted of detailed farm inspections of cattle, equipment and paddocks as well as scrutinising farming reports and record keeping systems.

Significant progress has been made on most of the farms to the extent that the process seems worthwhile.

There is still plenty of room for improvement on many fronts in pasture establishment, grazing management, breeder management, and specifically in the bedding in of conservative stocking rates on all of the farms.

A competition (resulting in 2 awards) is to be inaugurated in 2006 to recognise those farms achieving good farming outcomes and showing the greatest improvement over the year compared with 2005. The measure of efficiency will be the income produced as a proportion of the number of breeders run on the farm and will recognise the value of turn-off, reproduction rates and lack of mortalities.

Renewed Interest in Soybeans

by Rowena Eastick, Research Scientist

There is renewed interest in soybean production in the Top End. Katherine Research Station, in conjunction with Crops, Forestry and Horticulture (CFH), is comparing oil yield of soybean and sunflowers. Weed management is one challenge of soybean production, so an experiment to examine a number of herbicides, with particular emphasis on control of senna (sicklepod), was incorporated into the soybean area. Senna is also a major problem in cavalcade crops – there are currently no herbicides which can selectively control senna in this pasture. Results from the soybean herbicide trial may have some transferability for future herbicide evaluation in cavalcade.

Of relevance to this, the 14th Australian Soybean Industry Conference “Success with Soybeans” is being held in Bundaberg from the 26th to 28th March 2007. Rowena Eastick will be representing DPIFM, and has submitted a paper to be included in the conference proceedings. An abbreviated version of the document follows:

Weed management – a major challenge to the ‘success’ of NT soybean production.

Introduction

Soybeans are not grown commercially in the Northern Territory (NT), although there is interest in soybean production for biodiesel. Energy Crops Australia (ECA) has embarked on a project to assess the commercial viability of soybeans for oil, with the intention to supplement the recently commissioned Darwin Biodiesel plant. There are a number of technical and agronomic challenges to the ‘success’ of NT soybean production, confounded by weather extremes in the wet season. Effective weed management is one such challenge.

Weed management systems need to be developed specifically for soybean production under NT conditions. Pre-emergent herbicides such as trifluralin and pendimethalin, and inter-row cultivation, are used to control broadleaf weeds in far north Queensland. However, farming systems in the NT are based on minimum tillage practices, reducing the opportunity for inter-row cultivation, and the use of herbicides requiring mechanical incorporation. Pre-plant mulch management and in-crop chemical control will need to form the basis of weed management in soybeans in the NT.

Previous weed control experiments in the mid-1980s found no effective chemical control for native or introduced legumes in soybean crops. Sicklepod (Senna obtusifolia), a major legume weed in the southern United States, will be a threat to soybean production in the NT. Cavalcade (Centrosema pascuorum cv.cavalcade), an introduced legume pasture also has the potential to be a major weed in soybean crops. Herbicide efficacy, and interaction with mulch, needs to be evaluated for a range of weed species, with specific attention to legume weeds such as sicklepod and cavalcade.

Two soybean varieties (cvs.Lechhardt and Stuart), and sunflowers, will be evaluated for yield at Katherine Research Station (KRS) over the 2006-07 wet season. A number of
Herbicides will be assessed in conjunction with this experiment to assess their efficacy on weed control, particularly of sicklepod, in soybeans. Herbicides currently registered for broadleaf weed control in soybean (QDPI 2005) include: Imazethapyr (Spinnaker®), flumetsulam (Broadstrike®), metolachlor (Dual Gold®), trifluralin (Treflan®) and pendimethalin (Stomp®) applied pre-emergence; imazamox (Raptor®), imazethapyr, acifluorfen (Blazer®), and bentazone (Basagran®) applied post-emergence. Imazethapyr is currently the recommended herbicide for broadleaf and grass weed control in soybeans in the NT. However, this has no efficacy against sicklepod, so alternative herbicides need to be considered. According to USA experience, herbicides effective on senna include: acifluorfen post-emergence (at 2 leaf stage only), flumetsulam pre-emergence, metribuzin (Sencor®) pre-emergence, although this has several soil type constraints, imazaquin (Scepter®) either pre- or post-emergence, and chlorimuron (Classic®) post-emergence. The latter two herbicides are not available in Australia.

This paper presents the early results of this experiment, and discusses future directions for weed management strategies in NT soybean production.

Materials and Methods

The experiment was conducted at the Katherine Research Station. The site was retained as a sabi grass fallow, for the previous two years, with a history of broadleaf weeds. The area was mulched on 20th December 2006 to reduce sabi biomass (3-6t/ha over the area), then irrigated to freshen up vegetation prior to an application of 3L/ha glyphosate (450 g/kg) on the 29th January 2007. The area was re-mulched on the 2-3rd January due to large amounts of remaining biomass. Soybean was sown in 25cm rows on the 11th January using a John Shearer trash-culti drill planter; intended plant population was 350-450,000 plants/ha.

The pre-emergent herbicide treatments were applied on the 12th January with 100L/ha water volume, applied with 18m boomspray. Main weeds present were regenerating sabi and emerging pigweed (Trianthema portulacastrum). Approximately 30mm of rain fell two days after herbicide application.

Six herbicide treatments (Table 1) were applied.

Table 1. Herbicide treatments.

<table>
<thead>
<tr>
<th>Trade Name</th>
<th>Active (g/kg or /L)</th>
<th>When applied</th>
<th>Rate /ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dual Gold &amp; Spinnaker WDG</td>
<td>Metolachlor (960) &amp; Imazethapyr (700)</td>
<td>Pre Post</td>
<td>2L 140g</td>
</tr>
<tr>
<td>Spinnaker WDG</td>
<td>Imazethapyr (700)</td>
<td>Pre</td>
<td>140g</td>
</tr>
<tr>
<td>Spinnaker WDG</td>
<td>Imazethapyr (700)</td>
<td>Post</td>
<td>140g</td>
</tr>
<tr>
<td>Sencor 480SC</td>
<td>Metribuzin (480)</td>
<td>Pre</td>
<td>750ml</td>
</tr>
<tr>
<td>Broadstrike</td>
<td>Flumetsulam (800)</td>
<td>Pre</td>
<td>50g</td>
</tr>
<tr>
<td>Control</td>
<td>No herbicide</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Soybean emergence counts and biomass samples were conducted on the 25th January to assess phytotoxicity. Weed ratings were also conducted to determine efficacy of herbicide treatments on grass and broadleaf weed control. Ratings were given as: 0 = no weed; 1 = very low (<5% coverage, isolated emerging plants); 2 = low infestation (5-25% coverage, weeds less than 5cm diameter or height); 3 = medium infestation (25-50% coverage, weeds between 5-10cm diameter or height; 4 = high infestation (>50% coverage, weeds greater than 10cm diameter or height).

Haloxyfop (Verdict 520) at 400ml/ha was applied on the 26th January (2 weeks after pre-emergent treatments applied) over all plots except the control, for control of regenerating perennial sabi, plus emerging sabi and barnyard grass (Echinochloa spp.). The post-emergent treatments (Spinnaker) were applied on the 31st January. Crop, grass and broadleaf weed biomass will be assessed on the 14th February (2 weeks after post-emergent treatments applied) to evaluate early weed control. Final crop, grass, and broadleaf weed biomass will also be assessed at crop maturity. Other soybean physiological parameters, such as plant height, number of pods, total grain weight / plant and 100 seed weight, will be assessed at final harvest as part of the soybean versus sunflower yield comparison.

Results and Discussion

Herbicides did not affect soybean vigour. Grass species, mainly barnyard grass, were the dominant weeds. Pigweeds were the dominant broadleaf weed. Unfortunately, no senna, and only isolated cavalcade, emerged in any treatments, including the control. The Dual Gold, Spinnaker pre-emergent, and Sencor treatments (no post-emergent treatment results were collected by time of writing) provided significantly better grass weed control than no
herbicide. All herbicide treatments, with the exception of Spinnaker post emergent, which was effectively another control at the time of first ratings, resulted in less broadleaf weeds than no herbicide (Figure 1).

**Figures 1**

![Figure 1](image)

**Conclusions**

Imazethapyr is currently the basis of weed control in wet season minimum tillage soybeans in the NT. It is likely to be the most effective option for broad spectrum weed control. Initial results from this experiment confirm this. The next series of measurements will indicate the relative weed control of Spinnaker applied either pre-emergent, post-emergent only, or post-emergent following a pre-emergent herbicide treatment. Generally, the use of alternate pre-emergent herbicides requiring incorporation by cultivation or irrigation is not feasible, and reliance on rainfall for incorporation is unpredictable.

Further work is required to assess available herbicides on a wider weed spectrum, including legume weeds such as sicklepod, cavalcade, Crotalaria spp, phasey bean (Phaseolus macroptilium) and buffalo clover (Alysicarpus vaginalis). Ideally, inclusion of the herbicides imazaquin and chlorimuron available in the USA, offers the potential for more effective weed control options in the NT. Chlorimuron is considered the best choice for control of sicklepod in soybean, based on environmental behaviour, as well as cost-effectiveness. The scope to include these herbicides is uncertain.

Future work should include herbicide assessment in wet season and in dry season irrigated crops, where incorporation by irrigation provides greater pre-emergent herbicide options. Shielded sprayers may also be more suited to dry season than wet season production, due to better access and trafficability.

Identifying suitable in-crop herbicides is one of the major strategies for soybean weed management. However, other weed control options, including grass or cereal rotations, mulch management and minimal tillage, need to be considered. Future commercial soybean production in the NT may also provide impetus for adoption of varieties genetically modified for herbicide resistance. Weed control is one of the many challenges to the potential success of soybeans in the NT. Developing effective integrated weed control strategies with minimal impact on the environment will contribute to addressing this challenge.

### Multibreed Composites Superior to Brahmans in Trial at Douglas Daly and Kidman Springs

by Gihan Jayawardhana Ph: 8999 2224 - Mob: 0409 699 544

Multibreed composites retain larger amounts of heterosis (hybrid vigour) in future generations than do the old-style two-breed animals such as Droughtmasters, Brafords and Charbrays. They also combine the good points of more different cattle types. They are more suitable for meat quality-based markets than the Brahman and are being explored as a possible alternative to Brahman in case of a downturn in live exports. Some of the large cattle companies such as Napco and AA Company are shifting to multibreed composites. This trial compares a composite suitable for the Top End with Brahman that are being improved by selection for growth and reproduction.

A composite of 56.3 per cent Brahman, 12.5 per cent Africander, 12.5 per cent Tuli, 6.3 per cent Shorthorn, 6.3 per cent Hereford and 6.3
per cent Charolais is being compared with the Brahman at Douglas Daly Research Farm (DDRF) and Victoria River Research Station (VRRS). This cross gives a mix that is 81 per cent tropically adapted and 19 per cent unadapted Bos taurus and can be expected to retain about 64 per cent of heterosis in the second generation onwards. They were created by crossing half Belmont Red, quarter Tuli, and quarter Charbray bulls (from Geoff Maynard’s Mt Eugene stud in Queensland) to the Brahman cows.

Both the Composites and comparison Brahman bulls are selected on weight, testicle size and percentage normal sperm at yearling and are used for a maximum of three years to maximise genetic progress. The females are selected on pregnancy and rearing a calf (empties are culled except, if necessary, as yearlings or lactating two-year-olds). None of the animals are treated for worms, ticks or fly. They are all multiple-sire mated with DNA typing being used to identify sires to enable recording in Group Breedplan, the Australia-wide genetic evaluation system. Breedplan is used to assess genetic progress, rather than as a within-herd selection tool. This allows this program to be replicated in more extensive herds.

The Composites are the same weight at birth and slightly heavier at older ages than the Brahmans (see below).

The reproductive performance of the Composites is better at all ages. As reproduction is more important for profitability than growth or carcase, this is the most significant advantage of Composites.

The closeness of the pregnancy rates in the lactating three-year-olds is due to most Composites being on their second calf while most Brahmans are on their first.

The testicle size of yearling composites averages 25.7cm with 24.6 per cent normal sperm versus 22.4cm with 6.9 per cent normal sperm for the Brahmans. This is over three times the amount of normal sperm.

During the past two years, two groups of yearling heifers from two different properties have been mated at DDRF. Their pregnancy rates at a common weight range are compared to our selected Brahmans and the Composites below.

This indicates that Composites will show an even greater improvement in the industry than in this trial as they are currently being compared to a Brahman strain that is reproductively better than those in the industry.

This year 17 Brahman and 19 Composite homebred herd bulls were Genestar tested for tenderness and marbling.

There are now four pairs of tenderness and three pairs of marbling genes available. They account for about 30 per cent of the variation in these traits. In a northern supermarket situation tenderness is more important than marbling though neither is currently important for live export. The bulls that are selected as herd bulls...
are sampled at selection at yearling and the results are used in the selection at two and three. A summary of the gene frequencies is shown in the following graph.

The average frequency of the tenderness genes is higher in the Composites but, surprisingly, more marbling genes exist in the Brahmans.

We also sent a group of Composite and Brahman steers to the Austasia feedlot in Lampung, Indonesia with the following results:

View Table at Attachment A

The feedlot performance was relatively similar. The striking difference is that the Composites had a worse feed conversion than the Brahmans. Some of this could be due to the Composites’ heavier weight, and hence heavier demand for maintenance. The causes will be presented when the data is fully analysed.

Two-year-old Brahman and Composite heifers with calves at foot and pregnant again at DDRF.

Free Bore Meters for Darwin Rural and Daly Region Volunteers

The Northern Territory Government is undertaking a bore metering project to obtain information about ground water consumption and management in the Darwin rural (Litchfield Shire) area and Daly region.

The Department of Natural Resources, Environment and the Arts (NRETA), is conducting the project, which is calling for volunteers to have meters fitted to their bores at no cost to the land owner.

Bores fitted with these meters will provide the NT Government with data on water consumption, which will in turn provide information for improved water planning. This improved planning will ensure these regions continue to have water now and into the future.

About 300 meters are planned to be fitted to bores in these areas, free of charge, and would be in place for a period of two years. At the end of the project, land owners have the choice of keeping the bore meter or having it removed – free of charge.

The NT Government has no intention of charging for private water use from bores – now or in the future.

The NT Government estimates that unlicensed extraction in the Darwin rural area is approximately 5,500 ML/year - this is equivalent to the water content of 2,200 standard Olympic size swimming pools.

This is in comparison with the 3,500 ML/year, or 1,400 standard size Olympic swimming pools, which is extracted from the licensed public water supply (town water) bore fields.

NT Government’s Water Management Branch Director, Ian Lancaster, is encouraging all types of bore users whether they be from a standard rural block, small scaled agricultural enterprises or larger scale agricultural enterprises to be involved in the project.

“We have a near pristine environment in the Northern Territory and don’t want to make the same mistakes as people have done down south - we want to ensure water is used in a sustainable way,” he said.

“If we want future Territorians to have the same great lifestyle and healthy environment we currently enjoy, then we need to take stock and plan.”

The NT Government is also conducting a survey regarding water metering and general water usage in the rural area. The survey aims to determine the different attitudes land owners have towards bore metering and general water use.

The metering project and survey is funded by the Australian Government Water Fund, through the Water Smart Australia program, which is a shared commitment to water reform between Australian Commonwealth, State and Territory Governments.
National Livestock Identification System (NLIS) in the Northern Territory

By now, most pastoralists and livestock owners will be aware that the National Livestock Identification System (NLIS) is being implemented in the Northern Territory. NLIS will be mandatory in the Northern Territory for all cattle movements from the 1st July 2007.

Cattle that won’t require RFID’s fitted after 1st July 2007 are cattle which are moving from their property of birth directly to the Darwin Wharf. The cattle may be consigned to an Australian Quarantine Inspection Service (AQIS) registered export premise to complete export treatment protocols en route to the wharf, if the Chief Inspector of Stock (CIS) has approved the export premise. The registered export premises approved by the CIS are:

- Adelaide River Grazing
- Berrimah Export Yard
- Cedar Park Export Yard
- Katherine Cattle Transit Centre
- Noonamah Export Yard
- Rum Jungle Export Yard

This is possible as all Australian States and Territories agreed that herd-based tracing, such as brands and waybills would provide credible tracing where cattle go from their property of birth to live export. If your cattle were not born on the property they will require a post breeder Radio Frequency Identification Device (RFID) (orange) fitted to the right (offside) ear.

It is mandatory for all buffalo moving off a property to be identified by one of two methods:

They will carry an RFID tag and full transaction recording to the NLIS database will apply the same as cattle.

Prior to movement off a property a transaction tag with the Property Identification Code (PIC) will be applied to the right ear of the buffalo. This tag will remain in the ear of the buffalo and with any subsequent movements another transaction tag will be applied to the ear of the buffalo.

It is the responsibility of the property owner to ensure that all cattle are identified correctly and in accordance with the Stock Diseases Regulations. The owner of the destination property/export depot will be responsible for scanning and notifying the national database of the livestock movement details. In addition to NLIS requirements for livestock, all cattle moved outside the boundaries of a property require a waybill and must be branded.

As 1st of July looms closer Northern Territory livestock owners should clarify their specific requirements to comply with the National Livestock Identification System. This may include the purchase of RFID’s and scanning equipment if required. Producers may also need to establish an account with the NLIS database. Producers are encouraged to contact their local stock inspector about attending an NLIS workshop run by the Department of Primary Industries, Fisheries and Mines (DPIFM).

For further information or assistance on NLIS contact:

Sharon Kearney (Stock Inspector)
Ph 8999 2031
Email: sharon.kearney@nt.gov.au


The Grubber Roller and Seeder (GRAS) Machine

by Ben Beumer, Extension Officer - Pastoral Production ph: (08) 8999 2302

G.R.A.S. stands for Grubber Roller and Seeder. It is certainly not a new concept as similar large machines have been around for years. These bigger machines, some weighing as much as 10 tonnes are called Chopper-rollers and are used primarily for controlling sucker regrowth and rejuvenating old grass stands. Being large
and heavy they require large tractors or dozers to pull them and are difficult to transport from one area to the next.

Grass seed needs some soil disturbance for best establishment and development. As commercially available improved grass seeds can cost as much as $30 a kilogram it is wise to provide favourable establishment conditions.

To do this usually requires a tractor, plough and a fertiliser spreader or seeder. These are not always available, so I decided to manufacture a simple machine that could disturb the soil and sow the seed in one pass, and be towed by a Quad bike.

The GRAS machine was manufactured using two old gas cylinders for the rollers. The teeth were made from 75mm X 50mm X 5mm angle-iron cut into 40mm wide sections. The 50mm end of the angle-iron was welded flat onto the roller leaving the 75mm end sticking up and becoming the ‘tooth’. The end of the ‘tooth’ was sharpened with a grinder to enhance soil penetration. There are eight rows of teeth on each roller with four rows having seven teeth and four rows having eight teeth. The teeth have a 100mm space between them and positioned so that the space alternates from row to row. The rows of teeth are welded on the roller diagonally across to make them more aggressive. The rollers are positioned one in front of the other but off-set in the mainframe by ten degrees to further their aggression. The rollers are off-set opposite to ensure the machine tows straight and does not crab.

The drums are made from rolled sheet metal and are 40 cm in diameter and 100cm long. Each drum has four rows of holes and each row has ten holes. Each hole is 12mm in diameter and has a slide welded above it with corresponding openings that can be moved across to close or open the holes, adjusting the seeding rate. Inside each drum is a seed-agitating arm that swings from the drum axle and ensures the seed remains loose and free-flowing. There is a large door situated between two of the rows in each drum to allow easy access for filling or removing seed.

The GRAS machine was designed to operate in virgin country, reasonably open wooded grass savannah where no clearing is required. The area should be sprayed with glyphosate using a boom spray in strips where the seed is to be sown to minimise competition at seedling emergence. Allow a reasonable amount of time (6 hours) for the plant to take up the herbicide and then run the GRAS machine over the strips. As the machine rolls along the teeth sink into the ground. As they come out they leave a divot for the seed to fall into. The following rains will wash seed into the divots where it will be reasonably protected from the elements and have access to moisture for germination.

I manufactured two seed drums that sit above the rollers and rotate via pulleys and belts to each other and the rear roller.

The two drums give you three options:

1. Allows for sowing 2 different seed types
2. Enables to carry twice as much of one seed type, or
3. Carry seed in one and fertiliser in the other.

The GRAS machine working width is 100cm and towing at 5km/h will sow one hectare every two hours. The machine has its own wheels, making transportation between jobs easier. These wheels are folded up during operation. Tractor weights can be placed on the machine to make it work the soil better depending on moisture levels (and hardness). It would be quite easy to make a larger version of this machine to accommodate the use of a utility or similar vehicle to increase the speed of sowing.

I have trialled this machine on a block at Humpty Doo sowing arnhem grass into a horse paddock with good success. The 1ha paddock was divided into two. One half was sown in January 2006 and the other half was sown mid January 2007 so each half could be spelled in its
establishment year. Both paddocks could be described as open woodland with reasonable stands of eucalypts in each. Existing grasses and weeds were sprayed with glyphosate at 3 L/ha and amicide 650 at 1 L/ha prior to sowing. The seed was sown at 5 kg/ha due to low germination. The results can be seen in Figure 3.

Figure 3. Pasture Established Using the GRAS Machine

On the left of the photo new area sown January 2007 and on the right Arnhem grass sown January 2006

The new area sown on the 21/1/07 was revisited on the 12/3/07, 50 days after sowing. No substantial rain, in any one shower (<3mm), fell on this area for 7 days after sowing. The pasture seen growing in figure 4 was lush and over 30cm in height whilst the grasses in figure 5 are sparse and only about 10cm high. The grasses in figure 4 are growing in a well mulched and shaded area. The seeds and seedlings would have benefited from the shade during the 7 day drought and subsequent hot days after germination. The mulch would have provided cover, moisture and some nutrition. The seeds sown out in the open where there were no trees to provide shade and no mulch for cover or moisture would have suffered greatly from the elements prior to rain. With another month of rain and some fertiliser I would expect these struggling seedlings to mature and survive the Dry season.

Figure 4: Shade and Mulch

Figure 5: No Shade and No Mulch

Hay and Seed Production Summary 2005

by Arthur Cameron, Principal Agronomist Pasture Development

The Primary Industry division of DPIFM conducted a survey to estimate fodder (hay and silage) and seed production in the Northern Territory during 2005. These figures include the significant amount of mulching hay made in the Darwin rural area, and the increasing amounts of silage made on a number of Top End properties. The figures are tabulated below.

Hay and silage production increased this year, while seed production declined. Silage production has increased to a level where it will be recorded separately in the table. The value of the hay and silage produced is estimated at $13.76 million and the seed at $536,000.

These figures represent the majority of the production in the NT in 2005.

Hay, silage and seed production in the NT by district (tonnes)

See Figures at Attachment B

Tick Inspections

At least 72 hours notice for on-property tick inspections or routine testing

by B Radunz, Chief Veterinary Officer - 20 February 2006

I remind all livestock owners, managers, agents and exporters that at least 72 hours notice is required for on-property tick inspections or routine testing. All efforts are made to provide the service on the requested day and time if this prior notice is provided.

Prior notice enables efficient deployment of staff resources.
Investigation of disease is excluded from this general principle.

Please assist your local Regional Veterinary Officers and Regional Stock Inspectors to deliver the required services by providing adequate prior notice.

About the Indigenous Pastoral Program

The Indigenous Pastoral Program (IPP) is a multi-agency approach to address the needs of industry for more viable pastoral lands and labour, and the needs of Indigenous people for sustainable economic and social development using their often under-utilised land resources.

The program’s two core aims are to:

- facilitate an increase in cattle numbers on Indigenous land;
- facilitate an increase in Indigenous participation in the pastoral industry.

To this end the Indigenous Land Corporation (ILC) initially provided three-year part funding to the Northern and Central Land Councils, and the Department of Primary Industry, Fisheries and Mines (DPIFM) to develop a collaborative approach. These partner agencies also contributed substantial complementary resources of their own to the program.

In its first three years, the IPP was governed by a steering committee comprised of representatives of the above agencies along with industry representation from the NT Cattlemen’s Association (NTCA) and training representation from the NT Department of Employment, Education and Training (DEET).

The IPP responds to requests from land owners and demand outstrips the capacity of the program to deliver extension by up to 4 to 1. As a result, prioritisation of properties and landowner groups takes place in order to focus limited existing resources.

In the program’s first three years it achieved marked successes. These included:

- Country developed with an estimated carrying capacity of 25,000 head;
- Country to be established in 2006 capable of running a further 10,000 to 20,000 head;
- Thirty seasonal stock camp positions and 25 short-term fencing positions being filled by Indigenous people at various locations;
- Significant integration of external agencies into the program including training support from the FarmBis program, funding for Indigenous training from DEET and additional funding for core employees of the IPP from the National Landcare Program.

A new Memorandum of Understanding in 2006 extended the IPP by a further five years. The partners to the new MoU are:

- Land Council
- Central Land Council
- NTCA
- ILC
- DPIFM
- Commonwealth Department of Employment and Workplace Relations (DEWR).

The ILC will again provide part funding for dedicated program workers employed by the partner agencies, and the partner agencies will also continue to provide significant complementary funding for those positions and for IPP processes.

The new MoU recognises the significant work of the program partners to date and also formalises a role for industry, represented by the NTCA, within the program. It also gains additional resources from a significant program contribution by DEWR for training and employment initiatives. This will allow the establishment of an Indigenous Trainee Scheme, commencing in 2007, aiming to train, employ and mentor up to 60 Indigenous trainees in the NT pastoral industry over the next three years.
The partners to the Indigenous Pastoral Program recognise that their collaborative approach has been a major reason for the program’s success. The partner agencies have an equal voice on the steering committee, and issues are seen as surmountable obstacles, rather than impenetrable barriers.

**Our Goals**

The long-term benefits of this program are far-reaching and include:

- social, financial and developmental benefits for Indigenous communities;
- an increase in the NT cattle herd and pastoral land availability;
- increases in the trained labor force for the pastoral industry and the availability of additional jobs specifically for Indigenous people;
- increases in the Gross Domestic Product of the Northern Territory, benefiting all Territorians.

The Indigenous Pastoral Program is aiming to continue to quietly build on its successes of the past four years and to continue to provide sustainable developments in land and employment that will last not just for the next five years, but for many more years to come.

**Enterprise Planning for Economic, Environmental, and Social Outcomes**

by Simone White

**What’s it all about?**

The project is funded by the National Heritage Trust through the Regional Investment Strategy to develop, promote and deliver a tailored enterprise planning program.

Enterprise planning has been known as many different things over the years including property management planning, strategic business planning and farm management planning to name a few.

The Enterprise Planning Project’s aims are to assist primary producers in the pastoral, agricultural and horticulture sectors of the NT critically analyse their enterprises to identify business, personal and National Resource Management (NRM) goals and directions, and take the actions needed to achieve these.

The program will initially work at a strategic level and then flow into the existing planning tools and training opportunities available.

**What is happening at the moment?**

At this stage work on the project is happening in three main areas.

**Updating the framework** – review and update existing property management planning type frameworks and include relevant benchmarks and best practice guidelines. A toolkit will also be developed which will include courses available, products that can be used to meet identified goals and a directory of assistance from the department and others.

**Case Studies** – identify businesses that have been through some form of strategic business planning/property management planning process to discover what benefits they gained, what worked and what didn’t during the process, any challenges they faced and what changes they may have made to their business as a result.

**Pilot Businesses** – identify potential participants to be involved the enterprise planning process from start to finish. The process will be designed to take participants through each area of their business to determine where they are now, where they want to be and how they will bridge any gaps. At the end of the process participants will have had the opportunity to develop their own plan including goals and actions and have the skills and confidence to continue working with it in the future.

**Who do I contact?**

Project Coordinator, Simone White on 8973 9739 or simone.white@nt.gov.au

*How do you know if you’re getting there if you don’t know where you’re going?*
Quotable quotes

The man who views the world at 50 the same as he did at 20 has wasted 30 years of his life.  
Mohammed Ali

Grass grows, birds fly, waves pound the sand. I beat people up.  
Mohammed Ali, Time Magazine, 29 November 1999

I had one guy at a gas station in New York say to me, "Hey, you look like Hugh Grant. No offence."  
Hugh Grant on being recognized in public

640K ought to be enough for anybody.  
Bill gates 1981

By three methods we may learn wisdom:  
First, by reflection which is noblest;  
Second, by imitation, which is the easiest;  
And third, by experience, which is the bitterest.  
Confucius

It's not true I had nothing on. I had the radio on.  
Marilyn Monroe Time Magazine New York, 1952)

Useful websites

Attachment A  
**Multibreed Composites Superior to Brahmans in Trial at Douglas Daly and Kidman Springs**

<table>
<thead>
<tr>
<th>Breed (no.)</th>
<th>Induction Weight</th>
<th>Feedlot Gain</th>
<th>Average Daily Gain</th>
<th>Feed Conversion</th>
<th>Slaughter Weight</th>
<th>Dressing Percentage</th>
<th>Carcase Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brahman (23)</td>
<td>291kg</td>
<td>155.6 kg</td>
<td>1.57 kg</td>
<td>6.08kgDM/kg</td>
<td>446.6 kg</td>
<td>50.4%</td>
<td>225 kg</td>
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<tr>
<td>Composite (27)</td>
<td>316 kg</td>
<td>155.3 kg</td>
<td>1.58 kg</td>
<td>6.52kgDM/kg</td>
<td>471.3 kg</td>
<td>50.1%</td>
<td>237 kg</td>
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<tr>
<td>Difference</td>
<td>25 kg</td>
<td>-0.3 kg</td>
<td>0.01 kg</td>
<td>0.44kgDM/kg</td>
<td>24.7 kg</td>
<td>-0.3%</td>
<td>12 kg</td>
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# Attachment B

## Hay, silage and seed production in the NT by district (tonnes)

<table>
<thead>
<tr>
<th>District</th>
<th>Feed Hay</th>
<th>Silage</th>
<th>Mulch Hay</th>
<th>Seed</th>
</tr>
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<tbody>
<tr>
<td>Adelaide River</td>
<td>810</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alice &amp; Barkly</td>
<td>5200</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Batchelor</td>
<td>160</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Darwin</td>
<td>3770</td>
<td></td>
<td>550</td>
<td></td>
</tr>
<tr>
<td>Darwin River</td>
<td>500</td>
<td></td>
<td>2040</td>
<td></td>
</tr>
<tr>
<td>Douglas Daly</td>
<td>14800</td>
<td>27300</td>
<td>200</td>
<td>7</td>
</tr>
<tr>
<td>DPIFM</td>
<td>680</td>
<td></td>
<td></td>
<td>9</td>
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<tr>
<td>Katherine &amp; VRD</td>
<td>23410</td>
<td>7700</td>
<td></td>
<td>62.5</td>
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<tr>
<td>Mary River</td>
<td>350</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Miscellaneous</td>
<td></td>
<td></td>
<td></td>
<td>1.1</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>49680</strong></td>
<td><strong>35000</strong></td>
<td><strong>2790</strong></td>
<td><strong>79.6</strong></td>
</tr>
</tbody>
</table>

These figures were compiled with the assistance of departmental officers Ruth Allan (Tennant Creek), Ben Beumer (Darwin), Chris Materne (Alice Springs) and Phil Hausler (Darwin).