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EDITORS: Paul Graham & Gladys Hore
Department of Primary Industry and Fisheries
PO Box 79, Berrimah NT 0828

ISSN: 1320-727X
EDITORIAL

Record Rainfall in the Darwin area, and the best for many years across the Top End, has been the highlight of the 1994/95 Wet season. With waterholes full and water tables high, we can look forward now to a good dry season, whenever it arrives. In the Coastal Plains region, it may be some time before the floodplains are accessible to grazing so we hope that there is plenty of upland feed to last.

Climate and its effects on agriculture and the future of the world's population have been in the news recently with the greenhouse conference in Berlin. You remember that in 1994, we profiled the El Nino phenomenon and its effect on Australia's weather, particularly the instances of drought in the eastern States. Although the Southern Oscillation Index associated with El Nino has now been positive for several months and there are good signs that the current El Nino is breaking up, drought conditions still prevail in parts of the eastern states. Almost everywhere, followup rains are badly needed before winter sets in.

Enquiries about farming prospects in the NT are at an all time high level, particularly from drought-affected Queensland producers. However, the Katherine-Daly Development Scheme, which is planning the release of smaller blocks for more intensive pastoral and agricultural production has been delayed by legal action within the ownership of Douglas Station. This has prevented the settlement of purchase of this station by the Northern Territory Land Corporation.

Talk of the Greenhouse effect has focussed attention again on land clearing with calls for total prohibition Australia wide. For the NT, we believe these calls to be founded on questionable scientific grounds. Any prohibition could have serious and unintended long term consequences, some of which we introduce in this issue and will develop in later issues of the Top Paddock. If you have any views on this question, we would like to hear from you.

The Northern Australian Agricultural Committee (NAAC) Strategy for industry development has been circulated widely to coincide with the launch of ‘The Future Directions for the Rural Industries’ by the Honorable Mick Palmer, Minister for Primary Industry and Fisheries on the 24th of March.

One of the NAAC strategies for development is to show people that producing in the Top End can be a successful business. The Queensland Country Live recently profiled Henry Townsend of La Belle Station, a well known success story, and in this issue, we cover another but less well known story from the Douglas Daly in a profile of cattlemen Bill and Eileen Doyle of Theyona Station.
RECENT PUBLICATIONS

Agnotes

B33 Raised Beds for Home Vegetable Gardens  
D10 Fruit Tree Fertiliser Rates in the Top End  
F80 Mistleflower  
I5 Choke - A Disorder of Bananas  
I25 Tomato Leaf Roll - A Serious Disease in the Top End  
J13 Housing for Pigs  
J27 Keeping Your Own Pigs  
J63 Water Buffalo Handling: Property to Abattoir Part I  
J64 Water Buffalo Handling: Property to Abattoir Part II  
J65 Water Buffalo Handling: Property to Abattoir Part III  
K5 Worms in Goats

Technical Bulletins

229 Wholesale Cut Flower Prices 1991-94  
230 Mango Market Report 1994/95

CEO'S HALF YEARLY AWARD

Dave Napier was named winner of the CEO's half-yearly award from July-December 1994.

Dave is the Principal Stock Inspector and has worked on the BTEC campaign for the past 15 years. He is an expert on the history of the Branch and uses this knowledge to assist new recruits. He has the respect of the staff and is always prepared to assist staff and tide them through difficult circumstances. He has been nominated in the Quality of Performance, Leadership, Staff Relations and Contribution to the Department categories.

Bull Survey TitBits - 1 - Introduction

During 1994, 28 property owners or managers from the Top End and 60 from the VRD cooperated with us in the conduct of a study of bull management practices. The response was tremendous. It took considerable effort to participate - there were over 300 questions in the survey instrument, and this meant two to three hours of each interviewee's valuable time. Thank you to all.

We present some of the major findings here. More will be presented in subsequent issues of Top Paddock, and a consolidated report will be published in due course.

Just follow the TitBit boxes.

Colin McCool, Gehan Jayawardhana, David Zuill, Terry Olm.
It takes a lot of energy and commitment and a lot of cold hard cash to make a success of mixed farming in the Northern Territory's Douglas/Daly basin.

Several have tried and failed, loosing their spirit and livelihood to the pressures of the Top End's often unforgiving climate, geographical conditions and other factors.

Bill and Eileen Doyle are not among the failures. That could have a lot to do with their incredibly positive outlook on life.

These jovial, hardworking American imports have moulded their 15 000 hectare property, Theyona, and the B & E Cattle Company into one of the great success stories of the Douglas/Daly.

Bill Doyle was raised on a cattle ranch in his native Florida where he got his first taste of mixed farming. The family venture involved raising cows and growing hay as a sideline to supplement the income.

But Bill soon outgrew Florida. He wanted more land than the American State had on offer for the level of finance he could muster.

Bill and his young wife Eileen turned their attention to the wide open spaces 'Down Under', initially buying Camp Creek Station before discovering Theyona on the Douglas Daly.

"Camp Creek was a good learning experience for us - good but hard country in a very harsh environment". Bill said. "We ran cattle but I had to take on outside work to make a living".

That outside work included driving a bulldozer and mustering feral buffalo that roamed the country in the days before BTEC.

The only bulldozing the Doyles do these days is associated with clearing more land to expand their intensive farming enterprise.

The Doyles run 2 000 head of mainly Brahman breeders on 3 000 hectares of improved pasture on their property. The improved pastures provide the best available nutrition for their cattle, which are raised for the lucrative live cattle trade.

As well, Theyona carries a small stud of Brahman cattle to produce bulls for their commercial herd.

Buffel and Sabi Grass, Verano Stylo, Cavalcade, Centro and Wynn Cassia have all been tried on Theyona, and all have done fairly well, giving Bill and Eileen what they call "the most spoilt cattle in the Territory".

The Doyles came with the so-called 'second wave' to the ambitious Douglas/Daly venture, but were the first to test out some innovative techniques relating to improved pasture and the undersowing of sorghum and centro.

"The Territory was like the Wild West to us, a Last Frontier, where the pioneering spirit still thrived" Bill said. "Back in Florida, you want to try something new so you go and see your neighbour who you know will have already tried it. But here in the
Territory, you have to do all the ground work yourself because there's a good chance it's never been done before."

"What we do here is often not according to past advice and we have to learn by trial and error."

Bill and Eileen Doyle have made a commitment to the Douglas/Daly and vow there's nothing that can't be done in the area.

They are happily sold on the concept of more intensive production on the small holdings where management of stock and pastures is so much easier than on huge, sprawling stations.

From their own experience in the Douglas/Daly, they've done far better than they ever expected, yet they say they have barely scratched the surface.

Eileen has been an equal and worthy partner in the Theyona farming enterprise, tending her cattle and toiling from dawn till dusk in the hot sun alongside her 'workaholic' husband.

Like Bill, she welcomes new farmers to the district with open arms. But she has a word of caution for would-be investors.

"It won't be easy unless you're prepared to channel supreme levels of energy and commitment and plenty of money into the land. With all these, it can be a big success."

It appears the Doyles will be farming the Douglas/Daly for a long time yet. "This is God's own country" says Bill. "Where on earth would we ever get better than what we've got here?"

Bill & Eileen (photograph compliments of Kerry Sharp, Public Relations DPIF)
Update on Interval between Slaughter and Treatments for Cattle Tick

Withholding Period (period between treatment and slaughter) is based on the Australian standards for maximum chemical residues in meat (Maximum Residue Limit MRL).

However, importing countries may have lower maximum standard or no standards at all if the chemical is not used in the country. In the latter case, the detection of any of the chemical is a violation.

In 1993 there were detection of organochlorines and organophosphates in meat which exceeded the MRL in the United States.

Early in 1994 abattoirs imposed a 21 day period between slaughter for export and the last treatment for cattle tick or buffalo fly. This made it difficult for producers in the ticky area of the NT to send cattle for slaughter to abattoirs in Queensland and South Australia.

The Meat Research Corporation funded research to clarify appropriate intervals since tick and buffalo fly treatments prior to slaughter for export.

The table below lists minimum intervals between slaughter and the last treatment for the common cattle tick and buffalo fly treatments used in the Northern Territory.

<table>
<thead>
<tr>
<th>Tickicides</th>
<th>Export</th>
<th>Domestic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taktic Dip</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>Bayticol Dip</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>Bayticol Pour-on</td>
<td>56 days</td>
<td>Nil</td>
</tr>
<tr>
<td>Barricade S</td>
<td>21 days</td>
<td>8 days</td>
</tr>
<tr>
<td>Cydectin Pour-on</td>
<td>Not Known</td>
<td>14 days</td>
</tr>
<tr>
<td>Blockade S</td>
<td>21 days</td>
<td>8 days</td>
</tr>
</tbody>
</table>
Chemical companies intend to apply a sticker to the labels to advise the interval prior to slaughter for export if it is different to the Australian withholding period.

This is the best information at the time of preparation of this article 10 January 1995.

The research results are still incomplete. I will keep you advised.

ALWAYS READ THE LABEL AND COMPLY WITH WITHHOLDING PERIODS

BRIAN RADUNZ

Bull Tit Bits - 2 - Breeder herd sizes and bull percentages

The average breeder herd size of properties sampled in the Top End and VRD respectively were 1,470 and 4,696 head. The ranges in herd size were 15 to 9,000 for the Top End and 50 to 28,000 in the VRD.

Average bull percentages used in each district were 4.7 and 5.3, with ranges of 1.1 to 9 and 1.9 to 17 for the Top End and VRD respectively.
CARBON STORAGE BY INTRODUCED DEEP-ROOTED GRASSES IN THE SOUTH AMERICAN SAVANNAS

Estimates of the global carbon dioxide balance have identified a substantial 'missing sink' of 0.4-4.3 gigatonnes per year. It has been suggested that much of this may reside in the terrestrial biosphere. Here we present an analysis of the carbon stored by pastures based on deep-rooted grasses which have been introduced in the South American savannas. Although the deep-rooted grasses were chosen principally for agricultural reasons, we find that they also sequester significant amounts of organic carbon deep in the soil. If our study sites are representative of similar pastures throughout South America, this process could account for the sequestration of 100-507 Mt carbon per year - a substantial part of the 'missing sink'. Thus, although some land-use changes (such as burning tropical rainforests) contribute to the atmospheric CO$_2$ burden, we conclude that the introduced pastures studied here to offset the effect of anthropogenic CO$_2$ emissions.

The combination of a deep-rooted grass with a nitrogen-fixing legume can increase nutrient cycling, greatly improve animal production and markedly increase soil biological activity. These effects occur mainly at the soil surface while C storage takes place below the plough layer. Thus, far from being environmentally degrading, improved pastures can fulfil the restorative role in tropical systems that was recognised in pre-Roman times for Mediterranean systems, and may play a vital part in stabilising the global carbon cycle and minimising the greenhouse effect of atmospheric CO$_2$.

From Nature Vol. 371, 236-238
The editors wish to acknowledge that the excerpts used in the following articles, were taken from GRDC Annual Report 1994.

VISION AND MISSION

The Grains Research and Development Corporation is a national organisation, grower and government supported, with a mandate to plan, fund and oversee research and development for the Australian grains industry.

We share a vision with the industry for a profitable, internationally competitive and ecologically sustainable Australian grains industry.

Our mission is to increase economic, environmental and social benefits for our stakeholders by directed investment in research and development.

We will achieve this by linking innovative research with market needs.

PIioneer cropping in the Northern Territory: Starting with no-till system

Conservation tillage studies by scientists at the Department of Primary Industry and Fisheries set the groundwork for bringing successful cropping into the Northern Territory during the past decade. Until recently, extensive cattle grazing of native pastures and some attempts at broad-area cropping with conventional tillage were the only forms of agriculture. Formidable barriers to successful cropping in the semi-arid tropics include high temperatures (working against seed emergence), high-intensity rainfall, soil erosion, water and nutrient stress combined with high cost of fertiliser and other inputs.

Continuous trials since 1984 have shown that no-till/legume rotations combined with low levels of fertiliser, herbicide and insecticide are the keys to a sustainable crop production system in the Douglas Daly region. Over an average five-year rotation no-till crops outyielded conventional till by 33 percent for maize, 12 percent for sorghum and 31 percent for soybeans - with the difference greatest in drier years.

Dr Kandiah Thiagalingam
FLOODPLAIN PASTURE ESTABLISHMENT

INTRODUCTION

The value of floodplain improved pastures in coastal regions of the Top End is well known. Cattle and buffalo performance on floodplains in the Dry season is the key to the profitability of the coastal properties in the NT. There are two basic categories of floodplain - black cracking clays, nearer the coast and the grey clay (solodics) further inland.

The black cracking clays support a range of productive species both native and improved but the depth of flooding and carrying capacity of the different types vary considerably.

Generally the solodics require improved pasture species to be planted before they are useful.

Some native species provide useful grazing for stock e.g. Rice grass *Leersia hexandra*, *Paspalum spp.*, *Eriochloa spp.*, *Hymenachne acutigluma*, *Pseudoraphis spinescens*, (Spiny mud grass) and some *Echinochloa spp.*

The most widely used improved species are *Hymenachne acutigluma* (native Hymenachne) and *Brachiaria mutica* (Para grass). Para Grass has become naturalised over the last 100 years in the Top End over large areas. Improvements in spread and vigour have occurred since the removal of the feral buffalo herds, with Hymenachne appearing in areas not previously seen in the last 20 years.

SITE PREFERENCES

Hymenachne favours the more deeply inundated floodplain or on the fringes of the paperbark and floodplain where there is significant seepage from upland country. Generally these areas are the last areas on the floodplain to dry out (if at all) towards the end of the "Dry". Hymenachne can be sown using runners and seed.

Para grass is more suited to the shallower flooded areas up to 600 mm in depth. It can be spread by both runners or seed.

Recent additions to floodplain pastures have been 'Amity' Aleman grass *Echinochloa polystachya* cv. Amity and *Hymenachne amplexicaulis* cv. Olive.

Amity appears at this stage to have a wider tolerance to flooding when compared to Para grass. It appears to be a little more tolerant to deeper flooding whilst on the other hand establishes better on the drier, non flooded (waterlogged only) areas. It can only be planted vegetatively as no viable seed is produced. It is very palatable to stock, but recovers well after grazing.

Olive likes similar conditions to native hymenachne i.e. deeper flooding and is also planted from seed or runners. It is also consumed readily by stock.

ESTABLISHMENT FROM SEED ON FLOODPLAINS

In the Top End, establishment from seed is always a risky procedure depending on weather (rainfall) during and following planting, particularly on the northern black cracking clays.

As black soils get very hot and crusty
if dry weather follows planting, seed survival can be low and seedling death is common.

Planting of seeds should be restricted to weather that promises frequent rain but not inundation of the area. This can be somewhat difficult to predict in advance. Also weather affects the trafficability of the black cracking clays, so the best times to plant are often not the best conditions to be driving on it.

**Ploughing** - The right conditions to plough are often difficult to capture. A light discing is all that is required e.g. disc harrows, in order to get a weed kill on the surface. It is often difficult to plough without first heavily grazing to remove the bulk of the vegetative material. This would be preferential to burning off to achieve trash removal. It is preferable to incorporate as much vegetative material when ploughing to improve soil structure, water holding capacity and to mulch the surface. Increased organic matter is likely to improve seedling establishment.

Most of the previously mentioned grasses prefer to have a bare weed free area surrounding the established plant to give the best possible spread. This allows runners to move in all directions unhindered, and it allows direct ground contact for roots being produced at runner nodes.

It must be remembered that once ploughed, the black cracking clays are difficult to work on after rain and if frequent rain occurs, then there is the possibility of not being able to get back on the ploughed ground at all as clay builds up continually on tyres or tracks. Generally tractors will be more useful if they have dual rear tyres for flotation and are not water-filled. Wider front tyres will also aid flotation. Wheel cages and half tracks are also other options for improving traction without bogging. Track type vehicles usually handle wet ground conditions best.

Seed can be just dropped onto the surface and some form of covering with a dragged log or pipe, peg toothed harrows, rubber tyred roller, or spiral roller will improve establishment and seedling survival. The ideal weather conditions after sowing for best establishment are cool cloudy weather with frequent light rain. (This is a common commodity in the Top End during monsoonal periods however, most monsoon periods are too late for seed planting).

If the soil is bare anyway e.g., deeper flooded drainage lines, then seed of Hymenachne can be simply dropped direct on the surface, just before rain. This method has been used successfully on Coastal Plains Research Station for Olive Hymenachne establishment.

An alternative method is to use a herbicide spray such as glyphosate or grammoxone/reglone (Sprayseed®) to kill off the vegetation without the need for ploughing in conjunction with minimum tillage planting or surface sowing.

This method has been used successfully with Glenn Joint vetch and Kazungula setaria.

The dead vegetation provides a good mulch for the soil surface and providing the seeds can get in contact with damp soil or organic matter, they are more likely to survive dry spells.
than those planted in ploughed ground.

Other seeded pasture species which establish on the less flooded black cracking clays are the legumes Glenn Joint Vetch, Bundey centro, Cavalcade centro, Milgara Blue pea and grasses are Kazungula setaria, Purple Pigeon grass and Tully. Phasey bean will also appear often however its seed has not been commercially available for some time.

With the exception of Phasey bean, the above varieties do better on the drier areas of floodplains where there is only very shallow flooding for short periods after heavy rain. Pangola grass also does well under these conditions.

Implements which can be used are combines with pasture seed boxes, drum roller seeders, or fertiliser broadcasters. Now available are small spinner broadcasters which can be attached to 4 wheel motorbikes. Aerial broadcasting is also an alternative when ground conditions preclude vehicular traffic.

**VEGETATIVE ESTABLISHMENT**

There are many and varied methods for establishing the vegetative types, which include the native and Olive hymenachne, Aleman grass, Para grass, Tully and Pangola. Again best establishment occurs if planting is done in cloudy humid conditions.

**Time of Planting**

Planting of runners can be carried out during most of the wet season on both rising and receding water. If planting on receding water there is not a long interval of growth. No grazing during the following dry is then critical for survival.

**Spread and disc-in method**

The runners are spread onto a ploughed surface and disced-in using disc harrows. The offset where adjustable can be reduced to better bury the runners, to put them in contact with damp soil.

The limitation with this method is that it must be done before the plains become too wet, as the clay adheres strongly to discs and tyres when moisture levels get high. The discs eventually clog up completely and won't plough. Disc scrapers are a necessity. During this period rain and weather conditions may not be the most conducive to good establishment. Good stands however have been produced by this method.

This method is suitable for para, Tully and Pangola.

**Machine Planting**

a) All Terrain Vehicles - 4 wheel-drive motor bike and Track type swamp buggies can be used to run over the runners, to bury them partially into the mud. Top End black cracking clays tend to be a bit more trafficable when there is a sheet of water over the soil surface. When surface water is present, runner establishment is usually enhanced.

This method is suitable for all the above grasses, with the depth of water determining the most suitable species.
b) Furrow planting - many machines have been designed with a rack to hold runners, have one or more seated people planting direct behind a disc or plough tyne, with other discs or tynes further behind to cover the runners with soil. This method works effectively and is limited only by the traction and power of the towing tractor and planting conditions.

Dual wheels, wide tracks, half tracks or wheel cages can be used to improve traction. This can be used on unploughed ground but any grass competition surrounding the planted runners will limit spread in the first year. Ploughing or spraying will reduce competition and enhance establishment.

**Herbicide vs Planting**

Because of the poor trafficability of ploughed ground when wet, there can be advantages in herbicide spraying before planting runners.

Spraying can cover the required area in a much shorter time, which offsets the cost of the herbicide and is less likely to be interrupted by bogging problems.

A method developed at CPRS has shown that Para grass runners are resistant to Diuron herbicide at rates of up to 10 kg per hectare. Best establishment is between 2 to 4 kg per ha of wettable powder. Diuron at these levels inhibits germination of all the annual grasses as well as killing most of the grasses and weeds already established. Some strong perennial grasses may be resistant e.g. blady grass. One application diuron will control growth for the full season.

This method allows runners the maximum area for spread in the first season.

When runners are placed on a square grid at 3 to 4 metre intervals, a fully covered sward will be achieved within 1 to 2 seasons. Three to four weeks lead time between spraying and planting Para runners, should be allowed.

**Low cost strategies**

Pasture establishment is always a trade off between the density of planting and the cost and speed of coverage. To establish a pasture quickly, it generally requires heavy seeding rates or close planting of runners.

If there are paddocks which can be allowed a longer establishment time before needed for grazing, there are methods which can be used to reduce the overall cost of planting runners. This relies on the plants rapid spreading ability when there is no competition in the soil next to an existing plant.

Single runners are capable of growing up to 4-5 metres in one wet season over bare ground. If a single row can be planted in one year and not grazed, ploughing or spraying next to this row in the following year will enhance spread during that next season. The distance between the rows in the first year will be determined by the time available before the paddock needs to be grazed. 10 metres would be the
minimum distance between rows if the aim is to reduce establishment costs. 50 to 100 metres between rows would be considered for establishment at low cost over a large area.

The main labour component is in collection and distribution of plant runners, and the fewer required to plant a given area, the lower the final cost. As a comparison the amount of runners required to cover 1 hectare at 2 metre spacings is 20 times that required to plant at 20 metre row spacings with 4 metres between runners. Reducing the amount of planting time per established hectare is likely to gain good acceptance from station staff as cutting, transporting and dropping runners can become tedious very quickly. On the other hand however, every spare hour can be gainfully employed in the wet season just by collecting a bag full of runners and planting them in a new area.

These methods of expanding out from strips each season do not preclude grazing once the initial strips are well established. Extra nitrogen fertiliser in the first year will encourage runners to thicken up and grow more vigorously.

Fertiliser

Early work on Para grass has given indications that there is no measured response to applied phosphorus on the black cracking clays. Establishment is usually satisfactory without fertilisers being applied however the application of a high nitrogen NPK mixture or urea may boost performance and dry matter significantly, particularly in the first season. There also may be a response to an application of zinc (zinc deficiencies were found in rice crops). However this has not been tested on Para or any of the other common floodplain grasses.

Ponding

Ponding is a technique whereby contour banks are constructed with the aim of trapping run-off or incident rain behind the bank to a depth of 30-1000 mm. The extra depth of water and the longer period of time water is available due to ponding enhances pasture availability for stock.

NP: Ponding banks should be designed so that fish migration is not impeded. Spillways are designed to allow fish to enter and leave during the wet season. Shallower banks are likely to be less disruptive to natural ecosystems. Natural coastal and tidal saltwater or brackish swamps should not be disturbed as these provide nursery areas for small fish at critical times of the year.

Ponding can benefit some of the species listed above e.g. Para, Aleman and the Hymenachnes. It’s effect is to reduce the loss of water through run-off and thereby extend the period that the grass remains green, (1-3 months), or transform areas not previously suitable so that they favour the growth of the above water loving species e.g. the drier plains of the Adelaide River system. Planning is required to suit the species preferred. e.g. Para will not tolerate as deep a flooding as the Hymenachnes. Aleman will tolerate a wider range of flooding than Para. If using Para seed, some areas will benefit if the banks are put in post planting, to allow seedlings to gain sufficient height before inundation
and to make seed bed preparation less prone to weather problems.

**Pests and Diseases**

Magpie geese can be a nuisance after planting by eating and pulling out freshly established runners, particularly if planting occurs before flooding.

The floodplain rat (Rattus colletti) has been known to extensively graze the green shoots and crowns of para grass in the dry season and in poor wet seasons thereby retarding establishment if growth in the first wet season has not been strong.

Some leaf spots (Tar Spot) caused by *Phyllochora* sp. are regularly seen on native *Hymenachne* but production does not appear to be affected.

**BULL TITBITS - 3 - Matting practices**

Seventeen (61%) of Top End respondents and 85% of VRD respondents practice year-round mating. Two properties in the Top End sample and five in the VRD sample practised controlled mating on a small proportion (9% and 20% of the breeder herd in the Top End and VRD respectively) of their breeder herds.

Reasons offered for not using controlled mating were:

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<th>Reason</th>
<th>Top End</th>
<th>VRD</th>
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<td>Not much point, because the bulls live away from the cows in the non-breeding season any way.</td>
<td>1.00</td>
<td>6.00</td>
</tr>
<tr>
<td>Scrub bulls would move in if the herd bulls were removed</td>
<td>3.00</td>
<td>5.00</td>
</tr>
<tr>
<td>Get more calves by leaving bulls in year-round.</td>
<td>11.00</td>
<td>26.00</td>
</tr>
<tr>
<td>I can't keep the bulls out</td>
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RURAL TRAINING

RISK MANAGEMENT

All rural industries are risky businesses due to uncertainties especially seasons and markets. The Rural Training Council of Australia has provided funding to provide a self learning package on risk management to all rural managers. It is written in a very readable form and has many practical suggestions as to how a better understanding of risk can improve decision making. It is a must for all managers. You can obtain a copy free by contacting Karen Pearce at the Rural College (ph 721 377) or Robert Speirs (ph 810067). Extra copies are available at $6 per copy.

The Northern Territory Rural College will be offering an accredited distant learning module based on the package. It is the core component of the Advanced diploma of Applied Science.

SHORT COURSE WEEK

The Northern Territory Rural College is planning a week of short courses in the week prior to show week. Keep this week free. It should be great fun and a great learning opportunity. Watch this space for details.

TECHNICAL ASSISTANCE

The DPI Katherine are able to offer assistance in providing training in:-
  - Preg Testing
  - Spaying
  - AI
  - Nutrition
  - Record Keeping
  - Rangeland Management
and other fields.

FIRST AID COURSES

Negotiations are underway to co-ordinate an itinerary of first aid short courses conducted on properties and in other rural locations. This should minimise the cost to participants. Contact Robert Speirs (ph 810067) if you want to participate.

TRAINEES

The first intake of the Certificate of Stock and Station Skills has commenced at the Rural College and finishes on the 6th of April. People wishing to employ motivated first year jackaroos or jillaroos should contact the rural college (ph 721 377).

Applications for the second intake (20/3/95 - 16/6/95) are due by 10th March.

Trainees from Central Group Training are currently at the Rural College. Any enquiries from potential trainees or employers should contact Bill Meecham (ph 532 622).

Trainees from Top End Group Training will commence shortly. Any enquiries from potential trainees or employers should contact Bill Sullivan (ph 412 112).

OPEN LEARNING

The Northern Territory University has an open learning centre which can provide distant education courses. Contact Bev Luke (466 299).
THE DOUGLAS DALY RESEARCH FARM BREEDER HERD - A KEY ELEMENT IN THE KATHERINE-DALY DEVELOPMENT

The Agriculture Division maintains a herd of 200 high-grade Brahman cows at Douglas Daly Research Farm. They have been used in a number of investigations aimed at raising cattle productivity in the Douglas Daly and other similarly-favoured areas of the Top End. The herd has been a Territory asset for several generations. The ancestors of these cows were bred on either DDRF, Tortilla Flats or Coastal Plains Research Station. There has been a high level of recording and measurement of various aspects of their performance, and there now exists a very comprehensive database of many aspects of this performance. This stockpiled data will continue to be an important resource for the Territory cattle industry.

Much of the early work on nutritional supplementation which has more recently led to the adoption of supplements throughout the Territory cattle industry took place using this herd. Similarly, much of the study of improved pastures utilised this herd.

Excess progeny from the herd have been sold to commercial producers over a wide area of the Top End, Gulf and Katherine Districts. They have performed creditably in a number of environments.

Since the herd was settled in at DDRF, it has been used in studies aimed at determining optimum achievable levels of herd productivity under improved management conditions, and to provide store stock for use in various stubble and pasture grazing trials. It has also been used in studies of various viral diseases which are clearly of economic significance to the Territory cattle industry. Further, because of the close level of supervision in this herd, it has played a key role in investigation of diseases which cannot be studied on commercial properties. In particular, it has helped in the study of early calf mortalities. It has also played a key role in the monitoring of arbovirus (Bluetongue, Ephemeral Fever and other viruses) activity in the area. Knowledge of the status of such diseases is important in maintaining our credibility with interstate and international buyers and their animal health regulators.

The most notable achievement of this herd in recent years has been the consistently high calving rates, which have ranged between 80% and 90% for a number of years, thus demonstrating that high-grade Brahmans can achieve outstanding breeding performance under the right management conditions. This pregnancy rate is undoubtedly the envy of many commercial producers in the area. The knowledge gained in the process of achieving this landmark are directly transferable to more intensively-managed commercial properties. On the other hand, we were also eminently successful in demonstrating that productivity plummets rapidly if the management standards are relaxed (a pregnancy rate of 54%).

Since then, we have examined the direction of research in the herd in consultation with the DDRF Management Committee, and developed a new set of research.
objectives aimed at answering questions that are relevant to the Douglas Daly area's rapidly emerging beef cattle breeding industry. Dr Gehan Jayawardhana is the project leader.

The topics being researched are:

Boran and Tuli Crossbreeding Demonstration 1993-1996

The effect of yearling mating on herd productivity 1995 Onwards

The effect of early weaning and an extended mating period on herd productivity 1995 - 2000

Productivity of aged cows under improved management 1994 Onward

Bull Performance evaluation methods 1996 Onward

Paramount amongst objectives in this new phase of this herd's usefulness is an evaluation of Boran and Tuli crossbreds. This project is well under way, and you may have seen some of the progress reports in this august journal. It was undertaken at the request of a wide range of industry participants.

The research topics and output are quite timely, given the way in which beef cattle breeding has expanded on the existing farms in the Douglas Daly. The farmers there are becoming increasingly more cattle-oriented. This trend will undoubtedly continue. Many of the parties interested in participating in the Katherine-Daly development have indicated an intention to establish beef cattle breeding enterprises.

Some have indicated an intention to undertake buffalo breeding enterprises.

The newer closer settlement in the region will mean that a more intensive cattle management system than the Territory norm is likely to prevail. The work to date and planned future work at DDRF will leave us well-equipped to service the new enquiries that will emerge as the Katherine-Daly Region develops.

Intensification of farming in the Katherine - Daly Region will provide new opportunities for farmers to develop and/or adopt new farming methods and new technologies. Indeed some farmers in the area have already been able to exploit the seasonal nature of supply of table beef animals because of their ability to more readily minimise the effects of the annual dry season drought. Already there are many registered stud animals in the area. There is a ready market for locally-bred and locally-adapted herd bulls in the pastoral zone and in the live export trade. At the moment, the bulk of Brahman herd bulls used in the Territory are procured from interstate. As the number of intensively managed enterprises increases, more and more herd bulls will be available locally. Because of the ongoing study of this herd, we will be have ready answers for many of the problems and questions that new breeders will encounter.

The herd will also be a key element of the ley farming systems study now commencing. This study seeks to integrate rotation of cropping, fodder and pasture production with cattle grazing, with a particular focus on flattening out the dry-season
nutritional trough for cattle.

The herd is also used for evaluating new technologies before they are tested on commercial properties. The most outstanding example of such work is the study of oestrus synchronisation and other artificial breeding techniques. In recent years, there has been an increasing interest in and adoption of artificial breeding across the Territory. Much of the pilot work was undertaken in this herd. There is yet more to come on improved oestrus synchronisation and embryo transfer, and this herd will be where such developments are trialled.

The herd has also been a showcase of the potential productivity of Territory cattle to buyers in the live export trade.

The herd will be increasingly used as a teaching tool. We have recently commenced conducting Producer Skills Schools at DDRF. Members of the herd will be used in the future as new topics for the Skills Schools are identified. A likely new topic to be introduced soon will be husbandry and health of stud cattle.

The DDRF breeder herd will continue to be a valuable Territory resource, perhaps even more valuable as the cattle industry in the region becomes more and more intensive and better-managed. It will always be adapting its direction to changing industry conditions, but continuing to provide timely, appropriate information to producers.

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**Bull TilBits - 4 - Breed composition**

When participants were asked to describe the breed composition of their herd, the following responses were given.

<table>
<thead>
<tr>
<th>Breed Description</th>
<th>% in Top End sample (28 responses)</th>
<th>% in VRD sample (60 responses)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pure Brahman</td>
<td>18</td>
<td>12</td>
</tr>
<tr>
<td>3/4 Brahman</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Upgrading to high-grade Brahman</td>
<td>71</td>
<td>73</td>
</tr>
<tr>
<td>All VRD Shorthorn</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Droughtmaster</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>All British Breeds</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Other mixed crosses</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>
WATER QUALITY MANAGEMENT

WATER QUALITY AND YOU - A COMMUNITY RESPONSIBILITY

WHERE DO WE START?

Water is live! It's really that simple!

Everyone - local communities, industry and government agencies - can play a part and work together in caring about water quality.

The NT Water Act restricts and controls the ways in which water quality can be affected. The Water Resources Division of the Power and Water Authority administers this Act.

To protect our water resources, the first step is to decide what are the beneficial uses of the water. Do we need the resource for drinking or recreation, for agriculture or industrial use, or for protection of aquatic ecosystems?

Once this is decided, water quality expectations and waste management plans can be developed. Licences can be issued with appropriate requirements for the licencee.

THE PROCESS

Water Resources Division will work with the community, industry and landholders to -

- identify high risk areas for potential pollution;
- Decide the beneficial uses of the water resource;
- Put in place waste management plans, licensing and monitoring programs;
- Monitor water resources to make sure the beneficial uses are protected and water quality targets are met;
- Enforce water quality management according to the Waste Discharge Licences - any breach of Licence may result in prosecution under the Water Act.

INDUSTRIAL AND LANDHOLDERS

As well as being involved in decision making on beneficial use of the resource, industry and landholders will -

- Set their own waste and land management plans to minimise the risk of pollution;
- Apply for Waste Discharge licences if they are likely to pollute or affect the beneficial uses of water resource;
- Carry out monitoring reporting and waste management as required by a Waste Discharge Licence.

Industry can also -

- Seek opportunities for better waste management;
- Support local community groups such as Waterwatch.

WHAT CAN YOU DO?

As a community member, you can -

- Assist in deciding the beneficial uses for water resources;
- Report pollution of water resources to the Water Resources Division, and insist on action;
- Assist in waste management activities in catchments and
ground water systems;
• Set up and participate in community monitoring groups such as Waterwatch.

WHY?

Water is the essential resource for life and industry everywhere - nowhere more so than in the Northern Territory, from the deserts of the Centre to the Top End tropics.

The real value of these essential resources for sustaining communities, industry, agriculture and ecosystems lies in their water quality.

It is all too easy to take our apparently abundant water resources for granted - groundwater seems inexhaustible, rivers bring down mighty floods in the wet season and refill magnificent wetlands.

We are most fortunate in the Northern Territory to have the major bounty of unspoiled natural water resources and sources of water for communities and industry.

But we must not assume that we are immune from problems experienced in other parts of Australia - river and sea pollution, algal blooms, salinisation of groundwaters and agricultural land.

All these problems are possible if we do not sensibly manage water resources for their best sustainable use - then we would have to pay more for water and economic development and risk losing ecosystems that are unique to the Northern Territory.

Everyone can play a part in the management of water quality so that the real value of water resources can be enjoyed today and in the future.

WATER QUALITY MANAGEMENT
- GET INVOLVED -

Find out what you can do by contacting:
Water Resources Division
GPO Box 1096
DARWIN NT 0801
or telephone 827 244
THE MODERN RURAL 'BLOCKIE'

For those of us who have been around for a while, the image that springs to mind of the traditional Blockie was one of laid back living. The barbie, the odd green can, a horse (or horses), a couple of dogs, plenty of trees and not much else. In other words, an alternative lifestyle and not a bad one either.

The good old days? Possibly.

Things have changed over the past ten years or so - greatly. The blocks are still there, only there are more of them and the Blockie", well, he's changed a bit too.

The underlying attitude is still there - a preferred lifestyle, but, with a difference. Times are tough and the challenge for those on the block (me included) is to make the block contribute a bit more than it did in the past.

The diversity of enterprise in the Rural area has to be seen to be believed. Almost traditionally we had the mango growers and a bit of hay production on the larger blocks, and that, basically was it.

The rural blocks are now a microcosm of agricultural operations.

We have deer farms, mango farms, hay producers, tropical fruit producers, poultry farms, crocodile farms, quail farms, emu farms, ostrich farms, horse breeders, flower growers, small cattle farmers, market gardens - the list goes on. When the Blockie is mentioned, the question is often asked, 'Oh yeah - them. Whada they do?'. On consideration, the answer will be 'A bloody lot'.

The rural developers keep a lot of people employed locally, in a variety of businesses, because there are literally thousands of them (us). Combined, these blockies probably buy more fencing material, seed, stock feed, dog tucker, irrigation equipment etc than many of the traditional large farms and stations.

Also their combined production of vegetables, tropical fruit and hay would be staggering. Amazing stuff isn't it?

As to the future, well, that's anybodies guess. The trend for increased production from the blocks should continue. It may tend to specialise - who knows.

One only has to look at the increase in market gardening. Most are well run, efficient and productive. They are also run by a lot of our newer citizens and 'blockies' and they have had it hard in many cases. They also know about hard work and small block production.

Could be there is something all of us could pick up. More on the blockie next issue.

Paul Graham
Extension Officer
LAND CLEARING

In this day and age with conservation issues understandably taking a prominent position in our lives, agriculture faces somewhat of a dilemma. "To Clear or Not to Clear", if so, how and to what effect and how much.

Opinion on anything to do with land is becoming increasing polarised with the extensive "tree huggers" on one side and the "knock it down - to hell with it" mob on the other. To be frank (and pardon the pun), both extremes are out of their respective trees.

Regardless of opinion, crops and pastures don't grow on concrete and bitumen and neither do they grow in thick scrub or forest. The bottom line is that land needs some clearing and preparation.

People in our game (Agriculture), will undoubtedly feel that common sense will get the job done and that most of us know how to do it, right?

Not necessarily.

Current thoughts on clearing and land conservation are a long way removed from the thinking (and common sense) of days past. Research and technology change and techniques and methods improve.

The point of all this is that the NT has, as of June 1992, a Pastoral Land Act, and this has certain requirements that must be met before clearing can proceed. More bureaucracy and Government interference eh? Again, not necessarily.

Could be simply some common sense on paper.

A publication titled "Guidelines for Clearing Pastoral Land" is available from the Pastoral Land Board of the NT. This booklet has had input from Department of Primary Industry and Fisheries, Department of Lands and the Conservation Commission of the NT. It is not heavy reading and is worth the effort.

To conclude, clearing land, felling trees, using chemicals, almost anything to do with Agriculture and the land can be controversial.

Much of the controversy is due to uninformed emotional opinion, although even critics of Agricultural practice have to eat.

Cropping and grazing activities need land and the land needs clearing. Fact not fiction. What is necessary is thought and some basic rules to get the job done right the first time around.

Finally, if you have any thoughts on this subject, drop us a line or ring in. We will only be too glad to help where we can.

Paul Graham
Extension Officer.
TWO NEW WEEDS ADDED TO THE NOXIOUS WEEDS LIST.

The Minister for Primary Industry and Fisheries, Mr Mick Palmer, has announced two new additions to the Northern Territory Noxious Weeds list - Siam weed (Chromolaena odorata), and the invasive prickly shrub, Barleria (Barleria prinophytis).

Siam weed is considered a major problem throughout South East Asia but had not been known to occur in Australia until the recent discovery of an infestation near Tully in northern Queensland.

Now that Siam weed does occur in Queensland, there is a distinct possibility of it spreading across the border into the Northern Territory.

This weed is considered to be one of the most serious threats to northern Australia's primary industries and environment.

Barleria infestations are known to occur in the Northern Territory at Humpty Doo and Berry Springs and in the Darwin urban areas.

Though its flowers are attractive, Barleria has no horticultural value because of its needle-sharp spines which make it the subject of much complaint by both professional nursery people and the general public.

Noxious weeds create major environmental and agricultural problems. The Northern Territory Noxious Weeds Act provides the legislative basis for weed control in the Northern Territory.

Under the Act, plants can be put into three classes of noxious weeds:

- **Class A** - to be eradicated. These weeds pose a significant threat and occupy a relatively small area giving a good chance of eradication.

- **Class B** - growth and spread to be controlled. These weeds are more widely spread and are not practical to eradicate, but prevention of their further spread is desirable. Eradication may be possible if they occur in geographically isolated situations.

- **Class C** - not to be introduced into the Territory. This class includes weeds which are not known to exist in the Territory but which could pose a significant threat if introduced. This class also includes all
Class A and Class B weeds, since further introduction of the weeds would only escalate the existing problems.

As landholders, you are encouraged to voluntarily control noxious weeds on your properties. Northern Territory legislation exists to allow for action to be taken against landholders who fail to implement adequate weed control measures.

Landholders can be served with a notice to eradicate or control a noxious weed and can be prosecuted and fined if they fail to comply.

As well, people in possession of hay or animal fodder containing noxious weed seeds can be issued with a notice not to sell, and to destroy the hay or fodder by specified means.

Weed Control is the Responsibility of the Land Holder

Barleria (Barleria prionitis) plant at Berry Springs in the Northern Territory

Spines on the new noxious weed, Barleria

Debbie Van Rangelrooy
Weeds Extension Officer
RIVERINE BUFFALO UPDATE

We now have five Riverine Buffalo in the NT. Bill and Hilary (they come from Arkansas) arrived last June. They were imported on behalf of the Buffalo Industry Council. After a week's rest, they were set to work in single-sire mating groups at Beatrice Hill. The cows in the group had been held aside for several years in anticipation of their arrival. Ernie Schloep also submitted six of his cows for service. Both bulls acquitted themselves well, averaging an 80% conception rate. This level of performance is in the same league as our best Swamp bulls at Coastal Plains Research Station! This means that we will have forty or more crossbred calves on the ground at CPRS in the middle of the year. There will be ongoing evaluation of their performance.

Bill and Hilary have now gone into single-sire mating groups in the Coastal Plains Research Station Herd as part of the routine annual breeding cycle. We hope that there will be plenty of demand for their services in the private sector later in the year.

More recently, (this March) we took delivery of another bull and two heifers. The bull was again imported on behalf of the Buffalo Industry Council. The heifers were imported for Allan and Sherrie Fisher of Swim Creek Station. All three have coped quite well with the sudden change from the North American winter to Top End Wet Season.

Gehan Jayawardhana, Barry Lemcke,

VISITING SCIENTIST FROM SARAWAK

Dr Sajem Jinem, regional veterinary officer of the Sarawak Department of Agriculture has recently arrived in Darwin to commence one month's work with officers of the Agriculture Division. He hails from Limbang, in the Fifth Division of Sarawak.

Dr Sajem's primary interest during his visit is in all aspects of buffalo health and production. He will also be extensively briefed on all aspects of the NT's live export trade (both cattle and buffalo).

Latest imports are the BIC and the Fisher's heifer seen here at Berrimah Farm having their first taste of Pangola grass. Photo compliments of Gary Tucker - Quarantine.
Bull Trials - 5 - Future directions for breeding

When asked what their future plans for their breeder herd composition were, 28 responses (100% of those interviewed) from the Top End and 54 responses (90% of those interviewed) from the VRD were given.

<table>
<thead>
<tr>
<th>Intentions</th>
<th>% of Top End respondents</th>
<th>% of VRD respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stabilise existing breed mix</td>
<td>14</td>
<td>23</td>
</tr>
<tr>
<td>Raise B. indicus content</td>
<td>71</td>
<td>72</td>
</tr>
<tr>
<td>Raise B. taurus content</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Ideal % B. indicus**

| less than 50 | 0 | 0 |
| 50           | 0 | 4 |
| 55           | 0 | 2 |
| 60           | 4 | 2 |
| 65           | 0 | 6 |
| 70           | 4 | 7 |
| 75           | 21| 26|
| 80           | 11| 17|
| 85           | 11| 2 |
| 90           | 4 | 2 |
| 95           | 0 | 0 |
| 100          | 48| 33|

**Weighted average preferred % B. indicus content of breeders in each District**

| 88 | 82 |

Clearly, the majority intend to maintain breed towards a high proportion of B. indicus blood.

Next issue: Sources of herd bulls, colour preferences, selection criteria...
BTEC FREIGHT REBATE

Restocking Freight Rebate Rate

From 20 February 1995 the rate is increased from $1.05 to $1.10 per kilometre per 40 foot deck.

Voluntary Destocking

From 20 February 1995 freight rebate has been provided for voluntary destocking which is part of the approved program.

From Infected Restricted and Provisionally Clear Tailtags

The freight for breeders and bulls will be paid to the nearest abattoir. The stock may be consigned to other abattoirs or for export.

Restockers to replace stock slaughtered as part of a voluntary destock will be eligible for restocking assistance consisting of a Restocking Freight Rebate and a payment of $25 per head for additional costs associated with restocking.

Transfer of Freight Rebate Eligibility

Freight rebate eligibility is not transferred to the new owner when the property is sold.

Freight rebate eligibility may be transferred to another property under the following circumstance.

"In the event that the property from which the destocking has occurred is sold, an owner may transfer freight rebate eligibility from the property which was destocked to another property within that State/Territory and purchased by the owner since the destock and subject to the approval of the administering authority".

General Advice on Freight Rebate

During May 1995 a letter will be sent to producers involved in BTEC who may still be eligible for BTEC Freight Rebate to provide more details.

More Details

For more details or if you have any queries contact your local Regional Veterinary Officer.

Brian Radunz

SOIL AND PLANT ANALYSIS

The Window into Soil and Plant Nutrition

DPIF's Chemistry Branch is now accredited by the Australian Soil and Plant Analysis Council (ASPAC) for nutrient testing of soil and plant tissue. This was achieved by participation in a quality assurance program conducted by ASPAC.

Primary producers who require more information on soil and plant testing can contact their local DPIF extension officer or the Principal Chemist at Berrimah Farm, Vlad Kawaljenko, on 89 2273
PREGNANCY TESTING

OR ARTIFICIAL INSEMINATION SCHOOL

The Agriculture Division is planning to run a pregnancy testing/artificial insemination school at Douglas/Daly Research Farm in July.

The course will take about three (3) days and the cost should be quite reasonable.

Anyone interested in taking part can contact:

Gehan Jayawardhana on 992 224

or

David Zuill on 992 341