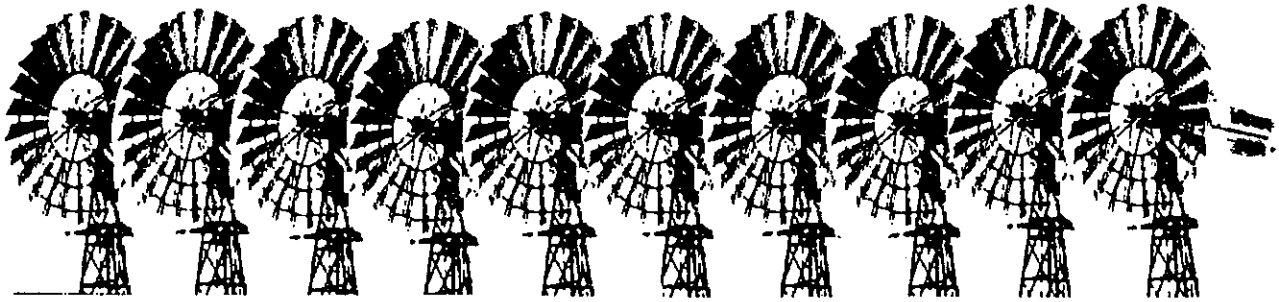


TOP PADDOCK

NEWSLETTER No. 2 NOVEMBER 1993

CONTENTS **PAGE**

EDITOR: Robyn Rann
Department of Primary Industry and Fisheries
PO Box 79, Berrimah NT 0828

ISSN : 1320 - 727X

EDITORIAL

Well, with the WET "nearly" upon us again we felt it timely to enclose a DPIF rainchart to stick on your wall, both for easy access to record your rainfall and to keep some DPIF contact numbers to hand should you need them.

This edition also includes some information to help our new wider audience with articles on crocodile hatchling diseases and deer farming.

As we advised earlier we are keeping you posted as to the results of the Boran and Tuli project. Brahman cross cows were inseminated early this year with Boran, Tuli and Brahman semen (some cows were also naturally mated to Brahman bulls). Calving commenced on the 3.11.93 and is progressing well. We have included a photo of the first NT Tuli calf in this edition along with some information from the consortium who can supply the Boran and Tuli semen.

I hope you enjoy this edition of Top Paddock and look forward to your feedback.

Robyn Rann
Editor.

RECENT PUBLICATIONS

Agnotes

D12	Establishing an Orchard
F67	Groundsel Bush
F68	Caltrop (*Tribulus terrestris*)
F69	Caltrop (*Tribulus cistoides*)
I4	Yellow Wing Grasshoppers
I6	Insects at Crop Establishment
K11	Chalkbrood Disease of Honey Bees
K13	American Foul Brood of Honey Bees
K14	European Foul Brood of Honey Bees

Technotes

No. 86	Spinifex Communities and Management for Pastoral Production in Central Australia

Technical Bulletins

No. 207	Horticulture Branch Technical Annual Report 1992-1993
No. 208	Northern Territory Pesticide Register
No. 210	Crop Gross Margin Budgets for the Douglas-Daly Region 1993-94
No. 211	Gross Margin Budgets for Field Crops in the Katherine Region 1993-94
No. 213	Reproduction of Imported Australian Breeder Cattle in the Philippines

DEER FARMING IN THE TOP END

Deer Farming has been an established farming enterprise in Australia for many years, particularly in Tasmania, Victoria, NSW and QLD.

We now have producers in the Top End who are established and like other Primary Producers, are battling to stay with it.

The problems with any farm enterprise are known to most of us and we all proceed accordingly but with deer .... well. The deer producer faces costs a lot of other farmers don't. Fencing costs are initially very high when compared to sheep and cattle, but those costs will be discussed at another time, because yard design and handling facilities are where many prospective deer farmers hit trouble.

Good facilities should allow for movement of stock from paddocks for drenching, drafting, velvet removal etc, in an efficient, minimum stress operation for both man and beast. Sounds familiar to what most stockmen consider the normal run of events doesn't it! Well, add an animal that is timid, intelligent, fast, flighty, and lightly boned and they do not bounce off yard posts and steel gates like the average beast that is handled in the Territory. They break bones, creating additional problems for the farmer.

It seems to be accepted by many deer farmers that their stock need good laneways of around 30 m in width and centrally located yards. Basically the same standards for site selection are used as for a cattle operation. i.e. power, water, road access, shade and topography.

A lot of discussion has taken place over the use of "Blind" races and yards. Semi darkness does seem to quieten deer down, but some people seem to think (quite logically) that it is the barrier effect rather than lighting that keeps the animals quiet. When one considers that deer will clear 2.5 m walls, I'm inclined to favour the barrier theory over the lighting. The fact is that to have a darkened handling area, one must have a roof and high walls. The combination of barriers and dim light conditions seems to be the key.

Another point to consider is operator safety. There have been several instances of handlers being attacked by deer, and small as they are in comparison to cattle, they can be quite dangerous.

With this in mind, access (and quick removal of ones self) has to be considered.

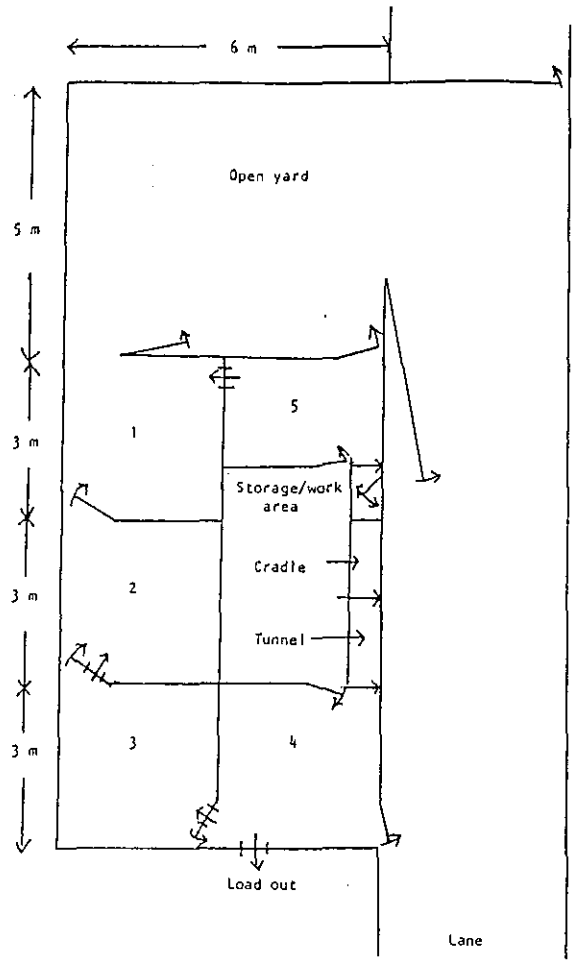
In essence, it boils down to "stockmanship" and an understanding of the animal.

With the time and space available, it is not possible to go into the varied and yet exacting specifications needed to successfully handle deer. However, the

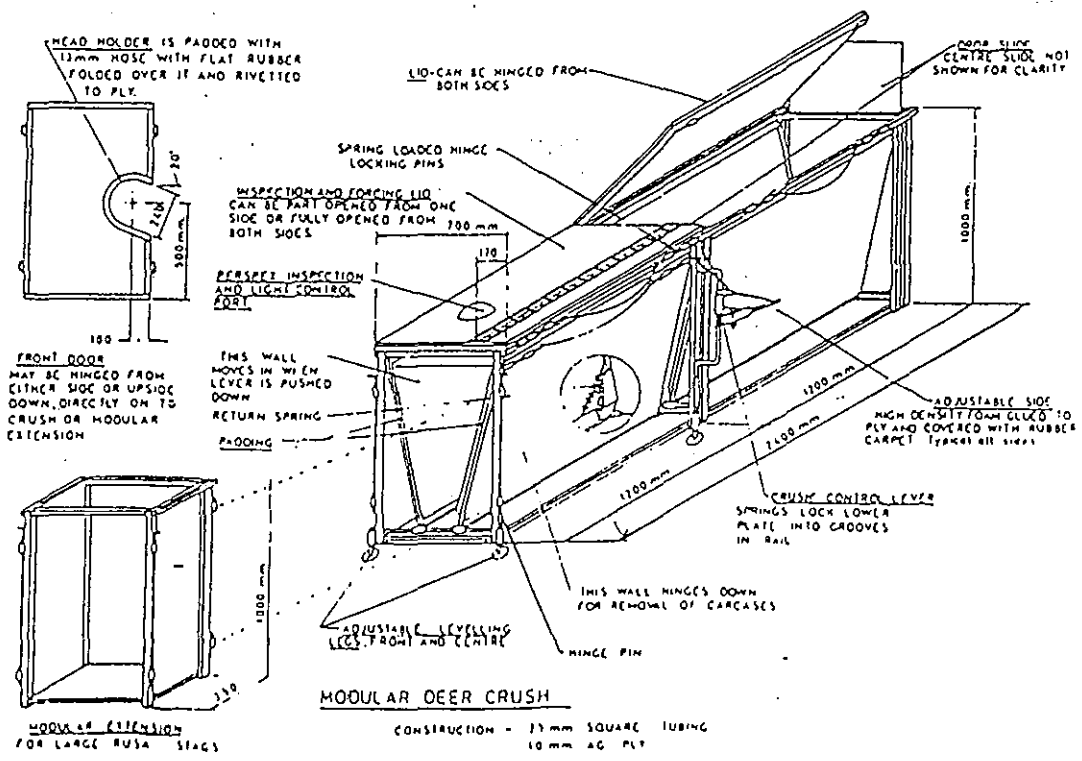
two diagrams shown below give the design for a modular deer crush and a basic set of deer yards. Yard designs vary from place to place, just like cattle yards, and are usually the result of the individual farmers needs and circumstances. Working with deer is comparatively new in the Territory and the farmers that have them are here for the long haul. Further information on the specifics of deer farming can be obtained by contacting Paul Graham, Extension Officer, Animal Production & Development, at Berrimah Farm on 892 321.

The next newsletter article will cover the specifics of fencing for deer farming.

Paul Graham, Extension Officer



Notes: a. Pens 1-5 under roof for daylight use
b. Doors with sliding panel



Using Fencing to Stop Feral Pig Damage to Crops

Exclusion fencing is the simplest and in the case of high value agricultural crops, the most cost-effective method of reducing damage by feral pigs. To be effective, fencing must be accompanied by diligent surveillance and maintenance, particularly if pigs have become accustomed to feeding in a particular crop.

A pig proof fence consists of pig netting and two electric outrigger wires as shown (see diagram). Variation to the design are possible. In particular, the third and fourth wires from the top need not be barb, and can be replaced by high tensile plain wires. The outrigger wires can either be strung to steel insulated posts or uninsulated creosote soaked posts. Both outrigger wires should be pulsed and suitable earths attached every five hundred metres. The energiser used should be rated at approx 8,000 volts. Pickets should be no further than 10 metres apart and closer if the terrain is rough. The bottom wire should be heavily galvanised.

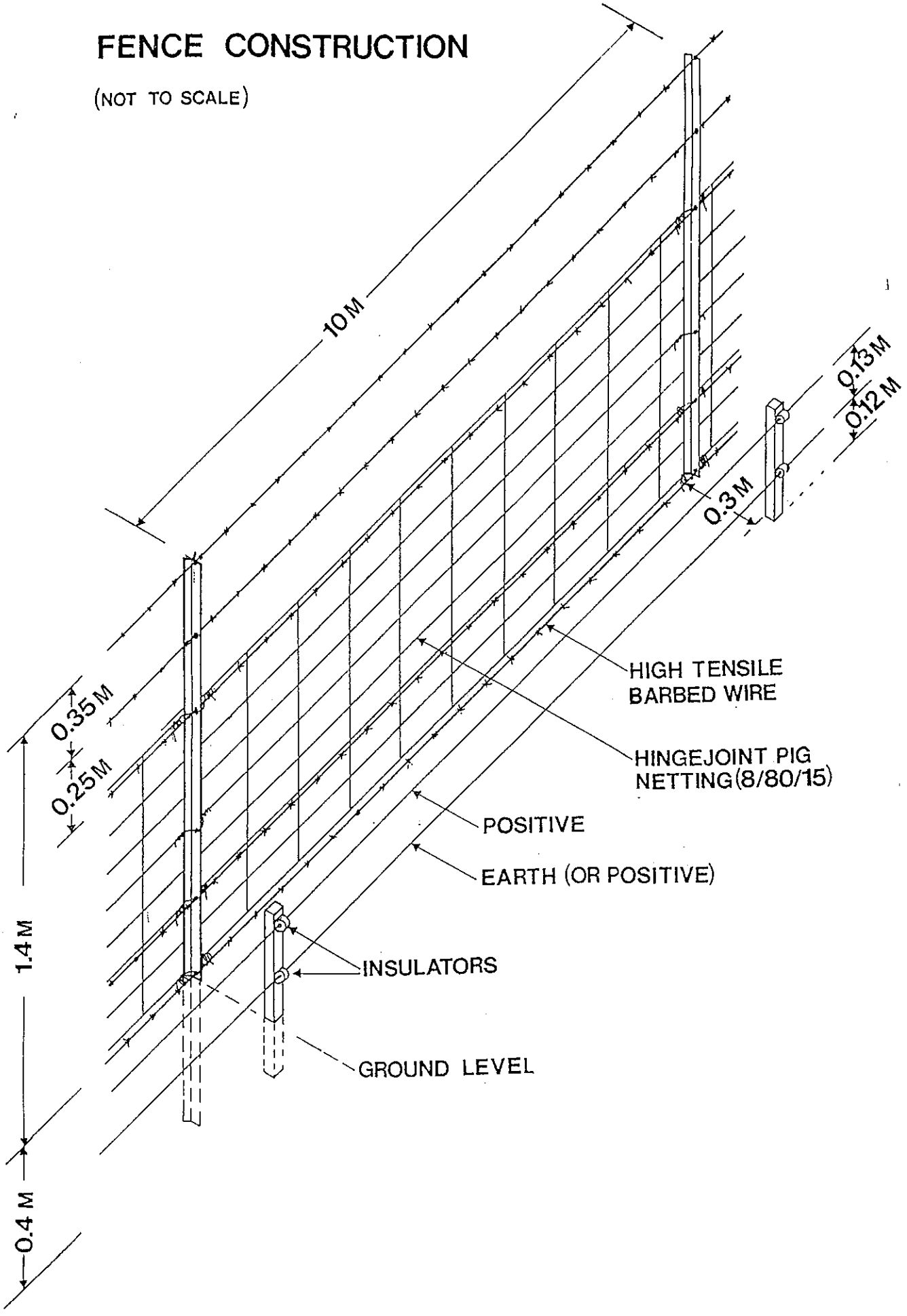
Fences should be constructed prior to planting so as to lessen the number of pigs that become accustomed to feeding in the paddock. The most effective and quickest way to remove pigs that have breached the fence and are camping within the crop is to use dogs to flush pigs from the crop. The cost of fencing excluding labour, clearing and energiser costs is approximately $2,500 per kilometre at todays prices.

If you are unsure of the economics of exclusion fencing, they can be easily calculated based on the length of fencing required (and hence cost) and the extent of damage caused by pigs. Losses caused by feral pigs in the Douglas Daly district have been recorded between 25 and 110 tonnes/100 ha crop. This varies substantially depending on the location of crops, with crops away from a suitable pig harbour (water & shade) typically not being extensively damaged. Each individual farmer will be best placed to make a choice regarding exclusion fencing. Exclusion fencing is recommended as the most cost-beneficial method of reducing crop damage caused by pigs when damage levels are high.

Peter Caley
Vet. Tech. Services, Darwin

FENCE CONSTRUCTION

(NOT TO SCALE)



The following is an extract from:

TROPICAL GRASSLAND SOCIETY OF AUSTRALIA NEWSLETTER VOL. 9 NO. 5, OCTOBER 1993

SECHURA ROCK PHOSPHATE

Most rock phosphates cannot provide sufficient phosphorus for fast-growing plants; they are treated with sulphuric acid to make the phosphorus available.

Not all rock phosphates are equally hard, but even the more reactive - from Carolina and Morocco - have to be finely ground to speed up the availability of phosphorus.

Sand from a Peruvian desert

In the late 1960's, a large deposit of phosphate rock was discovered in the Sechura Desert in northern Peru. This Sechura rock is the most reactive of all, with phosphorus available to plants without further treatment. This efficiency is due partly to its chemical composition, with low fluoride, but also to its peculiar physical nature. Sechura phosphate, as mined, is more like a sand than a rock, but the small grains are porous like pumice, giving a very large surface area.

Sechura reactive phosphate rock (RPR) has been tested extensively on pastures in New Zealand since the 1970's and is now available in Australia from Incitec as **Greenleaf RPR** with 12.4% total P. Sulphur can be blended in, if needed, to make Greenleaf RPR Supreme (10% S).

Greenleaf RPR is cheaper than super because it has not been acidulated. It is easier to handle than ground rock phosphate powder, but does not spread as well as pelleted super.

Where can RPR be used?

Sechura RPR is still a slow-release fertiliser, and Incitec recommend Greenleaf RPR as a maintenance fertiliser for pastures where rainfall is above 600 mm a year, the soil pH (in water) is below 6, and where present soil P levels are adequate.

For more information contact your local DPIF Extension Officer.

****

BTEC STRATEGIC PLAN 1993-1997

The Buffalo Industry Council has withdrawn endorsement of the Strategic Plan.

This is due to failed negotiations with National BTEC Committee to provide special assistance for the buffalo industry due to the enormous effect that BTEC has had.

BUFFALO INDUSTRY COUNCIL
PHONE: 421 211

Brian Radunz
Deputy Director Animal Health

PLANT POISONS EFFECTING CATTLE IN THE TOP END

Zamia palm and Ironwood are two very toxic plants which occur commonly in the Top End. They can effect cattle, horses, goats, sheep, donkeys and camels. Stock will not necessarily become poisoned because they have access to poisonous plants. Most toxic plants are unpalatable and are eaten only when animals are stressed or starving. In assessing the danger of poisonous plants on a property it is helpful to know if the plants are ever observed to be eaten.

Introduced stock are often less discriminating about what they eat than they would be in the paddocks which they were reared. Animals left in stockyards may become bored and eat poisonous plants within reach, as a result of curiosity.

Zamia Palm

There are about ten species of Cycads (zamia palm) in Northern Australia. They are probably all toxic. Young leaves of cycad plants, especially regrowth after burning is very palatable to stock. However, consumption of the plant and poisoning occurs at any time of the year. The condition seen in cattle is posterior ataxia, known as 'zamia staggers'. The poisonous principle in the cycad causes axonal dystrophy in the spinal cords of cattle. Cattle show knuckling over at the fetlocks of the hind limbs, swaying, staggering, collapse and hind leg incoordination. In more severely affected animals there is posterior paralysis. There is no treatment for the condition and the damage to the spinal cord is permanent.

The only way of preventing the disease is to remove all cycads from cattle paddocks. Advice should be sought from the Weeds Section of DPIF on how to do this.

Ironwood (*Erythophloeum chlorostachys*)

The leaves, twigs, and pods of the ironwood tree contain erythrophleine which is a highly cardiotoxic diterpenoid alkaloid. Cattle which have consumed the plant can show lack of appetite, staring and sunken eyes, sporadic contraction of the abdominal muscles, loud irregular heart sounds, difficult breathing and sometimes scouring. However, death often takes place very rapidly and there may be nothing to observe but dead animals. A post mortem examination of these animals may show haemorrhages in the heart and inflammation of the abomasum and the intestines. Diagnosis is generally confirmed by the presence of ironwood leaves in the stomach.

Ironwood trees are abundant all over the Top End and under normal grazing conditions no problems occur. Cases of toxicity are generally associated with starving stock.

Kel Small, Vet Technical Services, BARC

CROCODILE HATCHLING DISEASE AND TREATMENT

As in all intensively farmed animals the lifetime performance of a farmed crocodile is largely determined in the first 1/6th of its growing period. It follows that this is when the majority of death occurs.

In the NT crocodile industry generally there is a mortality rate of 6%. The animals that die can be broadly divided into two groups;

1. good, well grown crocs that suffer sudden death
2. emaciated animals that slowly decline in condition and die

At any stage in the hatchling period well performing animals can regress into either of the two categories.

A) STRESS

Background

It is known that crocodiles are very susceptible to "stress", so much so, that it is often difficult to know when intervening and treating a diseased animal will be counter productive due to the stress caused.

It is known that the physiological effects of stress are largely mediated by the actions of two hormones; adrenalin and nor-adrenalin. The effects of both these hormones on metabolism can be largely abolished by the administration of *alpha blockers* and *beta blockers* by a veterinarian.

Sudden Unexpected Death

Within this category there are at least three separate syndromes;

1. the best animals rapidly die after exhibiting nervous signs; circling, rolling, inability to swim, dilated pupils, flaccid muscles. Nothing abnormal is seen on post mortem.
2. good animals found dead, post mortem reveals signs of massive bacterial infection.
3. good animals found dead, nothing abnormal found at post mortem, save possibly fatty liver.

1. Nervous Signs

Background

This syndrome is only seen in aggressive, dominant animals and only after they have been handled, i.e. for grading. Hypoglycaemic shock (sudden low blood sugar) does occur in alligators and the signs described are very similar to those seen here.

In alligators, the fuel to supply the energy for the muscles in the violent movements associated with combat, work or flight comes almost entirely

from anaerobic metabolism. In the muscles, glucose is converted to lactate, the lactate is released into the blood and glucose taken up. In the normal course of events this lactate is picked up by the liver and reconverted to glucose. However, due to the very slow metabolism of the alligator this conversion takes a long time.
If the exertion continues, the muscles clear the blood of glucose almost entirely, below the level needed by the nervous system to function normally. This can result in the phenomenon known as hypoglycaemic shock.

When hatchlings are handled the large dominant animals often show the greatest reaction; threat display, vigorous swimming etc. It is known that these small crocodiles can have a small endurance -> about 5 minutes before total exhaustion. These exhausted animals have a high lactic acid level in the blood (the blood is acidic) and a dangerously low glucose level.

Suggested Treatment

Therapy should be aimed at increasing the pH (decreasing acid) and glucose levels in the circulation, and requires veterinary attention.

It is known that it takes a number of hours before oral glucose can have any effect on the level in the blood, therefore oral glucose therapy will probably be ineffective.

2. Sudden Death - Bacterial Infection

Background

In these animals evidence is found of massive bacterial infection, that is, bacteria can be cultured from all the tissues. Occasionally there is a puncture wound from fighting. In some cases there are small pin point abscesses on the liver, these are associated with fatty liver syndrome.

Initial observations seem to suggest that the majority of mortalities in this group occur at the end of the dry season, just when the feed consumption of the animals is starting to pick up. It occurs in good animals that would be expected to have a good appetite. Perhaps it is no coincidence that it is just at this time that the bacterial flora inhabiting the gut must experience significant changes.

The bacteria involved are commonly members of the group Enterobacteria. These are gram negative microbes commonly found in the gut of healthy animals and free living in the environment. Typically in veterinary medicine, members of this group are not usually primary pathogens, that is able to cause disease on their own. They come in when the animal has been weakened by some other factor.

The same seems to be largely true in crocodiles because mortality associated with these bacteria is usually sporadic, apparently connected cases often revealing different bacteria.

There are always exceptions to the rule, and infection with one member of the *Proteus* family has killed every animal in a particular pen.

Suggested Treatment

Inclusion of soluble oxytetracycline in the ration at the rate of 3 gm per 10kg of feed. Depending on the concentration of the commercial product the final inclusion rate will need to be calculated.

The pens should be drained every day, and chlorine added to the water.

The inclusion of drugs in the ration does tend to reduce the feed intake. It is quite possible that the apparent success of this treatment regime in preventing the disease is due to the reduced feed intake rather than any therapeutic value from the drug.

If there are more than two sudden deaths in any one pen within two days, the entire pen should be treated under veterinary supervision.

3. Sudden Death - Fatty Liver

This group includes all crocodiles in good condition found dead, but not the ones from which bacteria are found in the internal organs.

A fatty liver has been seen in many of these animals. Fatty liver, in mammals is known to be a metabolic disorder resulting from either an overproduction or under utilisation of fat. It results from an interplay of hormonal and nutritional factors. It is most commonly seen in starvation. Here, the liver is unable to make the special proteins required to transport the fats away from the liver.

When there is an adverse environmental stimulus a crocodile often stops eating altogether. When we see fatty liver at post mortem we are seeing the results of an upset in metabolism whereby the animal is no longer getting sustenance from its food, because it is not eating and the intestines are empty. So it starts to metabolise its body reserves, fat and protein.

In the wild the animal will seek a low temperature to reduce it's metabolic rate and so it's demand for glucose. However in a farmed situation the animal is unable to reduce it's temperature and so it is forced to maintain a high metabolic rate.

The body has to defend the glucose level in the blood and so it diverts protein into glucose synthesis. This results in a relative lack of protein. So the liver is unable to make the proteins it needs to transport the extra fat released from the fat reserves because of the negative energy balance.

The maintenance of animals not eating at high temperatures results in this metabolic disease. This could well contribute to their demise.

ANOREXIA LEADING TO DEATH

Background

It is possible to predict that once a crocodile has started to fall back, it will in all likelihood go on and die. These animals do eat but only a small amount. They appear to lack the will to live. In some cases, as in skin fungal infections, there is an apparent reason why they do this. However, it is often the case that apparently healthy animals will start to fall behind.

As mentioned above, it is "unnatural" for a fasting crocodile to maintain its temperature as high as 30°C. When it is forced to, it may lead to a metabolic disorder.

It is not known why the majority of these animals refuse to eat to the point of death. Most of the mortality occurs in the first dry season post hatching. Even when the temperature is apparently maintained at optimum levels a proportion of the animals will succumb to the anorexia condition.

It is possible that the seasonal decline in activity seen in saltwater crocodiles is not entirely temperature driven. It is quite likely that some other natural cycle is operating here. Possibly this cycle has an impact on the anorexia seen in hatchlings. Once September comes nearly all hatchlings will improve their eating and commence growing.

When a crocodile has not been eating for some time the gut is empty and it is surviving on breaking down its bodily reserves. The body fat is metabolised and this releases fat and the fat soluble vitamins. However the animal will be short of minerals and the water soluble vitamins, notably the Vit B complex. The kidneys will continue to function and excrete minerals. In the crocodile this leads to a deficiency in potassium. This deficiency is manifest, amongst other things by muscle weakness.

It is known that if anorexic crocodiles are treated with human growth hormone they will start eating and growing.

There are two components of any treatment: address the initial problem (often unknown) and address the resulting metabolic upset. This must be done under veterinary supervision.

In addition, if the animal is suffering from fungal infection it can be treated by painting the effected area with an antifungal treatment i.e. Imaverol, Oftentral, Fungazol and others. The effected animals should be exposed to the sun for a few hours every day, with the proviso that they are maintained at the correct temperature and protected from predators.

This is an attempt to pull together what is known about crocodilian metabolism and therapeutics to address the problem of disease in hatchlings on crocodile farms in the Northern Territory.

J. McInerney
Vet Technical Services, BARC

UPDATE ON DPIF RE-STRUCTURING
THE NEW STRUCTURE AND GOALS

Executive	Provide leadership to the Department in implementing the Governments policies.
Policy	Ensure the policy, machinery of government and corporate action relevant to primary industry and fisheries are constructive and coherent.

REGIONAL OFFICES

Alice Springs} Tennant Creek} Katherine }	Co-ordinate the Department's activities in the region.

10 DIVISIONS

Alice Springs Pastoral	Maximise the nett benefit to the NT from pastoral enterprise in the Alice Springs region.
Tennant Creek Pastoral	In partnership with industry, increase the long-term productivity of the region.
Katherine Pastoral	Optimise productivity and sustainability of the grazing industries in the Katherine region.
Agriculture	Create opportunities for the expansion of diversified and sustainable agriculture in the Top End.
Fisheries	Manage fisheries resources of the NT on a sustainable basis for the benefit of the community.
Horticulture	Continue to assist in the development and promotion of a sustainable horticulture industry in the Northern Territory.
Resource Protection	Protect the community and ensure that production and markets of primary products are not restricted by pests, disease and contaminants.
Animal Health	Maintain and enhance animal health, welfare and market access.
Commercial Development	Stimulate business and infrastructure development and fishing industries.
Land Resource Management	Ensure that the community's expectations of sustainable resource use are met by a profitable NT primary industry sector and other land managers.

4 SERVICES

Information	To develop and implement information management strategies, infrastructure and service to enhance and support the attainment of corporate goals and objectives.
Personnel	To achieve a workforce of skilled people who foster creativity, innovation, adaptability and commitment to changing needs in line with Departmental Objectives.
Finance	To provide an efficient and effective accounting service to client groups, including employees and the private and public sectors.
Public Relations	Enhance and promote the image of the Department and its officers into specifically targeted areas in order to create a conducive environment for the Department to pursue its corporate objectives.

CONTACTS

	Telephone
Peter Blake - Secretary	892 001
Howard Dengate - Deputy Secretary	892 002
John Dillon - Director Policy	892 394
Regional Managers	
Dave Newton-Tabrett - Alice Springs	518 100
Jack Peart - Tennant Creek	622 439
Tom Stockwell - Katherine	738 747
Acting Leaders	
Dave Newton-Tabrett - Director Alice Springs Pastoral	518 100
Jack Peart - Director Tennant Creek Pastoral	622 439
Tom Stockwell - Director Katherine Pastoral	738 747
Tony Hooper - Director Agriculture	892 385
Darryl Grey - Director Fisheries	894 319
Niranjan Dasari - Director Horticulture	892 284
Ian Kilduff - Director Resource Protection	818 733
Allen Bryce - Director Animal Health	892 131
Brian Kuhl - Director Commercial Development	892 162
Wayne Mollah - Director Land Resource Management	892 390
Sean Christie - Manager Information	892 150
John O'Leary - Manager Personnel	892 296
Trevor Saunders - Manager Finance	892 126
Kerry Sharp - Manager Public Relations	892 328

NO-TILLAGE : FOR SUSTAINABLE AGRICULTURE

Soil erosion, high soil surface temperatures and degradation of soil physical and chemical properties with intensive cultivation can be serious management problems to sustainable production on the soils of the Douglas Daly and Katherine districts. These problems can be minimised by the use of a **No-Tillage System** particularly in combination with a legume ley.

A no-tillage system is a form of land preparation whereby seed is directly drilled or placed into the undisturbed soil. This method will eliminate all preplanting seed bed preparation that is commonly used in conventional tillage. Weed control is generally achieved through appropriate use of herbicides.

Some farmers and researchers wrongly believe that no-till will produce higher yields and will work under all situations. Research in the tropics and in the temperate regions has shown that the success of a no-tillage system will depend on soil type, soil properties, drainage, climate, nature of the crop and the socio-economic status of the farming community. Therefore different tillage systems are required for different soil management problems and it should be kept in mind that no single tillage system is best for all combinations of soil, climate and economics.

Research conducted at the Douglas Daly Research Station by DPIF agronomists has shown that a no-till system with adequate **mulch** is beneficial in terms of crop production and soil and water conservation. In a well drained Tippera soil no-till increased maize, soybean and sorghum yields over conventional tillage by 12 to 130% and the highest increases were obtained in drier years. The other beneficial effects after 8 years of no-till cropping were increases in soil organic carbon and nitrogen and improved nitrogen fixation by soybeans. Most of the above beneficial effects can be attributed to better crop establishment with good soil moisture conservation.

WHAT ARE THE ADVANTAGES AND DISADVANTAGES OF A NO-TILL SYSTEM

Advantages:

* Reduced soil erosion
* Reduction in machinery cost
* Savings in labour and fuel- less number of operations
* Moisture conservation
* Improved seedling establishment
* Increased soil organic matter and nitrogen
* Lower soil temperature

* Conserves plant nutrients ie Plant nutrient losses are reduced

* More land use classes can be brought into cropping

* Reduced land preparation time

Disadvantages

* High insect pest infestations

* Additional herbicide costs.

These can be reduced through the selection of a suitable crop rotation system.

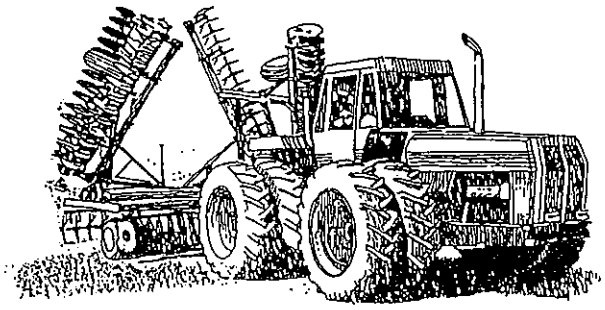
* Crop residues interfering with herbicide application at sowing

* Initial immobilisation or tie up of nitrogen.

It should be noted that no-tillage systems require a higher level of managerial skills and sometimes lower yields are produced initially due to low mulch levels, soil compaction at the start of sowing and presence of harmful insects or poor drainage conditions. It will take 2-3 years to stabilise the yield.

Further research will be undertaken by the Department to understand the potential benefits of the system in a mixed farming situation. No-tillage crop production eliminates the need to prepare the seed bed, other basic agronomic practices must still be followed, the system reduces some production costs but does not guarantee the farmer a profit if careful attention is not paid to the cost reduction effects of economic cropping practices (crop rotation, ley farming, mixed farming, cover crop etc.)

K. Thiagalingam, Agronomist,
Agriculture Division



MEAT RESIDUES IN EXPORT CATTLE

Producers, exporters and processors should be aware that many live export cattle have been subjected to drug treatments which make them unsuitable for immediate slaughter for human consumption. In some cases the meat withholding periods for these animals may be as long as 6 weeks.

It is imperative that in cases where animals are not exported for any reason, due inquiry is made into their drug residue status to avoid the serious consequences of allowing consumers to unwittingly consume meat containing drug residues.

Dennis Thompson
Senior Livestock Exports
VETERINARY OFFICER

HERBICIDE ROLLERS - A CHEAPER METHOD OF WEED CONTROL

With cattle production becoming more intensive and improved pastures more of a necessity, weeds, which tend to increase with heavier grazing and improved soil nutrients, will become more of a problem. Weed control can be costly but it is necessary if good production is to be achieved and maintained. Spraying equipment and herbicides are expensive and in many cases the best herbicide to use may also damage the pasture which you are trying to save.

Alternative methods of applying herbicides, where the weed only is treated, would seem to be a practical and cost effective way to go. Several machines capable of wiping herbicide onto plants are available and have been successfully used both interstate and overseas. Some of them are simple, robust and relatively cheap and so, if successful, are an attractive and practical method for weed control. They come in a wide range of sizes, from units which can be fitted to a Quadbike through to ones which are capable of covering 50 ha a day.

The Department of Primary Industry and Fisheries has purchased a medium sized one called a Herbicide roller (it has had limited testing to date) which should prove effective at taking tall, erect woody weeds out of pasture at minimum cost. This machine will be tested extensively in the Douglas/Daly District in the coming season in order to ascertain the rates and types of herbicides for best control of weeds such as sida, hyptis and cassia. Its effectiveness in control of suckers will also be examined.

Although testing in the Top End has been limited to date, three machines the same as DPIF's have been purchased and will be in use this season.

Further information may be obtained through your local DPIF Extension Officer.

Tom Price, Agriculture Division,
Extension Officer.

RAINFALL
1993 - 94

	JULY	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APRIL	MAY	JUNE	
1													1
2													2
3													3
4													4
5													5
6													6
7													7
8													8
9													9
10													10
11													11
12													12
13													13
14													14
15													15
16													16
17													17
18													18
19													19
20													20
21													21
22													22
23													23
24													24
25													25
26													26
27													27
28													28
29													29
30													30
31													31
TOTALS													
NUMBER DAYS													
YEARLY TOTAL													

DPI&F
CONTACTS

TOM PRICE
Extension Officer, Crops
892 315

JIM McINERNY
Crocodile Research
892 032

PAUL GRAHAM
Extension Officer, Animal Production
892 321

BARRY LEMCKE
Senior Animal Production Officer,
Buffalo/Cattle/Pastures
892 263

ROBYN RANN
Agribusiness Management Officer (PMP)
892 334

DAVE NAPIER
Principal Stock Inspector
892 337

MIKE POFFLEY
Extension Officer, Horticulture
892 220

GRAHAM SCHULTZ
Regional Weeds Officer
892 206

FERGAL O'GARA
Extension Officer, Crops ,Kath
738 736

DIANA PINCH
Veterinary Officer
892 288

COLIN TIDSWELL
Newsletter Enq/Cattle
892 252

REG ANDISON
Animal Production Officer, Kath
738 749

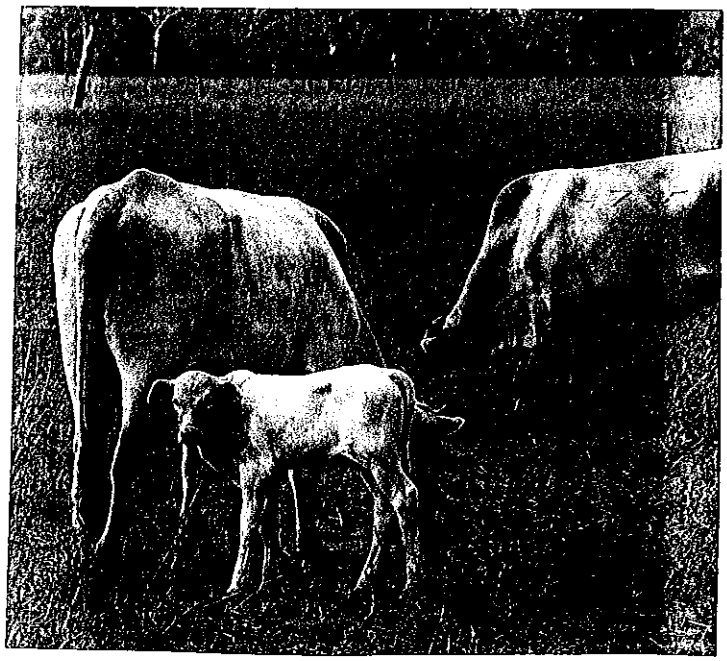
UPDATE ON THE BORAN/TULI PROJECT DDRF

Well the long awaited day has finally arrived and the cows at DDRF have begun calving. To date we have 6 Tuli and 3 Boran cross calves from our Brahman cross cows. The AI program has resulted in us expecting 30 of each breed and 30 sired by Brahmans born in the same time period to allow a demonstration comparison.

These animals are there, for you as producers to come and have a look, so please do. The following information was sent to us by Victorian Artificial Breeders Co-operative Society Limited (VAB) and we hope you find it of interest, we will keep you posted as to our local results as they come to hand.

by R Rann & C Tidswell,
Animal Production

******



OUR FIRST TULI CALF OCT 1993

The following are extracts from information supplied by VAB Laboratories, from where Boran and Tuli semen may be obtained.

BORAN HEIFERS AND TULI HEIFERS CYCLE EARLIER

Percentage of heifers cycling at 15 months of age

Dam breed Brahman	
Sire Breed	
Brahman	4%
Boran	20%
Tuli	22%
Dam Breed Brahman derived	
Sire Breed	
Brahman Derived	0%
Boran	14%
Tuli	42%

Data from 145 heifers showed more Tuli cross heifers and more Boran cross heifers for each genotype, were cycling (i.e. had reached sexual maturity) at about 15 months of age. The proportion of heifers cycling represents the proportion capable of becoming pregnant at that age.

AND THEY CYCLE AT A LOWER LIVE WEIGHT

In the Belmont Red and the Brahman dam group, the Boran and Tuli crossbreds cycled at a lower liveweight than the respective straightbreds. None of the straightbred interbred Hereford x Shorthorns or interbred Brahman crossbreds was cycling, preventing

comparisons of liveweights at sexual maturity within these dam breeds.

Early sexual maturity will result in higher annual calf crops.

HYBRID VIGOUR BOOSTS PRODUCTIVITY

At Belmont, straight red progeny (Interbred Hereford x Shorthorn, Belmont Red, Brahman cross and Brahman) sired by straightbred bulls were compared to the progeny of Boran and Tuli bulls from the same dam breeds. Within each dam breed, crossing to the Boran and the Tuli resulted in an increase in liveweight.

The straightbred bulls were selected mainly for high growth EBV's and the Boran and Tuli crossbred progeny were sired by Boran and Tuli bulls selected at random without regard to any characteristic. Growth records from 256 animals were used.

Comparing Boran and Tuli liveweights from different dam breeds at 12 months.

Dam Breed Brahman	
Sire Breed	
Brahman	227 kg
Boran	232 kg
Tuli	232 kg
Dam breed Brahman Cross	
Sire breed	
Brahman cross	216 kg
Boran	238 kg
Tuli	236 kg

Low liveweights of all the groups are a reflection of the severity of the environment in which they are reared. Despite the severe drought conditions in Queensland, the Boran and the Tuli crossbreds outperformed the respective straightbreds.

All animals were reared together and treated alike. None has been treated to control either internal or external parasites or has been offered supplementary feed.

Growth rates of all Boran and Tuli crosses are better than the control breeds. The growth rates show there has been no loss of resistance in the crosses.

Higher rates have been achieved without the use of large breeds.

A Profile of the Boran Breed

A new option for genetic improvement in beef herds through crossbreeding.

The Boran is an African *Bos indicus* breed with high resistance to ticks, heat and other stresses. It copes well with scarcity of feed and water and reaches sexual maturity earlier.

Borans were introduced to Australia in 1990 by CSIRO and the Boran and Tuli producer Consortium. They are the only Borans outside Africa and the only purebred African Zebus (*Bos indicus*) in Australia. Embryos collected from high performance donors in Zambia were washed, frozen and transferred into Australian bred recipients on the Cocos

Islands. The calves born on Cocos Island were health tested and flown to Australia.

The Boran was developed by the Borana people of Southern Ethiopia and Northern Kenya. They selected their cattle for the ability to produce enough milk to allow man, cow and calf to survive, despite regular feed and water shortages. Non productive animals were eaten. This form of selection, which differentiates the Boran from Indian Zebu breeds, developed a breed with high reproductive rates even under adverse conditions. The cattle also had to have a docile temperament, a strong herding instinct and a powerful desire to protect their young from predators. Other attributes, including resistance to parasites, diseases, heat stress and shortages of feed and water, are the result of hundreds of generations of natural selection in the stressful environment of their homeland.

Borans are medium sized cattle that mature relatively quickly.

Boran bulls have a prominent thoracic hump, loose dewlap and a well developed sheath. However, they are not prone to preputial prolapse.

Boran cows are renowned for their freedom from udder and teat defects. They also have a pronounced hump. The coat of Boran cattle is sleek and varies in colour from white through to grey to deep red. There is a high proportion of naturally polled animals.

The Tuli Breed Profile
Hardy, fertile and docile, producing excellent beef even under harsh conditions.

The Tuli is a pure African Sanga breed with early sexual maturity. They are *Bos taurus* with high adaptability, fertility and excellent temperament. They are well adapted to arid conditions and have high resistance to heat and cattle ticks.

The Tuli was introduced to Australia in 1990 by CSIRO and the Boran and Tuli Producer Consortium through the use of embryo transfer. Embryos were collected from purebred registered Tuli donors in Zimbabwe, washed and frozen, and implanted into Australian bred recipients on Cocos (Keeling) Island. The resultant calves, after health testing, were flown to Australia.

The origins of the breed are clouded by antiquity. The Sanga breeds have probably been in Africa for at least 5 000 years. One of these breeds, the Tswana, evolved in Southern Zimbabwe. The Tswana were able to cope with the stresses of parasites, diseases, heat and periodic droughts that occurred in their semi-arid homeland. In addition they were selected by their African owners in a manner that favoured docility and fertility even under stressful environmental conditions. In 1946 a group of the most productive Tswana were transferred to the Tuli research station and became known as Tulis. Commercial breeders have developed the breed further.

Tulis are medium sized cattle that reach sexual maturity at a relatively early age.

They have brown pigmented skin and sleek coats that may vary from dark red through shades of red to white. A high proportion of Tulis are naturally polled. Tuli bulls have a clean sheath and a pronounced cervicothoracic hump that is absent from Tuli cows. The cows are very easy calvers and are free from udder and teat defects.

Some Breed Facts

Differences in growth, using both the Boran and the Tuli breeds, have been obtained without any increase in birth weights. This indicates three important advantages of the F1 Brahman by Boran and F1 Brahman by Tuli.

Easy calving when Boran and Tuli bulls are mated to Brahman cows.

The mature size of the F1 Brahman by Boran and the F1 Brahman by Tuli animals will be similar to the Brahman.

F1's will attain sexual maturity and carcase maturity at an earlier age than straightbred Brahmans or other F1's produced by mating Brahmans to breeds of larger mature size (e.g. Indu-Brazil or Charolais).

Tick and worm resistance will be improved by using the Boran breed.

The Tuli is less resistant to tick and worms but the extra growth through hybrid vigour will offset their effect.

A Tuli Brahman cross should be as resistant to ticks and worms as the typical North Queensland Brahman cross.

Because the Brahman, the Boran and the Tuli have been separated geographically for a very long time and are not closely related, hybrid vigour will occur when they are crossed.

Tim Van der Poel
Victorian Artificial Breeders
(053) 679274

ALEMAN GRASS
A GRASS FOR FLOODED OR PONDED PASTURES

Description

Aleman Grass also known as German Grass *Echinochloa polystachya* cv Amity, has been available in the Top End now since about 1988.

Its use has been restricted by the need for vegetative planting. Significant amounts have now been planted around various properties and the grass looks promising.

Aleman Grass was introduced originally from South America (Mexico to the Argentine) and is a robust vigorous aquatic or semi aquatic grass which produces long stems which tend to grow upright or float on the surface but eventually move more horizontally due to the weight of the stem and leaf. Once in contact with the soil or when water recedes, they root down readily from the nodes and commence new leaf and stem growth at this point. Considerable spread from a single plant can be achieved in one season if the area around the plant is bare of competitive grasses - up to 3-4 metres.

The stems vary from 10-15 mm in diameter and 1-2.5 metres tall, with leaf blades from 10-25 mm wide and 200-600 mm in length. Stems can grow up to 2.5 m long in good conditions, containing 7-10 nodes or more.

The seed head is an open panicle 15-25 cm long producing seeds 4-5 mm in length which are not viable (infertile).

The colour tends to be a light blue green in comparison to the deep green of Hymenachne.

The leaf blades are longer and narrower than Olive hymenachne, wider than native hymenachne and longer and wider than Para grass. Leaf blades are smooth and hairless.

Yields of up to 20 tonnes/ha under good conditions can be expected.

Adaption

Aleman grass grows well in the black cracking clay soils of the Top End coastal areas.

Aleman should generally take deeper flooding than Para grass but less than Hymenachne. Overseas it is reported to grow in water to 3 m depth.

Flooding can occur from 3-12 months of the year.

Aleman will grow successfully on the Solodic (bulldust) plains of the Marrakai, Mt Bundey area and has been successfully established in swamps and lagoon areas further south and in the Katherine area.

Specific ponding to keep an area flooded for a longer period of the year is likely to provide a good site for the

growth of Aleman grass.

Banks planned and constructed to pond water up to about 1.2 m depth are suitable for Aleman.

Annual rainfall would probably need to be 1 000 mm or more, or the area planted would need to be a wet swamp for a considerable period of the year in a lower rainfall area.

It is mainly recommended for wet or seasonally flooded areas in the Top End.

Establishment

1) Aleman grass does not produce viable seed so that it has to be established vegetatively. The general procedure is to harvest the long stems during the wet season when it is active, trim off the leaves and plant sets of 2-3 nodes into mud with only 1 node showing. Care should be taken to plant the stem pieces right-way-up about 1-2 metres apart.

If the seedbed is very clean and no competition from other grasses is expected, then plant spacing could be increased to 4 metres between sets.

Row spacing can be varied depending on what expectations are for grazing in the future, and what level of grass competition is there i.e. If a good first year stand is required then plant spacings should be closed up to get good cover in the first year i.e. on 2 m x 2 m grid. If row spacing is widened then the area can be ploughed in between the rows in the beginning of the next wet season to encourage spread from the edge of the original row established previously. This can be done on a yearly basis until the two adjacent rows have merged.

This method can be used even in some standing water, but the top of the stems should be above the water level. The deeper the water, the longer the stem that is used, as long as the end of the stem is embedded in the mud.

Stem pieces can be dropped into free water but will be less successfully established than if planted into the mud. As well, good cool cloudy weather for 2-3 weeks after planting will improve the strike rate significantly.

2) A different method could be employed where the stems are dropped on the ground surface and disced in (either whole or chopped), if the soil is not yet waterlogged and is trafficable.

It does not matter if plant sets are planted vertically, angled or buried horizontally, as long as they are not planted upside down.

Cut stems, if kept covered and moist will develop a reasonable number of roots from each node which may aid in establishment. They can be stored for a week or more under these conditions and the planting material will still be viable.

If a track type vehicle is available, stems can be dropped in low water or muddy conditions, in front of the tracks.

In all planting situations the rate of coverage depends on removing surrounding grass competition so that the stems can root at the nodes whenever they become too heavy to be supported e.g. in heavy storms.

With removal of competition in between rows, even rows 10 metres apart should converge within 2-4 years, given good growth. Some grazing can still be expected during this time.

Management

Fertiliser requirements

Little has been done locally in the NT in determining fertiliser regimes, however on the black cracking clays, stands have persisted well without any fertiliser being applied at all. Its requirements are likely to be similar to Para grass where good responses to nitrogen applications are recorded in dry matter yields. Nitrogen fertiliser applied early in the establishment phase (e.g. when 20-30 cm tall) is likely to increase tillering and dry matter production considerably. NPK fertilisers are likely to boost aleman grass establishment on the solodic plains further inland where phosphorus levels are lower.

Grazing

Because of the land units that these grasses favour, most grazing will be restricted to the non flooded periods i.e. early dry season once water recedes through to early wet season. Mustering will need to be carried out prior to the expected flooding - usually January. It is good management to not graze too low just before deep flooding or plants will generally not survive inundation without leaf above flooded water level.

Generally 16-18 months should elapse before grazing i.e. during the second dry season. A very light grazing in the first dry season may promote tillering and reduce some of the other grass competition, however, as Aleman is very palatable, the latter could not be relied upon to occur without reducing the Aleman establishment significantly.

Aleman grass is very palatable and is usually grazed right to the crown by cattle, buffalo and horses during a dry season. This does not appear to reduce its ability to regrow once moisture is again available. Over grazing at this stage may cause problems.

It appears from observation that it is more palatable than Para grass and the Hymenachnes and it recovers well when spelled. It appears to be able to recover moisture from lower levels than Para grass, actively producing green shoots later into the dry season on black cracking clay soils.

Actual weight recordings of grazing production have not been taken in the Top End but in South America beef yields of 200-250 kg 1 ha/annum have been recorded.

Mixtures

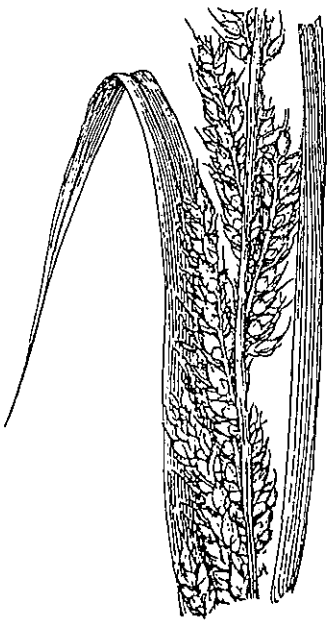
The inclusion of legumes into the system can give positive benefits in the first few years by contributing nitrogen to the grass. In the long term most legumes will be out competed by Aleman grass due to its aggressive growth and density.

Suitable species would be Glenn Joint Vetch, Murray phasey bean for wetter areas and Bundey for only light flooding areas.

Fire

Although Para grass and Aleman grass can recover from a bush fire, it is highly recommended that these areas are well firebreaked as there will be high losses of nutrient from the mulch if it burns - leaving a period when there will be significantly greater evaporation and a complete loss of feed for the stock till the next rains or irrigation.

Barry Lemcke,
Animal Production, Darwin



COMING EVENTS

BARC Seminar Series Program:

These Seminars are held at 3.00 pm in the JEB Conference Room at Berrimah Farm.

1994

January 14	The Role of Farmlets in R&D
February 11	Introduced Pasture Threats
March 11	Post-Harvest Disinfection of Horticultural Products
April 8	Irrigation Research
May 13	Client Survey
June 10	Crocodile Industry

****

WISHING YOU ALL

A

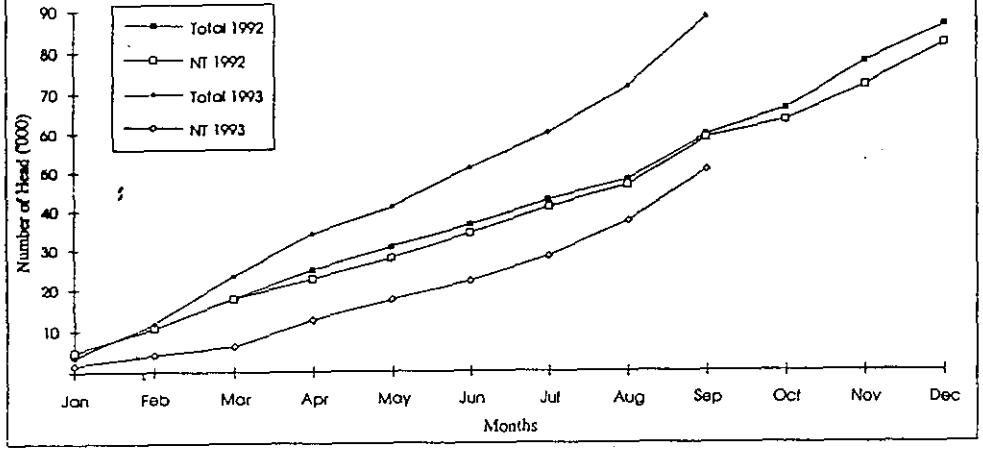
MERRY CHRISTMAS

AND

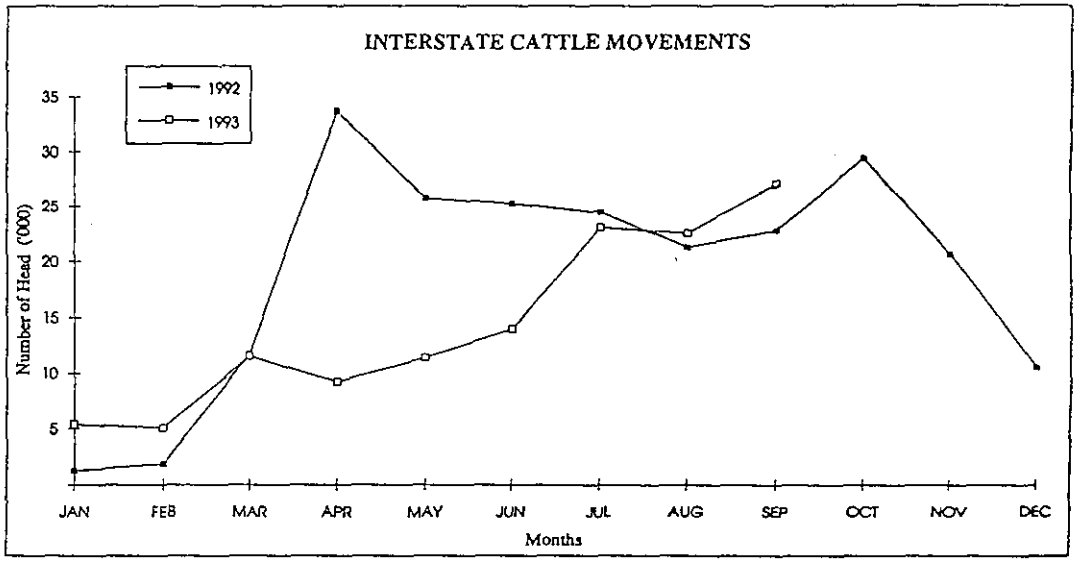
PROSPEROUS

NEW YEAR

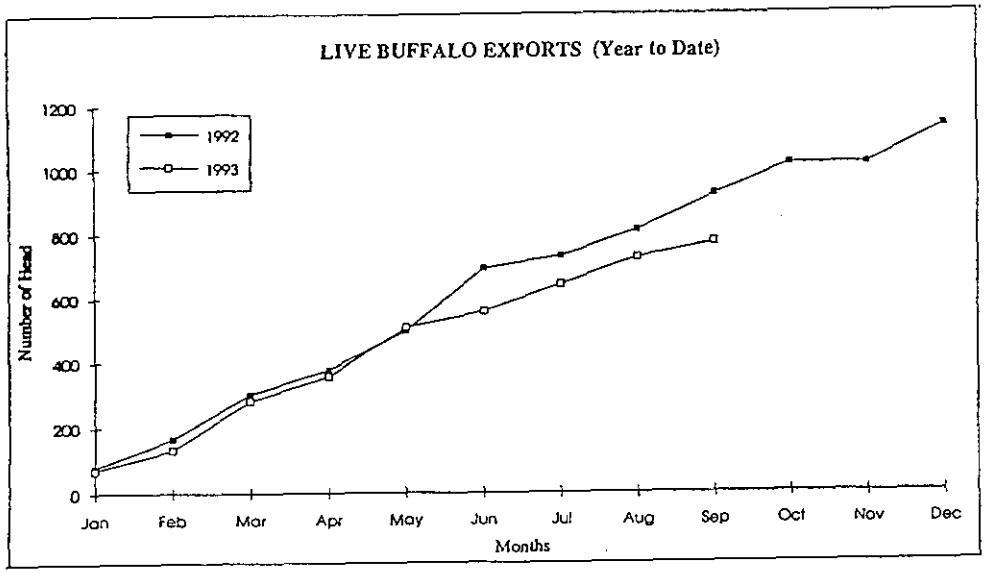
TOTAL LIVE CATTLE EXPORTS VIA DARWIN, NT CATTLE EXPORTS VIA DARWIN & WYNDHAM (Year to date)



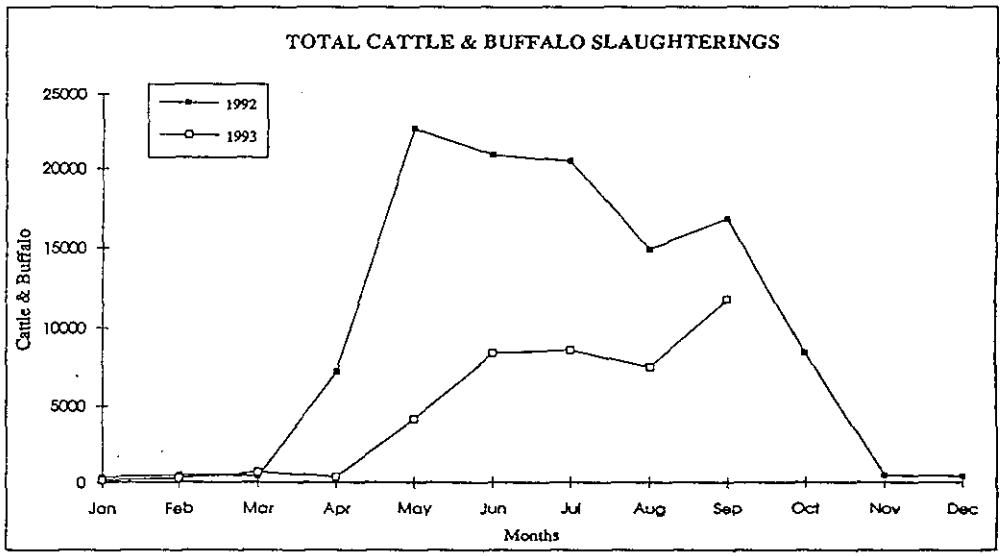
INTERSTATE CATTLE MOVEMENTS



LIVE BUFFALO EXPORTS (Year to Date)



TOTAL CATTLE & BUFFALO SLAUGHTERINGS



DPIF Economics

CATTLE & BUFFALO QUARTERLY REPORT
SEPTEMBER 1993

INTERSTATE MOVEMENTS

An estimated ***total of 72,442 cattle*** were moved interstate during the 3rd quarter of 1993 for slaughter or further growing. This was about 2 times more than the movements in the 2nd quarter of 1993 and about 6% less than the movements in the 3rd quarter of 1992.

Year to date: 128,901

Destination	Slaughter Cattle (3rd Qtr. 93)	Store Cattle (3rd Qtr. 93)	Total Cattle (Year to date)
South Australia	21,100	11,413	66,744
Queensland	11,535	14,221	35,173
Western Australia	2,597	9,790	19,615
Other States	350	1,436	7,369

SLAUGHTERINGS

An estimated 27,872 cattle and buffalo were slaughtered at NT abattoirs during the 3rd quarter of 1993 - ***24,096 cattle, 3,776 buffalo.*** This was about 2 times more than the 2nd quarter slaughterings of 1993 and about 47% less than the number slaughtered in the 3rd quarter of 1992.

Year to date: 37,838 cattle, 4,026 buffalo

Abattoir	Cattle		Buffalo	
	3rd Qtr. 93	YTD	3rd Qtr. 93	YTD
NT EXPORT				
Katherine	15.658	20,298	0	131
Meneling	6,218	12,921	3,672	3,672
NT DOMESTIC	2,220	4,619	104	223

LIVE EXPORTS

An estimated 37,275 cattle were exported through the Darwin Port during the 3rd quarter of 1993. Of this, 17,678 cattle originated from interstate (particularly Queensland). An estimated 28,418 head of NT cattle and buffalo were exported live (through Darwin & Wyndham Port) during the 3rd quarter of 1993 - **28,200 cattle, 218 buffalo.** This was 78% more than the number of NT live exports in the 2nd quarter of 1993 and it was 16% more than the exports during the 3rd quarter of 1992.

Year to date: 50,037 NT cattle, 773 NT buffalo; 52,703 interstate cattle (through the Darwin Port)

Livestock Type	Total (including Interstate)	Northern Territory only		Destination
		Darwin	Wyndham	
CATTLE				
Slaughter	1,865	1,718	0	Brunei
Slaughter	434	434	1,145	Sabah
Slaughter	0	0	838	Philippines
Slaughter	470	470	345	West Malaysia
Feeder	9,454	2,953	2,540	Indonesia
Feeder	23,543	12,543	1,855	Philippines
Feeder	0	0	929	Sabah
Feeder	0	0	0	Sarawak
Feeder	250	250	951	West Malaysia
Breeder	1,477	1,229	0	Philippines
Breeder	0	0	0	Sabah
Breeder	0	0	0	Thailand
BUFFALO				
Slaughter		218	0	Brunei
Breeder		0	0	Sabah
GOATS		100	0	Brunei
		49		Sabah
SHEEP		245	0	
CAMELS		19	0	Indonesia

COMMENTS

The live export trade increased in the 3rd quarter in response to increasing demand. Live export of interstate cattle during the 3rd quarter was similar to that of the numbers in the 2nd quarter of 1993.

Prepared by Economics Branch, Darwin. For further information contact Chris Kraus (089) 89 2364.

KATHERINE

GROSS MARGIN BUDGET SUMMARY

	GRAIN SORGHUM Conventional	GRAIN SORGHUM Zero-till	MUNGBEANS Zero-till	MUNGBEANS (Stockfeed)	SESAME	HAY
Yield (t/ha) Price ($/t)	2.0 230	2.5 230	0.85 500 x 80% 300 x 20%	0.85 300	0.75 900	7.0 120
GROSS INCOME ($/ha)	**460**	**575**	**405**	**255**	**675**	**840**
Land preparation	13	20	24	24	13	13
Planting	47	47	26	24	10	43
Fertiliser	83	83	26	26	104	65
Weed Control	17	17	-	-	8	-
Insect Control	-	-	18	-	52	-
PRE-HARVEST COSTS	160	167	95	74	187	120
HARVESTING COSTS	13	13	24	24	20	59
Wrap	-	-	-	-	-	74
Cartage @ $35/t	70	88	30	30	26	-
Clean, Grade, Bag	-	-	55	-	56	-
Handling	24	30	10	10	9	-
POST-HARVEST COSTS	94	118	95	40	92	74
TOTAL VARIABLE COSTS ($/ha)	**267**	**297**	**214**	**138**	**298**	**252**
GROSS MARGIN ($/ha)	**193**	**278**	**191**	**117**	**377**	**588**

Douglas Daly Gross Margin Budget Summary

	Sorghum	Maize	Sesame	Mung Bean	Cavalcade Hay	Rice
Yield (t/ha)	2.7	2.5	0.5	1	7	3
Price ($/ha)	230	245	1000	.8t/400 .2t/295	945	245
Other Income						
Fertiliser Subsidy	26	29	21		16	29
Agistment	26	26		19		
Gross Income	**673**	**667**	**521**	**478**	**961**	**764**
Land Preparation	24	24	12	24	15	30
Planting	38	122	10	30	104	44
Fertilisers	143	154	118	68	78	190
Weed Control	17	52	30		76	130
Pest Control			49	52		45
Pre-Harvest Costs	***222***	***352***	***220***	***174***	***273***	***439***
Harvesting Costs	***22***	***34***	***34***	***34***	***131***	***77***
Cartage	27	25	13	25		75
Clean & Grade			25	40		
Bag			13	25		
Handling	32	30	6	12		36
Post - Harvest Costs	***59***	***55***	***57***	***102***	***404***	***111***
Total Variable Costs ($/ha)	**303**	**441**	**310**	**311**		**627**
Gross Margin ($/ha)	**370**	**226**	**211**	**167**	**557**	**137**