

# Pastoral Industry Survey 2004

## Darwin





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*Researched and written by Phil Hausler*

## **Acknowledgements**

*Firstly, without the contribution of time and information by the pastoral producers this survey would not have been completed. I thank the many producers who completed this survey for their support and enthusiasm.*

*I would like to acknowledge the assistance from Ben Beumer and Barry Lemcke in collecting information for the survey in the Top End region. Also to Karen Richardson, Melanie Usher, and Michael Johansen for help in entering and retrieving information from the database and especially to Neil MacDonald, Trudi Oxley, Sally Leigo, Andrew Bubb and Arthur Cameron for their valuable assistance in structuring and editing this report. I would like to thank Dorianne Questroy and Auriel McFarlane for their administrative support and the Marketing and Communications division for the assistance with the publishing of this report.*

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## **Executive Summary**

Due to high rainfall and the sandy nature of most land systems, native pastures in the Top End are poor in quality. Stocking rates of cattle on native pastures are typically between six and 10 adult equivalents a square kilometre (O'Rourke et al, 1991). The tendency in the Top End region is toward smaller, more intensive properties using fertilised improved pastures in a mixed farming system where stocking rates can range from 80 to 120 animal equivalents a square kilometre.

Larger properties in the Top End are increasingly moving toward improved pastures for greater cattle productivity and management. Results from the survey show that 96 per cent of producers have improved pastures sown on their property and 84 per cent intend to sow more improved pasture in future. Beef cattle production from improved pasture was seen as the basis of their operation by 48 per cent of producers. The total estimated carrying capacity for the Top End region is expected to increase from 139,000 head in 2004 to 188,000 in 2009 (a rise of 28 per cent) and to 341,000 in 2014 (141 per cent on 2004). To facilitate this, the three main priorities for infrastructure development are increasing the number of watering points within paddocks, paddock subdivision and pasture improvement.

To help offset the cost of these developments, some Top End pastoral businesses have diversified. Other enterprises incorporated in some way into pastoral properties include hay production, tourism, horticulture, and mixed farming. Sixty-three per cent of Top End pastoralists produce their own hay and 28 per cent produce hay as a commercial venture in their overall business.

The main forms of property ownership and management are privately owned and employing a manager (40 per cent) and privately owned and managed (36 per cent). The average property area is 827 km<sup>2</sup> and 64 per cent of properties have total cattle numbers ranging between 300 and 5,000 head.

The three main types of cattle turned off in 2004 were 18-24 month old steers, 18-24 month old heifers and 10 years-plus cull cows. Sixty per cent of producers turned off their cattle in December, January, February, March and April.

Producers identified the availability of experienced permanent staff as the major hurdle facing the Top End pastoral industry. Competition from the mining and tourism sectors may be a reason. In 2004, there were 120 permanent and 81 seasonal employees working on the 24 survey cattle properties in the region.

The major issue affecting profitability is the high and increasing cost of inputs such as fertiliser, freight, fuel, herbicides and supplement.

The major land management issue identified is exotic weeds and the major issue affecting the environmental sustainability of pastoral businesses also is weeds. The ability of weeds to dominate pastures and decrease productivity is a real concern for Top End pastoralists. One producer said "...pasture management systems need to be developed to ensure a balance of weed control and productivity...".

The spread of unwanted improved pasture species such as Wynn cassia (*Chamaechrista rotundifolia*) and Gamba grass (*Andropogon gayanus*) was a concern.

The cost of controlling weeds takes up a large proportion of the annual budget. In 2004 on the 24 survey properties, pastoralists spent a total of \$1.6 million on weed control. The risk of erosion was also identified as a major issue affecting environmental sustainability and one that producers are aware of when monitoring pasture condition.

Pastoralists in the Top End are attempting to control feral animals. Ninety-six per cent of the pastoralists surveyed are attempting to control feral pigs, 84 per cent attempt to control wild dogs and 40 per cent control feral buffalo. The average estimated annual cost for a property to control feral animals was \$11,662 and the total cost for the surveyed properties in the Top End region in 2004 was \$244,000.

Producers care for the environment and are developing methods to measure the impact of their practices on the environment. Eighty-eight per cent of producers indicated that environmental management systems (EMS) were relevant, 88 per cent believed that biodiversity conservation was relevant and 68 per cent had taken action. An example of action included maintaining and preserving conservation areas on pastoral properties.



## Introduction

In 2004, the Department of Primary Industry, Fisheries and Mines (DPIFM), in collaboration with industry through the Northern Territory Cattlemen's Association (NTCA), developed a comprehensive survey of the Northern Territory pastoral industry. The objectives of this survey were:

1. To document the state of the cattle industry in the Northern Territory so that Government and industry can monitor more closely the performance of research and development through time.
2. To collect information to allow the needs of industry to be addressed by research and development organisations such as DPIFM and groups such as Regional Industry Advisory Committees and the NTCA.
3. To determine the most effective ways of providing extension information to producers in each region and to initiate or improve communication between DPIFM staff and cattle producers.
4. To give the industry an up-to-date picture of management practices so that future directions for research and development can be more relevant to industry.

The pastoral survey encompassed the Northern Territory. Officers from the four DPIFM regional offices in Darwin, Katherine, Tennant Creek and Alice Springs conducted it. A base survey was used with each regional office contributing additional relevant questions to that region. Additional questions for the Top End region included buffalo and hay production.

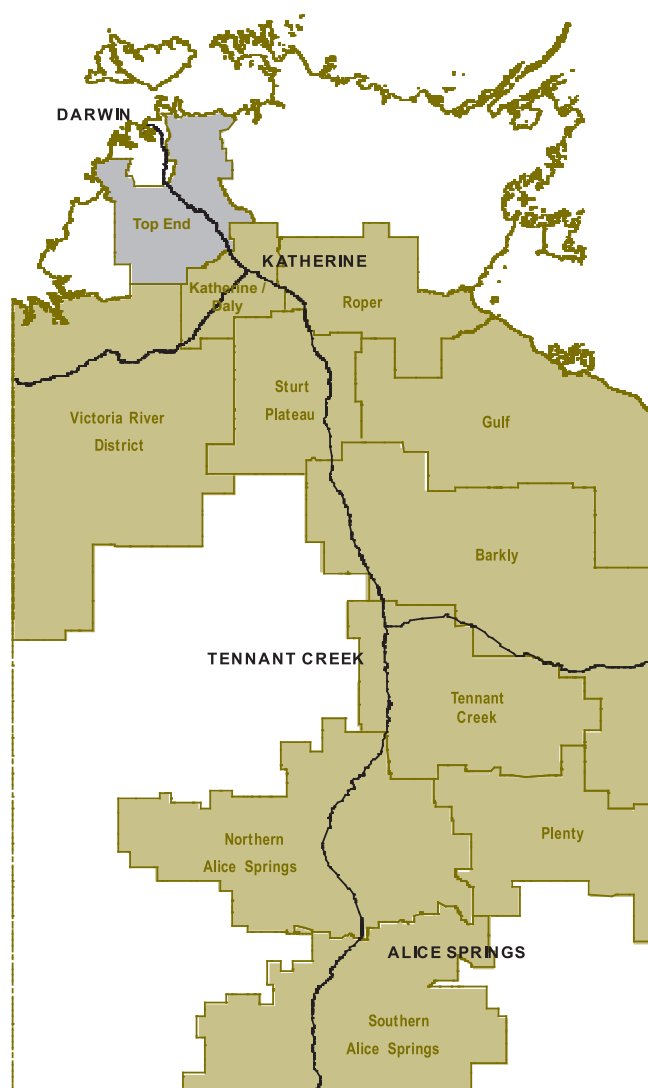
The Top End region extends from Darwin in the north to Pine Creek in the south and includes Jindare and Mary River stations. Laterally, it extends west to the Fitzmaurice River and east to Kakadu National Park (see map below outlining the pastoral regions surveyed).

There are distinct wet and dry seasons in the Top End of the Northern Territory. The wet season occurs from November to April and the Dry from May to October. The wettest months are usually January, February and March. Average annual rainfall in the region ranges from 1917mm in Darwin to 1428mm at Pine Creek. In the east, the annual average for Jabiru is 1480mm, while for Douglas Daly Research Farm in the west the average is 1220mm (see Appendix I for long-term annual rainfall and Appendix II for monthly average rainfall).

Of the total number of cattle turned off in the Northern Territory (535,000), approximately 270,000 head are sold into the South-East Asian export trade. Most export cattle are bred and grown out on the extensive grazing lands of the Victoria River District, Sturt Plateau and Gulf regions. A large number are grown out on floodplain and high rainfall improved pastures closer to Darwin, the export port. These cattle may be agisted, traded, or put on depot properties owned by the exporter.

In 2004 the major markets required 300 - 350kg steers or heifers to Indonesia (205,000 head of NT cattle exported from Darwin in 2004) and 280 - 300kg steers or heifers to the Philippines (29,000 head of NT cattle exported from Darwin in 2004). Other markets included Brunei (10,500 head in 2004) and west Malaysia (6,000 head in 2004).

MAP OF THE NORTHERN TERRITORY OUTLINING THE PASTORAL REGIONS SURVEYED





## **Method**

Copies of the survey were circulated to all pastoralists in November 2004, with an explanatory letter issued at least two weeks earlier. DPIFM officers interviewed pastoralists face to face and recorded answers on the form.

A total of 38 surveys were completed in the Top End region. Of these, two properties had changed hands and were not stocked at the time of the survey, eight properties had a total cattle number less than the NT-wide criteria of 300 head, and three properties were predominantly buffalo producers.

A further seven properties were not surveyed - five because owners could not be contacted and two were changing hands and not stocked at the time.

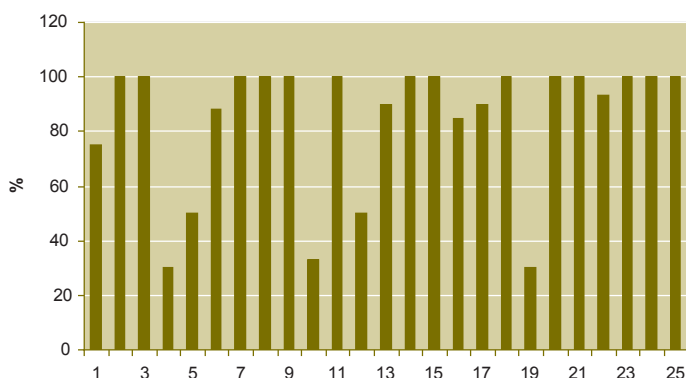
Because a pastoralist may own or manage more than one pastoral property, surveys were completed by each pastoral business unit rather than for each property. For example, one pastoral enterprise encompasses five pastoral leases, which combine to form one integrated pastoral operation. Similarly, one producer owns four freehold blocks of land, which are operated as one pastoral business. These pastoral businesses completed one survey each.

This report is based on the 25 remaining producers in the Top End who were predominantly beef cattle producers and had a total number of cattle greater than 300 head in September 2004.

TABLE 1 - TOTAL AND AVERAGE SIZE OF PROPERTIES AND PADDOCKS

	PROPERTY AREA KM <sup>2</sup>	NUMBER OF PADDOCKS	AVERAGE PADDOCKS SIZE KM <sup>2</sup>
Total	20680	479	
Average	827	19	51
Max	9260	59	300
Min	7	1	1

FIGURE 1 - PROPORTION OF BOUNDARY FENCING FOR EACH PROPERTY



## Results

### Picture of the Industry 2004

#### Size

##### Station size

The size of a Top End pastoral property carrying more than 300 head varies from quite large to very small. Table 1 shows that the average size of a cattle property in the Top End region is 827 km<sup>2</sup>, ranging from 7km<sup>2</sup> to 9,260 km<sup>2</sup>.

##### Number of Paddocks and size

There is a broad range in the number of paddocks (1 to 59) as well as the average paddock size (1km<sup>2</sup> to 300 km<sup>2</sup>). This could be attributed to the cross-section of small, intensively managed properties and the larger more extensively managed properties found in the Top End region. Paddock subdivision was the second highest priority for future infrastructure development (28 per cent of producers) (Appendix III).

### Current Infrastructure

#### Boundary Fencing

Figure 1 shows the proportion of properties boundary fenced. On average, 85 per cent of Top End region cattle properties are boundary fenced with 56 per cent fully enclosed.

#### Yards

Only one property relied on portable yards for handling cattle. Sixty-four per cent of properties had one set of permanent yards, 24 per cent had two permanent yards and one property had three. The average number of permanent yards for a property is one. Thirty-two per cent of properties used portable yards in conjunction with permanent yards and only 20 per cent of Top End pastoralists used trap yards.

#### Watering points

The average number of man-made permanent watering points on a station in the Top End region is 14 (ranging from 1 to 48) while 64 per cent of pastoral properties average 24 (ranging from 1 to 100) permanent natural watering points.

The average distance from water that Top End region pastoralists plan around is 3.4 km (ranging from 0.5 – 10km).



## Ownership

### *Length of Ownership and Management*

The average length of ownership of a Top End region cattle property is 10.2 years (ranging from 0.5 - 25 years) (Table 2).

Figure 2 shows the main forms of property ownership. Pastoral enterprises that are privately owned and employ a manager (40 per cent) and enterprises privately owned and managed (36 per cent) are the most common forms of ownership structure in the Top End while 8 per cent of properties are company owned and employ a manager. The low number of company owned properties is in contrast to some other regions of the NT.

Forty-four per cent of Top End region pastoral properties are run as an integrated production system with another property or properties in the region, Northern Territory or interstate, while another 40 per cent of the properties surveyed are run as a stand alone or individual enterprise. The remaining 16 per cent did not give a response to this question.

### *Staff*

A total of 120 permanent and 81 seasonal employees work on the 24 survey properties in the Top End region cattle properties. On average there are 5 permanent and seasonal employees on a property. The average number of permanent staff employed on a property running between 300 and 15,000 head is three, while the number of seasonal staff increases with herd size. For example, a property running 7,500 – 10,000 head requires three permanent and eight seasonal employees, and a property running 1,000 – 2,000 head requires three permanent and three seasonal employees. There is a large increase in the number of permanent staff required to maintain a herd size greater than 20,000 head. An explanation may be that several properties may be required to run this number of cattle, and in turn require a much larger number of staff (Figure 3).

TABLE 2 - LENGTH OF PROPERTY OWNERSHIP AND NUMBER OF EMPLOYEES

	CURRENT OWNER (YEARS)	CURRENT MANAGER (YEARS)	NUMBER OF SEASONAL EMPLOYEES	NUMBER OF PERMANENT EMPLOYEES
Total			81	120
Average	10	7	4	5
Range	0.5 - 25	0.5 -25	0 - 10	1 - 60

FIGURE 2 - PROPERTY OWNERSHIP

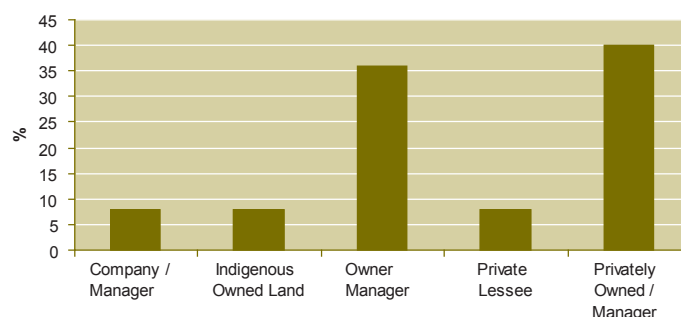


FIGURE 3 - PERCENTAGE OF PROPERTIES, BREEDER HERD SIZE AND NUMBER OF PERMANENT AND SEASONAL STAFF EMPLOYED

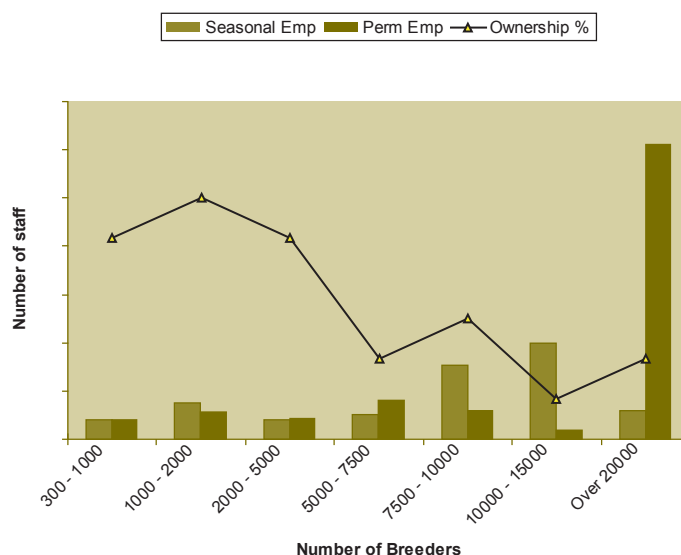


FIGURE 4 - TOTAL NUMBER OF CATTLE AND TOTAL NUMBER OF BREEDERS

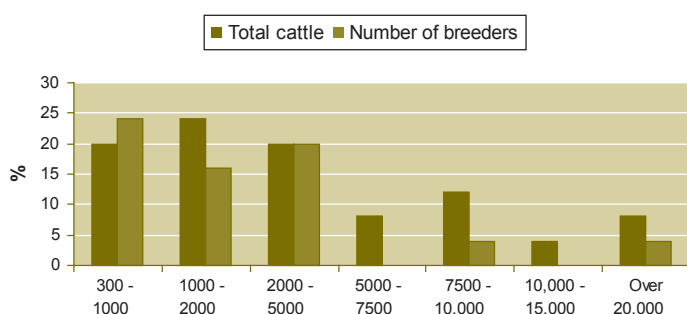


FIGURE 5 - MAIN TYPES OF CATTLE ENTERPRISES

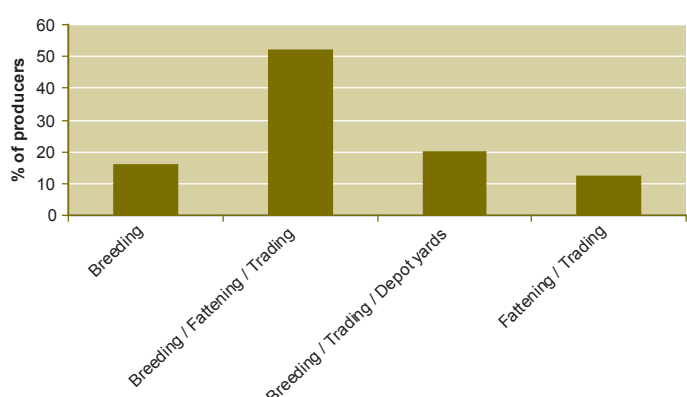


TABLE 3 - THE THREE MAIN TYPES OF CATTLE TURNED OFF

TYPE	TURN-OFF PREFERENCE (PER CENT OF PROPERTIES)		
	PRIMARY	SECONDARY	TERTIARY
Feeder steers 18-24 months	71	27	6
Feeder heifers 18-24 months	12	36	31
Cull cows 10 plus years	12	32	44
Weaners	4	0	0
Bulls	0	0	15
Fat Bullocks	0	5	0

## Number of Cattle / Number of Breeders

Six properties in the Top End region acted as depots from September 2003 to September 2004. There is insufficient information available to quote reliable annual cattle numbers through these depots.

The majority of cattle in the Top End region are managed in smaller herds. Sixty-four per cent and 60 per cent respectively of total cattle and number of breeders per property are found in herd sizes ranging between 300 and 5,000 head. This appears to be related to the high proportion of privately owned and managed pastoral enterprises in the Top End.

Figure 4 shows that the most common number of breeders on Top End cattle properties in 2004 was between 300 and 1,000 (24 per cent) and 2000 - 5,000 (20 per cent) followed by 1,000 - 2,000 (16 per cent).

## Practices

### Turn-off and markets

#### Main types of cattle enterprises

In the Top End, only 16 per cent of pastoralists described their main cattle enterprise as being a breeding-only operation, while 52 per cent of producers described their operation as breeding and fattening. A further 20 per cent of producers nominated either a breeding / fattening / trading or breeding / fattening / agistment operation (Figure 5). Effectively, 88 per cent of producers are breeding and fattening with some trading and agistment.

#### Main types of animals turned off and when

Producers were asked to describe the class, age and weight of the three main types of animals they turned off in the 12 months before September 2004.

The three main types of cattle turned off in the Top End region in 2004 were 18-24 month old steers averaging about 321kg (71 per cent), 18-24 month old heifers averaging about 303kg (36 per cent), and 10-plus year-old cull cows averaging about 423kg (44 per cent) (Table 3).

### Major Turnoff Period

In 2004, 60 per cent of producers turned their cattle off in the months December, January, February, March and April. Although there is limited data to support this, it appears that in December cattle are turned off floodplain pastures and from February through to April cattle are turned off improved pastures (Figure 6).

### Type and location of markets

By far the major market for Top End cattle is the South-East Asian export trade. From September 2003 to September 2004, 93 per cent of cattle sold went into this market. The majority of these cattle departed via Darwin. The remaining markets and destinations were 2.5 per cent into feedlots, 1.5 per cent as restockers or store cattle, and 3 per cent backgrounded. It is unclear what proportion of these cattle went to Queensland markets.

## Cattle Management

### Predominant breed of cattle

The predominant breed of cattle in the Top End region is Brahman at 64 per cent. Of the producers surveyed, 28 per cent maintain Brahman X Shorthorn and 4 per cent run Brahman cows with composite bulls sourced from Douglas Daly Research Farm (DDRF). One producer crossbreeds Brahman cows with Romagnola bulls (Figure 7).

### Breeding aims

The main breeding goal of Top End pastoralists is to concentrate on management rather than genetics (32 per cent) followed closely by selecting traits within the breed (28 per cent) (Figure 8).

### Mustering

#### Timing and number of rounds

The average number of musters that each property performs each year is two. Forty-four per cent of pastoralists do two musters and 12 per cent muster three times a year. Eighty-eight per cent of pastoralists have their round one muster between April and July, while the second muster takes place between June and December (48 per cent of producers) (Figure 9).

FIGURE 6 - MAJOR TURNOFF MONTHS

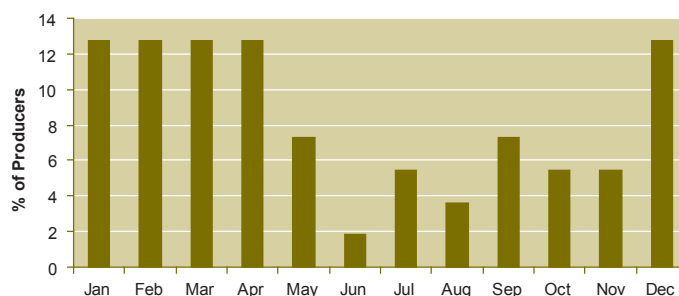


FIGURE 7 - PREDOMINANT BREED

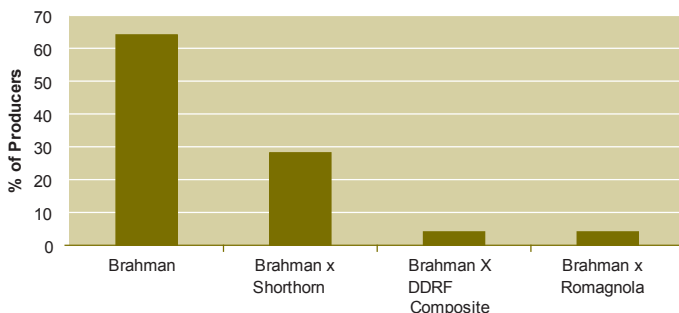


FIGURE 8 - MAIN BREEDING GOAL

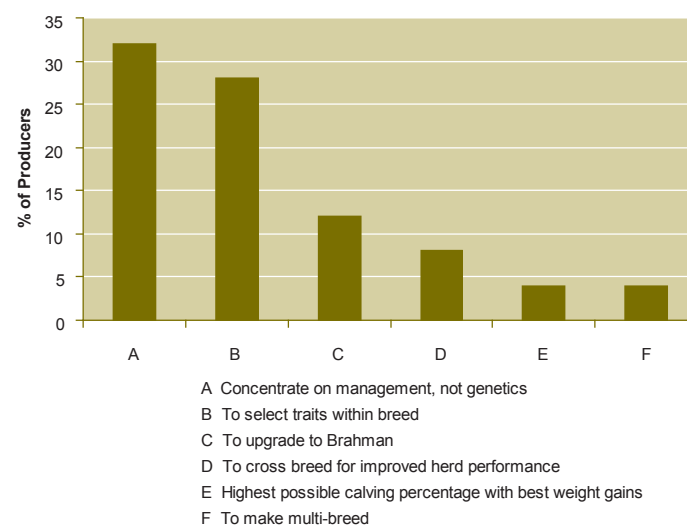


FIGURE 9 - TIME OF MUSTERING

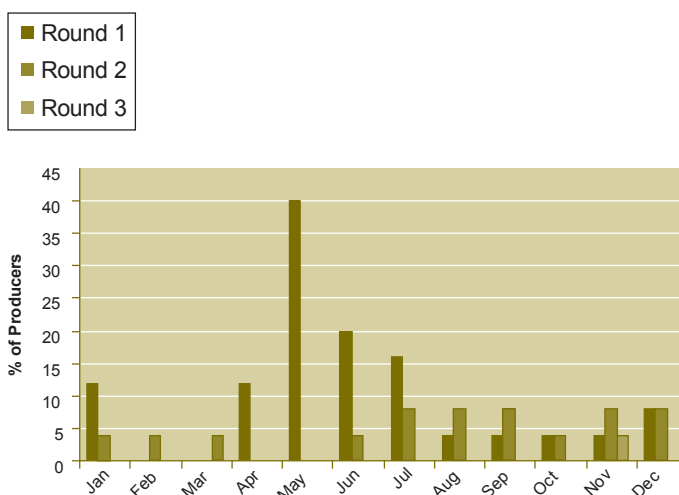
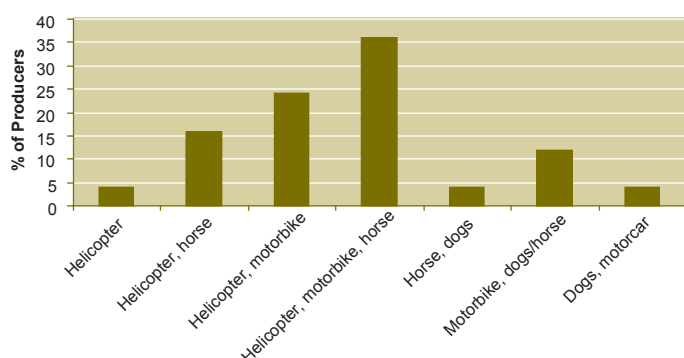




FIGURE 10 - MUSTERING METHOD



### Mustering method

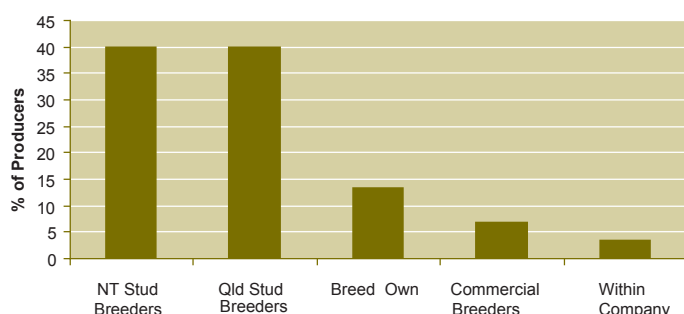
Of the cattle mustered in the Top End region, 80 per cent are mustered using a helicopter alone (1 property) or a helicopter in conjunction with horses and/or motorbikes (76 per cent). The remaining 20 per cent are mustered using horses and dogs (12 per cent), motorbike, dogs and horses or dogs and 4WD (Figure 10).

### Bulls

#### Number of bulls and their source

The average number of bulls used for every 100 cows by Top End pastoralists is four (ranging from 2 to 10). Figure 11 shows that bulls are sourced primarily from either Northern Territory or Queensland stud breeders.

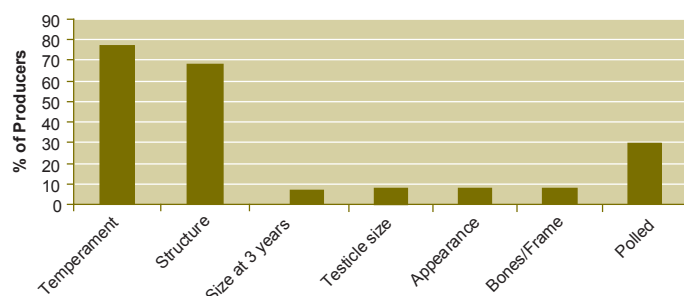
FIGURE 11 - SOURCE OF BULLS



#### Bull selection

When selecting bulls, 38 per cent of Top End pastoralists use Estimated Breeding Values (EBVs). Of those pastoralists who use EBVs, the two most important selection traits are fertility and growth rate (100 per cent of producers). Other traits used when selecting bulls include temperament (77 per cent of producers), structure (68 per cent) and whether or not the bulls are polled (27 per cent) (Figure 12).

FIGURE 12 - OTHER TRAITS USED TO SELECT BULLS



#### Fertility testing

Fertility testing of bulls is conducted on 38 per cent of the properties surveyed in the Top End region. Fertility testing is carried out every 1.9 years on average (ranging from one to four years).

### Breeders

#### Weaning percentage

The average estimated weaning percentage for breeding cows in the Top End region in 2004 was 70 per cent (ranging from 45 – 90 per cent). Some comments from producers regarding the weaning percentage were “....a very long dry season was experienced in 2003 and 2004 affecting the condition of the breeders”; “...cattle can only be mustered once a year due to weather conditions which puts extra pressure on the cows..” and one producer explained that because they were increasing their breeder numbers, and buying in more cows, the weaning percentage varied.

### *Mortality rates*

Due to the size of breeder paddocks and the lack of information on the age breakdown of Top End breeding herds it is difficult to estimate mortality rates. The estimated mortality rate for Top End breeder cows was 2.7 per cent and for aged cows 3.4 per cent in 2004 (Figure 13).

### *Controlled mating*

Controlled mating of breeder cows is practised on 35 per cent of Top End region cattle properties. Of the 65 per cent who do not control mate, 85 per cent gave the reasons of paddock and labour shortage, 8 per cent poor bull control, and 7 per cent believed controlled mating was too much trouble.

### *Cull cattle*

The average age that cows are culled in the Top End is 11 years (ranging from 10 to 12). On average, 12 per cent of cows are culled. The three main criteria used to select which breeders are to be culled are: Diagnosed not pregnant (29 per cent), temperament (27 per cent) and age (23 per cent) (Figure 14).

### *Segregation*

In the Top End, 70 per cent of pastoralists choose to segregate their breeding cattle. Age (47 per cent of those who segregate) and pregnancy status (32 per cent of those who segregate) are the most common forms of segregation (Figure 15).

### *Pregnancy testing/A.I./embryo transfer*

Pastoralists use pregnancy testing of breeder cattle as a management tool to cull out non-performers. Annual pregnancy testing of all mature breeders is carried out on 38 per cent of Top End pastoral properties and pregnancy testing of dry breeders only is carried out on 29 per cent of Top End properties. Breeding cows are artificially inseminated on 5 per cent of pastoral properties and no embryo transfer is done (Figure 16).

### *Animal health comment*

The total average cost for animal health treatments in Top End breeding herds is \$9.40 per head. This cost excludes the cost of mineral supplement. The main treatment is for botulism. In 2004, most producers were changing from an annual vaccine treatment for botulism to a long-acting vaccine.

FIGURE 13 - ESTIMATED MORTALITY RATES OF DIFFERENT CLASSES OF CATTLE

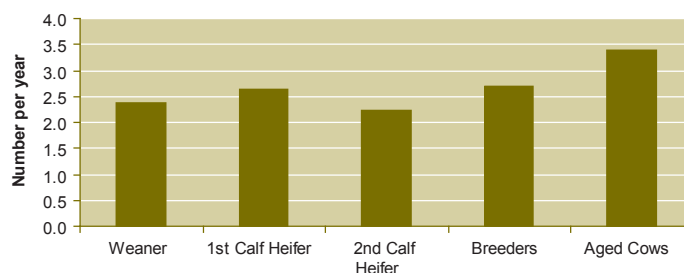


FIGURE 14. CRITERIA USED TO CULL BREEDERS

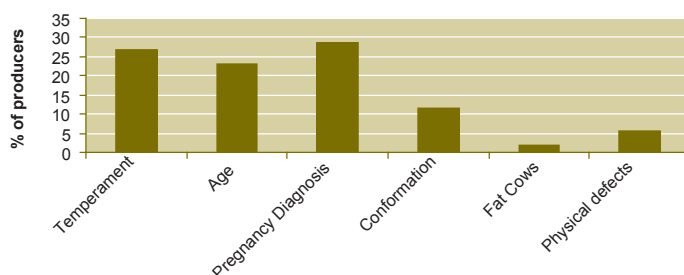


FIGURE 15. CRITERIA USED TO SEGREGATE BREEDERS

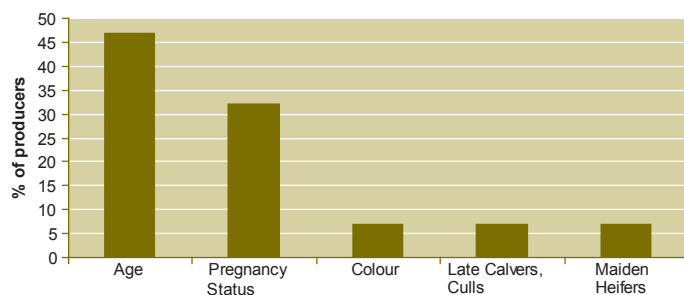


FIGURE 16 - PERCENTAGE OF PRODUCERS WHO PREGNANCY TEST

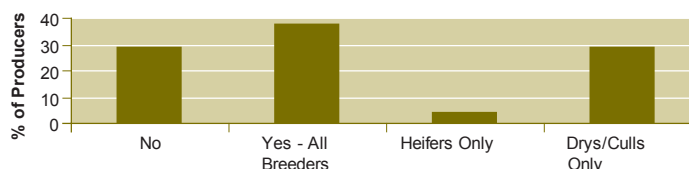


TABLE 4. THE PERCENTAGE OF PROPERTIES THAT CONTROL MATE AND THE AVERAGE LENGTH OF JOINING PERIOD

	1ST JOIN HEIFERS	2ND JOIN HEIFERS	BREEDERS
Percentage of properties that control mate	46	35	35
Average length joining period	3.9	4.6	4.6

FIGURE 17 - CRITERIA USED TO SELECT REPLACEMENT HEIFERS

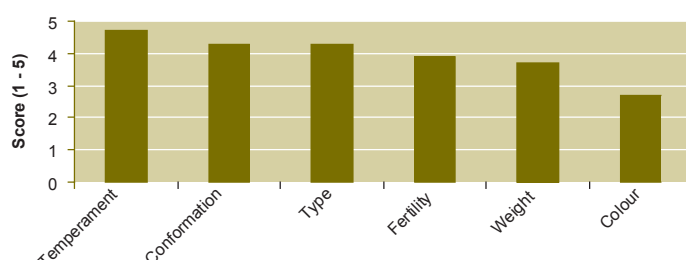
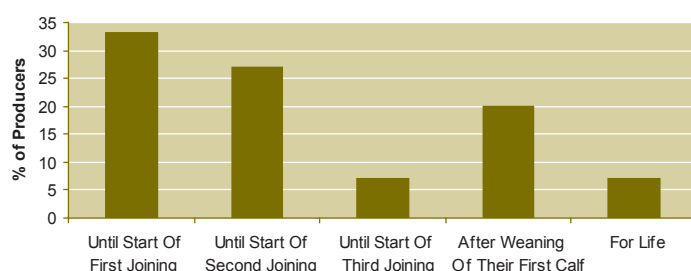


FIGURE 18 - THE LENGTH OF TIME HEIFERS ARE SEGREGATED



## Heifers

### Replacement heifers

In 2004, the average number of heifers kept as replacements in the Top End was 63 per cent (ranging from 2 – 100 per cent). When compared to the average number of breeders culled (12 per cent), this figure suggests that breeding herds in the Top End region are in a build-up phase, or mortalities are much greater than estimated.

### Control mate / joining

Table 4 shows that 46 per cent of Top End producers control mate their maiden heifers and 35 per cent control mate their second calf heifers. The average length of joining in first and second calf heifers is 3.9 and 4.6 months respectively. Of those who control mate their heifers, 42 per cent begin joining in January.

Of those producers who do not control mate their heifers, the major reason given was not having enough paddocks and labour (85 per cent). Other reasons include poor access to paddocks in the wet season to maintain fences and inadequate bull control.

### Selection age

The average age that heifers are selected for replacement breeders is 2 years with a few properties selecting yearlings

### Criteria used to select heifers

Pastoralists were asked to give a score to set criteria that they might use when deciding which heifers will be kept for future breeding. A score of 5 was extremely important and a score of 1 not important. Figure 17 shows that Top End pastoralists scored temperament (4.7), conformation (4.3), type (4.3), fertility (3.9) and weight (3.8) as the main criteria used to select replacement heifers.

### Segregation of heifers

In the Top End, 71 per cent of pastoralists practise some form of segregation of their heifers - that is, they run their heifers as an individual group separate to the rest of the breeding herd. Of those pastoralists who do segregate their heifers, 33 per cent segregate until the start of the heifers' first joining, 27 per cent until the start of the heifers' second joining and 7 per cent until the start of the heifers' third joining (Figure 18).

### Animal health

Heifers in the Top End region are given a botulism vaccine (40 per cent of properties), a 5 in 1 vaccine (16 per cent of properties) or a 7 in 1 vaccine (28 per cent of properties). The average cost per heifer for animal health treatments is \$12.20.

## Young Stock

### Weaning

The best opportunity a producer has to educate cattle is at weaning. The amount of time taken to handle young cattle correctly can impact greatly on their future performance and behaviour. Ninety-six per cent of Top End pastoralists wean their calves. Of these, 50 per cent wean by age, and 41 per cent wean at a different weight each year according to seasonal conditions (Figure 19). The higher proportion of producers who wean by age suggests that breeders are generally in good condition at weaning round 1 and in most cases there is little pressure exerted by the type of wet season to wean early or late. However, the length of dry season may necessitate a producer to wean early or at a lower weight in weaning round 2.

The average minimum mixed sex weaning weight in the Top End in 2004 was 106 kg for both the first and second round musters.

(Note: One pastoralist does not wean. No reason was recorded).

### Feeding method for weaners

Figure 20 shows the most common method of feeding weaners in the Top End is short-term feeding in the yards with hay (67 per cent of properties). Of those producers who feed their weaners, 38 per cent put their weaners on spelled pasture after feeding.

### Low stress stockhandling

Only three producers indicated they had trained their staff in low stress stockhandling methods.

### Nutrition Management

Ninety-six per cent of pastoralists in the Top End region feed their cattle mineral supplements at some time through the year. Seventy per cent of pastoralists in the Top End supplement all stock with phosphorus as the main mineral all wet season and 75 per cent supplement all stock with nitrogen as the main mineral all dry season.

Mineral supplements are commonly fed as lick blocks in both the dry season (67 per cent of pastoralists) and the wet season (71 per cent of pastoralists). One producer only uses a single Nutridose water medicator in the dry season (Figure 21).

FIGURE 19 - CRITERIA FOR WEANING

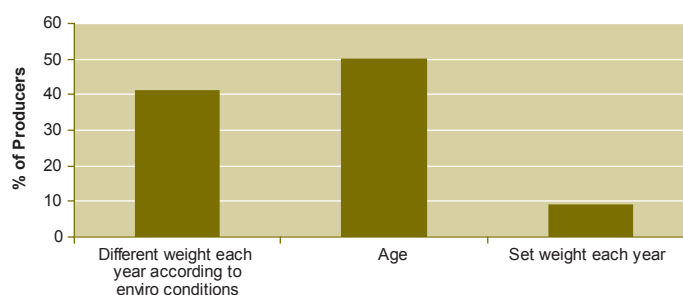


FIGURE 20 - FEEDING METHOD FOR WEANERS

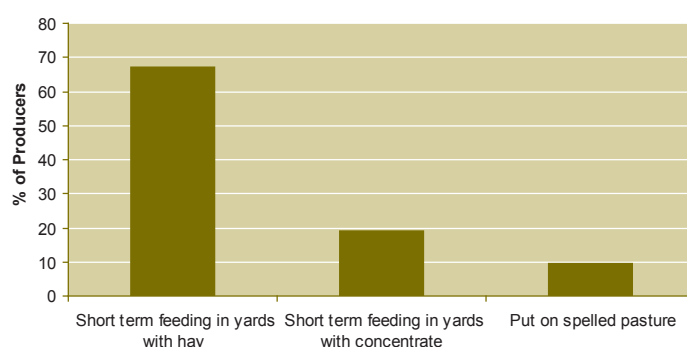


FIGURE 21 - FORM OF SUPPLEMENT FED IN WET AND DRY SEASONS

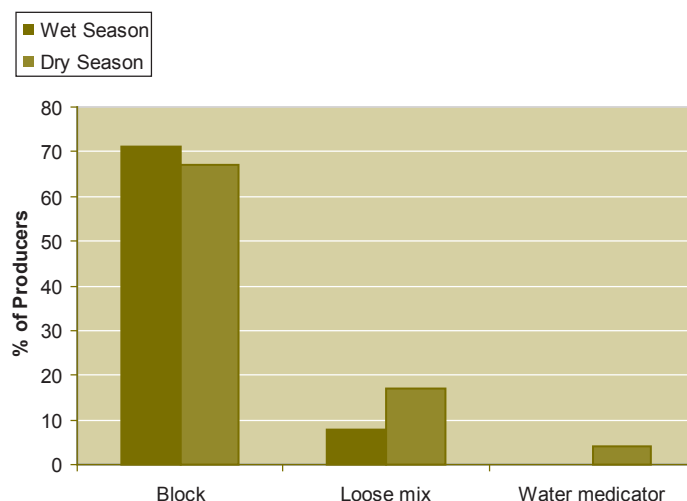
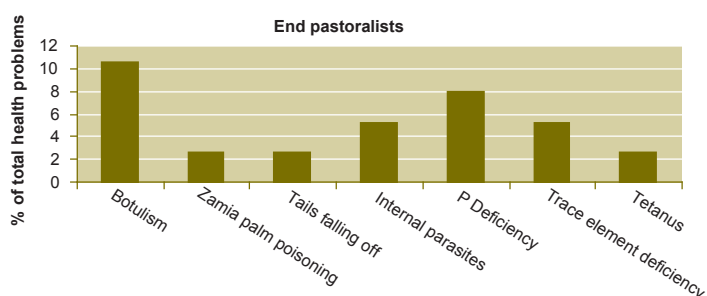


FIGURE 22 - OTHER HEALTH PROBLEMS IDENTIFIED BY TOP END PRODUCERS



### Nutrition Training

The NutritionEdge course has been attended by 13 per cent of pastoralists in the Top End region. Of those who attended, 33 per cent stated they had made decisions or changed practices relating to livestock nutrition on their property, based on information from the course.

### Hay Production

Hay production on pastoral properties is a common practice in the Top End with 63 per cent of properties producing their own hay in 2004. Of these properties that produced their own hay, the average amount was 712 tonnes (ranging from 110 to 3,200 tonnes). All hay is produced from improved pasture species.

## Animal Health

### Common Problems

The two most common health problems identified by Top End pastoralists were buffalo flies and cattle tick in the wet season on all stock classes (47 per cent) and three-day sickness in the wet season on feeder steers and heifers (16 per cent). Other problems are listed in Figure 22.

### Vaccines and costs

Seventy-six per cent of Top End region pastoralists nominated botulism as the most common disease vaccinated against. Of these, 100 per cent used long-acting vaccines. Other diseases vaccinated against in 2004 were red water (12 per cent), three-day sickness (6 per cent) and tetanus (6 per cent).

Twenty-four per cent of producers vaccinated against vibriosis in 2004 (20 per cent vaccinated bulls, 4 per cent vaccinated all cattle).

### Other Medical Treatments

The table in Appendix III shows the main chemicals used on Top End region cattle. This shows that 96 per cent of producers treat their cattle for buffalo fly and 88 per cent treat their cattle for ticks. The most common chemicals used are Defiance S for wound antisepsis and Compudose, a growth promotant.

### National Livestock Identification Scheme (NLIS)

At the time of the survey one pastoralist in the Top End region uses National Livestock Identification System (NLIS) accredited Radio Frequency Identification Devices (RFIDs) and 16 per cent plan to use NLIS tags as a management tool in the future. When asked if they needed to use NLIS readers, 68 per cent of producers said no. One answered yes for weaners and calves and 28 per cent did not answer (see Appendix IV for an NT government position and timing for implementation of NLIS).

### Bio-security and Animal Health

When asked if they were aware of the Cattle Council of Australia beef cattle bio-security plan for the Australian cattle industry, 52 per cent of pastoralists answered yes.

When asked if they were aware of the Animal Health Australia "Look, check, ask a Vet" program, 44 per cent of pastoralists answered yes.

## Grazing Management

### Carrying Capacity

The total estimated carrying capacity of Top End pastoral properties is 139,000 head. Producers were asked to give an estimate of future carrying capacities taking into account plans for future infrastructure development. In five years time the total estimated carrying capacity may be 188,000 (an increase of 28 per cent) and in 10 years time 341,000 (an increase of 141 per cent). The top three priorities for infrastructure development are increasing the number of watering points (36 per cent of producers), paddock subdivision (28 per cent) and pasture improvement (8 per cent). See Appendix V.





### Water point development

The average upper distance from water that producers plan their infrastructure around is 3.4 km (ranging from 0.5 to 10km) (Figure 23). Twenty-eight per cent believed 5 km would be enough and one producer nominated 10 km.

When asked if increasing water points in a paddock was enough to disperse cattle evenly throughout a paddock, 75 per cent of pastoralists answered yes and 25 per cent no. Other methods to disperse cattle are strategic fencing and location of supplement (Figure 24). Fire was nominated by only 8 per cent of producers, possibly due to the higher proportion of improved pasture. The standard practice is not to burn improved pastures and floodplain.

### Grazing Strategies

Twelve per cent of producers in the Top End indicated they maintained a continuous grazing regime, while 20 per cent undertook spelling and 36 per cent rotational grazing strategies. In 2004, only one Top End pastoralist was using time control or cell grazing (Figure 25). Sixteen per cent of producers undertake a seasonal grazing regime in which cattle graze upland pastures for about six months and then floodplain pastures for the other six months (Figure 26). To quote one producer "...property is flooded each wet season ...natural spelling ... property is run as two properties (one wet and one dry)".

When asked to describe their rotational grazing strategy, one pastoralist said "...stock are fed in a paddock until good feed value drops to a point that stock may stop increasing weight – then they are shifted to another paddock". Another producer described his rotational grazing as "...in the wet season – shift cattle out of smaller paddocks and let the pastures recover so they can be used during the dry season". Producers tend to make visual appraisals of stock and cattle condition to decide when to move cattle to another paddock.

FIGURE 23 - THE PLANNED UPPER LIMIT FROM WATER FOR INFRASTRUCTURE

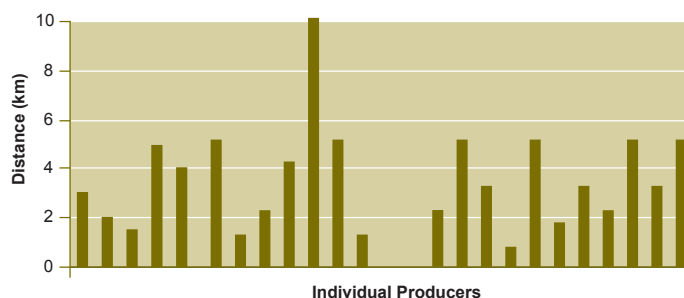


FIGURE 24 - METHODS OTHER THAN WATER POINTS USED TO DISPERSE CATTLE THROUGHOUT A Paddock

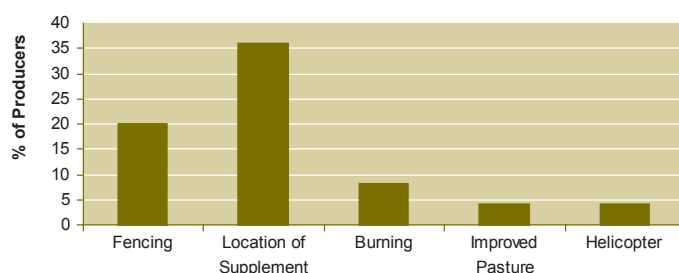


FIGURE 25 - TYPES OF GRAZING REGIME

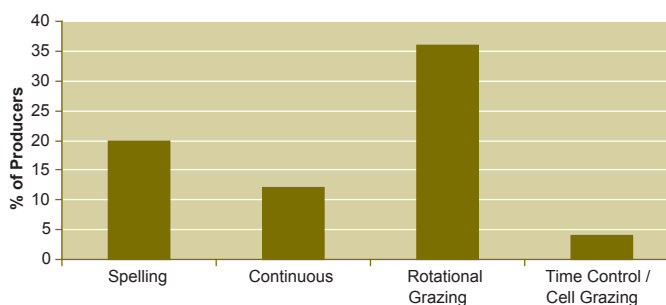


FIGURE 26 - DIFFERENT GRAZING STRATEGIES

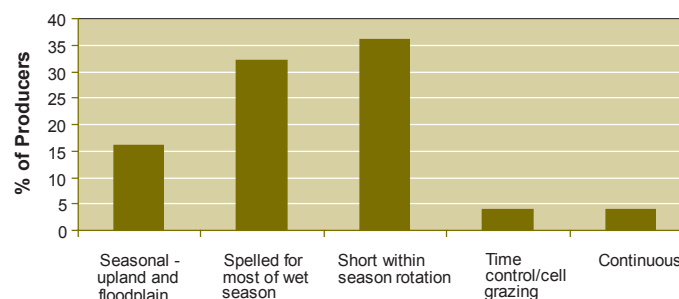


FIGURE 27 - THE ROLE OF IMPROVED PASTURE

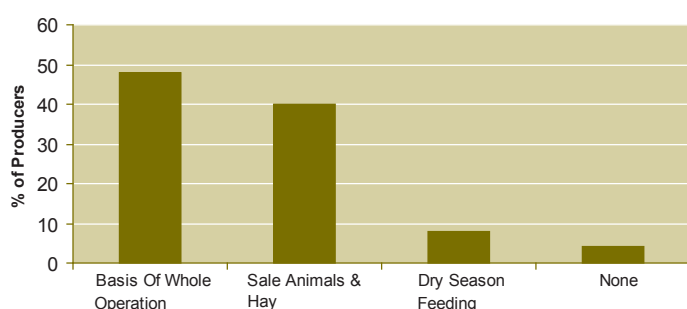
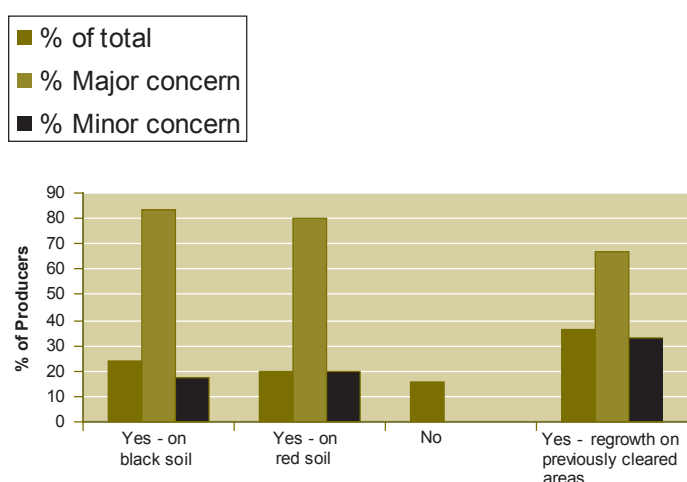


FIGURE 28 - THE BUILD-UP OF NATIVE TREES AND SHRUBS



## Fire

### Proportion of station affected by fire

Fire plays some role in the overall grazing management of a Top End pastoral property. Fifty-two per cent of producers use an early dry season burn to reduce fuel for firebreaks, and another 12 per cent burn both early in the dry season for fire control and late in the Dry to freshen up native pasture. Thirty-two per cent of producers use only a late dry season burn to freshen native pasture and control woody weeds and suckers. Four per cent of producers do not burn at all.

From September 2003 to September 2004 the number of properties in the Top End region affected by fire was moderate to low. The average proportion of a property burnt due to wildfire was 19 per cent (0 – 60 per cent) and intentionally burnt was 13 per cent (0 – 60 per cent).

## Improved Pastures

Pastoral activities in the Top End of the Northern Territory are based on smaller, more intensive properties. Improved pasture has been sown on 96 per cent of pastoral properties. The high rainfall (see Appendix I and II) experienced in the Top End, while conducive for introduced pasture, results in very poor native pastures. As an indication, stocking rates on Top End native pastures range from 6 to 10 animal equivalents (AE) per km<sup>2</sup> and on fully improved pasture, stocking rates range from 100 to 120 AEs/km<sup>2</sup>.

The role of introduced pasture was described as the “basis of our operation” or the “backbone of our grazing management” by 48 per cent of producers (Figure 27). A further 40 per cent of Top End pastoralists used improved pasture in their operation to feed weaners and finish off sale cattle.

The average area of high input improved pasture on a Top End pastoral property is 32 km<sup>2</sup> (ranging from 0 – 200 km<sup>2</sup>) and the average area of low input improved pasture is 19 km<sup>2</sup> (ranging from 0 – 150 km<sup>2</sup>). The main grass pastures are Jarra (*Digitaria milanijana*), Tully (*Brachiaria humidicola*) and Buffel (*Cenchrus ciliaris*). The main legume pastures are Cavalcade (*Centrosema pascuorum*), Stylos (*Stylosanthes spp.*) and Wynn cassia (*Chamaechnista rotundifolia*). These grasses and legumes are grown to improve diet quality in native pasture systems or improved pasture systems.

In the Top End region, 84 per cent of producers intend to increase the area of improved pasture. Of these producers, the average intended area of high input improved pasture to sow per property is 6 km<sup>2</sup> (ranging from 0-45) and the average area of low input improved pasture intended to sow is 5 km<sup>2</sup> (ranging from 0 – 25 km<sup>2</sup>). The main improved pasture grasses to be sown are Jarra (*Digitaria milanijana*) and Tully (*Brachiaria humidicola*) and the main legume pastures to be sown are Cavalcade (*Centrosema pascuorum*) and Stylo (*Stylosanthes spp.*).

The spread of unwanted improved pasture species in the Top End was considered to be of some concern (40 per cent of producers surveyed). Wynn cassia (*Chamaechnista rotundifolia*) and Gamba grass (*Andropogon gayanus*) were the only species nominated to be of concern if not managed.

## Natural Resource Management

### *Native Shrub and Tree Build-up*

A threat to the amount of grazing land available is the build-up of native trees and shrubs (Figure 28). Thirty-six per cent of Top End producers noticed a build-up of native trees and shrubs as regrowth on previously cleared areas. Sixty-seven per cent of these producers considered this to be of major concern and 33 per cent of little concern.

The effect of the build-up of native trees and shrubs on mustering and pasture growth and quality was rated by pastoralists (where 1 was not affected and 5 was greatly affected). The average score for the effect on mustering was 3.4, with 36 per cent scoring 5 and 17 per cent scoring 1 (Figure 29). The effect of the build-up of native trees and shrubs on pasture growth and quality was an average of 3.5, with 36 per cent of pastoralists scoring 5 and 13 per cent scoring 1.

To control the build-up of native trees and shrubs, 65 per cent of pastoralists conduct controlled burning (Figure 30). Thirteen per cent of pastoralists do not take any action to control native trees and shrubs because they cannot afford to and one producer because he/she does not believe it is an issue.

### *Weeds*

In the pastoral industry survey, producers were asked to rate the impact of each weed on their property taking into account environmental and economic considerations. Appendix VI shows weeds as having a high, medium or low impact. The weeds rated as having a high impact were *Sida* (*Sida spp.* 48 per cent of producers), *Senna* (*Senna spp.* 40 per cent), *Mimosa* (*Mimosa pigra* 24 per cent) and *Hyptis* (*Hyptis suaveolens* 40 per cent).

Pastoralists implement annual control programs for many weeds. The most common weeds controlled by producers are *Hyptis* (*Hyptis suaveolens* 88 per cent of producers), *Senna* (*Senna spp.* 84 per cent), *Sida* (*Sida spp.* 84 per cent) and *Mimosa* (*Mimosa pigra* 56 per cent). A detailed list of weeds and the proportion of producers who control them can be found in Appendix VI.

FIGURE 29 - THE RATED EFFECT OF NATIVE TREES AND SHRUBS ON MUSTERING AND PASTURE GROWTH AND QUALITY

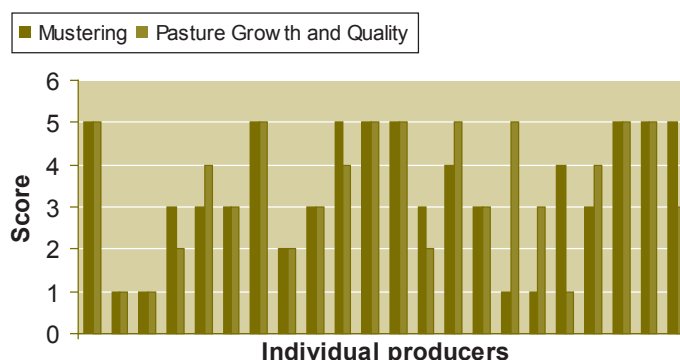
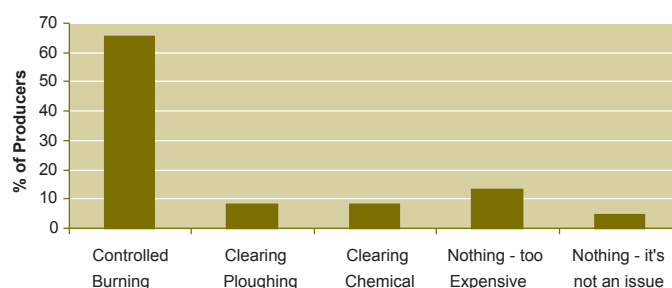


FIGURE 30 - METHODS USED TO CONTROL THE BUILDUP OF NATIVE TREES AND SHRUBS



The major comment from Top End pastoralists regarding weed prevention is common sense. Most pastoralists believe that by making their own hay (48 per cent) and insisting that contractors clean their machinery before entering the property, they will prevent the spread of weeds and help prevent new introductions. Other weed prevention methods discussed include buying certified seed, spelling bulls and introduced cattle in yards to empty out before putting in paddocks and restricting vehicle movement from other properties and/or areas.

Top End pastoralists spent about \$1.6 million on weed control in 2004. The average spent on a property each year is \$63,700 and the range is from \$500 to \$400,000.

FIGURE 31 - SOURCES OF RECRUITMENT FOR TOP END PASTORAL PROPERTIES

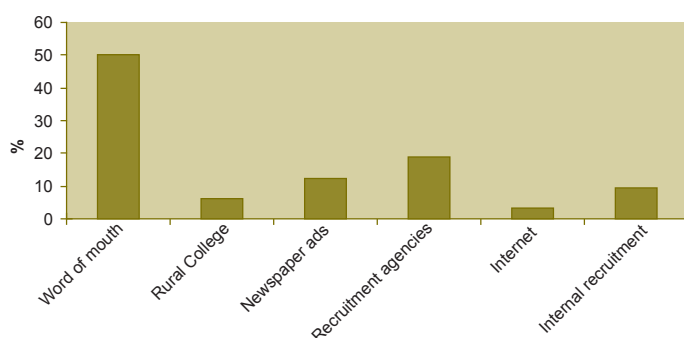
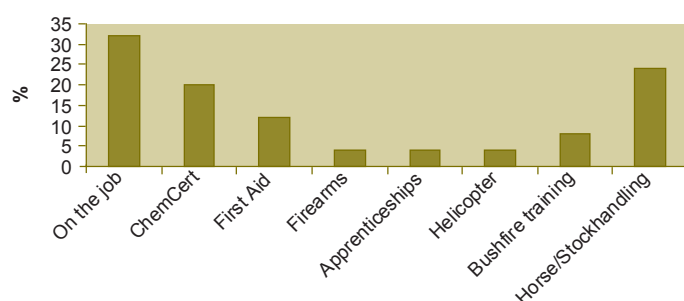


FIGURE 32 - TYPE OF STAFF TRAINING



### Pest animals

Feral animals are common throughout the Top End region. Species that rate a high impact by producers are feral pigs (52 per cent), wild dogs (52 per cent) and wallabies (40 per cent). Although wallabies are a native animal, they were included in this section because of their numbers in some areas. Appendix VII shows more detailed information on the rated impact of pest animals and the level of control by producers on pastoral properties.

Pastoralists in the Top End are attempting to control these feral animals. Ninety-six per cent of the pastoralists surveyed are attempting to control feral pigs, 84 per cent attempt to control wild dogs and 40 per cent control feral buffalo.

The average estimated annual cost for each property to control these feral animals was \$11,662 (ranging from \$100 to 100,000) and the total cost for the Top End region in 2004 was \$244,000.

## Business Management

### Staff

A total of 120 permanent and 81 seasonal employees work on these 25 Top End region cattle properties.

On average there are five permanent and four seasonal employees on each property. The average number of permanent staff employed on a property running between 300 and 15,000 head is three, while the number of seasonal staff seems to increase with herd size. For example, a property running 7,500 - 10,000 head will require three permanent and eight seasonal employees, and a property running 1,000 - 2,000 head will require three permanent and three seasonal employees. A much larger number of permanent staff are required to maintain a herd size greater than 20,000 head. An explanation may be that several properties may be required to run this number of cattle.

Although there are many ways to source staff, the most popular method for Top End pastoral properties is by word of mouth (64 per cent of producers) and using recruitment agencies (24 per cent of producers) (Figure 31).

Sixty-eight per cent of pastoralists in the Top End region indicated that staff training occurs on their property. The most popular type of training is "on the job training" (32 per cent of properties), followed by Chemcert training (20 per cent) and horse and stockhandling training (20 per cent) (Figure 32).

The availability of good quality staff is crucial in the operation of a pastoral property. Operations on properties were considered by 50 per cent of pastoralists to be limited by staff availability and turnover issues. When asked the major hurdles in the operation of a pastoral property, 52 per cent of pastoralists had an issue with the availability of good quality, experienced staff. Pastoralists identified this issue as the major hurdle to overcome in running their business. See Appendix VIII.

### Benchmarking

Benchmarking is a very useful tool for measuring and comparing performance. Of the Top End region pastoralists, 64 per cent understood what benchmarking was and 36 per cent did not. Fifty-six per cent use financial or production benchmarks to assist with their management.

Forty per cent of pastoralists use benchmarks to assist with the management of their natural resources. The types of benchmarks used include photographic records, regular soil testing and monitoring sites to observe the impact of grazing.

Property management plans have been developed on 40 per cent of the pastoral properties in the Top End region. Of these plans, 70 per cent include financial management, 50 per cent sustainable production systems, 40 per cent natural resource management systems and 10 per cent human resource management.

### Finance

Forty-four per cent of Top End pastoral enterprises are owned outright and do not require finance, while the remained finance through Agribusiness or through trading banks (Figure 33).

### Other enterprises

Some pastoral properties in the Top End have other ventures, businesses or production associated with them. Twenty-eight per cent of properties make hay as a commercial venture and 12 per cent have tourist activities. Eight per cent have mining, 8 per cent have a horticultural venture operating on their land and one property has included some mixed farming in their business (Figure 34). The remaining 40 per cent have no other enterprises associated with their pastoral activities.

FIGURE 33 - SOURCE OF FINANCE FOR TOP END PASTORAL PROPERTIES

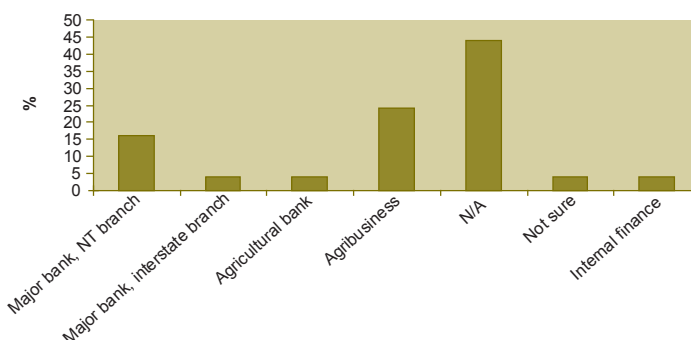
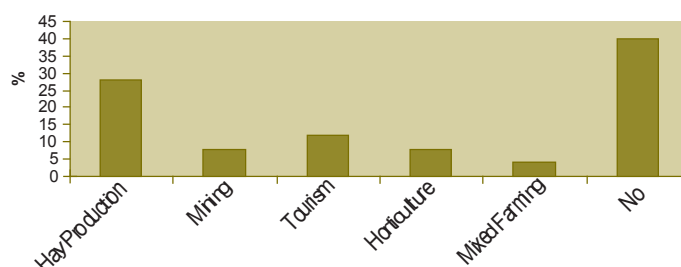


FIGURE 34 - OTHER ENTERPRISES ON TOP END PASTORAL PROPERTIES





## **Priorities**

### ***Hurdles***

In the survey pastoralists were asked to name their biggest hurdles in running/managing their enterprise. The response from Top End producers was diverse. The main issues were:

1. Staff availability (52 per cent of producers). The limited availability of experienced permanent staff is the major hurdle facing pastoral producers in the Top End. There appears to be strong competition in the region and the Northern Territory from the mining and tourism sectors.
2. Access / seasonal conditions / erosion (40 per cent of producers). Limited access during the wet season is a major hurdle. Some producers have great difficulty even accessing their property while others have problems transporting cattle out on roads governed by weight restrictions. Additionally, the seasonality of the wet season, that is, distinct wet and dry seasons, creates periods of feed abundance and feed drought. The frequently wet conditions can cause erosion. The cost of preventing and repairing erosion can be significant.
3. Low cashflow (28 per cent). Some properties in the Top End region require landclearing and pasture improvement to be financially viable. The cost of development is high and producers are comparing options to create a cash flow in this development phase of their operation.
4. Weeds (20 per cent). Top End producers identified weeds and their implications, especially their long-term cost to control as a major hurdle.
5. Cost of fuel / fertiliser / freight (16 per cent). Most of the fertiliser and mineral supplement used on a pastoral enterprise is sourced from interstate. Freight is a large component of the total cost to purchase these inputs. The increased cost of inputs, most notably fuel, does not appear to be offset by an increase in price for sale cattle.

See Appendix VIII.

### ***Issues Affecting Profitability***

Producers were asked to identify the major issues affecting the profitability of their pastoral business. These issues were different on different properties, and the significance varied.

1. Cost of fertiliser / freight / fuel / herbicides / supplement (34 per cent of producers). As most Top End producers have to generate their own electricity from diesel generators, ever-increasing

fuel costs significantly add to their bottom line. The high cost of inputs makes it more difficult to develop new country, sow improved pastures and control weeds in existing pastures.

2. Government (17 per cent). Producers believe that government policy and, in some cases, lack of decisiveness to effectively deal with politically motivated environmental issues and minority pressure groups, is a major issue affecting their profitability.
3. Markets and price (13 per cent). There is concern that Top End producers rely on the South-East Asian export trade totally for their market. While there has been some recent competition with the export trade from Queensland, there is a need for an export-accredited meatworks to open in the Top End of the Northern Territory. Another comment was that seasonal fluctuations occur in cattle prices and are hard to predict.
4. Mimosa control (11 per cent). Mimosa is a very invasive weed and can dominate vegetation on wetter areas, especially floodplains. The loss of these highly productive grazing areas and the very high cost of control can seriously affect the profitability of coastal pastoral properties.
5. Access (11 per cent). Having reliable access to and from home, place of work and or business is something that most people take for granted. With the very wet conditions experienced in the Top End Wet season, some pastoral producers are isolated at times. Lack of road access in the wet season may hinder, or prevent, the ability to sell cattle when prices are high and have a direct impact on profitability.

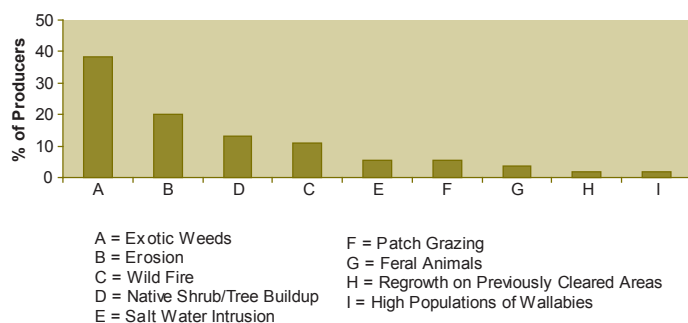
Appendix IX shows the other issues identified by Top End producers that may impact on the profitability of their business.

## **Land Management Issues**

The three major land management issues identified by Top End region producers were exotic weeds (38 per cent), erosion (20 per cent), and the build-up of native trees and shrubs in pastures (11 per cent). Other issues included wildfire, regrowth on previously cleared areas, saltwater intrusion and very high numbers of wallabies (Figure 35).



FIGURE 35 - MAJOR LAND MANAGEMENT ISSUES



## Environmental Sustainability

Producers were asked to identify the major issues affecting the environmental sustainability of their business. The results are detailed in Appendix X. The major issues identified were:

1. Weeds (46 per cent of producers). One producer said "...continual monitoring of present agricultural and pastoral practices is essential. Weeds are a big issue...". The ability of weeds to dominate pastures and decrease productivity is a real concern for Top End pastoralists. Pasture management systems need to be developed to ensure a balance of weed control and productivity.
2. Erosion (14 per cent). One producer said "...need to carefully manage clearing, planting, fencing, roads, grazing and total property management with above in mind (weeds and erosion)...".

## Relevant Industry Issues

In the survey, pastoralists were given a list of industry issues and asked whether they were relevant and, if so, what action they had taken. The results are shown in Appendix XI. A large majority (88 per cent) said Environmental Management Systems (EMS) were relevant, but only one producer had taken any action. Forty per cent were unsure, suggesting some producers are not certain of what EMS means to them.

In terms of biodiversity conservation, 88 per cent of producers indicated that it was relevant and 68 per cent had taken action. Examples of action were: excluding areas from grazing, maintaining and preserving wildlife corridors, adhering to clearing controls and maintaining conservation areas on their properties.

Only 8 per cent of producers indicated organic accreditation was relevant and none had taken any action.

Improved animal welfare was deemed relevant by 96 per cent of producers and 48 per cent had taken action. Thirty-six per cent were unsure. Some examples of improved animal welfare include design of cattle yards and quiet handling, always trying to improve handling techniques, and educating staff with reference to animal welfare.

Having a conservation plan for their property was believed to be relevant by 80 per cent of producers and 60 per cent had taken action. Action included erosion control, installation of soil conservation works and keeping stock off fragile areas.

Eco tourism was deemed relevant by 32 per cent of producers but only 8 per cent had taken action.

Quality Assurance Schemes were deemed relevant by 84 per cent of producers and only one had taken action.

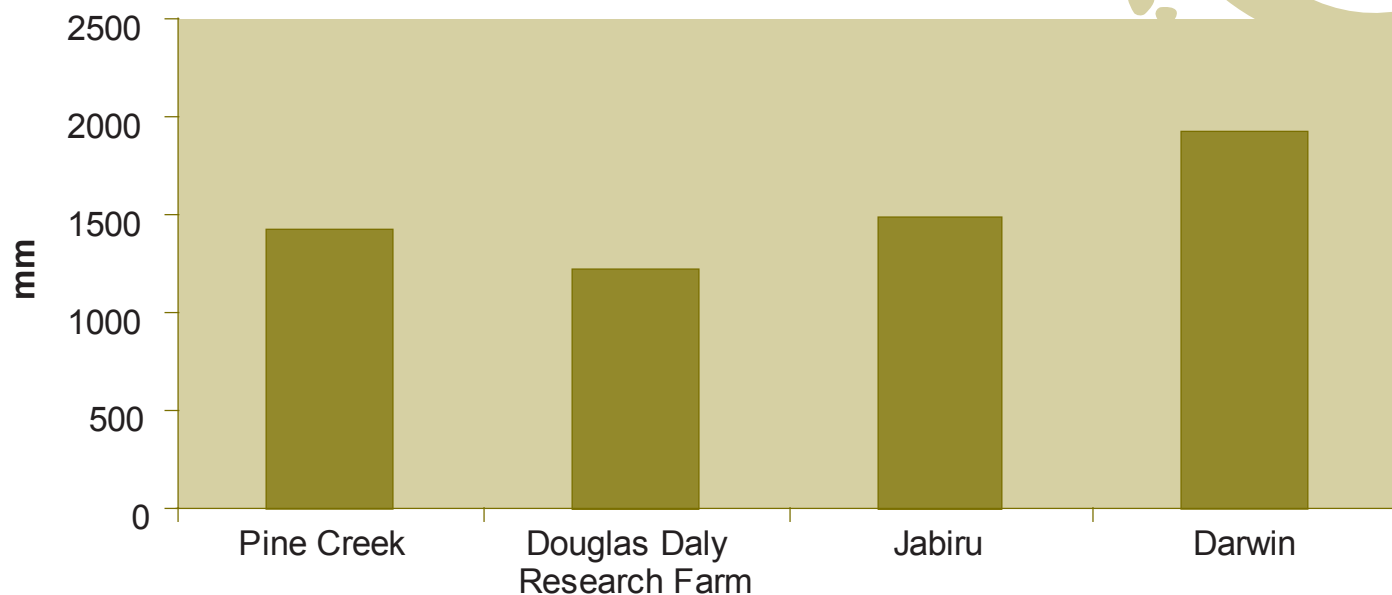
## Motivation

Producers were asked why they choose to be members of the pastoral industry. Most of the responses were about enjoying working with animals, it's your hobby as well as your work, it's all that they know and - the most common - it's about lifestyle. Words such as challenging, adventurous, satisfaction, enjoyment and opportunity were used. Some other responses were the price is right now, to enhance the balance sheet, born to it, always been in the country, love the country, expand the family business, that's all I know and to make money. To sum it all up, one producer said "Good bloody question!"

## References

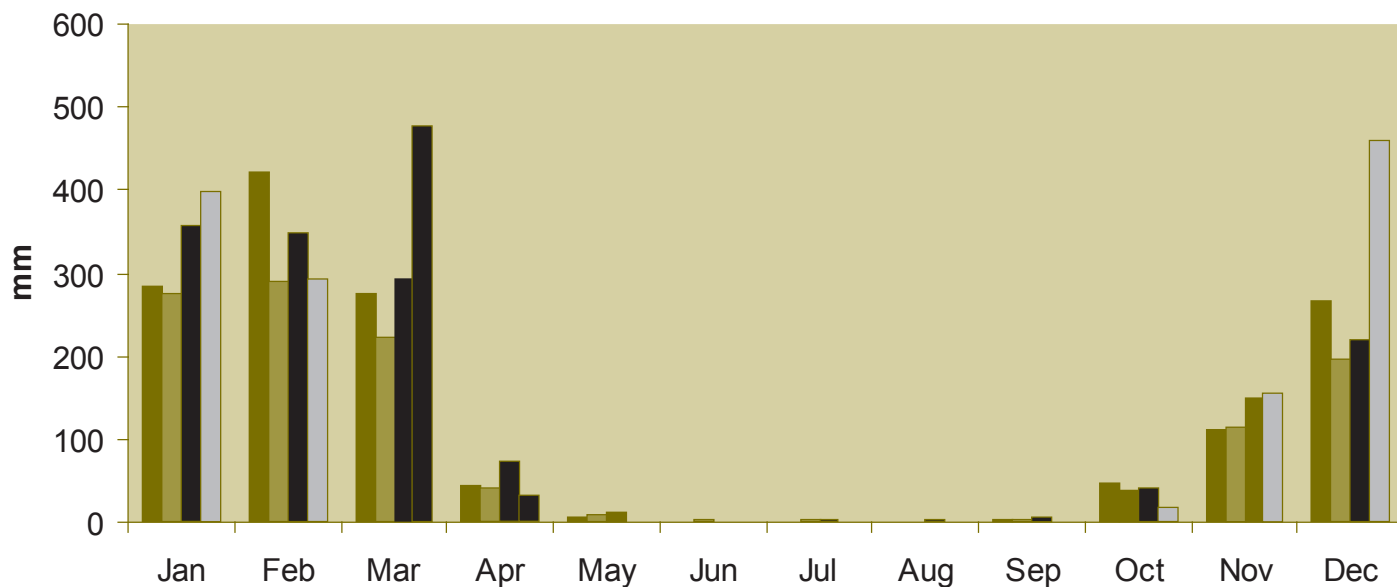
- Bureau of Meteorology, Darwin. Long-term average annual and monthly rainfall records for Darwin, Pine Creek, Jabiru and Douglas Daly Research Farm.
- P.K. O'Rourke, V.J. Doogan, T.H. McCosker and A.R. Eggington (1991). Prediction of Conception Rate in Extensive Beef Herds in North-Western Australia. Australian Journal of Experimental Agriculture. Volume 31,1-7.

## Appendix I - Annual Average Rainfall at 4 Sites in the Top End



## Appendix II - Average Monthly Rainfall at 4 Sites in The Top End

■ Pine Creek ■ Douglas Daly Research Farm ■ Jabiru ■ Darwin



### Appendix III - Proportion of Producers who Use Animal Health treatments and the Proportion of Animal Treatments Used

PEST CONTROLLED	WORMS		FLYS		LICE		TICKS		WOUND ANTISEPSIS		GROWTH PROMOTANTS	
Product Used	Paramax	36	Paramax	9	Paramax	17	Paramax	15	Defiance S	81	Compudose	67
	Cydectin	27	Cydectin	9	Cydectin	17	Cydectin	12	Hibitane	19	Revalor G	33
	Ivomec	18	Ivomec	3	Ivomec	17	Ivomec	0				
	Baymec	18	Baymec	6	Baymec	17	Baymec	12				
			Ear Tags	33	Acatak	33	Ear Tags	0				
			Supona	21			Supona	0				
			Sumifly	6			Sumifly	0				
			Barricade	9			Barricade	12				
			Plunge									
			Dip	3			Bayticol	12				
							Acatak	27				
							Plunge					
							Dip	12				
Percentage of producers who use agricultural chemical	80		96		24		88		64		72	

### Appendix IV - NLIS Update September 2005

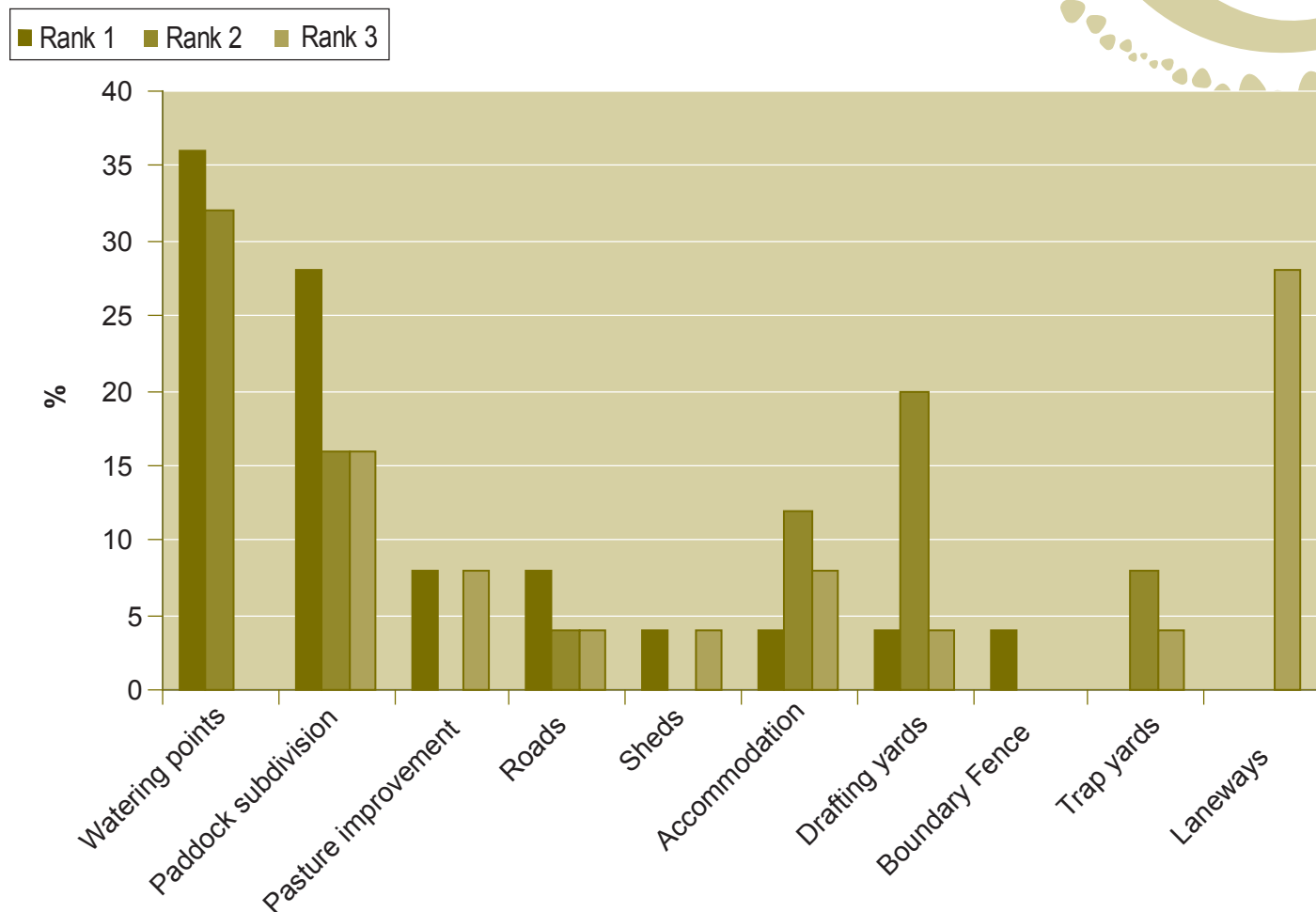
The mandatory use of Radio Frequency Devices (RFIDs) for NT cattle will be phased in over the next two years. The change to mandatory use of RFIDs is being adopted to support a nationally consistent approach to livestock traceability. In contrast to results at the time of the survey, pastoralists subsequently are committed to implementation.

A timetable detailing the implementation milestones has been approved the Minister for Primary Industry, Fisheries and Mines. Mandatory use of RFIDs and transaction recording to the national NLIS database will apply to:

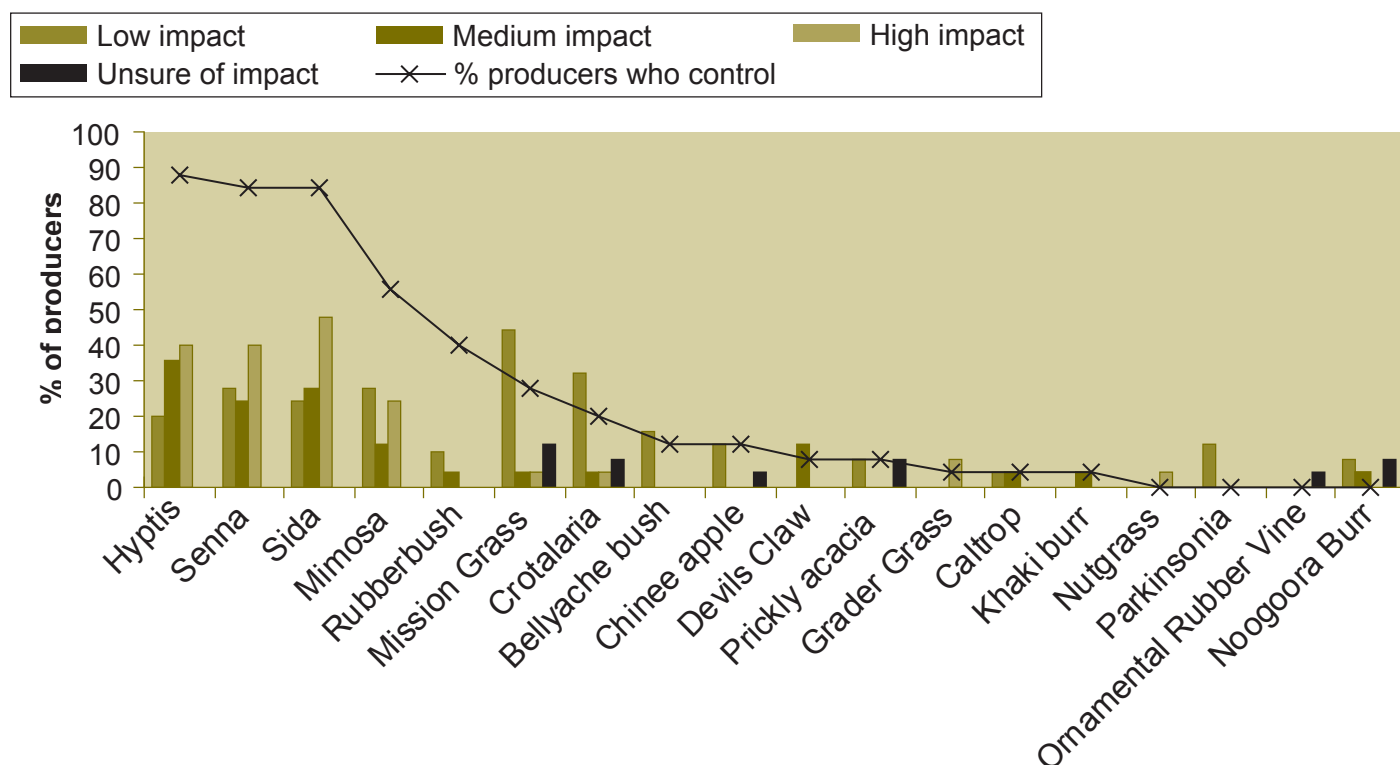
Cattle moving interstate	1 July 2005
Cattle carrying RFIDs must be recorded to the national database prior to entry to the NT. Any subsequent movements will be read and recorded.	1 July 2006
Cattle moving to saleyards	1 August 2006
Cattle moving to abattoirs	1 July 2006
Cattle moving from property to property	1 July 2007

(Under the risk based system agreed by the Primary Industries Ministerial Council, exemptions may apply where cattle go direct from property of birth to slaughter or export).

## Appendix V - Priorities for Infrastructure Development

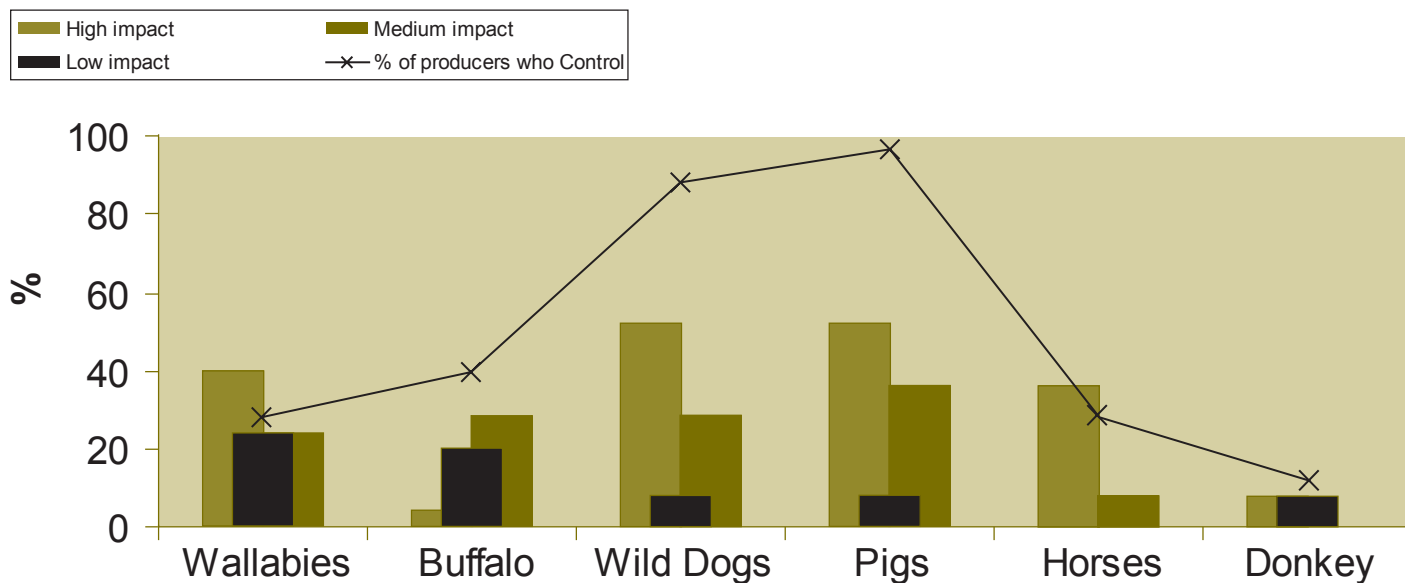


## Appendix VI - Rated Level of Impact of Weeds and Their Control

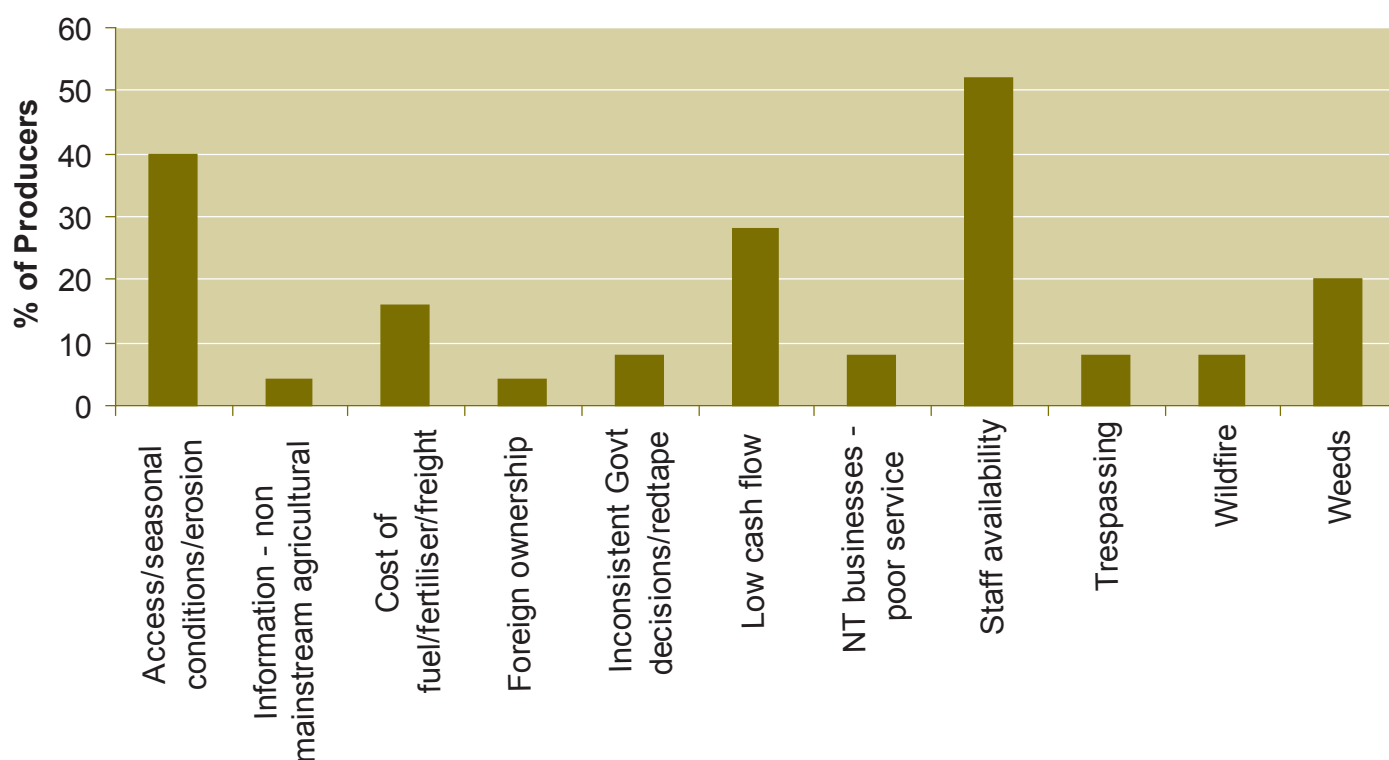




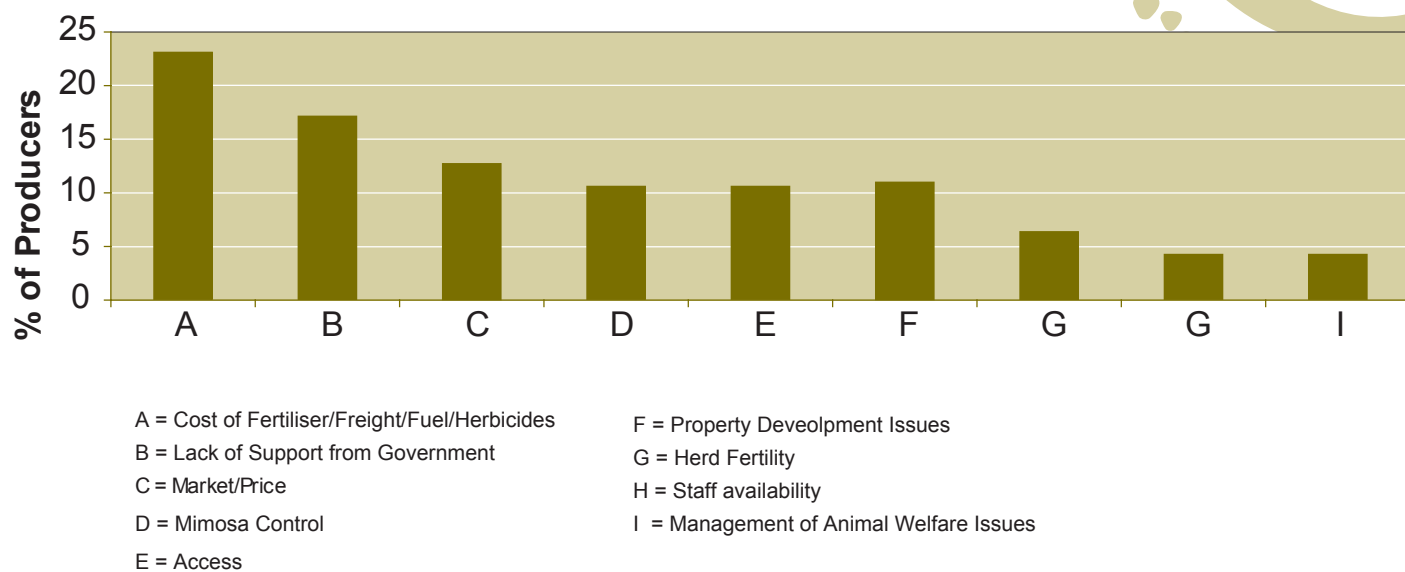
## Appendix VII - The rated level of impact of feral animals and their control by producers



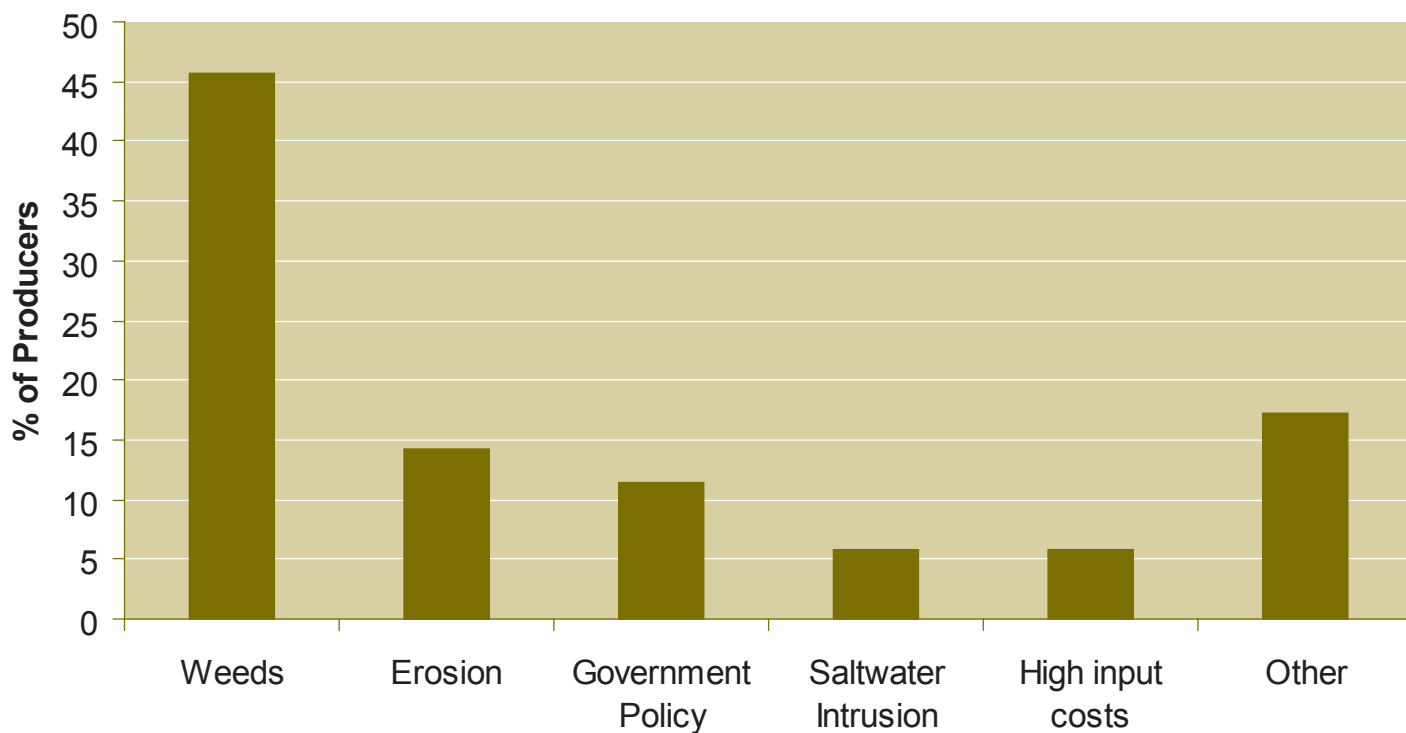
## Appendix VIII - Hurdles faced by Pastoral Producers



## Appendix IX - Issues Affecting Profitability



## Appendix X - Issues Affecting the Environmental Sustainability of Top End Pastoral Properties



## Appendix XI - Relevant Industry Issues

	EMS RELEVANT	EMA ACTION	BIODIVERSITY CONS. RELEVANT	BIODIVERSITY CONS. ACTION	ORG. ACC RELEVANT	ORG. ACC ACTION	IMP. ANIMAL WELFARE RELEVANT	ANIMAL WELFARE ACTION	CONS. PLAN RELEVANT	ECO TOURISM RELEVANT	ECO TOURISM ACTION	QAS RELEVANT	QAS ACTION
Yes	88	4	88	68	8	0	96	48	80	32	8	84	4
No	12	52	12	28	92	0	4	16	20	68	92	16	96
Unsure	0	40	0	4	0	0	0	36	0	0	0	0	0