EXTENSIVE BEEF PROPERTY DEVELOPMENT STRATEGIES FOR NORTH AUSTRALIA

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SUMMARY

Northern extensive beef property development strategies are determined by markets, management constraints and ecological resources. Priorities have been set for the implementation of development strategies. Initially, disease control requirements will force the outlay of considerable capital on fencing. Increasing animal production by using low capital techniques, such as improved husbandry and nutrition, is therefore necessary to recoup this outlay. The last priority is to increase stocking rate, which is long term and capital intensive. Priorities are expected to overlap due to integration of herd and range management systems.

INTRODUCTION

The region under discussion has been described by Winter (1978) and covers the tall grasslands (Norman 1966) above the 750 mm rainfall isohyet of monsoonal North Australia. Problems facing developers of extensive beef properties in this area are greater than elsewhere due to low prices, the large scale of operations and remoteness. The development strategies outlined would probably not be as necessary were it not for the disease eradication programmes forcing a shift from traditional management methods, the great advantage of which is low capitalisation. Development strategies of northern properties must rely more on variable costs and minimise fixed overheads which have to be serviced regardless of operating level. For this reason herd development has been emphasised and a deliberate attempt made to reduce the accent on range development.

KEY RESOURCE MANAGEMENT SYSTEMS

Beef cattle production is an agricultural business. Key resources used are natural, economic and managerial. The production concept is to apply economic and managerial inputs to a rangeland ecosystem, consisting of livestock (herd) and forage (range) systems, with the objective of producing beef economically.

Herd Systems

It is reasonable to assume that current disease control and eradication programmes will compel graziers to exercise better stock control through increased fencing. Development of a herd management system begins at this point and moves progressively, slowly and logically, towards greater herd segregation and control. Eight possible herd management systems are considered (Fig.1) and, whilst they do not represent an exhaustive list, they serve to illustrate the concepts of progressive herd control and implementation of improved husbandry techniques.

Range Systems

Improved water distribution is the first step in range development. A manager should only consider further range development after many years of herd control and improvement, increasing watering points and learning about the property. The second step in range improvement should be to increase animal unit production through improved nutrition. Increasing growth rate and decreasing turnoff time of males is a logical starting point (see B in Fig.1). Inputs such as fertilizer, management and supplements have to be chosen carefully with the knowledge that, if they have to be withdrawn for several years due to low prices, the system will not collapse. Lower biological efficiency is acceptable in this instance in an attempt to maintain economic efficiency. Examples of ten possible range management systems are given in Fig.1.

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FACTORS AFFECTING DEVELOPMENT

Market Forces

Market forces dictate the level of property development. The northern beef industry is subject to changes in market forces which are faced Australia wide but suffers further in respect of price, market size, market options and distance to markets (Heap and Michell 1979). The overriding influence of market forces is shown in Fig.1. Table I (Anon 1970) illustrates the market effect with low returns/animal.

Management Constraints

Management constraints may be financial, production oriented or administrative (see Fig.1). Table I illustrates the large scale and low stocking rates of northern properties. These impose production and administrative constraints on development. Because of low returns per head, capital invested per head must be correspondingly low as shown in Table I. Low turnoff, low returns and the consequent requirement for low capital investment per head impose severe financial constraints on type and rate of development.

Table I Comparison of northern properties with coastal Queensland

Parameter (average per Region)	North Australian Beef Regions		Coastal Qld Beef Regions	
	Kimberley	Darwin and Gulf	North	Central
Property size (ha)	383,625	416,233	14,625	4,578
Stocking rate (ha/beast)	39	34	11.5	6.2
Turnoff (%)	12.8	8.7	19.1	27.4
Capital invested/head	$37.20	$35.30	$77.30	$115.50
Return to Capital (ex.land)	5.2%	- 1.4%	9.7%	6.1%
Returns/Animal	$6.50	$3.90	$17.30	$17.00

Basic Ecological Resources

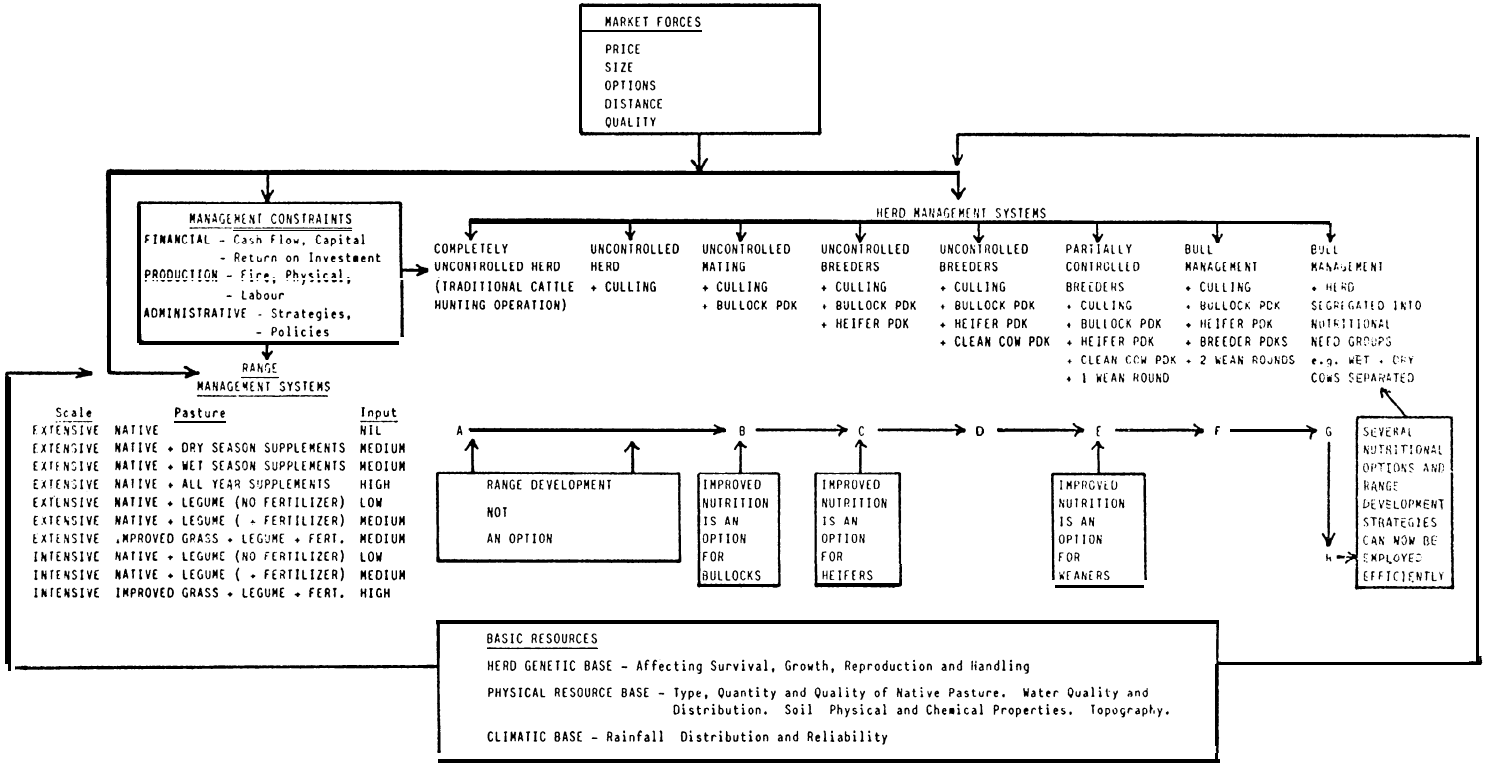
A manager must accept the limitations of available basic resources. These are the genetic make-up of the herd, the property's physical resources and the climate. The salient features of these are listed in Fig.1. Genetic composition of the herd can be altered with capital and time. Physical resource limitations are a major determinant of range development policies. A proposed production system should attempt to maximise benefit from the weather pattern to capitalise on optimum timing of breeding, weaning and turnoff.

DEVELOPMENT PRIORITIES

Fencing

The greatest single problem facing northern graziers over the 1980 decade is to obtain a return on disease control fencing. The challenge is to integrate fencing disease eradication, herd development and range improvement to get a return on fencing capital. Erection of fences on a previously unfenced property will not increase turnoff unless associated with different husbandry and nutrition practices. The associated high capital and maintenance costs would otherwise make the property non-viable.

Finances for range improvement during the fencing era are likely to be severely restricted. Graziers should therefore take the opportunity to improve herd performance and quality and attempt to lift turnoff rates by implementing better husbandry techniques. Fig.1 gives an illustration of this approach as progression is made from point A through B, C, D, E and F to point G. The work of Crouch (1970) demonstrated that managers normally take such a stepwise approach to development and that each practice helps finance the next. There is, of course, a great deal of variation in the steps which may be taken and in their order and timing.


MARKET FORCES
PRICE
SIZE
OPTIONS
DISTANCE
QUALITY
MANAGEMENT CONSTRAINTS
FINANCIAL - Cash Flow, Capital
- Return on Investment
PRODUCTION - Fire, Physical,
- Labour
ADMINISTRATIVE - Strategies,
- Policies
RANGE MANAGEMENT SYSTEMS
HERD MANAGEMENT SYSTEMS
COMPLETELY UNCONTROLLED HERD (TRADITIONAL CATTLE HUNTING OPERATION)
UNCONTROLLED HERD + CULLING
UNCONTROLLED MATING + CULLING + BULLOCK PDK
UNCONTROLLED BREEDERS + CULLING + BULLOCK PDK + HEIFER PDK
UNCONTROLLED BREEDERS + CULLING + BULLOCK PDK + HEIFER PDK + CLEAN COW PDK
PARTIALLY CONTROLLED BREEDERS + CULLING + BULLOCK PDK + HEIFER PDK + CLEAN COW PDK + 1 WEAN ROUND
BULL MANAGEMENT + CULLING + BULLOCK PDK + HEIFER PDK + 2 WEAN ROUNDS
BULL MANAGEMENT + HERD SEGREGATED INTO NUTRITIONAL NEED GROUPS e.g. WET + DRY COWS SEPARATED
Scale Pasture Input
EXTENSIVE NATIVE NIL
EXTENSIVE NATIVE + DRY SEASON SUPPLEMENTS MEDIUM
EXTENSIVE NATIVE + WET SEASON SUPPLEMENTS MEDIUM
EXTENSIVE NATIVE + ALL YEAR SUPPLEMENTS HIGH
EXTENSIVE NATIVE + LEGUME (NO FERTILIZER) LOW
EXTENSIVE NATIVE + LEGUME (+ FERTILIZER) MEDIUM
EXTENSIVE IMPROVED GRASS + LEGUME + FERT. MEDIUM
INTENSIVE NATIVE + LEGUME (NO FERTILIZER) LOW
INTENSIVE NATIVE + LEGUME (+ FERTILIZER) MEDIUM
INTENSIVE IMPROVED GRASS + LEGUME + FERT. HIGH
A
B
C
D
E
F
G
H
RANGE DEVELOPMENT NOT AN OPTION
IMPROVED NUTRITION IS AN OPTION FOR BULLOCKS
IMPROVED NUTRITION IS AN OPTION FOR HEIFERS
IMPROVED NUTRITION IS AN OPTION FOR WEANERS
SEVERAL NUTRITIONAL OPTIONS AND RANGE DEVELOPMENT STRATEGIES CAN NOW BE EXPLOYED EFFICIENTLY
BASIC RESOURCES
HERD GENETIC BASE - Affecting Survival, Growth, Reproduction and Handling
PHYSICAL RESOURCE BASE - Type, Quantity and Quality of Native Pasture. Water Quality and Distribution. Soil Physical and Chemical Properties. Topography.
CLIMATIC BASE - Rainfall Distribution and Reliability

Improving Animal Unit Performance

(i) Husbandry Introduction of *Bos indicus* genotypes is now widespread (Entwistle 1980) and should continue. Improved husbandry practices, such as strategic weaning, strategic mating, controlled heifer mating, AI, age and productivity culling, bull testing and pregnancy diagnosis, become feasible as herd control progresses and are quite likely to have a significant impact on production. Such herd development practices do not have a heavy reliance on inputs other than labour.

(ii) Nutrition Improved husbandry can only improve production to a certain limit before nutrition becomes a constraint. Nutrition is a range development option which may be supplied for survival, maintenance or production. Nutrition can be provided by either improved pasture or as a supplement to native pasture in the form of licks, legumes or conserved fodder. Some of the options which may be employed to improve nutrition are shown in Fig.1 under range management systems. An increase in carrying capacity can be expected from nutritional inputs as the limiting effect of dry season protein is reduced, but is eventually constrained by native pasture stability (Norman 1966).

Improved pastures (defined by Winks 1975) are capital intensive and could only be used for small, special purpose, intensive areas, Their use over extensive areas could not be recommended on present knowledge. Lick supplements are an effective way of increasing animal production from native pasture (Louw 1979) with low capital

Integrated pastures, where separate areas of native and sown pastures are combined for grazing, appear to hold the key to increasing production economically through improving nutrition (Winks 1975). See particularly the move from G to H in Fig.1. When doing any form of range improvement it must be a clear objective to maximise use and benefit from the free and abundant natural pasture resource. This implies care in the placement of legume supplement areas, if using integrated pastures. A philosophy of addition to poorer native pasture as opposed to replacement of good native pasture is warranted where applicable.

Increasing Stocking Rate

Assuming that animal production has been maximised for stable carrying capacity, increasing stocking rate will be the last consideration in range development. Instability of native grasses is the primary constraint to increasing stocking rate (Norman 1966). Intensified grazing pressures associated with domestic grazing of the original *Themeda australis* pasture in sub-coastal Queensland have let to its substitution with black spear grass (*Heteropogon contortus*). This succession does not occur in the higher rainfall regions of north Australia (Tothill personal communication). Replacement with exotic grasses, such as *Andropogon gayanus* and *Hyparrhenia* sp, to withstand heavy grazing in the low input system is the only stable method of increasing stocking rate in the long term. Commercial species to fill this role are not currently available. Increased stocking rate can therefore only be considered a long term option.

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