PRODUCERS' ATTITUDES TO ADOPTION OF PASTURE TECHNOLOGY IN NORTH QUEENSLAND

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ABSTRACT

Two recent surveys have measured producers' attitudes to introduced pastures in the wet and the dry tropics of north Queensland. The surveys highlighted differences between the two climatic areas in the conditions leading to the adoption of pastures and their subsequent management.

The managers of 15 properties on the McBride Plateau, an area of basalt country in the dry tropics, were surveyed in 1982. All were engaged in extensive beef production (average herdsize 4 750). None of the properties had significant areas of introduced pastures. While many managers had a positive attitude to pastures, few would be likely to plant commercial areas in the near future. Many lacked confidence in pastures for the district and other development priorities, notably fencing, had priority.

A similar survey in 1983 collected data from the managers of 58 beef properties in Hinchinbrook and Cardwell shires, both located in the wet tropics. All except one property had some area of introduced pastures. Most managers were well aware of the benefits of fertiliser, a key management practice. However, the effect of cattle prices on profitability appeared to be a factor which limited its use. Only one third fertilised regularly. It seemed a number of factors, for example, a low reliance on beef for income, the competing demands of other farm enterprises and an uncertain outlook for beef could inhibit these producers from maximising production from their pastures in the future.

INTRODUCTION

In recent years, surveys have been conducted by Queensland Department of Primary Industries (QDPI) extension staff in north Queensland to gain an understanding of producers' pasture management practices and the role they see for introduced pastures on their properties. One survey was on the McBride plateau in 1982. Data on extensive beef enterprises in the dry tropics (Wilson et al, 1984) were collected. A similar survey in Hinchinbrook and Cardwell shires in 1983 collected data on the more intensive systems in the wet tropics. The locations of the survey areas are shown in Fig. 1.

This paper discusses data from both surveys relevant to introduced pastures and highlights some factors likely to influence managers' decision making about the adoption of pasture technology.

THEORETICAL BACKGROUND

It must be stressed that extension is concerned with people and that ideas cannot be projected well without an understanding of the

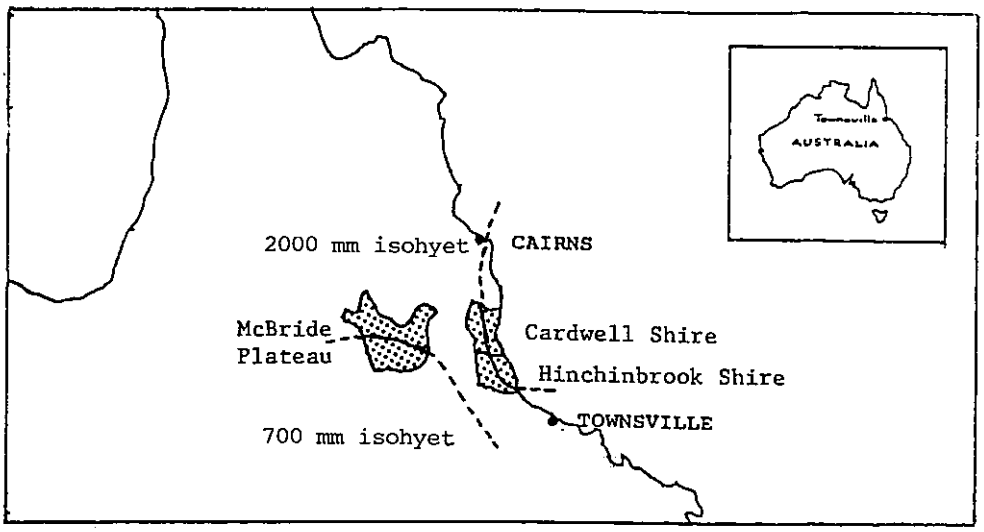

FIGURE 1
Locations of survey areas

potential audience. In contrast to the physical scientist who is concerned with such aspects as climate and growth rate, the extension person must also understand the people factors which govern the adoption of an innovation. These factors ultimately determine the rate of adoption of a new practice like improved pastures, and even whether it will be adopted at all. This was the rationale which prompted the surveys outlined in this paper.

It is generally accepted that there are four broad stages in producers' decision making processes which lead them to adopt new technology (Blackburn 1984):

1. Knowledge - an individual first becomes aware of a new practice.
2. Persuasion - favourable or unfavourable attitudes are formed.
3. Decision - activities are engaged in which lead to a choice of whether to accept or reject the idea.
4. Confirmation - reinforcement for the decision is sought, which may reverse the adoption decision.

This model highlights the importance of attitudes. Unless favourable attitudes are formed, producers are unlikely to proceed past stage two. It is important to note also that producers typically use a variety of information sources in the decision making process. Extension organisations are generally important at the early stages, whereas personal sources, for example, friends and neighbours, are more important at the later stages (Rogers and Shoemaker 1971).

This background highlights factors which an extension organisation must consider when planning educational programmes on an innovation like improved pastures. It is important to know at what

stage of the decision making process producers are at. For example, are they only just becoming aware of it or are they testing it? It is important to know what attitudes and opinions the producers have formed and what communication sources are being used.

MCBRIDE PLATEAU SURVEY

The McBride Plateau is the most northern of four basalt areas in the dry tropics of north-east Queensland. Average rainfall at 'Meadowbank', a property on the plateau, is 834 mm. The plateau is unique in that the soils are high in phosphorus but low in sulphur. The main tree species are ironbark and bloodwood and the predominant grasses are kangaroo, black spear and blue grasses. Native pastures grow rapidly during the wet season but consist of rank, low nutritive material for most of the year.

TABLE 1.
Selected background data for McBride Plateau properties

	Property Area			
	77 to 256 km²	256 to 640 km²	Over 640 km²	Total
No. of properties	8	4	3	15
Cattle:				
Total cattle (mean) No.	2 250	4 325	12 000	4 753
Branding (mean) %	58	62	56	59
Stocking rate head per km²	16	14	9	14
Cattle per full time No. labour unit	1 045	927	1 640	1 133
Property use:				
Breeding and fattening	1	2	0	3
Breeding and fattening + store breeding	3*	2	3I	8
Store breeding	4+	0	0	4
No. of paddocks:				
Up to 5	2	0	0	2
6 to 10	2	1	1	4
11 to 20	3	3	2	8
21 and over	1	0	0	1
	8	4	3	15
Stock handling details:				
Times per year stock handled				
One or two	0	0	2	2
Three	5	2	0	7
Four	2	1	1	4
Five or six	1	1	0	2
	8	4	3	15
Days per muster				
3 to 10	5	0	0	5
11 to 20	1	2	0	3
21 to 50	2	2	0	4
51 and over	0	0	3	3
	8	4	3	15
Cattle mustered per man day (mean)	86	42	21	61

*+I Include respectively one, three and one properties with fattening blocks in conjunction in other districts.

The introduction of legumes is one of the quickest and most profitable ways of improving fodder in the dry tropics (Courteney 1982). Research on the McBride Plateau, based on a number of Stylosanthes lines, has indicated that improved pastures could have application in commercial situations.

Table 1 shows selected background data on the 15 properties included in the 1982 survey (Only one property on the plateau was not surveyed). The extensive nature of these beef enterprises is reflected in these figures, for example, large herd sizes and low stocking and branding rates. There was a lot of variation between properties in the extent of subdivision. Similarly, there was much variation between properties in the number of times cattle were handled per year, in how long it took to carry out a muster and in how efficiently labour was used in cattle handling.

No property had a commercial area of stylo. However, many had experimented with different types of improved pasture, mostly other than the stylo types. In a similar study, Mortiss (1983) also found a low adoption rate for pastures but widespread experimentation on Cape York Peninsula properties.

TABLE 2.
Distribution of replies to attitude statements about improved pastures (McBride Plateau)

	Level of agreement*				
	SA	A	U	D	SD
Statements favourable to pastures					
Improved pastures make stock management easier.	6	4	0	3	0
Planting improved pastures is one way for me to expand my beef enterprise.	2	8	2	1	0
Improved pastures are a good low risk investment.	2	6	0	4	1
Pasture development has a high priority on my property.	2	3	1	5	2
DPI trial plots have shown that pasture legumes are easy to establish and cheap to maintain.	0	6	3	3	1
Statements unfavourable to pastures					
Improved pastures are too risky.	0	2	1	8	2
The fertiliser required by improved pastures makes them uneconomic.	0	2	6	4	1
Improved pastures on my property increase my management problems.	0	6	0	5	2
Improved pastures are no use in the dry season when stress on stock is greatest.	0	3	0	7	3
The production advantage from improved pastures is too small to justify the expense.	1	1	4	6	1
The problem with feed in this area is lack of rainfall, not pastures.	1	5	1	5	1
I have other more important things to spend my money on besides improved pastures.	3	4	2	4	0

* SA - Strongly agree
A - Agree
U - Undecided
D - Disagree
SD - Strongly disagree
13 managers completed the scale

To assess their attitude to improved pastures, managers were asked to indicate their level of agreement with 12 statements about pastures. The statements formed a Likert Scale (Moser and Kalton 1971). Their responses are shown in Table 2.

There were varying levels of agreement with the statements which emphasised the positive aspects of improved pastures. On one hand, a majority felt pastures made stock management easier and that pastures would enable expansion of their beef enterprise. However, only a minority felt that pature development had a high priority on their property.

Similarly, there were varying levels of agreement with the statements which were unfavourable to pastures. For example, a majority disagreed with the statement that pastures were too risky However, a majority agreed they had more important things to spend money on.

It seemed that, while most managers recognized that pastures could have a role in the district, they would not be undertaking pasture development in the near future. A number of managers made unsolicited comments which supported this finding. Some also said they needed more information on pastures. It is also significant that additional internal fencing was the most frequently mentioned property improvement item that would be made in the next five years (eight managers). These managers mostly ran properties where the mustering efficiency was low. The need for greater efficiency was probably a prime reason these managers saw a need for more fencing.

Overall, it appeared that while most managers had a positive attitude to pastures, many lacked confidence in pastures for the district and other developments, notably fencing, had priority.

HINCHINBROOK AND CARDWELL SHIRES SURVEY

The wet tropics in Queensland extend in a narrow coastal strip from near Cooktown to just north of Townsville (Moore 1970). The rainfall is of summer incidence, with some parts of the region recording some of the highest rainfall in Australia. (Innisfail average rainfall 3 644 mm). Because of this rainfall, pastures can be sown with a minimum of risk. Pasture studies have placed emphasis on rapid fat cattle turnoff and pasture stability.

A survey was carried out in 1983 in Hinchinbrook and Cardwell Shires, the two most southerly wet tropics shires. Australian Bureau of Statistics figures for 1982/83 showed 134 herds in the two shires of over 30 head. Only 26 of these were over 500 head. In drawing an interview sample, a stratified sampling procedure was used which allowed for a greater proportion of the larger herdsizes. Fifty-eight managers were interviewed. Table 3 shows selected background data for the properties surveyed.

The data show that properties with the larger herdsizes tended to be bigger and to rely more on beef for income. Because proportionately more of the properties with the larger herdsizes were included in the sample, the actual percentage of beef properties in the two shires

TABLE 3.
Selected background data on beef properties in Hinchinbrook and Cardwell Shires

	Herdsize			
	30 to 199 head	200 to 499 head	500 head and over	Total
Proportionate sample (%)	28	75	50	
Farm area (ha):				
40 to 199	15	6	0	21
200 to 599	6	14	5	25
600 and over	0	4	8	12
	21	24	13	58
Mean area (ha)	183	434	3 362	1 000
Mean pasture area (ha)	68	195	344	182
Main income:				
Beef	1	12	7	20
Sugar	12	4	3	19
Bananas	4	4	2	10
Other	4	4	1	9
	21	24	13	58
Type of cattle sold:				
Stores/young stock to 12 months	8	6	3	17
Steers and/or bullocks	6	15	8	29
Range of types	5	3	1	9
Stud cattle	2	0	1	3
	21	24	13	58

which rely on beef would be much lower than the figures in the Table indicate. It was somewhat surprising that only 29 properties (50% of the sample) turned off mostly fat steers or bullocks, as one would expect in this favoured rainfall area.

All but one property had some introduced pastures. Fertilising is considered a key management practice on pastures. Of the managers interviewed, 72% fertilised at planting. However, only 29% applied regular maintenance applications every two or three years as are generally required for maximum production. To assess attitudes to fertiliser use, managers were asked to indicate their level of agreement with a number of statements about fertilisers on pastures. Replies are shown in Table 4.

As with the previous attitude scale, there were varying levels of agreement with the different statements. For example, from the four statements favourable to fertiliser use, there was almost complete agreement that fertilised pastures were the most attractive way of fattening cattle in the wet tropics. However, only half agreed that it paid to fertilise irrespective of beef prices.

From the statements which were unfavourable to fertiliser use, the managers almost unanamously disagreed with the statement that production from fertilised paddock was no better than from unfertilised ones. On the other hand, around two thirds felt that varying cattle prices placed risks on getting money back from fertiliser.

TABLE 4.
Distribution of replies to attitude statements about fertiliser use (Hinchinbrook and Cardwell Shires)

	Level of agreement*				
	SA	A	U	D	SD
Statements favourable to fertiliser use					
Carefully fertilised grass/legume pastures provide the most economically attractive means of fattening cattle in the wet tropics.	11	37	7	1	1
Fertiliser use is the key to good weed control.	4	24	12	16	1
The cost of fertiliser is small compared to the extra income I could earn from the resulting good pastures.	3	25	12	16	1
In this district, it pays to fertilise pastures irrespective of beef prices.	1	25	5	20	6
Statements unfavourable to fertiliser use					
Production from fertilised paddocks is no better than from unfertilised ones.	0	0	1	23	33
A set of discs is the best form of fertiliser.	0	4	5	44	4
Money is better spent on feed supplements than on fertiliser.	1	5	9	36	6
I have more important things to spend my money on besides fertiliser.	1	12	11	30	3
Some of the newer grasses grow well without fertiliser.	1	12	12	27	5
Varying cattle prices place risks on getting my money back from fertilisers.	5	35	3	14	0

* 57 managers completed the scale

Overall, it appeared most managers were well aware of the benefits of fertiliser. The effect of cattle prices on the profitability of fertiliser use appeared to be the main factor which limited its use. In fact, around one third of those interviewed said they had decreased usage in response to the beef depression of the 1970's and that applications had not returned to the pre-depression levels.

It did appear that pasture productivity, overall, was less than optimum for most properties in the sample. The low level of fertiliser use was one indication of this. Also, only half of the sample turned off mainly fat steers or bullocks and stocking rates for fattening cattle on improved pastures were generally less than is regarded as possible. While there were significant areas available for new pastures, only a small number of managers planned to develop this country for pastures in the near future.

DISCUSSION AND CONCLUSIONS

None of the managers in the dry tropics survey had planted commercial areas of stylos. Further, their need to know more about pastures and the fact that other avenues for investment presently have priority will slow the rate of adoption over the next few years. Currently, most managers appear to be at the persuasion stage of the decision model. They are looking for additional information on which

to make decisions on the possible role of pastures in the district and on their properties. Many of the opinions expressed in the attitude scale appeared to be based on limited information.

Care should be taken in extrapolating these results to other districts in the dry tropics. The basalt country has a higher natural carrying capacity than other areas and there is possibly not the same potential for increased productivity. Further, pasture sowings in the basalt must be accompanied by an application of sulphur, making it a less attractive management package than seeding alone.

Increased internal fencing will allow managers to gain greater control over their cattle and also to make greater use of their native pasture. Crouch (1972) and Frank (1976) felt that this stage of property development was a prerequisite to successful pasture development. However, this may need qualification under present conditions. Extension staff in far north Queensland report an increased interest in planting stylos in the last 12 to 18 months in other districts, notably among peninsula graziers. One reason cited for this is that, rather than aiming for subdivision of an entire property, it is becoming more profitable to utilize only the more productive areas. This means that cattle handling can be improved and also that there is the potential to make greater use of any areas of improved pasture. The outlook for increased plantings over the next few years in the dry tropics is probably brighter than the McBride data indicate.

In the wet tropics, almost all beef producers have some areas of introduced pastures, so that the decision of whether to adopt introduced pastures or not is not currently relevant. In many cases, as the country was cleared, pastures were the best alternative use of the land. Decisions which will be made regarding future pasture management will largely determine future beef productivity in this part of Queensland.

Managers generally accept the positive effect of fertilisers on production. In terms of the adoption process, they are at the decision and confirmation stages insofar as fertiliser use is concerned. Almost all have used fertiliser at some stage in the past. However, managers continually re-evaluate the profitability of fertiliser use, beef prices being the main deciding factor in whether to apply fertiliser or not. For a number of reasons previously mentioned, there seems to be scope to profitably increase beef production from existing pastures.

The fact that beef cattle are only a part time enterprise on most beef farms in the wet tropics means that these producers are unlikely to devote their full management attention to their beef enterprise. Productivity could therefore remain less than optimum. On farms which rely on sugar for income, this may well have changed since the survey. Increasing production from pastures to compensate for the drop in sugar prices is one alternative. However, a more likely situation is that reduced cash flows would have lessened the inputs into pastures, especially fertilizer, thereby reducing production further.

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