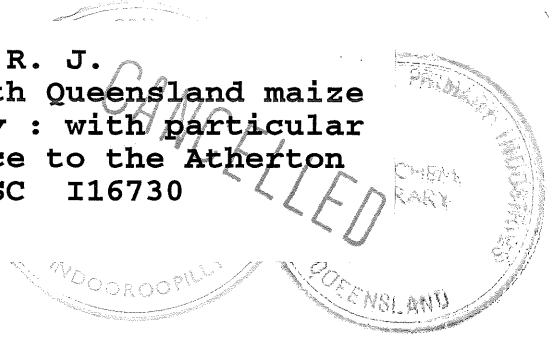


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The North Queensland maize
industry : with particular
reference to the Atherton
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THE NORTH QUEENSLAND
MAIZE INDUSTRY
WITH PARTICULAR REFERENCE TO
THE ATHERTON TABLELAND MAIZE MARKETING BOARD

R.J. Meyers
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1. INTRODUCTION

Maize growing in North Queensland displays an interesting dichotomy for a number of criteria. It is primarily found in two geographically distinct regions - one as a summer grown dry land crop; the other as a winter grown irrigated crop.

More importantly however, each region has its own brand of marketing system - one is controlled by a statutory marketing authority; the other left to market forces and the operations of private grain merchants.

This report looks at both the supply of, and demand for, maize in North Queensland as well as discussing the various marketing arrangements. Particular emphasis is given to the operations of The Atherton Tableland Maize Marketing Board. The final section involves a critical look at the types of marketing systems operating in the North Queensland maize industry.

2. PRODUCTION OF MAIZE IN NORTH QUEENSLAND

2.1 History of Production

Prior to the development of the Atherton Tableland in the late nineteenth century, maize in North Queensland was confined to small coastal pockets from Bowen to Cooktown. Its main use in those days was as a feed for work animals.

This changed in the 1890s however, when the Tableland was recognised as a suitable area for extensive agricultural cropping. As a result, maize plantings in North Queensland increased during the decade from 400 ha to more than 1 000 ha. It was estimated that by the year 1900 there were over 300 farms growing maize. Many of these farms were, at that time, being worked by Chinese refugees from the gold mining areas.

Following the allocation of soldier settlement blocks at the end of the First World War, production of maize on the Tableland increased substantially, peaking in 1938 at some 26 500 tonnes. The period 1938 to 1975 saw the industry decline at first, then increase in response to changes in demand. Initially, demand waned as the traditional market for maize - feed for work animals - was eroded by the advent of mechanization in the farming, mining and transport industries.

This was soon countered, however, by the steady growth of the northern dairy, poultry and pig industries. An additional contributing factor was the establishment of Lakeland Downs as a maize growing area. The appointment of a plant breeder at Kairi by the Department of Primary Industries in the early 1960s led to greatly improved maize varieties emerging. Within ten years most growers had switched to the newly developed QK37 variety which, conjointly with improved agronomic practices, increased yields significantly. These factors combined to boost production from around 12 000 tonnes during the 1950s to a peak of 27 000 tonnes in 1976.

More recently, the Burdekin district has emerged as a significant maize growing region, increasing its production from several hundred tonnes in the 1960s to a record 6 500 tonnes in 1981. The expansion of horticulture in the Bowen Basin has brought a decline in maize production in that area. The only other region in North Queensland where maize is grown is the Ingham surrounds, where several hundred tonnes are harvested each year.

2.2 Current Production

Currently in North Queensland, the most important maize production areas are on the Atherton Tableland and in the Burdekin district.

Traditionally, maize is grown as a summer grain, relying on seasonal rains to provide the required moisture. Under these conditions, irrigation is usually not necessary. This is the practice on the Atherton Tableland and around Ingham but in the Burdekin, maize is grown as a winter crop using irrigation. The Tableland crops are harvested from late May through August while Burdekin maize is usually harvested between October and December.

In 1980-81, a total of 6 465 ha was planted to maize on the Tableland, producing some 21 150 tonnes at an average yield of 3.3 t/ha. This compares with 534 ha in the Burdekin yielding 2 144 tonnes (4.0 t/ha) and 128 ha at Ingham which produced 271 tonnes (2.1 t/ha).

For 1981-82, the completed Burdekin harvest resulted in a substantial increase in production with nearly 6 500 tonnes of maize produced from approximately 1 500 ha. On the Tableland, 6 800 ha were planted to produce 23 885 tonnes. Ingham produced approximately 300 tonnes. Total North Queensland maize production for 1981-82 came to 30 685 tonnes.

Table 1 compares the importance of North Queensland maize producing districts for 1981-82.

TABLE 1MAIZE: NORTH QUEENSLAND PRODUCTION 1981-82

<u>District</u>	<u>Production (tonnes)</u>	<u>% of N.Q. Production</u>
Atherton Tableland plus Cook Shire	23 885	77.8
Burdekin	6 500	21.2
Ingham	300	1.0
TOTAL N.Q.	<u>30 685</u>	<u>100.0</u>

(SOURCE: Australian Bureau of Statistics)

2.3 North Queensland Production in Perspective

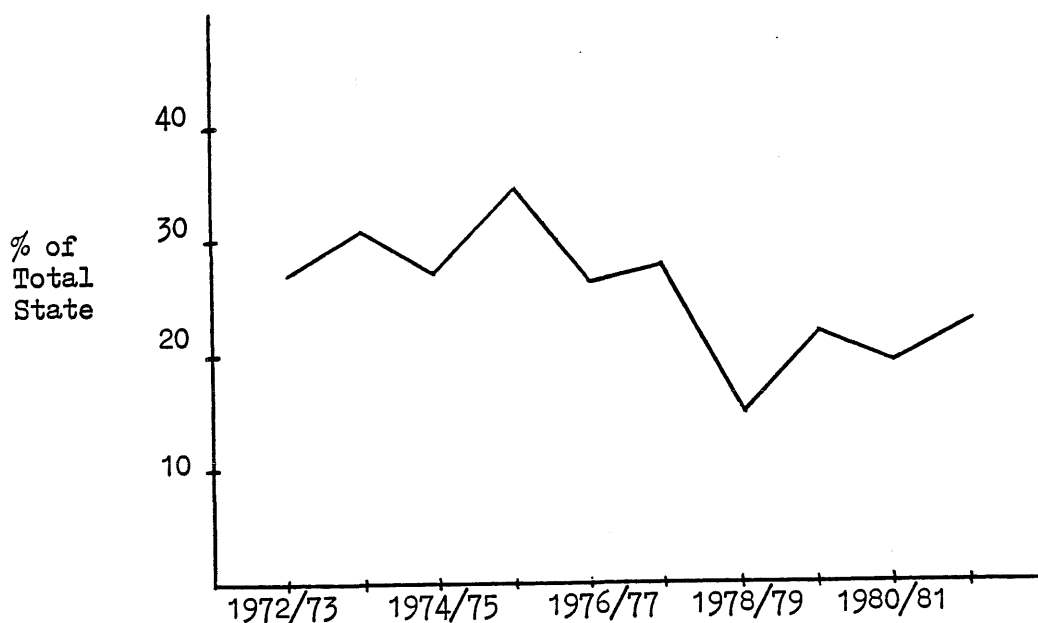
In the 1980-81 season, the total production of maize in Queensland was 123 190 tonnes, of which North Queensland's contribution was 23 579 tonnes or 19.2 per cent. The other major maize producing districts in Queensland are: Wide Bay - Burnett (39.9 per cent of the 1980-81 crop) and the Darling Downs (33.7 per cent). The remaining districts in the state accounted for only 7.2 per cent of the total maize production.

Table A1 in the Appendix shows the relative production of maize for the various districts throughout Queensland for the period 1976-77 to 1980-81.

The relative importance of North Queensland in the overall State maize production for the last ten years is shown in figure 1 below. It can be seen from this table that North Queensland has declined in a relative sense as a maize growing area. In the early 1970s the North accounted for about 30 per cent of the State's crop, but by the end of the decade, the proportion had declined to approximately 20 per cent.

FIGURE 1

MAIZE: NORTH QUEENSLAND PRODUCTION AS A PERCENTAGE OF TOTAL STATE
1972-73 TO 1981-82



Yields in North Queensland in the 1980-81 season varied from 4.0 tonnes/ha for the irrigated Burdekin crop to 2.1 tonnes/ha achieved in the Ingham region. The Tableland produced a range of yields averaging 3.3 tonnes/ha. This compares with the State average of 2.9 tonnes/ha.

In 1980-81 there were 226 growers in North Queensland - approximately 17 per cent of the 1 354 Queensland maize growers.

The above statistics are shown on a district basis for the 1980-81 season in Table A2 in the Appendix.

2.4 Agronomic Aspects of Maize Production

As pointed out earlier in the report, the two districts in North Queensland have completely different production patterns. On the Tableland, maize is a dry-land summer crop while in the Burdekin, it is produced as an irrigated winter crop. (From here on unless otherwise stated, it is

assumed that the Atherton Tableland district includes both the Cook and Hinchinbrook shires.)

2.4.1 Atherton Tableland

The bulk of the maize grown on the Tableland is produced within the triangular boundary of Kairi/Tolga/Atherton. In this area, as well as north towards Mareeba, maize is predominantly grown as a cash crop in rotation with peanuts, potatoes, vegetables or pasture seed.

To the south of this area, dairy farmers opt for a pasture/maize rotation. Further south and west, into the Herberton shire, maize is expanding into the recently cleared eucalypt country.

The Mareeba shire is increasing its maize production as growers find the drier climate of that district can result in increased yields and a higher quality grain. Further to the north, the development of Lakeland Downs has boosted production in the Cook Shire. The red soils of this area are well suited to maize growing.

Throughout the Tableland, maize is produced under summer rainfall conditions with little or no irrigation. Consequently, plantings rely to a certain extent on the timing of the rains, although by late November/early December planting has usually begun. Normal cultural practices include pre-emergent weedicide spraying and both basal and side fertilizer applications (nitrogen and phosphorus are usually required). Under normal circumstances, insects and diseases are not problems.

Harvesting generally commences six months after planting i.e., around May/June, although weather conditions may dictate variations. Drier conditions allow for harvesting at five months, while untimely rains can delay the timetable a further three to four months. Usually, the Tableland maize harvest is complete by mid to late August.

Yields on the Tableland vary between districts and individual farmers. In some instances, yields of up to 7 tonnes/ha have been recorded while in other areas, and at different times, the yield can be as

low as 2 - 3 tonnes/ha. As a general guide, 4 tonnes/ha is a fair average yield expectation.

Maize varieties are bred and tested at the Department of Primary Industries' Kairi Research Station. Once proven, new varieties are distributed to commercial seed growers who produce the certified seed for the local industry. These seed growers are normally located well away from the principal maize growing areas so as to minimize the risk of disease and insect damage, and also to guard against cross pollination by a neighbouring commercial crop.

2.4.2 Burdekin

In the Burdekin district almost the entire maize crop is grown in the Ayr shire, with the Bowen shire periodically contributing a small amount. Approximately 90 per cent of the Burdekin crop is grown under irrigation - the remaining 10 per cent (dryland) is found to the south of Ayr where water for irrigation is not readily available.

Planting occurs from April to July depending on seasonal conditions. Both fertilizers (nitrogen and sometimes phosphorus) and weedicides are required and usually control of insect pests (cutworms, leaf hoppers and heliothis) is necessary. The only significant disease problems are connected with root rots which can be controlled by preventing moisture stress.

Harvest time is usually October to December depending on weather conditions and time of planting. Yields range from 3 tonnes to 8 tonnes/ha, with 5 tonnes/ha judged a reasonable result for an irrigated crop. Seed is generally purchased from the commercial seed companies.

2.5 Economic Aspects of Maize Production

As the agronomic aspects of maize production differ markedly between the Tableland and the Burdekin, so too do the economics of crop production. Hence a separate analysis is required for each region.

2.5.1 Atherton Tableland

The major costs associated with growing a maize crop on the Tableland are land preparation, seed purchase, weed control and fertilizers.

The total variable costs for a maize crop (1980 figures) up to the harvesting stage, amount to approximately \$180 per ha. Harvesting and marketing costs per ha naturally depend on the yield. For a yield of 4 tonnes/ha, these costs amount to approximately \$30, taking total variable costs to \$210 per ha.

Assuming the same yield and a return to grower of \$100 per tonne, the gross margin for Tableland maize comes to \$190 per ha. This is well below the gross margin for peanuts (\$772 per ha) although the capital investment required for that crop is much greater than for maize. Grain sorghum, with a lower average yield of 3 tonnes/ha, has a correspondingly lower gross margin of \$132 per ha.

2.5.2 Burdekin

Added to the normal pre-harvesting costs for maize in the Burdekin is the cost of irrigation. On 1981 prices, the irrigation expense for maize comes to approximately \$70 per ha. This brings the total pre-harvest cost to \$265 per ha. Assuming a yield of 5 tonnes/ha, total variable costs come to \$400.

With an average return to grower of \$110 per tonne and the same yield as above, the gross margin for irrigated maize works out at \$150 per hectare. This compares with gross margins of \$290 per ha for rice and \$224 per ha for soybeans in the same district.

The full gross margin calculations for both Atherton Tableland and Burdekin maize can be found in Appendix 1.

3. DEMAND FOR MAIZE AND MAIZE PRODUCTS

The North Queensland maize industry was originally established in response to localized demand for a grain feed for work animals. With the passage of time, this market all but disappeared as machines replaced the beasts of burden. This left an established industry on the Tableland in need of alternate outlets.

In the period prior to the Second World War, over 100 000 tons of maize was shipped interstate, and in 1938-39, a shipment of some 7 000 tons was sent to Canada. Following the war, interstate trading ceased and, until the late 1950s, Tableland maize was divided between the local stockfeed industries and the export market.

At this time, the major stockfeed outlet was the north-western grazing areas of Queensland where maize proved to be a very useful supplementary feed - both for sheep and cattle. By the 1960s however, the pig, poultry and dairy industries in the north were flourishing and these soon became the major outlets for the Maize Board. In fact, in the early 1970s, these industries absorbed the whole of the Tableland maize production.

The following table from the Atherton Tableland Maize Marketing Board's Report for the 1972-73 Pool, gives a breakdown of sales for that crop:

TABLE 2

MAIZE: North Queensland 1972-73 Pool - Disposals

<u>Product</u>	<u>Sales (tons)</u>
Whole maize	1 705
Kibbled maize	1 365
Maize meal	8 129
Maize meal used in stock foods	3 807
Screenings and offal	345
Maize stocks 31.5.73	1 600
<u>TOTAL</u>	<u>16 951</u>

(SOURCE: The Atherton Tableland Maize Marketing Board)

By the mid 1970s, maize production on the Tableland had increased to such an extent that the local market could no longer absorb the whole crop. Alternate markets, e.g., exports, had to be found. The 1976 record crop of over 27 000 tonnes was divided almost equally between the local and export markets.

Since that time, the Maize Board has continued to export, with 11 300 tonnes being shipped overseas in 1980, 10 400 tonnes in 1981 and 11 400 tonnes in 1982. Also in 1981 for the first time, the Burdekin crop exceeded local demand and 2 500 tonnes were exported through Gladstone.

It can be seen then, that when examining demand for North Queensland maize, both the local and export markets have to be considered. For the domestic outlet it is convenient to divide the analysis between the consuming groups, namely, the poultry, pig, dairy and grazing industries.

3.1 Local Demand

There is very little demand for whole grain maize per se on the domestic market. The bulk of the maize sold locally is in the form of a feed e.g., as a mash (for pigs and poultry); as a meal (for dairy stock); or kibbled (for horses).

The table below shows the respective local sales of maize and maize as a component of maize products for the 1980-81 Pool.

TABLE 3

MAIZE: 1980-81 Pool - Atherton Tableland Maize Marketing Board

Domestic Disposals

<u>Product</u>	<u>Sales (tonnes)</u>	<u>%</u>
Whole maize	718	8.4
Kibbled maize	1 164	13.5
Maize in meal	3 467	40.3
Maize in mash	3 093	36.0
Screenings and offal	157	1.8
	<u>8 599</u>	<u>100.0</u>

(SOURCE: The Atherton Tableland Maize Marketing Board)

As can be seen from this table, the bulk of the maize crop sold locally is in either maize meal or mash form. Sales of whole maize rarely exceed ten per cent of the Board's domestic market.

In an attempt to estimate the potential demand for North Queensland maize by the local industries, a theoretical approach will be used before being modified by practical constraints. This approach involves applying consumption data for respective grain consuming animals to the various animal industries in the North. The result is an estimate of the maximum northern grain market which, given the ready substitutability of most grains, can be taken as the potential market for maize.

While this has proved to be relatively easy for the poultry and pig industries where accurate figures are available, the dairy and grazing industries, because of their more extensive nature, require a more subjective approach.

3.1.1 The Poultry Industry

The poultry industry is a significant user of grain. The required diet for pullets, layer hens and broilers must include the correct proportions of energy, protein, vitamins and minerals. These should be provided from a variety of sources in such a way as to minimize the ration cost.

Grains are a relatively cheap source of energy and protein and, as a result, are used extensively in poultry feeds. Most grains are relatively substitutable in feed rations, although some (such as maize) command a slight premium due to small differences in nutritional and energy contents.

The poultry industry in North Queensland can be divided into two constituent sections - laying hens and broilers. As each type of bird has different feed requirements, a separate calculation has to be made in each case.

(a) Layers:

The grain requirement for a 3 000 hen quota farm is detailed in Appendix 2. From this it can be seen that such a farm would require approximately 120 tonnes of feed per year. Given an average grain composition of poultry feeds of 70 per cent, the grain requirement for the birds is 84 tonnes per year.

For the purpose of assessing local demand, three progressively sized markets will be considered:

1. Far North Queensland - being the coastal strip from Cardwell north, including the Atherton Tableland. (This could be considered to be the Maize Board's immediate or primary market.)
2. North Queensland - being the coastal strip from Bowen north, including the Atherton Tableland.
3. Greater North Queensland - being all of Queensland north and west of Mackay.

The table below shows the respective quota numbers and the resultant calculated grain requirements for each of the market areas outlined above.

TABLE 4Estimated Grain Requirements - Laying Hens

Market Area	Quota Number*	Grain Requirement (tonnes)
1	97 300	2 725
2	203 217	5 690
3	246 389	6 840

(* as supplied by the Hen Quota Committee, 1982)

The maximum grain requirements for layer hens for Market Area 1 is thus 2 725 tonnes. Therefore, this is the theoretical potential market for maize provided by this section of the poultry industry in that region.

In Market Area 2, it would be theoretically possible to sell 5 690 tonnes of maize and for Area 3, the potential market is 6 840 tonnes of maize.

(b) Broilers:

Appendix 3 sets out the grain requirements for broilers. This shows that a 110 000 broiler farm uses 540 tonnes of feed per year. Given a grain component of 70 per cent, the annual grain consumed would be approximately 380 tonnes.

For broilers there is no need to look to the market areas detailed above as all the broiler hens in the north are on two farms near Cairns - thereby falling into all three areas. The total number of broilers on these farms is roughly 375 000*. Thus their grain consumption would be approximately 1 300 tonnes per year. Again this represents the theoretical potential market for maize - as demanded by this section of the poultry industry.

(c) Layers and Broilers:

Combining the figures from the above two sections gives the potential maize requirement generated by the poultry industry in North Queensland.

The demand is shown in the table below, using the market area approach detailed in (a) above.

(* Source - "Primary Industries in Far North Queensland ", D.P.I. publication)

TABLE 5Estimated Grain Requirements - Poultry Industry

Market Area	Grain Requirement (tonnes)		
	Layers	Broilers	Total
1	2 725	1 300	4 025
2	5 690	1 300	6 990
3	6 840	1 300	8 140

3.1.2 The Pig Industry

As with the poultry industry, pig rations are devised on the basis of the least cost combination of ingredients providing the required energy, protein, etc. Again, grains provide a relatively cheap source of energy and certain amino acids and consequently are a major component of pig diets.

Estimates of feed consumption in this industry have been calculated as consumption per breeder equivalent - see Appendix 4. Using this method, average feed consumption worked out at approximately 4 300 kg per breeder equivalent per year. Assuming the rations contain, on average, 75 per cent grain, the annual breeder equivalent grain consumption is about 3 200 kgs.

To extrapolate this to industry-wide demand for grain, it is assumed that 10 per cent of an area's pig numbers are sows (breeders). The same market areas as for Section 3.1 are used here.

The table below gives the approximate breeder number and the thus calculated grain requirement per annum for the North Queensland pig industry.

TABLE 6Estimated Grain Requirements - Pig Industry

Market Area	Sow Number	Grain Requirement (tonnes)
1	1 080	3 450
2	1 880	6 020
3	2 100	6 720

Thus the theoretical potential maize market provided annually by the pig industry is 3 450 tonnes for Far North Queensland, 6 020 tonnes for North Queensland and 6 720 tonnes for Greater North Queensland.

3.1.3 The Dairy Industry

Unlike the previous two industries, the dairy industry does not rely on grains as a significant feed component. Grains can be used as a supplementary ration, but unless they are particularly cheap, they do not compare with alternate feeds e.g., a combination of irrigated pastures and molasses.

Consequently, grains are used neither extensively nor uniformly across the dairy industry. Hence it is more difficult to quantify the grain requirement for the dairy industry than for the pig and poultry industries.

Nevertheless, reasonable estimates can be made. Appendix 5 details three different types of grain (predominantly maize) consumption patterns found in the North Queensland dairy herd. These are divided into heavy, moderate and sporadic users. It has been estimated that these would be represented by 10, 30 and 20 per cent respectively of the Tableland dairy herd of some 22 000 head.

The number of cows and corresponding grain consumption for each of the categories listed in Appendix 4 appears in the following table.

TABLE 7

Estimated Grain Requirements - Dairy Industry

Extent of Grain Consumption	No. of Cows (approx.)	Aggregate Consumption (tonnes)
Heavy user herds	2 200	2 200
Moderate user herds	6 600	3 960
Sporadic user herds	1 100	165
TOTALS	9 900	6 325

As the entire North Queensland dairy herd is located on the Tableland, there is no need to employ the market area analysis used for the other industries. It can be seen then, from the above table, that the estimated demand for maize in the North Queensland dairy industry is about 6 300 tonnes annually.

3.1.4 The Grazing Industry

In times of dry (or more particularly drought) conditions, grains are often used as a supplementary feed for grazing cattle. There is also a steady (though small) market for grain as a feed for stud cattle and horses (work and sporting). Very little grain has been fed to sheep in recent years.

It is more difficult to estimate the demand for grain in the cattle grazing industry than in any other. The existence of a market depends entirely on weather and price. In very dry conditions there is a market in north-west and central Queensland for grains at the right price. Usually, the period of demand would extend from May to December, but at any time, unseasonal rains could cancel the demand.

At best, the grazing industry represents a spot market, although in some years - such as 1982 - it could take a significant quantity of grain. Traditionally, Central Queensland graziers are supplied with sorghum from The Central Queensland Grain Sorghum Marketing Board and indeed sorghum is sold into the north-west, especially around Winton, Hughenden and Charters Towers.

While the size of the market for grain in the north-west does vary considerably, it has been estimated that it would be possible to sell 2 000 to 3 000 tonnes of grain into that area in a dry-to-very-dry season.

3.1.5 North Queensland Grain Requirements - A Consolidation

The local demand for grains from four industries - poultry, pig, dairy and grazing has been examined. In addition, three market areas have been identified, namely, Far North Queensland, North Queensland and Greater North Queensland. While the figures produced for the pig and poultry industries may be regarded as being fairly accurate, those for the dairy industry would be somewhat less so, and for the grazing industry, a rough guide only.

However, when consolidated, they can be considered to provide a reasonable indication of the maximum size of the market for grains in North Queensland. The table below sets out the market requirements for grain, by industry, for the three previously defined market areas. (A figure of 1 500 tonnes has been taken as a long run average annual demand for the grazing industry.)

TABLE 8

Estimated Grain Requirements - North Queensland

Market Area	Industry				
	Poultry	Pig	Dairy	Grazing	Total
1	4 025	3 450	6 325	-	13 800
2	6 990	6 020	6 325	-	19 335
3	8 140	6 720	6 325	1 500	22 685

This table shows that, for the Far North Queensland area alone, a maximum annual demand for grain, and hence the potential maximum market for maize, of some 13 800 tonnes exists. Extending this area south to Bowen (i.e., Market Area 2), the size of the potential market increases to over 19 000 tonnes per annum. If we consider the whole of Market Area 3 the annual grain demand rises to almost 23 000 tonnes.

For practical purposes it must be recognized that the whole of the North Queensland grain market is not likely to be met by maize. Although maize is, for all intents and purposes, totally substitutable for any other grain in the various stock feeds, individual producers may prefer to use another type of grain. Furthermore, some producers may grow part or all of their own requirements e.g., sorghum or maize. Additionally, other grains may, from time to time, be significantly cheaper than maize and would thus be preferred.

From a maize seller's standpoint, it is useful to conceptualize the extent of the potential market so that some idea of respective market shares can be gained. For instance, if it can be established in which industries or areas sales are low, it should be possible to take action to reverse poor sales performances in such industries/areas.

3.2 Export Demand

Whereas the domestic demand for whole maize is minimal, the export market is totally whole grain oriented (with the exception of some mixed feed sales to Papua-New Guinea). Exports of North Queensland maize have fluctuated over the past few years from a high of almost 14 000 tonnes in 1977 to as low as 5 100 tonnes in 1979.

In 1981, Maize Board exports totalled some 10 400 tonnes while for the first time, growers in the Burdekin were forced to sell maize overseas - to the tune of 2 500 tonnes. In 1982, the Board exported approximately 11 400 tonnes. Burdekin maize was not exported in 1982 as there was sufficient drought-created demand to dispose of all of the crop on the domestic market.

On the world scene however, these quantities are miniscule and hence in no way can the Maize Board or the Burdekin merchants (working through the Q.G.G.A.) hope to influence export prices. They are, then, very much price takers with respect to overseas sales.

The export price for maize is obviously influenced by a number of factors, for example: current maize stocks, price and availability of substitutes, expected or forecast production of maize and other grains, current and expected demand for grains etc. With the ready availability of substitutes, the world maize trade does not provide a long term outlet on which to base an industry. Prices fluctuate markedly. Under current maize industry circumstances in North Queensland the export market should be treated as an outlet for production surplus to domestic requirements rather than as a primary market in itself.

Prices for maize exported by the Maize Board in recent years are detailed below.

TABLE 9

MAIZE: North Queensland

Export Prices Received - A.T.M.M.B. (1975-82)

<u>Year</u>	<u>Price (f.o.b. Cairns)</u> <u>\$/t</u>
1975	84.00
1976	81.60
1977	88.95
1978	67.75
1979	98.00
1980	105.57
1981	110.00
1982	116.00

(SOURCE: The Atherton Tableland Maize Marketing Board)

In real terms, i.e., allowing for inflation, the price received in 1982 was about 30 per cent less than the 1975 export return.

4. MARKETING OF MAIZE IN NORTH QUEENSLAND

4.1 The Atherton Tableland Maize Marketing Board

4.1.1 History

The origin of The Atherton Tableland Maize Marketing Board can be traced back to the early 1900s when the maize industry was being established on the Tableland.

The pioneering growers faced many common problems. These included the need for specialised drying and storage facilities to cope with the high moisture content of the grain; the marketing problems associated with long distances from major outlets; and the need for countervailing selling powers to combat local grain buyers.

The enactment of the Primary Product Pools Act in 1922 provided growers with an opportunity to organise themselves formally and thus to speak and act in a unified fashion. Consequently, on 31 August 1923 an Order in Council was issued pursuant to the abovementioned Act constituting the "Atherton Tableland Maize Board". In 1946 an amendment to the Primary Producers' Organisation and Marketing Act caused the Board's name to be formally changed to "The Atherton Tableland Maize Marketing Board".

The Government of the day favoured the formation of such a Board for a number of reasons, not the least being to test whether the construction of centralised drying and storage facilities and the associated financing scheme could become an example, not only to other maize growers, but to producers of storage commodities in general. Consequently, immediately after its formation, the Maize Board commenced construction of the required drying facilities and storage silos. A government guarantee was provided to help finance the operation.

In order to adequately service the maize growing districts included in the Board's prescribed area, storage facilities were erected at Atherton, Kairi and Tolga. Each depot had a storage capacity of some 2 800 tons. Artificial drying facilities were installed at the Atherton site. The Board handled its first crop in the 1924-25 season when a total of 17 099 tons of maize was received.

In subsequent years, it was found that the storage capacity was insufficient to meet industry requirements. Consequently, during the 1935-36 season, an additional 4 200 tons of storage was provided at Atherton. This capacity remained unchanged until the 1967-68 season when the Atherton depot capacity was boosted by an additional 6 000 tons of storage.

Prior to the 1935-36 crop, the Board operated principally to receive maize from growers, dry and store the grain, then sell it as whole grain. However, it became apparent during the 1930s that there was a good local market for both stock and poultry feeds. In order to cater for this growing demand, the Board, in 1935, began to manufacture poultry rations - thereby introducing the "Athmaize" branch of stock and poultry feeds. (The brand continues to this day.)

When the additional storage shed was constructed in Atherton during the 1967-68 season, the opportunity was taken to upgrade the stockfeed manufacturing plant. As a result of this, the Board was able to provide a bulk delivery service for its customers.

Another innovation adopted by the Maize Board was the result of a flow on from the advent of mechanical pickers. While these machines greatly increased the speed of harvesting, they also brought with them the problem of extraneous matter contamination and the inclusion of diseased cobs in the harvested crop. To counter this, in 1953-54 the Board found it necessary to install additional cleaning and grading equipment. At the same time, improved cooling facilities were provided in order to enhance the safe storage of the grain.

Over the years, the Tableland maize production has often exceeded local demand, forcing the Board to look to interstate and overseas markets. As mentioned previously, until the Second World War most of the excess grain was sold interstate. Following the war, export became common with sales to Japan, New Zealand, Sweden and Denmark.

However, it was not until the 1972-73 season that the Maize Board and the Cairns Harbour Board finally agreed to establish storage and grain

handling facilities at the Cairns wharf. Since that time, the Board has been able to export its surplus grain from the Cairns terminal.

4.1.2 Area of Operation

When the Board was originally constituted in 1923 its area of operation (that geographical area constitutionally proclaimed as the Board's area) was defined as: "... the Petty Sessions Districts of Atherton, Herberton and Chillagoe."

This area was extended, by Order in Council in 1937 to include not only the above districts but also: "... that locality which is contiguous to and is distant not more than fifty miles from a boundary of the said Petty Sessions Districts of Atherton, Herberton and Chillagoe ...".^(a)

In 1969 the area was redefined again by Order in Council as: "The area comprised in the Magistrates Courts Districts of Atherton, Mareeba, Malanda, Herberton and Chillagoe and in all that locality which is contiguous to and not more than fifty miles distant from a boundary of the said Magistrates Courts Districts..." (see Map Appendix 8)^(b)

In 1969 amendment also provided for the division of the Board's area into two Zones, namely:-

- "(i) The Atherton Zone, which shall be called Zone A and shall comprise the whole of the Board's area except the area included in the local authority areas of the shires of Hinchinbrook and Cardwell; and
- (ii) The Ingham Zone, which shall be called Zone B and shall comprise the local authority areas of the shires of Hinchinbrook and Cardwell."^(b)

(a) Amended by Order in Council dated 21 January, 1937 and published in Government Gazette of 23 January, 1927.

(b) Amended by Order in Council dated 10 April, 1969 and published in Government Gazette of 12 April, 1969.

One of the main reasons for dividing the Board's area into two Zones was to provide for two delivery and payment pools, i.e., a Zone A pool and a Zone B Pool. However, with the decline of maize production in the Ingham district, the Board's area is now, for all practical purposes limited to Zone A as defined above.

4.1.3 Powers

In addition to the general powers bestowed on The Atherton Tableland Maize Marketing Board by the various parts of the Primary Producers' Organisation and Marketing Act, the Board has additional, more specific, powers conferred upon it by way of various Orders in Council over the years. The more significant of these powers are outlined below.^(a)

- authority to grind, crush, crack or kibble maize.^(b)
- power to borrow money by the sale of debentures subject to firstly, Treasury sanction to enter into negotiations, and secondly the authority of the Governor in Council to proceed with the borrowing (inserted as S.14N of the Primary Producers' Organisation and Marketing Act, 1969).^(c)
- power to declare zones within the prescribed Board area (viz. Zones A and B) and the power to declare zonal pools for the purpose of making payments to growers.^(d)
- with respect to the Board's compulsory acquisition powers, maize growers are entitled to withhold not more than five tonnes of their crop from delivery. To be able to retain more than five tonnes, express permission from the Board is required.^(e)

(a) Original Order in Council dated 31 August, 1923 and published in Government Gazette of 1 September, 1923.

(b) Inserted by Order in Council dated 28 March, 1963 and published in Government Gazette of 30 March, 1963.

(c) Section 14N inserted by Order in Council dated 13 November, 1969 and published in Government Gazette 15 November, 1969.

(d) Amended by Order in Council dated 10 April, 1969 and published in Government Gazette of 12 April, 1969.

(e) Inserted by Order in Council dated 21 July, 1927 and published in Government Gazette of 30 July, 1927.

- carrying of maize - other than for the purpose of delivery to the Board - is not permitted unless the carrier has been issued with a permit by the Board to so carry the said grain. The Board is the sole issuing authority of the carrying permits. Board members and inspectors appointed by the Board have powers to stop and inspect any vehicles suspected of carrying the commodity maize within the Board area without a permit. Any such commodity so found may be seized by the Board member or inspector.^(a)
- power to manufacture stock foods and/or poultry foods incorporating ingredients other than maize providing that all times the proportion of maize in such feed is not less than the prescribed minimum proportion (currently 46 per cent).^(b)
- a discretionary power exists for the Board to require every grower of any part of the commodity to deliver to the Board on or before the tenth day of each month a return showing the quantities of the commodity grown, produced, acquired, handled, sold or disposed of by the grower during the preceeding month.^(c)

4.1.4 Function

Marketing Boards exist primarily to compensate primary producers for the special and often difficult circumstances under which they must necessarily operate in order to market their particular commodity. The principal techniques by which these statutory marketing authorities address these problems include a countervailing selling power for the grower/suppliers and the provision of economies of scale for handling, processing and generally marketing the commodity.

Primary producers usually conceive that the marketing boards provide them with a system of "orderly marketing". Atherton Tableland maize growers would expect, as do other growers associated with their respective marketing boards, that the primary function of the Maize Board is to maximise returns to growers (in the long run).

(a) Inserted by Order in Council dated 29 May, 1930 and published in Government Gazette of 31 May, 1930.

(b) Inserted by Order in Council dated 3 December, 1964 and published in Government Gazette of 5 December, 1964.

(c) Included in original Order in Council

A recent study of Queensland Marketing Boards^(a) suggested that other, albeit secondary, functions of a marketing board include:

- to act as intermediaries between growers and Government;
- to encourage improved on-farm management; and
- prompt and convenient acceptance of the crop.

It could also be argued, however, that as marketing boards are set up and maintained under the umbrella of legislation introduced by Governments, they also have a function - or a duty - to see that their specially bestowed powers are not abused. That is, that they are not used to disadvantage another section of the community.

Local users of Atherton maize would argue that the Maize Board has a duty to ensure their continual access to the commodity at a fair and reasonable price. It would seem, therefore, that if the Maize Board is to function properly, it should seek to maximise returns to its growers but only within reasonable bounds. While its first duty may be to its grower/suppliers, the Board should be mindful of its duty to its consumer/customers.

4.1.5 Method of Operation

The Maize Board operates intake or delivery centres at Atherton, Kairi and Tolga. The Atherton and Tolga depots are equipped with separators and driers while Kairi acts more as a temporary centre for storage. All grain received is eventually delivered to the Atherton headquarters of the Board. At this depot, grain for export is loaded onto rail wagons and all stockfeeds are manufactured.

With the exception of the items of capital expenditure detailed previously, the Board's facilities are those originally constructed when it commenced operations. While the various depots seem to cope with their respective functions, they are not without problems. One of the major difficulties that occurs is the intake at the Atherton depot. Here, the intake pit has a capacity of only six tonnes and the outloading auger from the pit to the drier can only manage 20 tonnes per hour.

(a) Berge, B.A. & Vinning, G.S. "Queensland's Marketing Board System: An Evaluation". (1979)

This intake centre consequently becomes a bottleneck during the harvest period resulting in long lines of trucks being forced to queue for hours on end. Unfortunately, the arrangement of the depot is such that it would be a very expensive exercise to re-construct the intake facility.

Sales

As mentioned earlier in this report, the Board disposes of the maize as either whole grain (local and export), kibbled maize, meal or mash. Maize is passed through a cracking machine for kibbled maize, a coarse hammer mill for meal and a fine hammer mill for maize mash. Various additives (meat meal, vitamins etc.) are introduced to both the mash and, to a lesser extent, the meal before these products are bagged or bulk delivered.

With total storage capacity of approximately 17 000 tonnes, the Board must move fairly quickly when the anticipated harvest is of the order of 22 000 to 24 000 tonnes. In recent years, the Board has tried to export early in the pool year to relieve pressure on the storage. This also improves the Board's cash flow. In 1982, for example, export tenders for 12 000 tonnes were called in April. Agreement was reached by May for export in July/August.

Payments to Growers

Payments to growers are on a pool basis. The Board sells the crop on behalf of growers and after all appropriate charges and costs are deducted, the net returns are distributed to growers according to tonnage delivered. While individual adjustments are made for quality differentials, all freight and drying costs are pooled.

Each pool spans twelve months - from 1 June to 31 May the following year. Finalisation of a pool normally takes about fifteen months. Intake usually commences early in June. By this stage most of the previous year's crop has been disposed of, leaving minor carryover stocks. The current crop is received over the next few months and the selling of that pool begins (see Appendix 6 for the 1980-81 Pool Receipts and Disposals).

Payments to growers are normally spread over fifteen months and split into four instalments. For maize delivered in June, for example, a first advance is paid in July/August, a second in December, a third payment in April and a fourth and final payment in September when all pool income has been received by the Board, costs have been finalised and the books audited.

Growers who wish to use their maize for their own purposes are required firstly to deliver the crop to the Board which then stores it on the growers' behalf. Desired quantities of the maize are later returned to the respective growers as they so require. There is a fee charged for this service, the rate being determined annually by the Board. The proceeds thus collected help to meet the overhead costs e.g., storage, incurred by the Board each year.

Finance

The Maize Board derives its finance from normal commercial sources, which allows the Board to operate on a fluctuating overdraft. Table 10 shows the Board's cash position at the end of each month for the 1981-82 pool. It can be seen that the Board has a surplus of funds for only three months - July to September which are the months of, and those immediately subsequent to, export.

Most of the Board's financial dealings concentrate on crop finance. The Board does not borrow from the Rural Credits Department of the Reserve Bank. This is in contrast with most other marketing boards in Queensland. Growers' first advances are usually paid just after the receipt of payments for exports and thus, for example, for the 1981-82 pool, first advances of some \$800,000 were paid subsequent to the receipt of \$1.15 million from export sales.

Capital expenditure by the Maize Board in the past has tended to be funded entirely by borrowings, the Board having no accumulated reserves of any significance from which to draw. Thus the Maize Board continues to rely on normal commercial sources for financing capital expenditure.

The Board is currently considering whether or not to establish a General Reserve Fund, as provided for in Section 18(5) of the Primary Producers' Organisation and Marketing Act, in order to establish reserves for future use. Even if this should proceed, it would be some time before these reserves reach a level which would be of significant value to capital funding needs.

TABLE 10

ATHERTON TABLELAND MAIZE MARKETING BOARD
MONTHLY CASH BALANCE, 1981-82 POOL

Month Ending	Current Account	Short-term Investments	Net Position
	\$	\$	\$
Opening bal.	320,682.15 Dr	-	320,682.15 Dr
30 June	223,456.88 Dr	-	223,456.88 Dr
31 July	51,465.55 Cr	-	51,465.55 Cr
31 August	62,505.54 Cr	250,000.00	312,505.54 Cr
30 Sept.	84,687.15 Dr	450,000.00	365,312.85 Cr
31 Oct.	168,585.45 Dr	-	168,585.45 Dr
30 Nov.	117,003.52 Dr	-	117,003.52 Dr
31 Dec.	389,291.70 Dr	-	389,291.70 Dr
31 Jan.	320,883.36 Dr	-	320,883.36 Dr
28 Feb.	265,123.17 Dr	-	265,123.17 Dr
31 March	332,369.52 Dr	-	332,369.52 Dr
30 April	473,451.66 Dr	-	473,451.66 Dr
31 May	396,430.46 Dr	-	396,430.46 Dr

Dr = Debit balance or overdraft

Cr = Credit balance

(SOURCE: The Atherton Tableland Maize Marketing Board)

4.2 Other Marketing Arrangements for North Queensland

Apart from the Maize Board, there are two other large grain and stockfeed outlets operating in North Queensland namely Burval Produce (Home Hill) and Lower Burdekin Produce Agency (Ayr). Additionally, there

are several smaller produce merchants active in the region such as Charters Towers Produce (Charters Towers), Causeway Produce Agency (Townsville) and Hickmott's Produce Factory (Bowen).

These merchants operate as wholesalers and, to a lesser extent, retailers, dealing in grains and stockfeeds as well as a variety of farming equipment and accessories. Wholesale feeds are the mainstay of these businesses. The merchants buy direct from local grain farmers, or from Central and Southern Queensland as required, then dry and store the grain until sale. Feed mixing tends to be done on demand - most merchants offer a range of feeds for horses, cattle, pigs, poultry and birds. The feeds are generally sold in bags although bulk deliveries can be arranged on request.

Unlike the Maize Board, the produce merchants normally pay growers on a 30 days cash basis rather than as a series of advances. In 1981, Burdekin maize growers were paid up to \$110/tonne on farm for their crop which will exceed the amount to be received by suppliers to the Maize Board (approx. \$100/tonne over the four payments) for that year's harvest.

4.2.1 Burval Produce

Burval Produce is based in Home Hill where purchased grains are dried and stored and the various feeds are prepared. Outlets are also operated in Ayr, Charters Towers, Cairns and, more recently, Malanda and Mareeba.

Approximately two-thirds of the maize and sorghum grown in the Burdekin and Bowen areas would be handled by Burval. In 1981, this amounted to approximately 9 000 - 10 000 tonnes. For 1982, their share could be as high as 12 000 tonnes of the two grains. Burval has the capacity to store about 6 000 tonnes of grain.

The Burval operation began some eight years ago, basically in response to localised demand, i.e., in the Burdekin. Since then, the enterprise has gone from strength to strength, identifying and servicing new markets in North Queensland, from the point of view of both new

industries and new areas. From the Burdekin, they spread west to Charters Towers to cater for the grazing market, then north to Cairns for the pig and poultry industries.

In recent times, for reasons to be discussed in the following chapter, Burval has seen fit to establish outlets in both Malanda (for the Tableland dairy market) and Mareeba (for the Tableland pig and poultry market). This involves trucking grain and feed almost 500km from the Burdekin up to the Atherton Tableland.

In 1981, Burval was involved with the Queensland Grain Growers' Association in the export of the surplus 2 500 tonnes of Burdekin maize. Exports of maize from the 1982 crop would have been necessary had it not been for the drought-created demand for supplementary feeding.

4.2.2 Lower Burdekin Produce Agency

The Lower Burdekin Produce Agency is the second of the two big merchants operating in North Queensland. Like Burval, this operation arose from the need to provide a service for the local (Burdekin) demand for grains and feeds. Also like Burval, L.B.P.A. has expanded into new areas and new industries so that both these merchants compete with each other in most of the markets they serve.

The Lower Burdekin Produce Agency is not as large as Burval, with approximately 3 000 tonnes of storage catering for a throughput of some 4 000 - 5 000 tonnes of grain annually. Lower Burdekin operates solely from its Ayr base without the benefits of established outlets in other northern centres. Nevertheless, this firm has proved to be a very real force in the North, having captured markets from both Burval and the Maize Board.

4.2.3 Other Produce Merchants

As mentioned, there are several other produce merchants operating in North Queensland, although these tend to be on a relatively small scale and are usually specialised - both in market area and range of produce.

Both Charters Towers and Causeway Produce, for example, aim primarily at the western grazing market. Even collectively, all these agencies are not a substantial force as they tend to attract a small loyal following (e.g., from pastoral houses) and do not appear to be prepared to move into those areas traditionally serviced by other firms.

5. AN ASSESSMENT OF MAIZE MARKETING OPERATIONS

The previous chapter outlined the different ways in which maize is marketed in North Queensland. The contrast is distinct - the traditional growing area, the Tableland, with its well-established orderly marketing arrangements in the shape of the Marketing Board; and the more recent and expanding maize growing district, the Burdekin, with its freely operating private grain merchants.

The Atherton Tableland Maize Marketing Board, like most agricultural marketing boards, suffers from a certain lack of flexibility with respect to commercial orientation. The corollary of the Board's power of compulsory acquisition is that the Board is obliged to accept all of the crop delivered - provided it meets with the prescribed intake requirements.

Given the variable size of the district's harvest each year, the Board has to be able to cater for a range of intake tonnages. Intake has varied over the years from as low as 4 500 to a high of 26 000 tonnes. In recent years intake has averaged around 20 000 tonnes. To allow for this, the Board has storage facilities of approximately 17 000 tonnes.

In years when a large crop is harvested, the Board exports early to alleviate the pressure on the storage facilities. Because of the degree of urgency associated with clearing the storage, the Maize Board is not in a strong position when it comes to negotiating terms of trade e.g., price. Furthermore, North Queensland is not over-endowed with bulk grain handling (export) terminals. Consequently, the Board is forced to use the Cairns facility which, to be blunt, is barely adequate.

The biggest drawback of this terminal is its very slow loading capacity - approximately 1 200 tonnes of grain per day. Consequently, a shipment of 10 000 tonnes of maize takes more than eight days to load, thus incurring considerable demurrage charges. Overseas buyers of the Board's maize are aware of this problem and usually tender f.o.b. Cairns, thereby placing the onus on the Board to load the ship. In 1982 transport and handling costs for the export maize were about \$20 per tonne. This reduced the contracted price of \$116 per tonne f.o.b. Cairns to \$96 per tonne ex-mill.

Export returns are generally less than the ruling domestic price, often significantly so. When high loading costs are incurred, the export return becomes increasingly unfavourable. Table 11 compares the domestic and export prices on an ex-mill basis for the six years since 1975-76. This shows the export return to vary from between 48 and 83 per cent of that received on the domestic market.

TABLE 11

THE ATHERTON TABLELAND MAIZE MARKETING BOARD

COMPARISON OF EXPORT AND DOMESTIC PRICES: 1975-76 - 1980-81

Year	Export Price F.O.B. Cairns \$/t	Export Shipment Costs \$/t	Export Price Ex-mill \$/t	Domestic Ex-mill \$/t	Export Price as a Percentage of Domestic Price
1975-76	84.00	9.84	74.16	89.29	83.1
1976-77	81.60	10.77	70.83	95.12	74.5
1977-78	88.95	11.62	77.33	107.28	72.1
1978-79	67.75	12.79	54.96	115.56	47.6
1979-80	98.00	14.93	83.07	132.03	62.9
1980-81	105.57	15.95	89.62	158.80	56.4

(SOURCE: The Atherton Tableland Maize Marketing Board)

Clearly, in years when large crops are received by the Board, growers' returns are reduced by the export factor - the higher the percentage of exports, the greater this reduction becomes. In both 1980-81 and 1981-82, 57 per cent of the crop was exported. In those years, the export price (ex-mill) was 57 and 58 per cent respectively of the domestic return. This resulted in a substantial difference between prices received by the maize growers and the price paid by the local maize buyers - a factor which did not go unnoticed in the local area.

By contrast, in years which the crop intake is small, there is no problem as all the delivered crop can be marketed locally. However, the inherent problem of a small intake is the increased per unit Board charges. The Maize Board has a typically high level of fixed costs which must be met

regardless of throughput, hence the smaller the intake the higher the fixed costs per unit.

The "ideal" crop size for the Board to handle would be one large enough to spread the overhead costs sufficiently to minimize Board charges, but not so large as to be surplus to domestic requirements and storage capacity. A crop of 15-16 000 tonnes should fit this description.

A further feature of The Atherton Tableland Maize Marketing Board is its relative operational inflexibility - a characteristic displayed by many statutory agricultural marketing authorities. Decision making tends to be more involved and constrained than for the private grain merchants - decisions being cleared by management through the board of directors, for instance - and opportunities are often lost simply because of the constraints associated with the Board.

The maize industry in the Burdekin contrasts sharply with that on the Tableland - as has been pointed out in the previous chapter. The Burdekin grain merchants have far greater flexibility than the Board. They are not bound by the provisions of The Primary Producers' Organisation and Marketing Act (which regulates the operations of the marketing boards) and therefore can deal in other commodities and enterprises, offer an unlimited range of payments (including bartering arrangements such as crop for fertilizer and/or chemicals) and are generally better placed to act quickly to take advantage of situations as they arise.

There has only been one year in the past when the Burdekin crop has exceeded local demand. As a rule, almost all of the maize is purchased by the two prominent grain merchants - Burval and Lower Burdekin Produce. These operators, especially Burval, handle a whole range of feeds and other farm products and have established outlets throughout the North. They are well placed to match up supply and demand and have the storage capacity to handle the peak grain harvesting periods.

Primarily because of the diversity of their operations and their less restricted practices, these merchants can operate on a unit cost

basis which is lower than the Marketing Board. A comparison of grower returns (Burdekin and Atherton Tableland) for the last five years is shown below. This is not a precise comparison because returns in the Burdekin vary significantly in any one year depending on the time of harvest, harvesting and cartage arrangements, drying and cleaning charges and so on. For these reasons, a price range is shown.

TABLE 12

MAIZE: NTH. QUEENSLAND: PRICES PAID TO GROWERS

Year	\$/t	
	Burdekin	Atherton Tableland ^(a)
1978	85-100	70
1979	90-110	84
1980	120-130	99
1981	110-130	101
1982	115-150	112 (est.)

(a) Board prices

This table shows that the Burdekin growers have consistently received higher returns compared to their Tableland counterparts. Bearing in mind that the grain merchants usually pay in full within 30 days while the Board makes a series of four payments over 15 months, the difference is even more marked.

On the other hand, the Tableland growers have less personal involvement with the marketing of their individual crops given that they know that all they have to do each year is deliver to the Board. Burdekin growers have to put more effort into their marketing arrangements such as determining terms and conditions of harvesting, delivery and acceptance, not to mention the timeliness of these operations.

There has been no move by the Burdekin growers to introduce any sort of "orderly marketing" into their maize growing operations. The majority of these farmers are also sugar growers and often rice growers as well -

both examples of industries with statutory authorities controlling the marketing arrangements. Nevertheless these growers do not, at this stage, wish to introduce any such marketing controls into the maize industry in their district. Conclusions can be drawn from this but it is not the purpose of this survey to draw or suggest such conclusions.

The Tableland maize growers, on the other hand, have persisted with the statutory authority which has been in operation for some sixty years. The continued existence of The Atherton Tableland Maize Marketing Board may be due more to the inertia of its grower/suppliers than to any persistently good performance by the Board.

Only time will tell whether producers in either region become dissatisfied with their marketing arrangements and opt for an alternative system.

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APPENDIX 1GROSS MARGINS FOR MAIZE(a) Atherton Tableland

Table 1: Tractor Operations

	Hrs/ha
Land preparation (includes basal fertiliser application and sowing)	9.0
Pre-emergent weedicide spraying (x 1)	0.5
Side dressing of fertiliser/row cultivation (x 1)	1.0
Post emergent weedicide application	Nil
Insecticide	Nil
Harvesting (x 1) about 2 to 3 ha/hr	0.5
TOTAL	10.0
Variable costs per hectare	
<u>LAND PREPARATION</u>	
	\$ \$
8 tractor hours @ \$5.00/hour (includes sowing and basal application)	40.00
<u>WEED CONTROL</u>	
4.5 Atrazine ^R @ \$3.67/L (pre-emergent)	16.52
One pre-emergent spray by boomspray: ½ tractor hour @ \$5.00/hour	2.50
<u>SEED</u>	
15kg/ha @ \$30.00/25 kg bag (690 series)	18.00
<u>SIDE DRESSING FERTILIZER and INTER-ROW CULTIVATION</u>	
1 tractor hour per ha @ \$5.00/hr	5.00
<u>FERTILISER</u>	
Basal fertiliser - 125kg/ha DAP ^R @ \$346.90/t	43.24
Side fertiliser - 200kg/ha urea @ \$266.10/t	53.22
<u>IRRIGATION</u>	
Irrigation	Nil
<u>INSECT CONTROL</u>	
Seldom required except for occasional armyworm spray	Nil
<u>DISEASE CONTROL</u>	
Disease control	Nil
<u>CASUAL LABOUR</u>	
Seldom needed	Nil
TOTAL COSTS TO HARVEST STAGE	\$178.48

R = Registered Trade Name

Harvesting and marketing

A contract rate of \$8.00 per tonne is used in this leaflet. Maize is usually harvested at about 20% moisture content.

The grain is trucked to the Maize Board silos in Atherton for weighing and further drying to 14% moisture content before storage. Maize is used mainly on the local market for livestock feeding. If the crop is large, the remainder is usually exported.

Payment is made in four instalments. The first advance is usually made within 8 weeks of delivery. The three remaining payments are made in December of the intake year and April and August of the following year.

All transport costs and Board handling costs are pooled, meaning that all growers pay the same amount per tonne. These costs are automatically deducted from Growers' returns by the Board so that the grower gets a final payout net of these costs. Board handling costs are commonly in the \$20.00 to \$30.00 per tonne range, depending upon the volume of the crop.

Total variable costs

The total variable costs for a range of yields are shown in table 2.

TABLE 2: Total Variable Costs (nearest dollar)

ITEM	Yield (t/ha)					
	2	3	4	5	6	7
Total Variable Costs/ha	194	202	210	218	226	234
Total Variable Costs/t	97	67	53	44	38	33

Gross income

Table 3 sets out the Gross Income for a range of yields and prices.

TABLE 3: Gross Income (dollars)

PRICE (\$/t) (to grower)	Yield (t/ha)					
	2	3	4	5	6	7
70	140	210	280	350	420	490
80	160	240	320	400	480	560
90	180	270	360	450	540	630
100	200	300	400	500	600	700
110	220	330	440	550	660	770
120	240	360	480	600	720	840

APPENDIX 1 (CONT.)(a) Atherton Tablelands (cont.)

Gross margins

GROSS MARGIN = GROSS INCOME LESS VARIABLE COSTS

There is no allowance for fixed costs such as depreciation rates, farmer's unpaid labour etc.

Table 4 shows the Gross Margins for a range of yields and prices.

TABLE 4: Gross Margins (dollars per hectare)

PRICE (\$/t) (to grower)	Yield (t/ha)					
	2	3	4	5	6	7
70	-54	8	70	132	194	256
80	-34	38	110	182	254	326
90	-14	68	150	232	314	396
100	6	98	190	282	374	466
110	26	128	230	332	434	536
120	46	158	270	382	494	606

APPENDIX 1 (CONT.)(b) BurdekinGross Margin per Hectare

GROSS INCOME		\$/ha
5 tonnes per hectare at \$110 per tonne delivered		550
VARIABLE COST		\$/ha
Land preparation	23	
Planting	45	
Fertilizer inc. application	124	
Crop protection - 1 x cultivation	3	
Irrigation 4.5ML at \$15.40/ML	69	
Harvesting \$15/tonne	75	
Freight \$7/tonne	35	
Drying \$5/tonne	<u>25</u>	
TOTAL VARIABLE COSTS		400
GROSS MARGIN		
Gross Margin per hectare		150
Gross Margin per ML of water		33

Effect of Price and Yield Charges on Gross MarginTable 1: Gross Margin (\$/ha)

Yield (t/ha.)	Price \$/tonne				
	90	100	110	120	130
4.5	20	65	110	155	200
5.5	83	138	193	248	303
6.5	144	209	274	339	404
7.5	209	284	359	434	509

APPENDIX 2GRAIN REQUIREMENT - LAYER HENS (Including Pullets)

This calculation will be based on a laying hen farm with a quota of 3 000 birds.

Data *

No. of layers (24 weeks on):	3 000
No. of pullets (0-18 weeks):	1 000
No. of young hens (18-24 weeks):	333
Layer (and young hen) feed consumption:	90gms/bird/day
Pullet feed consumption:	48gms/bird/day
Grain component of feed:	70%
Layer mortality:	15% per batch

Calculation

(a) Layers:

Layer mortality for life of batch	= 15%
∴ Layer number - beginning of batch	= 3 000
Layer number - end of batch	= 2 550
Av. Layer number per batch	= 2 775
Batch feed consumption	= 2 775 x $\frac{90}{1\ 000}$ x 365 kg/yr
	= 91.2 tonnes/year.

(b) Pullets:

No. of pullets per batch	= 1 000
Batch feed consumption	= 1 000 x $\frac{48}{1\ 000}$ x 365 kg/yr
	= 17.3 tonnes/year.

(c) Young Hens:

No. of young hens per batch	= 333
Batch feed consumption	= 333 x $\frac{90}{1\ 000}$ x 365 kg/yr
	= 10.9 tonnes/year.
∴ Total Feed Consumption	= 91.2 + 17.3 + 10.9 tonnes/yr
	= 119.4 tonnes/year.
Grain component of feed	= 70%
∴ Total Grain Requirement for 3 000 Quota hen farm.	= 119.4 x 0.70 tonnes/yr.

84 tonnes grain/year

APPENDIX 3GRAIN REQUIREMENT - BROILERS

The grain requirement for broilers has been calculated from information supplied by a North Queensland broiler producer.

Data

Number of broilers:	110 000 birds (approx.)
Feed consumption (total)	
- broiler starter ration:	10 tonnes/month
- broiler finisher ration:	35 tonnes/month
Grain component of feed:	70%

Calculation

Total feed consumption	= 10 + 35 tonnes/month
	= 45 tonnes/month
	540 tonnes/year.
∴ Total grain consumption for 110 000 flock	= 540 x 0.70 tonnes/year
	<u>380 tonnes grain/year.</u>

APPENDIX 4GRAIN REQUIREMENT - PIGS (BREEDER EQUIVALENT)

The grain requirements for the pig industry is calculated on a "breeder equivalent" basis i.e., the amount of grain consumed by a one-sow piggery.

Data *

Feed consumption:	82 kgs/breeder/week
Grain component of feed	
- grower ration:	79%
- creep ration:	67%
Average grain component: (weighted)	75%

Calculation

Feed consumption	= 82 kgs/breeder eq./week
	= $\frac{82}{1\ 000}$ x 52 tonnes/breeder eq./year
	= 4.3 tonnes/breed eq./year
∴ Grain component	= 4.3 x 0.75 tonnes/breeder eq./year
	= <u>3.2 tonnes grain/breeder eq./year</u>

* Data provided by Pig & Poultry Branch, Department of Primary Industries

APPENDIX 5GRAIN REQUIREMENT - DAIRY

Grain (primarily maize) is fed to dairy cattle as a supplementary feed. Consequently, it is very difficult to assume an average feed consumption figure, as grain may be fed from 0 - 1 000 kg/cow/year over the whole range of the herd.

For the purposes of this exercise, three groups of grain consuming cattle will be assumed: heavy, moderate and sporadic users.

(a) Heavy users

Grain consumption = 3.3 kg/cow/day for the lactation period (300 days)
= 1 tonne/cow/year.

(b) Moderate users

Grain consumption = 2 kg/cow/day for the lactation period
= 600 kg/cow/year.

(c) Sporadic users

Grain consumption = 0.5 kg/cow/day for the lactation period
= 150 kg/cow/year.

APPENDIX 6THE ATHERTON TABLELAND MAIZE MARKETING BOARD1980-81 POOLSource & Uses of Maize

<u>Receivals:</u>	<u>Tonnes</u>
Net Receivals	23 266
add Carry-over from 79-80 Pool	644
	<hr/>
	23 910
less Carry-over to 81-82 Pool	1 215
	<hr/>
Gross stocks available to Board	22 695
less Return to Growers	2 263
	<hr/>
Net stocks available to Board	20 432
	<hr/>
 <u>Disposals:</u>	
Whole Export	11 288
Whole Local	718
To kibbling	1 164
To maize meal	3 467
To maize in mash	3 093
Screenings	84
Offal	73
Under-run	545
	<hr/>
	20 432
	<hr/>

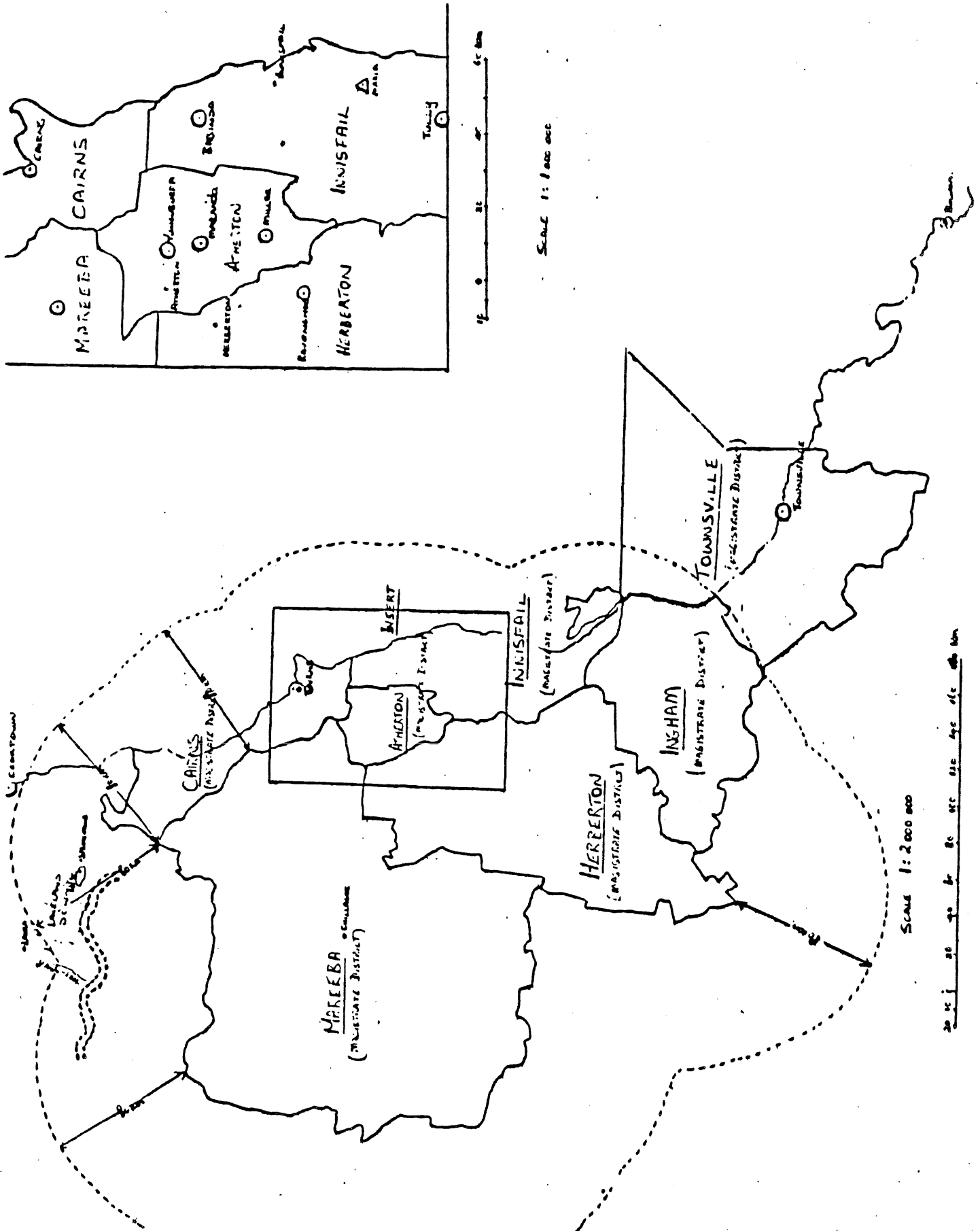
APPENDIX 7THE ATHERTON TABLELAND MAIZE MARKETING BOARDBalance Sheet as at 31 May 1982

	\$	\$
<u>ASSETS:</u>		
<u>Current Assets</u>		
Sundry debtors	306,497	
Stock on hand	475,947	
Other	<u>130</u>	782,574
<u>Fixed Assets</u>		
Land	8,502	
Buildings and Machinery	182,561	
Office Furniture and Machines	<u>7,251</u>	198,314
Deferred Charges		<u>7,045</u>
TOTAL ASSETS		<u>987,933</u>
<u>LIABILITIES AND RESERVES:</u>		
Current Liabilities		454,176
<u>Non-current Liabilities</u>		
Debenture loans	86,305	
Fixed loans	<u>225</u>	86,530
Growers' Funds		<u>436,218</u>
Total Liabilities Including Growers' Funds		976,924
General Reserves		<u>11,009</u>
TOTAL LIABILITIES AND RESERVES		<u>987,933</u>

APPENDIX 8

THE ATHERTON TABLELAND MAIZE MARKETING BOARD

AREA OF JURISDICTION



7. TABLES

TABLE A1 Maize: Production in Queensland by Districts
1976-77 to 1980-81.

TABLE A2 Maize: Queensland: Production by Statistical
Divisions 1980-81.

TABLE A1

MAIZE: PRODUCTION IN QUEENSLAND BY DISTRICTS

1976-77 TO 1980-81

Division	1976-77		1977-78		1978-79		1979-80		1980-81	
	Production (tonnes)	%	Production (tonnes)	%	Production (tonnes)	%	Production (tonnes)	%	Production (tonnes)	%
Moreton	4 415	5.7	4 440	5.2	6 837	6.2	5 547	5.7	7 923	6.4
Wide Bay-Burnett	18 307	23.8	26 195	32.9	41 614	37.4	34 440	35.2	49 150	39.9
Darling Downs	32 424	42.1	25 856	32.5	44 874	40.4	35 061	35.8	41 567	33.7
South West	-	-	75	0.1	-	-	275	0.3	70	0.1
Fitzroy	722	0.9	625	0.8	1 021	0.9	523	0.5	887	0.7
Central West	-	-	-	-	-	-	-	-	-	-
Mackay	-	-	-	-	30	-	183	0.2	14	-
Northern	873	1.2	656	0.8	1 085	1.0	1 315	1.3	2 426	2.0
Far North	20 253	26.3	22 047	27.7	15 640	14.1	20 570	21.0	21 153	17.2
North West	-	-	-	-	-	-	-	-	-	-
TOTAL STATE	76 994	100.0	79 594	100.0	111 101	100.0	97 914	100.0	123 190	100.0

(SOURCE: Australian Bureau of Statistics)

TABLE A2

MAIZE: QUEENSLAND: PRODUCTION BY STATISTICAL DIVISIONS
1980-81

Division	Area (hectares)	Production (tonnes)	Yield (t/ha)	Number of Growers
Moreton	2 309	7 923	3.4	213
Wide-Bay Burnett	19 933	49 150	2.5	552
Darling Downs	12 615	41 567	3.3	334
South West	16	70	4.4	N.P.
Fitzroy	536	887	1.7	26
Mackay	30	14	0.5	N.P.
Northern	662	2 426	3.7	23
Far North	6 465	21 153	3.3	203
TOTAL QUEENSLAND	42 566	123 190	2.9	1 354

N.P. - Not available for separate publication.

(SOURCE: Australian Bureau of Statistics)

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