# Gilbert River agricultural precinct proposal

Scoping brief on the proposed Gilbert River agricultural precinct, including a marketing and gross margin analysis prospective

Queensland Government

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On 26 March 2009, the Department of Primary Industries and Fisheries was amalgamated with other government departments to form the Department of Employment, Economic Development and Innovation.

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# Summary

The Gilbert River Agricultural Precinct concept has been around in one form or another for many years. However, it would appear to be timely to review this project with regard to the current national and global issues with food security and depleted water resources.

The report aims to provide an appreciation of the current resource position and provide agricultural information relevant to advancing a business case to the Federal government for construction of a dam in this region.

Pervious reports had demonstrated agriculture arable agricultural land between 10000-25000ha in a mosaic landscape along the Gilbert river. The proposed dam could be located on a property called 'Green Hills', which is approximately 80km west of Georgetown.

Time constraints have limited in-depth market analysis and market window investigations; therefore, the body of the report has been broken down into three sections:

1. Crops which are currently grown and required limited market investigation.

2. Potential cropping options which need further market and production analysis.

3. Longer term potential cropping and industry alternatives which require in-depth analysis but could have long term economic, social and environmental benefits.

The report was also centred on the current advice of the Department of Environment and Resource Management (DERM) which infers that a dam of 300000ML could yield an average annual yield of 100000ML.

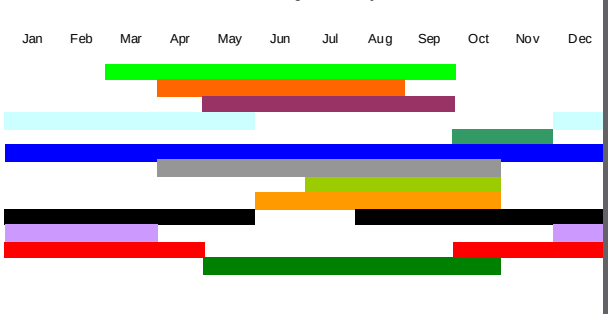
Section 1 indicates, given the current information and based on this current scenario, at least two major crops (peanuts and rice) and the doubling of mango production would be required to gain an infrastructural critical mass for this agricultural precinct. This would also be in conjunction with a range of small cropping options. It would appear that this type of cropping mix and production area is required to limit production failure, market distortions and maximise the efficient use of land and water infrastructure.

### Table 1. Potential agricultural economic profile for Gilbert River precinct

**Summary**

| Agricultural activity | Area (ha) | Total Water used (ML) | | Volume sold | | Farm Gate Gross Revenue ($) |
|---|---|---|---|---|---|---|
| Cattle stores (silage) | - | 2,500 | Head | 6,199 | $ | 4,100,599 |
| Fodder** | 800 | 2,800 | Tonnes | 6,000 | $ | 1,000,000 |
| Pumpkins** | 500 | 2,500 | Tonnes | 9,000 | $ | 6,750,000 |
| Peanuts** | 3,000 | 28,500 | Tonnes | 21,000 | $ | 12,150,000 |
| Mangoes | 300 | 2,700 | Tonnes | 3,234 | $ | 8,061,900 |
| Maize** | 2,500 | 15,000 | Tonnes | 20,500 | $ | 6,150,000 |
| Mung Beans** | 500 | 2,000 | Tonnes | 800 | $ | 586,672 |
| Navy beans** | 500 | 2,500 | Tonnes | 1,100 | $ | 990,000 |
| Rockmelons** | 200 | 800 | Tonnes | 8,929 | $ | 7,905,000 |
| Rice** | 3,000 | 25,500 | Tonnes | 21,000 | $ | 9,450,000 |
| Sorghum** | 1,500 | 6,000 | Tonnes | 9,300 | $ | 2,790,000 |
| Soybeans** | 500 | 2,750 | Tonnes | 1,250 | $ | 687,500 |
| Watermelons** | 500 | 2,000 | Tonnes | 10,000 | $ | 8,200,000 |
| | 13,800 | 95,550 | | | | 68,821,671 |

**Harvesting Seasonality**




*Note ** area double cropped in a 12-18mth cropping cycle*

***The projections only give indicative likely outcomes of the proposed cropping income, production and water consumption. It does not indicate the profitability or viability of the proposed Gilbert River agricultural precinct.***

Section 2 indicates the possible diversity within the proposed cropping region with such crops as cotton, bananas, cashews, citrus and horticultural crops; however, further market and production analysis would be required.

Section 3 highlights possible industry and production alternatives such as an organic precinct, forestry and bio-energy options for the proposed precinct; however, in-depth analysis and research would be required to evaluate these opportunities.

## Scope of the report

This report brings together a range of information relevant to the construction of a dam and the creation of an agricultural precinct on the Gilbert River in Far North Queensland. Its aim is to provide an appreciation of the current resource position and provide agricultural information relevant to advancing a business case to the Federal government for construction of the dam.

The report covers:

- a general overview of the soil and climate attributes,
- potential cropping opportunities,
- gross margins on selected crops,
- potential gross farm gate values, and
- gross margin analysis on selected crop options.

The report focuses only on the proposed Gilbert River agricultural precinct within the Etheridge Shire.

## Background

The sub-region is characterised by the extensive alluvial plains of the large river systems that drain the area to the northern coastline. These areas support mainly blue grass (*Dicanthium* spp.) grasslands and various open woodlands dominated by species such as coolabah (*E. microtheca*), gidgee (*A. cambagei*) and paperbark (*Melaleuca* spp.).

Along the coast are extensive estuarine areas and floodplains supporting mangroves, sedgelands and grasslands providing important wetland habitat. Gently sloping sandstone tablelands along the eastern margin of the region support a variety of eucalyptus woodlands and lancewood (*A. shirleyi*) low open forests.

The region is in the Gulf Plains bio-region. The major occurrences of wetlands are on the plains and littoral shores of the Gulf of Carpentaria. An aggregation of 15 sites (1071770ha) has environmental importance to Queensland and three sites have importance nationally. The Southern Gulf Aggregation (553380ha) is a potential RAMSAR site.

*Source: North Region Footprint, 2008, DPI&F.*

The index of socio-economic disadvantage is a measure of an area's disadvantage relative to other areas. Using this index, the Gulf region is generally significantly disadvantaged when compared to other local government areas across Queensland, while many of the local government areas are in the top 10% of the most disadvantaged areas of Queensland.

*Source: North Region Footprint, 2008, DPI&F.*

Land tenure in the Gulf region is mainly pastoral leases, Aboriginal land, nature reserves and mining leases, with a relatively small area of freehold land. Leases are managed by both pastoral companies and individuals. Many leases in the Gulf will be due for renewal in the next 5-10 years and will be subject to the new leasehold land conditions and monitoring requirements. Native title and Indigenous Landuse agreements may be more important in future negotiations.

*Source: North Region Footprint, 2008, DPI&F.*

The dominant land use on large pastoral leases is cattle grazing on native pastures at low stocking rates and with relatively few improvements.

A combination of *Bos indicus* cross cattle and use of supplements have increased herd numbers and productivity since the 1970s. Further improvement through better management strategies, such as early weaning and targeted supplementation, could further improve productivity. Live export facilities and port infrastructure were installed in Karumba in 1994 with significant benefits.

*Source: North Region Footprint, 2008, DPI&F.*

The World Wildlife Fund and the Queensland Conservation Council are pushing for the area to be a "wild area". Four 'Wild Rivers' are declared within the region.

The Gulf Water Resource Plan identifies potential for expansion of irrigation for horticulture on the Gilbert River.

The Gulf area is heavily dependent upon primary industries with low levels of value-adding activity.

The Gulf region lies within a strongly mineralised geological area and forms part of the North West Mineral Provence, which contains substantial resources of gold, base metals and other industrial metals and gemstones.

Gold was mined at Kidston, but this has subsequently closed. Georgetown has recognised deposits of uranium and this may become important in time depending upon state and federal government policies.

*Source: North Region Footprint, 2008, DPI&F.*

# Population

| Local Government Area | Estimated Residential Population as at 30 June 2007 |
|---|---|
| Etheridge Shire Council | 934 |

*Source: Queensland Regional Profiles, Office of Economic and Statistical Research (OESR), 2009.*

# Existing agricultural situation

The principal land use in the region is for grazing beef cattle. There are also a small number of agricultural developments occurring within the Etheridge shire region including mangoes, peanuts, broad-acre crops and hay based crops.

**Table 2. Industry activities**

| Crop Type | Approx Area (ha) | Notes |
|---|---|---|
| Mangoes | 150ha | 2 major enterprises |
| Peanuts | 70-150ha | 1 major enterprises |
| Board acre cropping | 70-150ha | 2 major enterprises |
| Hay based crops | 150-200ha | 3-5 major enterprises |

*(Pers.comm.)*

**Table 3. Cattle industry overview of the Gulf Region**

| Shires | Area Under Production (ha)* | Adjusted Cattle Numbers* | Adjusted Trading Entities* |
|---|---|---|---|
| Etheridge Shire | 39064658.13 | 309947 | 108 |
| Carpentaria Shire | 43565479.37 | 448500 | 45 |
| Burke Shire | 30620162.46 | 208698 | 24 |
| Western part of Herberton[1] Shire | 1966349.98 | 56982 | 66 |
| Western part of Mareeba[2] Shire | 14431113.20 | 153220 | 34 |
| **Totals** | **129647763.14** | **1177347** | **277** |

** Adjusted to reflect land, reserve areas, national parks, etc.*

*Source: Gulf regional profile – cattle.*

# Current agriculture land tenure

Currently there are approximately 108 pastoral property entities located within the Etheridge Shire, with a small number of freehold properties within the precinct area.

# Public and private infrastructure

The closest township to the proposed Gilbert River Agricultural Precinct is Georgetown, approximately 80km to the east. Georgetown predominately services the grazing industry and some limited mining activity in the region.

# Road distances

**Table 4. Road distances**

| Location | Destination | Approximate Distance (km) |
|---|---|---|
| Georgetown | Cairns | 354 |
| Georgetown | Townsville | 522 |
| Georgetown | Brisbane | 2187 |
| Georgetown | Sydney | 3197 |
| Georgetown | Melbourne | 3856 |

[1] The former Herberton Shire is now part of the Tableland Regional Council.

[2] The former Mareeba Shire is now part of the Tablelands Regional Council.

# Freight costs

**Table 5. General freight charges**

| Location | Destination | Cost |
|---|---|---|
| Georgetown | Cairns | $105 per cubic metre + 10% fuel charge |
| Georgetown | Brisbane | $110 - $130 per tonne |

# Soil types

In this catchment 295000ha were assessed for agricultural potential. About 30% of the total area was assessed as potential agricultural land and all this land was within 5km of the river. Most of the potential land is located in the northern section of the study area, below the proposed precinct Green Hills site. Significant areas of deep sandy red and yellow earths (Pit, Mundy, Searly) occur on elevated plains. The alluvial soils (Mills) derived from rhyolitic and granitic parent material form broad low levees to a distance of about 2km from the river. These soils have few limitations to the production of a range of crops.

Irrigation methods are likely to be restricted to spray or micro irrigation because of the high permeability of the profiles. These soils are suitable for the production of tree crops, bananas, maize, soybeans, peanuts and annual horticulture.

*Source: Gulf agro-economic study, p.52, DPI, 1999.*

# Climate

The area is only serviced by three weather recording stations – Georgetown (291m), Croydon (116m) and Mt Surprise (610m). It is assumed that the Georgetown and Croydon stations are more representative of the region because Mt Surprise is more elevated and has a more easterly location.

*Source: Gulf agro-economic study, p.50, DPI, 1999.*

## Rainfall

This area can be described as experiencing a sub-humid, tropical climate with 90% of annual rainfall in from December to March, but with a very high degree of rainfall variability both spatially and temporally. The average rainfall for the area varies greatly. Apart from the weather recording stations at Georgetown and Croydon, property homesteads provide the only other rainfall information. The early summer rain is associated with thunderstorm activity and has great variation spatially. Rainfall later in the season is mainly due to moist tropical air flowing in from the Gulf and rainfall depressions resulting from cyclonic disturbances originating both in the Gulf and Coral Sea. The highest and lowest amounts of rainfall measured in Georgetown are 1560mm and 247mm respectively. The mean deviation from the mean rainfall, expressed as a percentage of the mean, exceeds 44% for the Georgetown recording station. Drought is a common feature of the region and can extend for several years.

*Source: Gulf agro-economic study, p.50, DPI, 1999.*

**Table 6. Median monthly rainfall**

| Month | Georgetown (mm) | Croydon (mm) |
|---|---|---|
| January | 190 | 188 |
| February | 187 | 166 |
| March | 104 | 94 |
| April | 11.0 | 8.6 |
| May | 0.5 | 0.4 |
| June | 1.2 | 0.8 |
| July | nil | nil |
| August | nil | nil |
| September | nil | nil |
| October | 6.6 | 308 |
| November | 37 | 27.0 |
| December | 104 | 95.8 |
| **Variability** | **44%** | **n/a** |

*Source: Gulf agro-economic study, p.50, DPI, 1999.*

## Temperature

Information on this data is based on the recording stations at Georgetown and Croydon. Topographical limitations indicate that the Georgetown and Croydon sites are generally representative of sites identified with agricultural potential.

Temperature extremes are common, with both heatwaves and minor frosts being experienced in the area. Frosts of varying severity have been experienced over most of the area. Georgetown averages about 1-2 light frosts per year while Mt Surprise can experience 3-4 heavy frosts per year. Croydon has not registered a frost. Diurnal variations are greatest in the winter and spring months and can be up to 16°C. Frosts have been observed along the river terraces and alluvial flood plains adjacent to the streams when not officially recorded at the weather stations. Local topography influences the frequency for frost occurrence in the area.

Generally, daytime temperatures are high with cooler night temperatures. Heat wave conditions (consecutive days with temperatures over 38°C) are frequent in the region. Georgetown has recorded a period up to nine consecutive days of temperatures greater than 38°C but averages periods of about four days per year from November to February. Croydon has recorded a maximum temperature of 43.9°C and frequently records temperatures above 40°C during September to March. Croydon averages 20 days per month when temperatures are above 38°C during October to February

### Table 7. Temperatures at Georgetown and Croydon

| Month | Probability of frost (%) | Minimum Temperature (°C) | Maximum Temperature (°C) | Minimum Temperature (°C) | Maximum Temperature (°C) |
|---|---|---|---|---|---|
| January | nil | 22.9 | 34.3 | 24.1 | 35.7 |
| February | nil | 22.7 | 33.4 | 23.8 | 34.7 |
| March | nil | 21.4 | 33.2 | 23.2 | 34.4 |
| April | nil | 19.2 | 32.4 | 20.9 | 34.0 |
| May | nil | 16.1 | 30.3 | 17.9 | 34.0 |
| June | 0.3 | 12.8 | 28.1 | 14.5 | 31.7 |
| July | 0.9 | 12.0 | 28.1 | 14.0 | 29.2 |
| August | 0.6 | 13.0 | 30.0 | 15.7 | 29.2 |
| September | 0.1 | 16.1 | 32.8 | 19.1 | 31.2 |
| October | nil | 19.7 | 35.6 | 22.2 | 34.2 |
| November | nil | 21.8 | 36.5 | 24.3 | 36.9 |
| December | nil | 22.8 | 36.0 | 24.4 | 38.2 |

*Source: Gulf agro-economic study, p.51, DPI, 1999.*

### Table 8. Relative humidity

| Month | Georgetown Relative Humidity (%) | Croydon Relative Humidity (%) |
|---|---|---|
| January | 57 | 58 |
| February | 63 | 63 |
| March | 56 | 56 |
| April | 49 | 44 |
| May | 49 | 43 |
| June | 46 | 41 |
| July | 44 | 39 |
| August | 39 | 34 |
| September | 34 | 32 |
| October | 34 | 33 |
| November | 40 | 38 |
| December | 47 | 46 |

*Source: Gulf agro-economic study, p.52, DPI, 1999.*

## Evaporation

Evaporation has been measured in the region in two ways. Data has been calculated from mean daily rates, but has also been calculated from saturated vapour deficits.

Calculated rates for mean daily evaporation are indicated and have been multiplied by number of days to estimate the monthly evaporation. The results of both estimates are presented. The data estimates the total annual evaporation to be in the order of 2300-2800mm/annum.

**Table 9. Evaporation at Burketown and Cloncurry**

| Month | Georgetown | | | | Croydon | |
|---|---|---|---|---|---|---|
| | Calculated from Saturated Vapour Deficits | | Calculated from Daily Pan Rates | | Calculated from Daily Pan Rates | |
| | mm/day | mm/month | mm/day | mm/month | mm/day | mm/month |
| January | 8.2 | 255 | 6.9 | 215 | 6.7 | 210 |
| February | 7.6 | 215 | 5.9 | 165 | 5.7 | 160 |
| March | 6.5 | 200 | 6.1 | 190 | 6.2 | 190 |
| April | 6.5 | 200 | 5.9 | 180 | 6.6 | 200 |
| May | 5.6 | 175 | 4.7 | 145 | 5.8 | 180 |
| June | 5.4 | 165 | 4.0 | 120 | 4.9 | 150 |
| July | 5.8 | 180 | 4.2 | 130 | 5.3 | 165 |
| August | 7.2 | 225 | 5.4 | 170 | 6.4 | 200 |
| September | 9.2 | 275 | 7.1 | 215 | 8.3 | 250 |
| October | 11.3 | 350 | 8.3 | 260 | 9.3 | 290 |
| November | 11.4 | 345 | 8.5 | 255 | 9.3 | 280 |
| December | 10.3 | 320 | 7.9 | 245 | 8.4 | 260 |

*Source: Gulf agro-economic study, p.52, DPI, 1999.*

# Market and financial analysis

The agro-economic study in 1999 demonstrated a number of crops suitable for the region; these include rockmelons, mango, banana, citrus, grapes, cashews, cotton, peanuts, leucaena, hay and aquaculture. This report will recover those opportunities and describe other potential cropping opportunities within the agricultural precinct.

Time constraints have limited in-depth market analysis and market window investigations; therefore, this section of the report has been broken down into three subsections:

(a) Crops which are currently grown and required limited market investigation.

(b) Potential cropping options which need further market and production analysis.

(c) Longer term potential cropping and industry alternatives which require in-depth analysis but could have long term economic, social and environmental benefits.

A summary has been developed from Subsection (a) based on the following criteria:

- crops which are and have been grown in the region,
- agricultural produce which are less affected by market forces and market manipulation,
- discussions with local producers,
- agronomic reports on the region,
- water availability proposed for the dam, and
- land suitability types.

Current advice from DERM suggests a conservative area suitable for cropping exist between 10000-25000ha with a reliable water resource yield of 100000ML per year from the proposed dam capacity of 300000ML.

With these constraints the report has focused on the 100000ML yield capacity, working on a base premise of approximately 7-10ML per hectare of cropping activity.

## Gross margin analysis

Gross margins are a method often used to assess the economic structure of an agricultural enterprise. Enterprise gross margin is the difference between the gross output and the variable costs used to produce that output. It is important to note that a gross margin is not a measure of farm profitability.

Gross margin analysis has been adopted to reflect the area under production, yield, farm gate income and water utilisation.

All yields, costs and returns have been based on previous agricultural gross margin profiling work carried out in Far North Queensland in 2008. Adjustments have been made where possible to reflect extra costs associated with the operation of agricultural enterprises in the Gilbert River region.

Gross margins have been attached to support the yield, farm gate price, water usage and area under production.

## Crops which are currently grown and required limited market investigation

The crops selected are mangos, peanuts, rice, maize, soybeans, mung bean, melons, pumpkins, fodder crops and a cattle/silage production system.

The summary has been based on a generalised enterprise cropping mix reflecting production risk strategies, climatic conditions and current market opportunities. While the total area would appear to be higher than 10000ha it simply reflects the nature of a "normal" rotational and double cropping system. It must be also recognised that a certain amount of land would be under fallow.

In the development of the cropping options a key consideration was not to exceed the maximum annual water yield of 100000ML.

## Mangoes

As an evergreen topical tree, the mango is adapted to warm conditions and is intolerant of frost. Generally temperatures in the 25-30°C range are optimum for growth, although the plant will tolerate at least 40°C. Flowering is stimulated by a reduction in growth rate caused by a combination of lower night temperatures and droughting. Ideally mangoes should be exposed to dry tropical conditions in the July-December reproductive period.

Despite their adaptation to a wide range of soils, it is important to grow mangoes on lighter soils of only moderate fertility. This is necessary for the production of high quality, well coloured fruit to meet market demand. Increasingly the market is unwilling to purchase green skinned mangoes, even if they are mature. The aim is to have a low nitrogen status in the soil at fruit maturity for optimum colour development.

*Source: Gulf agro-economic study, p.58, DPI, 1999.*

### *Market update*

The total market is evenly divided between the Northern Territory, Bowen/Townsville and the Atherton Tablelands region. The total area under production from these regions is approximately 7200ha, with approximately 1300000 trees.

The predominate variety across all the regions is Kensington Pride (KPs). Other varieties grown are earlier R2E2, Kent and Palmer, later varieties such Honey Gold and Calypso and rare cultivars such as Keow-Sovary.

Time constraints for this report do not allow further market analysis on the market window for mangoes from the Gilbert region. Therefore, area under production has been based on a conservative value of 300ha. This projection target volume should have limited detrimental effects on current market prices.

## Peanuts

Peanuts have been grown in the region. Cropping could occur during most of the year on the levee soils. Yields would be expected to be in the order of 3t/ha for soybeans and peanuts. Both crops could be grown under spray irrigation. The risks to production from weather and humidity should be minimal. Water requirements for these crops would be of the order of 2-3ML/ha during the wet season and up to 8-11ML/ha in the dry season. Other legumes such as mung beans and navy beans could be grown during the spring and autumn as they are relatively fast maturing crops.

*Source: Gulf agro-economic study, p.54, DPI, 1999.*

The risks to production from weather and humidity should be minimal. Native and feral wildlife – due to large areas of relatively undisturbed habitat in the area – could cause production losses. Transport to processing areas would need to be undertaken, with greater transport costs associated with soybeans than peanuts.

*Source: Gulf agro-economic study, p.55, DPI, 1999.*

***Market update***

In 2006 the Australian market used approximately 40000 tonnes of peanuts a year. The peanut butter market is growing at more than 5% per year and the confectionery sector at more than 10%. However the snackfood market is static.

The Australian industry has move towards new genetics that have delivered cultivars with disease resistance to aflatoxin and soil and foliar diseases.

Processing yields have also improved with less 'oil' kernels. In 1950, 40-50% of yields were edible kernels; now this is 65-70%.

New varieties also have reduced shell content. For example, the new Hi Oleic variety Lyons has 18% shell content compared with 32% for the old Virginia Bunch variety. New varieties also have improved blanching ability.

*Source: 2006 Annual Report, PCA.*

Discussions with a Peanut Company of Australia representative had suggested solid interest in this region. The representative suggested that their company was in expansion mode and looking for cropping areas between 5000-10000ha in northern Australia. This crop would not compete against other regions, and therefore, it would not be impacted by market forces.

Consequently, peanuts could create a significant platform for the current agricultural precinct proposal. The summary has thus projected a peanut crop area of 3000ha and this is believed to be relatively conservative.

## Rice (dry land)

Dry land rice would appear to be an emerging industry in northern Australia, with interest from one major processor (Sunrice) and from grains merchants. Variety trials are currently being carried out in the Burdekin and Atherton Tablelands regions with positive yield being projected.

The yields would be expected to be about 7-8 t/ha for the winter crop. Millouts would be expected to be about 60%. Risks to production would be from native and feral wildlife. Currently, there are no processing facilities in the region and it would be expected that small mills could handle about 10000 tonnes but a large mill would require a supply from about 3000ha.

*Source: Gulf agro-economic study, p.30, DPI, 1999.*

***Market update***

Global food security is a growing issue with a number of countries. China, Korea and Saudi Arabia in particular are seeking land in other countries to secure vital grain production and supply. Couple this with water issues in the southern states and northern Australian becomes well placed as a future production area.

Discussions with a range of industry sources have suggested that northern Australia is well positioned for specialised rices and short grain varieties.

Reports are indicating sound prospects for this cropping option. However, further analysis is required on variety types, product drying and transport considerations.

This crop may also be a critical cropping platform for the proposed agricultural precinct and, therefore, rice cropping projections of 3000ha has been adopted.

## Maize

Maize is often considered to be a standard crop rotation with a range of other crop types. While the maize prices have sometimes been marginal there has been a steady growth in production and it would appear to be a fairly stable market. Yields of 8-10t/ha can be expected under irrigation while yields of 6-7t/ha under dryland production.

### *Market update*

Currently the Atherton Tableland region grows approximately 5000ha, producing approx 35000 tonnes of grain. This grain in sold locally, particularly within the dairy industry. The Atherton Tableland dairy industry would appear to be strengthening with increases farm gate milk prices. There is a direct relationship with higher milk prices and an increase in grain supplementation and, thus, maize grain demand.

Tableland growers tend to move in and out of maize depending on price and other cropping alternatives, while grain merchants would prefer to have longer term business relationships. This opens the opportunity to new entrants to secure production relationships and long term contracts. Thus, there is good evidence for an increase in grain production in a new northern maize growing region. Therefore, a conservative area under production has been projected at 2500ha.

## Soybean

Oilseeds are an increasingly important crop group in Australian agriculture. Oilseeds are grown in Australia are for edible products and, to a lesser extent, industrial oil. Soybean is a high protein meal and is used in stock feeds. Soybeans are cultivated widely throughout the world and represent 50% of oilseed production and 80% of world oilseed trade.

*Source: Gulf agro-economic study, p.54, DPI, 1999.*

### *Market update*

The Burdekin is currently constructing a soybean processing plant for human consumption. This may provide a solid market outlet for the crop. Further market analysis would be required in the areas of seed quality, production techniques and transport linkages; however, this provides sufficient evidence to be included in an agriculture precinct production cycle. A conservative area of 500ha has been included in the cropping programme.

## Mung beans

Mung beans are an ancient and well-known crop in Asia. It is often included in rice or wheat-based cropping systems in the tropics and subtropics. Mung beans are a fast growing crop with an average plant to harvest of 55 to 65 days. This makes it a useful cropping option to fit into a multiple cropping system.

### *Market update*

Currently the majority of the Australian crop (95%) is used for human consumption and, therefore, requires strict hygiene requirements. These strict hygiene requirements indicate the need for a high level of production knowledge and skill to achieve good yields and prices.

Discussions with a grain merchant specialising in mung beans within the Burdekin region suggests a solid growth future for mung bean production in an enterprise production cycle. Therefore, this crop has been included within the analysis of 500ha under production.

## Rockmelons

Day temperatures of 20-30°C and night temperatures above 15°C are best for crop growth. The crop is very sensitive to low temperatures and this confers a comparative production advantage in winter to the Katherine/Darwin and Kununurra areas over the coastal districts of Queensland's dry tropics (Bowen to Ayr). Frost at any stage will kill rockmelons, restricting the available periods for inland cropping to parts of autumn and spring. Rockmelons are best grown in the dry tropics as high humidity, dews and wet conditions encourage fungal diseases which lead to poor fruit quality.

In the past rockmelons have required light soils with excellent drainage. However, the widespread adoption of drip irrigation, plastic mulch and laser levelling has resulted in the crop being successfully grown on heavy soils. Intense rainfall during the cropping period has caused significant crop losses on heavy soils. Thus a risk assessment is required, based on the frequency of occurrence of flooding rains during April-December in coastal North Queensland. Yield of rockmelons varies greatly in relation to temperature; being lowest in winter and highest in autumn and spring. The crop averages 27 tonnes per hectare. Irrigation requirements for the crop is 2.4ML/ha.

*Source: Gulf agro-economic study, p.57, DPI, 1999.*

### *Market Update*

Rockmelons are primary growing in the Burdekin/Bowen regions with approximately 400ha under production, producing approximately 17500 tonnes of produce. The high value product competes with the Northern Territory and Kununurra regions, with production mainly occurring over the winter months.

This industry requires highly developed and skilled operators with generally high quality standards. It would appear that the region would be well suited and may have some comparative advantages with climate and distance to southern markets via the central Queensland transport corridor. This suggests there is enough evidence for producing this type of crop. A conservative value of 200ha has been adopted in the analysis. Areas under production could be increased if producers developed a co-operative approach with production and marketing.

## Watermelon and pumpkins

Watermelons and pumpkins are seen as an opportunistic crop in many cropping regions throughout Australia and would appear to suit the current agronomic and land suitability information for the Gilbert River agricultural precinct.

### *Market Update*

The Burdekin region seems to dominate the production levels with approximately 1000ha under production. The region generally crops under plastic with a drip irrigation system, making it a capital intensive system.

This industry is now a highly management intensive system with high casual labour requirements. Analysis suggests that the market now requires seedless melons and smaller types of pumpkins. However; it appears to be a market opportunity and, therefore, has been included within the analysis. Areas under production could be increased if producers developed a co-operative approach with production and marketing. The area projected under cropping activity is 500ha.

## Hay cropping systems

The cattle industry in the Gulf region is examining opportunities to improve production and expand the live cattle trade. The production of high quality forage hay and growing of leucaena for cattle fattening can contribute to value-adding to current beef enterprises. These crops would be developed as a contribution to the cattle enterprise.

*Source: Gulf agro-economic study, p.56, DPI, 1999.*

### Leucaena

Although leucaena will persist in a wide range of soil conditions, it requires fertile soils for high productivity. Unlike many trees, it suits self-mulching, clay soils. Leucaena is grown in areas that have cold winters including frosts, such as inland central Queensland's Brigalow region where over 20000ha are grown in dryland areas.

Leucaena is a high quality, long lived, leguminous forage tree. It is well adapted to the >600mm rainfall zone for Queensland. Therefore, field trials would be required to confirm production and financial projected outcomes on these soil types.

Leucaena produces very palatable, nutritious, high protein leaf for cattle, giving liveweight gains of 250-300kg per head per year. This option does require a high level of expertise in establishing and managing the crop.

### Cavalcade

Cavalcade (*Centrosema pascuorum*) is a native of seasonally arid regions in tropical South and Central America. Cavalcade is suitable for areas with reliable wet and dry seasons, receiving 700-1500mm of average annual rainfall.

It is adapted to a wide range of soil types. Cavalcade has survived prolonged water logging and partial submersion on seasonally flooded soils. It can also tolerate periods of drought during the dry season.

In pure swards, under good growing conditions, Cavalcade provides 4-6 tonnes of high quality herbage, with up to 8 tonnes under ideal conditions. Seed yields up to 1000kg/ha have been recorded. Cavalcade is very palatable, and is well accepted and sought out by stock. There is currently some doubt about its ability to persist in continuously grazed mixed pastures.

### Butterfly pea

Butterfly pea is a summer growing legume and is most productive on deep, fertile soils when temperatures are warm. With appropriate management and suitable soils it can persist and be productive in 650-1250mm rainfall areas.

Butterfly pea can be a successful grazing management system. It suits a ley legume rotation, provides a high quality fodder option and generates a potential seed income stream. The gross margin reflects a hay based enterprise only. Production field trials would be required to confirm the financial projected outcomes.

*Source: The Butterfly Pea Book: guide to establishing and managing butterfly pea pastures in central Queensland, 2005.*

**Table 10. Indicative productive regions for butterfly pea**

| North Queensland Region/District | Median rainfall (mm) | Autumn temperature limitation to growth* | Potential forage production^ | Months of potential high growth |
|---|---|---|---|---|
| ***Peninsula***<br>Cooktown, Coen, Laura, Chillagoe | 650-1700 | 1 | High | 6 |
| ***Gulf***<br>Burketown, Normanton, Croydon, Georgetown, Mt Surprise | 700-900 | 2 | High | 5 |
| ***Dalrymple***<br>Charters Towers, Lyndhurst, Mingela | 650-750 | 3 | High | 5 |

** Autumn temperature limitation: 1 nil, 5 high.*

*^ Forage production: High = 4000kg/ha/year, med = 2000-4000kg/ha/year, low = 500-2000kg/ha/year.*

*Source: The Butterfly Pea Book: guide to establishing and managing butterfly pea pastures in central Queensland, 2005.*

## Grass hay

There area a range of grass crops which are suitable for hay production. Currently the Rhodes grass species are the most prominent in the north and provides another cropping rotation with peanuts, maize and rice. The Gilbert region is well placed to increase the current volume produced as it sits in the centre of the gulf grazing industry.

There are a range of hay types which could be grown, below is current mix grown on the Atherton Tableland which could be adapted to the proposed Gilbert River agricultural precinct.

**Table 11. Grasses and legumes grown on the Atherton Tablelands**

| Hay Type | Example of Varieties |
|---|---|
| ***Grasses*** | |
| *Chloris gayana* (dip) | Katambora, Finecut |
| *Chloris gayana* (tet) | Callide |
| *Brachiaria decumbens* | Signal (Basilisk) |
| *Brachiaria humidicola* | Tully |
| *Setaria sphacelata* and hybrids | Splenda, Narok, Solander, Splenda |
| *Megathyrsus maximus* (Gatton) | Gatton |
| *Megathyrsus maximus* (winter) | Hamil |
| *Dichanthium aristatum* | Floren |

| Hay Type | Example of Varieties |
|---|---|
| ***Grasses cont.*** | |
| *Bothriochloa* spp. | Bisset, Dawson |
| *Andropogon gayanus* | Kent (gamba) |
| *Urochloa mosambicensis* | Nixon |
| *Brachiaria* hybrids | Mulato |
| *Brachiaria brizantha* | Toledo |
| *Digitaria milanjiana* | Jarra, Strickland |
| ***Legumes*** | |
| *Lablab purpureus* | Rongai, Highworth |
| *Vigna unguiculata* | Meringa |
| *Glycine max* | Leichhardt |
| *Stylosanthes scabra* | Seca, Siran |
| *Stylosanthes hamata* | Verano, Amiga |
| *Stylosanthes guianensis* | Nina, Temprano |
| *Stylosanthes seabrana* | Primar, Unica |
| *Chamaecrista rotundifolia* | Wynn |
| *Macroptilium* spp. | Siratro, Aztec, Cardaarga, Juanita |
| *Arachis pintoi* | Amarillo |
| *Desmodium* spp. | Silverleaf, Greenleaf |
| *Neonotonia* spp. | Cooper |
| *Aeschynomene* spp. | Lee, Reid, Kretcshmer |
| *Desmanthus virgatus* | Marc |
| *Centrosema molle* | Cardillo |

*Source: Atherton Tableland Agricultural Profile, DPI&F, 2008.*

This leads to another possible cropping option, grass and legume seed production. The Atherton Tableland profiling analysis suggests that this industry has a farm gate value in excess of $12 million annually. However, further analysis is required to review any further industry market expansion.

***Market update***

The hay industry is directly related to the prosperity of the grazing industry. Current analysis suggested that the industry is still vibrant and growing in the short to medium term with the growing demands for quality grass feed beef.

Analysis would indicate a cost differential on freight compared to the Atherton Tablelands giving the industry a comparative advantage.

A conservative area under production has been used of 800ha.

### Supplemental forage cattle system

An emerging production system in the north is to use a fodder silage with a feed ration based around a paddock feed-out system. This type of system requires a high level of knowledge and expertise. The system is generally based on culling weaners at 150kg with a 180 day ration paddock feed-out. The production approach is to capture the market opportunity of young beef based around a grass/fodder system.

***Market update***

Current advice suggests a growing export cattle market for young, grass fed, accredited carcasses. Suggestions have been made that MLC will have this type of accreditation in place by mid 2009.

A conservative percentage (2%) for Etheridge shire cattle numbers and placement through a supplement feeding system has been used. This could attract some 6200 head of cattle, which could gain a price premium of an average current sale price of $660 per head. The silage has been projected to be purchased from the precinct; therefore, it has not been listed as a cropping enterprise within the summary.

## Summary of the base cropping scenario

Given the current information, and based on this current scenario, at least two major crops (peanuts and rice) and doubling of mango production would be required to gain an infrastructural critical mass for this agricultural precinct. This would also be in conjunction with a range of small cropping options. It would appear that this type of cropping mix and production area is required to limit production failure and market distortions and maximise the efficient use of land and water infrastructure.

***The projections only give indicative likely outcomes of the proposed cropping income streams. It does not indicate the profitability or viability of the proposed Gilbert River agricultural precinct.***

**Table 12. Snap shot of the Gilbert River agricultural precinct cropping profile**

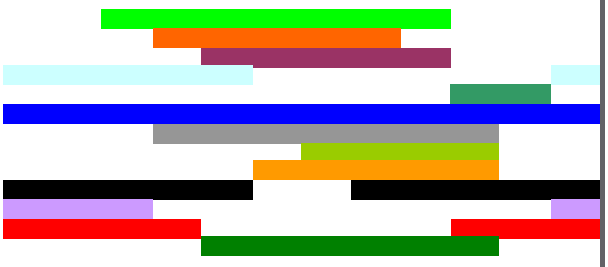
| | |
|---|---|
| Total area under major production | 13800ha |
| Total gross revenue - farm gate | $68821671 |
| Total variable input costs – adjusted to cropping only | $53258682 |
| Gross margin – adjusted to cropping only | $11462390 |
| Gross margin per hectare – adjusted to cropping only | $830.61/ha |
| Total irrigation water used | 95550ML |
| Average irrigation used per hectare | 6.74ML/ha |
| Selected production transported outside the region<br>(mangoes, peanuts, rice, sorghum, soybeans, navy beans, melons, pumpkins and hay) | 104613 tonnes |

**Table 13. Summary of the potential economic Gilbert River agricultural precinct profile**

**Summary**

| Agricultural activity | Area (ha) | Total Water used (ML) | | Volume sold | | Farm Gate Gross Revenue ($) |
|---|---|---|---|---|---|---|
| Cattle stores (silage) | - | 2,500 | Head | 6,199 | $ | 4,100,599 |
| Fodder** | 800 | 2,800 | Tonnes | 6,000 | $ | 1,000,000 |
| Pumpkins** | 500 | 2,500 | Tonnes | 9,000 | $ | 6,750,000 |
| Peanuts** | 3,000 | 28,500 | Tonnes | 21,000 | $ | 12,150,000 |
| Mangoes | 300 | 2,700 | Tonnes | 3,234 | $ | 8,061,900 |
| Maize** | 2,500 | 15,000 | Tonnes | 20,500 | $ | 6,150,000 |
| Mung Beans** | 500 | 2,000 | Tonnes | 800 | $ | 586,672 |
| Navy beans** | 500 | 2,500 | Tonnes | 1,100 | $ | 990,000 |
| Rockhoneydrew melons** | 200 | 800 | Tonnes | 8,929 | $ | 7,905,000 |
| Rice** | 3,000 | 25,500 | Tonnes | 21,000 | $ | 9,450,000 |
| Sorghum** | 1,500 | 6,000 | Tonnes | 9,300 | $ | 2,790,000 |
| Soybeans** | 500 | 2,750 | Tonnes | 1,250 | $ | 687,500 |
| Watermelons** | 500 | 2,000 | Tonnes | 10,000 | $ | 8,200,000 |
| | 13,800 | 95,550 | | | | 68,821,671 |

**Harvesting Seasonality**




*Note ** area double cropped in a 12-18mth cropping cycle*

# Potential cropping options which need further market and production analysis

## Cotton

Cotton would suit the area as the high temperatures; low rain and high sunlight are advantageous to cotton production. Because of the permeability of the soils it is most likely that the crop would require micro irrigation. Spray irrigation is not recommended for cotton. Water requirements to grow a crop would be about 7-8ML/ha. Yields would be expected to be about eight bales per hectare.

The growing of cotton on permeable soils so close to the river would need to be carefully evaluated and strict codes of practice applied so that water quality did not impact on the Gulf fishing industry and downstream beef producers were not affected.

A small ginnery would require about 35000-40000 bales before being established. It would be expected that cotton would be rotated with crops such as soybeans or peanuts.

*Source: Gulf agro-economic study, p.54, DPI, 1999.*

***Market update***

The Burdekin produced its first commercial crop of Bt™ cotton in 2008 of 160ha, with solid yields achieved. The industry is now reviewing gin development options. If the ginnery goes ahead it may offer the ability of cotton being produced in the proposed Gilbert River agricultural precinct and being transported to the Burdekin for processing. Alternately, cotton could be grown on the Gilbert and transported for processing at a central location such as Mareeba or Charters Towers. Further analysis would be required on these and other production and transport issues.

## Bananas

Bananas are available all year round from Queensland's major production areas; however, there are advantages in producing bananas in the Gilbert region. These include the fact that the slightly drier climate should reduce the volumes of pre-harvest chemicals required. Banana production in the Gilbert region is likely to be restricted to supplying bananas for import replacement in the processing sector as well as backup supply to Queensland's east coast producing regions in the event of cyclone destruction of their crop. These bananas crops may also provide additional supplies to the domestic and international organic banana markets.

*Source: Gulf agro-economic study, p.59, DPI, 1999.*

***Market update***

The current production in Queensland is approximately 260000 tonnes, making up approximately 90% of the total Australian production, with Far North Queensland producing 95% of Queensland production. Cavendish bananas make up approx 95% of the market with the remainding 5% coming from lady finger, Goldfinger, Ducasse, FHIA 18, Red Dacca, Sucrier and Plantain.

*Source: Industry statistics, Australian Banana Growers Council, 2008.*

Bananas have been produced in small commercial volumes in the Gilbert region since Cyclone Larry.

While this crop would appear to have opportunities, particularly in respect to the lesser varieties such as lady finger, further market analysis would be required as it would appear that the market is at equilibrium and now faces the threat of product importation from Philippines. The outcome of how successfully Philippines' bananas will penetrate the national market will have direct impact on whether further expansion is viable.

## Table grapes

Table grapes tend to perform best in areas of low summer rainfall. The plant is susceptible to severe frost and frost of any sort in springtime is undesirable. Long hours of sunlight in spring and summer and warm temperatures for ripening fruit and building sugars are desirable. Grapes prefer well drained soils to encourage the development of a deep root system, which will lead to a sound, vigorous vine able to withstand adverse conditions. Poorly drained soils promote root disease.

Table grape production in the tropics is feasible due to recent advances in viticultural practices and production systems. New table grape vineyards will be planted with mostly seedless varieties, in response to trends in consumer preference. Yields of 7.5t/ha are projected for a fully developed table grape orchard. Irrigation requirements for table grapes are about 5ML/ha. Table grapes take three years to reach full production.

*Source: Gulf agro-economic study, p.63, DPI, 1999.*

***Market update***

There are a number of small producers on the Atherton Tablelands and within the Burdekin irrigation region. It would appear there is an early market window for table grapes in October-November; however, it has been suggested that a great deal of skill and knowledge is required to bring a viable crop into this window.

Further trial work would be necessary to proof production and the market window.

## Cashew

Cashew (*Anacardium occidentale* L.; Anacardiaceae) is a tropical evergreen tree from north-east Brazil. It ranks third in world production of edible tree nuts, with a current world production of about 700000 tonnes nut-in-shell (NIS). This is produced mainly in India, Brazil, Vietnam, Africa and South East Asia. Local consumption and demand by importing countries for cashews continues to increase providing opportunities for expansion of the crop worldwide. Nuts may be sold as NIS, raw kernel or as processed value-added products (roasted, chocolate coated, etc). NIS price is influenced by nut size and kernel recovery, which determines the yield of kernel to the processor. Kernel price is influenced by quality standards (e.g. kernel size and percentage of breakage) and these are defined by the International Organisation for Standardisation (ISO).

Cashews are well suited to the seasonally wet/dry tropical climate and does not suffer the perishability problems associated with other soft-fleshed tropical fruits. It can be stored for long periods and can withstand long distance transport.

*Source: Gulf agro-economic study, p.57, DPI, 1999.*

***Market update***

There is a cashew orchard on the Atherton Tablelands of 240ha with approximately 48000 trees. This property was recently purchased by a Sydney investor; however, the future development plans of the property are unknown.

*Source: Atherton Tableland Agricultural Profile, DPI&F, 2008.*

Major market competition comes from Brazil, India and Mozambique cashews. This could be interrupted as a difficult market to develop. Therefore further market analysis would be required to attain the true market potential for this crop.

## Citrus

Citrus in this scenario consists of grapefruit, mandarin and lemon, and without firm allocations of areas between these three. Citrus will tolerate high temperatures, provided the trees are well supplied with soil moisture. Trees are sensitive to frost when young or having a recent growth flush. By contrast, a mature tree with no new growth can tolerate light frost provided it is not under any stress. In general, planting citrus is not recommended in areas where heavy frost occurs regularly. Drier coastal or inland areas are preferred for citrus to reduce the risk of pest and disease problems.

Citrus trees require a minimum of 60cm of well-drained topsoil. A depth of 1m is preferable. Loams and sands are preferred, although very sandy soils have a low holding capacity and require expert management. Clay soils have a risk of tree death due to plant diseases that are prevalent in wetter soils. Yields for a mature citrus orchard of normal density (275-400 trees per hectare) range from 45-55t/ha. Irrigation requirements for citrus are about 8ML/ha. Citrus orchards will bear some crops after three years and reach maturity at 10 years.

*Source: Gulf agro-economic study, p.61 DPI, 1999.*

***Market update***

The Atherton Tableland has approximately 350ha under production with approximately 100000 trees, covering such tree crops as mandarins, oranges, lemons, limes and grapefruit.

*Source: Atherton Tableland Agricultural Profile, DPI&F, 2008.*

Further market analysis would be required to define whether there is a realistic market window for a both domestic and export trade.

Tropical fruit tree crops such as avocados, lychees, longans, etc may also provide cropping opportunities; however, extensive research and development, coupled with market research, would be needed to develop this opportunity.

## Other grain crops

The Gilbert River region has grown a range of grains crops such as wheat, barley, oats, sunflowers, etc. While all these represent potential cropping opportunities further market research would be required to gain a better understanding of local market demand.

## Modular abattoir concept

If the agricultural precinct was to precede this might give the impetus for a small modular styled abattoir concept. This would be on the back of the opportunities gained from the agricultural precinct with regards to fodder and cattle production. However, this would require detailed market analysis covering all the associated issues concerning an abattoir, such as potable water, waste management, labour sources, cattle sources, environmental issues, planning controls, transport linkages, etc.

***Longer term potential cropping and industry alternatives require in-depth analysis but could have long term economic, social and environmental outcomes.***

## Organic precinct

Demand for organic food has increased markedly over the past few years. A number of factors have propelled the organic market inlcuding food scares (Mad cows, Dioxin levels, etc), awareness of health issues, genetically modified organisms, animal welfare and greater information and education profiles.

*Source: Trade opportunities for organic foods, DPI&F, July 2007.*

The world organic market is experiencing significant growth. The global food and drink market was valued at US$23 billion in 2002 and was expected to be AU$150 billion by 2006.

The Australian organic industry is currently valued at approximately $350 million and is growing at 25% per year. Approximately 40% of production is destined for the export market.

*Source: Trade opportunities for organic foods, DPI&F, July 2007.*

This creates a distinctive opportunity for any new agricultural precinct as it could be developed from a base concept where all controls and accreditation would be in place prior to any type of cropping development occurring. This type of precinct would be marketed as a total organic precinct, similar to the King Island concept, offering special brand recognition in the market and thus potentially attracting a price premium.

This type of concept would be unique within the tropics and offer attributes such as a stand alone tourism destination and possibly create food processing opportunities for the region.

An organic precinct would open up a range of crops which currently have limited market access due to over production and potentially open up new markets both locally and from an export prospective. Advice from a Trade and Investment Officer with Queensland Primary Industry & Fisheries (QPIF), Department of Employment, Economic Development and Innovation (DEEDI), has suggested that there is a large ready export market opportunity for organic grains in Asia and Arabic states which currently can not be met.

An organic precinct would be perceived as having environmental benefits which could potentially create fewer issues from a planning prospective.

## Aquaculture

Currently there is no aquaculture gross margin analysis available. The production tables below have been presented to give an overview of the current production systems for barramundi and red-claw production in Queensland.

Aquaculture is a highly intensive production system with high capital, variable and fixed costs structures. These types of enterprises require high levels of management and are generally becoming highly vertically intergraded to guarantee supply.

*Source: North Region Footprint, 2008, DPI&F.*

Further research and development and market research would be necessary to capitalise on these potential opportunities.

**Table 14. Barramundi production in Queensland (2004-05 to 2006-07)**

| | 2004–05 | 2005–06 | 2006–07 |
|---|---|---|---|
| **Total production (tonnes—whole-fish basis)** | **1437** | **1745** | **2091** |
| Average price ($/kg) | $8.30 | $8.04 | $8.86 |
| Total value ($ million) | $11.92 | $14.03 | $18.52 |
| **Pond production (tonnes)** | **No.** | **No.** | **No.** |
| 0.01 to 1.0 | 5 | 2 | 3 |
| 1.1 to 10.0 | 3 | 8 | 10 |
| 10.1 to 50.0 | 11 | 10 | 7 |
| 50.1 to 100.0 | 2 | 2 | 2 |
| Over 100.0 (1) | 4 | 4 | 5 |
| Number of producing farms (1) | 25 | 26 | 27 |
| Number of non-producing farms | 51 | 52 | 54 |
| Total pond-based farms responding (1) | 76 | 78 | 81 |
| **Tank production (tonnes)** | **No.** | **No.** | **No.** |
| 0.01 to 1.0 | 0 | 3 | 0 |
| 1.01 to 5.00 | 0 | 4 | 4 |
| 5.1 to 10.0 | 1 | 1 | 0 |
| Over 10.00 | 2 | 3 | 2 |
| Number of producing farms | 3 | 11 | 6 |
| Number of non-producing farms | 17 | 26 | 31 |
| Total recirculation farms responding | 20 | 37 | 37 |
| **Pond & tank production (tonnes)** | **No.** | **No.** | **No.** |
| Total number of responses | 96 | 115 | 118 |
| Number of farms surveyed | 122 | 134 | 129 |

*Source: Report to farmers, Aquaculture Production Survey Queensland 2006-07, DPI&F.*

**Table 15. Redclaw crayfish farm numbers and production levels in Queensland (2004/05 to 2006/07)**

| | 2004–05 | 2005–06 | 2006–07 |
|---|---|---|---|
| **Total production (tonnes)** | **98.6** | **104.9** | **100.2** |
| Average price ($/kg) | $12.98 | $12.43 | $14.45 |
| Total value ($'000) | $1.280 | $1.304 | $1.448 |
| **Pond & tank production (kg)** | **No.** | **No.** | **No.** |
| 1 to 100 | 17 | 18 | 9 |
| 101 to 500 | 26 | 20 | 12 |
| 501 to 1000 | 9 | 6 | 8 |
| 1001 to 5000 | 6 | 11 | 11 |
| Over 5000 | 5 | 4 | 6 |
| Number of producing farms | 63 | 59 | 46 |
| Number of non-producing farms | 106 | 128 | 140 |
| Number of responses | 169 | 187 | 186 |
| Number of farms surveyed | 222 | 211 | 203 |

*Source: Report to farmers, Aquaculture Production Survey Queensland 2006-07, DPI&F.*

## Biodiesel

In recent years there has been a significant interest from a number of local and international entrepreneurs wanting to develop annual and perennial oil crops in the region. Of these, three perennials – *Jatropha curcas* (physic nut), *Millettia pinnata* (pongam tree) and the oil palm – have been the subject of considerable scrutiny, but remain to be demonstrated commercially.

*Source: North Region Footprint, 2008, DPI&F.*

Opportunities for high yielding, annual oil crops like mustard, peanuts and new strains of soybeans, could be usefully grown as rotational crops in existing farming systems in the region. Potential areas for development of these crops include grazing and indigenous lands on Cape York Peninsula, the coastal Wet Tropics and Tablelands, as well as the Dry Tropics/Savannahs. There is also tremendous potential to develop biodiesel production from micro-algae.

*Source: Scoping report for Gregory Downs District – Burke Shire, DPI&F, 2008.*

For further information contact Peter Holden, DPI&F, Mareeba.

## Forestry

Forestry is an emerging industry, particularly within the wet tropics region. There has been a suggestion that African mahogany may provide opportunities within the Gregory Downs district.

The tree rotation length is:

- African mahogany: 15-20 years
- Sandalwood: 15-20 years
- Teak: 20 years.

## African mahogany (*Khaya senegalensis*)

In recent years shire councils, including Charters Towers and Mareeba, have investigated the use of plantations to efficiently recycle municipal effluent and have adopted African mahogany as an important component of these systems.

Numerous private landowners have invested their own money into well managed African mahogany plantings.

The area of the African mahogany estates in North Queensland is estimated at:

- Northern Tropical Timber plantations: 355 hectares
- Comalco:  165 hectares
- Private landowners: 156 hectares
- DPI&F trials:  12 hectares.

*Source:  Scoping report for Gregory Downs District – Burke Shire, DPI&F, 2008.*

For further information contact Geoff Dickinson, QPIF, Mareeba.

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# Appendix 1. Gross margins

## Peanuts

| | | |
|---|---|---|
| Total area (ha) | 0 | |
| Area (ha) | 1 | |
| Average Price $/tonne | $ | 900.00 |
| Yield (tonnes/ha) | 4.50 | |
| Yield total tonnes | 0 | |
| | | |
| Income/ha | $ | 4,050.00 |
| Total Income | $ | - |

To be used as a guide only

| variable costs | AVNo operts | Hrs/ha | Cost/ha | | Cost/ha | Cost/ha | Total cost |
|---|---|---|---|---|---|---|---|
| **Machinery operations** | | | | | | | |
| Other | | | | | | | |
| Deep ripping | 2 | | 35.5 | | 71.04 | | |
| Discing | 1 | | 23.6 | | 23.55 | | |
| Rotary Hoe | 1 | | 63.3 | | 63.28 | | |
| Cultivating | 2 | | 14.1 | | 28.12 | | |
| Planting | 1 | | 47.5 | | 47.51 | | |
| Spraying | 10 | | 8.2 | | 81.52 | 315.02 | $ - |
| **Planting** | | Unit cost | | | | | |
| Seed | 1 | 125 | 2.19 | | 273.75 | | |
| Inoculants | 1 | 1.60 | 5 | | 8.00 | 281.75 | $ - |
| **Fertiliser** | **No appls** | **No/kg/ha** | **No/l/ha** | **$/kg/ L** | | | |
| Lime / 5% Magnesium | 1.00 | 1250.00 | | 0.13 | 160.00 | | |
| CK 66 / Cropmasta 11 | 1.00 | 185.00 | | 1.25 | 231.25 | | |
| Zinc Sulphate | 2.00 | 1.00 | | 1.96 | 3.92 | | |
| Sodium Molybdite | 2.00 | 1.00 | | 0.88 | 1.75 | | |
| Urea | 4.00 | 3.00 | | 1.04 | 12.53 | | |
| Calcium Nitrate | 0.00 | 4.00 | | 0.80 | 0.00 | | |
| Solubor | 2.00 | 1.50 | | 3.52 | 10.56 | | |
| Other | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | |
| Other | | | | | 0.00 | 420.01 | $ - |
| **Herbicide control** | | | | | | | |
| Flame | 0.00 | | 0.40 | 182.00 | 0.00 | | |
| Dual Gold | 0.00 | | 2.00 | 32.04 | 0.00 | | |
| Prometryn 900 | 1.00 | | 1.00 | 26.00 | 26.00 | | |
| Roundup | 0.00 | | 1.50 | 12.82 | 0.00 | | |
| Stomp | 0.00 | | 3.00 | 7.22 | 0.00 | | |
| Basagran | 2.00 | | 2.00 | 35.04 | 140.16 | | |
| 2,4-DB | 1.00 | | 0.50 | 9.50 | 4.75 | | |
| 2,4DB (clean up) | 1.00 | | 1.70 | 19.00 | 32.30 | | |
| Blazer | 1.00 | | 2.00 | 40.00 | 80.00 | | |
| Fusillade Forte | 1.00 | | 1.24 | 51.45 | 63.80 | | |
| Wetting Agent | 2.00 | | 1.00 | 6.35 | 12.70 | 359.71 | $ - |
| **Fungicide** | | | | | | | |
| Chlorothalonil | 6.00 | | 2.50 | 11.00 | 165.00 | | |
| Alto | 1.00 | | 0.60 | 132.40 | 79.44 | | |
| Folicur | 0.00 | | 0.44 | 48.00 | 0.00 | | |
| agridex | 3.00 | | 1.00 | 7.10 | 21.30 | | |
| Amistar Xtra | 2.00 | | 0.50 | 187.11 | 187.11 | 456.79 | |
| **Insecticide** | | | | | | | |
| Dimethoate | 1.00 | | 0.35 | 11.25 | 3.94 | | |
| Vivus Gold | 0.00 | | 0.38 | 151.00 | 0.00 | | |
| Lannate | 0.00 | | 2.00 | 10.74 | 0.00 | | |
| Lorsban | 0.00 | | 0.90 | 17.25 | 0.00 | | |
| Nitifol | 0.00 | | 0.25 | 27.40 | 0.00 | 3.94 | |
| | | | | $/unit | | | $ - |
| **Irrigation** | ML/ha => | 9.50 | | 35.00 | 332.50 | 332.50 | $ - |
| **harvesting/marketing** | **No operations** | **$/hr** | T/ha | **Unit cost** | | | |
| Digging | 1.00 | | 1.00 | 55.02 | 55.02 | 55.02 | |
| Threshing | 1.00 | | 4.50 | 133.11 | 598.99 | 598.99 | |
| Cleaning | 1.00 | | 4.50 | 15.00 | 67.50 | 67.50 | |
| drying | 1.00 | | 4.50 | 30.00 | 135.00 | 135.00 | |
| freight to PCA | 1.00 | | 4.50 | 25.00 | 112.50 | 112.50 | $ - |
| **levies** | | | | 0.10 | 45.00 | 45.00 | $ - |
| Wages | 1.00 | 20.00 | | 3.00 | 60.00 | 60.00 | $ - |
| | | | | | **Total costs** | **$ 3,244** | **$ -** |
| | | | | | **Income** | **$ 4,050** | **$ -** |
| | | | | | **Gross Margin** | **$ 806.28** | **$ -** |

Costs & Returns - effects of yields and prices Costs & Returns - effects of yields and prices Costs & Returns - effects of yields and prices

| Expected On-farm Price ($/t) | Expected Yield (t/ha) | | | | | | |
|---|---|---|---|---|---|---|---|
| | **3.15** | **3.6** | **4.05** | **4.50** | **4.95** | **8.4** | **5.85** |
| $630 | -$581 | -$380 | -$179 | $22 | $223 | $424 | $625 |
| $720 | -$380 | -$150 | $79 | $309 | $539 | $768 | $998 |
| $810 | -$179 | $79 | $338 | $596 | $854 | $1,113 | $1,371 |
| $900 | $22 | $309 | $596 | **$883** | $1,170 | $1,457 | $1,744 |
| $990 | $223 | $539 | $854 | $1,170 | $1,486 | $1,801 | $2,117 |
| $1,080 | $424 | $768 | $1,113 | $1,457 | $1,801 | $2,146 | $2,490 |
| $1,170 | $625 | $998 | $1,371 | $1,744 | $2,117 | $2,490 | $2,863 |

# Rice (dry land)

To be used as a guide only

| | | | | | | | | | | PER HA | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **INCOME ($/ha)** | | **Yield (T/ha)** | | | **($/tonne)** | | | | | | |
| Price/tonne | | 7 | | | | | | $450.00 | /tonne | | |
| less: | Cartage | (Farm to Depot) | | | $20.00 | | | $20.00 | /tonne | | |
| | Freight | | | | | | | | /tonne | | |
| | Storage | | | | | | | | /tonne | | |
| | | | | | | | | | /tonne | | |
| ON-FARM PRICE ($/tonne) | | | | | | | | $430 | /tonne | | |
| times YIELD | | | | | | | | 7.00 | t/ha | | |
| **GROSS INCOME ($/ha)** | | | | | | | | | | **$3,010** | **$0** |
| **VARIABLE COSTS ($/ha)** | | | | | | | | | | | |
| Machinery Operations (F.O.R.M) | | | | | | | | | | | |
| | Primary tillage | | | | 1 | | x | $34.88 | each | $34.88 | $0 |
| | Secondary tillage | | | | 2 | | x | $29.57 | each | $59.14 | $0 |
| | Hilling | | | | 1 | | x | $25.57 | each | $25.57 | $0 |
| | Inter-row tillage/fertiliser | | | | 1 | | x | $15.66 | each | $15.66 | $0 |
| | Boom spraying | | | | 3 | | x | $16.87 | each | $50.60 | $0 |
| | Planting | | | | 1 | | x | $29.68 | each | $29.68 | $0 |
| | Laser levelling | (assume 1/3 levelled/yr) | | | 0.30 | | x | $100.00 | each | $30.00 | $0 |
| | operation | | | | | | x | | each | | |
| | | | | | | | | Mach total | $245.53 | | |
| Fallow spraying | | | | | | | | | | | |
| | glyphosate | 1 | sprays | x | 1.20 | L | x | $8.70 | /L | $10.44 | $0 |
| | herbicide | | sprays | x | | L | x | | /L | | |
| | herbicide | | sprays | x | | L | x | | /L | | |
| | | | | | | | | Chemical total | $10.44 | | |
| Seed | | | | | 150.0 | kg | x | $0.39 | /kg | $58.50 | $0 |
| Fertiliser | | | | | | | | | | | |
| | Urea | 1 | | | 195.0 | kg | x | $750.00 | /tonne | $146.25 | $0 |
| | Superphosphate | 1 | | | 284.0 | kg | x | $980.00 | /tonne | $278.32 | $0 |
| | Muriate of potash | 1 | | | 50.0 | kg | x | $1,113.00 | /tonne | $55.65 | $0 |
| | Zinc | 1 | | | 50.0 | kg | x | $49.00 | /tonne | $2.45 | $0 |
| | Urea | 1 | top dress | | 195.0 | kg | x | $750.00 | /tonne | $146.25 | $0 |
| | | | | | | | | Fertiliser total | $628.92 | | |
| Herbicide | | | | | | | | | | | |
| | Barnstorm | 1 | sprays | x | 2.50 | L | x | $18.75 | /L | $46.88 | $0 |
| | Starane | 1 | sprays | x | 0.40 | L | x | $35.04 | /L | $14.02 | $0 |
| | Herbicide | | sprays | x | 0.00 | L | x | | /L | | |
| Insecticide | | | | | | | | | | | |
| | Chlorphrifos | 1 | sprays | x | 2.00 | L | x | $13.15 | /L | $26.30 | $0 |
| | Lorsban | 1 | sprays | x | 1.20 | L | x | $17.25 | /L | $20.70 | $0 |
| | insecticide | | sprays | x | 0.00 | L | x | | /L | | |
| Fungicide | | | | | | | | | | | |
| | fungicide | | sprays | x | | L | x | | /L | | |
| | fungicide | | sprays | x | | L | x | | /L | | |
| Growth Regulator | | | | | | | | | | | |
| | | | sprays | x | | L | x | | /L | | |
| | | | | | | | | Chemical | $107.89 | | |
| Aerial spray ( fertiliser) | | | 1 | | | | x | $50.00 | /ha | $50 | |
| Aerial Image | | | 1 | | | | x | $3.85 | /ha | $3.85 | $0 |
| Irrigation | | | | | 8.50 | ML | x | $40.00 | /ML | $340.00 | $0 |
| Insurance | | | Rate (% of Inc) | | 1.65% | | | $49.67 | /ha | $49.67 | $0 |
| Research levy | | | | | 3.00 | $/t | | | | $21.00 | |
| | | | | | | | | **TOTAL PRE-HARVEST COSTS =>** | | $1,516 | $0 |
| Pre-harvest spray | | | | | | | | | | | |
| | | | sprays | x | | L | x | | /L | | |
| Harvesting: | | | | | | | | | | | |
| | Own Harvesting Costs | | | | | | | $0.00 | /ha | | |
| | Contract header | | | | 10.0 | T/hour | @ | $25.00 | /hr | $175.00 | $0 |
| | plus fuel | | | | 32.3 | L/ha | x | $1.20 | /L | $38.80 | $0 |
| | Chaser bin | | | | 0.3 | Hr/ha | | $45.78 | | $14.65 | |
| | Drying cost | Harvest @ 19% | | | | | | | | | |
| | | Process @ 14% | | | 35.0 | $/T | | | | $245.00 | |
| | | | | | | | | Harvest | $473.45 | | |
| | | | | | | | | **TOTAL HARVEST COSTS =>** | | **$473** | **$0** |
| **TOTAL VARIABLE COSTS ($/ha)** | | | | | | | | | | **$1,989** | **$0** |
| **Income per ha** | | | | | | | | | | **$3,010** | |
| **GROSS MARGIN ($/ha)** | | | | | | | | | | **$1,021** | **$0** |
| **GROSS MARGIN ($/ML)** | | | | | | | | | | **$120** | |
| **YIELD TO COVER VARIABLE COSTS (t/ha)** | | | | | | | | | | **4.63** | |
| **PRICE TO COVER VARIABLE COSTS ($/t)** | | | | | | | | | | **$304** | |

Costs & Returns - effects of yields and prices Costs & Returns - effects of yields and prices

| Expected On-farm Price ($/t) | Expected Yield (t/ha) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 4.9 | 5.6 | 6.3 | 7.00 | 7.7 | 8.4 | 9.1 |
| $301 | -$514 | -$304 | -$93 | $118 | $328 | $539 | $750 |
| $344 | -$304 | -$63 | $178 | $419 | $660 | $900 | $1,141 |
| $387 | -$93 | $178 | $449 | $720 | $991 | $1,262 | $1,532 |
| $430 | $118 | $419 | $720 | **$1,021** | $1,322 | $1,623 | $1,924 |
| $473 | $328 | $660 | $991 | $1,322 | $1,653 | $1,984 | $2,315 |
| $516 | $539 | $900 | $1,262 | $1,623 | $1,984 | $2,345 | $2,706 |
| $559 | $750 | $1,141 | $1,532 | $1,924 | $2,315 | $2,706 | $3,098 |

# Maize (irrigated)

To be used as a guide only

| | | | | | | | | | | PER HA | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **INCOME ($/ha)** | | | | | | | | | | | |
| Price/tonne | | | | | | | | $300.00 | /tonne | | |
| less: | Cartage | (Farm to Depot) | | | | | | $0.00 | /tonne | | |
| | Freight | | | | | | | | /tonne | | |
| | Drying | | | | | | | | /tonne | | |
| | Storage | | | | | | | | /tonne | | |
| | Levies | | | | | | | | /tonne | | |
| ON-FARM PRICE ($/tonne) | | | | | | | | $300 | /tonne | | |
| times YIELD | | | | | | | | 8.20 | t/ha | | |
| **GROSS INCOME ($/ha)** | | | | | | | | | | **$2,460** | **$0** |
| **VARIABLE COSTS ($/ha)** | | | | | | | | | | | |
| Machinery Operations (F.O.R.M) | | | | | | | | | | | |
| | Primary tillage | | | | 1 | | x | $44.88 | each | $44.88 | $0 |
| | Secondary tillage | | | | 1 | | x | $38.40 | each | $38.40 | $0 |
| | Fertiliser application | | | | 1 | | x | $7.56 | each | $7.56 | $0 |
| | Inter-row tillage | | | | 1 | | x | $21.13 | each | $21.13 | $0 |
| | Boom spraying | | | | 2 | | x | $16.58 | each | $33.15 | $0 |
| | Planting | | | | 1 | | x | $23.48 | each | $23.48 | $0 |
| | operation | | | | | | x | | each | | |
| Fallow spraying | | | | | | | | Mach total | 168.61049 | | |
| | glyphosate | 1 | sprays | x | 1.20 | L | x | $12.82 | /L | $15.38 | $0 |
| | herbicide | | sprays | x | | L | x | | /L | | |
| | herbicide | | sprays | x | | L | x | | /L | | |
| | | | | | | | | Chemical total | 15.3822 | | |
| Seed | | 77000 | <= seeds/ha | | | | x | $3.30 | /1000 seeds | $254.10 | |
| Fertiliser | | | | | | | | | | | |
| | Veg eking TE | | | | 125 | kg | x | $1,020.00 | /tonne | $127.50 | $0 |
| | Tunza | | | | 620 | kg | x | $1,100.00 | /tonne | $682.00 | $0 |
| | Vigortig | | | | 4 | L | x | $4.69 | /L | $18.76 | |
| | Lig Zinc + Boron | | | | 4.00 | L | x | $1.96 | /L | $7.84 | $0 |
| Herbicide | | | | | | | | Fertiliser total | 836.1 | | |
| | Roundup Max | 1 | sprays | x | 2.50 | L | x | $17.00 | /L | $42.50 | $0 |
| | Surpass | 1 | sprays | x | 0.70 | L | x | $6.00 | /L | $4.20 | $0 |
| | LI700 | 1 | sprays | x | 0.15 | L | x | $0.00 | /L | $0.00 | $0 |
| | Dual gold | 1 | sprays | x | 2.00 | L | x | $32.04 | /L | $64.08 | $0 |
| Insecticide | | | | | | | | | | | |
| | Gemstar | 1 | sprays | x | 0.38 | L | x | $52.90 | /L | $19.84 | $0 |
| | insecticide | | sprays | x | 0.00 | L | x | $0.00 | /L | | |
| | insecticide | | sprays | x | 0.00 | L | x | $0.00 | /L | | |
| Fungicide | | | | | | | | | | | |
| | fungicide | | sprays | x | | L | x | $0.00 | /L | | |
| | fungicide | | sprays | x | | L | x | $0.00 | /L | | |
| Growth Regulator | | | | | | | | | | | |
| | | | sprays | x | | L | x | $0.00 | /L | | |
| Crop Desiccation | | | | | | | | | | | |
| Aerial spray | | | | | | | 1 x | $40.00 | /ha | | |
| | | | | | | | | Chemical | 130.6175 | | |
| Scouting | | | | | | | | $0.00 | /ha | | |
| Irrigation | | | | | 6.00 | ML | x | $40.00 | /ML | $240.00 | $0 |
| Casual labour | | | | | | | | $0.00 | /ha | | |
| Chipping | | | | | | | | $0.00 | /ha | | |
| Insurance | | | | | | | | $0.00 | /ha | | |
| | | | | | | | **TOTAL PRE-HARVEST COSTS** | | | **$1,645** | **$0** |
| Pre-harvest spray | | | | | | | | | | | |
| | | | sprays | x | | L | x | | /L | | |
| Harvesting: | | | | | | | | | | | |
| | Own Harvesting Costs | | | | | | | $0.00 | /ha | | |
| | Contract header | | | | 1.8 | ha/hour | @ | $250.00 | /hr | $138.89 | $0 |
| | plus fuel | | | | 32.3 | L/ha | x | $1.10 | /L | $35.57 | $0 |
| | Freight | | | | 8.2 | Tonnes | | $0.00 | | $0.00 | |
| | | | | | | | | Harvest | 174.46 | | |
| | | | | | | | **TOTAL HARVEST COSTS** | | | **$174** | **$0** |
| **TOTAL VARIABLE COSTS ($/ha)** | | | | | | | | | | **$1,819** | **$0** |
| **GROSS MARGIN ($/ha)** | | | | | | | | | | **$641** | **$0** |
| **GROSS MARGIN ($/ML)** | | | | | | | | | | **$107** | |
| **YIELD TO COVER VARIABLE COSTS (t/ha)** | | | | | | | | | | **6.06** | |
| **PRICE TO COVER VARIABLE COSTS ($/t)** | | | | | | | | | | **$222** | |

Costs & Returns - effects of yields and prices Costs & Returns - effects of yields and prices

| Expected On-farm | Expected Yield (t/ha) | | | | | | |
|---|---|---|---|---|---|---|---|
| Price ($/t) | 5.74 | 6.56 | 7.38 | 8.20 | 9.02 | 9.84 | 10.66 |
| $210 | -$614 | -$442 | -$269 | -$97 | $75 | $247 | $419 |
| $240 | -$442 | -$245 | -$48 | $149 | $346 | $542 | $739 |
| $270 | -$269 | -$48 | $173 | $395 | $616 | $838 | $1,059 |
| $300 | -$97 | $149 | $395 | **$641** | $887 | $1,133 | $1,379 |
| $330 | $75 | $346 | $616 | $887 | $1,157 | $1,428 | $1,699 |
| $360 | $247 | $542 | $838 | $1,133 | $1,428 | $1,723 | $2,018 |
| $390 | $419 | $739 | $1,059 | $1,379 | $1,699 | $2,018 | $2,338 |

## Sorghum

To be used as a guide only

| | | | | | | | | | PER HA | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|
| **INCOME ($/ha)** | | **Yield (T/ha)** | | | **($/tonne)** | | | | | |
| Price/tonne | | 6.2 | | | | | $300.00 | /tonne | | |
| less: | Cartage | (Farm to Depot) | | | | | $0.00 | /tonne | | |
| | Freight | | | | | | | /tonne | | |
| | Storage | | | | | | | /tonne | | |
| | | | | | | | | /tonne | | |
| ON-FARM PRICE ($/tonne) | | | | | | | $300 | /tonne | | |
| times YIELD | | | | | | | 6.20 | t/ha | | |
| **GROSS INCOME ($/ha)** | | | | | | | | | **$1,860** | **$0** |
| **VARIABLE COSTS ($/ha)** | | | | | | | | | | |
| Machinery Operations (F.O.R.M) | | | | | | | | | | |
| | Primary tillage | | | 1 | | x | $34.88 | each | $34.88 | $0 |
| | Secondary tillage | | | 1 | | x | $29.57 | each | $29.57 | $0 |
| | Hilling | | | 0 | | x | $25.57 | each | | |
| | Inter-row tillage/fertiliser | | | 0 | | x | $15.66 | each | | |
| | Boom spraying | | | 1 | | x | $16.87 | each | $16.87 | $0 |
| | Planting | | | 1 | | x | $29.68 | each | $29.68 | $0 |
| | Laser levelling | (assume 1/3 levelled/yr) | | 0.00 | | x | $100.00 | each | | |
| | operation | | | | | x | | each | | |
| | | | | | | | Mach total | $111.00 | | |
| Fallow spraying | | | | | | | | | | |
| | glyphosate | 1.00 | sprays | x | 2.50 | L | x | $8.70 | /L | $21.75 | $0 |
| | Surpass | 1.00 | sprays | x | 0.7 | L | x | $6.00 | /L | $4.20 | $0 |
| | LI700 | 1.00 | sprays | x | 0.15 | L | x | 11.006 | /L | $1.65 | $0 |
| | | | | | | | | Chemical total | $27.60 | | |
| Seed | | | | | 9.0 | kg | x | $5.50 | /kg | $49.50 | $0 |
| Fertiliser | | | | | | | | | | | |
| | Urea | 1.00 | | | 430.0 | kg | x | $750.00 | /tonne | $322.50 | $0 |
| | Superphosphate | 1.00 | | | 150.0 | kg | x | $980.00 | /tonne | $147.00 | $0 |
| | Muriate of potash | - | | | 50.0 | kg | x | $1,113.00 | /tonne | $0.00 | $0 |
| | Zinc | - | | | 50.0 | kg | x | $49.00 | /tonne | $0.00 | $0 |
| | Urea | - | top dress | | 195.0 | kg | x | $750.00 | /tonne | $0.00 | $0 |
| Herbicide | | | | | | | | Fertiliser total | $469.50 | | |
| | Dual gold | 1.00 | sprays | x | 2.00 | L | x | $32.04 | /L | $64.08 | $0 |
| desiccatic | roundup max | 1.00 | sprays | x | 1.50 | L | x | $17.00 | /L | $25.50 | $0 |
| | | - | sprays | x | 3.00 | L | x | | /L | $0.00 | $0 |
| Insecticide | | | | | | | | | | | |
| | Gemstar | 1.00 | sprays | x | 0.38 | L | x | $52.90 | /L | $19.84 | $0 |
| | | - | sprays | x | 1.20 | L | x | $17.25 | /L | $0.00 | $0 |
| | | | sprays | x | 0.00 | L | x | | /L | | |
| Fungicide | | | | | | | | | | | |
| | fungicide | | sprays | x | | L | x | | /L | | |
| | fungicide | | sprays | x | | L | x | | /L | | |
| Growth Regulator | | | | | | | | | | | |
| | | | sprays | x | | L | x | | /L | | |
| | | | | | | | | Chemical | $109.42 | | |
| Aerial spray ( fertiliser) | | | 0 | | | | x | $50.00 | /ha | $0 | |
| Aerial Image | | | 0 | | | | x | $3.85 | /ha | $3.85 | $0 |
| Irrigation | | | | | 4.00 | ML | x | $40.00 | /ML | $160.00 | $0 |
| Insurance | | | Rate (% of Inc) | | 0.00% | | | $0.00 | /ha | | |
| Research levy | | | | | 0.00 | $/t | | | | $0.00 | |
| | | | | | | | | **TOTAL PRE-HARVEST COSTS =>** | | $931 | $0 |
| Pre-harvest spray | | | | | | | | | | | |
| | | | sprays | x | | L | x | | /L | | |
| Harvesting: | | | | | | | | | | | |
| | Own Harvesting Costs | | | | | | | | /ha | | |
| | Contract header | | | | 10.0 | T/hour | @ | $80.00 | /hr | $496.00 | $0 |
| | plus fuel | | | | 32.3 | L/ha | x | $0.00 | /L | $0.00 | $0 |
| | Chaser bin | | | | 0.3 | Hr/ha | | $0.00 | | $0.00 | |
| | Cartage | | | | 50.0 | $/T | | | | $310.00 | |
| | Drying cost | Harvest @ 19% | | | | | | | | | |
| | | Process @ 14% | | | 0.0 | $/T | | | | $0.00 | |
| | | | | | | | | Harvest | $806.00 | | |
| | | | | | | | | **TOTAL HARVEST COSTS =>** | | **$806** | **$0** |
| **TOTAL VARIABLE COSTS ($/ha)** | | | | | | | | | | **$1,737** | **$0** |
| **Income per ha** | | | | | | | | | | **$1,860** | |
| **GROSS MARGIN ($/ha)** | | | | | | | | | | **$123** | **$0** |
| **GROSS MARGIN ($/ML)** | | | | | | | | | | **$31** | |
| **YIELD TO COVER VARIABLE COSTS (t/ha)** | | | | | | | | | | **5.79** | |
| **PRICE TO COVER VARIABLE COSTS ($/t)** | | | | | | | | | | **$280** | |

Costs & Returns - effects of yields and prices Costs & Returns - effects of yields and prices

| Expected On-farm | Expected Yield (t/ha) | | | | | | |
|---|---|---|---|---|---|---|---|
| Price ($/t) | 4.34 | 4.96 | 5.58 | 6.20 | 6.82 | 7.44 | 8.06 |
| $210 | -$825 | -$695 | -$565 | -$435 | -$305 | -$174 | -$44 |
| $240 | -$695 | -$546 | -$398 | -$249 | -$100 | $49 | $198 |
| $270 | -$565 | -$398 | -$230 | -$63 | $105 | $272 | $439 |
| $300 | -$435 | -$249 | -$63 | **$123** | $309 | $495 | $681 |
| $330 | -$305 | -$100 | $105 | $309 | $514 | $718 | $923 |
| $360 | -$174 | $49 | $272 | $495 | $718 | $942 | $1,165 |
| $390 | -$44 | $198 | $439 | $681 | $923 | $1,165 | $1,407 |

## Soybeans (irrigated)

To be used as a guide only

| | | | | | | | | | | PER HA | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **INCOME ($/ha)** | | **Yield (T/ha)** | | | **($/tonne)** | | | | | | |
| Price/tonne | | | | | | | | $550.00 | /tonne | | |
| less: | Cartage | | | | | | | | /tonne | | |
| | Freight | | | | | | | | /tonne | | |
| | Drying | | | | | | | | /tonne | | |
| | Storage | | | | | | | | /tonne | | |
| | Levies | | | | | | | | /tonne | | |
| ON-FARM PRICE ($/tonne) | | | | | | | | $550 | /tonne | | |
| times YIELD | | | | | | | | 2.50 | t/ha | | |
| **GROSS INCOME ($/ha)** | | | | | | | | | | **$1,375** | **$0** |
| **VARIABLE COSTS ($/ha)** | | | | | | | | | | | |
| Machinery Operations (F.O.R.M) | | | | | | | | | | | |
| | Primary tillage | | | | 3 | | x | $24.48 | each | $73.45 | $0 |
| | Secondary tillage | | | | 2 | | x | $19.02 | each | $38.05 | $0 |
| | Fertiliser application | | | | 0 | | x | $7.56 | each | | |
| | Inter-row tillage | | | | 2 | | x | $21.13 | each | $42.27 | $0 |
| | Boom spraying | | | | 2 | | x | $16.58 | each | $33.15 | $0 |
| | Planting (assume own planter) | | | | 1 | | x | $23.48 | each | $23.48 | $0 |
| | Laser levelling | | | | 0.00 | | x | $60.00 | each | | |
| | operation | | | | | | x | | each | | |
| | | | | | | | | Mach total | 210.40 | | |
| Fallow spraying | | | | | | | | | | | |
| | glyphosate | 1 | sprays | x | 1.20 | L | x | $12.82 | /L | $15.38 | $0 |
| | Surpass | 1 | sprays | x | 0.7 | L | x | $6.00 | /L | $4.20 | $0 |
| | LI700 | 1 | sprays | x | 0.15 | L | x | | /L | $0.00 | $0 |
| | | | | | | | | Chemical total | 19.58 | | |
| Seed | | | | | 60.0 | kg | x | $1.40 | /kg | $84.00 | $0 |
| Inoculants | | | | | 0.00 | | | $0.00 | | | |
| Fertiliser | | | | | | | | | | | |
| | Veg eking | | | | 100 | kg | x | $1,113.00 | /tonne | $111.30 | $0 |
| | | | | | | kg | x | | /tonne | | |
| | | | | | | | | Fertiliser total | 111.30 | | |
| Herbicide | | | | | | | | | | | |
| | Dual gold | 1 | sprays | x | 2.00 | L | x | $32.04 | /L | $64.08 | $0 |
| | | | sprays | x | | g | x | | /L | | |
| | | | sprays | x | | L | x | | /L | | |
| Insecticide | | | | | | | | | | | |
| | Marlin | 1 | sprays | x | 2.00 | L | x | $10.00 | /L | $20.00 | $0 |
| | Decis | 1 | sprays | x | 0.50 | L | x | $22.50 | /L | $11.25 | $0 |
| | Dimethoate | 1 | sprays | x | 0.50 | L | x | $11.25 | /L | $5.63 | $0 |
| Fungicide | | | | | | | | | | | |
| | fungicide | | sprays | x | | L | x | $0.00 | /L | | |
| | fungicide | | sprays | x | | L | x | $0.00 | /L | | |
| Growth Regulator | | | | | | | | | | | |
| | | | sprays | x | | L | x | $0.00 | /L | | |
| Crop Desiccation | | | | | | | | | | | |
| | Regione | 1 | sprays | x | 3 | L | x | $22.00 | | $66.00 | $0 |
| | | | | | | | | Chemical | 166.955 | | |
| Aerial spray | | | | | | | x | 30 | /ha | $0 | |
| Scouting | | | | | | | | $0.00 | /ha | | |
| Irrigation | | | | | 5.50 | ML | x | $40.00 | /ML | $220.00 | $0 |
| Casual labour | | | | | | | | $0.00 | /ha | | |
| Chipping | | | | | | | | $0.00 | /ha | | |
| Insurance | | | | | | | | $0.00 | /ha | | |
| | | | | | | **TOTAL PRE-HARVEST COSTS** | | | | **$812** | **$0** |
| Pre-harvest spray | | | | | | | | | | | |
| | | | sprays | x | | L | x | | /L | | |
| Harvesting: | | | | | | | | | | | |
| | Own Harvesting Costs | | | | | | | $0.00 | /ha | | |
| | Contract header | | | | 2.5 | ha/hour | @ | $250.00 | /hr | $100.00 | $0 |
| | plus fuel | | | | 32.3 | L/ha | x | $1.10 | /L | $35.57 | $0 |
| | Freight | | | | 2.5 | Tonnes | | $80.00 | | $200.00 | |
| | | | | | | | | Harvest | 135.57 | | |
| | | | | | | **TOTAL HARVEST COSTS** | | | | **$336** | **$0** |
| **TOTAL VARIABLE COSTS ($/ha)** | | | | | | | | | | **$1,148** | **$0** |
| **Income per ha** | | | | | | | | | | **$1,375** | |
| **GROSS MARGIN ($/ha)** | | | | | | | | | | **$227** | **$0** |
| **GROSS MARGIN ($/ML)** | | | | | | | | | | **$41** | |
| **YIELD TO COVER VARIABLE COSTS (t/ha)** | | | | | | | | | | **2.09** | |
| **PRICE TO COVER VARIABLE COSTS ($/t)** | | | | | | | | | | **$459** | |

Costs & Returns - effects of yields and pricesCosts & Returns - effects of yields and prices

| Expected On-farm | Expected Yield (t/ha) | | | | | | |
|---|---|---|---|---|---|---|---|
| Price ($/t) | 1.75 | 2 | 2.25 | 2.50 | 2.75 | 3 | 3.25 |
| $385 | -$474 | -$378 | -$282 | -$185 | -$89 | $7 | $103 |
| $440 | -$378 | -$268 | -$158 | -$48 | $62 | $172 | $282 |
| $495 | -$282 | -$158 | -$34 | $90 | $213 | $337 | $461 |
| $550 | -$185 | -$48 | $90 | **$227** | $365 | $502 | $640 |
| $605 | -$89 | $62 | $213 | $365 | $516 | $667 | $818 |
| $660 | $7 | $172 | $337 | $502 | $667 | $832 | $997 |
| $715 | $103 | $282 | $461 | $640 | $818 | $997 | $1,176 |

# Navy beans (irrigated)

To be used as a guide only

| | | | | | | | | | | | PER HA | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **INCOME ($/ha)** | **Yield (T/ha)** | | | **($/tonne)** | | | | | | | | |
| Price/tonne | | | | | | | | $900.00 | /tonne | | | |
| less: Cartage | | | | | | | | | /tonne | | | |
| Freight | | | | | | | | | /tonne | | | |
| Drying | | | | | | | | | /tonne | | | |
| Storage | | | | | | | | | /tonne | | | |
| Levies | | | | | | | | | /tonne | | | |
| ON-FARM PRICE ($/tonne) | | | | | | | | $900 | /tonne | | | |
| times YIELD | | | | | | | | 2.20 | t/ha | | | |
| **GROSS INCOME ($/ha)** | | | | | | | | | | | **$1,980** | **$0** |
| **VARIABLE COSTS ($/ha)** | | | | | | | | | | | | |
| Machinery Operations (F.O.R.M) | | | | | | | | | | | | |
| Primary tillage | | | | | 3 | | x | $24.48 | each | | $73.45 | $0 |
| Secondary tillage | | | | | 2 | | x | $19.02 | each | | $38.05 | $0 |
| Fertiliser application | | | | | 0 | | x | $7.56 | each | | | |
| Inter-row tillage | | | | | 2 | | x | $21.13 | each | | $42.27 | $0 |
| Boom spraying | | | | | 2 | | x | $16.58 | each | | $33.15 | $0 |
| Planting (assume own planter) | | | | | 1 | | x | $23.48 | each | | $23.48 | $0 |
| Laser levelling | | | | | 0.00 | | x | $60.00 | each | | | |
| operation | | | | | | | x | | each | | | |
| Fallow spraying | | | | | | | | Mach total | | 210.40 | | |
| glyphosate | 1 | sprays | x | | 2.50 | L | x | $12.82 | /L | | $32.05 | $0 |
| Surpass | 1 | sprays | x | | 0.7 | L | x | $6.00 | /L | | $4.20 | $0 |
| LI700 | 1 | sprays | x | | 0.15 | L | x | | /L | | $0.00 | $0 |
| | | | | | | | | Chemical total | | 36.25 | | |
| Seed | | | | | 63.0 | kg | x | $1.40 | /kg | | $88.20 | $0 |
| Inoculants | | | | | 0.00 | | | $0.00 | | | | |
| Fertiliser | | | | | | | | | | | | |
| Veg eking | | | | | 63 | kg | x | $1,113.00 | /tonne | | $70.12 | $0 |
| Urea | | | | | 100 | kg | x | $1,044.00 | /tonne | | $104.40 | $0 |
| Herbicide | | | | | | | | Fertiliser total | | 174.52 | | |
| Dual Gold | 1 | sprays | x | | 2.00 | L | x | $32.04 | /L | | $64.08 | $0 |
| | | sprays | x | | | g | x | | /L | | | |
| | | sprays | x | | | L | x | | /L | | | |
| Insecticide | | | | | | | | | | | | |
| Marlin | 1 | sprays | x | | 2.00 | L | x | $10.00 | /L | | $20.00 | $0 |
| Decis | 1 | sprays | x | | 0.50 | L | x | $22.50 | /L | | $11.25 | $0 |
| Dimethoate | 1 | sprays | x | | 0.50 | L | x | $11.25 | /L | | $5.63 | $0 |
| Fungicide | | | | | | | | | | | | |
| fungicide | | sprays | x | | | L | x | $0.00 | /L | | | |
| fungicide | | sprays | x | | | L | x | $0.00 | /L | | | |
| Growth Regulant | | | | | | | | | | | | |
| | | sprays | x | | | L | x | $0.00 | /L | | | |
| Crop Desiccation | | | | | | | | | | | | |
| Regione | 1 | sprays | x | | 3 | L | x | $22.00 | | | $66.00 | $0 |
| | | | | | | | | Chemical | | 166.955 | | |
| Aerial spray | | | | | | | x | 30 | /ha | | $0 | |
| Scouting | | | | | | | | $0.00 | /ha | | | |
| Irrigation | | | | | 5.00 | ML | x | $40.00 | /ML | | $200.00 | $0 |
| Casual labour | | | | | | | | $0.00 | /ha | | | |
| Chipping | | | | | | | | $0.00 | /ha | | | |
| Insurance | | | | | | | | $0.00 | /ha | | | |
| | | | | **TOTAL PRE-HARVEST COSTS** | | | | | | | **$876** | **$0** |
| Pre-harvest spray | | | | | | | | | | | | |
| | | sprays | x | | | L | x | | /L | | | |
| Harvesting: | | | | | | | | | | | | |
| Own Harvesting Costs | | | | | | | | $0.00 | /ha | | | |
| Contract header | | | | | 2.5 | ha/hour | @ | $250.00 | /hr | | $100.00 | $0 |
| plus fuel | | | | | 32.3 | L/ha | x | $1.10 | /L | | $35.57 | $0 |
| Freight | | | | | 2.2 | Tonnes | | $80.00 | | | $176.00 | |
| | | | | | | | | Harvest | | 135.57 | | |
| | | | | **TOTAL HARVEST COSTS** | | | | | | | **$312** | **$0** |
| **TOTAL VARIABLE COSTS ($/ha)** | | | | | | | | | | | **$1,188** | **$0** |
| **Income per ha** | | | | | | | | | | | **$1,980** | |
| **GROSS MARGIN ($/ha)** | | | | | | | | | | | **$792** | **$0** |
| **GROSS MARGIN ($/ML)** | | | | | | | | | | | **$158** | |
| **YIELD TO COVER VARIABLE COSTS (t/ha)** | | | | | | | | | | | **1.32** | |
| **PRICE TO COVER VARIABLE COSTS ($/t)** | | | | | | | | | | | **$540** | |

Costs & Returns - effects of yields and pricesCosts & Returns - effects of yields and prices

| Expected On-farm | Expected Yield (t/ha) | | | | | | |
|---|---|---|---|---|---|---|---|
| Price ($/t) | 1.54 | 1.76 | 1.98 | 2.20 | 2.42 | 2.64 | 2.86 |
| $630 | -$218 | -$79 | $60 | $198 | $337 | $475 | $614 |
| $720 | -$79 | $79 | $238 | $396 | $555 | $713 | $871 |
| $810 | $60 | $238 | $416 | $594 | $772 | $951 | $1,129 |
| $900 | $198 | $396 | $594 | **$792** | $990 | $1,188 | $1,386 |
| $990 | $337 | $555 | $772 | $990 | $1,208 | $1,426 | $1,644 |
| $1,080 | $475 | $713 | $951 | $1,188 | $1,426 | $1,663 | $1,901 |
| $1,170 | $614 | $871 | $1,129 | $1,386 | $1,644 | $1,901 | $2,158 |

# Mung beans

To be used as a guide only

| | | | | | | | | | $/ha |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | *a guide only* | |
| **INCOME** | | | | | | | | | |
| Mung Beans Burdekin | | | 1.60 | tonnes /ha | @ | $1,100.00 | | | |
| | | | | % Graded | Price | Yield t/ha | $/ha | | |
| | | Grades | Sprouting | 85% | $935 | 1.36 | $1,272 | | |
| | | | Cooking | | $800 | 0.00 | $0 | | |
| | | | Processing | 13% | $143 | 0.21 | $30 | | |
| | | | Rubbish | 2% | $0 | 0.03 | $0 | | |
| | | | | | | 1.60 | | | |
| | | | | 100% | | Sub Total | $1,301 | /ha | |
| | | | | | | less grading | $ 80.00 | /t | |
| **TOTAL INCOME: $/ha** | | | | | | Total | $1,173 | /ha | **$1,173.34** |
| **VARIABLE COSTS** | | | | | | | | | |
| **Machinery operations** | | No opts | | | From form costs | | | | |
| Disc | | | 2 | | | 34.51 | | | 69.03 |
| Ripping | | | 1 | | | 44.88 | | | 44.88 |
| Rotary hoeing | | | 1 | | | 77.32 | | | 77.32 |
| Contract planting | | | | | | | | | $74.00 |
| Seed | | | 22 | kg/ha | @ | $1.40 | /kg | | $30.80 |
| Fertiliser - planting | Veg eking | | 100 | kg/ha | @ | $1,020 | /tonne | | $102.00 |
| Fertiliser - growing | | | 0 | kg/ha | @ | $0 | /tonne | | $0.00 |
| Fertiliser - folia | | | 0 | l/ha | @ | $0.00 | /l | | $0.00 |
| | | | | l/ha | @ | $0.00 | /l | | $0.00 |
| | | | | l/ha | @ | $0.00 | /l | | $0.00 |
| Folia Application - Ground | | | 0 | application | @ | $0.00 | /pass | | |
| | | | | | | | | | $0.00 |
| Herbicide - knockdown | | Roundup Max | 2.5 | L/ha | @ | $12.27 | /L | | $30.69 |
| | | Surpass | 0.7 | L/ha | @ | $6.00 | /L | | $4.20 |
| | | LI700 | 0.15 | L/ha | @ | $8.00 | /L | | $1.20 |
| Herbicide - pre emergent | | Stomp | 2 | L/ha | @ | $10.80 | /L | | $21.60 |
| | | | 0 | L/ha | @ | $0.00 | /L | | $0.00 |
| Herbicide Application - Ground | | | 2 | Passes | @ | $30.00 | /pass | | $60.00 |
| Insecticides | | | 0 | L/ha | @ | $0.00 | /L | | $0.00 |
| | | Steward | 0.4 | L/ha | @ | $58.90 | /L | | $23.56 |
| | | Dimethoate | 0.5 | L/ha | @ | $7.90 | /L | | $3.95 |
| Insecticide Application - Ground | | | 2 | Passes | @ | $30.00 | /pass | | $60.00 |
| Crop Desiccation | | Reglone | 3 | L/ha | @ | $22.00 | /L | | $66.00 |
| Descant Application | | | | | @ | $30.00 | /ha | | $30.00 |
| Irrigation | | | 4 | ML | @ | $39.00 | /ML | | $156.00 |
| Contract Harvesting | | | | | @ | $100.00 | /ha | | $100.00 |
| Freight | | | 1.6 | T | @ | $80.00 | /T | | $128.00 |
| **TOTAL VARIABLE COSTS** | | | | | | | | | **$1,083.23** |
| **GROSS MARGIN** | | | | | | | | | **$90.12** |
| **BREAKEVEN YIELD** | | | | | | | | | **0.92** |
| **BREAKEVEN PRICE** | | | | | | | | | **$677.02** |

**SENSITIVITY ANALYSIS**

**Price / tonne**

| **Yield** | $880.00 | $935.00 | $990.00 | $1,045.00 | **$1,100.00** | $1,155.00 | $1,210.00 | $1,265.00 | $1,320.00 |
|---|---|---|---|---|---|---|---|---|---|
| 0.80 | -$379.23 | -$335.23 | -$291.23 | -$247.23 | -$203.23 | -$159.23 | -$115.23 | -$71.23 | -$27.23 |
| 1.00 | -$203.23 | -$148.23 | -$93.23 | -$38.23 | $16.77 | $71.77 | $126.77 | $181.77 | $236.77 |
| 1.20 | -$27.23 | $38.77 | $104.77 | $170.77 | $236.77 | $302.77 | $368.77 | $434.77 | $500.77 |
| 1.40 | $148.77 | $225.77 | $302.77 | $379.77 | $456.77 | $533.77 | $610.77 | $687.77 | $764.77 |
| **1.60** | $324.77 | $412.77 | $500.77 | $588.77 | **$676.77** | $764.77 | $852.77 | $940.77 | $1,028.77 |
| 1.80 | $500.77 | $599.77 | $698.77 | $797.77 | $896.77 | $995.77 | $1,094.77 | $1,193.77 | $1,292.77 |
| 2.00 | $676.77 | $786.77 | $896.77 | $1,006.77 | $1,116.77 | $1,226.77 | $1,336.77 | $1,446.77 | $1,556.77 |
| 2.20 | $852.77 | $973.77 | $1,094.77 | $1,215.77 | $1,336.77 | $1,457.77 | $1,578.77 | $1,699.77 | $1,820.77 |
| 2.40 | $1,028.77 | $1,160.77 | $1,292.77 | $1,424.77 | $1,556.77 | $1,688.77 | $1,820.77 | $1,952.77 | $2,084.77 |

# Mangoes (Kensington Pride)

To be used as a guide only

| | | |
|---|---|---|
| Total area (ha) | 1.00 | |
| Area (ha) | 1 | |
| Packaging (kgs) | 7 | |
| Price $/tray (7 kg/tray) | $ 19.00 | |
| Price $/kg | $ 2.71 | |
| Juice price ($/kg) | $ 0.50 | |
| Yield (trays/tree) | 11.00 | |
| Juice % | 10% | |
| Yield (kgs/tree) | 77.00 | |
| Trees/ha | 140 | <=Range between 111 - 185 tress/ha |
| Total Yield/ha (trays) | 1540 | 300 462,000 Total trays |
| Juice trays | 154 | Total Area (ha) production in trays |
| Yield ( kgs for juice) | 1,078.0 | |
| Yield ( first grade only) | 1386 | |
| Income Trays | $ 26,334.00 | |
| Income/ha Juice | $ 539.00 | |
| Total income ($/ha) | $ 26,873.00 | |
| Total kgs | 10,780.00 | |

Tonnes per ha => 10.78

| variable costs | AVNo operts | Hrs/ha | Form Cost | | Cost/ha | Cost/ha | $/tray |
|---|---|---|---|---|---|---|---|
| **Machinery operations** | | | | | | | |
| Other | | | | | | | |
| Slashing | 6 | | 8.09 | | 48.55 | | |
| Spraying | 5 | | 14.93 | | 74.65 | | |
| Hand pruning | 1 | 20.00 | 11.0 | | 220 | | |
| Contact hedging | 1 | 0.36 | 200 | | 72 | | |
| other | 0 | | 4 | | 0 | **415.20** | 0.27 |
| **Planting** | | | | | | | |
| other | 0 | 0 | 0 | | 0.00 | | |
| Other | 0 | 0.00 | 0 | | 0.00 | **-** | - |
| **Fertiliser** | **No appls** | **No/kg/tree** | **No/l/tree** | **$/kg/ L** | | | |
| Super | 1.00 | 0.50 | | 0.98 | 754.60 | | |
| Gypsum | 1.00 | 0.50 | | 0.80 | 616.00 | | |
| K-spray | 0.00 | 0.50 | | 1.48 | 0.00 | | |
| Solubor | 1.00 | 0.02 | | 3.52 | 86.73 | | |
| Cultar | 0.20 | 0.01 | | 236 | 726.88 | | |
| Zinc | 0.00 | 0.00 | | 1.96 | 0.00 | | |
| Other | 0.00 | 0.00 | | | 0.00 | | |
| Other | 0.00 | 0.00 | | | 0.00 | | |
| Other | 0.00 | 0.00 | 0.00 | | 0.00 | | |
| Other | | | | | | **2,184.21** | 1.42 |
| **Herbicide/insecticide** | | | | | | | |
| Basta | 0.00 | | 0.01 | 21.55 | 0.00 | | |
| Agral | 2.00 | | 0.01 | 6.88 | 105.89 | | |
| Sprayseed | 0.00 | | 0.00 | 12.27 | 0.00 | | |
| Roundup | 1.00 | | 0.01 | 12.82 | 118.44 | | |
| Insecticide Supracide | 0.00 | | 0.02 | 24.89 | 0.00 | | |
| Endosulfan | 4.00 | | 0.02 | 10.05 | 1237.98 | | |
| White oil | 2.00 | | 0.01 | 0.00 | 0.00 | | |
| Dimethoate | 4.00 | | 0.08 | 11.25 | 5197.50 | **6,659.81** | 4.32 |
| **Fungicide** | | | | | | | |
| Octave | 1.00 | 0.00 | | 176.22 | 271.38 | | |
| Copper | 1.00 | 0.03 | | 17.50 | 673.75 | | |
| Dithane | 1.00 | 0.02 | | 7.77 | 239.30 | | |
| Amistar | 1.00 | 0.002 | | 187.11 | 576.30 | | |
| Other | | | | | 0.00 | | |
| Other | 0.00 | | | | 0.00 | **1,760.73** | 1.14 |
| **Irrigation** | **ML/ha** | 9.00 | | 35.00 | 315.00 | **315.00** | 0.20 |
| **harvesting/marketing** | Trees picked/day | $/labour unit | Hrs/labour unit | $/tray | | | |
| Picking per labour unit | 13.00 | $ 20.00 | 9.00 | 1.26 | 1938.46 | **1,938.46** | 1.26 |
| | Ctns Packed/day | $/labour unit | Hrs/labour unit | | | | |
| Packing/sort per labour unit | 120.00 | $ 20.00 | 9.00 | 1.50 | 2079.00 | **2,079.00** | 1.50 |
| Lebaycid | 1.00 | app/kg | 0.09 | 97.77 | 8.80 | **8.80** | 0.01 |
| Spinflo (hot dip) | 1.00 | app/kg | 5.00 | 16.15 | 80.77 | **80.77** | 0.06 |
| Sportak | 1.00 | app/kg | 0.09 | 168.08 | 15.13 | **15.13** | 0.01 |
| Bin hire | 1.00 | $/bin | 20.00 | 4.31 | 86.24 | **86.24** | 0.06 |
| Packaging | 1.00 | $/tray | 2.65 | | 3672.90 | **3,672.90** | 2.65 |
| Commissions (gross sales) | 10% | | | | 2633.40 | **2,633.40** | 1.71 |
| Levies | 1.00 | $/tray | 0.10 | | 138.60 | **138.60** | 0.10 |
| Freight | 1.00 | $/kgs | 0.13 | | 1212.78 | **1,212.78** | 0.88 |
| Fuel surcharge % | 20% | | | | **Total costs** | **$ 23,201.02** | $ 15.59 |
| | | | | | **Income** | **$ 26,873.00** | $ 19.00 |
| Bin Capacity (KGS) | 250.00 | | | | **Gross Margin** | **$ 3,671.98** | $ 3.41 |

Disclaimer

This gross margin has been prepared based on discussion and information supplied by the producers and relevant industries bodies. The State of Queensland does not accept liability for any decision, action taken, or loss suffered in reliance upon or based upon this analysis and for application to specific circumstances, independent professional advice should be sought

## Rockmelons and honeydew melons
(Speedling, trickle, plastic – Irrigated dry tropics)

To be used as a guide only

| (1) GROSS INCOME | Yield (Cartons/Ha) | | $/17kg Carton | | $/Ha |
|---|---|---|---|---|---|
| | 2,500 | | $15.81 | 1 | $39,525 |
| Tonnes/ha=> | 44.6 | $/kg | $ 0.93 | | |

| (2) PRE HARVEST COSTS | | Operations | $/Operation | $/Carton | $/Ha |
|---|---|---|---|---|---|
| Machinery Costs (F.O.R.M.) | Ripping | 1 | $44.88 | $0.02 | $44.88 |
| | Discing | 2 | $34.51 | $0.03 | $69.03 |
| | Rotary Hoe | 1 | $77.32 | $0.03 | $77.32 |
| | Bed & Mulch | 1 | $35.28 | $0.01 | $35.28 |
| | Planting | 1 | $122.57 | $0.05 | $122.57 |
| | Tape Laying | 1 | $73.64 | $0.03 | $73.64 |
| | Inter-row Herbicide | 1 | $16.58 | $0.01 | $16.58 |
| | Spray Application | 12 | $27.30 | $0.13 | $327.63 |
| | Mulch Removal | 1 | $26.66 | $0.01 | $26.66 |
| Fuel | | | | $0.00 | |
| Repairs & maintenance | | | | $0.00 | |
| | | **Kgs/Ha** | **$/Kg** | | |
| Speedling (Number Required) | | 20,000 | $0.10 | $0.80 | $2,000.00 |
| Fertiliser Sowing | CK55 | 300 | $1.38 | $0.17 | $414.29 |
| Trickle | Potassium Nitrate | 50 | $1.19 | $0.02 | $59.70 |
| | Calcium Nitrate | 50 | $6.75 | $0.14 | $337.50 |
| | Magnesium Sulphate | 50 | $0.60 | $0.01 | $30.10 |
| | | **Applications** | **L or Kgs/Ha** | **$/Kg or L** | |
| Herbicide | Sprayseed | 1 | 3.5 | $12.27 | $0.02 $42.96 |
| Insecticide | Endosulfan | 2 | 2.1 | $10.05 | $0.02 $42.20 |
| | Aphidex/Pirimor PP | 1 | 1 | $55.50 | $0.02 $55.50 |
| | Vertimec | 2 | 0.2 | $77.91 | $0.01 $31.16 |
| | Success | 2 | 0.4 | $402.50 | $0.13 $322.00 |
| | Talstar | 3 | 0.6 | $39.90 | $0.03 $71.82 |
| | Synergy | 3 | 0.3 | $52.50 | $0.02 $47.25 |
| | Confidor Guard | 1 | 0.7 | $186.53 | $0.05 $130.57 |
| | Admiral | 1 | 0.5 | $242.10 | $0.05 $121.05 |
| | Chess | 2 | 0.2 | $324.50 | $0.05 $129.80 |
| | Gemstar | 1 | | $52.90 | $0.00 $0.00 |
| | DCTron | 3 | 2 | $5.00 | $0.01 $30.00 |
| | Lannate | 2 | 2 | $20.55 | $0.03 $82.20 |
| Fungicide | Acrobat | 2 | 0.36 | $289.60 | $0.08 $208.51 |
| | Mancozeb | 4 | 2 | $6.82 | $0.02 $54.56 |
| | Amistar | 2 | 0.45 | $204.48 | $0.07 $184.03 |
| | Bayfidan | 2 | 0.4 | $187.11 | $0.06 $149.69 |
| | Nimrod | 2 | 0.6 | $45.80 | $0.02 $54.96 |
| | Sulphur | 3 | 3.5 | $2.62 | $0.01 $27.47 |
| | Bravo | 4 | 2 | $35.00 | $0.11 $280.00 |
| | | **ML/Ha** | **$/ML** | | |
| Water Charges | | 4 | $44.00 | $0.07 | $176.00 |
| Labour Cost | | | | $0.48 | $1,200.00 |
| | | **Metres** | **$/Metre** | | |
| Irrigation | Trickle Tape | 6,600 | $0.13 | $0.33 | $831.60 |
| | Layflat (4",4yr life) | 50 | $3.42 | $0.07 | $171.00 |
| | Plastic Mulch | 6,600 | $0.11 | $0.30 | $752.40 |
| | | **Weeks** | **Hive No./ha** | **$/Hive/Wk** | |
| Hire of Hives | | 4 | 3 | $10.00 | $0.05 $120.00 |
| | | **$/Ha** | | | |
| Crop Monitoring | | $130.00 | | $0.05 | $130.00 |
| TOTAL PRE HARVEST COSTS | | | | **$3.63** | **$9,082** |

| (3) POST HARVEST COSTS | | $/Carton | $/Ha |
|---|---|---|---|
| Harvest & Pack | Picking | $1.45 | $3,625.00 |
| | Packing | $1.45 | $3,625.00 |
| | Dipping | $0.03 | $62.50 |
| | Electricity | $0.03 | $70.00 |
| | 17kg Cartons | $2.55 | $6,375.00 |
| | Machinery Costs | $0.19 | $480.00 |
| | Cartage on Farm | $0.10 | $240.00 |
| TOTAL POST HARVEST COSTS | | **$5.79** | **$14,478** |

| (4) MARKETING COSTS | | $/Pallet | Pallets | $/Carton | $/Ha |
|---|---|---|---|---|---|
| Freight | (Pallet = 56 Ctns) | $125.00 | 44.64 | $2.23 | $5,580.36 |
| Commission | | 12.50% | | $1.98 | $4,940.63 |
| TOTAL MARKETING COSTS | | | | **$4.21** | **$10,521** |

| SUMMARY TABLE | $/Carton | $/Ha |
|---|---|---|
| TOTAL PRE HARVEST COSTS | $3.63 | $9,082 |
| TOTAL POST HARVEST COSTS | $5.79 | $14,478 |
| TOTAL MARKETING COSTS | $4.21 | $10,521 |
| TOTAL VARIABLE COSTS | $13.63 | $34,080 |
| GROSS MARGIN | **$2.18** | **$5,445** |

**SENSITIVITY ANALYSIS - $ PER CARTON (Expressed per Ha)**

| $/Ctn | Gross Income | Variable Costs | Gross Margin |
|---|---|---|---|
| **$11.00** | $27,500 | $32,577 | ($5,077) |
| **$12.00** | $30,000 | $32,890 | ($2,890) |
| **$13.00** | $32,500 | $33,202 | ($702) |
| **$14.00** | $35,000 | $33,515 | $1,485 |
| **$15.00** | $37,500 | $33,827 | $3,673 |

## Seedless watermelons

(Speedling, plastic, trickle – Irrigated dry tropics)

To be used as a guide only

| (1) GROSS INCOME | Yield (Tonnes/Ha) | | $/Tonne | | $/Ha |
|---|---|---|---|---|---|
| | 20 | | $820.00 | 1 | $16,400 |
| | | | | 0.82 | |

| (2) PRE HARVEST COSTS | | Operations | $/Operation | $/Tonne | $/Ha |
|---|---|---|---|---|---|
| Machinery Costs (F.O.R.M.) | Ripping | 1 | $44.88 | $2.24 | $44.88 |
| | Discing | 2 | $34.51 | $3.45 | $69.03 |
| | Rotary Hoe | 1 | $77.32 | $3.87 | $77.32 |
| | Bed & Mulch | 1 | $35.28 | $1.76 | $35.28 |
| | Planting | 1 | $122.57 | $6.13 | $122.57 |
| | Tape Laying | 1 | $73.64 | $3.68 | $73.64 |
| | Inter-row Herb | 1 | $16.58 | $0.83 | $16.58 |
| | Spray Application | 9 | $27.30 | $12.29 | $245.72 |
| | Mulch Removal | 1 | $27.30 | $1.37 | $27.30 |
| Fuel | | | | | |
| Repairs & maintenance | | | | $0.00 | |
| | | Kgs/Ha | $/Kg | | |
| Seedlings (Number Required) | | 5,330 | $0.05 | $14.39 | $287.82 |
| Fertiliser Sowing | CK55 | 300 | $1.37 | $20.56 | $411.26 |
| Trickle | Potassium Nitrate | 50 | $1.43 | $3.58 | $71.64 |
| | Calcium Nitrate | 50 | $6.75 | $16.88 | $337.50 |
| | Magnesium Sulphate | 50 | $0.60 | $1.51 | $30.10 |
| | | Applications | L or Kgs/Ha | $/Kg or L | |
| Herbicide | Sprayseed | 1 | 3.5 | $12.27 | $2.15 | $42.96 |
| Insecticide | Endosulfan | 2 | 2.1 | $10.05 | $2.11 | $42.20 |
| | Aphidex/Pirimor PP | 1 | 1 | $55.50 | $2.78 | $55.50 |
| | Success | 2 | 0.4 | $402.50 | $5.00 | $322.00 |
| | Vertimec | 2 | 0.2 | $77.91 | $1.56 | $31.16 |
| | Talstar | 3 | 0.6 | $39.90 | $3.59 | $71.82 |
| | Synergy | 3 | 0.3 | $52.50 | $2.36 | $47.25 |
| | Confidor Guard | 1 | 0.7 | $186.53 | $6.53 | $130.57 |
| | Admiral | 1 | 0.5 | $242.10 | $6.05 | $121.05 |
| | Chess | 2 | 0.2 | $324.50 | $6.49 | $129.80 |
| | DCTron | 3 | 2 | $5.00 | $1.50 | $30.00 |
| | Coragen | 2 | 0.1 | $390.00 | $3.90 | $78.00 |
| | Lannate | 2 | 2 | $20.55 | $4.11 | $82.20 |
| Fungicide | Mancozeb | 4 | 2 | $6.82 | $2.73 | $54.56 |
| | Acrobat | 2 | 0.36 | $289.60 | $10.43 | $208.51 |
| | Bayfidan | 2 | 0.4 | $109.64 | $4.39 | $87.71 |
| | Amistar | 2 | 1 | $187.11 | $18.71 | $374.22 |
| | Bravo | 2 | 2 | $35.00 | $7.00 | $140.00 |
| | Nimrod | 2 | | $45.80 | $0.00 | $0.00 |
| | Sulphur | 2 | 0.6 | $2.62 | $0.16 | $3.14 |
| | | ML/Ha | $/ML | | |
| Water Charges | | 4 | $44.00 | $8.80 | $176.00 |
| Labour Cost | | | | $50.00 | $1,000.00 |
| | | Metres | $/Metre | | |
| Irrigation | | 5,330 | $0.13 | $33.58 | $671.58 |
| | Trickle Tape | 50 | $3.42 | $8.55 | $171.00 |
| | Layflat (4",4yr life) | 5,330 | $0.11 | $30.38 | $607.62 |
| | Plastic Mulch | | | | |
| | | Weeks | Hive No. | $/Hive/Wk | |
| Hire of Hives | | 4 | 3 | $10.00 | $6.00 | $120.00 |
| | | $/Ha | | | |
| Crop Monitoring | | $80.00 | | $4.00 | $80.00 |
| TOTAL PRE HARVEST COSTS | | | | $325.37 | $6,729 |

| (3) POST HARVEST COSTS | | $/Tonnes | $/Ha |
|---|---|---|---|
| Harvest & Pack | | $37.00 | $740.00 |
| | Picking | $38.00 | $760.00 |
| | 1 Tonne Octo Bins | $38.00 | $70.00 |
| | Electricity | $15.00 | $300.00 |
| | Machinery Costs | $20.00 | $400.00 |
| | Cartage on Farm | | |
| TOTAL POST HARVEST COSTS | | $148.00 | $2,270 |

| (4) MARKETING COSTS | | $/Pallet | Pallets | $/Tonnes | $/Ha |
|---|---|---|---|---|---|
| Freight | | $125.00 | 37.00 | $231.25 | $4,625.00 |
| | (Pallet = 1 Tonne) | | | | |
| Commission | | 12.50% | | $102.50 | $2,050.00 |
| TOTAL MARKETING COSTS | | | | $333.75 | $6,675 |

| SUMMARY TABLE | $/Tonne | $/Ha |
|---|---|---|
| TOTAL PRE HARVEST COSTS | $325.37 | $6,729 |
| TOTAL POST HARVEST COSTS | $148.00 | $2,270 |
| TOTAL MARKETING COSTS | $333.75 | $6,675 |
| TOTAL VARIABLE COSTS | $807.12 | $15,674 |
| GROSS MARGIN | $12.88 | $726 |

SENSITIVITY ANALYSIS - $ PER TONNE (Expressed per Ha)

| $/Tonne | Gross Income | Variable Costs | Gross Margin |
|---|---|---|---|
| $700.00 | $14,000 | $15,374 | ($1,374) |
| $750.00 | $15,000 | $15,499 | ($499) |
| $800.00 | $16,000 | $15,624 | $376 |
| $850.00 | $17,000 | $15,749 | $1,251 |
| $900.00 | $18,000 | $15,874 | $2,126 |

# Large pumpkins (Jap)
(Trickle, – Irrigated dry tropics)

To be used as a guide only

| (1) GROSS INCOME | Yield (Tonnes/Ha) | | $/Tonne | | $/Ha |
|---|---|---|---|---|---|
| | 18.00 | | $750.00 | | $13,500 |
| | | | 0.75 | | |

| (2) PRE HARVEST COSTS | | Operations | $/Operation | | $/Tonne | $/Ha |
|---|---|---|---|---|---|---|
| Machinery Costs (F.O.R.M) | Discing | 4 | $34.51 | | $7.67 | $138.05 |
| | Rotary Hoe | 1 | $77.32 | | $4.30 | $77.32 |
| | Planting | 1 | $122.57 | | $6.81 | $122.57 |
| | Spray Application | 4 | $27.30 | | $6.07 | $109.21 |
| | Fertiliser App. | 1 | $21.15 | | $1.18 | $21.15 |
| | Aerial Spraying | 1 | $30.00 | | $1.67 | $30.00 |
| Fuel | | | | | | |
| Repairs & maintenance | | | | | $0.00 | |
| | | Kgs/Ha | $/Kg | | | |
| Seed (number required) | | 5354 | $0.09 | | $27.78 | $500.06 |
| Fertiliser Sowing | CK55 | 500 | $1.37 | | $38.08 | $685.44 |
| Trickle | Potassium Nitrate | 20 | $1.43 | | $1.59 | $28.66 |
| | Calcium Nitrate | 20 | $6.75 | | $7.50 | $135.00 |
| | Magnesium Sulphate | 2 | $0.60 | | $0.07 | $1.20 |
| | | Applications | L or Kgs/Ha | $/Kg or L | | |
| Herbicide | Sprayseed | 1 | 3.5 | $12.27 | $2.39 | $42.96 |
| Insecticide | Endosulfan | 2 | 2.1 | $10.05 | $2.34 | $42.20 |
| | Aphidex/Pirimor PP | 1 | 1 | $55.50 | $3.08 | $55.50 |
| | Success | 2 | 0.4 | $402.50 | $17.89 | $322.00 |
| | Vertimec | 2 | 0.2 | $77.91 | $1.73 | $31.16 |
| | Talstar | 3 | 0.6 | $39.90 | $3.99 | $71.82 |
| | Synergy | 3 | 0.3 | $52.50 | $2.63 | $47.25 |
| | Confidor Guard | 1 | 0.7 | $186.53 | $7.25 | $130.57 |
| | Admiral | 1 | 0.5 | $242.10 | $6.73 | $121.05 |
| | Chess | 2 | 0.2 | $324.50 | $7.21 | $129.80 |
| | DCTron | 3 | 2 | $5.00 | $1.67 | $30.00 |
| | Coragen | 2 | 0.1 | $390.00 | $4.33 | $78.00 |
| | Lannate | 2 | 2 | $20.55 | $4.57 | $82.20 |
| Fungicide | Mancozeb | 4 | 2 | $6.82 | $3.03 | $54.56 |
| | Acrobat | 2 | 0.36 | $289.60 | $11.58 | $208.51 |
| | Bayfidan | 2 | 0.4 | $109.64 | $4.87 | $87.71 |
| | Amistar | 2 | 1 | $187.11 | $20.79 | $374.22 |
| | Bravo | 2 | 2 | $35.00 | $7.78 | $140.00 |
| | Nimrod | 2 | | $45.80 | $0.00 | $0.00 |
| | Sulphur | 2 | 0.6 | $2.62 | $0.17 | $3.14 |
| | | ML/Ha | $/ML | | | |
| Water Charges | | 5 | $44.00 | | $12.22 | $220.00 |
| | | Hours | $/Hour | | | |
| Labour Cost | | | | | $55.56 | $1,000.00 |
| Irrigation | Trickle Tape | 5,330 | $0.13 | | $37.31 | $671.58 |
| | Layflat (4",4yr life) | 50 | $3.42 | | $9.50 | $171.00 |
| | Plastic Mulch | 5,330 | $0.11 | | $33.76 | $607.62 |
| | | Weeks | Hive No./ha | $/Hive/Wk | | |
| Hire of Hives | | 4 | 3 | $10.00 | $6.67 | $120.00 |
| | | $/Ha | | | | |
| Crop Monitoring | | $80.00 | | | $4.44 | $80.00 |
| TOTAL PRE HARVEST COSTS | | | | | $376.20 | $6,772 |

| (3) POST HARVEST COSTS | | Tonnes/Hr | $/Hr | $/Tonne | $/Ha |
|---|---|---|---|---|---|
| Harvest & Pack | Harvest & Cart | 0.5 | $20.00 | $40.00 | $720.00 |
| | 1 Tonne Octo Bins | | | $38.00 | $684.00 |
| | Machinery Costs | | | $0.00 | $0.00 |
| | Cartage on Farm | | | $0.00 | $0.00 |
| | Electricity | | | | $10.00 |
| TOTAL POST HARVEST COSTS | | | | $78.00 | $1,404 |

| (4) MARKETING COSTS | | $/Pallet | Pallets | $/Carton | $/Ha |
|---|---|---|---|---|---|
| Freight | (Pallet = 1 Tonne) | $183.00 | 18.00 | $183.00 | $3,294.00 |
| Commission | | 12.50% | | $93.75 | $1,687.50 |
| TOTAL MARKETING COSTS | | | | $276.75 | $4,982 |

| SUMMARY TABLE | $/Tonne | $/Ha |
|---|---|---|
| TOTAL PRE HARVEST COSTS | $376.20 | $6,772 |
| TOTAL POST HARVEST COSTS | $78.00 | $1,404 |
| TOTAL MARKETING COSTS | $276.75 | $4,982 |
| TOTAL VARIABLE COSTS | $730.95 | $13,157 |
| GROSS MARGIN | $19.05 | $343 |

SENSITIVITY ANALYSIS - $ PER TONNE (Expressed per Ha)

| $/Tonne | Gross Income | Variable Costs | Gross Margin |
|---|---|---|---|
| $600.00 | $10,800 | $12,820 | ($2,020) |
| $650.00 | $11,700 | $12,932 | ($1,232) |
| $700.00 | $12,600 | $13,045 | ($445) |
| $750.00 | $13,500 | $13,157 | $343 |
| $800.00 | $14,400 | $13,270 | $1,130 |
| $850.00 | $15,300 | $13,382 | $1,918 |

## Hay production

| | | | | | |
|---|---|---|---|---|---|
| Number of cuts | | 2 | | | |
| area (ha) | | 1 | | | To be used as a guide only |
| Av Yield (bales/ha) | 120 kg round bale | 50.00 | | | |
| Price ($/bale) | | $ 25.00 | | | |
| Income Hay | | $ 2,500.00 | | | |
| | | Total income => | $ 2,500.00 | | |
| **Average Total income per ha** | **2,500.00** | | | | |

| **Machinery applications** | **Applications** | **Unit cost** | **FORM/ha** | **$/ha** | **$/ha** |
|---|---|---|---|---|---|
| Disc/roller | 2 | | $ 38.40 | 76.80 | |
| Rotary hoe | 0 | | | - | |
| Slashing | 0 | | | - | |
| Roller (Cambridge) | 1 | | $ 4.51 | 4.51 | |
| Planter (Covington type) | 1 | | $ 23.48 | 23.48 | |
| Fertiliser spreader | 1 | | $ 9.04 | 9.04 | |
| Boom spray | 1 | | $ 15.43 | 15.43 | |
| Plane application | | 40 | | 0.00 | |
| | | | | | 129.26 |
| | ***Applications*** | ***rate*** | ***$/unit cost*** | ***$/ha*** | ***$/ha*** |
| **Establishment costs** | | | | | |
| Seed planting rate | 1 | 12 | 1.50 | 18.00 | |
| | | | | | 18.00 |
| **Fertiliser** | ***Applications*** | ***rate*** | ***$/unit cost*** | ***$/ha*** | ***$/ha*** |
| Tropical Pasture P | 0 | 150.00 | 0.85 | - | |
| Muriate Potash | 1 | 100.00 | 1.11 | 111.30 | |
| Urea | 0 | 200.00 | 1.04 | - | |
| DAP | 0 | - | - | - | |
| SSP | 1 | 200.00 | 0.88 | 175.00 | |
| Sodium molbdate | 1 | 1.50 | - | - | |
| Other | 0 | - | - | - | |
| Other | 0 | - | - | - | 286.30 |
| **weed control** | ***Applications*** | ***rate*** | ***$/unit cost*** | ***$/ha*** | ***$/ha*** |
| Treflan | 0 | 2.00 | 10.00 | - | |
| Bushkiller | 0 | - | 18.00 | - | |
| Spinnaker | 1 | 0.15 | - | - | |
| Endosulphan | 1 | 2.10 | 10.05 | 21.10 | |
| Other | 0 | - | - | - | 21.10 |
| | ***Applications*** | **ML/ha** | **$/ML** | | ***$/ha*** |
| Irrigation | 1 | 3.5 | 25.00 | 87.50 | 87.50 |
| ***Hay Harvesting*** | ***Applications*** | **Unit cost** | **FORM/ha** | | ***$/ha*** |
| Mowing/cutting | ***1*** | | 10.30 | 10.30 | |
| Baling | 1 | | 75.39 | 75.39 | |
| Loading | 1 | | 13.34 | 13.34 | 88.72 |
| ***Seed Harvesting*** | | time/ha | | | |
| Harvesting (legumes) | 0 | | | 0.00 | |
| Suction harvest | 0 | | | | |
| Hand harvest | 0 | | | | 0.00 |
| Drying & Cleaning | 1 | $ 0.30 | <=$/kg | | |
| | | | | | 0.00 |
| | | | | **Total costs** | **$ 630.89** |
| *0* | | | | **Income** | **$ 2,500.00** |
| | | | | **Gross margin** | **$ 1,869.11** |

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