FEAT Regional Scenarios

Major Parameter Information Sheet

2015

(Note: document includes the Bundaberg 2020 Major Parameter Information Sheet).

Queensland Government

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1 Introduction

Regional Farm Economic Analysis Tool (FEAT) files are provided as a tool to assist growers in their use and understanding of FEAT and generalised sugarcane economics. The FEAT scenarios were developed in consultation with growers and industry advisors from each region, and are current for the year 2015. The operations, input costs and yields used in these scenarios reflect broad regional trends and are not reflective of any individual situation. The regional files are provided solely as a means of demonstrating the functionality of FEAT. This information sheet outlines the method of estimation for each of the major parameters. All prices are exclusive of GST.

2 Major Parameters

2.1 Regional Assumptions

2.1.1 Climate and Soil Characteristics

The following tables provides details of the key climate and soil characteristics used to develop the representative farms.

Table 1: Key climate and soil characteristics by region

Burdekin (Delta)	
Location	Area of around 38,000 hectares surrounding Ayr and Home Hill and falling within the Lower Burdekin Water jurisdiction.
Soil	Light to medium soils.
Climate	Tropical climate with generally hot, humid summers and milder drier winters. Most rainfall occurs between January and March. Average annual rainfall around 1070mm.
Burdekin (BHWSS)	
Location	Area of around 35,000 hectares surrounding Clare, Millaroo and Dalbeg on the lower Burdekin flood plain.
Soil	Heavy soils.
Climate	Tropical climate with generally hot and humid summers and milder drier winters. Most rainfall occurs between January and March. Average annual rainfall around 1070mm.
Tully	
Location	Area of around 22,000 hectares extending from the Kennedy Valley in the south to Feluga in the north.
Soil	Flood Plain: heavy alluvial, slopes, light soils.
Climate	Tropical climate, significant rainfall in most months of the year. Short dry season. Average annual rainfall around 2850mm.
Mackay	
Location	Area of around 80,000 hectares surrounding Mackay.
Soil	Volcanic clay soils; sandy/clay duplex; heavy cracking clays.
Climate	Humid subtropical climate. Highly variable. Sunny dry winter and hot humid summer. Most rainfall occurs between January and March. Average annual rainfall around 1500mm.
Herbert	
Location	Area of around 76,000 hectares surrounding Ingham.
Soil	Terrace silty loam: acidic soils, low in organic matter.
Climate	Tropical climate, with a humid wet season from November to April, and an average annual rainfall of around 2000mm.

2.1.2 Farming System Characteristics

Table 2 describes the key characteristics of the various farm management systems used to develop the regional scenarios. Where appropriate, the same farming principles were applied across all regions to ensure that profitability between regions is comparable. For example, farms in all regions

are assumed to operate under controlled traffic and grow a legume break crop in the fallow. Farming characteristics involving irrigation management, green or burnt cane harvest, and the number of ratoons, however, were selected according to standard industry practice within each region. A standard farm size of 150 hectares was selected to enable a comparative assessment between regions. Note that, the actual average farm size in each region may differ from 150 hectares.

Table 2: Characteristics of the sugarcane farming systems

Field	Characteristics
Irrigation Management	Furrow irrigation (BHWSS and Burdekin Delta). Applied as overhead water (traveller and pivot) (Mackay).
Soil Management	Controlled traffic with pre-formed beds. Reduced tillage and zonal tillage of block prior to planting. Zero tillage in ratoons. Legume cover crop in fallow.
Nutrient Management	Six Easy Steps nutrient management and soil testing each cycle. Subsurface nutrient application. Soil ameliorant applied in soy fallow.
Pest Management	Integrated pest management.
Harvesting	Cane is burnt prior to harvest (BHWSS and Burdekin Delta).
General	Tractor fleet consists of: one 103-kW tractor, one 75-kW tractor and one 47-kW tractor. 150 hectare farm size. Contract planting (cane). Contract harvesting. Laser levelling each cycle. Plant crop and three ratoons (BHWSS and Burdekin Delta). Plant crop and four ratoons (Tully, Mackay and Herbert). Legume break crop grown between sugarcane cycles.

2.2 Cane Assumptions and Summary

2.2.1 Sugar & Molasses Prices ($)

The sugar price is set at the five-year Queensland average price of sugar between 2010 and 2014 ($430). The molasses price is the five-year average of the annual prices reported by Mackay Sugar between 2010 and 2014 ($102.46).

2.2.2 Harvest Cost ($/tonne)

Determined by region based on local advice

Table 3: Harvest cost by region

Region	($/tonne)
Burdekin (Delta)	$7.20
Burdekin (BHWSS)	$7.20
Tully	$8.50
Mackay	$8.50
Herbert	$8.50

2.2.3 Levies/Penalties ($/tonne)

Levies/penalties are sourced from relevant industry bodies and are correct for 2015. In the Burdekin Delta and BHWSS regions levies include the Burnt Cane Levy. The cost of levies will vary depending on the membership in various organisations.

Table 4: Levies and penalties by region

	Region				
	Burdekin (Delta)	Burdekin (BHWSS)	Tully	Mackay	Herbert
Levies/Penalties	$0.81	$0.90	$0.65	$0.96	$0.85

2.2.4 Yield and CCS

Set at the average annual yield (tonnes per ha) and CCS by region according to available historical data (see table below). In the case of Mackay, the average yield of a property with access to irrigation was estimated based on the assumption that 2ML of irrigation will boost yield by 16 tonnes per hectare compared with no irrigation (due to limited access to data).

Table 5: Yield and CCS data ranges by region

Region	Historical Data Range
Burdekin (BHWSS)	2005-2014
Burdekin (Delta)	2005-2014
Tully	2006 - 2014 (excluding 2011)
Mackay	2005, 2007-2009, 2012-2014
Herbert	2005-2014 (excluding 2011)

2.3 Machinery

2.3.1 Fuel Cost ($/litre)

Estimated at $1 per litre, after diesel fuel rebate and the removal of GST.

2.3.2 Percentage of Full Load, Speed and Field Efficiency

Estimated based on local advice, influenced by type of operation (i.e. tilling, spraying, planting etc) and soil type. Field efficiency is influenced by; time taken to perform adjustments to machinery, time to add seed/fertiliser, minor breakdowns, turning at row ends and other non productive delays.

2.3.3 Repairs and Maintenance - Tractors ($/hr)

Based on the sum of the major tractor repair and maintenance components (i.e. maintenance including oil and filters, tyres, batteries and repairs) expressed in $ per hour.

2.3.4 Repairs and Maintenance – Implements ($/hr)

Total lifetime repairs and maintenance is estimated at 25 per cent of the implement price when new. Cost per hour is a function of the implements productive life.

2.3.5 Out of Field Tractor Hours

Equal to 10 per cent of total tractor plus implement hours.

2.4 Plant, Ratoons and Soy

2.4.1 Billets

The price of billets used for planting is equivalent to the on farm price of cane.

2.4.2 Chemical Input Costs

Fertiliser, herbicide and pesticides prices were sourced from local suppliers during the year 2015.

2.4.3 Irrigation

Water rates are sourced from local water providers and are correct for 2015. Irrigation volumes are estimated in each region for plant, ratoons and legumes based on local advice.

Table 6: Water rates by region

Region	ML/ha	
	Average Cane	Legume
Burdekin (BHWSS)	12	4
Burdekin (Delta)	16	5
Tully	0	0
Mackay	2	0
Herbert	0	0

Electricity for irrigation is applied under Tariff 65 (peak and off-peak). Electricity tariffs are sourced from Ergon Energy and are correct for 2015.

2.5 Fixed Costs

2.5.1 Land Rates

Based on the median unimproved value of cane land per hectare and the relevant council rate for each region.

2.5.2 Business Insurance

Based on regional averages as determined by past research and applied to each region as a percentage of income.

2.5.3 Business Electricity; Licenses & Fees; Land Maintenance

Based on an average figure as determined by past research and applied on a per hectare basis.

2.5.4 Accountancy and Legal; Bank Charges, Telephone and Stationary; R&M Buildings; R&M Motor Vehicle, Registration, Fuel; Training

Based on regional averages as determined by past research and applied at a standard rate to all regions as a percentage of income.

2.5.5 Labour

Data on farm labour requirements is from local knowledge and advice. Labour is priced at $35 per hour.

2.5.6 Water

Water tariffs for irrigation are sourced from the supplier based on the appropriate water scheme. Water tariffs are correct for 2015.

2.5.7 Electricity (Irrigation)

A daily supply charge for electricity (irrigation) is applied based on tariffs sourced from Ergon energy and correct for 2015.

FEAT Regional Example - Bundaberg

Major Parameter Information Sheet

2020

This publication has been compiled by Steven Smith, of Queensland Agribusiness Solutions and Brendon Nothard, of the Department of Agriculture and Fisheries.

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1 Introduction

Regional Farm Economic Analysis Tool (FEAT) example files are provided as a tool to assist growers in their use and understanding of FEAT and generalised sugarcane economics. The FEAT example was developed in consultation with growers and industry advisors from the Bundaberg region, and is current for the year 2020. The operations, input costs and yields used in this scenario reflect broad regional trends and are not reflective of any individual situation. This regional file is provided solely as a means of demonstrating the functionality of FEAT. This information sheet outlines the method of estimation for each of the major parameters. All prices are exclusive of GST.

2 Major Parameters

2.1 Regional Assumptions

2.1.1 Climate and Soil Characteristics

The following table provides details of the key climate and soil characteristics used to develop the representative farm.

Table 1: Key climate and soil characteristics

Bundaberg	
Location	Area south, south-west of Bundaberg supplying Bundaberg Sugar Mill.
Soil	Grey Sodisol - Sodic Duplex Soil (common name: Forest Grey). Sandy to loam characteristics with a sodic clay subsoil.
Climate	Sub-Tropical climate with generally warm, humid summers and milder drier winters. Most rainfall occurs between January and March with a built-up storm season in November & December. Average annual rainfall around 1,000mm.
Irrigation	Most cane growing farms in the region (approximately 90%) utilise irrigation in sugarcane production. Irrigation water is largely sourced from on-farm bores/dams, licenced allocations from rivers/creeks or from Sunwater's Bundaberg Water Supply Scheme (river and channel). The representative farm assumes all water is sourced from the Sunwater Channel Scheme.

2.1.2 Farming System Characteristics

Table 2 describes the key characteristics of the farm management system used to develop the regional example file. Where appropriate, the same farming principles are applied across the different example files to ensure that profitability between the regions are comparable. For example, farms in all regions are assumed to operate under controlled traffic and grow a legume break crop in the fallow. However, farming characteristics involving irrigation management, green or burnt cane harvest, and the number of ratoons, were selected according to standard industry practice within each region. A standard farm size of 150 hectares was selected to enable a comparative assessment between regions. Note: the actual average farm size in each region may differ from 150 hectares.

Table 2: Characteristics of the sugarcane farming system

Field	Characteristics
Irrigation Management	Travelling gun system (i.e. hard hose).
Soil Management	Controlled traffic with pre-formed beds. Reduced tillage and zonal tillage of block prior to planting. Zero tillage in ratoons. Legume cover crop in fallow.
Nutrient Management	Six Easy Steps nutrient management and soil testing each cycle. Subsurface nutrient application. Soil ameliorant applied in soy fallow. Cane trash is retained.
Pest Management	Integrated pest management.
Harvesting	Cane is pre-dominantly harvested green.

General	Tractor fleet consists of: one 103-kW tractor, one 75-kW tractor and one 47-kW tractor. 150 hectare farm size. Contract planting (cane). Contract harvesting. Plant crop and four ratoons. Legume break crop grown between sugarcane cycles.

2.2 Cane Assumptions and Summary

2.2.1 Sugar Prices ($)

The sugar price is set at the five-year Queensland average price of sugar between 2015 and 2019 ($417.41).

2.2.2 Harvest Cost ($/tonne)

Determined by region based on local advice.

Table 3: Harvest cost by region

Region	($/tonne)
Bundaberg	$ 8.75

2.2.3 Levies/Penalties ($/tonne)

Levies/penalties are sourced from relevant industry bodies and are correct for 2020.

Table 4: Levies and penalties by region

Region	($/tonne)
Bundaberg	$ 1.07

2.2.4 Yield and CCS

Set at the average annual yield (tonnes per ha) and CCS by region according to available historical data (see table below). In the case of Bundaberg, the average yield of a property with access to irrigation was estimated based on the assumption that 5ML of irrigation will boost yield by 25 tonnes per hectare (conservative estimate) compared with no irrigation (due to limited access to data).

Table 5: Yield and CCS data ranges by region

Region	Historical Data Range
Bundaberg	2015 - 2019

2.3 Machinery

2.3.1 Fuel Cost ($/litre)

Estimated at $1 per litre, after diesel fuel rebate and the removal of GST.

2.3.2 Percentage of Full Load, Speed and Field Efficiency

Estimated based on local advice, influenced by type of operation (i.e. tilling, spraying, planting etc) and soil type. Field efficiency is influenced by; time taken to perform adjustments to machinery, time to add seed/fertiliser, minor breakdowns, turning at row ends and other non-productive delays.

2.3.3 Repairs and Maintenance - Tractors ($/hr)

Based on the sum of the major tractor repair and maintenance components (i.e. maintenance including oil and filters, tyres, batteries and repairs) expressed in $ per hour.

2.3.4 Repairs and Maintenance – Implements ($/hr)

Total lifetime repairs and maintenance is estimated at 25 per cent of the implement price when new. Cost per hour is a function of the implement's productive life.

2.3.5 Out of Field Tractor Hours

Equal to 10 per cent of total tractor plus implement hours.

2.4 Plant, Ratoons and Soy

2.4.1 Billets

The price of billets used for planting is equivalent to the on-farm price of cane ($37.89/t).

2.4.2 Chemical Input Costs

Fertiliser, herbicide and pesticides prices were sourced from local suppliers during the year 2020.

2.4.3 Irrigation

Water rates are sourced from local water providers and are correct for 2019-20. Irrigation volumes are estimated in each region for plant, ratoons and legumes (peanuts & soybeans) based on local advice.

Table 6: Water rates by region

Region	ML/ha		
	Average Cane	Peanuts	Soybeans
Bundaberg	5	3	2

Electricity for irrigation is applied under Tariff 65 (peak and off-peak). Electricity tariffs are sourced from Ergon Energy and are correct for 2019-2020.

2.5 Fixed Costs

2.5.1 Land Rates

Based on the median unimproved value of cane land per hectare and the relevant council rate for each region.

2.5.2 Business Insurance

Based on regional averages as determined by past research and applied to each region as a percentage of income.

2.5.3 Business Electricity; Licenses & Fees; Land Maintenance

Based on an average figure as determined by past research and applied on a per hectare basis.

2.5.4 Accountancy and Legal; Bank Charges, Telephone and Stationary; R&M Buildings; R&M Motor Vehicle, Registration, Fuel; Training

Based on regional averages as determined by past research and applied at a standard rate to all regions as a percentage of income.

2.5.5 Labour

Data on farm labour requirements is from local knowledge and advice. Labour is priced at $35 per hour.

2.5.6 Water

Water tariffs for irrigation are sourced from the supplier based on the appropriate water scheme (Sunwater Channel). Water tariffs are correct for 2019-20.

2.5.7 Electricity (Irrigation)

A daily supply charge for electricity (irrigation) is applied based on tariffs sourced from Ergon energy and correct for 2019-20.