# LAND MANAGEMENT

## Introduction

The economy of the Shire relies heavily upon agricultural production, which covers most of the coastal plains area. Because of this, the state of the environment depends heavily upon land management.
Efforts continued in 2003 to minimise adverse impacts, through the promotion of responsible and improved land-use practice.

## News

**JRCMA—Sustainable Agriculture**
The JRCMA conducted work with canegrowers. The aim is to develop soil specific guidelines for fertiliser application. The work will improve on region-wide guidelines, which lack practical specificity.

**FNQLGPPAC**
Work continued on the FNQLG Pest Plant Advisory Committee's Regional Pest Management Plan. The plan has developed strategies to help landholders ensure that they control pest plants on their land. The strategy will be released in 2004.

**Council**
Council promoted best practice through the development of stormwater management information leaflets for agriculture. These list the techniques currently available to help prevent erosion, pest invasion, or nutrient and sediment loss.

## Pest management

The Council's commitment to weed control continued in 2003. Close to 50% of the original levels of weeds at the inception of the program have so far been controlled.
Levels of Hymenachne, Pond Apple, Lantana and Sickle Pod are still thought to be increasing in the Shire. The other 37 declared pest plants in the Shire remained at static levels or were decreasing.
Weed control was aided in 2003 and previous years by the exceptionally dry climatic conditions prevalent.
The Council promoted weed management during Weedbuster Week with an educational display. Landcare organised a weed identification and revegetation workshop, along the South Johnstone River in Innisfail.

**Pressure**
- Land management aims to achieve the best productivity from the land with a balance of minimum environmental harm. Poor land practice wastes money because excesses of fertiliser or work are required, and the environment is impacted in the following ways.

- Fertilisers and nutrients are lost from the land and cause problems in waterways and the ocean.
- Sediment is lost from the land and causes turbidity in waterways. Nutrients will also be bound to this sediment.
- Pest plants entail control costs, and reduce the land's productivity. Uncontrolled pest plants can also impact upon neighbouring land, and natural ecosystems.
- Pest animals harboured on land may affect crops or cause problems to stock or native wildlife.
- Inappropriate clearing can lead to increased risks of erosion, weed invasion where the land is not managed, and places pressure on the remaining biodiversity in the Shire.

Currently, the Shire's agriculture has some major effects on aspects of the environment. Landholders have been working towards reducing this pressure for some time. Research has continued into effective methods of better practice so that environmental concerns are balanced against farmer's livelihoods.

**Land Clearing** (Source : NRM&E SLATS website www.nrme.qld.gov.au/slats/index.html
Vegetation clearing has slowed over the last ten years according to the NRM&E's satellite imaging.

| Rate of woody vegetation change (ha per year) | | | | | | | | | %Wooded Vegetation Cover* (WHA=47%) | % Total Clearing in Queensland |
|---|---|---|---|---|---|---|---|---|---|---|
| Year | New woody regrowth | CLEARING | | | | | | | | |
| | | Pasture | Crops | Forest | Mining | Infra-structure | Settlement | Total Cleared | | |
| 99-01 | 0 | 15 | 8 | 0 | 0 | 2 | 0 | 25 | 62.41 (15.41) | 0.0043 |
| 97-99 | 2 | 7 | 21 | 1 | 0 | 0 | 0 | 30 | 62.43 (15.43) | 0.007 |
| 95-97 | 5 | 7 | 86 | 0 | 0 | 0 | 3 | 96 | 62.49 (15.49) | 0.028 |
| 91-95 | 0 | 0 | 120 | 0 | 0 | 2 | 1 | 123 | 62.56 (15.56) | 0.042 |

Hymenachne was the primary target for control by Council during 2003, which reduced the weed's levels down to a manageable level for the landholder.
The Hymenachne and Siam control programs run by Council and by NRM&E Land Protection wrapped up in 2003. Controlling these pest plants is now the landholder's responsibility. Council will be responsible for ensuring compliance.

Success of the Hymenachne Control Program

| No. of Properties | Council assisted | Weed area | Self control | Weed area |
|---|---|---|---|---|
| Start 2001 | 30 prop. | 375 ha | 10 prop. | 50 ha |
| End 2003 | 26 prop. | 105 ha | 9 prop. | 4.5 ha |

Pest animal populations, including pigs and dingoes remained at static levels during 2003. The recent emergence of feral deer in the Shire has not become as bad a problem as expected. The deer have been culled to low levels, as they are sought after by locals for meat.

**Implications**
- Poor land management affects the livelihoods of those participating in other industries. Fisheries and reef tourism are the most immediately affected when nutrients, chemicals or sediment in runoff impact adversely on aquatic ecosystems. Tourism on the land will also be affected when natural values are disregarded.

Land degradation through erosion or through forms of soil contamination impacts upon future generations. Over-exploitation for short-term returns may destroy or impair the land as a resource for future generations.

Pest management is required or the pest species will spread and affect the whole community, reducing productivity for all.

## Cattle

The cattle industry grew steadily during the latter half of 2003, due mainly to changes over from cane. The DPI was receiving approximately a new registration every fortnight.

It is estimated that there are now 258 registered cattle growers (with 11 head or more of cattle).

Johnstone Shire has traditionally been a fattening area for cattle. Outside growers pasture cattle for a time to fatten the beasts before sales. This is changing, as the Shire has seen an increase in permanent growing areas for live export.

Land management for the cattle industry may be affected by the water quality protection plan in 2004. Growers are concerned that the plan may affect them adversely by contributing costs to their operations. Grazing land is not known to contribute high levels of nutrients to waterways.

## Sugar Cane

Green trash blanketing, Crop rotation and strategic tillage were promoted for the cane industry at an Australian Cane Farmer's Association conference, and by the Sugar Research and Development Corporation. These systems both reduce labour and increase productivity. Additionally, the methods reduce nutrient and sediment losses from cane land.

28,250 hectares were harvested, this is lower than for 2002 (35,500 ha).

| Area | Mourilyan | South Johnstone | Babinda |
|---|---|---|---|
| Tonnes of Cane | 747,388 | 798,486 | 996,345 |
| Area (ha) | 8,899 | 9,310 | 10,041 |
| CCS | 12.72 | 12.79 | 12.05 |
| Green Trash Blanketing | 96% | 93% | 98% |
| Area Fallowed | 6% | 6.3% | 8.7% |

Source: BSES. All areas improved the level of green trash blanketing. The introduction of crop fallowing is still at an early stage.

Cane land management continued to improve in the Shire during 2003. There was greater understanding and implementation of strategic (or zonal) tillage. These terms better describe what is also known as minimum tillage. Strategic tillage has proved positive for farmers, as it reduces costs, time, and labour. The practice reduces the risk of erosion and therefore the risk of sediment loss into waterways.

Crop rotation (fallowing) has been less popular, as farmers are presently not confident that higher yields will result after an initial shortfall. The current economic circumstances of the cane industry are considered a barrier to the introduction of crop rotation.

Almost all farmers have adopted green trash blanketing as standard practice, on all or most of their farm areas.

2003 saw a reduction in fertiliser usage on cane, which reduced this pressure on the environment. However, this occurred mainly because farmers were unwilling to invest heavily in fertiliser for crops at current cane prices.

Cane productivity was not affected by the reduction in fertiliser application. This is the effect of a long history of super-application of fertilisers, so soils maintained high nutrient levels.

In effect, low cane profitability has had benefits to farm management, through refinement of fertiliser use.

Farmers should perform soil testing regularly with professional advice from agencies such as BSES; it is guaranteed to save money on fertilisers, and to prevent over-fertilisation affecting the environment.

Similarly, financial constraints caused farmers to reduce the application of chemicals for control of pests such as the cane grub. These chemicals are highly expensive. Unfortunately, there is a risk now that by saving costs, farmers are exposing themselves to an outbreak of cane grub. If this were to occur it would further add to the tribulations of the industry, the costs of which would far outweigh those saved by controlling the grub.

An alternate chemical to control cane pests, Comfidor, will undergo trials. There is some concern that the new chemical is more mobile in the soil than the usual Chlorpyrifos, which binds well to soil particles. Trials will be conducted to address this issue, which is of particular concern here in the Wet Tropics.

BSES increased the number of workshops and seminars held with farmers to promote effective best practice. Participation by farmers has been encouraging.

COMPASS workshops have also continued.

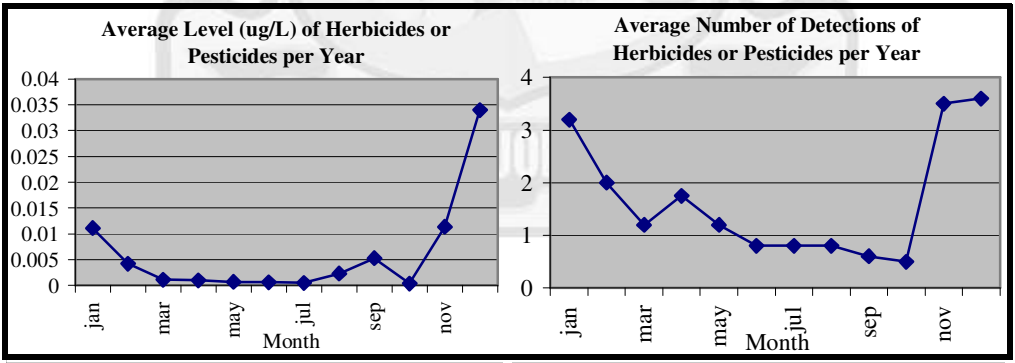
## Pesticides and Herbicides

Water Monitoring by Council's Health Department includes a test for pesticides and herbicides in five waterways. Although these levels have not yet exceeded health or environmental guidelines, they form an indicator of the management of farm chemicals, and the management of chemical runoff from farms. Frequency Seen in the table describes how often the chemical was detected during the year.

**Pesticide and Herbicide Detections**

| Site | mg/L | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Freq. Seen | Average Level* | Freq. Seen | Average Level* | Freq. Seen | Average Level* | Freq. Seen | Average Level* | Freq. Seen | Average Level* |
| **Johnstone River** | Atrazine | 17% | 0.045 | 0% | 0 | 0% | 0 | 8% | 0.020 | 0% | 0 |
| | Diuron | 8% | 0.030 | 0% | 0 | 0% | 0 | 8% | 0.020 | 10% | 0.010 |
| | OC/OP | 0% | 0 | 9% | 0.010 | 0% | 0 | 0% | 0 | 0% | 0 |
| **Nyleta Creek** | Atrazine | 8% | 0.460 | 9% | 0.020 | 9% | 0.030 | 0% | 0 | 0% | 0 |
| | Diuron | 8% | 0.310 | 9% | 0.030 | 0% | 0 | 0% | 0 | 0% | 0 |
| **Jurs Creek** | Atrazine | 0% | 0 | 0% | 0 | 0% | 0 | 8% | 0.030 | 0% | 0 |
| **Liverpool Creek** | Atrazine | 33% | 0.193 | 18% | 0.025 | 36% | 0.038 | 17% | 0.030 | 0% | 0 |
| | Diuron | 42% | 0.068 | 9% | 0.040 | 36% | 0.040 | 50% | 0.053 | 40% | 0.015 |
| | OC/OP | 0% | 0 | 9% | 0.010 | 0% | 0 | 0% | 0 | 0% | 0 |
| **Mena Creek** | Atrazine | 50% | 0.120 | 9% | 0.080 | 9% | 0.020 | 17% | 0.025 | 18% | 0.030 |
| | Diuron | 75% | 0.224 | 4% | 0.044 | 73% | 0.076 | 50% | 0.037 | 45% | 0.024 |

* Average of the level of pesticides when detected. Detected levels were often higher. However, no exceedences of any Health or Environmental Guidelines were ever recorded. Water volumes in the Shire are quite high.
Note: All sites were tested for all pesticides and herbicides - only rows including detections have been presented.




From the table - incidences of Chemicals in certain regions, such as Mena Creek and Liverpool Creek, are more common. It can be seen from the graphs how the incidences and levels of chemicals increase during the wet season.
Overall, there appears to have been a reduction in the levels of chemicals over the last few years. This could indicate some improved farm management. Alternately, it may be due to the recent dry weather, which would have reduced stormwater runoff.

## Bananas

A few more banana farmers incorporated Environmental Management Systems (EMS) on their farm operations to minimise pollution from runoff or farm chemicals, and to minimise water requirements. Awareness of EMS is increasing in the farming community, but there is still a need for greater adoption.

No major problems with diseases affected the banana industry – due mainly to dry weather. The only significant disease that affected bananas in 2003 was yellow sigatoka. Regulations to control the spread of yellow sigatoka have been tightened. This will add further costs to banana farming at a difficult time. No further outbreaks of black sigatoka were reported; it appears that this disease has been successfully controlled.

It is estimated that there are 250-280 growers in the Shire, with bananas on approximately 5000 hectares.
These numbers did not change greatly during 2003, but may be affected during 2004 if the industry continues to experience low profitability.
2003 was characterised by overproduction, low profitability and low returns for growers.

Pressures on the environment from the industry are mainly from access to water resources, and nutrients entering waterways. Low rainfall during the year caused growers to exert more than usual pressure on the Shire's streams and waterways. Yields were slightly reduced due to the lack of water.

It is hoped that the adoption of environmental management systems will help to alleviate pressure on the environment from fertiliser use. However, the adoption of an EMS does not yet guarantee environmental best practice. The ISO 14000 standards are based on continuous improvement, so growers can meet legal requirements by making only minimal changes over time. Whilst this should result in improved practice in the long term, growers are presently under heavy financial pressure to optimise yields. Because fertiliser use is only a small proportion of the cost of production for horticulture, farmers often over fertilise in order guarantee high yields. This is a form of risk management on income when prices for the crop are likely to fluctuate.

The environment is currently at the bottom of the list of banana grower's concerns. Primary concerns are imports from the Philippines, low profitability, labour, and industry structure and representation. Until these problems are settled, environmental best practice will be low priority.

## Tropical Fruits

The Tropical Fruit Industry suffered a poor harvest in 2003. This was due to climatic conditions. Although there was a good flowering, dry weather reduced the crop yield. Furthermore, with the onset of rains in the wet season, fruit drop affected ~60% of crops.
Tropical fruits remains a relatively small industry, but is expected to grow in the future. Issues with land management from this sort of farming are not clear at present, but the industry is environmentally friendly at the present scale.

Land areas for the Region are estimated as follows:
Rambutan—170 hectares (~30 ha in the Shire)
Mangosteen—100 hectares
Durian—100 hectares
Other Tropicals*—100 hectares
(*Includes Pomelo, Dragon Fruit, Carambola, Star Apple, Abiu).
(Source: DPI)

Tropical fruits are ideal high value crops for the Shire, as the area is guaranteed good rainfall each year. During wet years, this form of horticulture is less likely to have adverse environmental effects such as erosion from runoff.
Diversification into tropical fruit is an option for cane farmers, especially since areas that cannot be mechanically harvested for cane can be used for fruit trees. Cane growers are likely to already have much of the farming equipment required. While cane can be grown around Queensland, tropical fruits are restricted to the Far North.

## Conclusion

Land management has continued to improve, with more involvement from landholders. Control of pest species has progressed, with targeted weeds down to half their original levels. Riparian revegetation continued, but much remains to be done, and the state of the Shire's waterways has not yet seen significant improvement.

## Future Direction

Land management will continue to improve. There may also be some lessening of environmental pressure if the traditional agricultural industries are downsized.
Control of Pest Species will have to continue. It remains to be seen how landholders respond to the changeover in responsibility. Council will take on the new role of enforcement.

**OVERALL GRADE B**

| Criteria | Grade | Recommendation Group | Explanation |
|---|---|---|---|
| Action on recommendations<br>**20 of 20**<br>Completed | **A** | -Best practice and sustainable land practices<br>-Waterways and riparian areas<br>-Pest species | -Promoted and supported by all organisations.<br>-Revegetation ongoing.<br>-Weed control. |
| Filling deficiencies in data | **C** | -Waterways and riparian areas<br>-Land practices | -Stormwater monitoring ongoing.<br>-Some information available through Mills. Further information required. |
| State of the Shire | **B+** | -Land Practices<br>-Waterways<br>-Pest Species | -Growers have continued to implement changes slowly over time, despite difficult economic conditions. Some have displayed exemplary commitment.<br>-Waterways still under pressure.<br>-Weed control continues to achieve success. |
| Goal Achievement | **B-** | -All | -All organisations continued to make steady progress. |
| Community Awareness | **B** | -All | -Promotion of best practice by Council and other organisations. Landholder participation has been improving slowly. |