

Subtropical banana information kit

Reprint – information current in 2004



REPRINT INFORMATION – PLEASE READ!

For updated information please call 13 25 23 or visit the website www.deedi.qld.gov.au

This publication has been reprinted as a digital book without any changes to the content published in 2004. We advise readers to take particular note of the areas most likely to be out-of-date and so requiring further research:

- Chemical recommendations—check with an agronomist or Infopest www.infopest.qld.gov.au
- Financial information—costs and returns listed in this publication are out of date. Please contact an adviser or industry body to assist with identifying more current figures.
- Varieties—new varieties are likely to be available and some older varieties may no longer be recommended. Check with an agronomist, call the Business Information Centre on 13 25 23, visit our website www.deedi.qld.gov.au or contact the industry body.
- Contacts—many of the contact details may have changed and there could be several new contacts available. The industry organisation may be able to assist you to find the information or services you require.
- Organisation names—most government agencies referred to in this publication have had name changes. Contact the Business Information Centre on 13 25 23 or the industry organisation to find out the current name and contact details for these agencies.
- Additional information—many other sources of information are now available for each crop. Contact an agronomist, Business Information Centre on 13 25 23 or the industry organisation for other suggested reading.

Even with these limitations we believe this information kit provides important and valuable information for intending and existing growers.

This publication was last revised in 2004. The information is not current and the accuracy of the information cannot be guaranteed by the State of Queensland.

This information has been made available to assist users to identify issues involved in subtropical banana production. This information is not to be used or relied upon by users for any purpose which may expose the user or any other person to loss or damage. Users should conduct their own inquiries and rely on their own independent professional advice.

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Queensland Government



Before you **START**

If you have never grown subtropical bananas before, you will find this section very useful. It is a checklist of the things you need to know before you start. It will help you make the right decision about growing subtropical bananas. The information here is brief and to the point. We provide more detail on important areas in other chapters. Symbols on the left of the page will help you make these links.

Introduction to the Australian banana industry

Australia grows about 15 000 ha of bananas in Queensland, northern New South Wales, around Darwin in the Northern Territory, and Kununurra and Carnarvon in Western Australia. The Northern Territory and Western Australia supply about 3% of the national crop.

In Queensland, the main banana producing areas are the wet tropical coast in the north, the Atherton Tableland and the subtropical coastal belt in the south. In New South Wales, Coffs Harbour and the Tweed Coast Basin are the biggest banana producing regions. The subtropical industry extends from Rockhampton in Queensland to the Coffs Harbour, Woolgoolga and Nambucca Heads areas in New South Wales. The majority of Australian production comes from north Queensland, mainly from the Innisfail and Tully districts. Since the 1970s, the trend has been towards a rapidly expanding north Queensland industry and a shrinking subtropical industry.

Table 1. Distribution of varieties in tropical and subtropical areas (hectares)

	Cavendish	Ladyfinger	Other varieties
Subtropical total area			
4436	2967	1341	128
Tropical total area			
10552	10147	230	175



Characteristics of main varieties
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Ninety-five percent of bananas grown in Australia are Cavendish types; the Williams variety is the most popular. Mons Mari variety is very common in southern Queensland along with small areas of Grande Naine, grown mainly in north Queensland.

About 1571 ha of Ladyfingers are grown in Australia, mostly in New South Wales, southern Queensland and on the Atherton Tableland in north Queensland. There are about 101 ha of Goldfinger and 131 ha of Ducasse as well as much smaller areas of varieties including Sucrier, Pacific Plantain and Red Dacca. Some specialty niche market varieties are grown but their production is minor. The north Queensland industry is based almost entirely on Cavendish varieties grown on relatively flat land using a high degree of mechanisation.

In the subtropical areas, the industry is based on a mixture of varieties including Cavendish, Ladyfinger and the relatively new Goldfinger and Bananza. In many subtropical production areas plantations are often established on steeper slopes to ensure freedom from frost. These steeper slopes, which prevent mechanisation, mean that there is often a large degree of manual work required to manage and harvest subtropical bananas.

Under good management, Cavendish bananas generally produce a much higher yield per hectare than other varieties. Top quality Ladyfinger bananas commonly obtain much higher prices but production is limited by the destructive Panama disease (*Fusarium wilt*), for which there is yet no effective cure. Goldfinger is resistant to Panama disease and other diseases, but is still establishing its market niche. Bananza also has resistance to Race 4 Panama disease.

Because of the existence of the destructive diseases banana bunchy top virus and Panama disease, the industry is carefully regulated; all banana planting material must have an inspector's approval. We recommend using tissue cultured plantlets over conventional planting material because of their pest and disease-free status to establish clean blocks.

Fruit is harvested all year round, with peak production in the summer months and is marketed mainly in the metropolitan wholesale markets of Brisbane, Sydney, Melbourne and Adelaide. Fruit is consigned to market in a hard green condition and artificially ripened with ethylene gas prior to sale. This is a specialist operation usually performed by marketing agents who only sell bananas. At this stage, there is little export of bananas occurring.

Know what you are getting into

Subtropical banana production has declined from an 80% share of total Australian production in the early 1970s to less than 25% today. Expansion in the tropics at the expense of subtropical production regions reflects competitive advantages in environment, which may result in higher yields of more consistent quality fruit. Reasons for the northern drift of the industry include:

- The tropical climate enables faster plant growth and a quicker bunch cycle, meaning that average yields are up to 40% higher than subtropical areas.
- The crop is grown on relatively flat land enabling a high degree of mechanisation and lower production costs. This contrasts with subtropical areas where bananas are grown on steep slopes in some areas to avoid frost.
- North Queensland has been able to produce long lines of uniform product that supermarkets in particular demand. The market generally pays up to 15–20% more for north Queensland fruit because of its reputation for consistent appearance and size.
- The large farms in north Queensland benefit from economies of scale and can operate successfully on a low margin per carton of fruit sold. A 200 hectare farm can be much cheaper to work per hectare than a 5 hectare farm.
- Major improvements for transportation of the product from north Queensland to southern markets include roads, refrigerated road transport and palletisation.

However, north Queensland growers face a higher risk of damage from tropical cyclones, which in the past have devastated large areas of the tropical industry.

Despite the trend towards tropical production, the subtropical industry remains a significant and important part of the Australian banana industry. Its main advantages are:

- Subtropical bananas are thought by many consumers to have a sweeter, better flavour than tropical bananas.
- The smaller fruit produced in subtropical conditions is suited to consumer needs.
- The subtropical climate is well suited to production of acid sweet varieties for example, Ladyfinger, Goldfinger and organic bananas for niche type markets.
- Production areas are closer to the main markets, reducing transport costs.

- Because of the lower risk of damage from cyclones, there is a significant price bonus when the tropical industry is decimated by a major cyclone, which historically occurs every five to seven years. Whilst these occurrences may result in temporary higher returns for subtropical growers they should not be relied upon to maintain profitability.
- There are generally less problems with leaf diseases in the drier subtropical areas than the wet, humid tropical areas.

In addition to these advantages over tropical banana growing, there are some advantages for bananas over other crops. In particular, the crop can be grown on steep slopes with shallower soils that have little alternative agricultural use. For the new grower, the crop is also a little more forgiving in the learning cycle as it lacks the highly intensive management requirements of most other tree and plantation crops.

There are several constraints, however, to successful subtropical banana production. Here are the important things you need to know.

- The steep slopes used to gain winter warmth and avoid frost, limit the amount of mechanisation possible meaning that banana growing is physically very hard manual work.
- Again, because of the steep slopes and the lower mechanisation, the production costs are higher making it difficult to compete with north Queensland producers.
- Steep slopes also greatly increase the soil erosion risk. Plantations and roadways need to be laid out very carefully and soil conservation structures regularly maintained.
- Market prices, particularly for Cavendish, fluctuate greatly, often falling below the cost of production. It is often only when cyclones decimate the north Queensland crop that good returns are possible in subtropical areas. Returns will also depend heavily on fruit being produced and marketed under approved quality management systems. Prospective growers should see this as an essential goal.
- The uncertain returns from subtropical bananas requires growers to have minimum exposure to loan borrowings, as repayments may be difficult during lean times. Alternatively, growers would need capital reserves, off-farm or other farm income to supplement their return from bananas.
- Subtropical bananas are subject to the serious diseases banana bunchy top virus and Panama disease that often cause significant plant and production losses. Panama disease is a particular problem for the Ladyfinger variety and the widespread presence of the disease effectively precludes its use in most of the banana growing areas in northern NSW and southeast Queensland. There is as yet no effective

cure for banana bunchy top virus or Panama disease. However, bunchy top has been successfully managed on a regional basis using a systematic program of removing infected plants.

What variety should I grow?

Success in subtropical banana growing depends very much on selecting a good quality, disease free site and then carefully managing the crop to ensure the production of premium quality, blemish free fruit. This only comes with considerable experience. Emphasis may also need to be given to growing varieties such as Ladyfinger and Goldfinger, which are considered more appropriate for subtropical regions.

Before embarking on growing subtropical bananas, take time to research the subject thoroughly. Examine potential markets and their requirements and quality standards, and thoroughly check market price and throughput information. Be cautious about unsupported claims of economic performance and do a thorough business plan.

What you can expect to make

Yields

Yields for non-irrigated Cavendish plantations range from 500 to 3000 cartons/ha/year. Bunch size can vary from 10 to 30 kg or more (less than 1 to more than 3 cartons). Management practices, plantation layout, plantation age, pest and disease incidence and seasonal variations can affect yield. The average expected yearly yield is between 1500 and 2000 cartons/ha. A figure of 1540 cartons/ha is commonly used as an industry standard. Yields are best on warmer, north facing slopes.

Yields for irrigated Cavendish plantations can be about 50% higher than those for non-irrigated plantations.

Yields for Ladyfinger plantations vary from 300 to 1000 cartons/ha/year assuming a bunch size of around 12 kg (1 carton). The average expected yield is between 500 and 750 cartons/ha/year. Ladyfinger bananas can be grown without irrigation but good yields are more reliable under irrigation.

Prices

Prices for bananas vary widely depending on demand, supply and fruit quality. The general range for Cavendish prices in the Brisbane and Sydney wholesale markets is \$5 to \$25 per carton. Prices at the higher end of the range are generally achieved only when there is serious dislocation to the northern supply. These market prices represent the range of Cavendish bananas from both tropical and subtropical areas.



Gross margin tables
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Note that the average price for subtropical fruit would normally be lower than the average price for tropical fruit. There is a price premium for tropical north Queensland Cavendish of 15 to 20%, as shown in Figure 1.

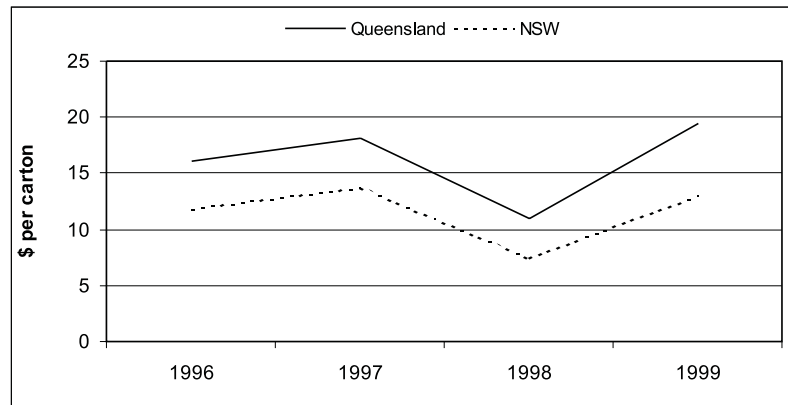


Figure 1. Average price for Cavendish bananas from NSW (subtropical) and Queensland (mainly tropical) at the Brisbane Market 1996 to 1999

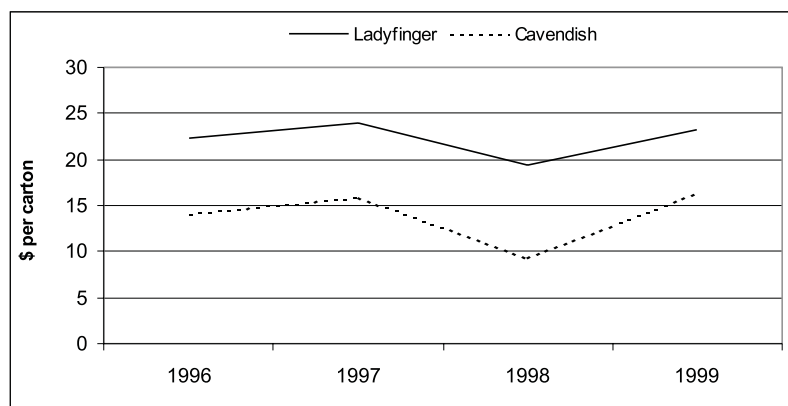


Figure 2. Average prices for Ladyfinger and Cavendish bananas from NSW and Queensland combined at the Brisbane Market 1996 to 1999

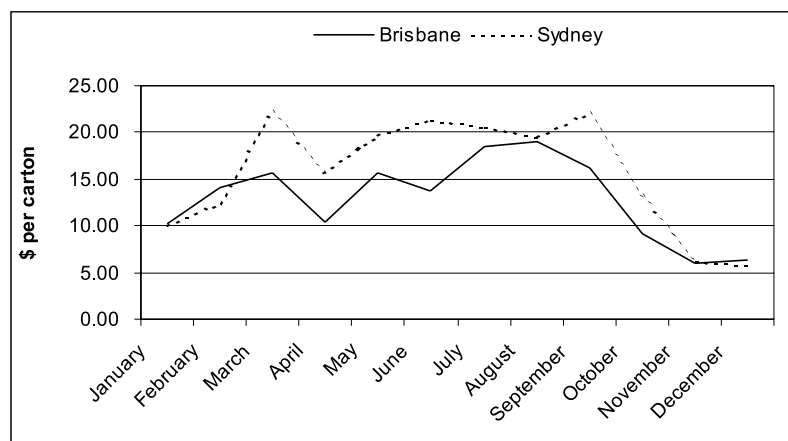


Figure 3. Average price for subtropical Cavendish bananas at the Brisbane and Sydney markets in 1999

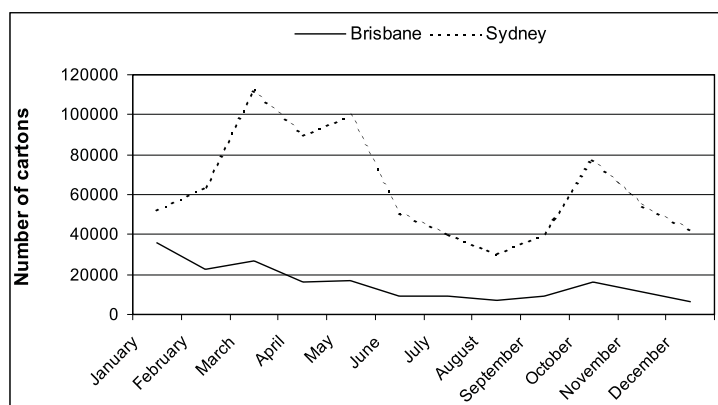


Figure 4. Average throughput for subtropical Cavendish bananas at the Brisbane and Sydney markets in 1999

Prices for Ladyfinger range from \$10 to \$27 per carton depending upon the time of year and quality and are more consistent than Cavendish prices because of the limited supply of Ladyfinger.

Figure 2 shows the average price over the whole year for Ladyfinger and Cavendish fruit for the years 1996 to 1999. There is only a limited correlation between supply and price for Cavendish fruit. Figures 3 and 4 show price and throughput for subtropical fruit in the Brisbane and Sydney markets.

Production costs

Based on a production unit of about four to six ha, yearly production costs for non-irrigated Cavendish are estimated to be about \$13 000 / ha or about \$8.30 /carton. For Ladyfinger, yearly production costs are about \$6 000 /ha or about \$11.00 /carton. These include all growing and marketing costs such as fertilisers, sprays, bunch covers, cartons, marketing fees, fuel and casual labour but do not include the grower's own labour, fixed costs such as rates, taxes, depreciation and interest on loans. Production costs for irrigated Cavendish plantations, are estimated to be about 25% higher because the high planting density requires greater inputs, and the plants need to be pruned or tied.

Income

Income after production costs for non-irrigated Cavendish is almost negligible for the average farm situation. Growers need above-average management skills to operate farms larger than six ha to be profitable, or need to supplement the banana income from other crops or off-farm. Although the gross margin figure for irrigated Cavendish is significantly better, it does not take into account the overhead costs of the irrigation system. When these are considered, it is also a marginal economic proposition on average figures.

The capital you need

Excluding the cost of house and land, you would need about \$100 000 to establish a six ha plantation. This includes the cost of basic machinery such as a sprayer and fertiliser spreader, a small packing shed, a second-hand four wheel drive tractor, utility vehicle, land preparation and plant establishment.



The farm you need

Soil

Soils should be well drained with no heavy clay or rock shelves within 50 cm of the surface. Clay loams are preferred. Sandy soils are less suitable as they dry out rapidly, lose nutrients quickly, fail to provide adequate root anchorage in windy weather, have low nutrient retaining ability and are susceptible to serious erosion.

If bananas have previously been grown in the soil, you need to check if Panama disease was recorded. This is vital if you are contemplating growing Ladyfinger because of its susceptibility to this disease.

HINT

Steep slopes may be subject to land clearing restrictions in some regions, check with your local council.

Slope

Slopes up to 15% are preferred as machinery can be operated safely and this allows a range of layout options while minimising soil erosion. However, slopes up to 30% can be used provided in-fall access roads are cut to manage runoff and facilitate access for spraying and harvesting equipment. This type of layout requires expert assistance in design and construction and is expensive to both develop and maintain.

Aspect

Slopes facing north and north-east are preferred as these are warmer and better protected from damaging south-easterly and westerly winds. Windbreaks are recommended on all sites as banana plants with poorly developed root systems are susceptible to wind blowdown. If the root system is healthy, usually wind will bend the plants rather than uproot them. Damage to roots and stem bases by nematodes and banana weevil borer will contribute to uprooting or plants falling over.

Climate

As bananas are susceptible to frost damage, they should only be grown on warm, sheltered, frost-free sites. Injury to the plant begins when the temperature drops below 13°C.

Water

At least 1250 mm of annual rainfall is desirable, preferably spread evenly throughout the year. Irrigation is therefore recommended to supplement rainfall during the normally dry winter, spring and early summer months in subtropical Australia. A water storage reserve of 6 to 10 ML/ha is considered suitable to maintain production in very dry years. Water salinity should not exceed 0.6 deciSiemens per metre (dS/m).

HINT

Test salt content of water before buying a farm

The machinery and equipment you need

Small plantations may reduce capital costs by sharing equipment with neighbouring farms and by buying second-hand equipment. Essential equipment for a small banana plantation includes:

- knapsack sprayer or microsprayer for weed control
- blower-mister (powered knapsack) for leaf spraying
- protective equipment for use when spraying
- a lockable chemical storage area
- 4WD utility or tractor and trailer or carry-all for transport of fruit
- padded trailer with an A-frame for transport of fruit on utility or trailer
- packing shed with basic washing and packing equipment including scales
- sundry tools such as cane knives, desuckering shovels, extension ladder, bunch covering tool, bunch pads
- PTO operated airblast sprayer for leaf disease control (if slopes are not too steep to prevent use of this type of machinery)

Optional equipment:

- tractor attachments such as a grader blade and rippers for land preparation and track maintenance
- more sophisticated packing equipment such as a packing wheel, packing lines, carton gluing or stapling equipment
- an irrigation system
- roller conveyor
- fertiliser spreader

The labour you need

An experienced grower can manage approximately four hectares of Cavendish or six hectares of Ladyfinger without permanent or significant casual labour. A small amount of casual labour at peak harvesting and packing times may be necessary.

Other considerations

Harvesting and farm operations

As bananas produce fruit all year round, there are no significant seasonal breaks. Heavy, manual labour is involved in almost every aspect of production. Harvesting bananas on steep slopes involves cutting heavy bunches and manhandling them to the utility or trailer used for bunch transport. Particular care and training is needed to avoid injuries to workers and damage to fruit.

Major plantation operations include planting, fertilising, weed control, desuckering, detrashing, pest and disease monitoring, spraying, bunch covering, harvesting and packing. Cavendish bananas also need propping or tying. To be profitable, these operations should be integrated into a timely, well-managed program requiring a good understanding of the banana growth cycle and good organisational skills. Pest and disease management may involve regular monitoring requiring skills in pest and disease identification.

Marketing

In a modern horticultural business, an understanding of marketing and a commitment to quality throughout the entire production and marketing system are essential. This involves regular communication with people in the market chain and a willingness to work with other growers in cooperative marketing ventures.

To be successful, the orchard must be run as a business. This is a complex operation requiring many skills including business planning, bookkeeping and maintaining farm records. As production and marketing technology changes, it will also help if you are prepared to experiment with new ideas. There are several options for marketing your fruit. They include:

- individual growers, grower groups or cooperatives selling direct to central produce markets in Australia's major cities;
- direct selling to major city chain stores and fruit barns;
- selling locally.

Traditionally growers send fruit to their preferred agent for sale but cooperatives and marketing groups have started so that growers can play a bigger role in the marketing of their fruit.



Marketing
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