

# Mango information kit

Reprint – information current in 1999



## REPRINT INFORMATION – PLEASE READ!

For updated information please call 13 25 23 or visit the website [www.dpi.qld.gov.au](http://www.dpi.qld.gov.au)

This publication has been reprinted as a digital book without any changes to the content published in 1999. We advise readers to take particular note of the areas most likely to be out-of-date and so requiring further research: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](http://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- Financial information—costs and returns listed in this publication are out of date.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.dpi.qld.gov.au](http://www.dpi.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 1999. 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 the production of mangoes. 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.

While every care has been taken in preparing this publication, the State of Queensland accepts no responsibility for decisions or actions taken as a result of any data, information, statement or advice, expressed or implied, contained in this publication.



Queensland Government



# *Before you* **START**

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

## Contents

An overview of the Queensland mango industry .....	2
The mango tree .....	2
Know what you are getting into .....	3
What you can expect to make .....	3
The capital you need .....	5
The farm you need .....	6
The machinery and equipment you need .....	7
The labour you need .....	8
Other considerations .....	8

## **An overview of the Queensland mango industry**

Queensland grew about 7000 ha of mangoes in 1997–98, producing about 34 000 tonnes of fruit worth \$58 million. Production areas are spread from Cooktown in the north, west to Georgetown and south to the Gatton and Esk districts. They include the Atherton Tableland, Burdekin, Bowen, Rockhampton, and some drier areas of south Queensland around the Coastal Burnett, Gympie and the Sunshine Coast. The Burdekin and the Atherton Tableland dominate the industry in planted area and current production. Mango production is predicted to continue growing over the medium term as the large number of young trees already planted come into full production.

Kensington Pride is the main variety, making up 80% of current plantings and 90% of the fruit marketed. This variety, due to its unique flavour, dominates the Australian industry though it is not grown in any other country. It is sensitive to cold and is very susceptible to diseases and skin disorders.

Varieties that mature later than Kensington Pride, such as R2E2, Keitt, Kent, Palmer and Brooks, account for half of new plantings. These varieties are grown to extend the seasonal availability of mangoes for the domestic and export markets. Varieties such as Keow Savoey and Nam Doc Mai fit into niche markets.

The Queensland mango harvest starts in north Queensland in late October and ends in southern areas in early April. Most of the fruit is sold in the main domestic markets of Brisbane, Sydney, Melbourne and Adelaide but about 10% is exported overseas, mainly to Singapore, Hong Kong and Japan. Quarantine restrictions for mango seed weevil exclude fresh Queensland mangoes from Western Australia.

A small percentage of production is processed into canned mango, mango juice and a wide range of mango-flavoured products. The processing industry is expanding its markets within Australia and overseas and new products such as frozen, minimally processed fresh fruit and dried products are being developed.



Mango varieties  
Section 4 page 22

## **The mango tree**

The mango is a tropical evergreen tree that is suitable for areas with cool dry winters and hot wet summers. It grows vigorously and flowers and fruits on the terminals. The mango tree flowers in late winter and is harvested in summer. It then produces several vegetative flushes before entering a semi-dormant period in late autumn or winter. Mature trees can grow to 25 m but in most commercial orchards trees are pruned to 3.5 to 4.5 m high. Trees are long-lived (orchards in the Bowen area are over 40 years old) but have a tendency to become biennial bearing.



About the mango  
Section 4 page 2

## Know what you are getting into

New growers are attracted to mangoes by the perception of good returns on the domestic market, especially during the early and late production times when less fruit is produced. Mangoes are also regarded as an easy crop to grow. However, it takes excellent management skills in growing, packing and marketing to be a successful grower.

Here are some of the important things you need to know before you decide to grow mangoes.

- Increasing domestic production has resulted in falling prices and, due to the seasonal nature of the crop, limited opportunities for expanding domestic consumption. The industry is focused on increasing exports of fresh and processed products to overcome the expectation of gluts on the domestic market as production continues to expand.
- The variety Kensington Pride is sensitive to climatic conditions that will result in irregular production. It is risky to depend on this variety alone unless you have a climatic niche that suits it well.
- The harvest and postharvest handling of the crop is complex because the fruit is susceptible to postharvest disease and is easily damaged by careless handling after harvest. Careful postharvest handling, including fruit handling systems, disease control, ripening and temperature management, is critical to maintain fruit quality.
- Mangoes grow into large trees that are difficult to manage and harvest. You must be prepared to prune and shape trees regularly to manage tree height.
- Mangoes are susceptible to Queensland fruit fly and diseases such as anthracnose, stem end rot and bacterial black spot, which are worse in areas with wet spring weather. As these diseases can wipe out the whole crop, systematic and thorough application of fungicides with suitable spray application equipment is required.

more info



Postharvest handling  
Section 3 page 39

more info



Disease control  
Section 3 pages 30

For these reasons, prepare a thorough business plan before you decide to grow mangoes. Talk to technical experts and leading growers to become familiar with the complex management of the crop.

## What you can expect to make

### Yields

The potential yield of a mango tree depends on its size, tree spacing and your management. In an orchard where trees are heavily pruned and not allowed to exceed a height of 4.5 m, the average marketable yield of a mature tree is 70 kg of fruit per year. This yield may be achieved between the sixth and eighth years, depending on management of the trees, but could take as long as 10 years in the subtropics.

Trees start to bear in the third year after planting, when you can expect to pick about 10 kg of fruit per tree.

The mango is subject to cyclic annual variation in fruiting and this makes prediction of yields difficult (Table 1). Good tree management practices can reduce this variation.

**Table 1.** Mango yields (Kensington Pride) with age of trees

Tropics		Subtropics	
Age (years)	Average yield (kg/tree) 9 m x 6 m spacing	Age (years)	Average yield (kg/tree) 9 m x 6 m spacing
0 - 4	0 - 10	0 - 3	0
5 - 8	10 - 120	5 - 10	20
8 - 12+	20 - 200	10+	35 - 70

Other mango varieties may require different tree spacings and return different yields, so seek expert advice before anticipating yields from your plantation.

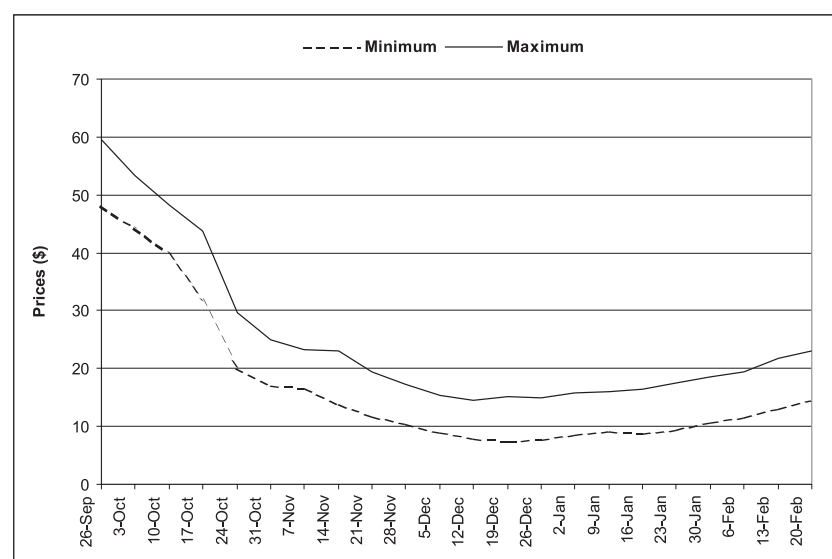
## Prices

Prices will vary throughout the season depending on the volume of fruit on the market, quality and demand. During the main production time an average price of \$10 to \$14 per 7 kg tray can be expected, though prices up to \$17 can be realised for outstanding quality fruit, while poor quality fruit may return only \$4 per tray.

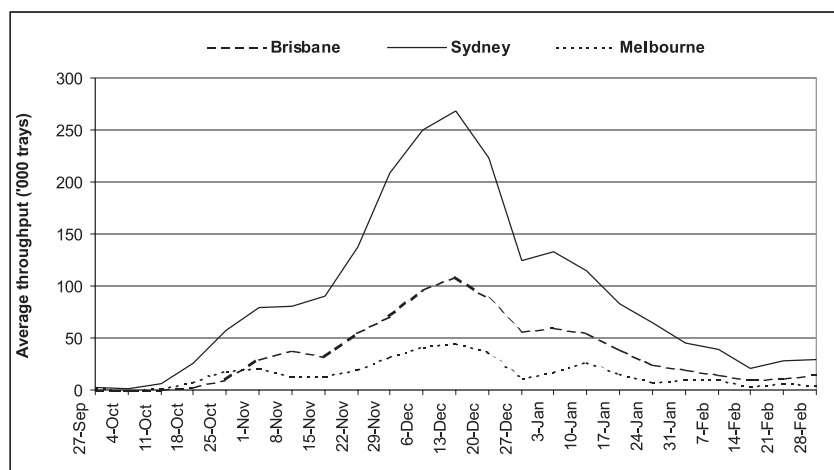
Early and late season fruit throughout the state can sell for between \$20 and \$30 per tray. Figure 1 shows average maximum and minimum prices for the 1997–98 seasons for all markets combined. Figure 2 shows throughput on the Brisbane, Melbourne and Sydney markets from 1991 to 1997.



Market price  
information  
Section 6 page 12



**Figure 1.** Average maximum and minimum prices for the 1997–98 season for all markets combined



**Figure 2.** Average throughput in trays on the Brisbane, Sydney and Melbourne markets between 1991 and 1997

### Production costs

Production from the orchard in the first five years is low and the variable operating costs (fertilisers, insecticides, fungicides, herbicides, pruning, labour and machinery) will increase from \$2 to \$11 per tree.

Costs from the sixth year increase rapidly due to harvest, postharvest handling and marketing costs, which are the major production costs. The preharvest costs rise to about \$18 per tree with harvesting costs nearly \$70 for a tree yielding an average of 12 trays.

Harvesting and marketing the crop will cost about \$125 000 a year for a 19 ha orchard. Fixed costs such as repairs and maintenance, rates and administration and an allowance for the owner-operator will add another \$55 000 to orchard costs.

### Gross income

At an average marketable yield of 2232 trays per hectare and an average price of \$14 per tray, the gross return would be \$23 250 per hectare. This figure takes into account that some fruit will be sold as second grade and some to processing at lower prices than the \$14 average for first grade. To arrive at your net income, deduct about \$20 000 for growing and marketing costs, plus fixed costs such as rates, depreciation and electricity.

### The capital you need

Table 2 is a guide to the amount of money needed to develop mango orchards ranging in size from 2 to 50 ha, assuming that 185 trees are planted per hectare.



Economics  
Section 4 page 15



**Table 2.** A guide to the capital needed to develop different sized mango orchards (185 trees/ha)

Area (ha)	Cost (\$)
2	125 000
10	174 000
20	560 000

These figures include the capital costs of trees, irrigation, fencing, machinery and setting up a packing shed, not the cost of a house or land.

## The farm you need

### Soil

Mango trees grow best on light, well-drained soils with reasonably low fertility. Avoid highly fertile soils because trees on these soils develop very poor fruit colour. Heavy soils should also be avoided because trees grow slowly and rain at harvest can cause problems with machinery access.

### Slope

Slopes of up to 15% are suitable provided the orchard is designed to minimise soil erosion. Avoid slopes greater than 15% as they present a major erosion risk and make it difficult to operate machinery safely. A good grass cover should be maintained in the interrow.

### Climate

Mangoes prefer warm wet summers followed by a cool dry winter and spring. A dormant period during winter is essential to initiate flowering. Dry weather is preferred from the end of April to harvest, but supplementary irrigation is needed.

Heavy frosts can kill trees but damage from light frosts on young trees may not be noticed for several months. Damage from light frosts shows up as rotting bark near the base of the tree.

Temperatures below 12°C during flowering can affect pollination and result in fruit without a seed. These fruit, often called nubbins, will drop before they become fully mature.

The most favoured areas for mango production include the coastal dry tropics between Bowen and Townsville, the drier areas of the Atherton Tableland and Rockhampton, and some drier areas of south Queensland.

### Wind

Wind damage in mangoes results in skin blemishes on maturing fruit and also predisposes the fruit and leaves to severe bacterial diseases. Always include effective windbreaks in mango orchards.

### Water



Growing the crop  
Section 3



Irrigation from flowering to harvest greatly increases fruit set and size in mangoes. A mature tree may need up to 2000 L of water per week during this period if it coincides with a hot dry spell.

Mangoes can tolerate more saline water than most other tree crops, but water with a salinity (electrical conductivity) greater than 2 deciSiemens per metre (dS/m) should be avoided.

## **The machinery and equipment you need**

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This is the basic machinery and equipment you will need to operate a 10 ha mango orchard:

### **Tractors and vehicles**

- 60kW tractor
- utility

### **Implements**

- single tyne ripper
- trailer
- slasher
- fertiliser spreader
- orchard sprayer
- boom spray herbicide applicator
- harvest aid (depending on the harvesting system you choose)

### **Irrigation**

- pumping equipment
- mainlines and lateral lines
- under-tree sprinklers

### **Equipment**

- pruning equipment
- harvesting equipment (secateurs, crates)

### **Buildings**

- machinery shed and workshop
- chemical storage shed
- packing shed (includes fork-lift, packing and grading equipment and a cold room). This is optional. Some growers use central packing sheds.



## **The labour you need**

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One person could manage the routine operations on a 10 ha orchard, but extra casual labour would be needed for harvesting, packing and pruning an orchard of this size. Routine operations include fertilising, pest control, interrow slashing and irrigation.

Depending on yield and the combination of varieties in your orchard, up to ten casual staff will be needed for harvesting, packing and pruning. A 10 ha orchard would take about three weeks to pick.

Mangoes have a concentrated harvest period and large quantities of fruit must be handled in a short time. This requires good organisational skills and the ability to manage casual labour effectively.

## **Other considerations**

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Growing and marketing mangoes successfully requires commitment. You will need to manage nutrition, irrigation, and pest and disease control effectively to produce regular crops of high quality fruit.

Mango markets can be oversupplied quickly, so you will need to develop a marketing strategy to send fruit to the most appropriate interstate or overseas market. You will also need a commitment to quality if you wish to obtain the best price for your fruit. An involvement in a marketing group may be an advantage to growers who are inexperienced in the marketing of their fruit.

An ability to operate and maintain machinery, and to read and understand chemical labels, is essential. Careful attention to detail, and the ability to recognise and treat problems early, is necessary to be a successful grower.