

Low chill stonefruit information kit

Reprint – information current in 1998



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 1998. We advise readers to take particular note of the areas most likely to be out-of-date and so requiring further research: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- Financial information—costs and returns listed in this publication are out of date.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 1998. 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 low chill stonefruit 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.

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 low chill stonefruit before, 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 low chill stonefruit.

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 low chill stonefruit industry	2
Know what you are getting into	2
What you can expect to make	3
The capital you need	6
The farm you need	6
The machinery you need	8
The labour you need	9
Other considerations	9

An overview of the low chill stonefruit industry

Australia grows about 2000 ha of low chill stonefruit. Over half is grown in New South Wales, the main production areas being the North Coast, the Central Coast and the Outer Sydney region. Queensland is the second most important producer, growing about 20% of Australia's crop. Major production areas are the North and South Moreton, the Burnett region, the Granite Belt and the Atherton Tableland. Most of the remaining Australian production comes from the Sunraysia and Swan Hill districts in Victoria; the Riverland in South Australia; and around Carnarvon, Gingin and Perth in Western Australia.

Before the 1980s, the main production of stonefruit was restricted to varieties requiring high chilling and grown in the colder, temperate areas of Australia. Production from these varieties was concentrated from December to February. However, the introduction in the 1970s of improved low chill varieties from Wayne Sherman at the University of Florida, revolutionised the Australian stonefruit industry. These varieties enabled good quality fruit to be grown in warmer climates with out-of-season production from September to December.

Peaches and nectarines, with smaller areas of plums, are the main low chill stonefruit grown. Apricots are not yet grown to any extent because of the lack of suitable varieties. All major commercial varieties grown originate from the Florida low chill stonefruit breeding program.

Trees are grown in orchards from grafted or budded nursery trees. Harvesting starts in September but the main production is from mid-October to the end of November.

Most fruit is consigned to the metropolitan wholesale markets in Brisbane, Sydney, Melbourne and Adelaide. Smaller quantities are marketed in Perth and Hobart. A small but increasing quantity is exported.

Know what you are getting into

Low chill stonefruit is seen as an attractive proposition because it offers growers a quick return compared with other tree crops and good profitability from a small area of land. However, there are several constraints to converting these advantages into a profitable business. Here are the important things you need to know.

- Low chill stonefruit is a highly labour intensive crop. Trees need to be pruned two to three times a year; fruit needs to be hand thinned once or twice a season; harvesting is demanding for a few months; and pest management, including spraying, requires year-round attention. You need to be well organised and skilled in labour management to cope with these needs.
- The crop is generally more difficult than other tree crops to understand and manage. Trellising, tree training, pruning, fruit thinning, use of growth retardants, and pest and disease manage-

ment are just some of the complex operations required. Success will depend on quickly learning these management skills and putting them into practice.

- Stonefruit is highly susceptible to a wide range of insect pests and diseases. Some of these are difficult to identify and control. If pests and diseases are not managed properly, there will be a significant reduction in fruit yield and quality. Successful production requires frequent spraying and skills in identifying and managing the range of important pests and diseases.
- The September to November cropping season for low chill stonefruit increases the risk of significant crop loss. Late frosts may damage flowers and developing fruit. Maturing fruit is then exposed to wind and hail damage from seasonal storms in spring and early summer. At this time, there is also a high risk of damage from birds and flying foxes. This period often coincides with a food gap in the preferred native plant food sources of these animals. The risk from birds and flying foxes makes it essential to totally net the orchard. This requires a considerable capital investment.
- Current large plantings will result in a large increase in production with potentially lower prices on the domestic market. While export markets may grow enough to absorb the extra production, many markets are still largely untested, making future prices and returns uncertain. Future prices will also depend increasingly on fruit quality. Success will only be assured when fruit is produced and marketed under some system of quality control. Prospective growers should see this as an essential goal.



Before embarking on low chill stonefruit, take time to research the subject thoroughly. Examine potential domestic and export markets, and thoroughly check market price and throughput information as well as variety and fruit quality standards. Be cautious about extravagant claims of economic performance and do a thorough business plan.

What you can expect to make

Yields

Yields need to be considered in relation to tree density. For close planted trees on a palmette system (800 to 1000 trees per hectare), average yields for an early variety such as Flordaprince peach range from about 15 to 25 kg per tree at maturity in about the fourth year. For wide planted trees on an open vase system (500 to 700 trees per hectare), average yields for Flordaprince range from about 25 to 35 kg per tree at maturity. Using these figures, a mature orchard under either system should be expected to produce about 15 to 20 tonnes per hectare per year. Average yields for later maturing varieties such as Flordagold are generally higher, ranging from about 25 to 30 tonnes per hectare per year.

Prices

Prices for low chill peaches generally range from \$15 to \$20 per single layer tray for early season fruit in August–September to about \$8 to \$12 per tray in the peak of the season during October–November. Prices for low chill nectarines are generally slightly higher overall, ranging from about \$18 to \$25 per single layer tray in August–September to \$10 to \$15 per tray in the peak of the season during October–November. Prices for Gulf Ruby plums generally range from \$20 to \$25 per nine-litre carton at the start of the season in September to about \$10 to \$15 per carton when the variety ends in November.

Graphs of average prices for the Brisbane and Sydney wholesale markets for the 1994 to 1996 seasons are shown in Figures 1 to 3. Graphs of average monthly throughputs for the Brisbane wholesale market for the same period are shown in Figure 4.



Market price
information
Section 6 page 10

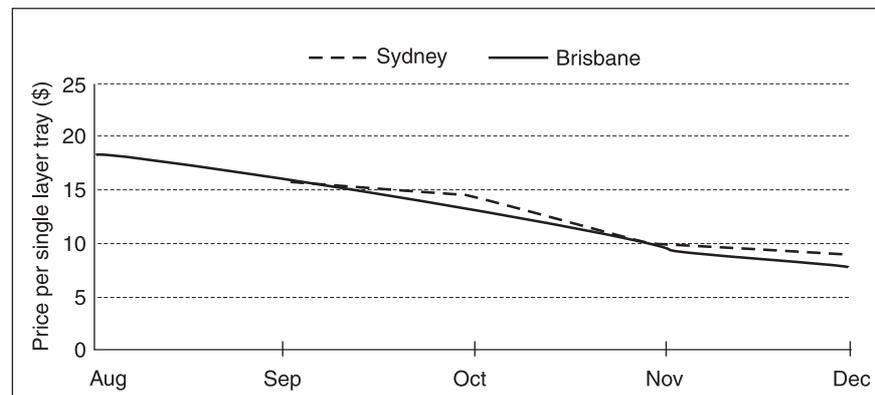


Figure 1. Average monthly prices for low chill peaches at the Brisbane and Sydney markets 1994 to 1996

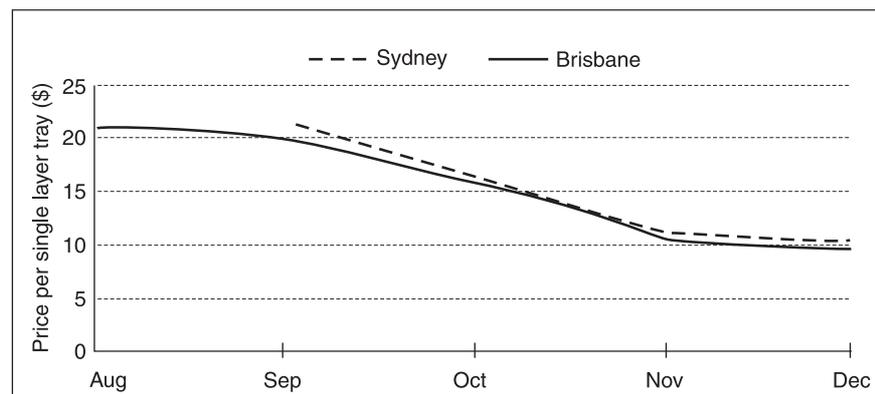


Figure 2. Average monthly prices for low chill nectarines at the Brisbane and Sydney markets 1994 to 1996

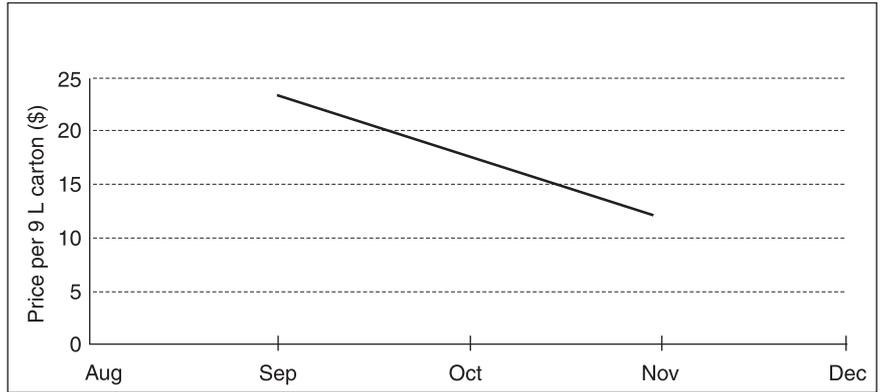


Figure 3. Average monthly prices for Gulfruby plums at the Brisbane market 1994 to 1996

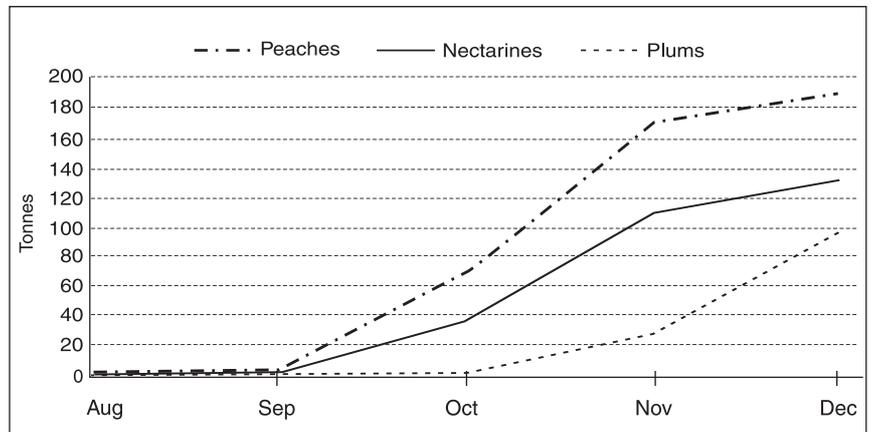


Figure 4. Average monthly throughput of low chill stonefruit at the Brisbane market 1994 to 1996

Production costs

Once the trees are planted, production costs range from about \$5000 per hectare per year in the first year to about \$30 000 to \$40 000 per hectare per year at maturity in the fourth year. These figures include all growing costs such as watering, fertilising, pest control, weed control, pruning, and fruit thinning, as well as marketing costs such as harvesting, packing and transport. The figures apply to a small orchard of up to four hectares where the farmer does most of the routine work such as spraying and fertilising, and employs casual labour for most of the pruning, fruit thinning, harvesting and packing. Fixed costs such as rates, taxes, depreciation and interest on loans are not included.

Gross margin and cash flow

No significant income is received until the second year. Annual income from sale of fruit then quickly exceeds annual production costs to reach a gross margin (proceeds from sale of fruit less production costs) in a mature orchard after the fourth year of about \$20 000 to \$25 000 per hectare per year. These figures are based on a netted orchard on a



palmette system yielding about 20 kg per tree and fetching an average price of about \$12 per tray.

When capital costs and fixed or overhead costs such as permanent labour, rates, insurance, repairs and depreciation are also considered, total expenses are greater than income each year until about the fourth year. Accumulated expenses can be expected to exceed accumulated income until about the eighth or ninth year. These figures suggest that the minimum size for a viable low chill stonefruit farm is about three hectares.

The capital you need

Excluding the cost of house and land, a new grower would need about \$150 000 to establish a four hectare, low chill stonefruit orchard. This covers the cost of basic machinery, an irrigation system, a shed, land preparation and tree establishment. The figures assume some equipment including a tractor and utility are bought second-hand. A further \$90 000 is required in the second year to buy a cold room, basic packing equipment and orchard netting. Fruit grading equipment worth \$10 000 to \$15 000 is recommended in the fourth year.

Capital costs may be reduced by buying second-hand equipment or by joining a cooperative which has its own packing shed.



Capital costs
Section 4 page 12

The farm you need

Soil

Stonefruit trees prefer sandy loams, but any well drained soil without heavy clay or rock within one metre of the surface is acceptable. Poor drainage leads to reduced vigour, root disease, waterlogging and tree death. Where the topsoil is less than one metre deep, plant trees on mounds.

Light coloured soils are preferred as they often promote earlier fruit maturity. A soil pH of between 5.5 and 6.5 (1:5 water) is preferred.

Slope

Slopes of up to 15% are suitable provided the farm is designed to minimise soil erosion. Steeper slopes present a major erosion risk and make it difficult to operate machinery safely. Avoid these wherever possible.

Low-lying areas should be avoided where there is a danger of late frost or water accumulation.

Situation

A protected situation is considered essential to reduce fruit marking and allow better pest and disease control. A north to north-easterly aspect will provide protection from winds and maximise sunlight. A warm, well protected situation will also hasten fruit maturity. To maximise early maturity, plant early maturing varieties in the warmest sites.

Climate

Stonefruit trees require a certain period of rest or dormancy to produce fruit. This dormancy is induced mainly by exposure to periods of low temperatures. Temperatures that provide the chilling range from 2 to 12°C when recorded at mid-tree level. The required amount of exposure to these low temperatures to induce dormancy varies with the variety and is called the chilling requirement.

Low chill stonefruit varieties from the University of Florida program have a chilling requirement assigned to them and it is important that your farm has the climate to suit this requirement. Most low chill stonefruit varieties have chilling requirements within the range of 50 to 450 chill units.

The assessment of the amount of chilling received at your farm site is complex and is covered in more detail elsewhere in this kit. The easiest and best rule-of-thumb is to ascertain for your site the mean or average temperature of the coldest month (July in Queensland and New South Wales), and calculate the approximate chilling units from the graph in Figure 5.

Insufficient chilling leads to delayed and prolonged budburst. This results in uneven shoot development, flowering and fruit maturity, and, in extreme instances, bud shedding. Some varieties will set fruit under such conditions but fruit become more pointed and sutures are more prominent, reducing its quality.

If a variety's chilling requirement is satisfied too soon in a location susceptible to late frosts, the crop and tree may be damaged. Small green fruit are more susceptible to frost damage than the blossoms. Once buds have started growing, a frost below -2°C can damage the tree. Consequently, it is important that trees are planted on elevated sites with good air drainage to avoid spring frost damage.



Determining chilling units
Section 4 page 25

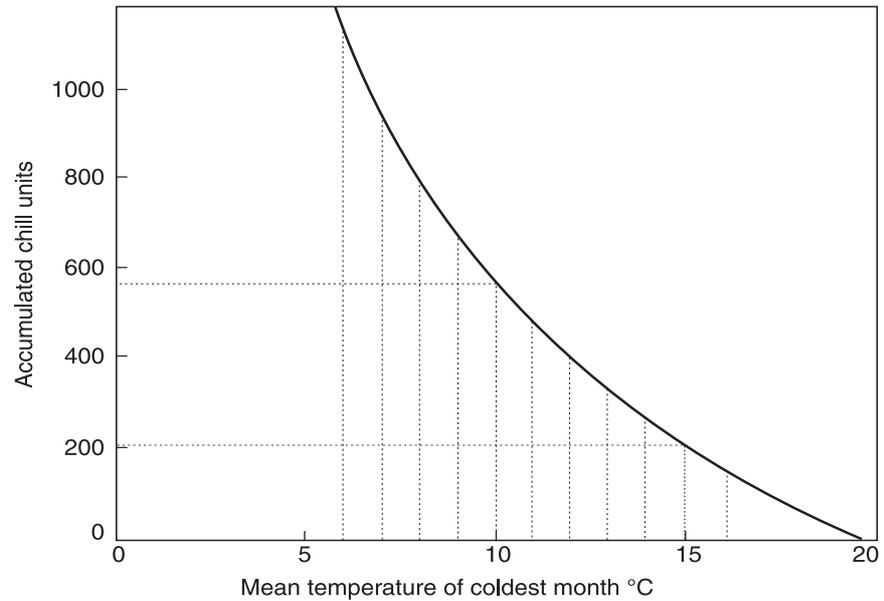


Figure 5. Relationship between the mean temperature of the coldest month (July in Queensland and New South Wales) and chilling units (George and Nissen chilling model)

Water supply

Irrigation is essential if high quality stonefruit is to be grown. In coastal areas with good summer rainfall, a water reserve of five to seven megalitres per hectare of mature trees is necessary to maintain production in a dry year. In drier inland areas, a reserve of up to 12 megalitres per hectare is recommended.

As low chill stonefruit is highly sensitive to salt, water salinity should not exceed 600 microSiemens per centimetre.

The machinery you need

Here is a list of the essential equipment required in the first year:

- tractor large enough to operate spray equipment and narrow enough to fit through the orchard if growing trees on the palmette system
- spray application equipment including a hydraulic pressure or airblast sprayer for pest and disease spraying and a separate knapsack or hand gun unit for weed sprays. Safety equipment to use when spraying is also required
- irrigation system (under tree sprinkler or trickle)
- utility
- slasher
- pruning equipment including secateurs, saws and loppers
- workshop and tools

- shed for storage of equipment, materials and later for packing
- chemical storage area.

Optional equipment includes:

- fertiliser spreader
- mulch spreader
- pneumatic/hydraulic secateurs
- cultivation equipment
- 4-wheel motorbike.

When fruit production begins in the second year, these items are also required:

- forced-air cold room
- picking equipment
- grading and packing equipment
- orchard netting for protection from birds, flying foxes and possibly hail.

Optional equipment includes:

- pruning or picking platform
- specialised grading equipment.

Small orchards can reduce capital costs by becoming part of a packing cooperative and by using second-hand machinery.

The labour you need

Two people can comfortably handle up to four hectares of low chill stonefruit without the need for permanent labour. However, casual labour will be needed for pruning, flower and fruit thinning, harvesting and packing. These operations need to be completed within relatively short periods, so the number of casual workers required may be high. Fruit thinning, the most labour intensive operation, is the peak casual labour need. For a four hectare crop, 10 to 15 casual workers may be needed to complete flower and fruit thinning within the appropriate two weeks.

Contract pruning and thinning services may be available in some areas, and these are an alternative to employing casual labour.

Other considerations

As production and marketing technology is changing rapidly, it will help if you are prepared to experiment with new ideas. An integrated crop management approach is recommended. This requires a willingness to either employ specialised consultants for pest monitoring and water management or to learn these monitoring systems yourself. High density palmette orchards require very high levels of management.

Stonefruit has a concentrated harvest period during which large quantities of fruit must be handled in a short period. This requires good organisational and labour management skills and the ability to train staff.

A knowledge of marketing and a commitment to quality throughout your entire production and marketing system are becoming essential if you wish to maximise your returns. Regular communication with people in the market chain, as well as other growers, is an integral part of this process.

To be successful, the orchard must be run as a business. This is a complex operation requiring many skills such as the ability to:

- interpret information supplied by pest management and irrigation consultants;
- interpret results of leaf tissue and soil analyses and correctly apply the recommended fertilisers;
- promote and develop markets for your product;
- monitor receipts and expenses and maintain good financial records.