

Sweet corn information kit

Reprint – information current in 2005



REPRINT INFORMATION – PLEASE READ!

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This publication has been reprinted as a digital book without any changes to the content published in 2005. We advise readers to take particular note of the areas most likely to be out-of-date and so requiring further research: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- Financial information—costs and returns listed in this publication are out of date.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 2005. 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 sweet corn 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 sweet corn before, then you will find this chapter 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 sweet corn. The information here is brief and to the point. We provide more detail on important areas in other chapters of the book. Symbols on the left of the page will help you make these links.

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An overview of the sweet corn industry

The sweet corn industry in Australia is dominated by the processing sector. Sweet corn is grown in central NSW, for freezing and canning, and in the Lockyer Valley in Queensland for canning. The Central West and Riverina districts of NSW produce more than 50% of Australia's sweet corn; the majority of it being processed. Approximately 55% of the Queensland tonnage is processed—about 13% of the value of the Queensland crop. The Victorian industry is now totally fresh market production.

In the year ending 30 June 2002, Queensland produced 38% of the Australian tonnage and 55% of the value (Source: ABS). Any growth in production will depend on access to export markets. Some increase in production for the domestic market is possible, however, over-production will rapidly occur. The fresh market (domestic and export) sweet corn industry, like most vegetable industries, has a small number of large growers who produce 80 to 90% of the product marketed.

The processing industry is different because the processing company contracts supply from a number of growers in different regions as close to the factory as is possible. This spreads the risks of crop loss from adverse weather conditions and allows a longer processing season by growing in districts with slightly different climates.

The industry was based on the domestic market until 1990. Most sweet corn is still sold on the Australian domestic market, but there is increasing interest in the export markets of south east Asia.

To avoid adverse weather conditions or pest and disease outbreaks the processing industry has a more concentrated production and harvesting period in each region than the fresh market industry. The longer production season of fresh market sweet corn allows a greater buildup of pest and disease problems which therefore tend to become more significant for fresh market growers. The specifications for fresh market are more stringent, increasing the importance of pests and diseases. The processing industry can process small quantities of insect damaged cobs, whereas the fresh market producers usually market 100% sound cobs, particularly product destined for export.

Pre-packed cobs have an increasing market share, these are usually cobs that have been trimmed of insect damage. There is also a small market for baby corn, however this product meets considerable competition from imports from countries with low labour costs.

Major production times

South Queensland produces from spring to autumn and New South Wales produces summer and autumn crops. Victoria, Tasmania and South Australia produce mainly summer crops, while north Queensland has winter production. The only other Australian production during winter is from the Ord in Western Australia. Table 1 shows the main planting and harvesting periods for Australia.

Table 1. Main planting and harvesting times for sweet corn in Australia

State	District	Plant	Harvest
QLD	Dry tropics	early March – late August	mid May – early November
	Bundaberg	January – April mid July – mid September	April – July October – December
	Southern Queensland	early August – late February	early November – mid June
NSW	Sydney Basin	August – late February	November – early June
	Central West: Dubbo – Narromine	late September – early January	late December – early May
	Cowra	late October – early January	late January – early May
	Bathurst	mid November – late December	mid February – late March
	Riverina	mid September – early January	late December – late April
VIC	East Gippsland	late September – late January	late December – May
	Northern Victoria	early September – December	late December – April/May
	Southern Victoria	early October – January	late January – April/May
TAS	Northern Tasmania	late October – November	mid February – April
SA	Riverland	September – February	December – May
WA	Metropolitan	mid August – mid March	December – June
	Harvey, Bunbury, Busselton	mid September – early February	mid December – late May
	Manjimup, Albany	November – January	mid January – mid May
	Carnarvon	February – May August – September	July – October mid November – January
	Kununurra	April – early September	early July – late October

SWOT analysis

Table 2 lists the Strengths, Weaknesses, Opportunities and Threats (SWOT) affecting the sweet corn industry in Australia.

Table 2. Factors affecting the Australian sweet corn industry

Strengths	Weaknesses	Opportunities	Threats
<p>Increasing consumption in USA and other developed countries which is likely to be translated to SE Asian markets.</p> <p>Rising per capita consumption.</p> <p>A ready acceptance of tray (pre) packs of fresh corn on the Australian market.</p> <p>Summer and winter production providing continuity of supply to domestic and export markets.</p> <p>The plant grows quickly and is a good rotational crop.</p> <p>Farming operations can be mechanised.</p> <p>Adoption of world's best practice by the industry, a technology and market innovator.</p> <p>Enthusiastic and professional teams of service providers and industry representatives.</p>	<p>Pest management issues particularly insecticide resistance.</p> <p>Strict import restrictions limited access to useful cultivars from USA.</p>	<p>Increasing demand for fresh supersweet corn in export markets.</p> <p>Increasing consumer preference for fresh rather than frozen sweet corn.</p> <p>New supersweet varieties expected to increase demand.</p> <p>Development of new supersweet varieties with better pest and disease tolerance.</p> <p>Pest management opportunities to introduce new technologies including IPM.</p>	<p>Imports eroding domestic market opportunities for increased production.</p> <p>Competition on SE Asian markets from sweet corn exported from USA and China.</p>

Know what you are getting into

When setting up for sweet corn production, there is a high capital cost in cooling (fresh market) and field equipment, for example spray equipment and harvester. It is difficult to develop a profitable business on small production areas.

Sweet corn is very prone to pest damage. Good management, particularly of the corn earworm (heliethis), can be difficult—complete crop losses do occur. Sweet corn has a high requirement for good quality water. Crop establishment can be difficult, particularly when planting into cool soil.

What you can expect to make

Yields

Yields for fresh sweet corn vary from around 600 to 1300 x 18 L packages per hectare for the major temperate supersweet varieties in north

Queensland with an average of 950 packages per hectare. The 18 L package holds about 9 kg (around 24 to 30) whole cobs or around 40 pre-packed cobs. In southern areas, yields range from 800 to 1500 x 18 L packages per hectare with an average of around 1000 to 1200/ha.

Crops grown for processing will produce yields of 14 to 20 t/ha in Queensland and 12 to 24 t/ha in NSW with an average of 17 t/ha.

Prices

Fresh market prices vary greatly depending on quality and supply. Price per 18 L package can range from \$2 to \$24, but average prices over the past 10 years on the Brisbane market have ranged from \$9 to \$13. Processing crops are grown under contract at a set price depending on quality. The following graphs were derived from information provided by Ausmarket Consultants, www.ausmarket.com.au.



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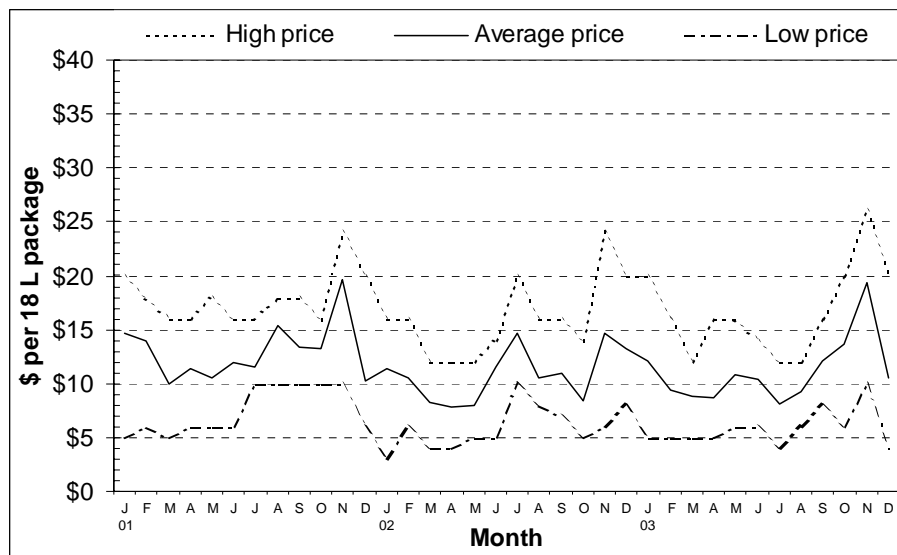


Figure 1. Average price of 18 L packages at the Brisbane market 2001 to 2003

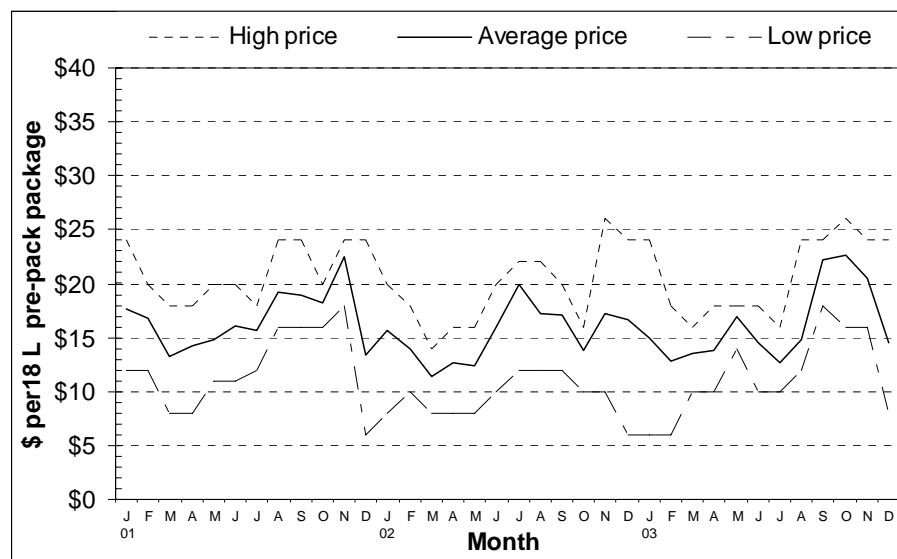


Figure 2. Average price of 18 L pre-pack packages at the Brisbane market 2001 to 2003

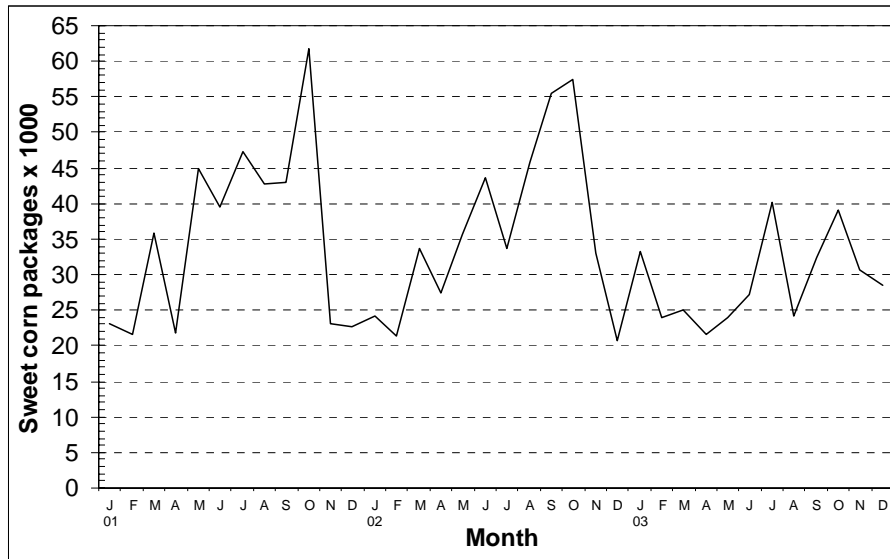


Figure 3. Throughput at the Brisbane market 2001 to 2003

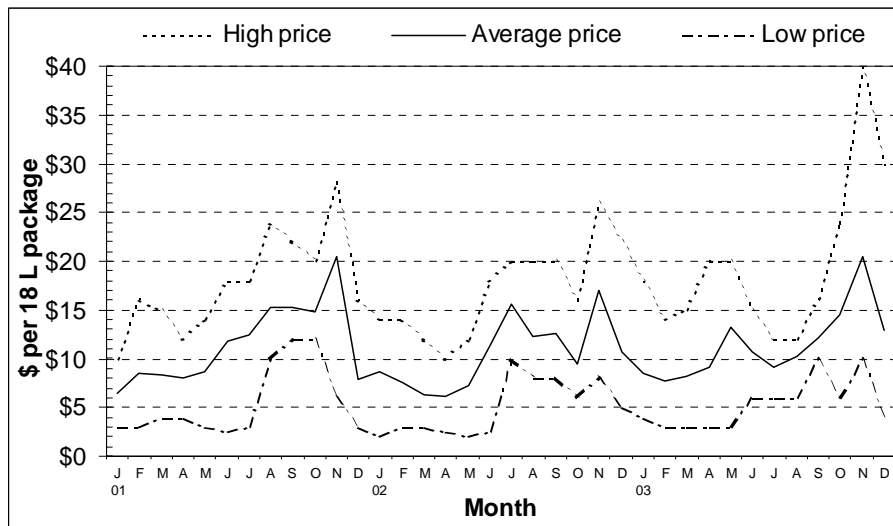


Figure 4. Average price of 18 L packages at the Sydney market 2001 to 2003

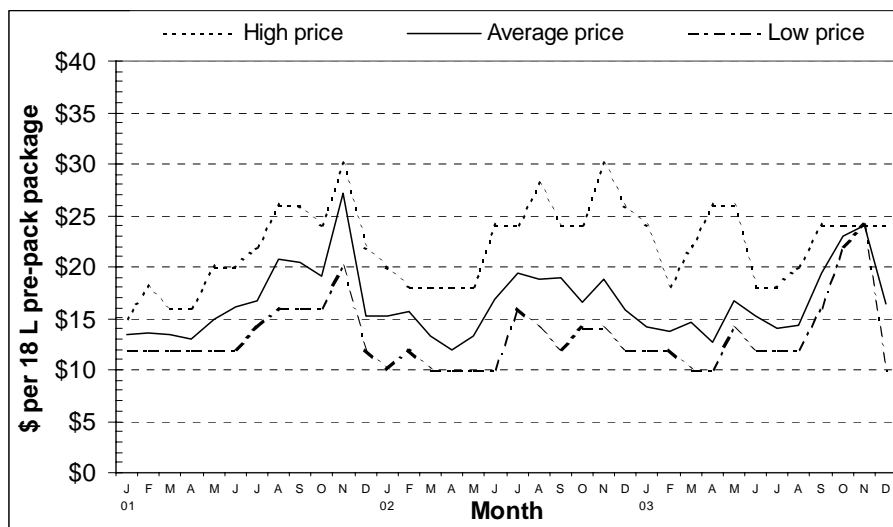


Figure 5. Average price of 18 L pre-pack packages at the Sydney market 2001 to 2003

Production costs

Tables 3 and 4 show the estimated average costs in \$ per 18 L package and \$/ha of producing fresh market sweet corn in southern and northern Queensland. For the south Queensland crop it assumes 40% of the cobs are undamaged and sold loose in 18 L packages, and 60% are grub damaged and are trimmed and sold in pre-packs in 18 L packages. Costs are based only on whole cobs in 18 L packages for the north Queensland crop.

Table 3. Estimated average variable costs (\$/18 L package and \$/ha) for a 1100 package /ha crop grown in south Queensland

	\$/package (loose)	\$/package (pre-pack)	\$/ha
Preharvest costs (growing)	2.45	2.45	2 694
Postharvest costs (pick, pack, cool and package)	3.64	7.14	6 310
Marketing costs (freight and commission)	1.98	2.60	2 587
TOTAL	\$8.07	\$12.19	\$11 591

Table 4. Estimated average variable costs (\$/18 L package and \$/ha) for a 950 package per hectare crop grown in north Queensland

	\$/package (loose)	\$/ha
Preharvest costs (growing)	3.16	3 001
Postharvest costs (pick, pack, cool and package)	3.25	3 084
Marketing costs (freight to Brisbane and commission)	2.78	2 641
TOTAL	\$9.19	\$8 726

Table 5 show the estimated average costs in \$/t and \$/ha for a centre pivot irrigated processing crop in New South Wales. These crops are harvested and transported by the processors.

Table 5. Estimated average variable costs in \$/t and \$/ha for a 17 t/ha processing crop in NSW

	\$/tonne	\$/ha
Preharvest costs (growing)	77.99	1 326
Postharvest costs (national levy, 0.5%)	0.80	14
TOTAL	\$78.79	\$1 340

Gross margin

The gross margins (income after deducting growing, harvesting and marketing costs) are shown in \$ per package and \$/ha in the tables below. Table 6 is for a 1 100 package per hectare crop grown in southern Queensland. This gross margin was based on 40% of the cobs being undamaged and sold loose in packages at \$11 per package, and 60% with grub damage trimmed and sold in pre-packs at \$16 per package. The gross margin is worked out at an average of \$14 per package. Table 7 is for a 950 package per hectare crop grown in north Queensland and

sold as whole cobs at \$11 per 18 L package. To determine your net income, you need to deduct fixed costs such as rates, depreciation, electricity and living expenses.

Table 6. A gross margin in (\$/18 L package and \$/ha) for a 1100 package/ha crop grown in south Queensland

	\$/package (loose)	\$/package (pre-pack)	\$/ha
Total income (1100 packages/ha)	11.00	16.00	15 400
Less			
Total variable costs	8.07	12.19	11 592
Gross margin	\$2.93	\$3.81	\$3 808



Gross margin
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Table 7. A gross margin in (\$/18 L package and \$/ha) for a 950 package/ha crop grown in north Queensland

	\$/package (loose)	\$/ha
Total income (950 packages/ha)	11.00	10 450
Less		
Total variable costs	9.19	8 726
Gross margin	\$1.81	\$1 724

Table 8 shows the gross margin in \$/t and \$/ha for a 17 t/ha centre pivot irrigated processing crop grown in New South Wales.

Table 8. A gross margin in (\$/t and \$/ha) for a 17 t/ha processing crop grown in New South Wales

	\$/tonne	\$/ha
Total income (17 t/ha)	159.00	2 703
Less		
Total variable costs	78.79	1 339
Gross margin	\$80.21	\$1 364

Note: A bonus may be paid for low heliothis infestation

The capital you require

You would need a minimum of \$420 000 for new machinery and equipment to establish and grow 20 ha of fresh market crop per year and \$220 000 to set up production as a processor.

In some areas, contractors can be used for planting, spraying and harvesting, especially for processing crops. This will reduce the capital outlay required to get into sweet corn production. A crop monitoring service may also be available in some areas. Table 10 shows essential machinery and equipment.

The farm you need

Soil

A wide range of soil types, from medium clays to sandy alluvial soils, is suitable. Good drainage and depth is essential. The soil type is an important factor in determining the type of irrigation used.

Climate

Do not schedule plantings to coincide with frosts, or times when heavy rainfall can be expected. Heavy rainfall and hot, dry, windy weather during silking affects pollination. Poor pollination results in missing kernels (blanking) producing poor cob quality. Heavy rainfall can prevent machinery access for spraying and harvesting and cause soil crusting. Hail can also cause damage.

Slope

A slight slope is preferred to allow machinery, particularly harvesters, to operate effectively and allow water to drain off the field. Cultivation is essential so minimal slopes reduce soil erosion.

Water

Quality. Sweet corn is moderately sensitive to saline irrigation water and is most sensitive when very young. The level of salinity that can be tolerated depends on the method and management of irrigation and the soil type.

Because the water is in contact with the leaves, overhead irrigated sweet corn is more sensitive to saline water—damage may occur if the water has a conductivity above 1.5 deciSiemens per metre (dS/m). Water with a conductivity up to 2.2 dS/m may show little damage if well-managed drip or furrow irrigation is used. Table 9 shows the water conductivity threshold at which yield reduction occurs for different soil types.

Table 9. Water conductivity threshold for different soil types

	Sandy soil	Loam soil	Clay soil
Conductivity	2.2 dS/m	1.2 dS/m	0.7 dS/m

Source: NRM Facts, water series W55

Until recently, water conductivity was reported in microSiemens per centimetre ($\mu\text{S}/\text{cm}$), however it is now reported as deciSiemens per metre (dS/m).

To convert from $\mu\text{/cm}$ to dS/m use the following formulae:

microSiemens per centimetre ($\mu\text{/cm}$) divided by 1000 =
deciSiemens per metre (dS/m)

Example: $2200 (\mu\text{/cm}) \div 1000 = 2.2 (\text{dS/m})$

To convert from dS/m to $\mu\text{/cm}$ use the following formulae:

deciSiemens per metre (dS/m) multiplied by 1000 =
microSiemens per centimetre ($\mu\text{/cm}$)

Example: $1.2 (\text{dS/m}) \times 1000 = 1200 (\mu\text{/cm})$

Quantity. The amount of water required varies with locality, time of year, crop stage, irrigation method and soil type. Use crop consultants or scheduling devices (tensiometers or capacitance probes), to determine when to irrigate and how much water to apply. Sandy soils have a much lower water-holding capacity than clay-based soils, so more frequent irrigation is needed. The soil texture also determines the amount of water applied at any one time. Water requirements are higher in hot weather than cool weather.

As a general rule, sweet corn requires 30 to 60 mm of rain and/or irrigation per week. Requirements for advanced sweet corn may increase to 80 or 90 mm per week during hot weather. Furrow irrigators may have to irrigate every five to seven days in hot weather.

Sweet corn needs 4 to 8 ML/ha (megalitres per hectare) of water for overhead irrigation depending on how long the crop is in the ground. Queensland crops tend to be ready for harvest in less time than crops in southern states. The quantity of water required may be significantly reduced when using drip irrigation. For furrow irrigation, the figure can vary from 6 to 10 ML/ha.

Drip irrigation is widely used in north Queensland resulting in substantial savings in water use. Crops are produced using 3.5 to 4.0 ML/ha. Best irrigation management practice requires 3.5 to 3.7 ML/ha for a drip irrigated crop, with 4 ML/ha available for dry years.

The machinery and equipment you need

Table 10 shows the machinery and equipment needed for a 20 ha fresh market sweet corn production unit. The prices are estimates only. Second-hand machinery would normally cost less than half the new cost.

Table 10. Estimated cost of new machinery and equipment

Equipment	New price \$
Tractor (26 kW) for planting, cultivation and spraying	30 000
Tractor (45 to 60 kW) for plough, ripper and rotary hoe	60 000
Truck or tractor and trailer (FM)	10 000 – 40 000
Cultivation equipment	20 000 – 25 000
Fertiliser spreader	10 000
Planter	10 000
Irrigation equipment	50 000
Spray equipment for interrow herbicides	4 000
Spray equipment for crop	12 000
Single row towed plucker harvester (FM) OR	120 000
Harvester, 4 row corn puller (FM)	470 000
Harvester, 4 to 6 row knife roll (P)	300 000 – 325 000
Half-tonne bins (FM)	1 000
Bin tipper (FM)	3 500
Shed fork-lift (FM)	30 000
Pallet jack (FM)	650
Pre-packing equipment (FM)	40 000 – 100 000
Scales (FM)	1 200
Hydro-cooler (FM)	20 000
20 to 40 pallet cold room (FM)	35 000 – 50 000
Slasher/pulveriser	3 000 – 6 000
Total fresh market	\$420 350 – 883 350
Total processing	\$220 000 – 532 000

FM = fresh market, these items are not required if growing for a processor

More information on growing sweet corn organically is provided in: *Production systems for various markets* Key issues, Chapter 4.

The labour you need

Planting, spraying and harvesting are all done by machine. There is a high labour requirement for grading and packing in the shed and in the field if hand harvesting.

Other considerations

Management skills or access to consultants with these skills are required for managing pests, finances, staff and the crop. Skills in machinery operation and maintenance, and the ability to read and understand chemical labels, are essential. Careful attention to detail is necessary to be a successful grower.

Quality of the end product is the most important factor in successful sweet corn production. This starts with good land preparation and variety selection and continues through growing the crop and managing pests to careful harvesting, packing, cooling and marketing of the cobs.

Growing sweet corn organically

more info



Grower associations;
organic web sites
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Do some extensive market research to determine the size of the organic market and the prices you can realistically receive for your produce, particularly if it is not of the highest quality. The quality and yields from organic production systems may not always be offset by the higher prices that may be received.

more info



Where to get these
books
Chapter 5 page 254

Producing crops organically is usually understood to mean production without using synthetic pesticides and fertiliser. The philosophy of organic agriculture, however, is much more than that. Organic production systems are designed to produce high quality food while enhancing soil health, recycling organic wastes, increasing crop diversity and not relying heavily on external inputs. Organic production, therefore, seeks to protect the environment by working with rather than dominating the natural system—the aim is to be sustainable.

Organic production is not a low input production system, as the reduced use of synthetic and other external inputs needs to be offset by a higher level of management skills. Increased costs will be incurred for labour, alternative methods and materials to control pests, diseases and weeds, and to provide adequate nutrients.

To maximise market advantage, organic producers should seek organic accreditation with one of Australia's organic organisations which include:

- Bio-Dynamic Research Institute;
- Biological Farmers of Australia (BFA);
- National Association for Sustainable Agriculture;
- Organic Food Chain.

The booklet *Organic Agriculture—Getting Started* by David G. Madge, and the National Standard for Organic and Bio-Dynamic Produce are excellent information sources for prospective organic producers and well worth reading.