

Banana Growing Basics for New South Wales

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About this guide

This publication has been developed by NSW DPI and Bananas NSW, using our combined technical resources, and above all, the experience of some very successful growers.

This publication is one of a set of publications about banana growing. This publication gives a basic recipe with no frills and few explanations; just a list of things that must be done to successfully produce a crop of bananas. The Cavendish Bananas publication gives more detail of crop management activities in the plantation and packing shed and other publications cover the management of pests and diseases of banana crops. We hope you will spend some time reading these as they contain a lot of good ideas from good growers.

Current contacts within the contributing organisations are listed below.

NSW Department of Primary Industries.

Murwillumbah Office – Arthur Akehurst

Coffs Harbour Office – Greig Ireland & Peter Newley

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This document is part of a set of publications. The remaining parts of the set can be found at www.dpi.nsw.gov.au. Updated versions of this document will also be found at the above web address.

Disclaimer

The information contained in this publication is based on knowledge and understanding at the time of writing (2008). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of NSW DPI or the users independent adviser.

The product trade names in this publication are supplied on the understanding that no preference between equivalent products is intended and that the inclusion of a product name does not imply endorsement by NSW DPI over any equivalent product from another manufacturer.

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BANANAS

The Australian banana industry is based on two main varieties – Cavendish and ladyfinger.

The Cavendish variety includes varieties commonly referred to as Hybrids, Williams, Mons or Dwarf Cavendish and accounts for over 90% of Australian production, enjoying a loyal following amongst consumers. The industry often produces more fruit than the markets require and prices can be poor for extended periods. This is reflected in the wide range of prices for Cavendish

bananas in wholesale markets from season to season. When the market is over-supplied, fruit quality is important as returns for poor quality fruit do not cover costs of production.

The ladyfinger variety makes up the majority of the remaining crop and is popular in certain regions, such as Brisbane. The goldfinger variety also has a small following in Brisbane.

Consistent quality is the key to profitable banana production and this is the major focus of our publications.

Growing quality bananas all year round in a sub-tropical climate is not easy. As well as pests and diseases, environmentally induced problems such as chilled fruit and November dumps (short dumpy, unmarketable fruit) have to be managed.

These challenges can be met, and this Grower Guide is one step towards seeing best practice adopted in the banana industry.

One special caution. Bananas suffer from a soil-borne fungal disease known as Panama disease which kills the plants. Panama Race 1 affects ladyfinger and other similar varieties and Panama subtropical Race 4 affects Cavendish plants as well. It is a major threat to the industry's future. The Panama fungus is spread by movement of infected plants or soil and can be moved on Cavendish suckers.

If you get Panama disease on your property, you cannot get rid of it, so be sure your planting material comes from a clean source or you may be planting problems with your plants.

GROWING PRODUCTIVE PLANTS

Productive plants are the foundation of a good banana growing business.

- **Select a good site – e.g. north-east to northerly aspect, sheltered from cold winds and frost-free.**

Some growers don't mind if a small portion of their plantation does not have perfect aspect as it tends to spread their work load and production. However, poor site selection can have a dramatic effect on fruit quality.

- **Use good quality planting material (i.e. tissue-cultured plants) for protection against Panama disease and bunchy top virus.**

Vigorous plants can only come from good quality, disease-free planting material.

- **Plant at the right spacing.**

Plant spacings of 3.0 m × 2.4 m for Cavendish and 3.6 m × 3.6 m for ladyfinger.

Closer plant spacing leads to smaller bunches of smaller fruit, slower cycling, increased disease problems and poorer fruit quality.

- **Get a soil and leaf analysis every April to set the fertiliser program.**

A soil and leaf analysis in April will help determine fertiliser and lime requirements in plenty of time to plan the coming seasons fertiliser program.

- **Apply the fertiliser by the 'little and often' approach.**

Between 6 and 8 small fertiliser applications are best, preferably after rainfall, rather than in 2 or 3 big hits.

- **Irrigate regularly.**

To maximise yield and quality, bananas need up to 50 mm of irrigation each week at the height of summer. Design the irrigation system to water all the farm each week when required.

- **Remove suckers early and often.**

Start removing suckers at 4 to 5 months after planting, leaving a well placed, healthy follower. With tissue culture plants remove all suckers for the first six months and then select the follower. Remove all other suckers regularly or bunch weights will suffer.

- **Keep the leaves healthy.**

Keep leaf disease at low levels for high quality yields. Top growers aim to have one good leaf at harvest for every hand kept on the bunch. Green de-leaf often if fungal diseases are present.

- **Prop plants at bunch covering.**

Double propping is essential to protect Cavendish plants from falling over.

- **Protect the soil with cover crops.**

Cover crops are essential where the soil is bare. Keep some strips of cover crop going in the plantation after planting.



*Figure 1.
A ryegrass covercrop established soon after planting these young Cavendish plants helps slow water flow and protects the soil from erosion.*

PRODUCING QUALITY BUNCHES

Quality bunches do not just grow, they have to be managed. Take action to protect the bunch from pests, diseases and the elements – on time, every time.

- **Cover the bunches as soon as they are fully formed.**

Birds, bats, and leaves all scratch the fruit and ruin its appearance early, so put the bunch cover on very early, as soon as the bunch is fully emerged. At covering, remove any bracts that have not fallen out.

- **Prune to the correct number of hands.**

This is normally done at the same time as covering. Bunches need pruning to different levels for quality production in each season. In order to maximise fruit size, bunches that mature in winter are more heavily pruned than those that mature in summer.

- **Treat for *Deightoniella* fungus.**

This fungal disease causes blemishes on the skin. It is normally a greater problem with ladyfingers. It infects the young fruit as the bunch is emerging. It can be a big problem where there is a lot of dead leaf hanging and the humidity is high. Green de-leafing can minimise infections by reducing spore numbers.

- **Monitor for banana flower thrips.**

If they are present, flower thrips attack the fruit before the bell opens so it is too late to treat after the bracts have lifted. Monitor for their presence when pruning and if present in damaging numbers, either throat spray just before the bell emerges or bell inject.

- **Monitor for sugarcane bud moth.**

This caterpillar can scar the surface of the fruit and make it unsaleable. Monitor fruit at bagging and treat the bunches if required.

- **Remove any ripe fruits from the plantation immediately.**

Ripe fruit in the plantation will attract fruit bats and birds which damage the fruit.



*Figure 2.
A young bunch ready for pruning and bagging.*

HARVESTING QUALITY BUNCHES

All the good work in growing can be lost in a minute if harvesting is not done well.

- **Harvest at the right maturity.**

Cut the bunches when the fruit is 75% full **BUT** when 80% of bunches from a particular emergence time have been cut, harvest **ALL** the remaining bunches

- **Cut early in the day to avoid heat building up in bunches in hot weather.**

Fruit that is hot when it arrives at the packing shed will take a long time to cool down. However in winter very cold fruit may be more prone to bruising, so avoid harvesting too early in very cold weather.

- **Nick the pseudostem carefully to bring the bunch down slowly.**

If the stem bends over too quickly the bunch will come down too fast, causing discomfort for the picker, and damage to the fruit.

- **Use a shoulder pad to protect the fruit.**

A bare shoulder can cause bruised fruit, and buttons on shirts can lead to bad marking on ripened fruit. A pad will also protect the shoulder.

- **Use a well-padded softly sprung vehicle to take bunches from the plantation to the shed.**

As well as good padding, bunches need to be secured to the carrier so that they do not flop around.

- **Have ample soft padding between the bunches as well as on the carrier.**

Bunches need to be protected from neighbouring bunches as well as from the hard surface of the carrier.

- **Keep the padding cleaned.**

Dried sap on padding can scratch fruit. When bits of flower ends and leaf stick to the sap it becomes like sandpaper. Flower ends will also stick into the fruit. If the bunches are stood up, leave a short stub that extends beyond the bottom of the fruit when pruning. This will help reduce the damage to the bottom hand.

- **Ensure the road system is well maintained to reduce bruising of the fruit.**

Big bumps are bound to bounce the bunches and lead to bruising that will show up on the ripened fruit.

- **Hang the bunches on rails or dehand immediately.**

Double handling bunches in the shed will lead to bruising, especially on the bottom hands.



*Figure 3.
Bunches hanging on butcher rails ready for dehanding.*

PACKING QUALITY FRUIT

The packing shed is the gateway from your plantation to a happy consumer.

- **Talk to your buyer.**

Make sure you know what the market requires before you pack.

- **Dehand and/or cluster into clean water or onto a wheel.**

Dehand and cluster directly into clean water or onto a clean wheel and wash fruit well. If the fruit is being clustered, do it at this stage. Change the water regularly to prevent build up of sap and litter in the water.

- **Handle gently as every movement can blemish fruit.**

The damage to green fruit may only show up after ripening so it is essential to be careful at packing.

- **Only stack fruit in single layers on the wheel or bench.**

Hands stacked more than one high will cause fruit to be scratched and bruised.

- **Let fruit dry before packing.**

Wet fruit in the carton can lead to problems of rotting and staining.

- **Only pack quality fruit.**

Low quality fruit with blemishes or marks will be noticed by the marketer and by the consumer. If this fruit is put in cartons with good quality fruit the whole carton or consignment can be downgraded.

- **Use quality cartons.**

Cheap low quality cartons do not work, they regularly collapse, especially in high humidity ripening rooms.

- **Follow the packing standards for the particular variety.**

Make sure you know what standards your marketer is looking for and ensure that only that standard of fruit is in the carton.

- **Pack uniform sizes.**

Buyers make it very clear that they do not like mixed sizes in the same carton.

- **Pack uniform maturity.**

Don't pack stale and fresh fruit in the same carton.

- **Use absorption pads and plastic slip sheets.**

These are essentials for making sure the fruit taken out of the carton is as good as the fruit going into it. Talk to your wholesaler about what they prefer.

- **Pack to the correct weight.**

This includes allowing for shrinkage.

- **Don't 'top' cartons.**

Don't place low quality fruit on the bottom of the carton. This is still a regular complaint from the markets.

GETTING THE TIMING RIGHT

The previous list of activities is extensive and it will not always be possible to do all of them exactly as planned. Some jobs can wait for a week or two, while others cannot.

Leading growers put the following list of activities as their absolute priorities:

- **Bunch cover at the right time** – at least fortnightly in summer.
- **Debell and prune** – at bunch covering.
- **Protect the bunch from pests and disease** – at bunch covering.
- **Cut at the right maturity** – at least fortnightly.
- **Clean the shed at end of each day's packing** – to avoid post-harvest infections and contamination.

SUSTAINABLE BANANA PRODUCTION

As well as keeping the crop healthy you need to keep your farm healthy. The following are some areas that are important to sustainable banana production:

Healthy soils

If topsoil is lost to erosion or the nutrients get out of balance, productivity will decline.

- Protect soil from erosion with cover crops between the rows.
- Have well planned roads, with banks and drainage areas protected by cover crops to guard against washouts.
- Maintain soil organic matter.
- Have soil analysis carried out on a regular basis to assist to keep nutrients and pH in balance.
- Broadcast fertiliser in small amounts often rather than in a few big applications.
- Avoid applications of pesticides to the soil except when they are essential.

Pest management

Understand the life cycle of pests in your crop to help minimise pesticide use.

- Only treat with chemicals when really necessary – monitor pest incidence where possible.
- Use good cultural control such as green de-leafing for fungal control to help control pests rather than relying on pesticides alone to deal with the problem.
- Encourage beneficial insects and organisms to aid in pest control by avoiding overuse of pesticides, especially those that are broad-spectrum.

Water and irrigation management

- Maintaining healthy soils will assist with nematode control by soil fungi and insects.
- When irrigating, use water efficiently and only when the crop needs it.
- Understand the water holding capacity of your soil, and irrigate accordingly.
- Protect your local water resources from fertiliser runoff by applying small doses of fertiliser as the plants need it, and maintaining cover crop strips to stop fertilisers and soil from washing away.
- Protect your local water resource from being contaminated with Panama disease.

MEETING MARKET ACCESS REQUIREMENTS

Chemical training

Training and certification as an accredited chemical user is necessary for anyone applying pesticides as part of their employment or business. Keeping records of pesticide applications is mandatory. Training is available through ChemCert and SMARTtrain.

Market access requirements

An ICA-16 certification or Plant Health Certificate is required to send fruit to Victoria, Tasmania, South Australia and Western Australia where Queensland fruit fly is of concern. Contact NSW DPI's north coast offices for more information on accreditation.

Food safety accreditation

Growers need a food safety quality assurance scheme in place to sell fruit to major retailers. The food safety scheme will outline steps which prevent contamination of fruit or its packaging with pesticide residues, chemicals or microbes and will allow for a records-based trace-back if a problem is encountered.

The Freshcare® scheme will satisfy the food safety requirements; for more information go to www.freshcare.com.au

Stay focussed on quality

Remember – a professional approach to marketing will maximise the returns for your fruit.

- Communicate regularly with your marketer to be aware of what quality is required, and seek feedback on how well you are meeting these requirements.
- Pack tightly to standards and train all packing staff to do the same. Consistent standards over time are important in the marketplace.

Further information

For other titles about growing bananas go to www.dpi.nsw.gov.au

Also see the Australian Banana Growers Council at www.abgc.org.au

Horticulture Australia Limited at www.horticulture.com.au



Figure 4.
Bananas in a coolroom awaiting transport to the markets.



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