



Grow Great Fruit

ESSENTIALS COURSE



[WEEK 7 – EARLY AUTUMN]



Contents

SOIL MOISTURE MONITORING

SPOTLIGHT ON BLACK SPOT (APPLE SCAB)

WHEN SHOULD I PICK MY APPLES?

BUDDING (SUMMER GRAFTING) RECAP

SOIL LIFE: BACTERIA

LEARNING TO LOVE YOUR WEEDS

SPOTLIGHT ON FRUIT FLY

**MONITORING FOR PESTS, DISEASES, AND
NUTRITIONAL DEFICIENCIES**

GROWING YOUR OWN PEACH TREES FROM SEED

**FEEDING YOUR FRUIT TREES TO PREPARE FOR
NEXT SEASON**

SUMMER PRUNING CHERRIES & APRICOTS

**PLANNING YOUR HOME ORCHARD TO HARVEST
FRUIT FOR 6 MONTHS OR MORE**

SOIL MOISTURE MONITORING...

The aim with watering is to keep enough water in the soil that your fruit trees always have water available to their roots, without letting the soil get waterlogged. Once you have picked the fruit from your tree, it won't need nearly as much water—you can safely cut the water by up to half of what it was receiving when it had fruit on it, as long as conditions aren't too harsh.

Many gardeners rely on their knowledge of their garden, and how their plants look, to decide when to water, but it's easy to be a little more scientific about it, even in a home garden. For those growing fruit in dry climates—or a drought—this equipment can make a big difference to your water consumption.

TENSIOMETERS

Tensiometers consist of an enclosed plastic tube (like a big test tube) which are almost filled with water, have a ceramic base tip, and a rubber stopper at the top. The tube is buried so the tip is at a useful depth in the root zone (say 30cm or 60cm). As the soil dries it sucks moisture through the porous ceramic tip, creating a vacuum in the tube. This vacuum can then be measured and from the reading we can judge how dry or moist the soil is—the stronger the vacuum, the higher the reading and the drier the soil is.

Tensiometers are usually installed in pairs, with each one measuring at a different level (30cm and 60cm is common). A digital reader is used to take measurements. The reader has a pressure transducer connected to a needle that is inserted into the rubber stopper and measures the vacuum.

This is overkill for most home growers, and the solution is to use tensiometers that each have their own vacuum gauge (see picture, right). The advantage is that each tensiometer is then a stand-alone measuring station; the disadvantage is that they cost a bit more than tubes with just a rubber stopper in the top.

Tensiometer readings of between 40 and 80 are what we're aiming for. Lower than that is OK, it just means that the trees don't need watering. Once the readings move above 40 it's time to put some water on, and definitely keep the level well below 80, which is 'wilting point', by which time the tree is clearly under stress and needs immediate water.

It's good to have a tensiometer at the bottom of the root zone (say, 60cm), so you can know when to **stop** watering—once it's wet at that level there's no point watering further as the water—and nutrients—are just going to move below the root zone where the tree can't reach them. There is also the risk that water and nutrients will get leached out and eventually find their way into local waterways.

Tensiometers are not the most accurate way to monitor soil moisture, but on a small scale and/or budget, they offer a practical way for the home gardener to be a little bit more scientific than using the "Blundstone method" of checking soil moisture with your boot tip.

OTHER METERS

Garden centres have small gauges with a probe that you stick in the ground to get a moisture reading. These are not all that accurate but are cheap and have the advantage that you can easily move them around.

There are more expensive—and more accurate—versions available from places such as the Meter Man (www.themeterman.com.au).

AT A GLANCE...

When watering your fruit trees, the aim is to keep enough water in the soil so the roots always have access to water, without letting the soil get too dry or too wet. This week we explain how to use tensiometers, a simple water monitoring tool that are easy to use in a home garden to help you give your trees enough water, without wasting water by providing too much!



Tensiometer tube with gauge



Simple gauge with probe - handy for spot readings



Tensiometer tubes with digital reader



SPOTLIGHT ON...

BLACK SPOT (APPLE SCAB)

ABOUT: Black Spot is a common and widespread fungal disease of apples and pears, and attacks leaves, shoots, buds, blossoms and fruit. It's especially important in regions with high rainfall and relative humidity during the apple growing season. It's an extremely common disease, particularly in high rainfall areas, and is one of the main reasons for spraying, particularly in orchards that rely on chemicals. Though it can be very destructive of fruit and lead to substantial crop losses in a wet year, the disease doesn't hurt the trees.

AT A GLANCE...

Black spot (also called Apple scab) is a fungal disease of apples and pears which causes small black lesions on fruit and leaves. If the infection is severe, fruit can be badly deformed and unusable.



LIFE CYCLE: Primary infection happens in early spring (about the time the flowers start to open) and comes from spores which have survived over winter, either on the trees or on dead infected leaves and fruit on the ground. These primary infections can also develop for the first 6-8 weeks after flowering, though the main time is just after full bloom. As with most fungal conditions, infection is initiated by a combination of wet conditions and the right temperature - for Black spot this is 17°C-20°C. Once the disease is established, the initial infection can cause secondary infections any time throughout spring and summer, especially in warm wet weather. The more advanced the season, the longer the fruit must remain wet for an infection to start, so once the early spring danger period is over, the risk gradually diminishes.

SYMPTOMS: Black spot affects both the leaves and fruit of apples, and less commonly the flowers in early spring.

Leaves: With an early infection, the first spots are usually seen on the under surface of the leaves as they emerge in spring. They are a light brown, and a bit fuzzy, with an indistinct margin (as opposed to Alternaria leaf spot, for example, which has a clear, round margin). Over time both sides of the leaves can be infected, and the spots become more clearly defined, unless several spots are overlapping. As the disease progresses, the leaves stop growing around the spots, and the leaves become bent and slightly deformed.

Fruit: Small, black, scabby lesions form on fruit, and this causes deformity as the fruit grows. The fruit is still edible if the outbreak is not too severe, as it does only affect the skin.

A bad case, with multiple spots per apple, can make the fruit unusable because the fruit will stop growing



around the infection, which can lead to very small, deformed fruit with multiple spots. A badly infected apple or pear can also develop cracks in the skin.

Infections that happen early in the season are usually around the calyx (i.e. not the stem) end of the fruit, but secondary infections, which occur later in spring or in summer, can be anywhere on the fruit.

MONITORING: Black spot outbreaks generally occur in moist conditions. One of the few advantages of really dry conditions is that Black spot is rarely seen!



PREVENTION AND TREATMENT:

- Spray fungicide (copper or lime sulphur) throughout spring and early summer, especially before wet weather.
- If the disease is controlled well in spring with organic fungicides and good hygiene, then the chance of a secondary infection is much less.
- Remove badly affected fruit if you notice it throughout spring and summer, so it doesn't cause a secondary infection of clean fruit.
- Clean up fruit and leaves under infected trees before winter, as the fungus continues to live on the leaves over winter.
- In autumn, mow fallen leaves and then spray with an organic spray that is high in nitrogen (eg an extract made from soaked chook manure) or compost tea to promote rapid and complete breakdown of the infected leaves. Alternatively, rake leaves up and put in a compost pile to break down (then the compost can be returned to the soil under the trees).
- Choose varieties that are less prone to Black spot (eg Granny Smith, Golden Delicious, Fuji).
- Promote good air circulation with pruning and weed control.

WHEN SHOULD I PICK MY APPLES?...

Picking apples before they are ripe is short-changing yourself on flavour and size, and also means the fruit won't store as well. But often they colour beautifully, and look ripe, even when they're not.

So how do you tell? When is the right time to pick your apples?

On the farm one of the tests we use is to measure the Brix levels of the fruit (see next page).

But there are simpler tests you can use at home, without buying any equipment.

1. Pick an apple and cut it in half and have a look at the seeds – when the apple is ripe they will be a rich dark brown, and nice and plump.
2. Apples contain a lot of starch (like potatoes), and as they ripen, the starch is converted to sugar and the apple becomes sweeter. The amount of starch remaining in the apple can easily be seen with a simple iodine test (if you don't have any iodine in the bathroom cupboard, order some at the chemist). Pour a few drops of iodine onto a flat saucer, and place the cut apple on to the iodine, just for a couple of seconds. Now have a look at the apple – the iodine will have stained the starch and you will see at a glance how much remains in your apple. Remember, the less starch you can see, the riper your apple is (see photo).
3. Now look at the unstained half – can you see a ring around the core, where the texture is a little more translucent? Ripening starts from the core, and in some varieties you can actually see where the sugars have developed.
4. Look at the apples on your tree. On most varieties, the skin will have it's characteristic ripe colour (for example Jonathon's are bright scarlet), but there is another colour underneath, called the background colour. The background colour usually changes from green to a cream or white as the apple ripens. (As an aside, hot weather can cause bleaching of the skin colour, and late season apples such as Pink Ladies achieve much better colour as the weather starts to cool in autumn.)
5. The last test? Take a bite...savour the flavour...is that how you like to eat your apples, both for flavour and texture? Remember there's a difference between mature and ripe. Once mature, apples will continue to ripen slowly off the tree, but if picked before maturity, they'll remain unripe and unpleasant to eat. On the other hand, if they over-ripen on the tree, they won't store well and will go soft and floury much faster.

AT A GLANCE...

It can be difficult knowing the right time to pick apples—and you can't just rely on the colour of the skin! Here's a few simple tests you can do at home to determine ripeness before you pick.

MATURE...OR RIPE?

There's a difference between maturity and ripeness.

Fruit is mature when it has accumulated enough starch to let it ripen, and this can only happen while the fruit is on the tree. Once the fruit has enough starch, the starch begins to turn into sugar, and that's the beginning of ripening.

Ripening can then continue off the tree, but you get the best flavour if at least some of the ripening happens on the tree. Fruit that is ripened on the tree will often give a characteristic smell - another clue!



STORAGE

If you get the picking date right (remember to record it in your Fruit Tree Diary), you can expect your apples to last in good condition for weeks, if not months, if they are stored correctly.

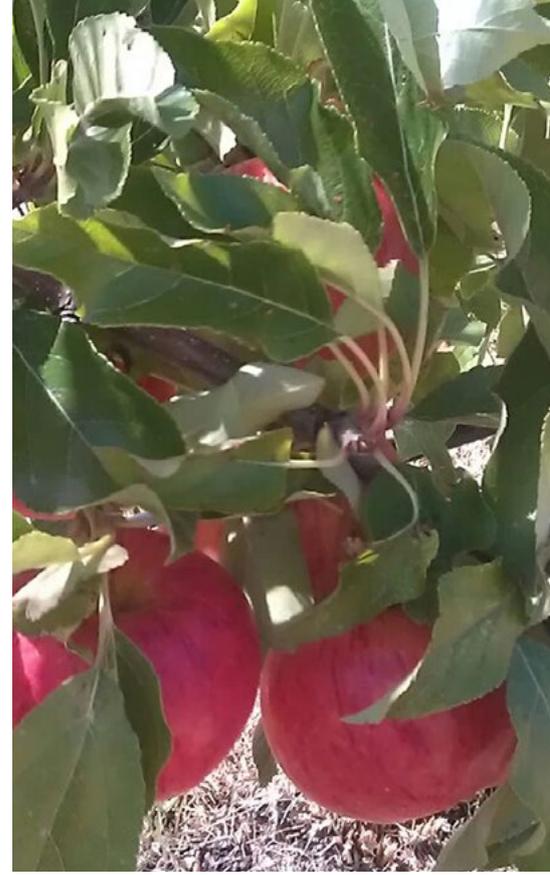
Apples continue to ripen after picking by producing ethylene gas, which makes nearby fruit also produce more ethylene gas in a positive feedback loop. If fruit is stored in a sealed bag the concentration of ethylene gas rises much faster and this promotes rapid ripening, so store fruit in an open container.

Commercial fruit growers solve this problem by storing the apples in a Controlled Atmosphere (called 'C.A.' storage) where ripening is delayed by replacing oxygen in the atmosphere with nitrogen (this method is allowable for organic apples). Chemical orchardists often use a different system where the apples are flooded with a chemical

called 1-Methylcyclopropene (known as 'SmartFresh'), which prevents the apple responding to ethylene. Organic growers are not allowed to use the second method... hmm, which would you prefer?

Fruit that has pest or disease damage or damaged skin produces more ethylene, so it is best to eat or cook any damaged fruit at picking time, and save the high quality undamaged fruit for longer term storage.

Storing fruit at cooler temperatures slows the production of ethylene and delays ripening. If you don't have enough room in the fridge, pack fruit in a cardboard box in the coolest, darkest place in the house. They'll store best if they don't touch each other, so wrap each apple in paper to extend storage time. Check it regularly and remove any fruit that has become too ripe or gone bad, lest one bad apple ruin the barrel!



BRIX METERS (REFRACTOMETERS) – WHAT ARE THEY AND DO I NEED ONE?

Brix meters—or refractometers—are a simple device that can tell us how much sugar a piece of fruit contains. Just a couple of drops of juice are placed on the glass viewing screen, the meter is then held to the light and a reading taken. The meter measures how much the light bends when it passes through the juice. These are an indispensable tool for winemakers, but are they any use with fruit?

Brix measurements are a great indication of sugar content, and healthier fruit has higher sugar levels, so Brix meters are useful in checking your fruit each season to see if your readings are getting better. There are charts available online that indicate what is a good reading for different types of fruit. Basically the higher the reading the more sugar there is and therefore the more nutrient-dense your fruit is.

When it comes to apples, they can't help us check how ripe the fruit is, only how much sugar is in it, and so this is where the iodine test comes into its own.

So, the short answer is, no, you don't need one, but they are handy for monitoring your fruit quality over time.

(If you do decide to get one you can pick them up on eBay for around \$30–\$40).



THE IODINE TEST...EXPLAINED

Iodine reacts with starch by going black, so the iodine test measures the amount of starch in your apple. As the apple ripens, the starch turns to sugar, and the size of the black stain shrinks, so the point of the test is to estimate how much starch has turned to sugar, as one of the indicators of ripeness.

In commercial orchards, the iodine test has commonly been used for varieties like Granny Smith, Pink Lady, Sundowner, Jonathan, Lady Williams, Gala and Golden Delicious, which all show a radial type staining pattern, as well as Braeburn, Fuji and Red Delicious which all show concentric type staining pattern. For unknown or not usually tested varieties, you'll need to first compare the staining pattern with the charts below to decide which one to use.

There are known stain patterns at different stages of ripeness for many varieties, as well as recommendations about when to pick depending on how the apples will be stored (in the commercial apple growing world, this is about whether the apples are due for long- or short-term storage, export, etc).

The usual iodine concentration is 2%. Here's more detailed testing instructions:

1. Cut the apple in half across the core - ideally chopping the seeds in half.
2. Pour the 2% iodine solution in a flat container to a depth of 5mm.
3. Dip one cut surface in the solution for at least 30 seconds.
4. Remove apple from the solution, remove excess iodine with blotting paper and lay it face up for 45 seconds before assessing. Cells that are full of sugar will not take up the iodine and will remain clear (not black).
5. Compare the starch staining pattern with the charts below. There are two types of starch staining patterns. (i) a **radial pattern**, where starch distribution tends to be patchy and arranged in a flower-like pattern; and (ii) a **concentric pattern**, where starch disappears in a more even progression from the core area toward the skin.

Unfortunately there is no single starch conversion chart around the world; different countries have different charts. The ones we've used here are the ones used in Australia by the Department of Primary Industries.

The recommendation for Starch Index results for different situations are in the table on the next page. If the variety of apple you grow is not on this list, make your best guess and keep records of test results and picking dates, and over time your experience will give you a more expert basis for making your picking decisions each year.

RADIAL PATTERN

CONCENTRIC PATTERN

Score 1. Entire surface stained blue-black.

Score 2. Staining absent from the core.

Score 3. Staining absent from the core and about 10% of the cortex.

Score 4. Staining absent from the core and 50% of the cortex.

Score 4.5. Staining absent from the core and about 70% of the cortex.

Score 5. Staining absent from 90% of the cortex and mainly evident near the skin

Score 1.1 Almost entire surface stained blue-black.

Score 1.7 Staining absent from the core.

Score 2.0 Staining absent from the core and about 10% of the cortex.

Score 3.0 Staining absent from the core and the cortex to the vascular bundles.

Score 4.0 Staining absent from the core and 50% of the cortex.

Score 5.0 Staining absent from 90% of the cortex and mainly evident near the skin.

RADIAL STARCH PATTERN	LONG-TERM STORAGE (Controlled atmosphere storage, or long term home storage)		SHORT-TERM STORAGE For storage in fridge up to 6 weeks (Riper, more flavor, won't keep as long)	
	STARCH INDEX	BRIX	STARCH INDEX	BRIX
Gala	1.0 - 2.5	>12.0	>3.0	>12.0
Jonathan	2.0 - 3.0	>11.5	>5.0	>11.8
Golden Delicious	2.0 - 3.0	>12.0	>5.0	>10.5
Pink Lady	1.5 - 3.0	>12.0	>3.0	>14.0
Sundowner	1.5 - 3.0	>12.0	>3.0	>14.0
Granny Smith	1.5 - 3.0	>12.0	>5.0	>12.5
Lady Williams	1.5 - 3.0	>14.0	>5.0	>14.0
CONCENTRIC STARCH PATTERN				
Red Delicious	1.4 - 3.0	>10.0	>4.0	>10.7
Fuji	2.5 - 4.0	>13.0	>4.0	>14.0



BUDDING (SUMMER GRAFTING)

...RECAP

Budding is an easy way to graft a new variety on to an existing fruit tree, fix pollination problems (and boost production) by adding a polliniser, or save a tree that has died back to the graft. As long as the bark is still lifting on the host tree, there's still time to do it this season.

During February we do an in-depth budding story, including photos, instructions and video of the technique, but to re-cap, here's the main points again:

- *Collect budwood just prior to budding if you can-it needs to be fresh*
- *On the tree (or rootstock) you're budding onto, choose a one-year lateral (i.e. wood that's grown this season)*
- *Make a t-cut on the lateral*
- *Insert the bud*
- *Tape it up with budding tape*
- *The most important thing is to make sure the inserted bud is facing the right way up (so it won't be trying to grow down to the ground!)*
- *Budding will still work as long as the bark of the host tree will lift away from the wood underneath when you cut it, to let you slip the bud underneath. Once the tree starts going into winter dormancy, the bark won't lift any more.*
- *Label your trees, and make a note in your Fruit Tree Diary about which varieties you have budded onto which trees.*
- *Give it a go! It's really simple and you'll learn just as much from your failures as your successes.*



Want to Grow Peach Trees From Seed?

Now is the time to save the stones from any peaches you eat, if you want to grow your own peach trees.

Eat the peach and save the seed (don't bother washing the stones, just let any remaining flesh rot away, though you might want to store them outside!). What to do next? Stay tuned for the rest of this story during April.



SOIL LIFE: BACTERIA



Soil bacteria can help clean up the soil.

At Grow Great Fruit, we just LOVE soil, and we hope you will too, as we introduce you to the fascinating, dynamic and thriving interactive web of life in the healthy soil beneath our feet.

By far the most exciting thing about soil (and what most people don't know) is that it's alive! Coming to understand that healthy soil contains a quivering, heaving mass of life is a magic moment for any gardener, and that's the moment you become a 'biological gardener'.

This week we're introducing you to soil bacteria, which are tiny single-celled organisms and by far the most numerous of all the soil microbes. A teaspoon of healthy soil can contain up to 3 billion bacteria—roughly equivalent in mass to 5 big dairy cows on a soccer-field-sized garden! In the right conditions (i.e., a laboratory), one bacteria can produce 10 billion offspring in just 24 hours! Fortunately soil conditions are very different—not least because there are predators—and things are much less hectic!

There is an estimated 60,000 different species (there can even be up to 20,000 different species in one teaspoon of soil). They actually live in the water in the soil, including the thin layer of water that surrounds the soil particles.

Commonly when we think of

bacteria we think of the diseases they can cause, yet they are also great workers for good, are vital to life and have lots of jobs to do in the soil—they are in fact the first step in the chain of decomposing organic matter, holding nutrients until they themselves are eaten by something up the food chain, or die and decay. Bacteria rarely die of old age—most usually they die because either conditions become unfavourable or they are eaten by something else.

Bacteria are amazing waste processors, and one of the jobs they can do is purify contaminated soil. They also help to create good soil structure by 'gluing' soil particles together.

WHAT CONDITIONS FAVOUR BACTERIA?

Bacteria are the smallest and toughest of the soil microbes, and can survive a wide range of conditions.

They can be killed if soil conditions get too extreme—too wet, too dry, too acidic or alkaline. Luckily though, instead of dying, many species simply become dormant until conditions are favourable again, then off they go and repopulate the soil.

Bacteria do best in conditions where there is lots of green or fresh plant material—so fresh organic

A handful of soil contains literally billions of microbes, such as bacteria and fungi.



matter. The abundant sugars in this type of material are easy for bacteria to digest, as against the drier, more woody and high-carbon plant materials which are broken down by other workers in the soil.

TYPES OF BACTERIA

There are two main groups of bacteria—anaerobes, which can exist in low- or no-oxygen environments, and aerobic bacteria, which require oxygen.

ANAEROBIC

Anaerobic bacteria are basically the bad guys when it comes to growing food. Some of the nasty smells that you come across—rotten-egg, ammonia, vinegar, and other rotten 'swampy' smells—are all a result of anaerobic decomposition. If you ever smell anything like this in your garden, it is a good warning sign that things aren't good for some reason—waterlogging is often a culprit. The main problems these guys cause is that they will outcompete 'good' (ie, aerobic) bacteria, and will promote conditions that favour pathogenic (disease-causing) bacteria.

AEROBIC

The opposite is true of aerobic bacteria, and it is from these that good soil gets its good, earthy, 'sweet' smell that gardeners instantly recognise.

BACTERIA AND NUTRIENT CYCLING

Bacteria are a vital part of the natural recycling system. The three major elements—carbon, sulphur and nitrogen—are all turned into plant-available form by bacteria. Carbon becomes carbon dioxide; sulfur is turned into water-soluble sulphates; and nitrogen—the most important of all—is held in inert form (the only form that plants can use) with oxygen or hydrogen in the form of ammonium, nitrates, or nitrites.

A major benefit of having the nutrients locked up in bacteria (apart from them being plant available) is that they are then relatively resistant to being leached through the soil (nutrient leaching is one of the risks of using artificial fertilisers).



Good drainage is key to avoiding waterlogging—a key factor favouring anaerobic (disease-causing) bacteria

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the big lesson here is that one of the best things you can do for your soil is ensure that it contains plenty of organic matter...

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HOW DO I ENSURE MY BACTERIA HAVE ENOUGH FOOD?

If bacteria don't exist in sufficient number in the soil, then the creatures that rely on them as a food source will also suffer, and so begins a process of deficiency up the soil food web chain, resulting in less than ideal conditions for anything you are trying to grow.

Bacteria are highly concentrated around the root zone (rhizosphere) of plants, where they thrive on root exudates and dead root cells. They are also found in concentrations in any organic matter in the soil. So the big lesson here is that one of the best things you can do for your soil is ensure that it contains plenty of organic matter.

Bacteria use enzymes to break down organic matter (not including themselves, which is very clever and vitally important for their own survival!).

DISEASE-CAUSING BACTERIA AND HOW TO CONTROL THEM

Many plant diseases are caused by bacteria. Some of the common ones include Bacterial canker and Bacterial spot.

The good news is that these organisms thrive only when conditions are poor—compaction, poor drainage, lack of soil structure, and waterlogging are all common ones—and these conditions can all be remedied with the simple addition of organic matter!

LEARNING TO LOVE YOUR WEEDS

We're on a mission at Grow Great Fruit to help you think differently about weeds!

A weed is just a plant that we have decided is in the wrong place. Many weeds are also herbs, which the Oxford Dictionary defines as "any plant with leaves, seeds or flowers used for flavouring, food, medicine, or perfume". The botanical definition of a herb is "any seed bearing plant which does not have a woody stem and dies down to the ground after flowering". Many plants we commonly think of as problem weeds fit into one or other of these definitions (including most of the plants we feature as "Weed of the Week").

In reality all plants, wherever they grow, have both positive and negative effects on the environment, the other plants growing near them, and us, the caretakers of the land, depending on what we're trying to achieve.

Nature absolutely hates bare ground, and some kind of plant (often what we think of as a weed) will always pop up to fill any bare patch. The truth is, they're usually doing more good than harm!

Think for a moment about the roots of all the plants in your garden—including the weeds. For most plants, around every little root is an area called the 'rhizosphere', and this zone is home to a specialised breed of soil microbes called mycorrhizal fungi (and to many bacteria, as we cover elsewhere this week).

Mycorrhizal fungi have a key role in providing nutrients directly to plants—they're basically the pizza delivery guys who get a call from the plant telling them what nutrient is needed. They use their hyphae (like really long arms extending into the soil) to send out chemical messages to get the nutrients and bring them back to the

AT A GLANCE...

Many plants we think of as weeds are also herbs, and contrary to popular belief, are often doing more good than harm.

plant.

It's an ancient system of natural fertility that has evolved over millions of years, and it's completely free!

If you pull the weeds out and leave bare earth, the soil will heat up and dry out, and the microbes will die or go into hibernation. Nature will heal this situation as quickly as possible with, you guessed it, another weed!

Deciding whether or not to let plants grow under your fruit trees is a matter of weighing up the costs and benefits. To make it easier, we've summarised this in the following table:

Benefits of weeds

Keep the ground cooler

Provide habitat for soil microbes on their roots

Provide organic matter in the soil for microbes and earthworms to eat

Weeds, especially fast growing annual herbs and grasses, help to pump carbon out of the atmosphere and into the soil

By providing more habitat for soil microbes and increasing the carbon in the soil, weeds help the soil to store more water

Attract predator insects that will eat pest insects

Many weeds are edible, have medicinal properties, or have other uses

Some weeds are nitrogen fixers, taking nitrogen from the air and making it available to your fruit trees

Some weeds are dynamic accumulators, 'mining' nutrients from deep in the soil and making them available to your fruit trees. These are often the ones that come up first in bare or disturbed soil, and they help prepare the soil for the plants that come afterwards.

Lots of weeds are 'indicator plants' that give you messages about your soil

Disadvantages of weeds

Compete for water

Compete for nutrients

If left too long, can help pest insects get into your fruit trees

If allowed to grow long under fruit trees, can prevent good airflow in the tree and stop it drying quickly after rainfall

If allowed to grow long under fruit trees, can be unpleasant to work around the tree

Some weeds are allelopathic and will discourage some fruit trees from growing well

Many provide habitat for some pests

May spread into the environment and out-compete native plants



GROUNDCOVER OR MULCH?

We reckon that a living groundcover is absolutely the best thing you can do for your soil, and while mulch is second best, it's much better than bare soil!

Mulch can be anything that covers the soil and stops the weeds coming up, but it's best to choose something that will give the best possible advantage to both soil and your fruit trees. Something that will break down over time and add organic matter to the soil, like lucerne straw, is perfect, and newspaper can be very cheap and effective (if not all that attractive!).

At our place, we use organic straw mulch for the first couple of years around young fruit trees, and then switch to a living groundcover as the tree matures. We scatter a mix of seed including clover, other legumes and various other plants. What we're aiming to create is a really diverse mixture of all sorts of grasses and herbs growing in the orchard.

SELF-SOWN OR CULTIVATED?

Once you appreciate the benefits of having plants growing under your fruit trees, you can either tolerate the weeds that naturally occur, or choose plants to grow there that will give you some extra benefits.

This might be vegies (asparagus is a common favourite for this, but it's worth trying almost any vegetable), culinary herbs like coriander, dill or tansy, or nitrogen-fixing legumes like clover, peas or beans.

One of the advantages to choosing the plants yourself is opting for plants with a low growth habit that don't need mowing, because as you can see from the table on the previous page, weeds often only become problematic when they get too long. One of the keys to managing your living groundcover is to either mow it, or let animals eat it down regularly throughout spring and summer. This

- reduces the competition for water
- keeps the grass in its growing phase (rather than setting seed), which maximises the amount of carbon it will pump into the soil)
- stops insect pests from climbing the grass into your tree
- makes it more pleasant to work around the tree.

But if you're not organised to plant a groundcover, don't stress! Seriously, whatever plants come up are the right ones. The more the health of your soil improves (by following our soil improvement suggestions throughout the year), the more the plants will naturally change under your fruit trees. Over the last ten years as the soil has improved on our farm, we've seen a natural progression away from invasive weeds like capeweed, to a diverse, balanced selection of clover, grass and herbs.

So learn to love your weeds and save yourself a whole lot of work by making weeding a thing of the past.

MAKE SURE YOUR WEEDS ARE SAFE:

In Australia, noxious weeds are weedy plant species that are controlled and /or managed under state or territory legislation. Depending on the weed, this may mean you're obliged to remove it if it's on your land, or the legislation may dictate a ban on the sale or trade of a particular weed.

It's helpful to be able to identify the noxious weeds in your area, and luckily there's a great database in Australia to help us do that, at <http://www.weeds.org.au/noxious.htm>. For example Paterson's Curse (also called Salvation Jane [photo]) was originally introduced as an ornamental herb from the Mediterranean, but escaped from gardens and has become a widespread weed across most of southern Australia, where it crowds out more useful pasture species and poisons sheep! Check it out and make sure you're not creating weedy problems for your neighbours!



SPOTLIGHT ON: FRUIT FLY

Fruit fly is a problem pest in many parts of the world, and there are many different species involved. The main pest in Australia is *Bactrocera tryoni*, or Queensland fruit fly (QFF), which is found in parts of Queensland, NSW, Victoria, and the Northern Territory. Another serious fruit fly pest is the Mediterranean fruit fly (MFF).

Unfortunately the range of Queensland fruit fly is expanding rapidly as a result of climate change, and flies are being found in regions they were previously not thought to be able to survive. In recent years fruit flies have been found near our place in central Victoria (Australia) for the first time and, while they are not a problem yet, we are taking early preventive action before they turn up in numbers.

The flies lay their eggs in a very wide range of produce (including most types of fruit), and the larvae hatch and eat the fruit. A tiny 'sting' is the only visible sign on the outside of the fruit that it has been attacked—until you open it up and find it full of larvae!

LIFE CYCLE

The female lays up to 20 eggs into ripening fruit, then the eggs hatch in about 2-4 days. The larvae feed on the flesh of the fruit, moving into the centre, which causes the fruit to prematurely ripen and rot, and usually fall to the ground.

Mature larvae leave the fruit and burrow into the soil to pupate. Adult flies emerge from the ground (this can take as little as 7 days in hot weather), mate, and the cycle starts again. A key part of the life cycle is that adults need to feed on protein before their eggs will mature.

MONITORING

Check fruit on the tree for 'stings', and check fruit that has fallen off the tree to see whether it has stings or larvae inside the fruit. Eggs are white and banana shaped, and larvae are white with paired black mouth hooks.

PREVENTION

- Keep fruit trees at a manageable size by pruning or planting dwarf trees so it's easier to control the fruit fly.
- Use exclusion methods (eg, nets, bags, or sleeves for the fruit) to stop the females having access to

your fruit.

- Collect and destroy all fruit from your garden (whether infested with fruit fly or not) to prevent and break the fruit fly breeding cycle in your garden.
- Use a bait containing spinosad, an organically allowed insecticide made from a naturally occurring bacterium species. In Australia one commonly available product is called Naturalure, which is an effective, organic and relatively cheap prevention method that works against all species of fruit fly. Naturalure is protein based and attracts and kills the adults before they mate.
- Trapping the flies is even cheaper if you make the traps yourself, but may not be as effective. Fruit flies are attracted to sugar and protein, so make a bait by mixing fruit juice or honey with a protein source like wheatgerm, Marmite or Vegemite, and add water to make the bait liquid enough to drown the flies. Place bait in the traps described on the following page. You can also add some pyrethrum to kill the flies on contact.
- Choose early fruiting varieties for your garden, as the problem tends to get worse as the season progresses.
- Remove from your garden and nearby unwanted fruit trees or other host plants that attract fruit fly.



Queensland fruit fly

- Increase habitat for predators of fruit fly such as ants, ground beetles, spiders and birds by having a bigger variety of plants in your garden.
- Use poultry to scratch under your fruit trees and eat the pupae.

TREATMENT

Keeping fruit fly under control really depends on destroying any larvae you find, because the population can very quickly build up (and spread to your neighbours). It's not enough to just gather any fallen fruit; you must also destroy any larvae that might be in the fruit by one of the following methods:

- put fruit in a pot and bring to boil;
- put fruit in a sealed, black plastic bag in the sun for a few days;
- freeze fruit;
- immerse in water for at least a week, but be very sure to make sure it stays underwater.
- bury in a pit at a depth of 60-90 cm—this is pretty deep, so is not very practical unless you have some earth moving equipment to dig a serious hole!

After treatment with one of the above methods to make sure the larvae are killed, fruit can safely be fed to chickens or other animals, or put in the compost.



Fruit fly trap



Mediterranean fruit fly

MONITORING FOR PESTS, DISEASES, AND NUTRITIONAL DEFICIENCIES



A bad case of brown rot

Getting to know your tree will help you respond quickly to attack from pests or diseases, and may help you save your crop!

The best way to monitor your fruit trees is to visit them often – say once a week – and have a good look at them. In early autumn they should still be covered with leaves, and the leaves of most varieties should be large, dark green, and healthy looking (though it's normal for them to have accumulated a bit of damage throughout summer).

If the tree no longer has fruit, it may have started to either lose its leaves, or the leaves may be starting to go yellow before dropping. This is normal, and can happen quite quickly after all the fruit has been picked. The leaves have essentially done their job (of converting sunlight into sugars) for the year, and the tree no longer needs them, so it starts to withdraw the nutrients from the leaves (hence the change of colour), and go into shut-down mode for winter.

AT A GLANCE...

Monitoring your fruit trees regularly is one of your best tools in the fight against pests and diseases, as it helps you respond quickly before a problem has got out of control.

Weekly visits throughout spring, summer and autumn help you get to know the tree, and learn what's 'normal'.

The better detective you can become, the easier it is to respond quickly and take appropriate action when a problem arises.

HEALTHY TREES ARE LESS PRONE TO ATTACKS BY PESTS AND DISEASES, AND PREVENTION IS USUALLY EASIER (AND OFTEN MORE EFFECTIVE) THAN THE CURE!

No matter how big or small your orchard or garden, there are 5 main strategies for keeping your tree healthy and preventing pest and disease outbreaks:

1. **Good planning:** Only grow as much fruit as you can realistically manage.
2. **Healthy soil:** Trees that grow in healthy soil are naturally more resistant to pests and diseases.
3. **Encourage variety:** No matter what pest you have, there is usually a predator that will eat it (eg. ants, beetles, spiders, predatory wasps, hoverflies, lizards, and birds). Encourage predators by growing a wide variety of plants, especially plants with yellow and white flowers, as predators are often attracted to them.
4. **Practise good hygiene:** Clean up fallen fruit and dispose of it; pick damaged or diseased fruit and destroy it; and mulch, burn, or bury diseased prunings.
5. **Maintain your trees:** Keep up to date with watering, feeding, and pruning your trees to make sure they don't get stressed.

Some pests will attack regardless of how healthy your trees are, including birds, Queensland Fruit Fly, codling moth, fruit bats and possums. These pests need physical preventive measures.



Healthy trees are less prone to attack by pests and diseases

Assess the overall health of the tree:

- Do the limbs look healthy? Are there broken branches, evidence of dieback, or blobs of gum or canker on the limbs or trunk?
- Now look at the leaves—overall, are the leaves a healthy green colour?
- Have the leaves started to turn yellow, and if so is it because the tree has finished harvest for the year, or for some other reason?
- Look at a few individual leaves, particularly if they are discoloured. Are there noticeable patterns on the leaves? This can be a sign of specific nutritional deficiencies, so take photos for future reference.
- If the tree still has fruit on it, look at individual pieces of fruit and check for damage, particularly from birds, Garden weevils, Fruit fly and Codling moth, or diseases such as Black spot or Brown rot. (The “spotlight” on pests and diseases we feature regularly in the Grow Great Fruit program will help you diagnose individual problems, or download a copy of our ebooks *What’s That Spot?* and *What’s Bugging My Fruit?* for a more comprehensive guide.)

If you are not sure what is causing the damage, carefully look around the tree and fruit for any evidence you can find—particularly fresh damage to leaves, or insects on the tree. If possible, take photos of the damage from more than one angle.

Post a photo and question on the online members’ forum (growgreatfruitprogram.com/forum)—another member may have experienced the same problem.

If you need help getting to the bottom of a problem, book in a time to speak with us for your monthly one-on-one consultation (go to growgreatfruitprogram.setmore.com) and send your photos and any other evidence you’ve gathered to us before your appointment.



Some nutritional problems and diseases show up as symptoms in the leaves

DIAGNOSIS, THEN WHAT?

At this time of year, towards the end of the season, it’s not unusual (in fact, it’s completely usual) for your fruit trees to be looking pretty tatty. Leaves are fairly fragile things, and may have accumulated quite a lot of damage from miscellaneous misadventure – insects eating them, storms, hail, sunburn, animal damage...you name it, your tree has likely experienced it!

Therefore, monitoring at this time of year has two main purposes: the first is to protect any fruit that still remains on the tree, because late season fruit (apples, pears and possibly plums depending on your climate) is really important to your food security. They are often varieties that will keep for a long time, and can contribute to you having fresh fruit on the table well into winter, particularly if you have a way of storing the fruit (maybe a dedicated fruit fridge in the shed?) Here on the farm we are regularly still eating fresh apples and pears on our porridge until at least mid-winter. Late season fruit is also particularly useful for preserving—not least because it may be the first chance you get to spend any time in the kitchen! We’ve always lamented that the biggest gluts of fruit come when we have the least amount of time available for bottling, and also that in high summer the last thing you often want to do is heat the kitchen by cooking up a storm. So, autumn preserving is the perfect solution!

The other main purpose of monitoring your trees in autumn is to notice anything going on with the tree that might need action before it goes dormant for winter. Having said that, one of the most likely courses of action you will take is—do nothing!

If you still have fruit on your trees, and discover that it’s been damaged, here’s a handy checklist of actions to help you decide what action to take (if any):

- If it will help disrupt the life cycle of the pest or disease that caused the damage (and therefore help to prevent the problem getting worse or recurring next season), damaged fruit should be removed from the tree and destroyed, eg Fruit fly, Codling moth, Brown rot.
- If you can prevent further damage to any remaining fruit on the tree, take preventive action, eg netting the tree to prevent bird damage, putting double-sided tape around the trunk of the tree to prevent damage from garden weevils or earwigs, and baiting or using fruit shields for Fruit fly.
- If the fruit will still be usable when it ripens and is not creating a further problem, leave it on the tree and do nothing.

If you diagnose or suspect a nutritional problem with your tree, we’ll be going into more detail about diagnosis and remediation of nutritional issues in an article on “Feeding your fruit trees” in coming weeks.

It’s a great idea to start keeping notes on each of your fruit trees (the Fruit Tree Diary we provided is a useful place to do this). Note the date, your diagnosis of the problem, and any action you took. This can be helpful in preventing problems from recurring next spring. And remember, DON’T PANIC. In a healthy garden, pests are inevitably followed by predators, and it’s important not to rush in and spray insects you suspect (or know) are pests—in fact, it’s easy to do more harm than good!

It’s very easy to confuse the pest with the predator, and if you spray what you think is causing the damage, you might be killing your saviour. It can also take some time for the predators to show up.

We had very bad pear and cherry slug in the pear, cherry and plum trees a couple of seasons ago, and it wasn’t until half way through the next summer that we noticed the predators had arrived, and were taking care of the problem much more efficiently than we could have! If the tree is not suffering too much damage, it’s worth cultivating patience...

GROWING YOUR OWN PEACH TREES FROM SEED

In this week's "Indoor Jobs" we've suggested that you save peach seed if you want to try growing your own peach trees next year, so here's a bit more detail about how, and why!

WHAT TYPE OF PEACHES ARE BEST AS A SOURCE OF SEED?

When you're growing your own peach trees from seed at home, the truth is it doesn't really matter what variety of peach you use as a source of seed—whatever variety you have will do! Some varieties will grow a great rootstock, some not so good, and you won't know until the tree has grown, been grafted and then planted in your garden. However, you're producing a totally free fruit tree, so it's a very small risk—even if it turns out to be a terrible tree (which is unlikely), you can just pull it out and start again.

Here on the farm we use Golden Queen (a late variety of clingstone peach) as our source of seed to grow peach rootstocks, and we find it very successful every year.

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WHAT'S A ROOTSTOCK?

Great question! Nearly all fruit trees are grafted, which is when wood from a tree of a known variety (e.g. 'Jonathan' apples) is joined to a 'rootstock'—a different variety of tree that is chosen for its physical characteristics, e.g. the size of the tree, whether it tolerates flood or drought, and whether it has resistance to particular diseases, for example.



Save cling peach seeds. Let the flesh rot away, and don't wash or scrub the seed.

Growing a rootstock from seed is a slightly unknown quantity, because you are not producing a tree that is genetically identical to its parent (as you are when growing a tree from a cutting). Just like humans, trees produce seed that is a genetic mix of the parent tree and the tree that provided the pollen that fertilized the flower. However, it's accepted practice for apples, pears, peaches and nectarines. Peaches and nectarines are all self-fertile, so there is at least a chance that peach seed will be the same (or very close) genetically to the mother tree.

Compared to a cutting, a seedling rootstock (i.e., a rootstock tree grown from a seed) is likely to be large and very vigorous.

Recovering peach seeds from the sand where they've been stored over winter



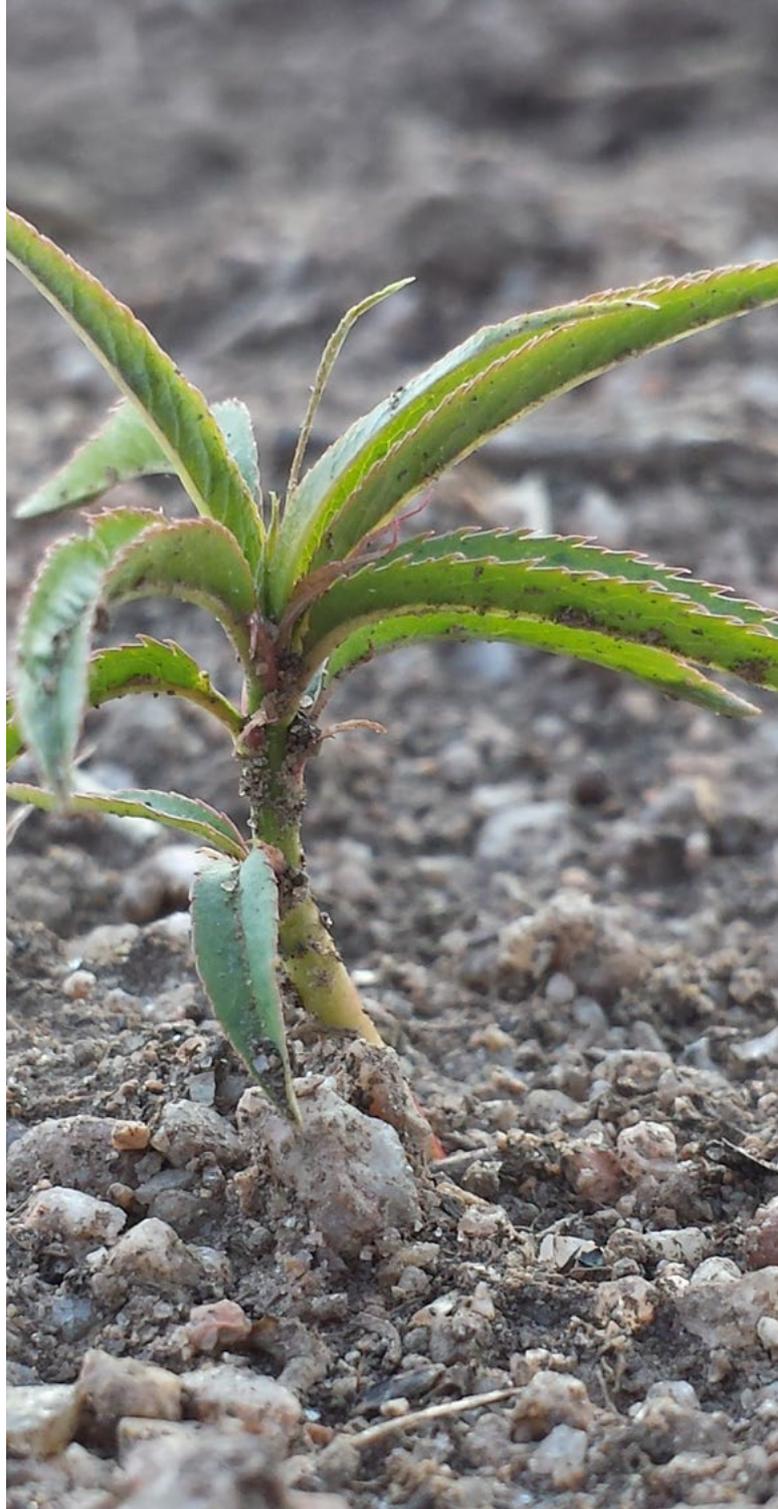
CAN PEACH ROOTSTOCKS BE USED TO GROW OTHER TYPES OF TREES?

Peaches and nectarines (which are basically the same) can be grown on a variety of different types of rootstock, but most commonly peach varieties are grafted onto peach rootstock—Elberta is one of the most common varieties of peach rootstock used in commercial nurseries. Peach trees can also be grafted onto plum, or even apricot rootstocks as well.

Peach and nectarine rootstock can be used to graft peach, nectarine, almond and apricot varieties onto.



After storing seeds in sand over winter, they will start to grow in spring.



A peach seedling emerging from seed planted in spring

METHOD

Collect your peaches, and eat them! Save the seed—don't wash or scrub any remaining flesh off the stone, just leave them to rot (you might want to leave them outside for this to happen).

Once clean, mix the seed into fine sand (the sort you'd find in a kids' sandpit), making sure they're completely covered. A plastic tub is perfect for the purpose, but make sure it has drainage holes, because if the seeds are sitting in water they will probably start to rot. The aim is to keep them damp so they don't dry out, but not too wet. In a 'normal' winter (do we have those any more?) rainfall will be sufficient to keep them damp, but it's a good idea to keep the pot near a tap to remind you to water it every now and then.

You'll be planting the seed in early spring—stay tuned!

FEEDING YOUR FRUIT TREES TO PREPARE FOR NEXT SEASON...

FRUIT TREES STORE NUTRITION IN THEIR BUDS IN AUTUMN BEFORE THE LEAVES FALL OFF, TO PREPARE THE TREES FOR SPRING.

Flower buds for next year's fruit actually start developing very early in the season, a month or two after the trees flower in spring. They continue to develop until the tree stops growing in late summer.

In late summer and autumn, the trees are storing carbohydrates and nutrients to use next season. Blossoming and initial fruit set next spring rely almost entirely on these reserves as an energy source.

In autumn, leaf nutrients are transferred to buds before leaf fall, and energy is also stored in the trunk and roots to sustain them during winter dormancy. The tiny, developing buds become inactive in preparation for winter survival. There is no water demand on the tree at this stage. Trees should not be stressed in autumn, and post-harvest care of trees can be looked on as insurance for fruit set the following year.

Therefore after harvest, and before the leaves fall off, it's important to make sure your trees have enough nutrients. What exactly are "nutrients" we hear you ask...you might have heard about the role of nitrogen in tree growth, or the importance of boron for the fruit to set properly...but what does it all mean?

Trees need access to a wide range of nutrients including the common ones like nitrogen, phosphorus and potassium, as well as "micro-nutrients" like boron, iron and manganese. Each one plays an

important role in the growth of the tree and in fruit development. But you don't need to worry too much about applying particular nutrients to your fruit trees, the key is to make the soil as healthy as possible, by adding organic matter to the soil around your trees regularly. Organic matter is pretty much anything that used to be alive, and some handy sources to use in the garden include:

- manure
- compost
- worm castings
- lawn clippings
- raked up leaves
- old straw or hay
- kitchen vegetable waste
- newspapers or paper waste

HOW DOES ORGANIC MATTER PROVIDE NUTRITION FOR THE TREE?

Organic matter is made of carbon, and nitrogen, and boron, and phosphorus and...well, all the nutrients that trees need. Unfortunately, the trees can't use them in that form, which is where the fantastic underground world of microbes comes in!

As well as organic matter, healthy soil also contains millions and millions of tiny microbes (such as bacteria and fungi), as well as more familiar critters like worms and bugs. Their job is to eat the organic matter (and

AT A GLANCE...
In autumn fruit trees start to shut down before becoming dormant in winter, but before then, the tree needs to store reserves of carbohydrates and nutrients in the flower buds to use next spring. The tree needs a lot of energy to produce flowers and fruit, before the new seasons' leaves and roots start supplying the tree with energy.
Most of the tree's nutrition comes from the soil, so it's important to constantly build the soil up and make it healthier, but sometimes you can give your tree an extra boost.



A home worm farm is a great way to turn kitchen and garden waste into something fantastic!

each other), which changes all those nutrients into a form that your fruit trees can absorb. It's an absolutely brilliant system, and it's totally FREE!

MICROBES & MICROBE FOOD

One of the things we are always doing on an ongoing basis is improving the levels of microbes in our soil—so fungi, bacteria, protozoa and nematodes being the main ones—and autumn is also a good time to be doing this.

BEWARE ARTIFICIAL FERTILISERS!

Most of the artificial fertilisers you can buy at your local garden shop will do more harm than good. These artificial fertilisers are usually harsh and salty, and may kill off all the wonderful worms, bugs, and microbes that you need to encourage to live in your soil. Look after your soil by steering clear of the nasty stuff, and sticking with the organic fertilisers.

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Regularly change the source of organic matter you put around your fruit trees, to make sure you are supplying a good balance of nutrients to the soil...

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Worm castings are great for the soil—and your trees

MICROBES

Worm castings and **worm juice** are the quickest and easiest way to be adding microbes to your soil, but compost tea is the most effective. The problem with worm castings is that you need a lot to be able to put some around each tree. Unless you have a major worm farm it's unlikely you'll have enough castings. This is where **compost tea** comes into its own—you can turn a couple of handfuls of castings into enough compost tea to apply to your whole garden or orchard. The brewing process multiplies by many thousands of times the number of microbes in the original castings—it's magical stuff! (We go into detail on how to build a home-scale compost tea brewer later in the year.)

If you do have enough worm castings, simply scatter some around the base of each tree, working them into the soil a bit if possible, and watering them in. It's good to do this when the soil is already a bit moist (which hopefully it is all the time!), so not during a stinking hot dry spell. This way the conditions are favourable for the microbes you're adding.

The same applies to compost tea—don't go putting it out during a hot dry soil as the microbes will find the going pretty tough. Damp soggy weather is an ideal time to be brewing and putting out compost tea.

MICROBE FOOD

In addition to adding biology (microbes) to the soil, it's also a good idea to be putting out some additional food for the critters. This can be done at the same time as compost tea or castings, or separately.

Even if you are not adding castings or compost tea, an application of microbe food is still well worthwhile. The more encouragement you can give to the biology that's already in your soil, the quicker your soil will

improve.

The two main sources of microbe food—and which are readily available—are liquid kelp and liquid fish. Both are fantastic food sources. These can be diluted and then just watered in around the base of your trees, going as far out as the drip-line (the edge of the tree canopy).

The most common liquid kelp available is Seasol, and for liquid fish there's Charlie Carp, but there are other brands of both.

DO I NEED TO USE FERTILISER AS WELL?

If you think your tree needs an extra boost (e.g. if it didn't grow well this season, or had bad disease or pest infestation), you can also use a fertiliser like well-rotted manure or pelletised manure (such as Dynamic Lifter). Fertiliser applications immediately after harvest have the greatest effect on tree and cropping performance. Fertiliser can either be put on the soil around the tree, or to make it easier for the buds to absorb nutrients directly, they can be sprayed onto the tree (this is called a foliar spray). Use your knapsack to spray the tree, and spray the whole tree until the leaves are dripping.

Foliar applications just before leaves start to fall are useful to ensure the right nutrients are stored in the buds to be ready for budswell and fruit development next season. Knapsack sprayers are the most practical for just a few trees; otherwise, a small pump-driven sprayer is best (and these can also be used to put out fungicide sprays at other times). We also go into the pros and cons of the various sprayers later.



Now is an ideal time to be adding compost around your trees

SUMMER PRUNING - CHERRIES & APRICOTS...

THERE'S STILL TIME TO FINISH PRUNING YOUR CHERRY AND APRICOT TREES BEFORE THE WEATHER TURNS COLD

There's a lot of confusion (and a lot of conflicting advice available) about summer pruning vs winter pruning, and what should be done when, so we've decided to get back to basics this week to help you make good pruning decisions!

The plethora of differing advice is why we've based the whole Grow Great Fruit program - pruning included - on basic principles rather than opinion or experience. These principles are based on the science of how trees grow, and how they're likely to react to different pruning cuts; we always say **there's no "right" or "wrong" when it comes to pruning, just cuts and consequences!**

To help us resolve the summer vs winter pruning issue, there's a few different principles we can draw on:

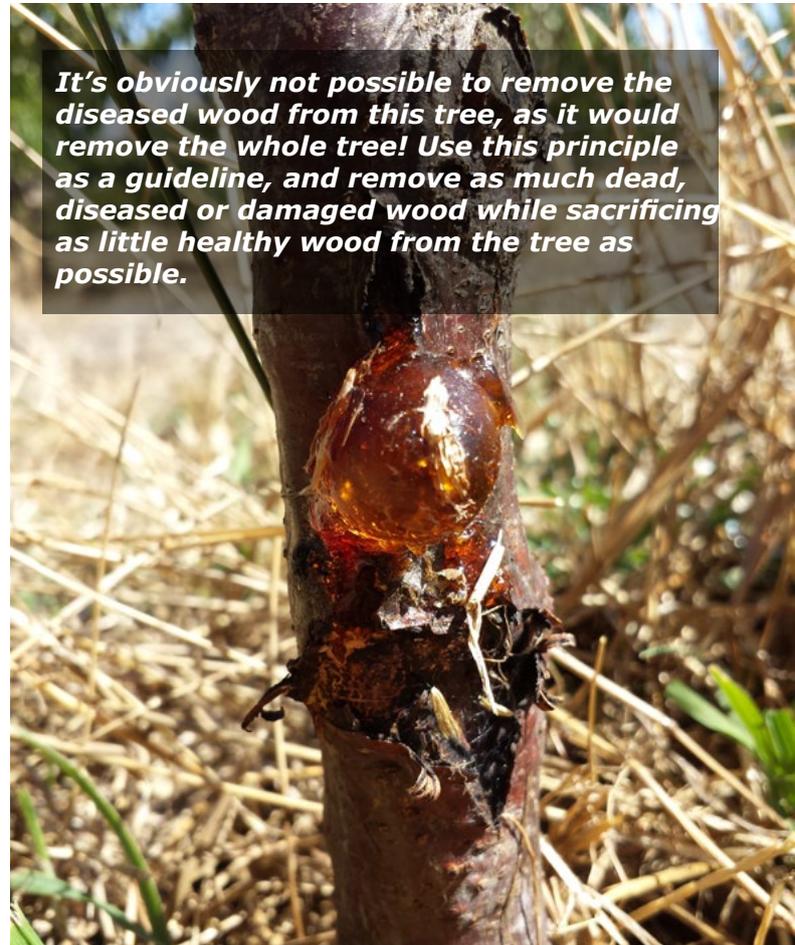
- Winter pruning encourages growth (vigour), i.e. pruning in winter is *more likely* (there are no absolutes in gardening) to encourage the tree to grow strongly in response to the pruning cut;
- Summer pruning *tends to* result in a smaller growth response
- Pruning in warm, dry weather leads to faster healing of pruning cuts, lower risk of spreading fungal disease between trees, and lower risk of introducing new fungal disease into a tree - therefore, it's one of the recommended preventive measures for many fungal diseases.
- Pruning a tree in summer when it is still bearing fruit may have multiple impacts on the fruit - more exposure to sun (resulting in either better colouring, or the potential of sunburn, depending on the amount of leaf colour and your environment), and the possible reduction of fruit size and sugar levels in the fruit.
- Summer pruning can reduce root growth in a tree, (this is one of the ways summer pruning reduces growth)

Understanding these principles will help you make pruning decisions based on your individual situation - for example even though we recommend summer pruning for apricot trees, you don't need to scramble to get your apricot pruned in the last week of summer if it happens to be cold and wet that week! Or, if you have a large plum tree you're trying to prune down to size, you're more likely to achieve the outcome you want by pruning it in summer rather than the more traditional practise of pruning it when it's dormant.

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There's no "right" or "wrong" when it comes to pruning, just cuts and consequences!

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It's obviously not possible to remove the diseased wood from this tree, as it would remove the whole tree! Use this principle as a guideline, and remove as much dead, diseased or damaged wood while sacrificing as little healthy wood from the tree as possible.



Always remove dead wood as a first step

OUR PRUNING RECOMMENDATIONS

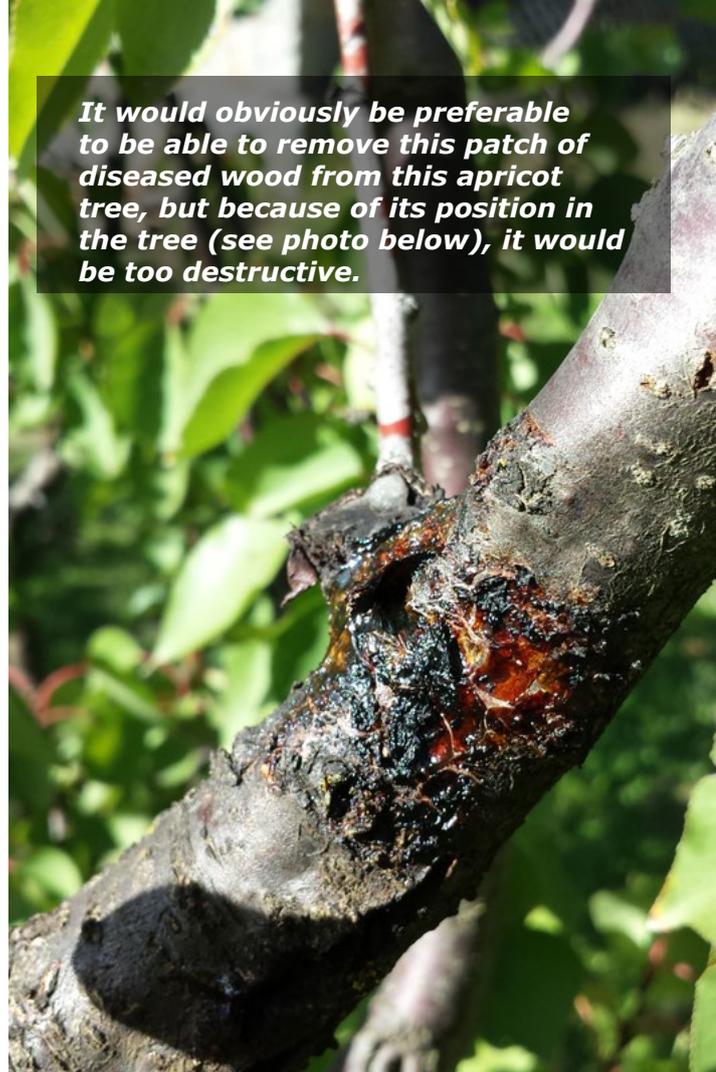
Based on the above principles, here's our recommendations:

- Prune apricot and cherry trees in warm, dry weather - wait until after the fruit has been picked and the tree's main rush of growth has slowed down, which usually means late summer or early autumn (i.e. now!). Apricots and cherries are particularly prone to gummosis and various fungal diseases, and cutting the wood in cold wet conditions is more likely to spread or introduce disease
- When pruning large 'monster' trees to reduce them to a more manageable size, prune in late summer
- Use summer pruning for selective removal of leafy shoots and water shoots, either to keep the size of the tree down, to direct new growth to the parts of the tree where you need it most, or to reduce shading of fruit or young shoots in the tree
- Most peaches, nectarines, plums, apples and pears can safely be pruned in winter, when the tree is dormant
- If peaches and nectarines have had bad fungal disease, prune them in late summer

GENERAL TIPS

No article on pruning is complete without a few general reminders and tips:

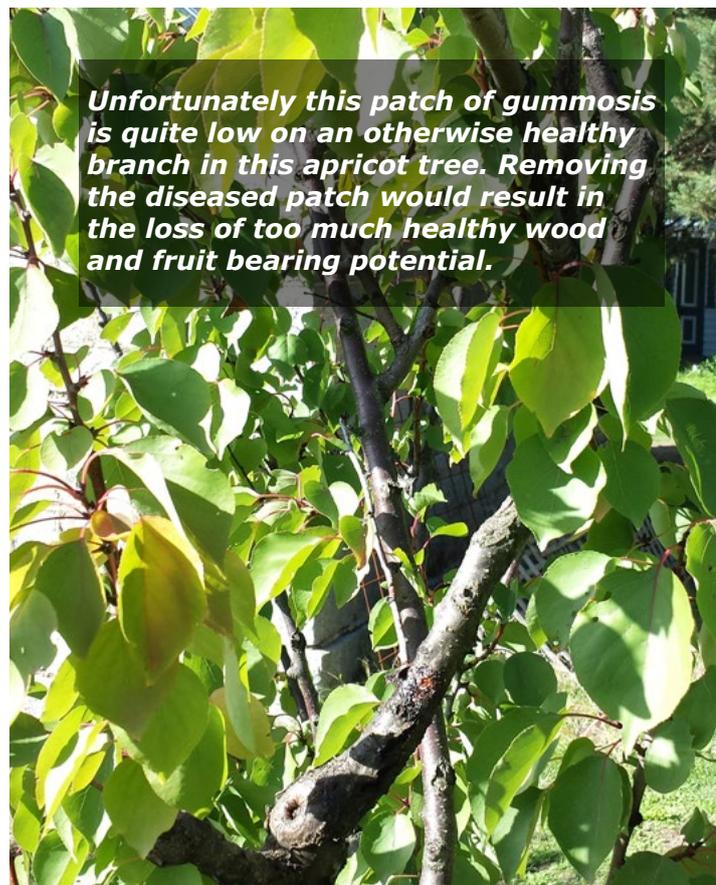
- Always start your pruning by removing dead and diseased wood, however it's not always possible to remove ALL the dead and diseased wood, because you might also be removing all the new wood that will bear fruit next year. Remove as much old diseased wood as possible without sacrificing too much healthy new wood
- Don't paint the pruning cuts with anything, as this can trap moisture in the cut and lead to higher risk of infection
- Keep pruning equipment clean and sharp
- Apricot trees produce their fruit on 1 year old wood and on semi-permanent spurs, so be sure not to remove all the young wood.
- Cherries produce fruit at the base of 1 year old wood, and on older wood
- Never leave a stub behind when you make a pruning cut; it always dies back to the next bud, and just encourages disease.



It would obviously be preferable to be able to remove this patch of diseased wood from this apricot tree, but because of its position in the tree (see photo below), it would be too destructive.



Remove wood that has died by cutting neatly back to the next healthy shoot.



Unfortunately this patch of gummosis is quite low on an otherwise healthy branch in this apricot tree. Removing the diseased patch would result in the loss of too much healthy wood and fruit bearing potential.

PLANNING YOUR HOME ORCHARD TO HARVEST FRUIT FOR 6 MONTHS OR MORE...

WITH THOUGHTFUL DESIGN, YOUR FRUIT TREE GARDEN CAN YIELD FRUIT FOR MANY MONTHS.

In February we spoke about looking at your fruit trees with a new eye, to judge whether they're meeting your needs. We suggested ways to use the Fruit Tree Diary and Fruit Tree Garden Planner that you received when you joined GGF to guide you through getting the most out of your existing fruit trees, and decide whether you need more trees.

We like to stretch our harvest time out as long as possible, because it spreads costs and risk, and gives us income for a longer time. This month we'll show you the technique we've used to plan our orchard, to help you pick fruit from your garden for 6 months or more!

CHOOSING VARIETIES

The key is choosing varieties that ripen consecutively. We start with the earliest cherries in late spring and finish with pears and apples in late autumn. Along the way we pick more than 90 varieties of deciduous fruit including cherries, apricots, peaches, nectarines, plums, apples, and pears (plus the citrus, figs, loquats, and berries we have in the garden). Each season we note picking dates for each variety, and keep adding new varieties to fill the gaps. We love adding early or late varieties that extend the length of harvest.

Another reason for spreading your harvest, and for growing as many different types of fruit as possible, is to minimise the inevitable risk posed by the weather. For example, a

hailstorm over your garden in January might damage early season peaches that are almost ripe and ready to pick, but do almost no damage to late-season apples that are still small and hard as bullets!

First, make a list of all the types of fruit you'd like to grow — if no-one in the family likes apples, don't bother growing them!



Observe your garden closely over all seasons to notice which spots are frost-prone, where it dries out fast or drains slowly after rain. This will help you place fruit trees in the best sites.



SPACE AND LAYOUT

Now consider your space. How many trees do you think you can fit? Most fruit trees can be as close as 2m apart quite comfortably. Even in a relatively small space you can increase the number of varieties you grow by using multi-grafted trees (trees with more than one variety growing from the same trunk), dwarfing varieties, or trellising fruit trees on fences or specially placed wires.

It's also important to consider local growing conditions: how long is your growing season, does it get cold enough to grow 'high-chill' varieties?

AT A GLANCE...

By choosing varieties that ripen sequentially, you can plan your garden to yield fruit over a long period.

Other considerations that can help you achieve a long harvest include space, pollination, multi-grafts, and creating microclimates in your garden.

Let's say for example, that you think you can fit 12 trees into your small suburban garden, including two dwarfing varieties in pots on the front porch, and a trellised tree on the north-facing back fence. You'd like to have fruit for as much of the season as possible, including cherries, apricots, peaches, apples and a few pears, but no plums because your next door neighbour gives you their excess.

The back fence is quite high, so the trellised tree could be a multi-graft with four varieties of apple (which will be a great opportunity for you to learn both grafting and espalier skills!).

Having identified that the back garden is prone to frost, the frost-tender apricots will be dwarfing varieties, in pots on the front porch. To create another micro-climate to protect the frost-tender cherries, you decide to install a water tank in the back garden allowing room to plant two cherry trees on the north side of the tank. The thermal mass of water in the tank, plus the sun-trap effect of the sunlight being reflected from its surface, will help to prevent frost damage to the cherry trees. Additional cover can also be provided with frost protective cloth. Making both trees multi-grafts will allow you to grow four different varieties of cherry.



MAKING A TREE LIST

Here's an example of what your list of trees might look like:

APPLES: (1 multigraft tree, espalier, 4 varieties): e.g., Gravenstein (ripen early Feb), Jonathon (late Feb), Granny Smith (late March-good for cooking and eating), Sundowner (mid May).

CHERRIES (2 trees, both multigrafts each with 2 varieties): e.g., Early Burlat or Empress or Earlise (mid-Nov), Merchant or Ron's Seedling or Stella (early Dec), Rainier white cherry (mid Dec), Lapins or Bing or Van or Sweetheart (late Dec).

APRICOTS (2 dwarf trees, in pots, both multigrafts with 2

varieties): e.g., Katy or Earlicot (late Nov), Castlebrite or Goldrich (early Dec), Trevatt or Moorpark (mid Dec), Hunter (early Jan)

PEACHES (3 trees): Tasty Zee white peach (mid Feb), O'Henry yellow peach (mid March), Golden Queen – clingstone (late March)

NECTARINES (2 trees): e.g., Goldmine white (late Jan), Fairlane yellow (mid Feb)

PEARS (2 multigraft tree, 4 varieties): e.g., Beurre Bosc (early March), Packham (late March), Corella (late March), Josephine (early April)

Assuming that each variety can be picked over a 2-week period, your picking chart would look something like this:

Fruit	Late spring	Early summer			Mid-summer			Late summer			Early autumn			Mid-autumn			Late autumn
	Nov	Dec			Jan			Feb			Mar			Apr			May
Empress (cherry)	■	■															
Castlebrite (apricot)		■	■														
Merchant (cherry)			■	■													
Rainier (cherry)			■	■													
Trevatt (apricot)			■	■													
Lapins (cherry)					■	■											
Goldmine (nectarine)							■	■									
Gravenstein (apple)								■	■								
Tasty Zee (peach)									■	■							
Fairlane (nectarine)									■	■							
Jonathon (apple)										■	■						
B. Bosc (pear)											■	■					
O'Henry (peach)												■	■				
Corella (pear)													■	■			
Golden Queen (peach)														■	■		
Granny smith (apple)															■	■	
Packham (pear)																■	■
Josephine (pear)																	■
Sundowner (apple)																	■

There are gaps in mid-January and late April, so you may decide to replace the Fairlane yellow nectarine with an earlier variety (eg, Fantasia, that ripens in late January). Similarly, you may decide to replace Granny Smith with the slightly later Pink Lady.

Your situation will be unique in every way, but this example illustrates that, with a little planning you can not only provide your own fresh fruit for half the year, but also have a choice of two or three varieties from your garden for most of the time.

You also need to check that the varieties you have chosen will pollinise each other (if required). For example, most apple trees need a different variety of apple nearby for the flowers to be fertilised and turn into fruit, but a lot of cherries, and all peaches and nectarines and some apricots, are self-fertile.

CHOOSING THE RIGHT VARIETIES

The Fruit Tree Database on our Yahoo Group lists hundreds of different varieties, including ripening times and pollination. Of course ripening times vary a LOT, depending on where in the world you live, so they are listed in the database as + or - a number of days from an indicator variety (eg Red Delicious is the indicator variety for apples), so you just need to find out when Red Delicious normally ripens in your district (which any local nursery should be able to tell you).

We can't stress enough how useful it is to keep a fruit tree diary. Record the position and variety of each tree in the garden (labels always seem to fall off or become unreadable), and each year monitor and record the dates of budswell, flowering and picking, as well as special weather events, or pests and diseases that

affect the trees or the fruit.

It's really hard to remember from one season to the next what actually happened and why, but with a diary you'll quickly build up a picture of your climate and conditions which will help you design and redesign your growing system to get maximum fruit production!



Record the position and variety of each tree in the garden...

ABOUT US

We—Katie and Hugh Finlay—run Grow Great Fruit from our farm in central Victoria, Australia. Teaching organic fruit growing was a natural progression from growing fruit commercially for years, and being asked thousands of fruit tree questions as we were selling fruit at markets.

We've always used organic, biological and regenerative farming methods, relying on building healthy soil to grow healthy trees and fruit—so that's what we teach. The trees get their nutrients from a diversity of microbes in the soil and plant tissues and from their relationships with other plants, rather than from artificial fertilisers.

We've been orchardists since 1998, both coming to it from non-farming careers, though Katie grew up on the orchard and Hugh worked on farms in Western Australia and the Middle East before roaming the globe for many years as a travel writer for Lonely Planet.

Training in organic farming, permaculture, soil biology, compost and holistic farming (as well as years of practical, hands-on experience) has all been important in developing our growing practices, the sustainable development of the farm, the establishment of the Harcourt Organic Farming Co-op, and the ethics of what we bring to you in Grow Great Fruit.

Diverse plantings rather than monoculture, spreading risk with biodiversity, and learning how to grow your own food successfully all contribute to food security—and we're on a mission to help build a secure food future for all!



DISCLAIMER: We make every effort to ensure the information given in this program is accurate. However, as conditions and methods vary, we cannot guarantee the results, and take no responsibility for any damage or injury that may occur, no matter how caused. But relax—you'll probably grow twice as much fruit as we predict...without incident!

Staying in touch

Part of what we love about the Grow Great Fruit Program is that we're building a community of like-minded fruit growers—something we wish we'd had when we were learning how to grow fruit.

There's lots of ways to join in, ask questions, share information, swap stories, make connections, and get to know us, and other GGF members.

On the socials...

See daily photos and updates from the farm, post comments, and share your own news on our social platforms:

Visit our [Facebook](#) page.



Instagram: [GrowGreatFruit](#)



For our exclusive community...

Grow Great Fruit Forum: Post your photos and questions online to get answers and feedback about fruit growing issues. Also a great place to brag about your success! Click [here](#).

Monthly Q&A Sessions: Join the community for a face-to-face friendly group chat once a month. Bring your questions and send photos in beforehand for us to share with the group. Register from the Members Home Page [here](#).

Blog. Our blog is another way we share what's happening on the farm, and go into more detail about various aspects of organic fruit-growing. Click [here](#) to view the blog.

All the material in the Grow Great Fruit program is the property of Hugh and Katie Finlay. It is provided to you as a member of the Grow Great Fruit program, and is not to be shared or distributed in any form without written permission.

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