

Buying quality macadamia trees

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INTRODUCTION

It is important to buy good quality planting stock when establishing an orchard. Good quality stock will ensure the trees get off to a good start and can continue to grow vigorously. Avoid trees that are stunted, root bound or infested with pests or infected by disease.

WHAT TO LOOK FOR WHEN BUYING TREES

Select vigorously growing trees that are free from pests and diseases with a good healthy root system.

Buyers should look for trees with the following:

- A healthy well formed root system that is not spiralled or twisted.
- A root system that has masses of very fine roots throughout the potting mix.
- A potting mix that is well-drained, friable and free from waterlogging and hard compacted clods.
- Healthy, vigorous, well-formed growth with dark green foliage.
- A minimum of 150 mm of hardened new growth above the graft. This should consist of at least two growth flushes with a strong graft union.
- Freedom from insect pests and diseases.

CHECKING THE ROOT SYSTEM

Before purchasing take at least two or three sample trees in every 100 trees and examine their root systems by removing them from their containers.

The root system needs to have a mass of fine white feeder roots throughout the potting mix.

A well-formed root system is necessary for sound growth and development of vigorous trees. Macadamias do not develop a single main taproot. Look for the development of a uniform and well distributed root system within the pot.

Trees with bent or distorted taproots (Figure 1) will have a weak root system and be more vulnerable to breakage and being blown over in later years. 'Crankhandled' and 'goosenecked' roots can be caused by careless transplanting of seedlings.

Another common problem to be aware of is root spiralling or root binding, caused by plants being in a small pot for too long. This can be easily recognised by removing the bag or pot and examining the root system.

CHECKING FOR PESTS AND DISEASES

A wide range of insects can affect young macadamia trees.

Introducing pests into a new orchard on nursery stock can result in a major setback in tree growth and development and add to orchard costs for many years. Pest infestations can stunt new growth and may kill young trees.

Four of the worst pests to look for are:

- Felted coccid
- Latania scale
- Twig girdler
- Trunk canker.

Felted coccid and **Latania scale** are difficult to see. It may therefore be a good idea to have an experienced person recommend a quality nursery and help you check the trees.

Felted coccid causes distinctive damage in foliage and twig growth. Affected leaves roll and twist into abnormal shapes. The pin-head sized coccids are approximately 1 mm long

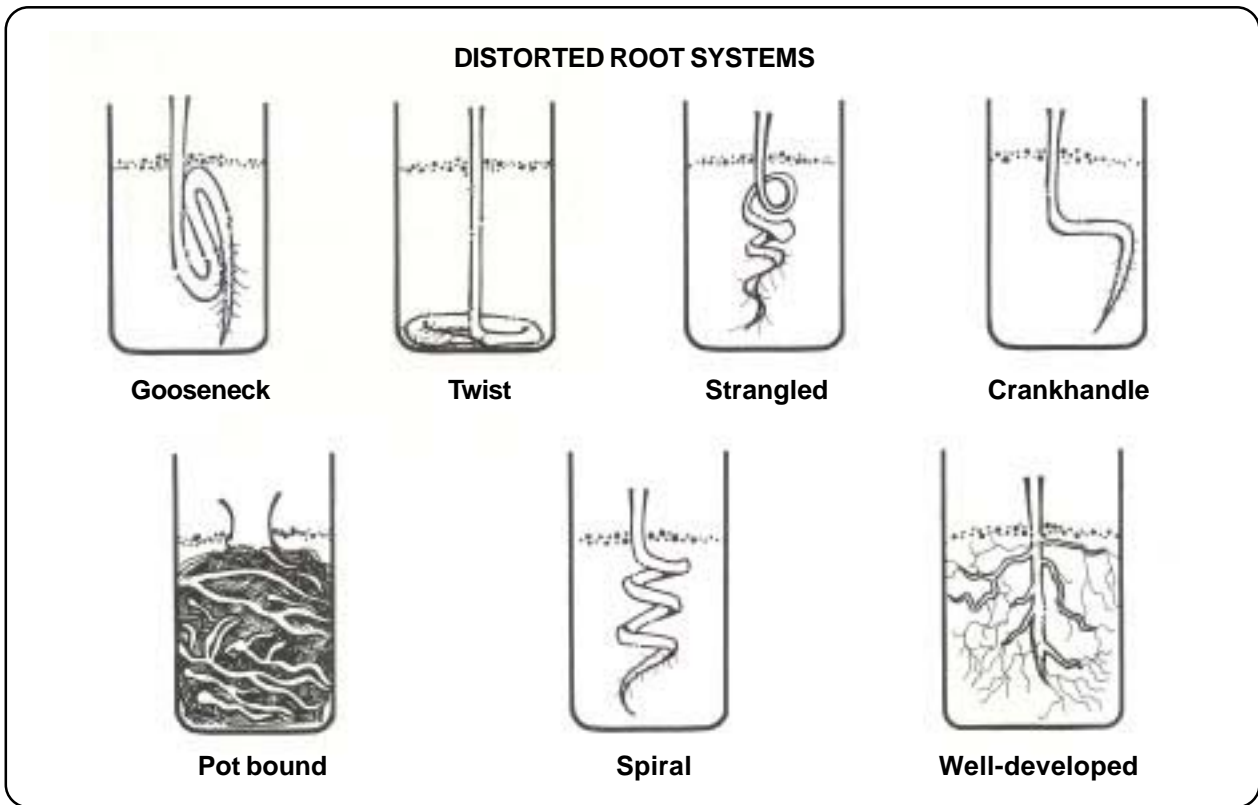


Figure 1. Jroot or gooseneck and crankhandle damage to roots is caused by careless transplanting of seedlings.

and are often present on the underside of leaves, often along the mid vein. In severe infestations they may also be present in large numbers in bark cracks, and on flowers. On closer inspection the female coccid, has a yellow brown felt-like covering. It is mobile before it settles, it then produces large numbers of eggs. These eggs hatch and a small white to yellow crawler emerges and begins to feed on the sap. The male crawlers have three longitudinal ridges, are white and have a felted covering.

Latania scale affects the stems of young trees. Heavy infestations may cause loss of foliage, and often form dense encrustations on branches.

Infested trees take on a dull khaki colour instead of being a healthy green. These insects are small and can be easily overlooked. The body of the insect is contained in the grey brown scale about 2 mm in diameter.

The caterpillar **larvae of twig girdlers** chew the bark and leaves thereby damaging young new growth, which causes multiple branching especially in young trees. Look for dead areas on leaves with light brown frass and webbing. The caterpillar is usually found within the webbing. The caterpillar is up to 23 mm long, yellow-orange colour with a black head. The adult

is a silvery-white moth, which is rarely seen, as it is active at night.

Trunk canker, caused by the fungus *Phytophthora cinnamomi*, is a disease, which may be introduced from an unsanitary nursery or from poor management practices. Infected trees are not easy to recognise but this fungal disease favours poorly drained, wet soil conditions. That is why a well-drained potting mix is so important. There may be small areas of brown resin oozing from cracks in the bark. Before buying nursery stock seek more specific advice on identifying this disease as it is not always obvious.

CHECKING TREES FOR OTHER PROBLEMS

Pot sizes that are too small

Trees planted in pots of insufficient size are another common problem. Grafted trees should be in pots of about 6-litre capacity, between 250 mm to 300 mm deep and 150 mm in diameter. In the first six months after planting macadamia seedlings into pots, roots can extend the entire depth of the container, so trees growing in shallow pots are more likely to become root bound.

Heavy compacted potting mixes

Compacted potting mixes are a major cause of slow development of nursery stock and they favour the development of trunk canker. Macadamia trees grow rapidly in well-aerated potting mixes and are capable of being grafted in less than 18 months.

Heavily compacted mixes discourage rapid root growth and leads to disease development.

In a compacted potting mix, the top few centimetres will have a mass of roots leading to the impression that the tree is healthy so it is important to tip plants out of pots and inspect them thoroughly. Trees that are pot bound should not be planted out until the root system has been cut back and the foliage growth reduced proportionally. Plants like this should not be purchased.

'Bulking' out potting mixes with topsoil is also a problem. This causes poor root growth and can result in young plants becoming waterlogged and susceptible to *Phytophthora*. The symptoms here are that new leaf growth begins dying back and browning from the tips.

'Advanced trees'

There is a common problem with the sale of 'advanced' trees that have been in pots too long. Buyers should not be influenced by bigger is best. These trees often have an inadequate root system for the size of their leaf canopy and they may not establish well when planted out.

CONCLUSION

Trees are one of the big costs of orchard establishment and buying inferior trees will definitely set back your enterprise for a long time. The above list is a guide to detecting important prob-

lems with nursery trees. They are not always easy to detect if you are new to macadamia growing. So, seek experienced help. The industry has many experienced consultants. Contact NSW Agriculture or the Australian Macadamia Society for further information.

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Disclaimer

The information contained in this publication is based on knowledge and understanding at the time of writing (August 2002). 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 New South Wales Department of Agriculture or the user's independent adviser.

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