

Certified Budwood Schemes – helping to protect: you, your business, industry, environment and the community.

The ability of the nursery industry to secure “high-health” plant propagation material does exist for some commodities via certification and improvement schemes. However, material is not available for all types of material needed by plant industries. In this month’s Nursery Paper, NGINA Industry Development Officer Michael Danelon looks at some of the options available to the industry to secure plant propagation material with the purity, authenticity and reliability to perform and enhance both the industry and environment.

Industry accreditation and certification of production nursery inputs

The nursery and garden industry propagates, grows and sells a wide range of plants to a variety of market sectors and customers.

The outbreak of Myrtle Rust (now referred to as Eucalyptus/ Guava Rust) on the east coast of Australia in May 2010 has been at a significant cost to the nursery industry, environment and community. However, it has helped to highlight the importance of biosecurity risks associated with moving nursery plants around the country and the impact exotic pests and diseases can have.

Anyone growing and selling plants needs to be aware of the pest and disease threats to the plants you grow and sell and what steps are required to prevent and manage them for your long term viability. Awareness and adoption of industry best management practice, guidelines and industry policy position should be common place for those in the nursery and garden industry.

To support the professional operation of the nursery industry, Nursery & Garden Industry of Australia (NGIA) through the support of levy funds from Horticulture Australia (HAL) developed the Nursery Production Farm Management System (NPFMS) for production nurseries, growing media manufacturers and greenlife markets.

The NPFMS is the framework supporting a sustainable future by allowing businesses to evaluate and manage areas of concern to them. The three industry on-farm programs consider:

- NIASA – Nursery Industry Accreditation Scheme Australia detailing industry best management practice
- EcoHort – Environmental Management System to demonstrate sound environmental stewardship and natural resource management and
- BioSecure HACCP – Biosecurity program to assist businesses to assess their current and future pest, disease and weed risks for imported and exported material.

Supporting NIASA accreditation as a source of consistent product and product performance is the BioSecure HACCP certification program. BioSecure HACCP addresses hazards through anticipation and prevention rather than reliance of end point inspection and treatment of products. BioSecure HACCP builds the integrity of the products by implementing critical control points within the business with the aim of achieving a high-health status product.



Stock within Auscitrus citrus repository

International certification entry requirements for australia

Imported plant material (seed, cuttings, budwood, cutflowers, live plants, tissue culture etc.) introduced to Australia requires assessment and formal testing as outlined by the import conditions (ICON) set by Department of Agriculture, Forestry and Fisheries¹ (DAFF). These conditions are based on the probable threat/risk of introducing pests and diseases with the imported material. For example, tissue culture flasks may be visually inspected for the presence of disease symptoms, or entry into an approved DAFF Post-Entry Quarantine facility may be required to assess high risk material for pest and diseases before release.

Refer to the DAFF ICON¹ website database listed below for more information on importing conditions.

Not all plant propagation material may display disease symptoms

In all plant production systems pests and diseases (e.g. insects, mites, fungi, bacteria, nematodes, viruses, viroids etc.) can cause varying degrees of damage and affect the quality of the plant, including its vigour and longevity.

Fortunately most of these pest problems can be managed, although some can be more challenging to detect and may go unnoticed for a period of time or disease expression may be masked under certain environmental conditions.

Graft-transmissible diseases pose threats to production nursery inputs

Viruses and other graft-transmissible diseases pose a significant threat as they can be difficult to detect and prevent if infected plant material is not managed appropriately. Graft-transmissible diseases are usually viruses or viroids which can be transferred from plant to plant by mechanical transmission (pruning/budding/grafting) or through infected propagation material. Some diseases can also be spread by insect vectors like aphids and thrips.

To reduce the risk of transferring virus and virus-like diseases in plant propagation material nursery hygiene and Biosecurity practices are paramount.

A number of methods are used to check the health status of plant propagation material. Tests include greenhouse biological indexing (transfer of sap and expression of the disease to indicator plants under ideal environmental conditions) and laboratory based molecular techniques.

When virus and virus-like diseases have been diagnosed and no source of healthy planting material is available, the infection can be eliminated from diseased material of some plant types via nucellar production (derived from cells of a maternal tissue in the ovule/seed without sexual reproduction), tissue culture, thermotherapy (hot water treatment/exposure) and shoot-tip micrografting.

Development of certified budwood schemes for specific plant inputs

Management of viruses or other graft-transmissible diseases can be achieved for some commodities using healthy (virus-free) planting material. The maintenance, testing and distribution of healthy stocks form the framework of a phytosanitation programme for certified seed, budwood and plant propagation material.

Such phytosanitary programs and repositories (a collection of 'clean' pest and disease-free germplasm to be utilised for propagation) do exist in certain intensive horticultural industries in Australia with some examples being: Almond Budwood Program (Almond)², Auscitrus Certified Budwood and Seed (Citrus)³, Australian Pome Fruit Improvement Program Ltd (Apple and Pear)⁴ and the National Vine Accreditation Scheme (Grape)⁵.

Phytosanitation programs provide industry with an ongoing supply of high health status propagation material of the varieties sought by growers, including new material with commercial potential.



Auscitrus citrus repository

Case study - auscitrus certified budwood and seed

Citrus is one of the most important commercial fruit crops grown throughout the world. It provides a basis for local agricultural industries, generates employment, raises income and provides an important source of foreign revenue. It is also a widely planted tree by gardeners.

The Australian Citrus Propagation Association (Auscitrus) was started in 1927 by a group of NSW Citrus nurserymen as a not for profit organisation to protect the citrus industry from various pest and disease problems. They have become the primary supplier of certified citrus seed and the only supplier of scientifically tested citrus budwood to citrus nurseries.

Auscitrus works in close partnership with New South Wales Department of Primary Industries (NSW DPI) who provide independent laboratory and greenhouse testing at the Elizabeth Macarthur Agricultural Institute (EMAI) in Camden NSW.

One particularly serious exotic citrus disease is Huanglongbing (HLB) which has not been detected in Australia. Within the Nursery Industry, HLB is considered a pest threat not only for citrus but also *Murraya paniculata* (Orange Jessamine) and *M. koenigii* (Curry Leaf plant) which are hosts of this disease.

Internationally, HLB has forced many citrus nurseries and orchardists out of business in Florida in the United States (US), Brazil and South Africa and threatens to impact the industry in California in the US where it was detected in 2012.

HLB is a graft-transmissible bacterial disease that is also spread by insect vectors. If HLB and an insect vector (one of which is the *Asian Citrus Psyllid*) were to arrive in Australia, it could have a catastrophic effect on the Australian citrus industry, citrus nurseries and ornamental nursery growers of the host *Murraya sp.* Diseases that are endemic (i.e. known to occur in Australia) of most concern to citrus include:

Citrus exocortis viroid (CEVd). CEVd or scaly butt, infection can lead to bark scaling below the bud union as well as severe dwarfing and decline. The disease is caused by a viroid that is symptomless in most citrus varieties but symptoms typically appear when infected



Citrus repository Nursery Auscitrus

budwood is grafted onto a susceptible rootstock. Studies have found that production can be reduced by up to 70%.

Citrus tristeza virus (CTV)⁶ There are many strains of CTV and some strains can cause a range of disease symptoms. Most citrus trees in Australia are likely to carry various mild strains of CTV that can be spread by aphids and infected plant material.

There are severe strains of CTV that cause stem pitting, tree decline and reduced production in infected grapefruit and sweet orange trees. The sweet orange stem pitting (OSP) strains are only known to occur in Queensland. **Government legislation is in place prohibiting the movement of citrus propagating material (with the exception of seed) from Queensland to other states.**

For over 40 years CTV has been successfully managed in grapefruit orchards by inoculating trees with a mild strain of CTV to protect against the more severe stem pitting strains.

The diseases mentioned above are symptomless in certain rootstock/scion combinations. This means an old tree in an orchard or backyard may appear healthy, but may in fact be carrying a serious graft transmissible disease. If budwood was sourced from this tree and was grafted onto a susceptible rootstock the resulting



Auscitrus nursery



Healthy citrus versus citrus with CEVd.

tree will begin to show symptoms and become a possible host for wider infection.

If you can't see the disease, how can you control it?

Auscitrus has extensive plantings of the majority of the commercially significant citrus varieties, and many of the more ornamental citrus lines. These plantings are regularly tested for disease (indexed) and maintained under strict biosecurity conditions to prevent cross-infection (hygiene/access restrictions/facilities/staff training/preventive measures).

Plantings are tested for trueness to type, and are actively managed for budwood production in field plantings and a NIASA accredited citrus nursery.

Citrus viruses and viroids can be killed by sterilising cutting tools with a fresh solution of 1.25% (12 000ppm) chlorine. A 10 second dip of cutting tools is adequate and should be followed by a rinse in clean (distilled/deionised) water.

Obligations to supply clean pest and disease free plant material

Any nursery producing or distributing plants has a responsibility to ensure that they are not distributing pest and diseases around Australia. To honour your obligations under federal and/or state/territory legislation consider:

- only propagating plants from parent material of a known high health status
- obtain plant propagation material from clean disease-free suppliers
- ensure internal controls are in place to prevent cross infection
- maintain records of source material and plant movements (allow traceability) and
- abide by the quarantine regulations of intra and interstate plant movements.

Securing clean plant material – think about the future

In many situations it may be a challenge to secure plant propagation material with the purity, authenticity and reliability to perform and enhance your business. There are however options individual businesses have in requesting and working toward receiving the type of material you are wanting from your suppliers. Plant health and the integrity of the plant products with regard to possible pest and disease infection are often taken for granted until it is too late.

Whilst there is the industry NPFMS programs available to all within the industry, the adoption by industry and industry stakeholders is one area where it should be recognised to help secure the future of businesses propagating, growing and selling plants. At the end of the day you are better to invest in a product with low risk rather than one produced in an environment that may cost you money in the long term.

Further Information

- NIASA Best Management Practice Guidelines, 5th edition 2013.
- National Nursery and Garden Industry Biosecurity Plan ver 3.0. Plant Health Australia/NGIA, May 2013.
- Reducing the pest risk; The Australian Nursery and Garden Industry's Policy Position on Quarantine and Biosecurity. NGIA 2012.
- BioSecure HACCP: Guidelines for Managing Biosecurity in Nursery Productions. NGIA 2008.

Nursery Papers

- October 2012, Reducing the Pest Risk – Industry's Policy Position on Biosecurity and Quarantine. A Kachenko, NGIA.
- April 2012, The Nursery Production Plant Health & Biosecurity Project. J McDonald, NGIQ.
- May 2011, Biosecurity – what is it and what does it mean to the nursery and garden industry. M Danelon NGINA.
- September 2009, Plant Health in Australia. G Dalwood NGISA.

Acknowledgements

Dr Nerida Donovan, Plant Pathologist, New South Wales Department of Primary Industries
Mr Tim Herrmann, Manager, Auscitrus. www.auscitrus.com.au

Websites – reference

- ¹ Department of Agriculture, Forestry and Fisheries ICON database Import Conditions <http://www.daff.gov.au/biosecurity/import/icon-icd>
- ² Almond Budwood Program - http://www.australionalmonds.com.au/industry/aba/aba_programs_services#budwood
- ³ Auscitrus Certified Budwood and Seed- http://www.auscitrus.com.au/docs/why_auscitrus.asp
- ⁴ Australian Pome Fruit Improvement Program Ltd (APFIP) was established in February 1997 by the Australian Apple and Pear Growers Association Inc (AAPGA – now Apple and Pear Australia Ltd) for the benefit of the Australian pome fruit (apple and pear) industry <http://www.apfip.com.au/1102.aspx>
- ⁵ National Vine Accreditation Scheme - <http://www.avia.org.au/pdf/accreditationscheme.pdf>
- ⁶ Citrus Tristeza Virus - http://www.daff.qld.gov.au/_data/assets/pdf_file/0019/71830/Citrus-Citrus-tristeza.pdf