



Auscitrus

**Australian Citrus Propagation Association
Incorporated**

ANNUAL REPORT

2012

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Auscitrus Mission Statement

“Auscitrus will ensure that adequate supplies of healthy, true to type, and certified citrus propagation material are produced in a scientifically sound, efficient, and economically sustainable manner”

Chairman's Report



As we know it has been a tough year for most citrus growers, with low returns due mainly to the impact of the high Australian dollar on export markets. This has reflected onto Auscitrus with a much smaller demand for seed and budwood. Nurseries are only growing trees to fill orders and growers with a couple of poor seasons behind them are not ordering any new trees. Auscitrus will be looking to supply bud sticks to growers who may wish to top work to new varieties instead of replacing trees.

At Auscitrus we are cutting costs where we can. Tim will be covering the secretarial work from here on, so please bear with us during this time if you are ordering. We have also suspended board fees until we see the final outcome of the 2012-13 financial year.

The indexing work will not be affected and will continue at E M A I. The same will apply to our two field/nursery staff; this work must be carried out in a timely manner as we continue to develop our new property. In the next few years we will start cutting back our orchard area at Dareton Research Station as our new seed and budwood trees mature on the new property.

At this time we do seek as much support as possible from all Australian citrus nurseries; we are here to make sure the industry has the best seed and budwood available, so growers have the best possible start in developing new citrus orchards. The board is well aware of the small extra cost of virus free material and try to keep the cost as low as possible, but remember, Auscitrus must remain viable.

We have great support from the staff at EMAI and our thanks go to Nerida and her team for their dedication to Auscitrus as they are well aware of the hard times in the industry and our policy of cost saving where possible.

Unfortunately we have had two break-ins to our sheds; each time the ute was stolen plus a number of tools. We have upgraded our alarm systems and Robert now takes the ute home each night. We were glad nothing was damaged in our shade-houses, it is a worry for us that at sometime vandalism could occur and set Auscitrus back a few years. I hope that when good times return we could possibly have a small dwelling on the property with a permanent resident which would help deter unwanted trespass.

My sincere thanks go to Tim and his staff for their efforts over the last 12 months, I hope the next year is easier for us all.

Finally I would remind you that we are looking for the support of the citrus industry and nurseries to keep Auscitrus viable.

Mike Arnold AFSM
Chairman

Auscitrus representation

State	Component Organisations	Grower	Nursery
South Australia	South Australian Citrus Improvement Society (2)	M. Arnold	S. Burdette
	Citrus Growers of SA(1)	B. Dring	
Victoria	Sunraysia Citrus Growers(2)	M. Cottrell	G. Chislett
Queensland	Qld Citrus Improvement Society(1)	T. Emmerton	
	Qld Nursery Industry(1)		W. Parr
Western Australia	Fruit West (1)	G Foord	
New South Wales	Nursery & Garden Industry NSW & ACT Limited(2)		G. Eyles B. Swane
	Riverina Citrus (1)	S. Brighenti	
	NSW Farmers Association (1)	S. Brighenti	
National	Citrus Australia Ltd	K. Parr	
	Totals	8	5

Auscitrus Management

Executive Committee:

Mike Arnold (Chairman)
Wayne Parr (Vice Chairman)
Steve Burdette
Gary Eyles
Kevin Parr

EMAI Management committee: Gary Eyles, Ben Swane, Tim Herrmann

Auscitrus Manager: Tim Herrmann

Public Officer: Gary Eyles

Auditor: WHK Thomsons Audit Services
Mildura VIC

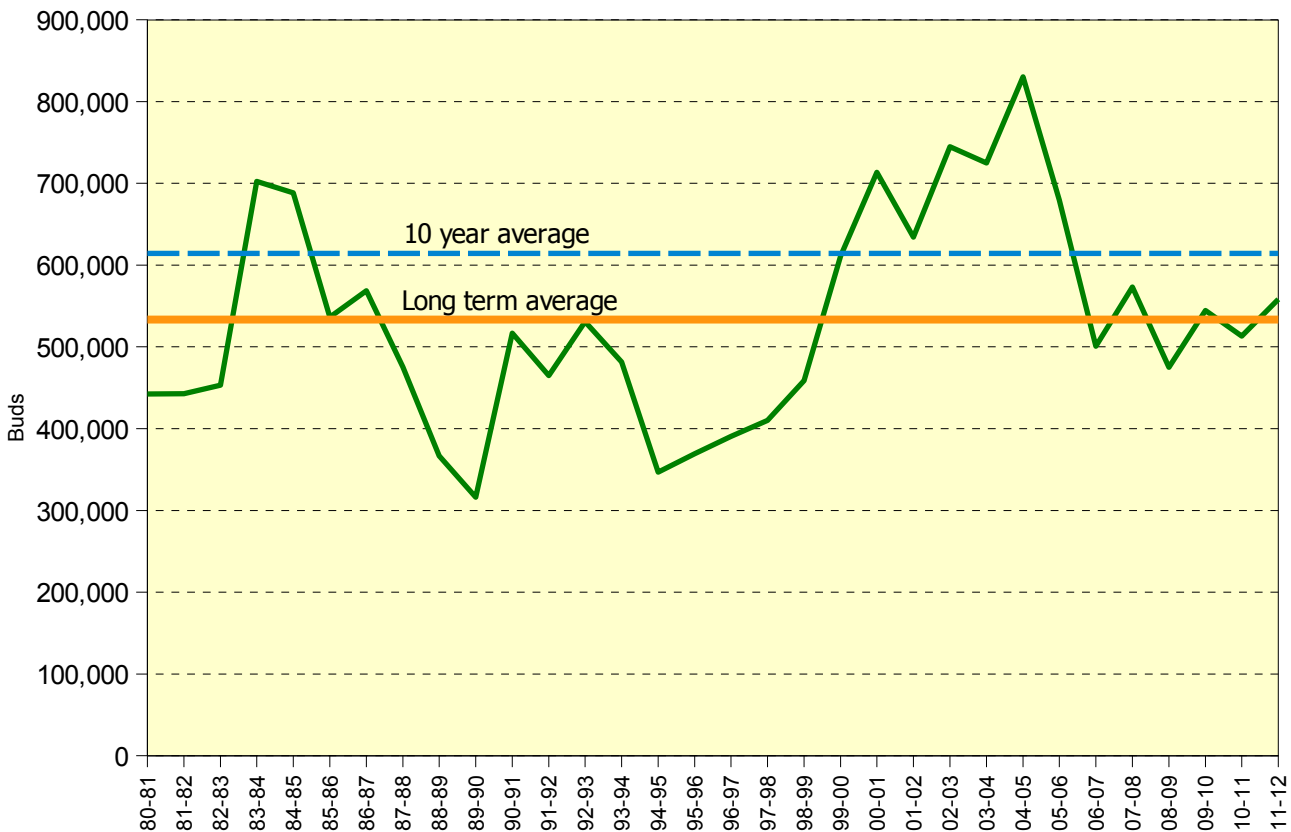
Commercial Operations

Tim Herrmann	Manager
Melinda Van Egmond	Administration-Finance officer
Hannah Bowes	Field Assistant (nursery)
Robert Bysouth	Field Assistant (general operations)

Budwood sales

Budwood sales were very similar to last years with sales of public varieties totaling 511,760 buds – the graph below however includes private varieties of which 46,370 buds were sold. This is increasing and will become a very significant component of future buds sales.

Budwood sales since 1980



Sales are still below the 10 year rolling average which was pushed up by very strong sales from 2000 to 2005 with corporate developments, managed investment schemes, and the north-west juicing developments all occurring at around the same time.

A significant proportion of bud sales goes to nurseries producing trees destined for the retail market. While this market is undergoing a downturn also, the continued sales of trees for backyard gardeners comprises a significant and important part of Auscitrus business.

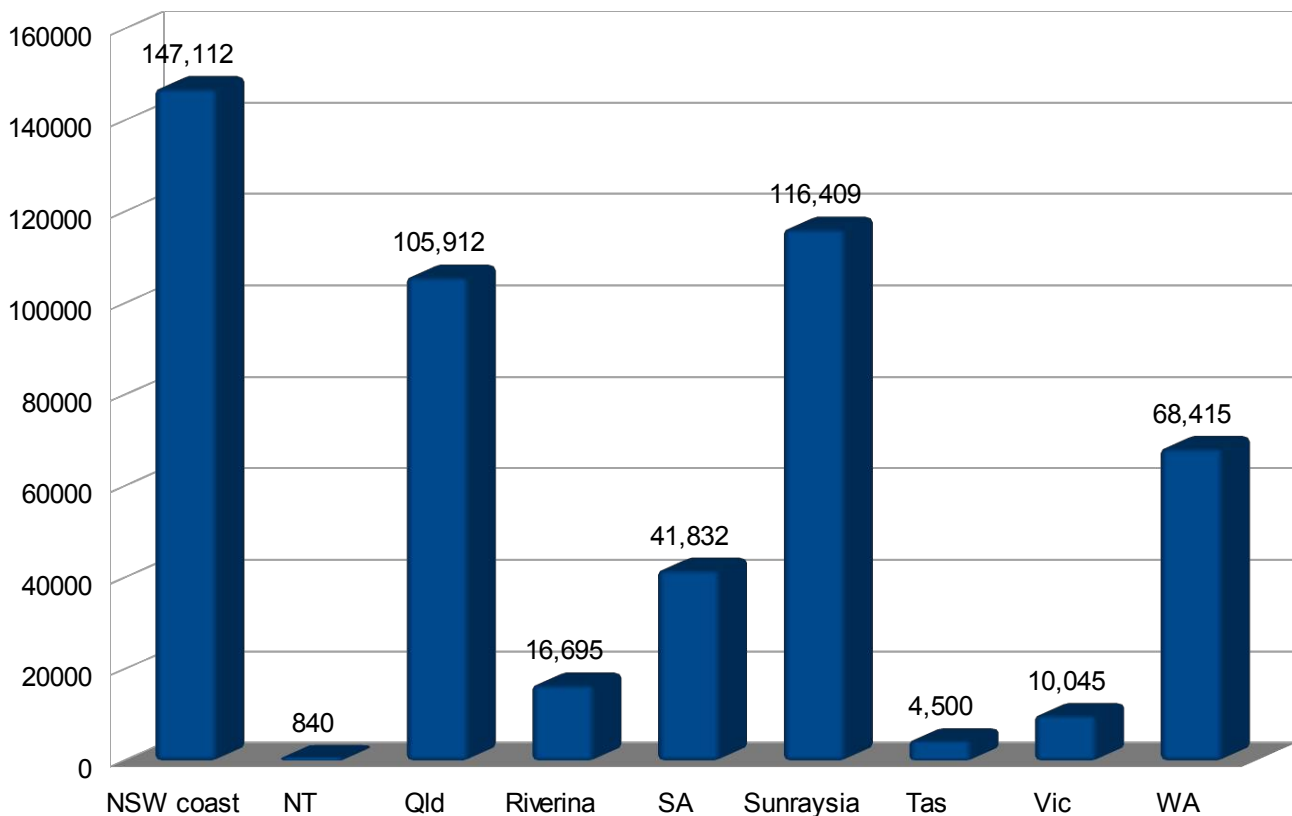
Top selling ten public varieties were:

Variety	Buds sold
Mandarin Imperial	50,605
Lime Tahiti	47,610
Mandarin W. Murcott Afourer	40,730
Navel Washington	33,825
Lemon Eureka (Taylor 3402)	33,590
Valencia Keenan	24,475
Lemon Meyer (806)	22,519
Mandarin Murcott	18,525
Mandarin Emperor	17,175
Mandarin Avana - Tardivo	15,100

Navel Cara Cara and Common Hamlin were just outside the top ten.

Private variety sales in total were 46,370 so made up a significant proportion of total sales, however private variety details are confidential and can not be reported by variety.

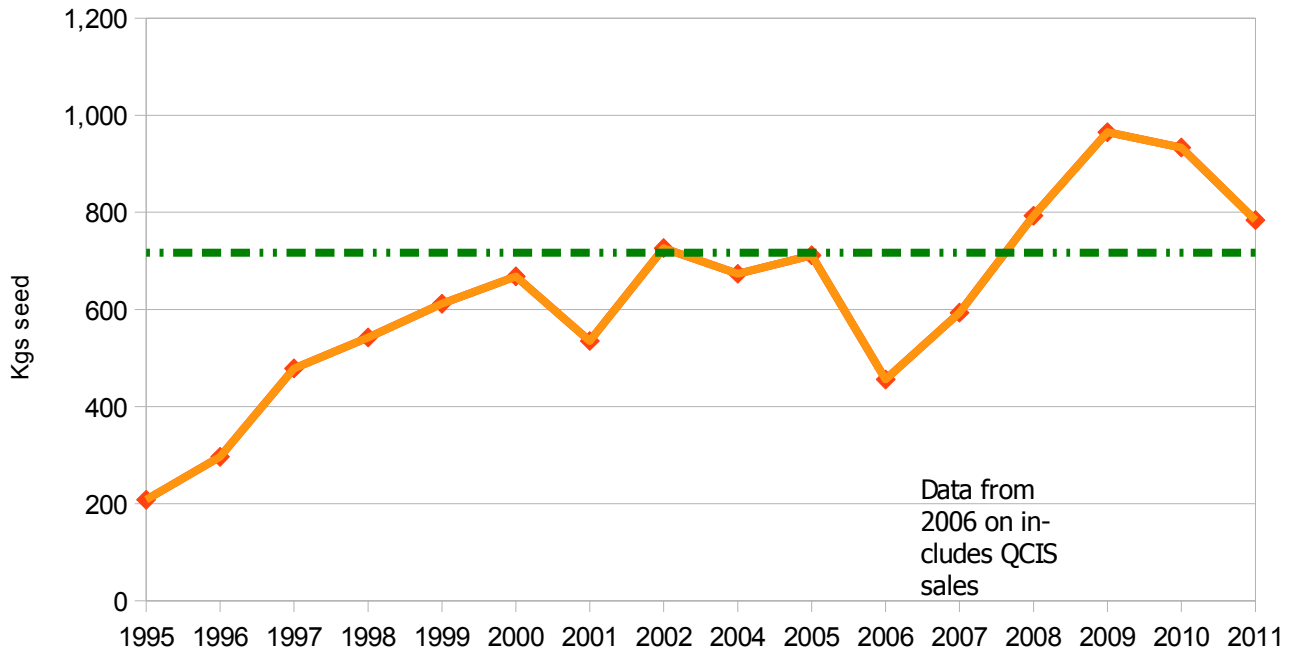
Total bud distribution by region shows similar trends to previous years (note that this does not include private varieties).



Seed Sales

Seed sales for 2011/12 were significantly lower than last years strong sales, at a total of 784 kgs. Orders for 2012/13 are significantly lower again although some late season sales are to be expected.

Historic seed sales



Qld harvested and extracted 229kgs of seed, Dareton 819 kgs, while only 3kgs of Flying Dragon came from Monash as the citrange from there was again not required.

The Monash plantings continue to be maintained as a backup supply in case of catastrophic events at Dareton. The Monash seed trees are less than two hours road travel from Dareton to allow fruit to be harvested and brought back to Dareton for seed extraction, yet far enough away to make it unlikely that a single event would wipe out both Dareton and Monash crops in the same year. Auscitrus and SACIS have signed an agreement to secure the future of the SACIS run seed block at Monash into the future.

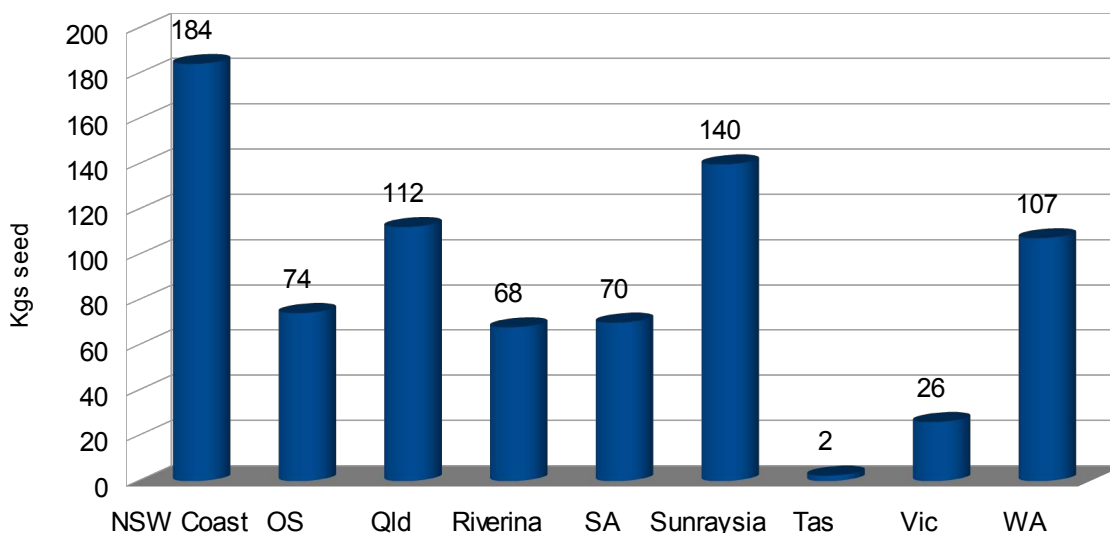
Carizzo, Troyer and Tri continue to dominate sales, while Flying Dragon continues to be a strong seller, as shown in this table of total sales:

Rootstock	Kgs sold
Benton Citrange	30.2
C35	32.8
Carrizo Citrange	126.3
Emperor	13.4
Cox Mandarin Hybrid	17.2
Emperor	1.8
Flying Dragon	87.4
P Trifoliata	186.8
Rangpur Lime	0.9
Rough Lemon	32.9
Sweet Orange	1.2
Swingle Citrumelo	52.2
Troyer Citrange	183.5
Volkameriana	17.8
West Indian Lime	0.2
Total Result	784

The majority of Swingle sales were to an overseas order.

Distribution of seed by region follows similar patterns to previous years:

Seed sales by region -2011/12



Seed export sales continue to provide a significant bonus income to the scheme.

Auscitrus operations at EMAI

Elizabeth Macarthur Agricultural Institute (EMAI) is located in a non citrus producing area at Menangle, on the outskirts of south western Sydney. At EMAI there is a NIASA accredited nursery and laboratories that are certified under ISO 9001:2008. Auscitrus is involved in 2 main areas at EMAI:

- Citrus Foundation Repository
- health status testing of its commercial budwood and rootstock seed trees

The following report covers activities during the 2011/12 financial year.

Citrus Foundation Repository

Repository for high health status clones, EMAI & Dareton

The repository currently holds 162 virus free citrus clones with at least 1 tree of each variety held in screen houses in 2 locations at Dareton and EMAI.

The virus free repository at EMAI fills 2 screen houses, with 52 private varieties held separately from the public varieties. All fruit observed on EMAI repository trees are photographed and the images are maintained in a database.

Three new imported varieties were released from quarantine over the 2011/12 year (December 2011) and mother trees were placed in the EMAI and Dareton repositories.

One screen house at EMAI housing the public varieties was refurbished in 2010, funded by NSW DPI. An application for capital works funding has been submitted to NSW DPI for the 2nd year running in an attempt to refurbish the other screen house.

Repository for pre-immunised clones, EMAI

The repository for pre-immunised clones is housed in a controlled environment greenhouse at EMAI. This repository contains over 80 citrus clones that have been pre-immunised with a mild strain of citrus tristeza virus (CTV). This mild strain serves to protect against more severe strains of the virus that may be introduced to trees in the field by aphids – this control mechanism is called mild strain cross protection.

Trees in the citrus repositories are tested regularly for graft-transmissible pathogens. Refer to the section on ‘Health status testing for citrus pathogens’ for testing details.

The maintenance and testing of public varieties is funded by HAL and Auscitrus via VC project CT10008 ‘Protecting Australia’s citrus genetic material’ from July 2010 to June 2015. The maintenance and testing of private varieties is covered by a contract agreement between the private variety owner and Auscitrus and is paid for by the variety owner.

It is important to note that the *high health* status of repository trees means that no viruses or viroids that we test for have been detected in these trees using our current test methods. These trees have a *high health status* but pathogens may be detected in these trees through improved test methods and the discovery of new pathogens.

Health status testing for citrus pathogens

Citrus viroids

All budwood source trees are tested every 3 years for citrus viroid infection using biological indexing methods on Etrog citron indicator plants. All suspect results from the biological indexing are investigated further using molecular techniques.

Viroid testing commenced for 440 Auscitrus budwood multiplication trees during the 2011/12 year. Molecular testing has also been performed on a selection of trees from the 2009/10 and 2010/11 testing to finalise results on samples started by previous indexing officers.

A decision was made in 2010 to test all repository trees for viroids using molecular methods. Many varieties had not undergone molecular testing for viroids since they were released from post-entry quarantine. Over the past 2 years repository trees at EMAI and Dareton have been tested for citrus viroids I, II, III and exocortis. Testing is near completion.

Citrus viroids IV and V are not known to occur in Australia. Positive control material for citrus viroids IV and V was obtained from scientists at the California Citrus Clonal Protection Program. The team has been working to develop the molecular method for CVd IV over the past year. Further work is needed to validate this method in the EMAI lab before test results can be confirmed.

Citrus tristeza virus (CTV)

CTV is endemic throughout Australia. There are many strains of the virus from mild to severe causing a range of disease symptoms.

Every tree in the citrus repositories is tested annually for the presence of CTV using a serological test called direct tissue blot immunoassay (DTBIA). This test is used to confirm that the virus is not present in the high health status clones and to confirm that the virus is present in the pre-immunised trees.

Trees in the EMAI screen house repositories for high health status clones were tested for CTV by DTBIA in autumn 2012 with no CTV detected. Trees in the Dareton repository will be tested in October 2012.

All trees in the pre-immunised repository tested positive for CTV in autumn 2012, except for Bergamote TID# 5002 and Afourer 5089. A number of trees were weakly positive but viral particles were still detected. Budwood is only sourced from pre-immunised trees that have tested positive for CTV during the past year.

All grapefruit trees in the budwood multiplication blocks are tested annually to confirm the presence of a mild isolate of CTV that protects trees against more severe grapefruit stem pitting strains. Molecular testing conducted in 2008 detected more than 1 strain of CTV in many trees.

During the 2011/12 financial year, 48 grapefruit trees from budwood multiplication blocks at Dareton were inoculated onto West Indian lime indicator plants to check for the presence of the mild pre-immunising strain of CTV. Biological indexing results confirm the presence of a mild protective CTV strain in the trees.

The budwood supply trees of some varieties other than grapefruit have also been inoculated with a mild strain of CTV (PB61) to protect against stem pitting strains of CTV. Samples from 20 trees (IrM2 and Afourer mandarins, Cara Cara orange and Rio Red grapefruit) were

tested by molecular methods to see if the mild strain (PB 61) is still present. Results show that the older trees (Cara Cara and Afourer) have lost the mild strain.

Citrus psorosis virus

Budwood multiplication trees are tested for psorosis virus every 9-12 years via biological indexing. During the 11/12 year, 159 budwood multiplication trees were tested for psorosis. No psorosis symptoms have been observed on the foliage of the indicator plants. The stems will be peeled to look for symptoms of CTV stem pitting.

Citrus tatterleaf virus

Repository trees on tolerant (symptomless) rootstocks are tested for citrus tatterleaf virus (CTLV) every 9-12 years. Samples from a subset of EMAI repository trees were inoculated onto Rusk citrange indicator plants in October 2010 and no CTLV symptoms were observed. Molecular testing is in progress for all EMAI and Dareton trees on CTLV tolerant rootstocks using the same extracts that were used for viroid testing.

Field inspection

The Auscitrus budwood multiplication blocks at Dareton Agricultural Research and Advisory Station were inspected on 15-16 November 2011 by Sylvia Jelinek. All trees in the budwood blocks 2, 3 and 4 were inspected for disease symptoms and off-type shoots.

Unthrifty trees potentially infected by graft-transmissible pathogens were identified and subsequent testing was performed. Suspect trees and off-type shoots were reported to Auscitrus in person immediately after the inspection.

General business

Pathogen elimination

Viruses and viroids can be removed from infected mother trees by shoot tip grafting and heat treatment. Successful shoot tip grafted plants then require testing to determine if all known pathogens have been eliminated.

Variety testing is in progress for 11 private varieties and 2 public varieties. A number of these varieties will require shoot tip grafting if they are to enter the repository program. Viable shoot tip grafts have been produced over the past year and there has been some success with pathogen elimination but so far all shoot tip grafts still contain at least 1 pathogen.

Quality assurance

The EMAI nursery is NIASA accredited and the Citrus Pathology and Soil Health Team is ISO 9001:2008 certified. The EMAI repository for virus-free citrus clones is also accredited as a MAF Biosecurity NZ off-shore quarantine facility (renewed in April 2010). The team was inspected and audited during the 2011/12 financial year and maintained their NIASA accreditation and ISO certification. The Auscitrus and EMAI management committee has also inspected the site on 2 occasions over the year.

New facilities

The EMAI citrus pathology team moved into newly constructed laboratories and offices in August 2011, funded by State Treasury. The team has access to high level quarantine (QC2 and QC3) facilities that are purpose built for pathologists working with local or exotic plant pathogens and have the capacity to handle a large scale plant disease outbreak.

Staff

NSW DPI staff involved with Auscitrus activities at EMAI during the 11/12 financial year:

Sylvia Jelinek	Technical Officer, Auscitrus Pathogen Indexing
Aida Ghalayini	Technical Officer, Molecular biology (1d/wk)
Allise Fail	Technical Assistant, Nursery (2.5d/wk)
Elissa Dell	Technical Assistant, Nursery (casual) Backfill July/August 2011 during Allise's maternity leave
Grant Dell	Head Gardener
Craig Gaunson	Leading Hand – Gardener
Nerida Donovan	Citrus Pathologist



Sylvia Jelinek, Auscitrus indexing officer, in new STG room at EMAI

List of public varieties in virus free repository

Type	Variety
Citron	Bergamote Buddah's Hand
Cumquat	Nagami
Etrog	Etrog citron
Grapefruit	Flame Henderson Marsh 3962 Marsh 3970 Ray Rio Red Star Ruby Star Ruby R. Cant Thompson (Eagle)
Lemon	Allen Eureka Fino Lambert Eureka Lemonade Limoniera 8A Prior Lisbon QLD Lisbon Taylor Eureka Verna
Lime	C. hystrix Eyles C. hystrix Malaya C. hystrix Nathanael Schweppes W.I.L Tahiti STG

Mandarin	<p> Avana Apireno Avana Tardivo Clausellina Satsuma Clementine (Arrufatina) Clementine (Caffin) Clementine (Clementard) Clementine (Corsica 1) Clementine (Corsica 2) Clementine (Fina) Clementine (Hernandina) Clementine (Marisol) Clementine (Nules) Clementine (Oroval) Daisy Eloise Encore Etna Fallglo Fortune Fremont (4566 R8T2) Hickson Imperial (0043/2) Miho Wase Satsuma Nour Nova (Spain) Nova (Trott) Okitsu Wase Satsuma Orogrande Parsons Special Pixie Primosole Sidi aissa Silver Hill Satsuma Sunburst </p>
Navel	<p> Benyenda Navel Cara Cara Fukumoto Hockney STG/HT Hutton Navel Leng Navel Navelate Navelina 315 Navelina Spain 7.5 Newhall (55-1 Spanish) navel Newhall (California) Palmer Thomson Washington navel (Atwood) Washington navel (Fisher) Washington Navel (Houghton) </p>

Orange	Arnold blood Bintang Cheng Renbin #5 Bintangchen #2 Hamlin Jincheng Lima Natal Parson Brown Pera (Bianchi) Pera (Limeira) Pera (Olympia) Pineapple Salustiana Sanguine Smith (Joppa) Tarocco Ippolito Tarocco Meli Nuc. C8158 Tarocco Meli Nuc. C8158 Tarocco Rosso Nuc. C4977 Tarocco Rosso Nuc. C4977
Pommelo	Namroi
Tangor / Tangelo	Ellendale (Herps) Ellendale / EM3 Murcott Tangor (Benham) Topaz tangor W.Murcott Afourer
Valencia	Berri 3501 Benyenda Valencia Delta seedless valencia Keenan 3125 Keenan 3247