



# Auscitrus

**ANNUAL REPORT**

**2010**

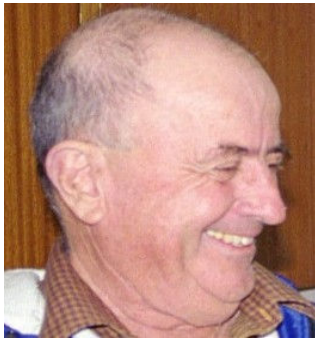
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### **Auscitrus Mission Statement**

**"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



After a very successful opening last year River Road has gone ahead in leaps and bounds. The property is in good heart and the seed trees are producing a very good crop of fruit.

The winter months gave us good rains, the river is flowing again and growers have been given increased allocations of water, this has all lead to a more positive feeling amongst growers and the replanting of many properties is again a good possibility.

The Board at its July meeting visited Eastern Creek Quarantine Station to talk with their management to discuss the time taken for material to pass through quarantine and to make them aware of growers desire to push varieties through as quickly as possible. Within 4 years the station at Eastern Creek will be closing and very little work has been done to establish a new quarantine station. Your committee will be watching and making sure progress is made on the establishment of a new station.

At the same time we visited EMAI to note work being done at the station and to discuss future employment of staff as Grant Chambers has left his work with Auscitrus but is still working at EMAI. We thank Nerida for her management and interest in helping Auscitrus progress at that facility.

We must progress nursery certification and accreditation as soon as possible to make sure industry has the best available planting material; to this end we hope to have a nursery forum during 2011 at Mildura.

We are also looking at the South Australian and Queensland schemes to see how best they can support Auscitrus. We believe that both schemes should be retained and supported as part of Citrus Improvement programs in Australia, but they may be better in a different support role. Discussions are ongoing with both states.

It is pleasing to note that visitors from overseas improvement schemes are very impressed with the planning and development of our River Road property and the high standards we maintain in the nursery area.

At the end of August we said goodbye to Theresa who is moving to Shepparton to be near her family. We now welcome Melinda to the Administration at Auscitrus.

In closing I must again thank the executive committee for their support and interest over the last 12 months. A big thank you to Tim and his staff for their management and progress of Auscitrus. The property is a credit to our Australian Citrus industry.

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)	K. Andrew	
Victoria	Sunraysia Citrus Growers(2)	M. Keenan	G. Chislett
Queensland	Qld Ctrus Growers(1)	T. Emmerton	
	Qld Nursery Industry(1)		W. Parr
Western Australia	WA Fruit Growers Association Citrus Council (1)	G. Fawcett	
New South Wales	Nursery & Garden Industry NSW & ACT Limited(2)		G. Eyles B. Swane
	Riverina Citrus (1)	J. Valenzisi	
	NSW Farmers Association (1)	J. Cade	
National	Citrus Australia Ltd	K. Parr	
	<b>Totals</b>	<b>8</b>	<b>5</b>

## **Auscitrus Management**

### **Executive Committee:**

<b>Mike Arnold</b>	(Chairman)
<b>Wayne Parr</b>	(Vice Chairman)
<b>Ben Swane</b>	
<b>Steve Burdette</b>	
<b>Kevin Parr</b>	

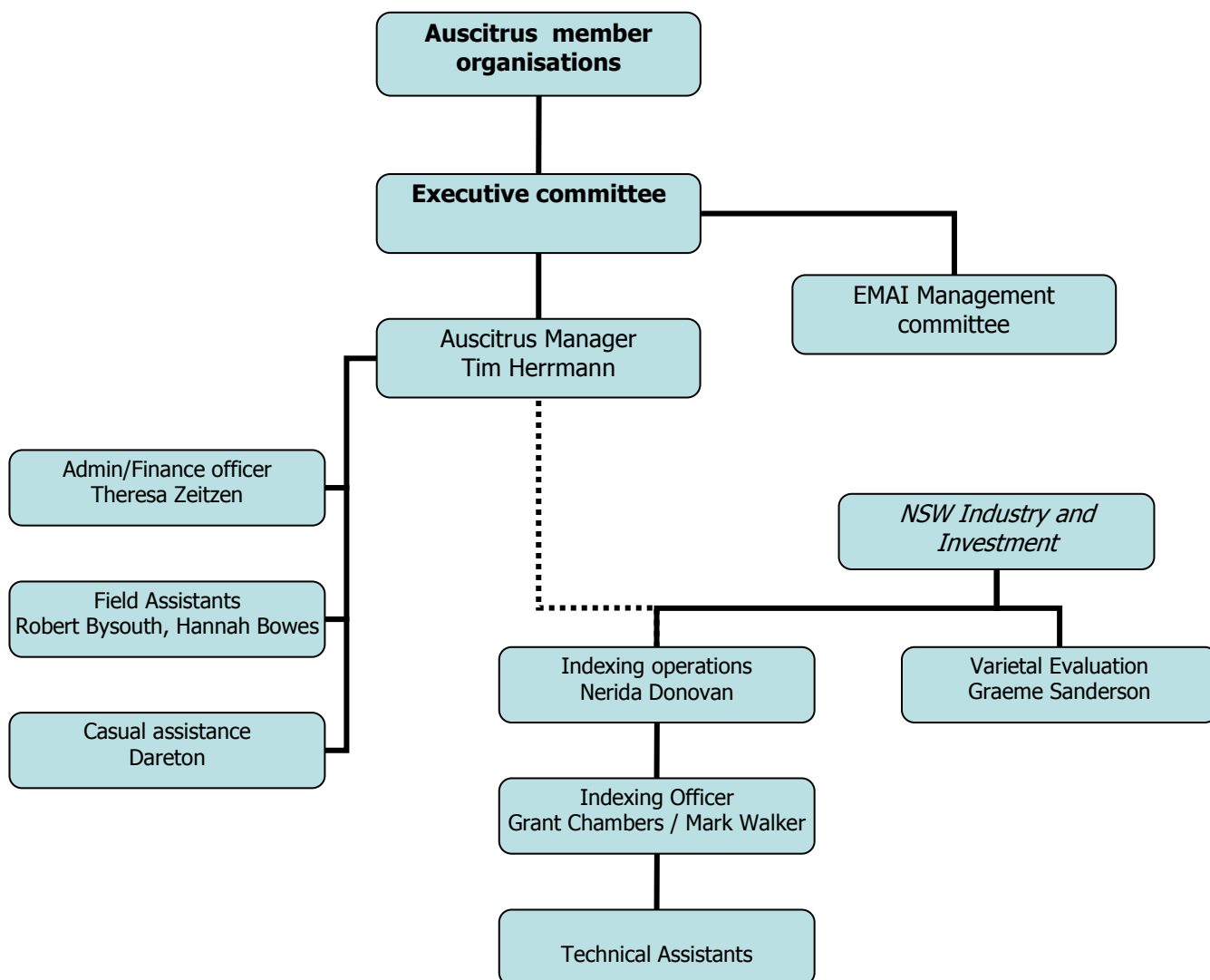
**EMAI Management committee:** Gary Eyles, Ben Swane, Tim Herrmann

**Auscitrus Manager:** Tim Herrmann

**Public Officer:** Theresa Zeitzen

**Auditor:** WHK Thomsons Audit Services  
Mildura VIC

## Auscitrus structure



## Manager's Report

A highlight of the past season was record seed sales, with strong sales both locally and to overseas customers. This supported slightly stronger but still somewhat mediocre bud sales. While the traditional public varieties continue to dominate Auscitrus bud sales, the contracted production of private varieties is becoming increasingly important.

Despite a somewhat positive outlook Auscitrus is still working hard to retain profitability. Strong seed sales have helped bolster income, while every effort is being made to minimize operational costs. The Executive committee and management are taking steps to ensure the long term viability of the scheme, and to place the organization in a strong financial position so it can continue servicing the citrus/nursery industries well into the future. This is becoming difficult as overhead costs continue to escalate while external funding is reduced, however a number of strategies are being developed to improve profitability.

The virus free foundation repository is no longer funded through levy funds, and so must be funded in the Auscitrus operational budget. Matched funding has been obtained through a HAL VC project, however this is still an additional cost to Auscitrus.

Key to sustainable operations is increasing bud sales, and an important strategy to help achieve this will be nursery certification. The development of a workable certification system has been in train for a number of years, but is now ready for widespread implementation. Demand for certified trees from growers and retailers should encourage nurseries to use the budwood scheme, which will in turn improve the profitability of the scheme through economies of scale, leading ultimately to reduced charges to nurseries. This will allow growers to be sure the trees they are planting have been produced using certified seed and budwood, and will allow nurseries to promote their trees under a formally certified system.

This year saw a revised strategic plan developed for Auscitrus, which now that the River Road facility is completed focuses on improving profitability of the operations and maintaining the provision of a source of high health status planting material to the Australian citrus industry.

Tim Herrmann B App Sc Ag  
Auscitrus Manager



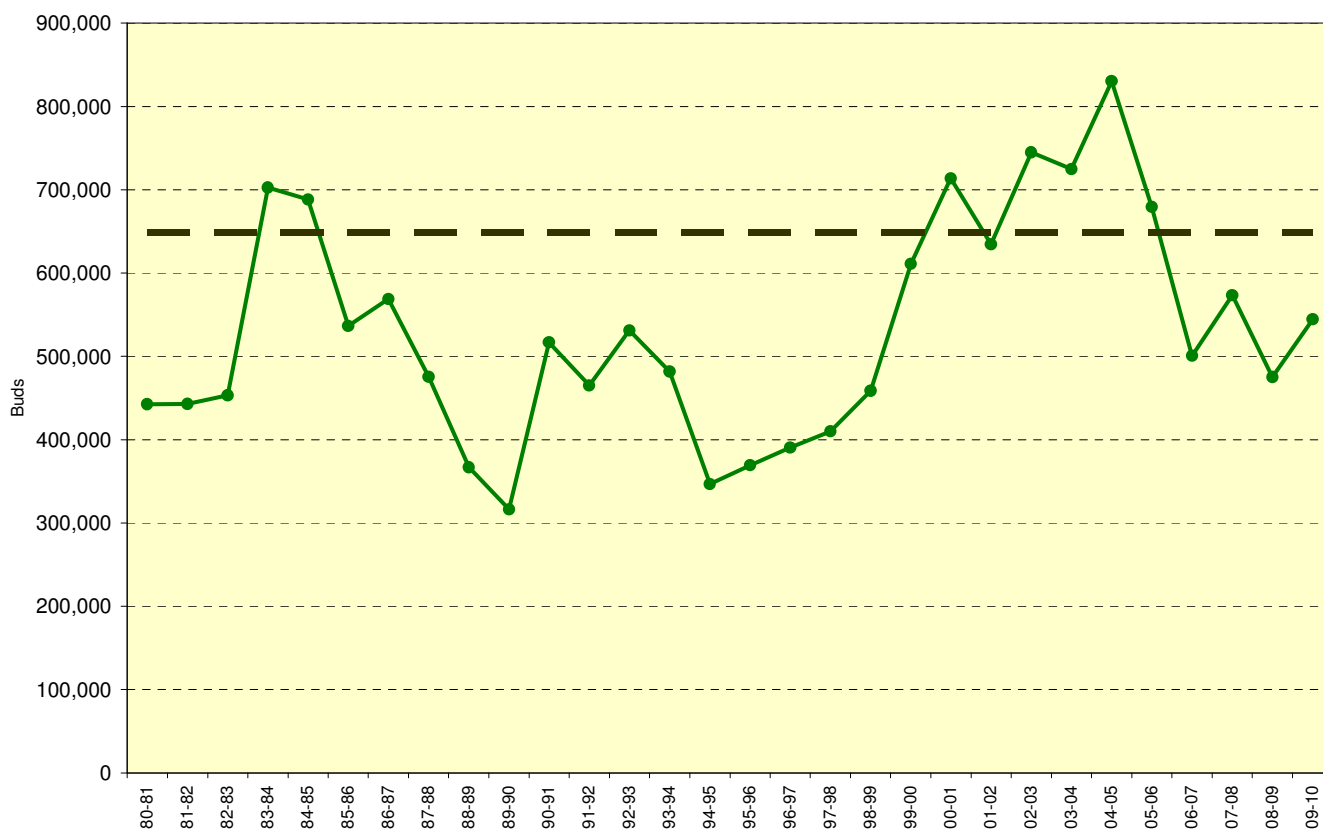
## Commercial Operations

Tim Herrmann	Manager
Theresa Zeitzen	Administration-Finance officer
Hannah Bowes	Field Assistant (nursery)
Robert Bysouth	Field Assistant (general operations)

## Budwood sales

Budwood sales were up from last year totalling 544,529 buds, although this is still well below the 10 year average. It may be a sign that sales are returning to sustainable levels however. Of those bud sales, 42,600 were of private varieties, which is becoming an increasingly significant part of Auscitrus operations.

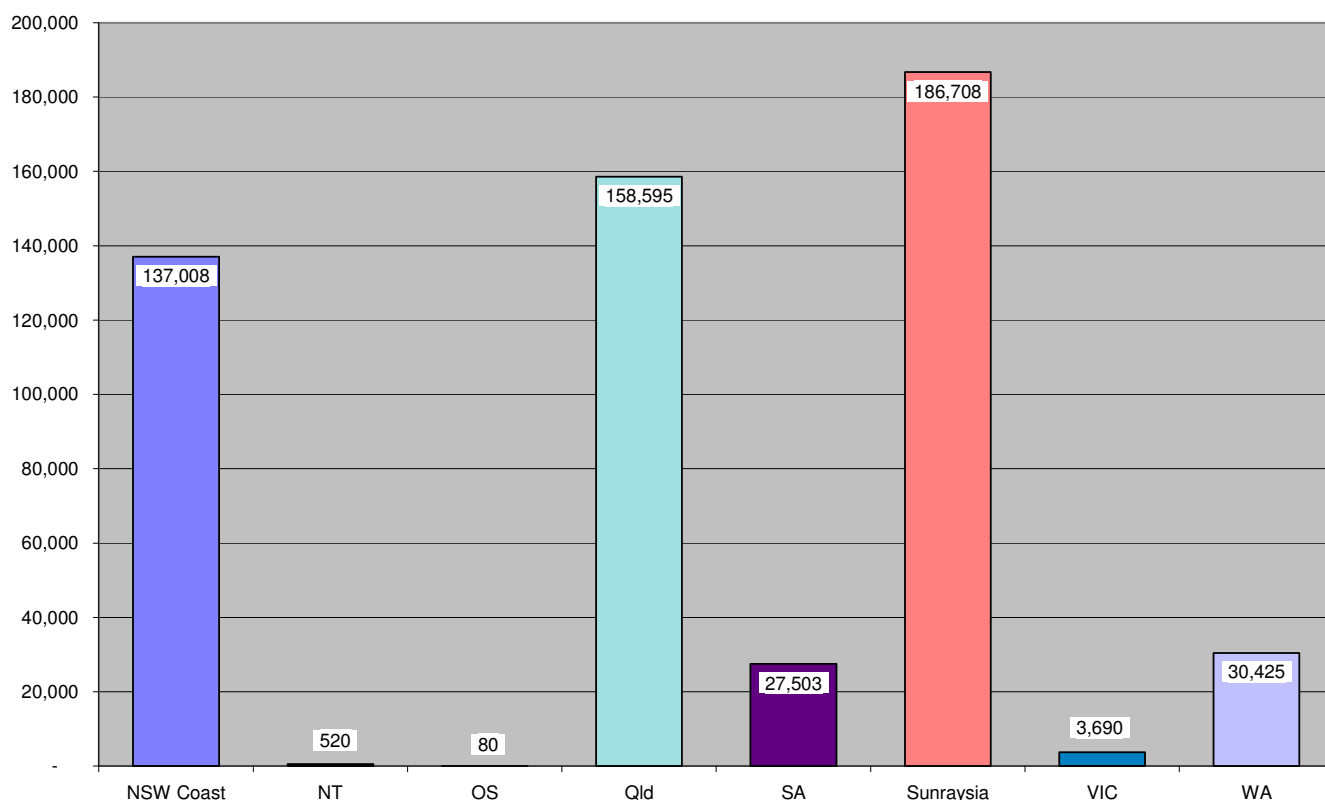
Budwood sales since 1980



Top selling ten varieties (private varieties excluded) were:

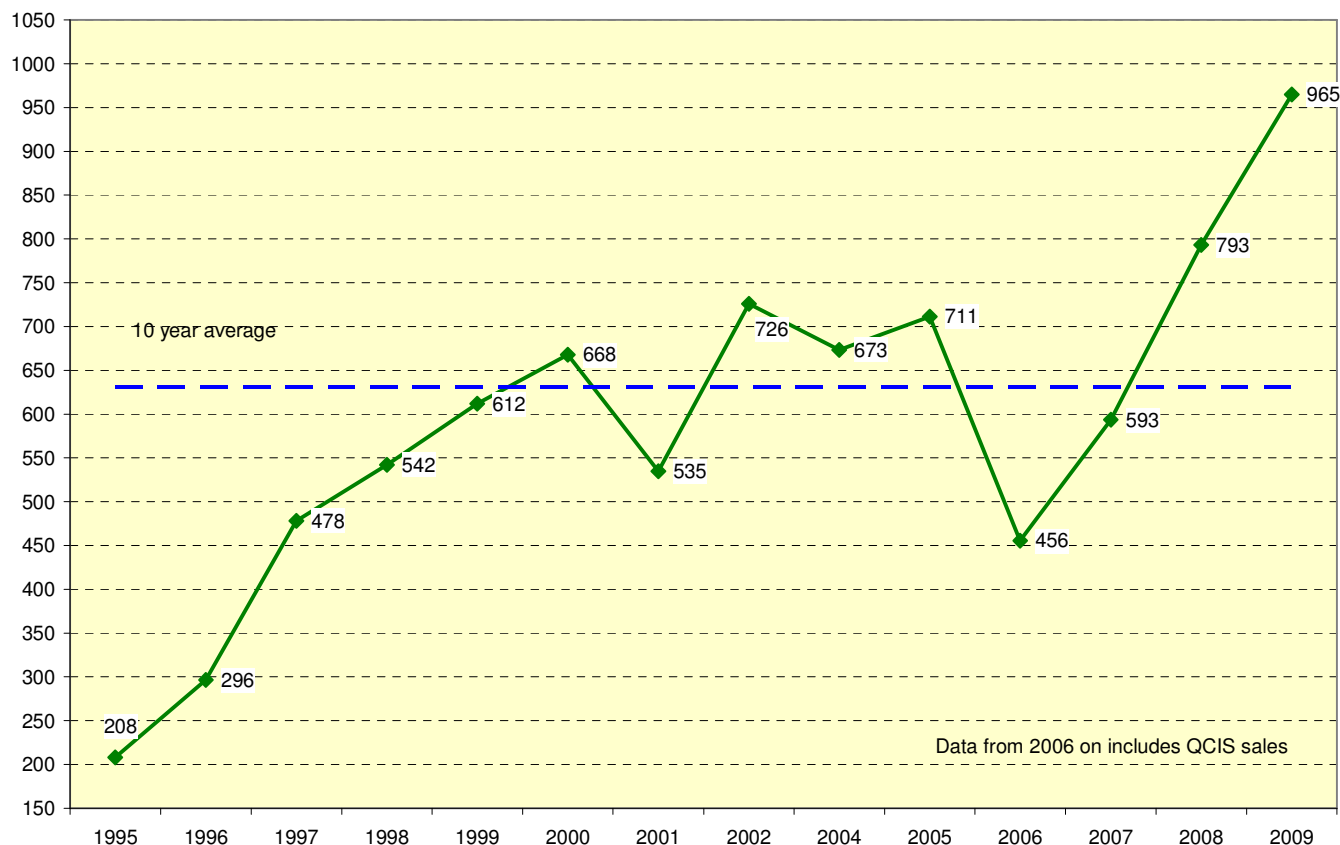
Variety	Total
Navel Washington	54,995
Mandarin Imperial	52,025
Lime Tahiti	45,785
Lemon Eureka(Taylor 3402)	44,730
ValenciaKeenan	44,090
Navel Late Lane	28,575
Mandarin Emperor	27,620
Lemon Meyer (806)	20,998
Valencia Seedless McMahon	17,230
Mandarin W. Murcott Afourer	14,520

And total bud sales distribution by region (the Riverina was omitted as there were zero bud sales to that region):



## Seed Sales

Seed sales for 2009/10 were at record levels, totalling 965 kgs.



Qld harvested and extracted 321kgs of seed, Dareton 930 kgs, while around 10kgs of Flying Dragon and Rough Lemon came from Monash as the citrange from there was not required. This leaves a moderate excess of seed in storage, mostly of Carizzo/Troyer citrange and trifoliata.

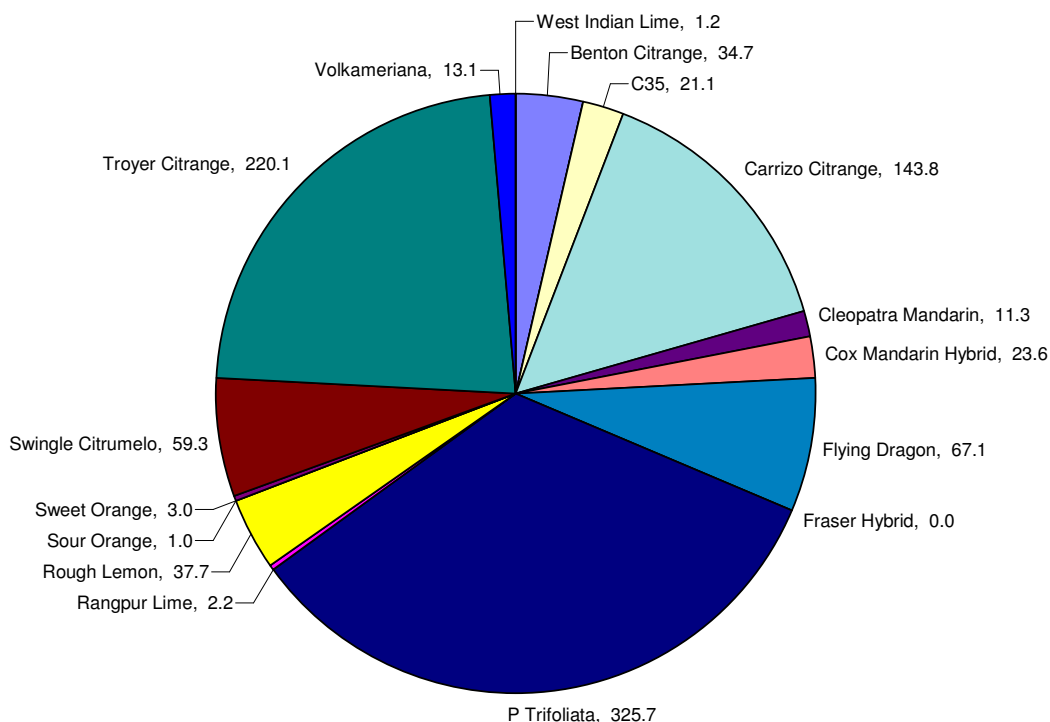
For the first year in many years there was a slight excess of Flying Dragon seed. There were still shortages in Rough lemon, C35 and Benton however. As the new trees on the River Road property come into full production this problem will disappear. As an indication there are currently only 8 mature trees of rough lemon and 10 younger trees (on Tri) at the Research Station - we have planted an additional 30 trees on citrange stock which should double our existing Rough Lemon production. Likewise we will have initially 60 but eventually 120 trees of C35 on the new planting (up from 12 existing trees), and 60 trees of Benton, up from the existing 12 trees.

As can be seen from the table below, 143.7kgs of seed was sold overseas.

## Distribution of seed by region

Variety	NSW Coast	OS	QLD	Riverina	SA	Sunraysia	Tas	Vic	WA	Grand Total
Benton Citrange	5.1		15.5	0.1	3.1	10.8	0.1	0.0		34.7
C32				0.0						0.0
C35		0.1	0.1	0.0		0.5			20.5	21.1
Carrizo Citrange	0.4	4.1	10.5	1.2	17.3	101.3		3.1	6.0	143.8
Cleopatra Mandarin	0.5	0.5	3.5	0.2		4.9	0.3	0.4	1.0	11.3
Cox Mandarin Hybrid	11.1		2.5	0.0		4.0		4.0	2.0	23.6
Flying Dragon	46.8		10.5	0.0		6.1	0.0	0.1	3.6	67.1
Fraser Hybrid				0.0						0.0
P Trifoliata	58.1	92.5	18.0	86.7	5.5	48.4	0.1	16.2	0.4	325.7
Rangpur Lime	1.1		0.1	0.0					1.0	2.2
Rough Lemon	6.1		2.3	0.0	1.3	17.2	0.3	0.2	10.5	37.7
Sour Orange	0.5				0.5					1.0
Sweet Orange			1.0	0.0					2.0	3.0
Swingle Citrumelo	27.1	4.5	19.8	0.0		2.7		2.1	3.0	59.3
Troyer Citrange	33.8	42.1	65.3	0.2	0.3	52.9	0.5	5.3	19.7	220.1
Volkameriana			5.0	0.0		8.0		0.1		13.1
West Indian Lime	0.2								1.0	1.2
<b>Grand Total</b>	<b>190.8</b>	<b>143.7</b>	<b>153.9</b>	<b>88.7</b>	<b>27.9</b>	<b>256.7</b>	<b>1.2</b>	<b>31.4</b>	<b>70.7</b>	<b>964.9</b>

Carizzo, Troyer and Trifoliata continue to dominate sales. Note that these figures don't show some orders carried forward into the next financial year - they are actual sales for the 2009/10 financial year.



## Evaluation of New Citrus Varieties

### HAL Grant to Auscitrus: CT09003 (2009 – 2010)

Graeme Sanderson	Research Horticulturist, Industry & Investment, NSW, Dareton
Troy Witte	Technical Assistant, I & I NSW, Dareton
Jason Bowes	Temporary Assistant, I & I NSW, Dareton

A one year extension was granted to Auscitrus by HAL to continue the variety evaluation component of project CT04003 'Evaluating new varieties and ensuring healthy budwood.' This allowed the on-going assessment of new citrus varieties to continue and the field establishment of 30 of the 31 new citrus introductions to be completed during October 2009. It has also seen a preliminary assessment conducted on 5 varieties producing fruit for the first time in 2010: TDE 2, 3, 4 mandarins along with EarlyGold and Bintangcheng # 2 processing oranges.

### Evaluation and Extension Activities in 2010

During the 2009/10 season 24 of the 31 new citrus varieties produced field fruit which allowed new and on-going assessment of fruit quality and the determination of Australian maturity periods. The core site in Sunraysia holds 19 trees of each variety with 12 reworked to mature Valencia and 7 established on a range of commercial rootstocks. Several varieties from this site have provided sufficient fruit to grade and collect fruit size distribution data and tree yields related to orchard management practices.

The general crop load at the core site was low in the 2009/10 season due to a heat wave during early fruit set in mid November 2009 and the alternate bearing habit of a range of the varieties. Early indications for 2010/11 are positive as flower bud formation is high on the majority of the varieties. HAL funding has been secured to continue the evaluation program to 2013 with I & I NSW as the lead agency.

Fruit of Caffin, Orogrande, Sidi Aissa and Nour clementines were provided to Coles in Melbourne to formally assess in their 'Would I Buy It' (WIBIT) weekly review of products. TDE 2, 3, 4 and Gold Nugget have also undergone the WIBIT process to gauge local market potential. Other varieties despatched to variety managers have included Alkantara, C1867, Nectar and Mandalate mandarins. A range of the new varieties were also displayed at the Murray Valley Citrus Board on the 11<sup>th</sup> August in conjunction with the CSIRO MerbeinGold variety 2350. Approved site visits have been a regular feature in 2010 as well as site inspections during July by the Fresh Produce Group (FPG) and HolmanFresh representatives.



TDE 4 'Yosemite Gold' - low seeded with bright orange skin colour.



TDE 3 'Tahoe Gold' fruit production at 3 years from reworking to Valencia orange.

## Pathogen indexing operations

The pathogen indexing component of Auscitrus operations is carried out under a deed of license by NSW Industry and Investment at the Elizabeth Macarthur Agricultural Institute (EMAI). EMAI is located in a non citrus producing area at Menangle, on the outskirts of south western Sydney. 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 2009/10 financial year.

### 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 806 Auscitrus budwood multiplication trees during the 2009/10 year. Testing was completed for 196 trees inoculated during 2008/09 and 259 trees inoculated during 2009/10. No viroids were detected. Field material from 12 of the budwood varieties submitted for biological indexing was also tested by RT-PCR with all results in agreement.

Newly imported citrus varieties are tested for viroids by sPAGE before they are released from the AQIS post-entry quarantine station at Eastern Creek. This testing was out sourced by AQIS to Auscitrus and the testing was conducted at EMAI. From July 2009 to April 2010, 9 samples from newly imported varieties (citrus and other genera) were tested for viroids by sPAGE. This testing is now outsourced to the Plant Health Diagnostic Service at EMAI.

#### 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 virus-free clones and to confirm that the virus is present in the pre-immunised trees.

Trees in the EMAI screen house repository for virus-free clones were tested for CTV by DTBIA in autumn 2010 with no CTV detected. The trees in the Dareton repository screen house are scheduled for testing during spring 2010.

All trees in the pre-immunised repository tested positive for CTV in autumn 2010, except for 2 trees of Afourer and 1 tree of Herps. 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 2009/10 financial year, 84 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. Stems were peeled in a subset of indicator plants to examine levels of stem pitting and these results supported the presence of mild strains only.

#### Citrus psorosis virus

Rootstock seed supply trees are tested for psorosis virus every 10 years via biological indexing. During the 09/10 year, 143 seed supply trees from Bundaberg Research Station were tested for psorosis. The varieties tested were Troyer, Swingle, Volkameriana, Benton, rough lemon, Cleopatra, C32, C35 and Flying Dragon. No psorosis virus was detected in the samples.

Ten budwood multiplication trees were also tested. No psorosis symptoms were observed on the foliage. After testing was completed the stems were peeled to look for symptoms of stem pitting. No CTV stem pitting was observed on the peeled stems.

#### Field inspection

The Auscitrus budwood multiplication blocks at Dareton Agricultural Research and Advisory Station were inspected on 11/11/09 by Grant Chambers, Nerida Donovan and Andrew Miles (Plant Pathologist, Qld DEEDI).

All trees in the budwood blocks 2, 3D and 4, and rows 1 and 2 of budwood multiplication block 3E were inspected for disease symptoms and off-type shoots.

A report was submitted to Auscitrus in November 09 outlining observations and recommendations for specific trees, including some recommended tree removals. No graft-transmissible pathogens were detected in any of the samples collected during 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.

Shoot tip grafting techniques were used to produce plantlets of Yuzu. Testing of the plantlets revealed that a viroid was still present so the process will be repeated. New plants have been propagated to produce fresh tips for grafting.

Five shoot tip grafted plantlets were successfully produced of a private variety. When sufficient material is available, they will be tested to see if CTV has been eliminated.

Material of another private variety was submitted for testing in June 2010. CTV was detected by DTBIA and biological indexing. Results for other pathogens are pending. The private variety owner has requested that the variety be shoot tip grafted to remove CTV and any other pathogens that are detected.



### Quality assurance

The EMAI nursery is NIASA accredited and the Citrus Pathology and Soil Health Unit is ISO 9001:2008 certified. The unit has been inspected and externally audited during the 2009/10 financial year and maintained both the NIASA accreditation and ISO certification.

The EMAI repository for virus-free citrus clones is a MAF Biosecurity NZ off-shore quarantine facility. The repository was re-accredited on 15/4/10. In the previous agreement, sequential PAGE was the only test method for citrus viroids accepted by Biosecurity NZ. Now they also accept viroid testing by RT-PCR. Budwood of a number of public and private citrus varieties have been sent to NZ under the new agreement.

### Staff

I&I NSW staff involved with Auscitrus activities at EMAI during the 09/10 financial year:

Grant Chambers	Professional Officer, Auscitrus Pathogen Indexing Full-time 1/7/09 – 6/8/09 Part-time (2.5 days per week) 7/8/09 – 2/4/10
Mark Walker	Professional Officer, Auscitrus Pathogen Indexing Part-time (2.5 days per week) from 12/4/10 On contract until October 2010
Allise Fail	Technical Assistant Part-time (2 days per week)
Margaret Coogan	Technical Assistant – casual
Elissa Dell	Technical Assistant – casual
Craig Gaunson	Leading Hand – Gardener
Nerida Donovan	Citrus Pathologist



Refurbishment of screen-house roof at EMAI - partly complete



## Citrus Foundation Repository

### Repository for virus-free clones, EMAI & Dareton

The repository currently holds 158 virus free citrus clones with at least 1 tree of each variety held in screen houses in 2 locations at Dareton (functional since October 2009) and EMAI.

The virus free repository at EMAI fills 2 screen houses, and at Dareton a large double screen house, with 49 private varieties held separately from the public varieties. All fruit observed on repository trees are photographed and the images are maintained in a database.

Only 1 new variety, Palmer navel, was released from quarantine over the 2009/10 year. Three trees of Palmer were released from quarantine in March. Four private local varieties were also added to the repository over the year.

The screen house at EMAI housing the public varieties was refurbished in 2010, funded by I&I NSW.

### Repository for pre-immunised clones, EMAI

The repository for pre-immunised clones is housed in a controlled environment glasshouse 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 of public varieties was part funded by HAL project CT09002 ‘Maintaining and developing a citrus gene bank’ from July 2009 to June 2010. Funding was not sufficient to cover the cost of testing the trees of public varieties so tests were funded by Auscitrus and I&I NSW. 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 *virus-free* 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.

## List of pubic varieties in virus free repository

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

<b>Mandarin</b>	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
<b>Navel</b>	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 1051 Thomson Washington navel (Atwood) Washington navel (Fisher) Washington Navel (Houghton)

<b>Orange</b>	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
<b>Pommelo</b>	Namroi
<b>Tangor / Tangelo</b>	Ellendale (Herps) Ellendale / EM3 Murcott Tangor (Benham) Topaz tangor W.Murcott Afourer
<b>Valencia</b>	Berri 3501 Benyenda Valencia Delta seedless valencia Keenan 3125 Keenan 3247