



*auscitrus*

**Australian Citrus Propagation Association  
Incorporated**

**ANNUAL REPORT**

**2020**

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## GOVERNANCE

### 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**

#### AUSCITRUS MEMBER ORGANISATIONS AND DELEGATES

<b>Member organisation</b>	<b>Delegate</b>
Citrus Australia Ltd	David Stevens (grower)
Nursery and Garden Industry NSW & ACT	Gary Eyles (nursery)
Nursery and Garden Industry NSW & ACT	Mark Engall (nursery)
Nursery and Garden Industry Qld	Wayne Parr (nursery)
Nursery and Garden Industry VIC	Sean Arkinstall (nursery)
Queensland Citrus Improvement Scheme	Nick Ulcoq (grower)
South Australian Citrus Improvement Society	Mike Arnold (grower)
South Australian Citrus Improvement Society	Steve Burdette (nursery) <i>pre 5/11/2019</i> <i>Post 5/11/2019 Vacant</i>
Sunraysia Citrus Growers	Greg Chislett (nursery)
Sunraysia Citrus Growers	Matt Cottrell (grower)
WA Citrus	Anthony Innes (nursery)

#### AUSCITRUS EXECUTIVE COMMITTEE

**Mike Arnold (Chairman)**

**Wayne Parr (Vice Chairman)**

**Gary Eyles (Public Officer)**

**Greg Chislett**

**Steve Burdette – post 5th Nov 2019, advisor to the committee**

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## BUDWOOD SCHEME

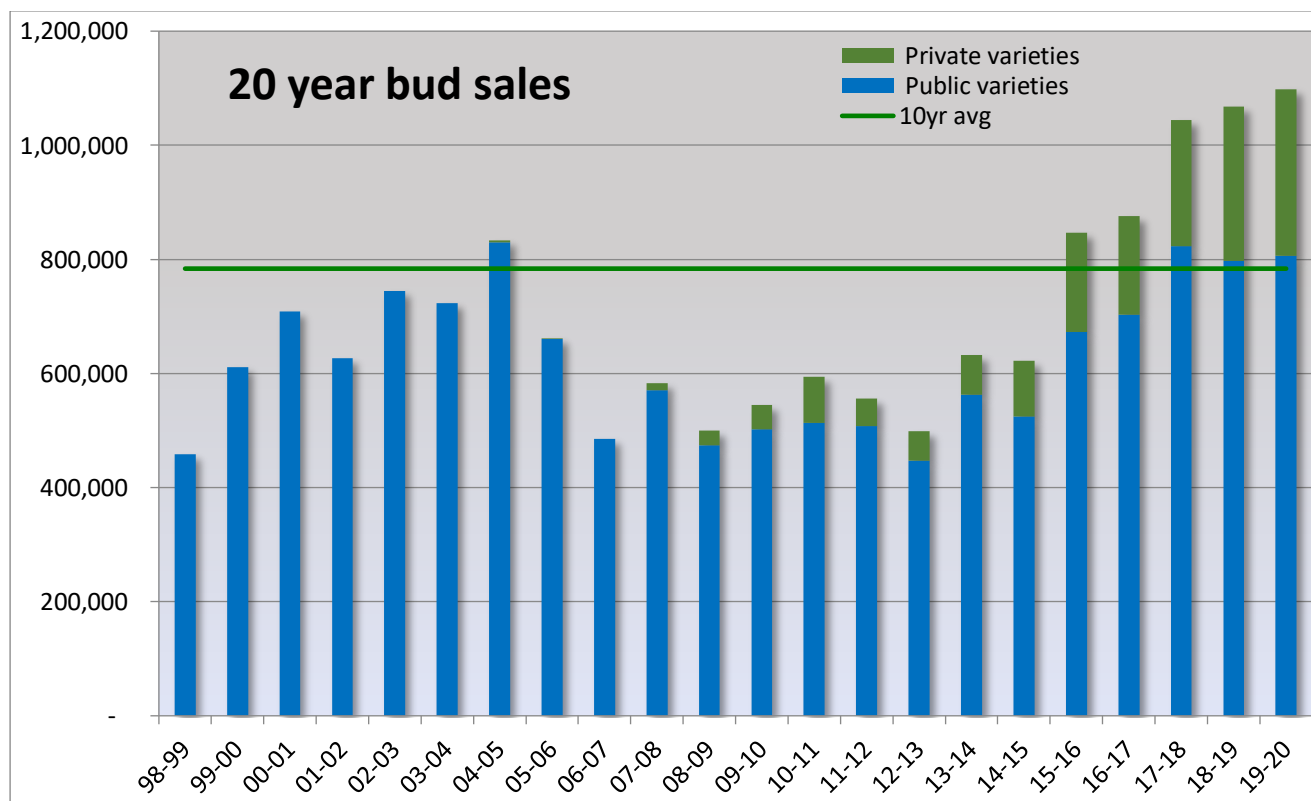
Bud sales for the 2019/20 season were:

Public varieties 806,485 (2018/19 - 797,248), Private varieties 291,953 (2018/19 - 270,437)

For a total of 1,098,438 buds. Top 10 varieties for the year were:

Variety	Buds sold
Afourer	125060
Cara cara	83310
Washington	65685
PV	64650
PV	54750
Murcott	47100
PV	39850
Eureka	39345
Tahiti	36265
Imperial	35310

(PV denotes private varieties, names of which can't be revealed for confidentiality purposes)

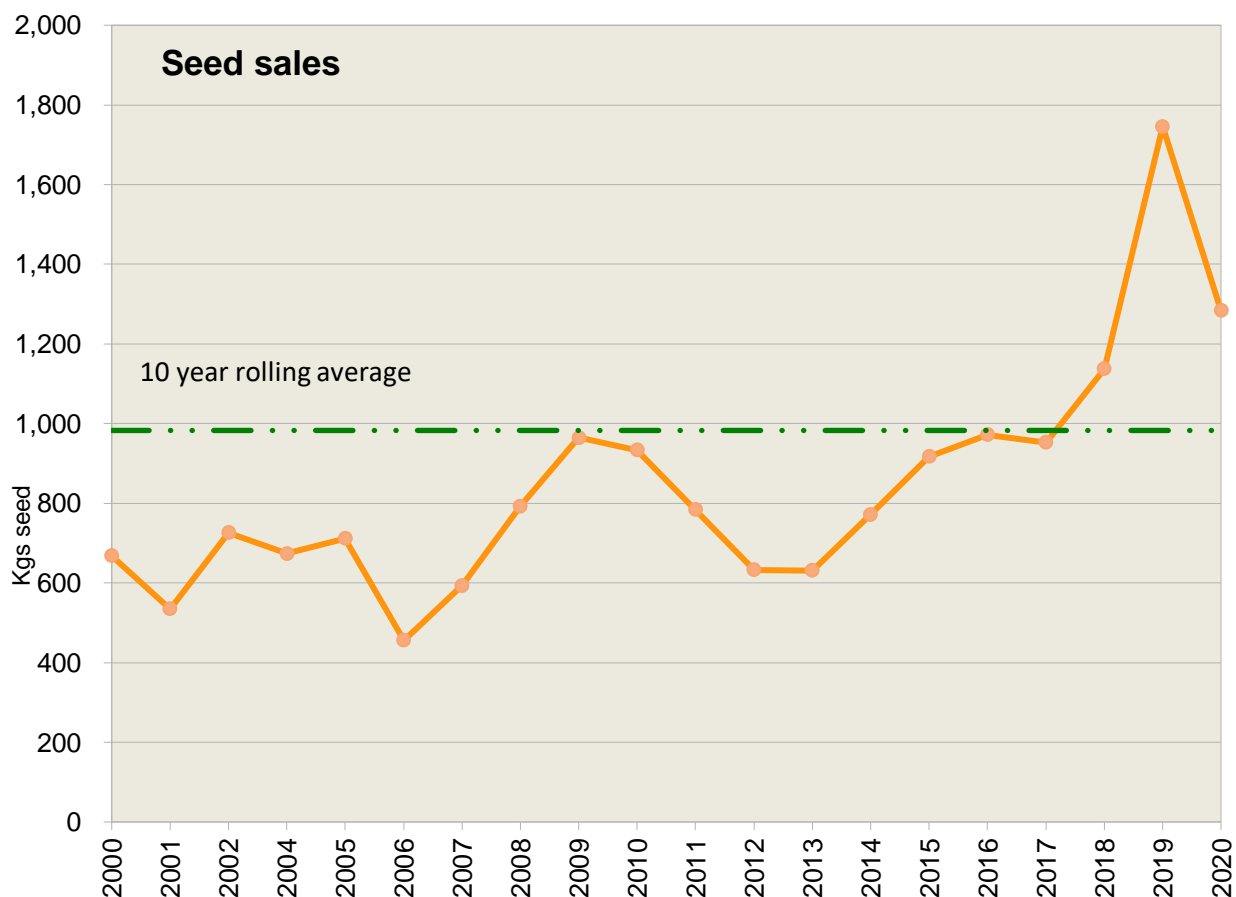


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## SEED SCHEME

Seed sales for the 2019/20 season came to 1284kg (2018/19 - 1746kg)

Variety	Seed sold
Carrizo	390.05
Ptrifoliata	313.05
Troyer	199.85
Flying dragon	109.1
C35	57.7
Zao yang	51
Benton	37
Rough lemon	35
Cox hybrid	34.76
Swingle	30.85
Cleopatra	12.55
Sour orange	6
Volkameriana	3.25
Rangpur lime	1.95
Sweet orange	1.6
Rusk citrange	0.1
West indian lime	0.1
Sothers	0.058



## AUSCITRUS OPERATIONS AT EMAI

Citrus is affected by several graft-transmissible organisms, which can be spread through propagation of infected material or via sap on cutting tools. Some organisms cause serious disease or death whilst others induce only mild symptoms. There is no cure for graft-transmissible diseases therefore it is important to prevent orchard infections by propagating new citrus trees using propagation material sourced from health-tested trees. The Auscitrus source trees are routinely tested for graft-transmissible diseases. Independent testing is provided by the NSW Department of Primary Industries (NSW DPI) at the Elizabeth Macarthur Agricultural Institute (EMAI) located on the outskirts of south western Sydney. At EMAI there are quarantine laboratories and a nursery that are certified under ISO 9001. Auscitrus is involved in 2 main areas at EMAI:

- National Citrus Repository Program;
- disease testing of budwood and rootstock seed supply trees.

The following report covers activities during the 2019/20 financial year.

## NATIONAL CITRUS REPOSITORY

The 'National Citrus Repository for High Health Status Clones' currently holds (248) citrus accessions with at least 1 tree of each variety held in screen houses in 2 locations; the Auscitrus property at Dareton (in the Sunraysia citrus growing region) and at EMAI (not in a citrus growing region). The repository contains both public (123) and private (125) citrus varieties from imported and local sources.

The 'National Citrus Repository for Inoculated Clones' is housed in a controlled environment green house at EMAI. This repository contains citrus clones that have been inoculated with a mild strain of *Citrus tristeza virus* (CTV). The 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.

Before a new variety enters the repository system, a foundation tree is propagated and rigorously tested for graft-transmissible pathogens including citrus viroids, CTV, *Citrus psorosis virus* (CPsV), *Citrus virus A* (CiVA), *Citrus leaf blotch virus* (CLBV) and *Citrus tatterleaf virus* (CTLV). A range of biological, serological and molecular methods are used to check the health status of the tree. If a pathogen is detected it must be eliminated by shoot tip grafting before a variety can enter the repository system. This ensures the high health status of trees held in the National Citrus Repositories. Imported varieties are tested and undergo pathogen elimination in post-entry quarantine run by the Australian Government Department of Agriculture, Water and the Environment. Auscitrus provides the service of pathogen testing and elimination by shoot tip grafting for new varieties selected in Australia.

During the 2019/20 year, 3 Australian selections (all privately owned), and 4 imported varieties (1 public and 3 privately owned), entered the repository program.

After entering the repository system, foundation trees are re-tested for graft-transmissible pathogens according to a designated schedule. Trees are tested annually for CTV but are not tested every year for those pathogens not transmitted by insect vectors. This is because the risk of infection with non-vectorised pathogens is low for trees managed under strict biosecurity protocols in the repository.

The maintenance and testing of public varieties is funded by Hort Innovation and Auscitrus and for private varieties 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 have been detected in these trees using 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.

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## TESTING FOR CITRUS DISEASES

CTV is graft-transmissible and can be spread by aphids. The repository houses are screened to exclude aphids but every tree in the repository is tested annually for CTV using a serological test called a 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 inoculated trees.

High health status trees in the Dareton repository screenhouse were tested for CTV in spring 2019, and trees in the EMAI screenhouses were tested for CTV in autumn 2020. No CTV was detected.

Inoculated repository trees tested positive for CTV in autumn 2020, except for 1 tree. Some trees were weakly positive but viral particles were still detected. Budwood is only sourced from inoculated trees that test positive for CTV during their last test. Trees where CTV was not detected, or only weakly detected, will be re-inoculated in spring 2020.

Dareton repository trees were sampled for testing for other graft-transmissible diseases (huanglongbing, viroids, *Citrus leaf blotch virus*, *Citrus tatterleaf virus*, *Citrus psorosis virus*, *Citrus virus A*) during spring 2019. Testing is in progress.

Testing for pathogenic viroids was completed for 1446 Auscitrus budwood supply trees during the year.

## PATHOGEN ELIMINATION

Viruses and viroids can be removed from infected mother trees by shoot tip grafting. Successful shoot tip grafted plants then require testing to determine if the pathogens have been eliminated. Auscitrus provides the service of pathogen testing and elimination for Australian citrus selections.

At the end of the 2019/20 year, 9 varieties are currently in the variety testing program for Australian selections. Of these varieties, 7 are undergoing pathogen elimination by shoot tip grafting. Pathogens were successfully eliminated by shoot tip grafting from 3 varieties during the 2019/20 year.

## RESEARCH AND DEVELOPMENT

The high health status of the Australian citrus industry is largely dependent upon accurate testing of propagation material for viruses and viroids which can cause graft-transmissible diseases. NSW DPI and Auscitrus are working together on an industry funded project supported by Hort Innovation to find better methods for screening citrus plant material. The current project (CT17007) started in November 2018 and will run until September 2022. Improvements to current protocols were identified through the previous project (CT14009), continue to be identified in the current project, and are adopted by Auscitrus where relevant.

## TEAM MEMBERS

Wendy Forbes	Auscitrus Indexing Officer (0.4 FTE)
Adrian Dando	Auscitrus Indexing Officer (0.6 FTE)
Grant Chambers	Technical Advisor
Anna Englezou	Technical Advisor
Nerida Donovan	Citrus Pathologist
George Haizer	Nursery Contractor (casual)
Vipawee Iamsa-at (Noi)	Nursery Contractor (casual)

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## APPENDIX 1: CLONES OF PUBLIC VARIETIES IN THE 'NATIONAL CITRUS REPOSITORY FOR HIGH HEALTH STATUS CLONES' AS OF JUNE 2020

Accession No.	Variety	Accession No.	Variety
I.N.99.0909	Afourer	A.N.91.0632	Marsh (3962 Druitt)
I.N.01.0927	Allen Eureka	I.N.94.0903	Midknight
I.N.99.0913	Avana Tardivo	I.N.91.0853	Miho Wase
I.N.99.0914	Avana Apireno	A.Q.04.0952	Murcott (Benham)
A.S.10.0985	Arnold blood	A.Q.90.4149	Murcott (Turner)
I.N.86.0600	Atwood	I.N.04.0956	Nagami
A.S.75.5095	B/3010	I.N.01.0925	Namroi
A.N.18.1054	Benton citrange	I.N.92.0900	Natal
A.Q.75.4022	Benyenda	A.D.97.0907	Nathanael kaffir lime
A.Q.78.4021	Benyenda - thorny	I.N.86.0550	Navelate
I.N.01.0926	Bergamia Bergamot Castagnaro	I.N.87.0546	Navelina Spain 7.5
A.S.94.0782	Berri 3501	I.N.93.0899	Navelina 315 ex Italy
I.N.06.0960	Bintangcheng # 2	A.S.92.0773	Neilson
I.N.08.0973	Bintangcheng Renbin # 5	I.N.86.0598	Newhall California
I.N.94.0904	Buddha's Hand	I.N.87.0551	Newhall 55-1 Spanish
I.N.98.0920	Caffin	A.N.75.0029	Newton – Keenan 3125
A.N.15.1033	Calamondin	A.N.75.0030	Newton – Keenan 3247
I.N.97.0924	Cara Cara	I.N.05.0957	Nour
A.N.14.0993	Cara cara new	A.Q.94.0778	Nova (Trott)
I.N.89.0704	Clementard	I.N.91.0734	Nova (Spain)
I.N.89.0706	Clausellina	I.N.87.0543	Nules
I.N.99.0910	Corsica 1	I.N.91.0852	Okitsu Wase
I.N.99.0911	Corsica 2	I.N.04.0955	Orogrande
A.V.94.0780	CSIRO 5	I.N.87.0545	Oroval
I.N.91.0733	Daisy	I.N.10.0984	Palmer 1051
I.N.94.0902	Delta seedless	I.N.86.0549	Parson Brown
	Ellendale / EM3	I.N.04.0951	Parsons Special /2
I.N.90.0736	Encore	I.N.90.0741	Pera Olympia
I.N.08.0974	Etna	I.N.90.0742	Pera Limeira
I.N.09.0979	Etrog	I.N.87.0547	Pineapple
I.N.00.0916	Eyles kaffir lime	I.N.86.0599	Pixie
I.N.89.0707	Fallglo (VI 484)	A.S.17.1043	Poorman's orange
I.N.90.0695	Fallglo (S-837-4-2)	I.N.04.0954	Primosole
I.N.87.0544	Fina	I.N.75.0036	Prior Lisbon



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Accession No.	Variety	Accession No.	Variety
I.N.89.0703	Fino	A.Q.91.0631	Queensland Lisbon
I.N.86.0597	Fisher	I.N.89.0619	Ray Ruby
I.N.91.0736	Flame	I.N.89.0708	Rio Red
I.N.93.0859	Fortune	I.N.93.0860	Salustiana
A.Q.94.0787	Fremont	I.N.98.0921	Sanguine
I.N.99.0912	Fukumoto	I.N.04.0953	Sidi Aissa
I.N.86.0548	Hamlin	A.N.75.0065	Silverhill
I.N.89.0620	Henderson	I.N.20.1068	Shiranui
A.N.75.0090	Herps Ellendale	A.Q.78.4020	Smith - Joppa
A.N.75.0041	Hickson	I.N.89.0709	Star Ruby
A.S.75.5077	Hockney	A.N.04.0950	Star Ruby (Cant)
A.N.73.0073	Houghton	I.N.15.1020	Sudachi
A.S.92.0772	Hutton	A.Q.94.0886	Sunburst
A.N.75.0043	Imperial 0043/2	A.N.08.0969	Tahiti lime
I.N.02.0930	Jaffa	I.N.94.0786	Tambun
I.N.06.0959	Jincheng 447	I.N.08.0968	Tarocco Ippolito
A.V.93.0774	Jenner 4439	I.N.07.0965	Tarocco Meli C8158
A.Q.19.1061	K15	I.N.07.0966	Tarocco Rosso C4977
A.N.75.0034	Lambert Eureka	A.N.75.0035	Taylor Eureka
A.N.75.0032	Lanes Late 3976	A.N.91.0633	Thompson (N Eagle)
A.Q.93.0785	Lemonade	A.S.75.5074	Thomson
A.N.73.0072	Leng	I.N.90.0818	Topaz tangor
I.N.92.0901	Lima 156 (acidless orange)	A.NT.15.1034	Tropical Emperor
I.N.00.0918	Limoneira 8A Lisbon	A.NT.15.1032	Tropical Meyer
A.V.94.0781	Lloyd/3 Leng	I.N.89.0705	Verna
I.N.94.0776	Malaysia 4669 kaffir lime	A.N.90.0771	West Indian lime (Schweppes)
I.N.87.0552	Marisol	A.N.13.0991	Yuzu
A.N.73.0068	Marsh (3970 Druitt)		