



auscitrus

**Australian Citrus Propagation Association
Incorporated**

ANNUAL REPORT

2023

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GOVERNANCE

OUR VISION

To be an integral component of Australia's citrus industry biosecurity through the provision of citrus propagation material produced according to world's best practice.

OUR MISSION

Auscitrus will protect the Australian citrus industry by ensuring that adequate high health and true to type citrus propagation material is produced in a scientifically sound, efficient, and sustainable manner.

AUSCITRUS MEMBER ORGANISATIONS AND DELEGATES

Member organisation	Delegate
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	Steve Burdette (grower)
South Australian Citrus Improvement Society	David Arnold (grower)
South Australian Citrus Improvement Society	Simon Lehman (grower)
Sunraysia Citrus Growers	Jonathan Chislett (nursery)
Sunraysia Citrus Growers	Matthew Cottrell (grower)
WA Citrus	Anthony Innes (nursery)

AUSCITRUS EXECUTIVE COMMITTEE

Gary Eyles (Chairman & Public Officer)

Wayne Parr (Vice Chairman)

David Arnold

Steve Burdette

Jonathan Chislett

CHAIRMAN'S REPORT



May I start this Chairmans report by congratulating our former chair Mike Arnold for his entry into the Citrus Australia Hall of Fame. It's a fitting tribute to Mike for the years of service to the Australian Citrus Industry.

With the industry going through a period of consolidation and nursery orders coming off their peak, Auscitrus has had to refocus and instigate our plans for these periods.

Auscitrus remains grateful to the citrus industry for the financial help supplied to complete stage 1 of the new insect screened budwood greenhouse. Stage 2 of the screened facility is now complete. This finalises our infrastructure contingency and preparedness plans for any localised incursion of HLB/ACP or both. Auscitrus has completely funded this second stage itself from funds generated over the last few years of high sales.

Now that we are cycling through this period of industry consolidation its convenient to have this construction phase completed. Both Tim and the Executive Committee have been very much aware of these cycles and that the organisation must have contingency plans in place. We are now focused on keeping costs as low as possible, making the best use of what we have in place while still supplying the high quality and quantity of propagation material that industry expects.

With Tim's prudent management and backing from the Executive Committee we expect to guide Auscitrus through this period of consolidation and be in a strong position to supply the future needs and requirements of the Australian industry.

Succession has also been part of the future planning for the executive committee. I am pleased to say we have welcomed some younger members onto the Executive and this plan is ongoing with the aim of keeping Auscitrus up to date and relevant.

The structure of Auscitrus has been a regular point of discussion. We as an executive are yet to find a more relevant structure, however we are open to suggestions at any time. We need to keep a balance between nursery representation and grower representation. This has been the core of Auscitrus since it started in 1928. Whatever structure we have in the future whether it be the same or something new we need to hold onto this balance.

Finally, I would like to express my thanks to Tim and his team at Dareton – Sierra, Robert, Margaret and Mandy. Nerida and her team at EMAI – Adrian, Wendy, Anna and Grant. The rest of the Executive and all our various delegates. It's these people that make Auscitrus the successful organisation that it has become and continues to be for the future.

Thank you

Gary Eyles
Chairman

BUDWOOD SCHEME

Total buds sold for the 2022/23 season came to **1,049,266 buds**, down slightly from last year's sales of 1,242,001.

Of this total 239,280 buds were private varieties, increasing from 188,555 buds last year.

Spring/summer 2022 sales were 689,298 buds, or 66% of the total, with summer/autumn 2023 sales of 359,968 buds.

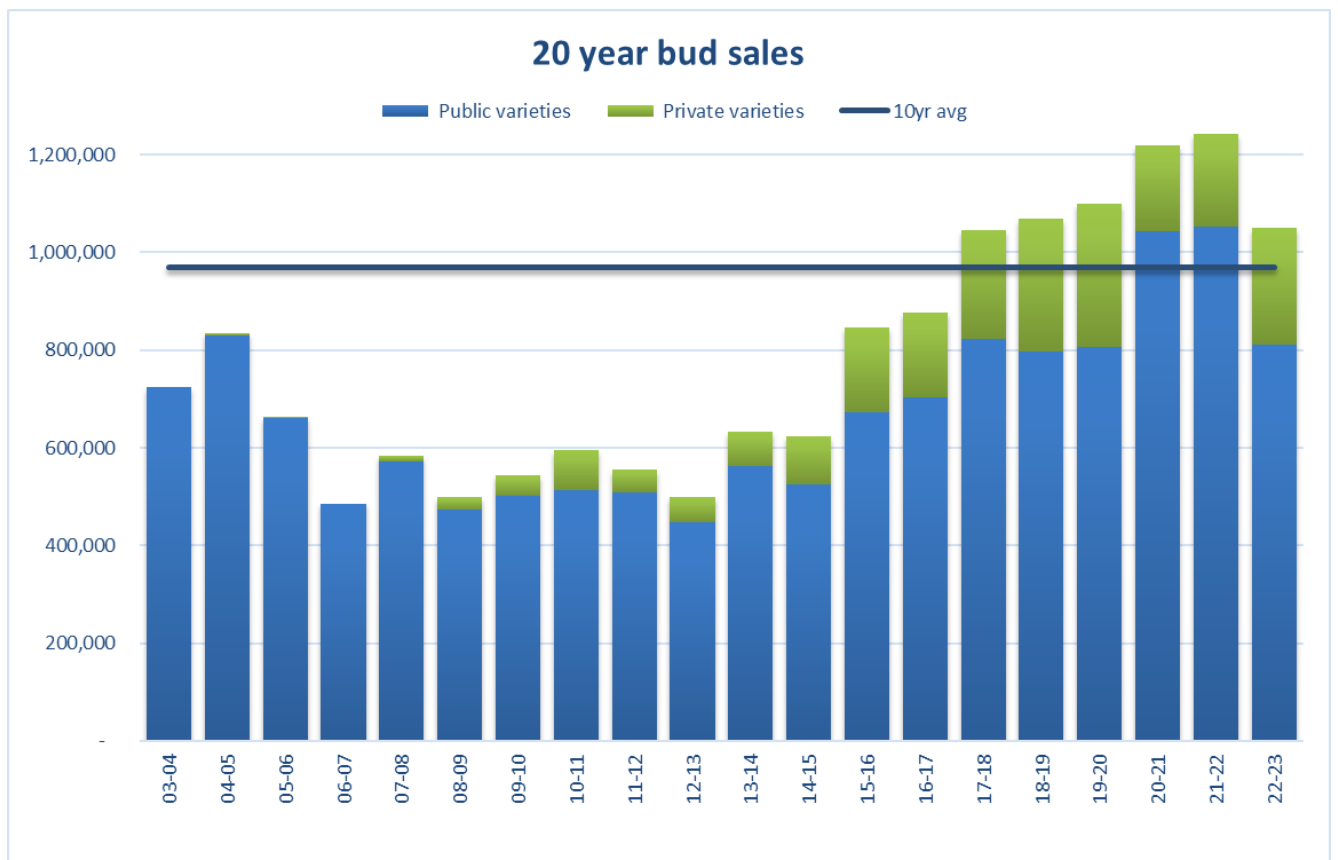
Public varieties that sold more than 10,000 buds for 2022/23 season as follows:

Variety	Bud sales
Afourer	120,815
Washington Navel	81,390
Lime Tahiti	47,160
Imperial Mandarin	46,844
Cara Cara Navel	35,500
Lemon Eureka Taylor	35,195
Murcott Mandarin	31,024
Meyer (806) Lemon	29,545
Emperor Mandarin	29,540
Lane Late Navel	26,715
Midnight Valencia Seedless	26,325
Ippolito - Tarocco	24,985
Kaffir Eyles Lime	19,460
Delta Valencia Seedless	16,890
Lemonade	12,880
Okitsu Satsuma	11,850
Lime Kaffir (Nathanael)	11,340
Fisher Navel	11,300

For a bigger picture the following are the top ten varieties cumulative for the past three years:

Variety	3 years bud sales
Afourer	360,559
Washington Navel	351,221
Cara Cara Navel	198,385
Lane Late Navel	181,759
Lime Tahiti	162,204
Lemon Eureka Taylor	138,479
Imperial Mandarin	125,215
Meyer (806) Lemon	103,009
Emperor Mandarin	80,130
Fisher Navel	71,840

Fisher was an anomaly with one very large order in 2021/22 but the others are following the trend over the past several years.



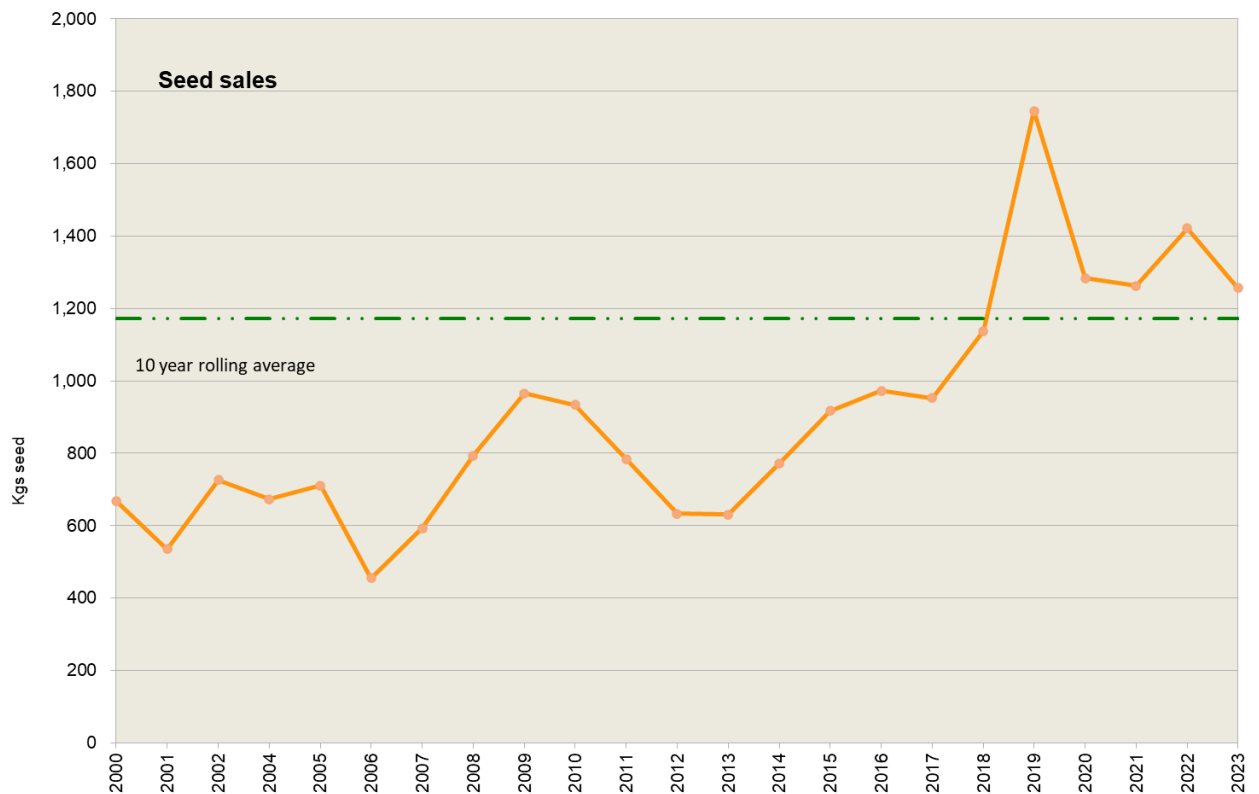
SEED SCHEME

Seed sales for the year came to **1,257kg**, down slightly from last year.

The main varieties sold were:

Rootstock	Kgs supplied
Carrizo Citrange	268
Troyer Citrange	220
Poncirus trifoliata	197
Flying Dragon	154
C35	82
Zao Yang	67
Cox Mandarin Hybrid	64
Swingle Citrumelo	55
Benton Citrange	47
C22	36
Cleopatra Mandarin	18
Volkameriana	15

Historical sales show the slight downturn in sales, although still above the 10-year average.



It is interesting (and concerning) to compare seeds sales to subsequent budwood sales.

Through 2020/21 and 2021/22 we sold 2,569kgs seed. At an average of 4000 seeds per kg that is 10.3 million seeds. Allowing for some losses during production:

- 30% spare not sown
- 30% seedling losses
- 20% budding losses or just don't make the grade

that is theoretically about 4 million trees.

Adjusting for the delay from seed sowing to budding we sold approximately 2 million buds for the equivalent period. Where did the other 2 million buds come from? Some seedlings were no doubt not used and discarded, but it seems unlikely that 2 million seedlings were thrown away. Our seed and budwood sales records for some individual nurseries clearly indicate they are getting buds from elsewhere.

Of the 194 Australian nurseries who purchased seed from us over this period, there were 128 nurseries that did not buy a single bud from the budwood scheme.

Two thirds of our seed customers purchased zero buds.

While these are predominantly smaller nurseries and hobbyists, this is still a serious concern for the biosecurity of our industry. We always encourage everyone to use tested budwood from the scheme whenever possible. Unfortunately, the people who need to heed this advice probably aren't reading this report.

We have promoted a nursery tree certification scheme branded as Citrus Secure in the past, which will provide a certificate for trees produced using tested budwood under an audited program.

This is still progressing in the background. We have prepared all we can with our internal resources and have now approached Citrus Australia for help to finalise and promote the scheme to citrus growers, and to assist with developing an independent auditing system. It has been a long process but there are several complicated issues to sort through, and we are still moving forwards with it.



SCREENHOUSE EXPANSION

The screenhouse expansion we have been undertaking is practically complete. The structure itself is complete and sealed up (apart from temporary removal of a wall panel for machinery access), and all electrical work is complete. Drains, irrigation, and floors are being installed at the time of writing, and the structure will be ready to receive trees if required in spring 2023.

As explained in previous reports this structure is a preparation for any future incursion of an insect transmitted pathogen such as huanglongbing or *Xylella*. Most buds will in the meantime still come from field orchard budwood trees, but we are preparing to be able to pivot to all bud production under screen if there is an incursion in our area.



Southern end of screenhouse



Insect screen over exhaust fans – doors are emergency exits only

AUSCITRUS OPERATIONS AT EMAI

Citrus is affected by several graft-transmissible diseases; the causal agents (pathogens) can be spread through propagation of infected material or via sap on cutting tools. Some pathogens 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 southwestern Sydney. At EMAI there are quarantine laboratories and a nursery complex. 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 2022/23 financial year.

NATIONAL CITRUS REPOSITORY

The 'National Citrus Repository for High Health Status Clones' currently holds (290) 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 (130) and private (160) 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 isolate of *citrus tristeza virus* (CTV). The mild isolate serves to protect against more severe variants of the virus that may be introduced to trees in the field by aphids – this control mechanism is called cross protection.

Before a new variety enters the repository system, a foundation tree is propagated and rigorously tested for graft-transmissible citrus pathogens. 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, Fisheries and Forestry. Auscitrus provides the service of pathogen testing and elimination by shoot tip grafting for new varieties selected in Australia.

During the 2022/23 year, eleven Australian selections (4 public and 7 privately owned) and seven imported varieties (2 public and 5 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-vectored pathogens is low for trees managed under strict biosecurity protocols in the repository houses.

The maintenance and testing of trees of publicly owned 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.

TESTING FOR CITRUS DISEASES

Foundation trees

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 and EMAI repository screenhouses were tested for CTV in autumn 2023. No CTV was detected.

Inoculated repository trees tested positive for CTV in autumn 2023 except for Delta Seedless and 12 newly inoculated trees which will be reinoculated in spring 2023. 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.

Budwood of one privately owned repository variety was tested for apple stem grooving virus (ASGV), CTV, tomato big bud phytoplasma, citrus black spot and citrus brown spot to meet export requirements.

Budwood and rootstock seed supply trees

Testing for pathogenic viroids was completed for 1043 budwood supply trees during the year. Testing for graft-transmissible viruses (ASGV, citrus psorosis virus and citrus leaf blotch virus) was completed for 715 Auscitrus rootstock seed supply trees. Testing for mild variant CTV by biological indexing was completed for 40 inoculated Auscitrus budwood supply trees.

Rootstock seed supply trees at the Auscitrus property (177) and Dareton Research Station (2) were tested for ASGV, citrus exocortis viroid and citrus leaf rugose ilarvirus to meet export requirements.

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.

During the 2022/23 year, 29 varieties were processed as part of the variety testing program for Australian selections, with pathogen elimination required for all these varieties. Eleven selections were released from the Australian variety testing program and entered the National Citrus Repository Program during the 2022/23 year.

A pilot program was successfully completed at EMAI for the processing of imported citrus varieties prior to their release from post-entry quarantine. Two public varieties imported by Auscitrus were used in the pilot. The Auscitrus team removed the pathogens and produced high health status foundation trees of both varieties in less than two years.

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 work together on industry funded projects supported by Hort Innovation to find better methods for screening citrus plant material. Project CT17007 started in November 2018 and concluded in September 2022. Further funding was secured, and the program is continuing under project 'CT21005 Improving Australia's ability to respond to graft-transmissible citrus diseases'. Improvements to current protocols were identified through the project work and adopted by Auscitrus where relevant.

TEAM MEMBERS

Nerida Donovan	Citrus Pathologist
Adrian Dando	Auscitrus Indexing Officer (0.8 FTE)
Wendy Forbes	Auscitrus Indexing Officer (0.4 FTE)
George Haizer	Nursery Contractor (casual)
Vipawee Iamsa-at (Noi)	Nursery Contractor (casual)
Grant Chambers	Technical Advisor
Anna Englezou	Technical Advisor

APPENDIX 1: NATIONAL CITRUS REPOSITORY FOR HIGH HEALTH STATUS

CLONES

Accession No.	Variety	Accession No.	Variety
		I.N.10.0984	Palmer 1051
I.N.91.0736	Flame	I.N.86.0549	Parson Brown
I.N.89.0620	Henderson	I.N.90.0739	Pera Bianchi
A.N.73.0068	Marsh (3970 Druitt)	I.N.90.0741	Pera Olympia
A.N.91.0632	Marsh (3962 Druitt)	I.N.90.0742	Pera Limeira
I.N.89.0619	Ray Ruby	I.N.87.0547	Pineapple
I.N.89.0708	Rio Red	A.S.17.1043	Poorman's orange
I.N.89.0709	Star Ruby	I.N.93.0860	Salustiana
A.N.04.0950	Star Ruby (Cant)	I.N.98.0921	Sanguine
A.N.91.0633	Thompson (N Eagle)	A.Q.78.4020	Smith – Joppa
		I.N.08.0968	Tarocco Ippolito
A.Q.19.1061	K15	I.N.07.0965	Tarocco Meli C8158
I.N.01.0925	Namroi	I.N.07.0966	Tarocco Rosso C4977
I.N.94.0786	Tambun	A.S.75.5074	Thomson
Citron		Mandarin and hybrids	
I.N.01.0926	Bergamia Bergamot Castagnaro	I.N.99.0909	Afourer
I.N.94.0904	Buddha's Hand	I.N.99.0913	Avana Tardivo
I.N.09.0979	Etrog	I.N.99.0914	Avana Apireno
Lemon		I.N.98.0920	Clementine (Caffin)
I.N.01.0927	Eureka (Allen)	I.N.89.0704	Clementine (Clementard)
A.N.75.0034	Eureka (Lambert)	I.N.99.0910	Clementine (Corsica 1)
A.N.75.0035	Eureka (Taylor)	I.N.99.0911	Clementine (Corsica 2)
I.N.89.0703	Fino	I.N.87.0544	Clementine (Fina)
A.Q.93.0785	Lemonade	I.N.87.0552	Clementine (Marisol)
I.N.00.0918	Lisbon (Limoneira 8A)	I.N.05.0957	Clementine (Nour)
I.N.75.0036	Lisbon (Prior)	I.N.87.0543	Clementine (Nules)
A.Q.91.0631	Lisbon (Queensland)	I.N.04.0955	Clementine (Orogrande)
A.NT.15.1032	Tropical Meyer	I.N.87.0545	Clementine (Oroval)
I.N.89.0705	Verna	I.N.04.0953	Clementine (Sidi Aissa)
Lime		I.N.91.0733	Daisy
A.N.23.1116	Australian Sweet Lime	A.N.75.0090	Ellendale (Herps)
A.N.08.0969	Tahiti lime		Ellendale / EM3

A.N.90.0771	West Indian lime (Schweppes)	I.N.90.0736	Encore
Orange		I.N.08.0974	Etna
A.S.10.0985	Arnold blood	I.N.89.0707	Fallglo (VI 484)
I.N.86.0600	Atwood	I.N.90.0695	Fallglo (S-837-4-2)
A.S.75.5095	B/3010	I.N.93.0859	Fortune
A.Q.75.4022	Benyenda	A.Q.94.0787	Fremont
A.Q.78.4021	Benyenda – thorny	A.N.75.0041	Hickson
A.S.94.0782	Berri 3501	A.N.75.0043	Imperial 0043/2
I.N.06.0960	Bintangcheng # 2	A.Q.04.0952	Murcott tangor (Benham)
I.N.08.0973	Bintangcheng Renbin # 5	A.Q.90.4149	Murcott tangor (Turner)
I.N.97.0924	Pigmented navel (Cara Cara)	A.Q.94.0778	Nova (Trott)
A.N.14.0993	Cara cara new	I.N.91.0734	Nova (Spain)
A.V.94.0780	CSIRO 5	I.N.04.0951	Parsons Special /2
I.N.94.0902	Delta seedless	I.N.86.0599	Pixie
I.N.86.0597	Fisher	I.N.04.0954	Primosole
I.N.99.0912	Fukumoto	A.N.75.0065	Satsuma (Silverhill)
I.N.86.0548	Hamlin	I.N.89.0706	Satsuma (Clausellina)
A.S.75.5077	Hockney	I.N.23.1114	Satsuma (Hiroshima 7)
A.N.73.0073	Houghton	I.N.91.0852	Satsuma (Okitsu Wase)
A.S.92.0772	Hutton	I.N.91.0853	Satsuma (Miho Wase)
I.N.02.0930	Jaffa	I.N.23.1113	Satsuma (Yura)
I.N.06.0959	Jincheng 447	I.N.20.1068	Shiranui
A.V.93.0774	Jenner 4439	A.Q.94.0886	Sunburst
A.N.75.0032	Lanes Late 3976	I.N.90.0818	Topaz tangor
A.N.73.0072	Leng	A.NT.15.1034	Tropical Emperor
I.N.92.0901	Lima 156 (acidless orange)	Papeda	
A.V.94.0781	Lloyd/3 Leng	I.N.94.0776	Kaffir lime (Malaysia 4669)
A.N.23.1115	Maltese Blood	A.D.97.0907	Kaffir lime (Nathanael)
I.N.94.0903	Midnight	I.N.00.0916	Kaffir lime (Eyles)
I.N.92.0900	Natal	I.N.15.1020	Sudachi
I.N.86.0550	Navelate	A.N.13.0991	Yuzu
I.N.87.0546	Navelina Spain 7.5	Kumquat	
I.N.93.0899	Navelina 315 ex Italy	A.N.15.1033	Calamondin
A.S.92.0773	Neilson	I.N.04.0956	Nagami
A.N.75.0029	Newton – Keenan 3125	Rootstock	

A.N.75.0030	Newton – Keenan 3247	A.N.18.1054	Benton citrange
I.N.86.0598	Newhall California	A.N.23.1110	<i>Citrus macrophylla</i>
N.87.0551	Newhall 55-1 Spanish	A.N.23.1109	West Indian lime