Australian Citrus Propagation Association Incorporated

ANNUAL REPORT

2017

AUSCITRUS ANNUAL REPORT 2017

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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

Member organisation	Delegate
Citrus Australia Ltd	Tania Chapman (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 (grower/nursery)
Sunraysia Citrus Growers	Greg Chislett (grower/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)

Steve Burdette

Greg Chislett

CHAIRMAN'S REPORT

I must firstly congratulate the ISCN for the great conference held in Mildura, and the pre and post congress tours. This all happened because of the great effort by Gary Eyles and the support of Auscitrus staff Tim and Mandy backed by the Auscitrus Committee. The glowing reports from the various nations makes it all worthwhile.

The citrus industry has again had a very successful year which is reflected in the sales of citrus bud wood and seed. As mentioned last year Citrus Australia has very good records of varieties planted and projected production for ten years. This is a great guide for growers replanting their orchards. As a grower I can only hope that industry works together to keep the citrus industry flourishing.

A second application to the Federal Governments Stronger Regions fund for screenhouse funding was again unsuccessful. I chased up most of the Federal politicians in citrus growing areas and a number of large packing sheds. We had twenty excellent letters of support, but received no money. We have the potential for finance through HIAL, they are very keen to help but they cannot finance capital expenditure, so we are now looking at funding via the bio security aspect, and hope to have more luck through that avenue.

The demand for citrus trees continues and our thanks go to Graeme Sanderson and Nerida for their articles in the citrus news making it very clear that growers should check that the seed and budwood of their new trees has come from Auscitrus, or take the consequences of a poor patch of trees at maturity.

Pat Barkley has sent an email she had received from the head of the Citrus Repository in Riverside, California, it stated a tree in the city had HLB and the repository was totally shut down. They could not prune trees, even from within the glasshouse. We must think about what would happen to Auscitrus if HLB was found in the Mildura area?

Again my thanks to the Management Committee for their support, especially for the ISCN, and to Tim and Mandy for their effort of administrative support for the conference and general running of Auscitrus. The field staff also need a mention for the great appearance of the Auscitrus grounds at the open day of the conference.

Mike Arnold A.F.S.M.

Chairman of Auscitrus

MANAGER'S REPORT

Once again, we are happy to be able to report higher than average seed and budwood sales, with demand strong across all growing regions. This is a good sign of the positive growth the Australian citrus industry is experiencing at present.

The upsurge in demand for lemon budwood continued, along with W. Murcott Afourer, and increasing interest in red fleshed navels and blood oranges (a trend likely to continue upwards). There were shortfalls in some of these varieties as there is inevitably a lag from predicting future demand to increasing supply of budwood, but we are working with Citrus Australia through their Varieties Leadership group to attempt to foresee any upcoming trends and prepare for them. The increasing involvement with private variety owners also affects our planning, as they have their own plans for rolling out new varieties that we try our best to work with. The relationship between Auscitrus and private variety owners is strong and we continue to build these relationships, as private varieties are increasingly the future of citrus production in Australia, as it is around the world.

We were lucky enough to be given the opportunity to help host the International Society of Citrus Nurserymen (ISCN) congress in Mildura in July. While this was a lot of work, we were grateful to be given the privilege to be involved with such an important international event. Congratulations must go to Mr Gary Eyles for bringing the congress here and leading the organisation of the event, with Australia being the first country to host the ISCN twice (having hosted it previously in 1990). In return, this gave us access to some of the best citrus nursery minds in the world, with some excellent information presented and feedback provided through networking with our international peers.

As Mike described in his Chairman's report, we were unsuccessful in obtaining funding to develop insect screened budwood production houses at our Coomealla site. This was disappointing, but nevertheless we continue to seek funding for this screenhouse as it is a high priority. Speaking with a number of leading researchers and nurserymen at the ISCN congress, the strong message received was that we MUST screen our budwood production ASAP, and we MUST implement a nursery certification scheme ASAP. They all stressed how important it is to have this in place BEFORE an incursion of HLB/ACP. Auscitrus can only do so much with its limited resources, so we need the financial support of the citrus industry and government to get this off the ground.

2017/18 is shaping up to be another busy year for seed and budwood sales, but our focus must remain on preparing the budwood scheme for any future incursion of HLB/ACP. The future of Auscitrus and by association Australia's citrus nurseries and orchards depends on it.

Tim Herrmann
Auscitrus Manager

BUDWOOD SCHEME

Bud sales/orders for the full 2016/17 budwood year finished up at 702,944 buds of public varieties, and 172,976 buds of private varieties, for a grand total of 875,920.

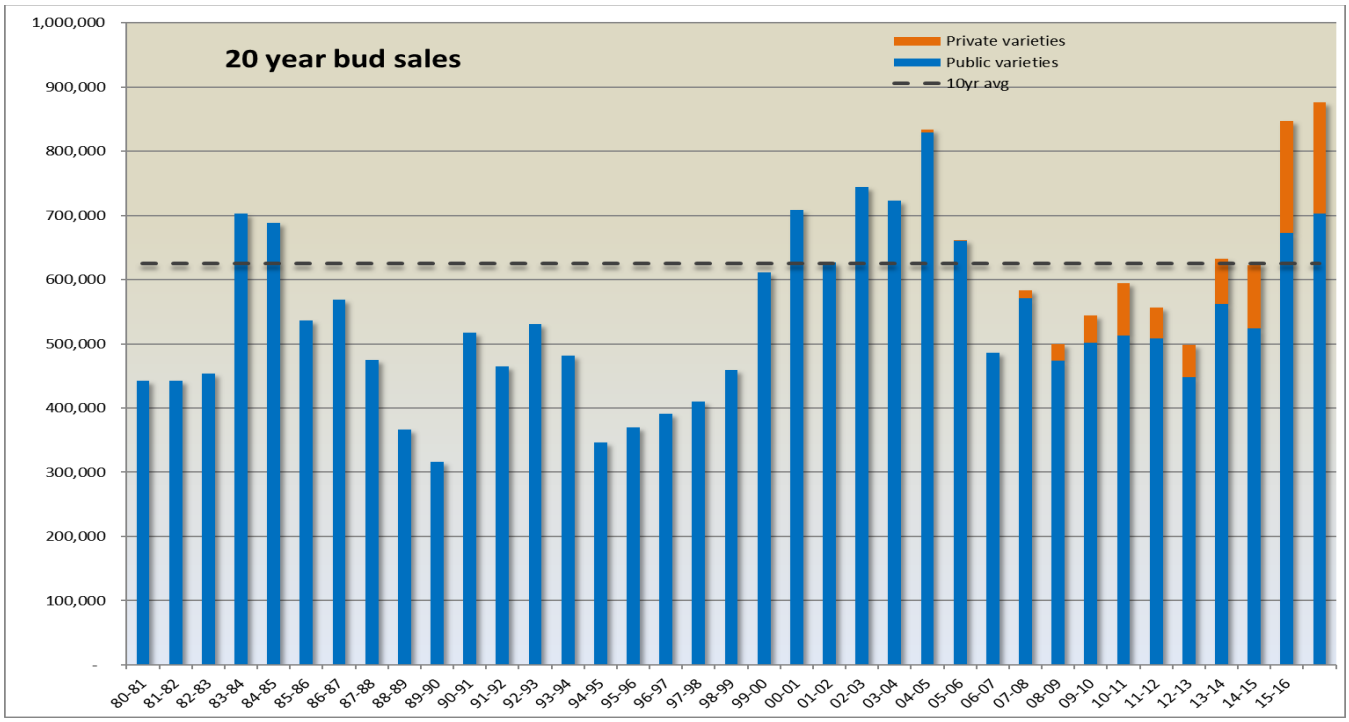
Previous all-time bud sales record was 847,068 in 2015/16.

Top selling varieties were:

Variety	Buds sold
W Murcott Afourer	75250
Tahiti	68311
Washington	49381
Eureka	43930
Murcott	42270
Imperial	37485
Keenan	31601
Meyer 806	26590
Cara Cara	26126
Salustiana	22178
Emperor	21826
Ippollito	20690

Shortfalls occurred for Cara Cara and Arnold Blood. There are 60 Cara Cara trees which have only just started producing budwood, so the supply of this should increase in future years. We have also planted an additional 30 Arnold Blood trees on top of the 30 we have already. Note the increased demand for Ippollito tarocco.

And the trend for the past few years:

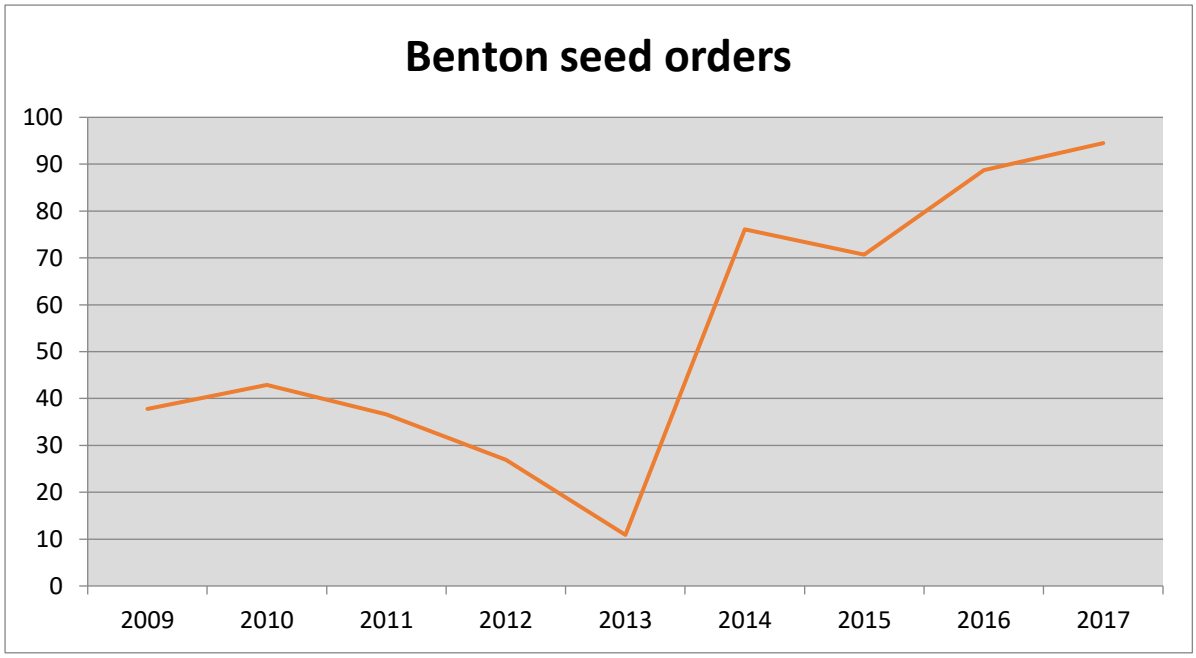


SEED SCHEME

Seed sales for the 2016/17 year ended up at 952kgs, short of last year's high of 972kgs but still the third highest on record. A breakdown of rootstock sales is as follows:

Rootstock	Kgs sold
P trifoliata	273.4
Troyer	187.69
Carrizo	146.08
Flying dragon	113.6
Swingle	55.53
C35	51.55
Cox hybrid	54.37
Benton	19.211
Rough lemon	16.425
Cleopatra	8.6
Sour orange	3.6
Volkameriana	15.5
Rangpur lime	0.95
Sweet orange	0.15

There is already 728ks of seed on order for 2017/18 so it is likely to be another strong year of seed sales ahead. This time last year we had 648kgs on order. Harvest for 2017 is almost complete, with around 1,800kgs of seed in storage. There are large excesses of the major commercial varieties apart from Benton, which is again in short supply.



We again applied an order weighting system to ensure nurseries that purchase Auscitrus budwood were given a fair allocation of Benton. We only had one complaint about this system from a new customer who had ordered the minimum order of Benton, and only needed a few seeds for his backyard. It was suggested that he order Cox seed instead.

AUSCITRUS OPERATIONS AT EMAI

Citrus is affected by a number of 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 using tested propagation material. 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
- Disease testing of budwood and rootstock seed supply trees.

The following report covers activities during the 2016/17 financial year.

NATIONAL CITRUS REPOSITORY

The 'National Citrus Repository for High Health Status Clones' currently holds 217 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 (119) and private (98) 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 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 is allowed to enter the repository system. This ensures the high health status of trees held in the National Citrus Repositories. During the 2016/17 year, 2 new publicly owned and 6 privately owned Australian selections underwent pathogen elimination to produce high health status foundation trees. No imported varieties released from post-entry quarantine entered the repository program during the 2016/17 year.

After entering the repository system, foundation trees are re-tested for graft-transmissible pathogens according to a designated schedule. Trees are not tested every year for pathogens which are 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. 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.

The maintenance and testing of public varieties is funded by Horticulture Innovation Australia and Auscitrus via project CT15005 'Protecting Australia's citrus genetic material' from September 2015 to July 2018. 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.

TESTING FOR CITRUS PATHOGENS

Citrus viroids

Auscitrus budwood source trees are scheduled for testing for citrus exocortis viroid every 3 years using biological indexing on 'Etrog' citron indicator plants. All suspect results from the biological indexing are investigated further using molecular techniques. Additional budwood sources may also be used, with trees tested prior to budwood supply.

Viroid testing commenced for 60 and was completed for 120 Auscitrus budwood supply trees during the 2016/17 year. Citrus exocortis viroid was not detected in samples from budwood source trees.

Citrus tristeza virus

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.

Trees in the EMAI screen house repositories were tested for CTV in autumn 2017. No CTV was detected. Trees in the Dareton screen house repository will be tested in spring 2017.

All inoculated repository trees tested positive for CTV in autumn 2017. A number of trees were weakly positive but viral particles were still detected. Budwood is only sourced from inoculated trees that have tested positive for CTV during their last test.

All grapefruit budwood supply trees are tested annually to confirm the presence of the mild isolate of CTV that protects trees against more severe grapefruit stem pitting strains. During the 2016/17 year, biological indexing on West Indian lime indicator plants was completed for 89 trees, confirming the presence of a mild protective CTV strain in the trees.

Citrus psorosis virus

Budwood supply trees are scheduled for testing for *Citrus psorosis virus* every 9-12 years via biological indexing. During the 2016/17 year, psorosis biological indexing was completed for 168 budwood source trees. No psorosis symptoms were observed on the foliage of indicator plants.

After psorosis indexing was complete, the stems were peeled to look for symptoms of CTV stem pitting.

Citrus leaf blotch virus

Rootstock seed supply trees are scheduled for testing for Citrus leaf blotch virus every 9-12 years using molecular techniques. Samples from 138 rootstock seed supply trees were tested during the 2016/17 year with no pathogen detected.

PATHOGEN ELIMINATION

Viruses and viroids can be removed from an infected variety by shoot tip grafting. Shoot tip grafted plants then need to be tested to see if the pathogens have been eliminated. Auscitrus provides the service of pathogen testing and elimination for Australian citrus selections.

At the end of the 2016/17 year, 8 varieties are currently in the variety testing program for Australian selections. Of these, 7 are undergoing pathogen elimination by shoot tip grafting.

Pathogens were successfully eliminated by shoot tip grafting from 2 private varieties and 6 public varieties during the 2016/17 year.

RESEARCH AND DEVELOPMENT

The high health status of the Australian citrus industry is largely dependent upon accurate testing of propagation material for graft-transmissible pathogens. NSW DPI and Auscitrus are working together on an industry funded project supported by Horticulture Innovation Australia which is looking at better methods for screening citrus plant material. The project started in October 2014 and is funded until March 2018. Improvements to current protocols have been identified through the project and adopted by Auscitrus.

STAFF

NSW DPI staff involved with Auscitrus activities at EMAI during the 16/17 financial year:

Sylvia Jelinek	Auscitrus Indexing Officer (1 FTE)
Allise Fail	Nursery Assistant (0.4 FTE)
George Haizer	Nursery Contractor (casual)
Grant Chambers	Technical Officer (Industry funded project)
Anna Englezou	Technical Officer (Industry funded project)
Nerida Donovan	Citrus Pathologist

APPENDIX 1: PUBLIC VARIETIES AND CLONES IN THE CITRUS FOUNDATION REPOSITORY

Accession No.	Variety	Accession No.	Variety
Orange			
Navel		*Other oranges*	
I.N. 86.0600	Atwood	I.N. 92.0901	Acidless orange (Lima 156)
A.Q. 78.4021	Benyenda – thorny	A.S. 10.0985	Blood orange (Arnold blood)
I.N. 97.0924	Cara Cara - California	I.N. 98.0921	Blood orange (Sanguine)
A.N. 14.0993	Cara Cara – new	I.N. 08.0968	Tarocco Ippolito
I.N. 86.0597	Fisher	I.N. 07.0965	Tarocco Meli C8158
I.N. 99.0912	Fukumoto	I.N. 07.0966	Tarocco Rosso C4977
A.S. 75.5077	Hockney	I.N.06.0960	Common orange (Bintangcheng # 2)
A.N. 73.0073	Houghton	I.N. 08.0973	Common orange (Bintangcheng Renbin # 5)
A.S. 92.0772	Hutton	I.N. 94.0902	Common orange (Delta seedless)
A.N. 75.0032	Lanes Late 3976	I.N. 86.0548	Common orange (Hamlin)
A.N. 73.0072	Leng	I.N. 02.0930	Common orange (Jaffa)
A.V. 94.0781	Lloyd/3 Leng	I.N.06.0959	Common orange (Jincheng 447)
I.N. 86.0550	Navelate	I.N. 94.0903	Common orange (Midknight)
I.N. 87.0546	Navelina Spain 7.5	I.N. 92.0900	Common orange (Natal)
I.N. 93.0899	Navelina 315 ex Italy	I.N. 86.0549	Common orange (Parson Brown)
A.S. 92.0773	Neilson	I.N. 90.0741	Common orange (Pera Olympia)
I.N. 86.0598	Newhall California	I.N. 90.0742	Common orange (Pera Limeira)
I.N. 87.0551	Newhall 55-1 Spanish	I.N. 87.0547	Common orange (Pineapple)
I.N. 10.0984	Palmer 1051	I.N. 93.0860	Common orange (Salustiana)
A.S. 75.5074	Thomson	A.Q. 78.4020	Common orange (Smith - Joppa)
Valencia			
A.S. 75.5095	B/3010		
A.Q. 75.4022	Benyenda		
A.S. 94.0782	Berri 3501		
A.V. 94.0780	CSIRO 5		
A.V. 93.0774	Jenner 4439		
A.N. 75.0029	Newton – Keenan 3125		
A.N. 75.0030	Newton – Keenan 3247		

Accession No.	Variety	Accession No.	Variety
Mandarin		**Grapefruit**	
I.N. 99.0909	Afourer	I.N. 91.0736	Flame
I.N. 99.0913	Avana Tardivo	I.N. 89.0620	Henderson
I.N. 99.0914	Avana Apireno	A.N. 73.0068	Marsh (3970 Druitt)
I.N. 98.0920	Clementine (Caffin)	A.N. 91.0632	Marsh (3962 Druitt)
I.N. 89.0704	Clementine (Clementard)	I.N. 89.0619	Ray Ruby
I.N. 99.0910	Clementine (Corsica 1)	I.N. 89.0708	Rio Red
I.N. 99.0911	Clementine (Corsica 2)	I.N. 89.0709	Star Ruby
I.N. 87.0544	Clementine (Fina)	A.N.04.0950	Star Ruby (Cant)
I.N. 87.0552	Clementine (Marisol)	A.N. 91.0633	Thompson (N Eagle)
I.N.05.0957	Clementine (Nour)	**Hybrid**	
I.N. 87.0543	Clementine (Nules)	A.S.17.1043	Poorman's orange
I.N. 04.0955	Clementine (Orogrande)		
I.N. 87.0545	Clementine (Oroval)	**Citron**	
I.N. 04.0953	Clementine (Sidi Aissa)	I.N. 01.0926	Bergamot Castagnaro
I.N. 91.0733	Daisy	I.N. 94.0904	Buddha's Hand
I.N. 90.0736	Encore	I.N. 09.0979	Etrog
I.N. 08.0974	Etna		
I.N. 89.0707	Fallglo	**Lemon**	
I.N. 93.0859	Fortune	I.N. 01.0927	Eureka (Allen)
A.Q. 94.0787	Fremont	A.N. 75.0034	Eureka (Lambert)
A.N. 75.0041	Hickson	A.N. 75.0035	Eureka (Taylor)
A.N. 75.0043	Imperial 0043/2	I.N. 89.0703	Fino
A.Q. 94.0778	Nova (Trott)	A.Q. 93.0785	Lemonade
I.N. 91.0734	Nova (Spain)	I.N. 00.0918	Lisbon (Limoneira 8A)
I.N. 04.0951	Parsons Special /2	I.N. 75.0036	Lisbon (Prior)
I.N. 86.0599	Pixie	A.Q. 91.0631	Lisbon (Queensland)
I.N. 04.0954	Primosole	A.NT. 15.1032	Tropical Meyer
A.N. 75.0065	Satsuma (Silverhill)	I.N. 89.0705	Verna
I.N. 89.0706	Satsuma (Clausellina)		
I.N. 91.0852	Satsuma (Okitsu Wase)	**Lime**	
I.N. 91.0853	Satsuma (Miho Wase)	A.N. 08.0969	Tahiti lime
A.Q. 94.0886	Sunburst	A.N. 90.0771	West Indian lime (Schweppes)
A.NT. 15.1034	Tropical Emperor		

Accession No.	Variety	Accession No.	Variety
Tangor/elo		**Papeda**	
A.N. 75.0090	Ellendale (Herps)	I.N. 94.0776	Kaffir lime (Malaysia 4669)
	Ellendale / EM3	A.D. 97.0907	Kaffir lime (Nathanael)
A.Q. 04.0952	Murcott tangor (Benham)	I.N. 00.0916	Kaffir lime (Eyles)
A.Q. 90.4149	Murcott tangor (Turner)	IN. 15.1020	Sudachi
I.N. 90.0818	Topaz tangor	A.N. 13.0991	Yuzu
Pummelo		**Cumquat**	
I.N. 01.0925	Namroi	A.N. 15.1033	Calamondin
I.N. 94.0786	Tambun	I.N. 04.0956	Nagami