Table 12 *Callistemon* varieties

	'UnicalOne'	*'Little John'	'Captain Cook'
PLANT: DENSITY	dense	dense	sparse
PLANT: HEIGHT	small	small	medium
PLANT: BRANCHING HABIT	strong	strong	medium
LEAF: COLOUR (RHS, 1995)			
young leaf	yellow-green RHS144A	yellow-green RHS 143A	yellow-green RHS 143A
mature leaf (upper side)	green RHS 137A	greyed-green RHS 189A	green RHS 137A
mature leaf (lower side)	green RHS 137B	greyed-green RHS 189A	green RHS 137B
LEAF: SHAPE	lanceolate	oblanceolate	lanceolate
LEAF: LENGTH (mm)			
mean	32.4	41.4	49.5
std deviation	3.47	4.62	6.50
LSD/sig	5.55	P≤0.01	P≤0.01
LEAF: WIDTH (mm)			
mean	5.9	8.3	5.7
std deviation	0.56	0.67	0.48
LSD/sig	0.64	P≤0.01	ns
LEAF: LENGTH/WIDTH RATIO			
mean	5.50	4.98	8.66
std deviation	0.44	0.24	0.65
LSD/sig	0.52	P≤0.01	P≤0.01
FLOWER: STAMEN AND STIGMA COLOUR	red RHS 46B	red RHS 46A	red RHS 46C
PETAL: DISTINCTIVENESS OF MARGIN	distinct	indistinct	indistinct
PETAL: COLOUR OF MARGIN (in apical region)	red RHS 48B	red RHS 49C-D	red RHS 49D
PETAL: COLOUR OF MIDZONE	yellow-green RHS 150A-B	yellow-green RHS 145A-B	yellow-green RHS 150C
PETAL: TRANSPARENCY	transparent	non-transparent	transparent
CALYX LOBE: RED COLOURATION OF MARGIN	strong	weak	strong
BUD: DISTINCTIVENESS OF RED COLOUR (before bud burst)	distinct	indistinct	distinct
BUD: COLOUR (prior to reflexing of petals)	red RHS 63B	green RHS 138B	red RHS 63C
SEED CAPSULE: COLOUR (IMMATURE)	green RHS 143B-C	green RHS 143A	green RHS 143B-C

Citrus reticulata x *Citrus sinensis*
Mandarin

'IrM1'

Application No: 1998/243 Accepted: 2 Dec 1998.
Applicant: **The State of Queensland through its Department of Primary Industries**, Brisbane, QLD.

Characteristics (Table 13, Figure 33) Plant: main branch attitude spreading, young shoot anthocyanin absent. Leaf: petiole development of wings absent or rudimentary. Flower: terminal bud anthocyanin absent, viable pollen present, flowering habit flowering once. Fruit: size medium (mean diameter 70.4mm at equator), shape oblate, shape at basal end moderately depressed, shape of distal end truncate, colour of surface yellow to orange RHS N25C (mean 0.27*), relief of surface smooth, areola absent, presence of navel absent or very rare, conspicuousness of navel not visible, thickness of rind thin (mean 3.6mm), adherence of rind to flesh medium, main colour of flesh orange RHS 26A (mean 0.12*), colour of juice yellow to orange, acid content of juice medium (mean 1.10% citric equivalent), total soluble solids of juice high (mean 13.05ºBrix), polyembryonic seeds present, time of maturity late, Brix to acid ratio: high (mean 12.4), number of flat seeds mean 0.6 per fruit, number of plump seeds mean 6.3 per fruit, weight mean 152g per fruit. (Note: All RHS colour chart numbers refer to 2001 edition. *a/b value from the L, a, b colour space measured with a Minolta Chromameter CR-200, average of 3 readings per fruit and 35 fruit per variety.)

Origin and Breeding Induced mutation: of 'Murcott' budwood. Gamma irradiation from a ^{60}Co (Cobalt 60) source was applied at different doses to 150mm bud sticks on 16/9/1991. Five hundred treated buds were budded onto Troyer citrange rootstock. One hundred and thirty six buds survived treatment and developed into trees, which were field planted at Bundaberg Research Station on the 27/8/1992. As trees commenced fruiting the fruit were cut and inspected for seed numbers from different limbs on each tree. This procedure was carried out in 1995, 96, 97 and 98. 'IrM1' was identified as showing consistently lower seed number than the parent variety with no apparent reduction in fruit size and good fruit quality in all four seasons. Budwood was taken from the original 'IrM1' tree and budded to Troyer citrange rootstock to establish daughter trees at two field sites in Oct 1998. A further generation of trees was established by taking budwood from these daughter trees and establishing grand-daughter trees (again budded to Troyer citrange rootstock), which were planted in Sep 2000. All trees of all three generations of 'IrM1' have consistently shown reduced seed numbers in each season. Selection criteria: consistent low number of seeds. Propagation: vegetatively through budwood. Breeder: Queensland Department of Primary Industries, Bundaberg, QLD.

Choice of Comparators The grouping characteristics used in identifying the most similar varieties of common knowledge were – Fruit: shape oblate, colour of surface yellow to orange, relief of surface smooth, presence of navel absent or very rare, total soluble solids of juice high. Seed: percentage of polyembryonic seeds high. Time of maturity of fruit: late. On the basis of these characteristics, the parental variety 'Murcott' was chosen as the most similar variety of common knowledge in existence at the time of lodgement of this application. Two additional selections from the same mutation breeding program, 'IrM2' (PBR Application No: 2001/176) and 'M22' were also included in the comparative trial to establish differences between mutations derived from 'Murcott'.

Comparative Trial Location: Mundubbera, QLD (Latitude 25º37' South, 151º15' East, elevation 166m), planted Oct 1998, DUS data collected Aug 2001 and 2002. Conditions: trial conducted in a commercial mandarin orchard with standard management practices, all trees budded to Troyer citrange rootstock, and tree spacing of 2.75 x 7 m. Trial design: planted in a single row with the 4 varieties arranged in a randomised complete block design with 7 replicates. Measurements: five organs (leaf/fruit/seed) randomly selected from each tree and assessed individually, such that all variables have a mean derived from 35 individual measurements.

Prior Applications and Sales
No prior applications. First budwood sold in Australia in Dec 2002.

Description: **Malcolm W. Smith**, Department of Primary Industries Queensland, Bundaberg, QLD.

Table 13 *Citrus* varieties

	'IrM1'	*'IrM2'	*'M22'	*'Murcott'
FRUIT: COLOUR OF SURFACE (RHS, 2001)	N25C yellow to orange	N25A orange	N25B yellow to orange	N25B yellow to orange
FRUIT: COLOUR OF SURFACE (a/b from L, a, b colour space*) LSD (P≤0.01) = 0.04				
mean	0.27[a]	0.35[b]	0.31[ab]	0.28[a]
std deviation	0.03	0.01	0.03	0.03
FRUIT: COLOUR OF SURFACE 'L' VALUE* LSD (P≤0.01) = 1.8				
mean	69.8[a]	67.8[b]	69.2[ab]	69.2[ab]
std deviation	1.5	0.7	0.9	1.0
FRUIT: COLOUR OF SURFACE 'a' VALUE* LSD (P≤0.01) = 2.6				
mean	19.0[a]	23.6[c]	21.7[bc]	19.7[ab]
std deviation	2.2	0.9	1.5	2.1
FRUIT: COLOUR OF SURFACE 'b' VALUE* LSD (P≤0.01) = 1.8				
mean	70.0[a]	67.8[b]	70.0[a]	70.0[a]
std deviation	0.6	1.1	1.1	1.3
FRUIT: THICKNESS OF RIND (mm) LSD (P≤0.01) = 0.5				
mean	3.6[a]	4.4[b]	3.3[a]	5.1[b]
std deviation	0.3	0.4	0.2	0.3
	thin	thin	thin	thin
FRUIT: COLOUR OF ALBEDO	white	pinkish	white	white
FRUIT: MAIN COLOUR OF FLESH (RHS, 2001)	26A orange	N25A-B orange	26A orange	26A orange
FRUIT: MAIN COLOUR OF FLESH (a/b from L, a, b colour space*) LSD (P≤0.01) = 0.03				
mean	0.12[a]	0.16[b]	0.12[a]	0.12[a]
std deviation	0.01	0.03	0.01	0.02
FRUIT: MAIN COLOUR OF FLESH 'L' VALUE* LSD (P≤0.01) = 1.3				
mean	46.9[a]	47.9[a]	45.5[b]	47.5[a]
std deviation	0.7	0.8	0.9	0.8
FRUIT: MAIN COLOUR OF FLESH 'a' VALUE* LSD (P≤0.01) = 1.0				
mean	4.0[a]	5.9[b]	4.1[a]	4.4[a]
std deviation	0.6	1.1	0.4	0.8
FRUIT: MAIN COLOUR OF FLESH 'b' VALUE* LSD (P≤0.01) = 1.7				
mean	34.5[ab]	36.1[b]	33.4[a]	35.1[ab]
std deviation	1.4	1.0	1.0	1.1
FRUIT: ACID CONTENT OF JUICE (% citric acid equivalent) LSD (P≤0.01) = 0.20				
mean	1.10[ab]	0.92[a]	1.15[b]	0.90[a]
std deviation	0.22	0.11	0.09	0.08
	medium	medium	medium	medium
FRUIT: PERCENTAGE OF POLYEMBRYONIC SEED (%) LSD (P≤0.01) = 12.3				
mean	100[a]	90[a]	97[a]	100[a]
std deviation	0	17	8	0
	high	high	high	high
FRUIT: TIME OF MATURITY	late	medium	late	late
FRUIT: BRIX TO ACID (ratio) LSD (P≤0.01) = 2.0				
mean	12.4[a]	14.8[b]	12.6[a]	14.3[ab]
std deviation	2.1	0.9	1.2	1.3
FRUIT: NUMBER OF FLAT SEEDS (per fruit) LSD (P≤0.01) = 1.1				
mean	0.6[a]	0.7[a]	0.4[a]	2.3[b]
std deviation	0.5	0.6	0.2	1.1
FRUIT: NUMBER OF PLUMP SEEDS (per fruit) LSD (P≤0.01) = 1.9				
mean	6.3[b]	6.6[b]	2.5[a]	21.9[c]
std deviation	1.2	1.5	0.5	1.4
FRUIT: WEIGHT (g per fruit) LSD (P≤0.01) = 26				
mean	152[a]	154[a]	119[b]	159[a]
std deviation	17	22	10	9

*Colour was measured objectively using a Minolta Chromameter CR-200 in the L, a, b colour space. 'a/b' provides an indication of 'redness' with higher values representing increased red colouration.

Means followed by the same letter are not significantly different at P≤0.01, Duncan's Multiple Range Test.