

Plant		Citrus		61(07019)	Primary essential character	
No	Characters	No. of samples	Methods	Rank or measurement unit		Remarks
1	Color of young leaves	10 shoots	Observation	1:Pale yellow 3:Light green 5:Green 7:Purple 9:Dark purple		Leaf color of sprouting shoot with 2 cm long
2	Spine	10 shoots	Observation	1:Spineless 3:Short 5:Intermediate 7:Long		Spines on spring shoots with moderate growth
3	Shape of leaf blade	15 leaves	Observation	1:Fusiform 2:Lanceolate 3:Oblanceolate 4:Elliptic 5:Ovate 6:Obovate 7:Orbicular 8:Obdeltoides 9:Other		Mature leaves of middle part of shoots with moderate growth (3 leaves/shoot x 5 shoots)
4	Shape of petiole wing	15 leaves	Observation	1:Trace 3:Narrow 5:Obdeltoides 7:Cordate		Mature leaves of middle part of shoots with moderate growth (3 leaves/shoot x 5 shoots)
5	Color of flower bud	10 flowers	Observation	1:White 2:Whitish yellow 3:Yellowish green 4:Light purple 5:Purple 6:Reddish purple		Color of flower bud just before anthesis
6	Fruit shape	10 fruits	Observation	1:Oblate 2:Globose 3:Ovoid 4:Oblong 5:Oblique 6:Obvoid 7:Pyriiform 9:Other		Normal mature fruits
7	Shape of fruit base	10 fruits	Observation	1:Long necked 2:Short necked 3:Evenly rounded 4:Truncate 5:Moderate concave 6:Deeply concave 7:Low collared with concave 8:High collared with concave 9:Low collared with short neck		Normal mature fruits
8	Shape of fruit apex	10 fruits	Observation	1:Nippled 2:Obtuse 3:Rounded 4:Truncate 5:Depressed		Normal mature fruits
9	Peel color	10 fruits	Observation	1:Green 2:Light green 3:Yellow 4:Light orange 5:Orange 6:Dark orange 7:Pink 8:Red 9:Purple		Normal mature fruits
10	Pulp color	10 fruits	Observation	1:Cream 2:Light green 3:Yellow 4:Light orange 5:Orange 6:Scarlet 7:Pink 8:Red 9:Purple		Normal mature fruits (Observe the transversal cut surface)

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No	Characters	No. of samples	Methods	Rank or measurement unit		Remarks
1	Waviness of leaf blade	15 leaves	Observation	1:Flat 3:Slight 5:Intermediate 7:Strong		Investigate the same leaves used in shape of leaf blade
2	Leaf blade index	15 leaves	Measurement	* (round to the 1st decimal place)		Investigate the same leaves used in shape of leaf blade. Leaf blade index = length of leaf blade/width of leaf blade
3	Wing index	10 leaves	Measurement	* (round to the 1st decimal place)		Investigate the same leaves used in shape of leaf blade. Wing index = wing length/wing width
4	Petal size	10 flowers	Measurement	mm (integer)		Length of petal
5	Collar	10 fruits	Observation	1:Absent 3:Obscure 5:Distinct		Investigate the same fruits used in fruit shape
6	Navel	10 fruits	Observation	1:Absent 2:Present		Investigate the same fruits used in fruit shape
7	Rind adherence	10 fruits	Observation	1:Slight 3:Moderate 5:Slightly strong 7:Strong		Investigate the same fruits used in fruit shape
8	Thickness of septa	10 fruits	Observation	3:Thin 5:Intermediate 7:Thick		Investigate the same fruits used in fruit shape
9	Bitterness of septa	10 fruits	Sensory	1:Absent 3:Weak 5:Intermediate 7:Strong		Investigate the same fruits used in fruit shape
10	Bitterness of vesicle	10 fruits	Sensory	1:Absent 3:Weak 5:Intermediate 7:Strong		Investigate the same fruits used in fruit shape
11	Color of mesocarp	10 fruits	Observation	1:White 3:Light yellow 5:Greenish white 7:Light orange 9:Red		Investigate the same fruits used in fruit shape
12	Uniformity of pulp color	10 fruits	Observation	3:Scattered 5:Intermediate 7:Solid		Investigate the same fruits used in fruit shape
13	Juiciness	10 fruits	Sensory	3:Little 5:Juicy 7:Very juicy		Investigate the same fruits used in fruit shape
14	Pulp texture	10 fruits	Sensory	3:Tender 5:Firm 7:Tough		Investigate the same fruits used in fruit shape
15	Seed size	10 seeds	Observation	3:Small 5:Intermediate 7:Large		Fresh seeds

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16	Seed surface		Observation	1:Smooth 9:Wrinkled	Texture of surface of fresh seeds
17	Color of outer seed coat	10 seeds	Observation	1:White 3:Cream 4:Yellow 5:Light brown 7:Dark brown 9:Other	Fresh seeds
18	Color of inner seed coat	10 seeds	Observation	1:White 2:Yellowish brown 3:Light brown 5:Dark brown 7:Red 9:Other	Fresh seeds
19	Embryo color	10 embryos	Observation	1:White 3:Cream 5:Light green 7:Green 9:Dark green	Fresh seeds

Plant		Citrus		61(07019)	Secondary essential character	
No	Characters	No. of samples	Methods	Rank or measurement unit		Remarks
1	Tree vigor	2 trees	Observation	3:Weak 5:Intermediate 7:Vigorous		
2	Tree attitude	2 trees	Observation	3:Upright 5:Spreading 7:Drooping		
3	Number of flowerings	2 trees	Observation	1:Once 2:Twice 3:Three times 4:Other		Number of flowering peaks in a year
4	Arrangement of flower	2 trees	Observation	1:Solitary 9:Inflorescent		
5	Fruit drop in winter	2 trees	Observation	1:None 3:Slight 5:Intermediate 7:Heavy		Limited to cultivars whose fruits are usually harvested after January
6	Bitterness induced by low temperature	2 trees	Sensory	3:None 5:Slight 7:Intermediate 9:Severe		Limited to cultivars whose fruits are usually harvested after January
7	Canker infection	2 trees	Observation	1:None 3:Light 5:Intermediate 7:Severe		Degree of infection under normal spraying of fungicide
8	Scabbing	2 trees	Observation	1:None 3:Light 5:Intermediate 7:Severe		Ibid
9	Citrus tristeza virus infection	10 shoots	Observation	1:None 3:Low 5:Intermediate 7:High		Degree of stem pitting on 2-year-old soft twigs

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No	Characters	No. of samples	Methods	Rank or measurement unit		Remarks
1	Flowering time	2 trees	Observation	1:Early 2:Middle 3:Late 4:Other		Date when about 80% of flowers are anthesised, standard species. Early=Navel orange, middle=Satsuma mandarin, late=Hirado buntan, other=trifoliate orange, etc
2	Development of style	2 trees	Observation	1:None 3:Incomplete 5:Complete		
3	Number of stamen	20 flowers	Measurement	3:Few 5:Intermediate 7:Many		Few:<=20, intermediate: 21-30, many:>=31
4	Pollen fertility	20 flowers	Measurement	% (integer)		Percentage of pollen grains stained well by aceto carmine
5	Winter hardiness of tree	2 trees	Observation	3:Weak 5:Intermediate 7:Hardy		Evaluation by defoliation, die-back of twig, tree death and so on
6	Peel damage induced by low temperature	2 trees	Observation	3:None 5:Light 7:Intermediate 9:Severe		Limited to cultivars whose fruits are usually harvested after January
7	Granulation induced by low temperature	2 trees	Observation	3:None 5:Light 7:Intermediate 9:Severe		Limited to cultivars which fruits are usually harvested after January

Plant		Citrus		61(07019)	Tertiary essential character	
No	Characters	No. of samples	Methods	Rank or measurement unit		Remarks
1	Fruit weight	10 fruits	Measurement	g (integer)		Average of fresh fruit weight
2	Fruit shape index	20 fruits	Measurement	1:<80 2:81-100 3:101-120 4:121-140 5:>141		(Transverse diameter/longitude diameter) x 100
3	Thickness of rind	10 fruits	Measurement	mm (round to the 1st decimal place)		Mean of 2 measurements at the equatorial cross section of each fruit
4	Number of segment	10 fruits	Measurement	* (round to the 1st decimal place)		
5	Acid content of juice	5 fruits	Measurement	mg (round to the 2nd decimal place)		Titrate acids of juice estimated as mg citric acid in 100 ml juice
6	Sugar content of juice	5 fruits	Measurement	* (round to the 1st decimal place)		Brix of juice
7	Maturation season	2 trees	Observation	1:Very early 3:Early 5:Intermediate 7:Late		Standard species:very early=Early satsuma (Sep.-Nov.), early=Common satsuma (Nov.-Dec.), middle=Hassaku (Jan.-Mar.), and late=Natsudaidai (Apr-.)
8	Percentage of seedless fruit	20 fruits	Measurement	% (integer)		(Number of seedless fruits/number of all fruits examined) x 100
9	Percentage of monoembryonic seeds	50 seeds	Measurement	% (integer)		(Number of monoembryonic seeds/number of seeds examined) x 100
10	Rind puffing	20 fruits	Observation	1:None 3:Slight 5:Intermediate 7:Severe		Limited to accessions with easy peeling fruits
11	Granulation	20 fruits	Observation	1:None 3:Slight 5:Intermediate 7:Severe		

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1	Thickness of fruit petiole	20 fruits	Observation	3:Thin 5:Intermediate 7:Thick		
2	Surface of epicarp	20 fruits	Observation	3:Rugose 5:Intermediate 7:Smooth		
3	Size of oil gland	20 fruits	Observation	3:Small 5:Intermediate 7:Large		
4	Density of oil gland	20 fruits	Observation	3:Dispersed 5:Intermediate 7:Dense		
5	Size of fruit axis	20 fruits	Observation	3:Small 5:Intermediate 7:Large		
6	Solidity of fruit axis	20 fruits	Observation	3:Hollow 5:Semi-hollow 7:Solid		
7	Number of seed	20 fruits	Measurement	* (round to the 1st decimal place)		Average seed number per fruit
8	Fruit cracking	20 fruits	Observation	1:None 5:Slight 7:Severe		
9	Regreening	20 fruits	Observation	1:None 3:Light 5:Intermediate 7:Severe		
10	Alternate bearing	2 trees	Observation	3:Light 5:Intermediate 7:Severe		