

Morphological Description of Walnut Genotypes under Agro climatic Conditions of Jammu and Kashmir

(Edition-1)



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(ISO 9001:2008 Certified)

and



Protection of Plant varieties and Farmer's Rights Authority (PPV & FRA)
Government of India



Published by :

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Citation: J.I.Mir, D.B. Singh, N. Ahmed, Megna Rashid, S.R.Singh, O.C.Sharma, Shiv Lal, Anil Sharma, Lal Chand and Wajida Shafi (2017). Morphological Description of Walnut Genotypes under Agro climatic Conditions of Jammu and Kashmir (Part-1). Central Institute of Temperate Horticulture (ICAR), Rangreth, Old Air Field, Srinagar- 190007, J&K, India

Layout and design: Dr. MEGNA RASHID

First Edition: 2017

Lasertypeset & printed at:

M/s. Royal Offset Printers, A-89/1, Naraina Industrial Area, Phase-I, New Delhi-110028

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PREFACE

Walnut (*Juglans regia* sp.) is one of the important temperate nut fruit revered since ancient times as a symbol of intellectuality as its kernel have convoluted surface inside the shell resembling to brain. There are 21 species of tree in the genus Juglans. The most commonly grown tree for nuts is the English or Persian Walnut It has many health invigorating properties as it is rich source of energy, protein, fibre, minerals, anti-oxidants and vitamins which are essential for optimum health. It is excellent source of mono saturated fatty acids (72%) like oleic acid and all omega -3 essential fatty acid like linolic acid, alpha-linoenic acid and arachialonic acid which helps to lower the bad cholesterol (LDL) and increases HDL or good cholesterol level in blood and prevents the coronary artery diseases and strokes favour blood lipid profile. It is grown mainly in Jammu & Kashmir, Himachal Pradesh, Uttarakhand and Arunachal Pradesh. However Jammu & Kashmir is the major walnut producing state contributing 80.58% of total area and 91.16% total production of the country. The most important walnut growing districts in Kashmir are Anantnag, Pulwama, Kupwara, Budgam, Baramulla and Srinagar, in Kashmir while in Jammu region Doda, Kistwar, Poonch, Udampur are important with minor quantity production in Rajouri and Kathu. Walnut presently grown is mostly of seedling origin, contributing towards large scale variability. Morphological description of walnut varieties under agro climatic conditions of Jammu and Kashmir will help scientist, students, researchers, farmers and other stakeholders for identification, characterisation evaluation and registration of distinct and new walnut varieties with high economic impact.

CITH-WALNUT-1

Genus-Species: *Juglans regia* L

Accession No. IC-561050

Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	High (> 100)	Nut Shape	Long trapezoid
Growth habit	Semi erect	Shape in cross section	Oblate
Density of branches	Dense	Shape of base perpendicular to suture	Truncate
Bearing habit	Terminal	Shape of apex perpendicular to suture	Truncate
Leaf Characteristics	States	Prominence of apical tip	Medium
Leaf let length (cm)	Long (>15)	Position of pad on suture	On upper 2/3
Leaf let shape	Broad elliptic	Nut diameter (mm)	Large (> 40)
Leaflet margin	Entire	Nut length(mm)	Large (> 40)
Leaflet colour	Dark Green	Nut weight (g)	Heavy (>20)
Leaf serration	Absent	Prominence of pad on suture	Weak
Rachis colour	Green	Shell surface	Smooth
Rachis persistence	Many	Shell colour	Light
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Slightly pubescent	Shell seal	Intermediate
Shoot colour	Brown	Shell integrity	Strong
Inflorescence characteristics	States	Shell thickness (mm)	Thin (<1)
Dichogamy	Protogynous	Packing tissue thickness	Thin
Initiation of 10% Female flowering	Early	Kernel Characteristics	States
Number of male catkins per cluster	Many	Kernel weight (g)	Heavy (>10)
Number of female flowers per cluster	Medium(2-4)	Kernel percentage	High (50-60)
Stigma colour	Green	Kernel veins (%)	Low(<30)
Hull dehiscence	Dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		kernel colour	Extra light

CITH-WALNUT-1



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-2

Genus-Species: *Juglans regia* L

Accession No. IC-561049

Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	Intermediate (50-100)	Nut Shape	Ovate
Growth habit	Semi erect	Shape in cross section	Round
Density of branches	Intermediate	Shape of base perpendicular to suture	Truncate
Bearing habit	Terminal	Shape of apex perpendicular to suture	Pointed
Leaf Characteristics	States	Prominence of apical tip	Medium
Leaf let length (cm)	Short (< 10)	Position of pad on suture	On upper half
Leaflet shape	Elliptic	Nut diameter (mm)	Large (> 40)
Leaflet margin	Entire	Nut length (mm)	Large (>40)
Leaflet colour	Dark green	Nut weight (g)	Heavy (>20)
Leaf serration	Absent	Prominence of pad on suture	Weak
Rachis colour	Yellow	Shell surface	Rough
Rachis persistence	Intermediate	Shell colour	Light
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Pubescent	Shell seal	Medium (1-2)
Shoot colour	Brown	Shell integrity	Strong
Inflorescence characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protogynous	Packing tissue thickness	Thick
Initiation of 10% Female flowering	Early	Kernel Characteristics	States
Number of male catkins per cluster	Many	Kernel weight (g)	Heavy(>10)
Number of female flowers per cluster	Medium (2-4)	Kernel percentage	Medium(40-50)
Stigma colour	Green	Kernel veins (%)	Low
Hull dehiscence	Dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-2



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel color

CITH-WALNUT-3

Genus-Species: *Juglans regia* L

Accession No. IC-587184

Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	Low (<50)	Nut Shape	Ovate
Growth habit	Spreading	Shape in cross section	Elliptic
Density of branches	Intermediate	Shape of base perpendicular to suture	Rounded
Bearing habit	Terminal	Shape of apex perpendicular to suture	Pointed
Leaf Characteristics	States	Prominence of apical tip	Medium
Leaflet length (cm)	Short (< 10)	Position of pad on suture	On whole nut
Leaflet shape	Elliptic	Nut diameter (mm)	Medium (30-40)
Leaflet margin	Entire	Nut length(mm)	Medium (30-40)
Leaflet colour	Dark green	Nut weight (g)	Heavy
Leaf serration	Absent	Prominence of pad on suture	Medium
Rachis colour	Green	Shell surface	Rough
Rachis persistence	Many	Shell colour	Light
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Glabrous	Shell seal	Very strong
Shoot colour	Brown	Shell integrity	Strong
Initiation of 10% Female flowering	Early	Shell thickness (mm)	Medium(1-2)
Inflorescence characteristics	States	Kernel Characteristics	States
Dichogamy	Protogynous	Packing tissue thickness	Thick
Number of male catkins per cluster	Intermediate		
Number of female flowers per cluster	Medium (3-4)	Kernel weight (g)	Heavy(>10)
Stigma colour	Green	Kernel percentage	Medium(40-50)
Hull dehiscence	Dehiscent	Kernel veins (%)	Low
		Kernel plumpness	Plump
		Ease of removal of kernel halves	Moderate
		Kernel colour	Light

CITH-WALNUT-3



Tree vigour



Leaf Colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-4

Genus-Species: *Juglans regia* L

Accession No. IC-587272

Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	Intermediate (50-100)	Nut Shape	Long trapezoid
Growth habit	Spreading	Shape in cross section	Oblate
Density of branches	Dense	Shape of base perpendicular to suture	Round
Bearing habit	Terminal	Shape of apex perpendicular to suture	Pointed
Leaf Characteristics	States	Prominence of apical tip	Medium
Leaflet length (cm)	Long (>15)	Position of pad on suture	on upper 2/3
Leaf shape	Broad elliptic	Nut diameter (mm)	Large (> 40)
Leaflet margin	Entire	Nut length (mm)	Large (>40)
Leaflet colour	Green	Nut weight (g)	Heavy (>20)
Leaf serration	Absent	Prominence of pad on suture	Medium
Rachis colour	Yellow	Shell surface	Rough
Rachis persistence	pubescent	Shell colour	Light
Time of leaf fall	Late	Shell strength	Intermediate
Shoot pubescence	Pubescent	Shell Seal	Strong
Shoot colour	Brown	Shell integrity	Strong
Inflorescence characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protoandrous	Packing Tissue thickness	Thin
Initiation of 10% Female flowering	Mid	Kernel Characteristics	States
Number of male catkins per cluster	Few	Kernel weight (g)	Heavy (>10)
Number of female flowers per cluster	Medium (3-4)	Kernel percentage	High (50-60)
Stigma colour	Green	Kernel veins (%)	Medium
Hull dehiscence	Dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-4



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-5

Genus-Species: *Juglans regia* L

Accession No. IC-587086

Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	High (> 100)	Nut shape	Ovate
Growth habit	Spreading	Shape in cross section	Round
Density of branches	Intermediate	Shape of base perpendicular to suture	Truncate
Bearing habit	Terminal	Shape of apex perpendicular to suture	Rounded
Leaf Characteristics	States	Prominence of apical tip	Medium
Leaflet length (cm)	Short (>10)	Position of pad on suture	On upper 2/3
Leaf shape	Elliptic	Nut diameter (mm)	Large (> 40)
Leaflet margin	Entire	Nut length (mm)	Large (>40)
Leaflet colour	Green	Nut weight (g)	Heavy(>20)
Leaf serration	Absent	Prominence of pad on suture	Strong
Rachis colour	Green	Shell Surface	Smooth
Rachis persistence	Many	Shell colour	Light
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Pubescent	Shell Seal	Intermediate
Shoot colour	Brown	Shell integrity	Strong
Inflorescence characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protandrous	Packing tissue thickness	Thick
Initiation of 10% Female flowering	Early	Kernel Characteristics	States
Number of male catkins per cluster	Many	Kernel weight (g)	Heavy (>10)
Number of female flowers per cluster	Medium (2-4)	Kernel percentage	High (50-60)
Stigma colour	Green	Kernel veins (%)	Medium (30-40)
Hull dehiscence	Dehiscent	Kernel plumpness	Plummy
		Ease of removal of kernel halves	Easy
		Kernel colour	Extra Light

CITH-WALNUT-5



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-6

Genus-Species: *Juglans regia* L

Accession No. IC-587141

Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	Intermediate (50-100)	Nut Shape	Ovate
Growth habit	Semi erect	Shape in cross section	Round
Density of branches	Intermediate	Shape of base perpendicular to suture	Emarginated
Bearing habit	Terminal	Shape of apex perpendicular to suture	Rounded
Leaf Characteristics	States	Prominence of apical tip	Weak
Leaflet length (cm)	Long (10-15)	Position of pad on suture	On whole length
Leaf shape	Broad elliptic	Nut diameter(mm)	Large (> 40)
Leaflet margin	Entire	Nut length(mm)	Large (>40)
Leaflet colour	Green	Nut weight (g)	Heavy
Leaf serration	Absent	Prominence of pad on suture	Strong
Rachis colour	Green	Shell surface	Rough
Rachis persistance	Slightly pubescent	Shell colour	Light
Time of leaf fall	Mid	Shell strength	Weak
Shoot pubescence	Pubescent	Shell seal	Intermediate
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protogynous	Packing tissue thickness	Very think
Initiation of 10% Female flowering	Early	Kernel Characteristics	States
Number of male catkins per cluster	Many	Kernel weight (g)	Heavy (>10)
Number of female flowers per cluster	Medium (3-4)	Kernel percentage	High(50-60)
Stigma colour	Green	Kernel veins (%)	Medium (30-40)
Hull dehiscence	Dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-6



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-7

Genus-Species: *Juglans regia* L

Accession No. IC-561057

Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour(cm)	High (> 100)	Nut Shape	Elliptic
Growth habit	Semi erect	Shape in cross section	Elliptic
Density of branches	Intermediate	Shape of base perpendicular to suture	Cuneate
Bearing habit	Terminal	Shape of apex Perpendicular to suture	Pointed
Leaf Characteristics	States	Prominence of apical tip	Medium
Leaflet length (cm)	Medium(10-15)	Position of pad on suture	On upper 2/3
Leaf shape	Elliptic	Nut diameter (mm)	Large (> 40)
Leaflet margin	Entire	Nut length (mm)	Large (>40)
Leaflet colour	Green	Nut weight (g)	Heavy (>20)
Leaf serration	Absent	Prominence of pad on suture	Strong
Rachis colour	Yellow	Shell surface	Rough
Rachis persistancec	Slightly pubescent	Shell colour	Medium
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Glabrous	Shell seal	Strong
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protoandrous	Packing tissue thickness	Very thick
Initiation of 10% Female flowering	Medium	Kernel Characteristics	States
Number of male catkins per cluster	Many	Kernel weight (g)	Heavy(>10)
Number of female flowers per cluster	Low(1-2)	Kernel percentage	High(50-60)
Stigma colour	Yellow	Kernel veins (%)	Medium
Hull dehiscence	Dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Amber

CITH-WALNUT-7



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-8

Genus-Species: *Juglans regia* L

Accession No. IC-587208

Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	Intermediate (50-100)	Nut shape	Long trapezoid
Growth habit	Semi erect	Shape in cross section	Oblate
Density of branches	Intermediate	Shape of base perpendicular to suture	Cuneate
Bearing habit	Terminal	Shape of apex perpendicular to suture	Rounded
Leaf Characteristics	States	Prominence of apical tip	Medium
Leaflet length (cm)	Short(<10)	Position of pad on suture	On upper half
Leaf shape	Narrow Elliptic	Nut diameter (mm)	Large (> 40)
Leaflet margin	Entire	Nut length (mm)	Large (>40)
Leaflet colour	Green	Nut weight (g)	Heavy
Leaf serration	Absent	Prominence of pad on suture	On upper half
Rachis colour	Yellow	Shell surface	Rough
Rachis persistence	Many	Shell colour	Light
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Pubescent	Shell seal	Intermediate
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protoandrous	Packing tissue thickness	Thin (<1)
Initiation of 10% Female flowering	Medium	Kernel Characteristics	States
Number of male catkins per cluster	Many	Kernel weight (g)	Heavy(>10)
Number of female flowers per cluster	Medium (2-4)	Kernel percentage	High(50-60)
Stigma colour	Green	Kernel veins (%)	Medium
Hull dehiscence	Dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-8



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-9

Genus-Species: *Juglans regia* L

Accession No. IC-587073

Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	High (>100)	Nut Shape	Round
Growth habit	Semi erect	Shape in cross section	Oblate
Density of branches	Spreading	Shape of base perpendicular to suture	Truncate
Bearing habit	Terminal	Shape of apex perpendicular to suture	Rounded
Leaf Characteristics	States	Prominence of apical tip	Medium
Leaflet length (cm)	Medium(10-15)	Position of pad on suture	On upper half of nut
Leaf shape	Elliptic	Nut diameter (mm)	Large (> 40)
Leaflet margin	Entire	Nut length (mm)	Large (>40)
Leaflet colour	Dark green	Nut weight (g)	Heavy(> 20)
Leaf serration	Absent	Prominence of pad on suture	Medium
Rachis colour	Green	Shell surface	Rough
Rachis persistence	Many	Shell colour	Light
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Glabrous	Shell seal	Intermediate
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium (1-2)
Dichogamy	Protogynous	Packing tissue thickness	Thin
Initiation of 10% Female flowering	Medium	Kernel Characteristics	States
Number of male catkins per cluster	Many	Kernel weight (g)	Heavy (>10)
Number of female flowers per cluster	Medium (2-4)	Kernel percentage	High (50-60)
Stigma colour	Green	Kernel veins (%)	High(>40)
Hull dehiscence	Dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-9



Tree vigour



Leaf colour



Male catkin



Female flower



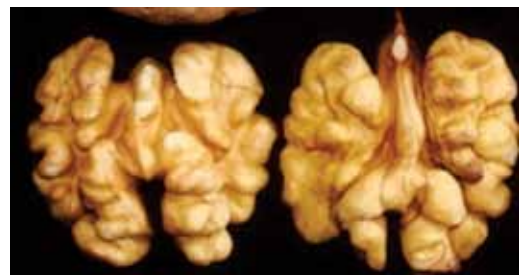
Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-10			
Genus-Species: <i>Juglans regia</i> L			
Accession No.IC-561061			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	High (>100)	Nut Shape	Long trapezoid
Growth habit	Semi erect	Shape in cross section	Oblate
Density of branches	Dense	Shape of base perpendicular to suture	Rounded
Bearing habit	Terminal	Shape of apex perpendicular to suture	Rounded
Leaf Characteristics	States	Prominence of apical tip	Medium
Leaflet length (cm)	Short(<10)	Position of pad on suture	On whole length
Leaf shape	Narrow elliptic	Nut diameter (mm)	Large (> 40)
Leaflet margin	Entire	Nut length (mm)	Large (>40)
Leaflet colour	Dark Green	Nut weight (g)	Heavy (>20)
Leaf serration	Absent	Prominence of pad on suture	Medium
Rachis colour	Green	Shell surface	Medium
Rachis persistence	Many	Shell colour	Light
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Slightly glabrous	Shell seal	Intermediate
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protoandrous	Packing tissue thickness	Thin
Initiation of 10% Female flowering	Medium	Kernel Characteristics	States
Number of male catkins per cluster	Intermediate	Kernel weight (g)	Heavy (>10)
Number of female flowers per cluster	Medium(3-4)	Kernel percentage	High(50-60)
Stigma colour	Green	Kernel veins (%)	Low(<30)
Hull dehiscence	Dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-10



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-11

Genus-Species: *Juglans regia* L

Accession No. IC-587310

Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	Intermediate (50-100)	Nut Shape	Round
Growth habit	Semi erect	Shape in cross section	Oblate
Density of branches	Dense	Shape of base perpendicular to suture	Rounded
Bearing habit	Terminal	Shape of apex perpendicular to suture	Rounded
Leaf Characteristics	States	Prominence of apical tip	Weak
Leaflet length (cm)	Long (>15)	Position of pad on suture	On whole length
Leaf shape	Broad elliptic	Nut diameter (mm)	Medium (30-40)
Leaflet margin	Entire	Nut length (mm)	Medium (30-40)
Leaflet colour	Dark green	Nut weight (g)	Medium(15-20)
Leaf serration	Absent	Prominence of pad on suture	Medium
Rachis colour	Green	Shell surface	Medium
Rachis persistancec	Many	Shell colour	Light
Time of leaf fall	Mid	Shell strength	intermediate
Shoot pubescence	Glabrous	Shell seal	intermediate
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protoandrous	Packing tissue thickness	Thin
Initiation of 10% Female flowering	Late	Kernel Characteristics	States
Number of male catkins per cluster	Many	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Heavy(>4)	Kernel percentage	Medium
Stigma colour	Green	Kernel veins (%)	Low(<30)
Hull dehiscence	Dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Extra Light

CITH-WALNUT-11



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-12			
Genus-Species: <i>Juglans regia</i> L			
Accession No.IC-622807			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	Intermediate (50-100)	Nut Shape	Broad Ovate
Growth habit	Erect	Shape in cross section	Round
Density of branches	Intermediate	Shape of base perpendicular to suture	Emarginate
Bearing habit	Terminal	Shape of apex perpendicular to suture	Rounded
Leaf Characteristics	States	Prominence of apical tip	Weak
Leaflet length (cm)	Short (<10)	Position of pad on suture	On upper half of nut
Leaf shape	Elliptic	Nut diameter (mm)	Medium(30-40)
Leaflet margin	Entire	Nut length (mm)	Medium(30-40)
Leaflet colour	Dark green	Nut weight (g)	Medium(15-20)
Leaf serration	Absent	Prominence of pad on suture	Weak
Rachis colour	Green	Shell surface	Medium
Rachis persistence	Many	Shell colour	Light
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Slightly pubescent	Shell seal	Strong
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protoandrous	Packing tissue thickness	Thin
Initiation of 10% Female flowering	Early	Kernel Characteristics	States
Number of male catkins per cluster	Many	Kernel weight (g)	Medium (6-10)
Number of female flowers per cluster	Medium (2-4)	Kernel percentage	Medium(40-50)
Stigma colour	Green	Kernel veins (%)	Low(<30)
Hull dehiscence	Dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Amber

CITH-WALNUT-12



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-13

Genus-Species: *Juglans regia* L

Accession No. IC-587115

Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	Intermediate (50-100)	Nut shape	Long trapezoid
Growth habit	Spreading	Shape in cross section	Round
Density of branches	Dense	Shape of base perpendicular to suture	Truncate
Bearing habit	Terminal	Shape of apex perpendicular to suture	Rounded
Leaf Characteristics	States	Prominence of apical tip	Medium
Leaflet length (cm)	Long (>15)	Position of pad on suture	On Whole Length
Leaf shape	Broad elliptic	Nut diameter (mm)	Large (>40)
Leaflet margin	Entire	Nut length (mm)	Medium (30-40)
Leaflet colour	Dark green	Nut weight (g)	Heavy (>20)
Leaf serration	Absent	Prominence of pad on suture	Strong
Rachis colour	Green	Shell surface	Smooth
Rachis persistence	Attached	Shell colour	Light
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Slightly pubescent	Shell seal	Strong
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium (1-2)
Dichogamy	Protogynous	Packing tissue thickness	Thin
Initiation of 10% Female flowering	Late	Kernel Characteristics	States
Number of male catkins per cluster	Many	Kernel weight (g)	Medium (6-10)
Number of female flowers per cluster	Low (<2)	Kernel percentage	Medium(40-50)
Stigma colour	Red	Kernel veins (%)	Medium(30-40)
Hull dehiscence	Dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-13



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-14			
Genus-Species: <i>Juglans regia</i> L			
Accession No.IC-0617692			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	Intermediate (50-100)	Nut Shape	Long trapezoid
Growth habit	Spreading	Shape in cross section	Oblate
Density of branches	Dense	Shape of base perpendicular to suture	Rounded
Bearing habit	Terminal	Shape of apex perpendicular to suture	Truncate
Leaf Characteristics	States	Prominence of apical tip	Weak
Leaflet length (cm)	Long (>15)	Position of pad on suture	On upper half of nut
Leaf shape	Broad elliptic	Nut diameter (mm)	Large (>40)
Leaflet margin	Entire	Nut length (mm)	Medium(30-40)
Leaflet colour	Dark green	Nut weight (g)	Heavy (>20)
Leaf serration	Absent	Prominence of pad on suture	Medium
Rachis colour	Green	Shell surface	Smooth
Rachis persistence	Attached	Shell colour	Light
Time of leaf fall	Mid	Shell strength	Strong
Shoot pubescence	Slightly pubescent	Shell seal	Strong
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium (1-2)
Dichogamy	Protogynous	Packing tissue thickness	Thin
Initiation of 10% Female flowering	Late	Kernel Characteristics	States
Number of male catkins per cluster	Many	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Low (<2)	Kernel percentage	Medium(40-50)
Stigma colour	Yellow	Kernel veins (%)	Medium(30-40)
Hull dehiscence	Dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-14



Tree vigour



Leaf colour



Male catkin



Female flower



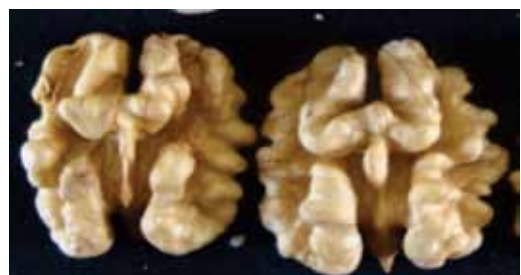
Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-15			
Genus-Species: <i>Juglans regia</i> L			
Accession No.IC-587227			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	Intermediate (50-100)	Nut shape	Long trapezoid
Growth habit	Semi Erect	Shape in cross section	Round
Density of branches	Dense	Shape of base perpendicular to suture	Truncate
Bearing habit	Terminal	Shape of apex perpendicular to suture	Rounded
Leaf Characteristics	States	Prominence of apical tip	Medium
Leaflet length (cm)	Long (>15)	Position of pad on suture	On upper half of nut
Leaf shape	Broad elliptic	Nut diameter (mm)	Large (> 40)
Leaflet margin	Entire	Nut length (mm)	Medium (30-40)
Leaflet colour	Dark green	Nut weight (g)	Heavy (>20)
Leaf serration	Absent	Prominence of pad on suture	Medium
Rachis colour	Green	Shell surface	Medium
Rachis persistence	Attached	Shell colour	Light
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Glabrous	Shell seal	Strong
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protoandrous	Packing tissue thickness	Thin
Initiation of 10% Female flowering	Late	Kernel Characteristics	States
Number of male catkins per cluster	Many	Kernel weight (g)	Heavy (>10)
Number of female flowers per cluster	Low (<2)	Kernel percentage	High (50-60)
Stigma colour	Green	Kernel veins (%)	Low(<30)
Hull dehiscence	Dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Extra Light

CITH-WALNUT-15



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-16			
Genus-Species: <i>Juglans regia</i> L			
Accession No.IC-587140			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	Intermediate (50-100)	Nut shape	Ovate
Growth habit	Spreading	Shape in cross section	Round
Density of branches	Dense	Shape of base perpendicular to suture	Truncate
Bearing habit	Terminal	Shape of apex perpendicular to suture	Truncate
Leaf Characteristics		Prominence of apical tip	Weak
Leaflet length (cm)	Long(>15)	Position of pad on suture	On upper half of nut
Leaf shape	Broad elliptic	Nut diameter (mm)	Medium (30-40)
Leaflet margin	Entire	Nut length (mm)	Medium (30-40)
Leaflet colour	Dark green	Nut weight (g)	Heavy (>20)
Leaf serration	Absent	Prominence of pad on suture	Medium
Rachis colour	Green	Shell surface	Medium
Rachis persistance	Attached	Shell colour	Light
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Glabrous	Shell seal	Strong
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protogynous	Packing tissue thickness	Thin
Initiation of 10% Female flowering	Early	Kernel Characteristics	States
Number of male catkins per cluster	Intermediate	Kernel weight (g)	Heavy(>10)
Number of female flowers per cluster	High (>4)	Kernel percentage	High (>40)
Stigma colour	Green	Kernel veins (%)	Medium(30-40)
Hull dehiscence	Dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-16



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-17			
Genus-Species: <i>Juglans regia</i> L			
Accession No.IC-587071			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	Intermediate (50-100)	Nut Shape	Elliptic
Growth habit	Spreading	Shape in cross section	Oblate
Density of branches	Dense	Shape of base perpendicular to suture	Truncate
Bearing habit	Terminal	Shape of apex perpendicular to suture	Rounded
Leaf Characteristics	States	Prominence of apical tip	Medium
Leaflet length (cm)	Long(>10)	Position of pad on suture	On whole length
Leaf shape	Broad elliptic	Nut diameter (mm)	Medium (30-40)
Leaflet margin	Entire	Nut length (mm)	Medium (30-40)
Leaflet colour	Dark green	Nut weight (g)	Heavy (>10)
Leaf serration	Absent	Prominence of pad on suture	Strong
Rachis colour	Green	Shell surface	Rough
Rachis persistence	Attached	Shell colour	Light
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Glabrous	Shell seal	Strong
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protogynous	Packing tissue thickness	Thin
Initiation of 10% Female flowering	Late	Kernel Characteristics	States
Number of male catkins per cluster	Intermediate	Kernel weight (g)	Heavy (>10)
Number of female flowers per cluster	Low(<2)	Kernel percentage	High (>40)
Stigma colour	Red	Kernel veins (%)	Low
Hull dehiscence	Dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Amber

CITH-WALNUT-17



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-18

Genus-Species: *Juglans regia* L

Accession No. IC-587163

Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	High(>100)	Nut Shape	Round
Growth habit	Spreading	Shape in cross section	Oblate
Density of branches	Dense	Shape of base perpendicular to suture	Truncate
Bearing habit	Terminal	Shape of apex perpendicular to suture	Truncate
Leaf Characteristics	States	Prominence of apical tip	Weak
Leaflet length (cm)	Medium (10-15)	Position of pad on suture	On upper half of nut
Leaf shape	Elliptic	Nut diameter (mm)	Large(>40)
Leaflet margin	Entire	Nut length (mm)	Large(>40)
Leaflet colour	Dark Green	Nut weight (g)	Heavy(>20)
Leaf serration	Absent	Prominence of pad on suture	Strong
Rachis colour	Green	Shell surface	Rough
Rachis persistence	Intermediate	Shell colour	Light
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Pubescent	Shell seal	Intermediate
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium
Dichogamy	Protoandrous	Packing tissue thickness	Thin
Initiation of 10% Female flowering	Late	Kernel Characteristics	States
Number of male catkins per cluster	Intermediate	Kernel weight (g)	Heavy(<40)
Number of female flowers per cluster	Medium(2-4)	Kernel percentage	Medium(30-40)
Stigma colour	Red	Kernel veins (%)	Low
Hull dehiscence	Dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-18



Tree Vigour



Leaf Colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel shape

CITH-WALNUT-19			
Genus-Species: <i>Juglans regia</i> L			
Accession No.IC-622808			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	Intermediate (50-100)	Nut Shape	Broad ovate
Growth habit	Spreading	Shape in cross section	Oblate
Density of branches	Dense	Shape of base perpendicular to suture	Rounded
Bearing habit	Terminal	Shape of apex perpendicular to suture	Rounded
Leaf Characteristics	States	Prominence of apical tip	Medium
Leaflet length (cm)	Long(>15)	Position of pad on suture	On upper 2/3 of nut
Leaf shape	Elliptic	Nut diameter (mm)	Large (30 40)
Leaflet margin	Entire	Nut length (mm)	Large (>40)
Leaflet colour	Dark green	Nut weight (g)	Heavy (>20)
Leaf serration	Absent	Prominence of pad on suture	Medium
Rachis colour	Green	Shell surface	Rough
Rachis persistence	Intermediate	Shell colour	Light
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Glabrous	Shell seal	Strong
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium (1-2)
Dichogamy	Protogynous	Packing tissue thickness	Thick
Initiation of 10% Female flowering	Late	Kernel Characteristics	States
Number of male catkins per cluster	Intermediate	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Low(<2)	Kernel percentage	Light(<6)
Stigma colour	Yellow	Kernel veins (%)	High(>40)
Hull dehiscence	Non-Dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-19



Tree vigour



Leaf Colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-20			
Genus-Species: <i>Juglans regia</i> L			
Accession No.IC-622809			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	Intermediate (50-100)	Nut Shape	Ovate
Growth habit	Semi erect	Shape in cross section	Oblate
Density of branches	Dense	Shape of base perpendicular to suture	Emarginated
Bearing habit	Terminal	Shape of apex perpendicular to suture	Rounded
Leaf Characteristics	States	Prominence of apical tip	Weak
Leaflet length (cm)	Long(>15)	Position of pad on suture	On upper 2/3 of nut
Leaf shape	Broad elliptic	Nut diameter (mm)	Large (>40)
Leaflet margin	Entire	Nut length (mm)	Large(>40)
Leaflet colour	Dark green	Nut weight (g)	Heavy(>20)
Leaf serration	Absent	Prominence of pad on suture	Medium
Rachis colour	Green	Shell surface	Medium
Rachis persistancec	Intermediate	Shell colour	Light
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Slightly pubescent	Shell seal	Weak
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protogynous	Packing tissue thickness	Thin
Initiation of 10% Female flowering	Late	Kernel Characteristics	States
Number of male catkins per cluster	Intermediate	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Low(<2)	Kernel percentage	Low(<40)
Stigma colour	Green	Kernel veins (%)	Low(<30)
Hull dehiscence	Dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-20



Tree vigour



Leaf Colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-21

Genus-Species: *Juglans regia* L

Accession No. IC-622810

Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour(cm)	Intermediate (50-100)	Nut Shape	Round
Growth habit	Spreading	Shape in cross section	Oblate
Density of branches	Dense	Shape of base perpendicular to suture	Truncate
Bearing habit	Terminal	Shape of apex perpendicular to suture	Rounded
Leaf Characteristics	States	Prominence of apical tip	Medium
Leaflet length (cm)	Long(>15)	Position of pad on suture	On upper half of nut
Leaf shape	Broad elliptic	Nut diameter (mm)	Medium (30-40)
Leaflet margin	Entire	Nut length (mm)	Medium (30-40)
Leaflet colour	Dark Green	Nut weight (g)	Medium (15-20)
Leaf serration	Absent	Prominence of pad on suture	Medium
Rachis colour	Green	Shell surface	Medium
Rachis persistence	Intermediate	Shell colour	Light
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Glabrous	Shell seal	Weak
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protogynous	Packing tissue thickness	Thin
Initiation of 10% Female flowering	Late	Kernel Characteristics	States
Number of male catkins per cluster	Intermediate	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Low(<2)	Kernel percentage	Low(<40)
Stigma colour	Red	Kernel veins (%)	Medium(30-40)
Hull dehiscence	Dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Amber

CITH-WALNUT-21



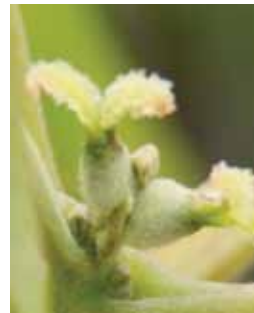
Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-22			
Genus-Species: <i>Juglans regia</i> L			
Accession No.IC-587354			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour(cm)	Intermediate (50-100)	Nut Shape	Broad ovate
Growth habit	Spreading	Shape in cross section	Round
Density of branches	Dense	Shape of base perpendicular to suture	Truncate
Bearing habit	Terminal	Shape of apex perpendicular to suture	Rounded
Leaf Characteristics	States	Prominence of apical tip	Weak
Leaflet length (cm)	Long(>15)	Position of pad on suture	On upper half of nut
Leaf shape	Broad elliptic	Nut diameter (mm)	Large (>40)
Leaflet margin	Entire	Nut length (mm)	Large (>40)
Leaflet colour	Dark Green	Nut weight (g)	Heavy (>20)
Leaf serration	Absent	Prominence of pad on suture	Medium
Rachis colour	Green	Shell surface	Rough
Rachis persistence	Intermediate	Shell colour	Light
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Glabrous	Shell seal	Weak
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Thin(<1)
Dichogamy	Protogynous	Packing tissue thickness	Medium
Initiation of 10% Female flowering	Late	Kernel Characteristics	States
Number of male catkins per cluster	Intermediate	Kernel weight (g)	Heavy (>10)
Number of female flowers per cluster	Low(<2)	Kernel percentage	Medium(40-50)
Stigma colour	Yellow	Kernel veins (%)	High(>40)
Hull dehiscence	Dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-22



Tree vigour



Leaf Colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-23			
Genus-Species: <i>Juglans regia</i> L			
Accession No.IC-587091			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	Intermediate (50-100)	Nut Shape	Broad Ovate
Growth habit	Semi Erect	Shape in cross section	Round
Density of branches	Dense	Shape of base perpendicular to suture	Rounded
Bearing habit	Terminal	Shape of apex perpendicular to suture	Rounded
Leaf Characteristics	States	Nut: Prominence of apical tip	Medium
Leaflet length (cm)	Medium (10-15)	Position of pad on suture	On upper 2/3 of nut
Leaf shape	Elliptic	Nut diameter (mm)	Large (>40)
Leaflet margin	Entire	Nut length (mm)	Large(>40)
Leaflet colour	Dark green	Nut weight (g)	Heavy(>20)
Leaf serration	Absent	Prominence of pad on suture	Weak
Rachis colour	Yellow	Shell surface	Rough
Rachis persistence	Intermediate	Shell colour	Light
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Slightly pubescent	Shell seal	Weak
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protogynous	Packing tissue thickness	Thin
Initiation of 10% Female flowering	Early	Kernel Characteristics	States
Number of male catkins per cluster	Many	Kernel weight (g)	Medium(6-10)
Flower: Number of female flowers per cluster	Low(<2)	Kernel percentage	Low(<40)
Stigma colour	Green	Kernel veins (%)	High (>40)
Hull dehiscence	Dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-23



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-24			
Genus-Species: <i>Juglans regia</i> L			
Accession No.IC-587230			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	High(>100)	Nut Shape	Long trapezoid
Growth habit	Spreading	Shape in cross section	Round
Density of branches	Dense	Shape of base perpendicular to suture	Truncate
Bearing habit	Terminal	Shape of apex perpendicular to suture	Rounded
Leaf Characteristics	States	Prominence of apical tip	Medium
Leaflet length (cm)	Medium(10-15)	Position of pad on suture	On whole length
Leaf shape	Elliptic	Nut diameter (mm)	Medium (30-40)
Leaflet margin	Entire	Nut length (mm)	Large (>40)
Leaflet colour	Dark Green	Nut weight (g)	Heavy(>20)
Leaf serration	Absent	Prominence of pad on suture	On upper 2/3 of nut
Rachis colour	Red	Shell surface	Rough
Rachis persistence	Intermediate	Shell colour	Medium
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Slightly Pubescent	Shell seal	Weak
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Thin(<1)
Dichogamy	Protoandrous	Packing tissue thickness	Thin
Initiation of 10% Female flowering	Late	Kernel Characteristics	States
Number of male catkins per cluster	Many	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Low(<2)	Kernel percentage	Medium(40-50)
Stigma colour	Green	Kernel veins (%)	High (>40)
Hull dehiscence	Dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Amber

CITH-WALNUT-24



Tree vigour



Leaf Colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-25			
Genus-Species: <i>Juglans regia</i> L			
Accession No.IC-622811			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	High(>100)	Nut Shape	Round
Growth habit	Semi Erect	Shape in cross section	Oblate
Density of branches	Intermediate	Shape of base perpendicular to suture	Rounded
Bearing habit	Terminal	Shape of apex perpendicular to suture	Rounded
Leaf Characteristics	States	Prominence of apical tip	Medium
Leaflet length (cm)	Short(<10)	Position of pad on suture	On whole length
Leaf shape	Elliptic	Nut diameter (mm)	Medium (30-40)
Leaflet margin	Entire	Nut length (mm)	Large (>40)
Leaflet colour	Dark green	Nut weight (g)	Medium (15-20)
Leaf serration	Absent	Prominence of pad on suture	Strong
Rachis colour	Green	Shell surface	Rough
Rachis persistence	Intermediate	Shell colour	Light
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Slightly pubescent	Shell seal	Very Strong
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Thick(>2)
Dichogamy	Protroandrous	Packing tissue thickness	Thin
Initiation of 10% Female flowering	Late	Kernel Characteristics	States
Number of male catkins per cluster	Intermediate	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Low(<2)	Kernel percentage	Medium(40-50)
Stigma colour	Yellow	Kernel veins (%)	High(>40)
Hull dehiscence	Partly-dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-25



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-26			
Genus-Species: <i>Juglans regia</i> L			
Accession No.IC-0617693			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	Intermediate (50-100)	Nut Shape	Triangular
Growth habit	Spreading	Shape in cross section	Round
Density of branches	Intermediate	Shape of base perpendicular to suture	Truncate
Bearing habit	Terminal	Shape of apex perpendicular to suture	Pointed
Leaf Characteristics	States	Prominence of apical tip	Medium
Leaflet length (cm)	Medium(10-15)	Position of pad on suture	On upper 2/3 of nut
Leaf shape	Elliptic	Nut diameter (mm)	Large (>40)
Leaflet margin	Entire	Nut length (mm)	Large(>40)
Leaflet colour	Dark green	Nut weight (g)	Medium(15-20)
Leaf serration	Absent	Prominence of pad on suture	Strong
Rachis colour	Green	Shell surface	Medium
Rachis persistence	Intermediate	Shell colour	Very Light
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Slightly pubescent	Shell seal	Very Strong
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protogynous	Packing tissue thickness	Thin
Initiation of 10% Female flowering	Early	Kernel Characteristics	States
Number of male catkins per cluster	Intermediate	Kernel weight (g)	Medium (6-10)
Number of female flowers per cluster	Low(<2)	Kernel percentage	Medium(40-50)
Stigma colour	Red	Kernel veins (%)	High(>40)
Hull dehiscence	Dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-26



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-27

Genus-Species: *Juglans regia* L

Accession No. IC-561056

Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	High(>100)	Nut Shape	Broad ovate
Growth habit	Spreading	Shape in cross section	Round
Density of branches	Intermediate	Shape of base perpendicular to suture	Rounded
Bearing habit	Terminal	Shape of apex perpendicular to suture	Rounded
Leaf Characteristics	States	Prominence of apical tip	Medium
Leaflet length (cm)	Medium(10-15)	Nut: Position of pad on suture	On whole length
Leaf shape	Elliptic	Nut diameter (mm)	Large(>40)
Leaflet margin	Entire	Nut length (mm)	Large(>40)
Leaflet colour	Dark green	Nut weight (g)	Medium(15-20)
Leaf serration	Absent	Prominence of pad on suture	Weak
Rachis colour	Green	Shell surface	Medium
Rachis persistence	Intermediate	Shell colour	Medium
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Glabrous	Shell seal	Weak
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Thick(>2)
Dichogamy	Protogynous	Packing tissue thickness	Thin
Initiation of 10% Female flowering	Late	Kernel Characteristics	States
Number of male catkins per cluster	Intermediate	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Low(<2)	Kernel percentage	Medium(40-50)
Stigma colour	Green	Kernel veins (%)	Low
Hull dehiscence	Partly-dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-27



Tree vigour



Leaf colour



Male catkin



Leaf colour



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-28

Genus-Species: *Juglans regia* L

Accession No. IC-0617694

Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	Intermediate (50-100)	Nut Shape	Round
Growth habit	Spreading	Shape in cross section	Oblate
Density of branches	Intermediate	Shape of base perpendicular to suture	Truncate
Bearing habit	Terminal	Shape of apex perpendicular to suture	Truncate
Leaf Characteristics	States	Prominence of apical tip	Strong
Leaflet length (cm)	Long(>15)	Position of pad on suture	On upper half nut
Leaf shape	Broad elliptic	Nut diameter (mm)	Medium(30-40)
Leaflet margin	Entire	Nut length (mm)	Medium(30-40)
Leaflet colour	Dark green	Nut weight (g)	Medium(15-20)
Leaf serration	Absent	Prominence of pad on suture	Strong
Rachis colour	Green	Shell surface	Hard
Rachis persistence	Intermediate	Shell colour	Light
Time of leaf fall	Mid	Shell strength	Strong
Shoot pubescence	Glabrous	Shell seal	Strong
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Thick(>2)
Dichogamy	Protogynous	Packing tissue thickness	Thin
Initiation of 10% Female flowering	Late	Kernel Characteristics	States
Number of male catkins per cluster	Intermediate	Kernel weight (g)	Light(<6)
Number of female flowers per cluster	Low(<2)	Kernel percentage	Low(<30)
Stigma colour	Green	Kernel veins (%)	High(>40)
Hull dehiscence	Slightly-dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Amber

CITH-WALNUT-28



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-29			
Genus-Species: <i>Juglans regia</i> L			
Accession No.IC-587270			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	Low(<50)	Nut Shape	Broad Ovate
Growth habit	Spreading	Shape in cross section	Oblate
Density of branches	Intermediate	Shape of base perpendicular to suture	Rounded
Bearing habit	Terminal	Shape of apex perpendicular to suture	Rounded
Leaf Characteristics	States	Prominence of apical tip	Medium
Leaflet length (cm)	Medium(10-15)	Position of pad on suture	On whole nut
Leaf shape	Elliptic	Nut diameter (mm)	Large(>40)
Leaflet margin	Entire	Nut length (mm)	Large(>40)
Leaflet colour	Green	Nut weight (g)	Medium(15-20)
Leaf serration	Absent	Prominence of pad on suture	Weak
Rachis colour	Green	Shell surface	Intermediate
Rachis persistence	Intermediate	Shell colour	Light
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Slightly Pubescent	Shell seal	Strong
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Thick(>2)
Dichogamy	Protogynous	Packing tissue thickness	Thin
Initiation of 10% Female flowering	Early	Kernel Characteristics	States
Number of male catkins per cluster	Intermediate	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Low(<2)	Kernel percentage	Medium(40-50)
Stigma colour	Yellow	Kernel veins (%)	Low(<30)
Hull dehiscence	Dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-29



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-30			
Genus-Species: <i>Juglans regia</i> L			
Accession No.IC-622812			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	Intermediate (50-100)	Nut shape	Ovate
Growth habit	Semi Erect	Shape in cross section	Oblate
Density of branches	Intermediate	Shape of base perpendicular to suture	Emarginated
Bearing habit	Terminal	Shape of apex perpendicular to suture	Rounded
Leaf Characteristics	States	Prominence of apical tip	Weak
Leaflet length (cm)	Long(>15)	Position of pad on suture	On upper 2/3 of nut
Leaf shape	Broad elliptic	Nut diameter (mm)	Large(>40)
Leaflet margin	Entire	Nut length (mm)	Large(>40)
Leaflet colour	Dark green	Nut weight (g)	Medium(15-20)
Leaf serration	Absent	Prominence of pad on suture	Strong
Rachis colour	Green	Shell surface	Medium
Rachis persistence	Intermediate	Shell colour	Medium
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Glabrous	Shell seal	Strong
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Thick(>2)
Dichogamy	Protogynous	Packing tissue thickness	Thin
Initiation of 10% Female flowering	Late	Kernel Characteristics	States
Number of male catkins per cluster	Intermediate	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	High (>4)	Kernel percentage	Medium(40-50)
Stigma colour	Yellow	Kernel veins (%)	Medium(30-40)
Hull dehiscence	Dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Amber

CITH-WALNUT-30



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-31

Genus-Species: *Juglans regia* L

Accession No. IC-587352

Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour(cm)	High(>100)	Nut shape	Elliptic
Growth habit	Semi Erect	Shape in cross section	Elliptic
Density of branches	Dense	Shape of base perpendicular to suture	Rounded
Bearing habit	Terminal	Shape of apex perpendicular to suture	Pointed
Leaf Characteristics	States	Prominence of apical tip	Medium
Leaflet length (cm)	Medium(10-15)	Position of pad on suture	On whole nut
Leaf shape	Elliptic	Nut diameter (mm)	Medium(30-40)
Leaflet margin	Entire	Nut length (mm)	Medium(30-40)
Leaflet colour	Green	Nut weight (g)	Medium(15-20)
Leaf serration	Absent	Prominence of pad on suture	Medium
Rachis colour	Green	Shell surface	Medium
Rachis persistence	Intermediate	Shell colour	Medium
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Pubescent	Shell seal	Strong
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protogynous	Packing tissue thickness	Thick
Initiation of 10% Female flowering	Early	Kernel Characteristics	States
Number of male catkins per cluster	Intermediate	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Low(<2)	Kernel percentage	Medium(40-50)
Stigma colour	Green	Kernel veins (%)	Low (<30)
Hull dehiscence	Dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-31



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-32

Genus-Species: *Juglans regia* L

Accession No. IC-587160

Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	High(>100)	Nut Shape	Broad Elliptic
Growth habit	Semi Erect	Shape in cross section	Oblong
Density of branches	Intermediate	Shape of base perpendicular to suture	Rounded
Bearing habit	Terminal	Shape of apex perpendicular to suture	Rounded
Leaf Characteristics	States	Prominence of apical tip	Medium
Leaflet length (cm)	Medium(10-15)	Position of pad on suture	On whole nut
Leaf shape	Elliptic	Nut diameter (mm)	Medium(30-40)
Leaflet margin	Entire	Nut length (mm)	Large(>40)
Leaflet colour	Dark green	Nut weight (g)	Medium(15-20)
Leaf serration	Absent	Prominence of pad on suture	On whole nut
Rachis colour	Green	Shell surface	Smooth
Rachis persistancec	Intermediate	Shell colour	Medium
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Slightly Pubescent	Shell seal	Intermediate
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protoandrous	Packing tissue thickness	Thick
Initiation of 10% Female flowering	Late	Kernel Characteristics	States
Number of male catkins per cluster	Intermediate	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Low(<2)	Kernel percentage	Medium(40-50)
Stigma colour	Red	Kernel veins (%)	High(>40)
Hull dehiscence	Partly-dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Amber

CITH-WALNUT-32



Tree vigour



Leaf Colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-33			
Genus-Species: <i>Juglans regia</i> L			
Accession No.IC-561052			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	Intermediate (50-100)	Nut Shape	Ovate
Growth habit	Semi Erect	Shape in cross section	Oblate
Density of branches	Intermediate	Shape of base perpendicular to suture	Emarginated
Bearing habit	Terminal	Shape of apex perpendicular to suture	Truncate
Leaf Characteristics	States	Prominence of apical tip	Strong
Leaflet length (cm)	Long(>15)	Position of pad on suture	On whole nut
Leaf shape	Broad elliptic	Nut diameter (mm)	Medium (30-40)
Leaflet margin	Entire	Nut length (mm)	Large (>40)
Leaflet colour	Green	Nut weight (g)	Medium(15-20)
Leaf serration	Absent	Prominence of pad on suture	Strong
Rachis colour	Yellow	Shell surface	Intermediate
Rachis persistancec	Intermediate	Shell colour	Light
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Slightly pubescent	Shell seal	Weak
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protoandrous	Packing tissue thickness	Medium
Initiation of 10% Female flowering	Late	Kernel Characteristics	States
Number of male catkins per cluster	Intermediate	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Low(<2)	Kernel percentage	Medium(40-50)
Stigma colour	Yellow	Kernel veins (%)	Low (<30)
Hull dehiscence	Partly-dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-33



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-34			
Genus-Species: <i>Juglans regia</i> L			
Accession No.IC-0617695			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	Intermediate (50-100)	Nut Shape	Ovate
Growth habit	Semi Erect	Shape in cross section	Oblate
Density of branches	Dense	Shape of base perpendicular to suture	Truncate
Bearing habit	Terminal	Shape of apex perpendicular to suture	Truncate
Leaf Characteristics	States	Prominence of apical tip	Weak
Leaflet length (cm)	Long (>15)	Position of pad on suture	On whole nut
Leaf shape	Broad elliptic	Nut diameter (mm)	Medium(30-40)
Leaflet margin	Entire	Nut length (mm)	Large(>40)
Leaflet colour	Green	Nut weight (g)	Medium(15-20)
Leaf serration	Absent	Prominence of pad on suture	Strong
Rachis colour	Yellow	Shell surface	Very rough
Rachis persistancec	Intermediate	Shell colour	Medium
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Slightly pubescent	Shell seal	Weak
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protoandrous	Packing tissue thickness	Medium
Initiation of 10% Female flowering	Early	Kernel Characteristics	States
Number of male catkins per cluster	Intermediate	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Low (1-2)	Kernel percentage	Medium(40-50)
Stigma colour	Yellow	Kernel veins (%)	High(>40)
Hull dehiscence	Non-dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-34



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-35

Genus-Species: *Juglans regia* L

Accession No. IC-0617696

Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	High(>100)	Nut Shape	Elliptic
Growth habit	Semi Erect	Shape in cross section	Elliptic
Density of branches	Intermediate	Shape of base perpendicular to suture	Rounded
Bearing habit	Terminal	Shape of apex perpendicular to suture	Pointed
Leaf Characteristics	States	Prominence of apical tip	Medium
Leaflet length (cm)	Long(>15)	Position of pad on suture	On whole nut
Leaf shape	Broad Elliptic	Nut diameter (mm)	Medium(30-40)
Leaflet margin	Entire	Nut length (mm)	Large (>40)
Leaflet colour	Dark Green	Nut weight (g)	Medium(15-20)
Leaf serration	Absent	Prominence of pad on suture	Medium
Rachis colour	Green	Shell surface	Intermediate
Rachis persistence	Intermediate	Shell colour	Medium
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Glabrous	Shell seal	Strong
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protoandrous	Packing tissue thickness	Medium
Initiation of 10% Female flowering	Early	Kernel Characteristics	States
Number of male catkins per cluster	Intermediate	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Low (1-2)	Kernel percentage	Medium(40-50)
Stigma colour	Green	Kernel veins (%)	Low (<30)
Hull dehiscence	Partly-dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-35



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-36			
Genus-Species: <i>Juglans regia</i> L			
Accession No.IC-587154			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	Intermediate (50-100)	Nut Shape	Ovate
Growth habit	Spreading	Shape in cross section	Oblate
Density of branches	Intermediate	Shape of base perpendicular to suture	Truncate
Bearing habit	Terminal	Shape of apex perpendicular to suture	Truncate
Leaf Characteristics	States	Prominence of apical tip	Strong
Leaflet length (cm)	Long(>15)	Position of pad on suture	On upper half of nut
Leaf shape	Elliptic	Nut diameter (mm)	Medium(30-40)
Leaflet margin	Entire	Nut length (mm)	Large(>40)
Leaflet colour	Light green	Nut weight (g)	Medium(15-20)
Leaf serration	Absent	Prominence of pad on suture	Strong
Rachis colour	Green	Shell surface	Medium
Rachis persistence	Intermediate	Shell colour	Medium
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Slightly pubescent	Shell seal	Strong
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	thin
Dichogamy	Protoandrous	Packing tissue thickness	Very thick
Initiation of 10% Female flowering	Early	Kernel Characteristics	States
Number of male catkins per cluster	Intermediate	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Low (<2)	Kernel percentage	Medium(40-50)
Stigma colour	Red	Kernel veins (%)	Low (<30)
Hull dehiscence	Dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-36



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-37

Genus-Species: *Juglans regia* L

Accession No. IC-0617697

Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour(cm)	Intermediate (50-100)	Nut Shape	Round
Growth habit	Semi Erect	Shape in cross section	Oblate
Density of branches	Dense	Shape of base perpendicular to suture	Truncate
Bearing habit	Terminal	Shape of apex perpendicular to suture	Rounded
Leaf Characteristics	States	Prominence of apical tip	Medium
Leaflet length (cm)	Long(>15)	Position of pad on suture	On upper 2/3 of nut
Leaf shape	Broad elliptic	Nut diameter (mm)	Medium(30-40)
Leaflet margin	Entire	Nut length (mm)	Medium(30-40)
Leaflet colour	Green	Nut weight (g)	Medium(15-20)
Leaf serration	Absent	Prominence of pad on suture	Strong
Rachis colour	Green	Shell surface	Medium
Rachis persistence	Intermediate	Shell colour	Medium
Time of leaf fall	Early	Shell strength	Intermediate
Shoot pubescence	Slightly pubescent	Shell seal	Strong
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protogynous	Packing tissue thickness	Medium
Initiation of 10% Female flowering	Early	Kernel Characteristics	States
Number of male catkins per cluster	Intermediate	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Low (<2)	Kernel percentage	Medium(40-50)
Stigma colour	Green	Kernel veins (%)	Low (<30)
Hull dehiscence	Partly-dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-37



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-38

Genus-Species: *Juglans regia* L

Accession No. IC-0617698

Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour(cm)	High(>100)	Nut Shape	Round
Growth habit	Spreading	Shape in cross section	Oblate
Density of branches	Intermediate	Shape of base perpendicular to suture	Rounded
Bearing habit	Terminal	Nut: Shape of apex perpendicular to suture	Rounded
Leaf Characteristics	States	Prominence of apical tip	Strong
Leaflet length (cm)	Medium(10-15)	Position of pad on suture	On upper 3/3 of nut
Leaf shape	Elliptic	Nut diameter (mm)	Large(>40)
Leaflet margin	Entire	Nut length (mm)	Large(>40)
Leaflet colour	Green	Nut weight (g)	Medium(15-20)
Leaf serration	Absent	Prominence of pad on suture	Strong
Rachis colour	Green	Shell surface	Medium
Rachis persistence	Intermediate	Shell colour	Medium
Time of leaf fall	Early	Shell strength	Intermediate
Shoot pubescence	Slightly pubescent	Shell seal	Strong
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protogynous	Packing tissue thickness	Thin
Initiation of 10% Female flowering	Early	Kernel Characteristics	States
Number of male catkins per cluster	Heavy	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Low (1-2)	Kernel percentage	Medium(40-50)
Stigma colour	Red	Kernel veins (%)	Medium(30-40)
Hull dehiscence	Partly-dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-38



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-39

Genus-Species: *Juglans regia* L

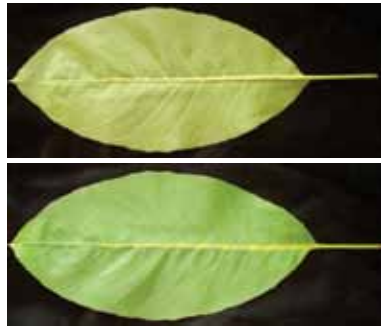
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Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour(cm)	Intermediate (50-100)	Nut Shape	Broad ovate
Growth habit	Spreading	Shape in cross section	Round
Density of branches	Intermediate	Shape of base perpendicular to suture	Truncate
Bearing habit	Terminal	Shape of apex perpendicular to suture	Rounded
Leaf Characteristics	States	Prominence of apical tip	Medium
Leaflet length (cm)	Medium(10-15)	Position of pad on suture	On upper 2/3 of nut
Leaf shape	Elliptic	Nut diameter (mm)	Large(>40)
Leaflet margin	Entire	Nut length (mm)	Large(>40)
Leaflet colour	Dark green	Nut weight (g)	Medium(15-20)
Leaf serration	Absent	Prominence of pad on suture	Strong
Rachis colour	Dark Green	Shell surface	Medium
Rachis persistence	Intermediate	Shell colour	Medium
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Slightly pubescent	Shell seal	Strong
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protogynous	Packing tissue thickness	Thin
Initiation of 10% Female flowering	Early	Kernel Characteristics	States
Number of male catkins per cluster	Heavy	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Low (<2)	Kernel percentage	Medium(40-50)
Stigma colour	Red	Kernel veins (%)	Low (<30)
Hull dehiscence	Dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-39



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-40

Genus-Species: *Juglans regia* L

Accession No. IC-587287

Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour(cm)	Intermediate (50-100)	Nut Shape	Ovate
Growth habit	Semi Erect	Shape in cross section	Oblate
Density of branches	Intermediate	Shape of base perpendicular to suture	Truncate
Bearing habit	Terminal	Shape of apex perpendicular to suture	Rounded
Leaf Characteristics	States	Prominence of apical tip	Medium
Leaflet length (cm)	Medium(10-15)	Position of pad on suture	On upper half of nut
Leaf shape	Elliptic	Nut diameter (mm)	Medium(30-40)
Leaflet margin	Entire	Nut length (mm)	Large(>40)
Leaflet colour	Dark green	Nut weight (g)	Medium(15-20)
Leaf serration	Absent	Prominence of pad on suture	Strong
Rachis colour	Green	Shell surface	Medium
Rachis persistence	Intermediate	Shell colour	Light
Time of leaf fall	Early	Shell strength	Intermediate
Shoot pubescence	Slightly pubescent	Shell seal	Strong
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protogynous	Packing tissue thickness	Thin
Initiation of 10% Female flowering	Early	Kernel Characteristics	States
Number of male catkins per cluster	Heavy	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Low (<2)	Kernel percentage	Medium(40-50)
Stigma colour	Red	Kernel veins (%)	Low (<30)
Hull dehiscence	Dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-40



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-41

Genus-Species: *Juglans regia* L

Accession No. IC-587231

Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	Low(<50)	Nut Shape	Broad Ovate
Growth habit	Spreading	Shape in cross section	Oblate
Density of branches	Intermediate	Shape of base perpendicular to suture	Rounded
Bearing habit	Terminal	Shape of apex perpendicular to suture	Rounded
Leaf Characteristics	States	Prominence of apical tip	Medium
Leaflet length (cm)	Medium (10-15)	Position of pad on suture	On upper 2/3 of nut
Leaf shape	Elliptic	Nut diameter (mm)	Medium (30-40)
Leaflet margin	Entire	Nut length (mm)	Large (>40)
Leaflet colour	Dark green	Nut weight (g)	Medium (15-20)
Leaf serration	Absent	Prominence of pad on suture	Weak
Rachis colour	Green	Shell surface	Rough
Rachis persistence	Intermediate	Shell colour	Light
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Slightly pubescent	Shell seal	Strong
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protogynous	Packing tissue thickness	Medium
Initiation of 10% Female flowering	Early	Kernel Characteristics	States
Number of male catkins per cluster	Heavy	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Low (<2)	Kernel percentage	Medium(40-50)
Stigma colour	Green	Kernel veins (%)	High(>40)
Hull dehiscence	Partly-dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Amber

CITH-WALNUT-41



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-42

Genus-Species: *Juglans regia* L

Accession No.IC-0622813

Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour(cm)	Intermediate (50-100)	Nut Shape	Elliptic
Growth habit	Semi Erect	Shape in cross section	Elliptic
Density of branches	Dense	Shape of base perpendicular to suture	Rounded
Bearing habit	Terminal	Shape of apex perpendicular to suture	Pointed
Leaf Characteristics	States	Prominence of apical tip	Strong
Leaflet length (cm)	Long(>15)	Position of pad on suture	On upper 2/3 of nut
Leaf shape	Broad elliptic	Nut diameter (mm)	Medium(30-40)
Leaflet margin	Entire	Nut length (mm)	Large (>40)
Leaflet colour	Green	Nut weight (g)	Medium (15-20)
Leaf serration	Absent	Prominence of pad on suture	Weak
Rachis colour	Green	Shell surface	Rough
Rachis persistence	Intermediate	Shell colour	Light
Time of leaf fall	Early	Shell strength	Strong
Shoot pubescence	Glabrous	Shell seal	Strong
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Thin(<1)
Dichogamy	Protandrous	Packing tissue thickness	Medium
Initiation of 10% Female flowering	Late	Kernel Characteristics	States
Number of male catkins per cluster	Low	Kernel weight (g)	Medium (6-10)
Number of female flowers per cluster	Medium(2-4)	Kernel percentage	Medium(40-50)
Stigma colour	Red	Kernel veins (%)	Low(<30)
Hull dehiscence	Partly-dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Amber

CITH-WALNUT-42



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-43

Genus-Species: *Juglans regia* L

Accession No. IC-0617699

Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour(cm)	Intermediate (50-100)	Nut Shape	Broad elliptic
Growth habit	Semi Erect	Shape in cross section	Round
Density of branches	Intermediate	Shape of base perpendicular to suture	Rounded
Bearing habit	Terminal	Shape of apex perpendicular to suture	Rounded
Leaf Characteristics	States	Prominence of apical tip	On whole length
Leaflet length (cm)	Medium(10-15)	Position of pad on suture	Weak
Leaf shape	Elliptic	Nut diameter (mm)	Medium(30-40)
Leaflet margin	Entire	Nut length (mm)	Large(>40)
Leaflet colour	Dark green	Nut weight (g)	Light(<15)
Leaf serration	Absent	Prominence of pad on suture	Strong
Rachis colour	Yellow	Shell surface	Rough
Rachis persistence	Intermediate	Shell colour	Medium
Time of leaf fall	Mid	Shell strength	Weak
Shoot pubescence	Pubescent	Shell seal	Intermediate
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Thin(<1)
Dichogamy	Protogynous	Packing tissue thickness	Medium
Initiation of 10% Female flowering	Early	Kernel Characteristics	States
Number of male catkins per cluster	Heavy	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Medium	Kernel percentage	Medium(40-50)
Stigma colour	Green	Kernel veins (%)	Low(<30)
Hull dehiscence	Partly-dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Amber

CITH-WALNUT-43



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-44			
Genus-Species: <i>Juglans regia</i> L			
Accession No.IC-587113			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour(cm)	Low(<50)	Nut Shape	Short trapezoid
Growth habit	Semi Erect	Shape in cross section	Oblate
Density of branches	Intermediate	Shape of base perpendicular to suture	Truncate
Bearing habit	Terminal	Shape of apex perpendicular to suture	Rounded
Leaf Characteristics	States	Prominence of apical tip	Medium
Leaflet length (cm)	Medium(10-15)	Position of pad on suture	On upper half of nut
Leaf shape	Elliptic	Nut diameter (mm)	Medium(30-40)
Leaflet margin	Entire	Nut length (mm)	Large(>40)
Leaflet colour	Green	Nut weight (g)	Light(<15)
Leaf serration	Absent	Prominence of pad on suture	strong
Rachis colour	Green	Shell surface	Medium
Rachis persistence	Intermediate	Shell colour	Medium
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Slightly Pubescent	Shell seal	Strong
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protogynous	Packing tissue thickness	Medium
Initiation of 10% Female flowering	Early	Kernel Characteristics	States
Number of male catkins per cluster	Heavy	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Medium(2-4)	Kernel percentage	Medium(40-50)
Stigma colour	Green	Kernel veins (%)	Medium(30-40)
Hull dehiscence	Partly-dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-44



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-45			
Genus-Species: <i>Juglans regia</i> L			
Accession No.IC-561059			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour	Intermediate	Nut Shape	Ovate
Growth habit	Spreading	Shape in cross section	Oblate
Density of branches	Dense	Shape of base perpendicular to suture	Truncate
Bearing habit	Terminal	Shape of apex perpendicular to suture	Rounded
Leaf Characteristics	States	Prominence of apical tip	Medium
Leaflet length (cm)	Medium	Position of pad on suture	On upper half of nut
Leaf shape	Elliptic	Nut diameter (mm)	Medium
Leaflet margin	Entire	Nut length (mm)	Large
Leaflet colour	Dark green	Nut weight (g)	Light
Leaf serration	Absent	Prominence of pad on suture	On upper 2/3 of nut
Rachis colour	Green	Shell surface	Medium
Rachis persistence	Intermediate	Shell colour	Medium
Time of leaf fall	Early	Shell strength	Intermediate
Shoot pubescence	Glabrous	Shell seal	Strong
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium
Dichogamy	Protandrous	Packing tissue thickness	Medium
Initiation of 10% Female flowering	Late	Kernel Characteristics	States
Number of male catkins per cluster	Heavy	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Low(<2)	Kernel percentage	Medium(40-50)
Stigma colour	Green	Kernel veins (%)	Medium (30-40)
Hull dehiscence	Dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-45



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-46			
Genus-Species: <i>Juglans regia</i> L			
Accession No.IC-50617700			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour(cm)	Intermediate (50-100)	Nut Shape	Short trapezoid
Growth habit	Spreading	Shape in cross section	Oblate
Density of branches	Dense	Shape of base perpendicular to suture	Truncate
Bearing habit	Terminal	Shape of apex perpendicular to suture	Emarginated
Leaf Characteristics	States	Prominence of apical tip	Medium
Leaflet length (cm)	Medium(10-15)	Position of pad on suture	On upper 2/3 of nut
Leaf shape	Elliptic	Nut diameter (mm)	Large(>40)
Leaflet margin	Entire	Nut length (mm)	Large(>40)
Leaflet colour	Dark green	Nut weight (g)	Medium(15-20)
Leaf serration	Absent	Prominence of pad on suture	Strong
Rachis colour	Green	Shell surface	Medium
Rachis persistence	Intermediate	Shell colour	Light
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Slightly pubescent	Shell seal	Strong
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium
Dichogamy	Protogynous	Packing tissue thickness	Medium
Initiation of 10% Female flowering	Early	Kernel Characteristics	States
Number of male catkins per cluster	Low(<2)	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Intermediate	Kernel percentage	Medium(40-50)
Stigma colour	Green	Kernel veins (%)	Low(<30)
Hull dehiscence	Dehiscent	Kernel plumpness	Moderate
		Ease of removal of kernel halves	Easy
		kernel colour	Light

CITH-WALNUT-46



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-47

Genus-Species: *Juglans regia* L

Accession No. IC-0617701

Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour(cm)	Intermediate (50-100)	Nut Shape	Broad elliptic
Growth habit	Spreading	Shape in cross section	Elliptic
Density of branches	Dense	Shape of base perpendicular to suture	Cuneate
Bearing habit	Terminal	Shape of apex perpendicular to suture	Pointed
Leaf Characteristics	States	Prominence of apical tip	Medium
Leaflet length (cm)	Medium(10-15)	Position of pad on suture	On whole nut
Leaf shape	Elliptic	Nut diameter (mm)	Medium(30-40)
Leaflet margin	Entire	Nut length (mm)	Large(>40)
Leaflet colour	Green	Nut weight (g)	Medium(15-20)
Leaf serration	Absent	Prominence of pad on suture	On whole length
Rachis colour	Green	Shell surface	Smooth
Rachis persistence	Intermediate	Shell colour	Light
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Pubescent	Shell seal	Strong
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protandrous	Packing tissue thickness	Medium
Initiation of 10% Female flowering	Late	Kernel Characteristics	States
Number of male catkins per cluster	Low(<2)	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Intermediate	Kernel percentage	Medium(40-50)
Stigma colour	Green	Kernel veins (%)	Low(<30)
Hull dehiscence	Dehiscent	Kernel plumpness	Moderate
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-47



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-48

Genus-Species: *Juglans regia* L

Accession No. IC-0617701

Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour(cm)	High(>100)	Nut Shape	Round
Growth habit	Spreading	Shape in cross section	Round
Density of branches	Dense	Shape of base perpendicular to suture	Rounded
Bearing habit	Terminal	Shape of apex perpendicular to suture	Rounded
Leaf Characteristics	States	Prominence of apical tip	Weak
Leaflet length (cm)	Medium(10-15)	Position of pad on suture	On whole length
Leaf shape	Elliptic	Nut diameter (mm)	Large(>40)
Leaflet margin	Entire	Nut length (mm)	Medium(30-40)
Leaflet colour	Dark green	Nut weight (g)	Light(<15)
Leaf serration	Absent	Prominence of pad on suture	Medium
Rachis colour	Red	Shell surface	Medium
Rachis persistence	Intermediate	Shell colour	Medium
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Glabrous	Shell seal	Strong
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protandrous	Packing tissue thickness	Medium
Initiation of 10% Female flowering	Late	Kernel Characteristics	States
Number of male catkins per cluster	Heavy	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Low(<2)	Kernel percentage	Medium(40-50)
Stigma colour	Green	Kernel veins (%)	Low(<30)
Hull dehiscence	Dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-48



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-49

Genus-Species: *Juglans regia* L

Accession No. IC-0617702

Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	High(>100)	Nut Shape	Ovate
Growth habit	Spreading	Shape in cross section	Oblate
Density of branches	Dense	Shape of base perpendicular to suture	Truncate
Bearing habit	Terminal	Shape of apex perpendicular to suture	Rounded
Leaf Characteristics	States	Prominence of apical tip	Medium
Leaflet length (cm)	Medium(10-15)	Position of pad on suture	On upper 2/3 of nut
Leaf shape	Elliptic	Nut diameter (mm)	Medium(30-40)
Leaflet margin	Entire	Nut length (mm)	Large(>40)
Leaflet colour	Green	Nut weight (g)	Light(<15)
Leaf serration	Absent	Prominence of pad on suture	Medium
Rachis colour	Green	Shell surface	Smooth
Rachis persistence	Few	Shell colour	Light
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Slightly pubescent	Shell seal	Intermediate
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium (1-2)
Dichogamy	Protogynous	Packing tissue thickness	Medium
Initiation of 10% Female flowering	Late	Kernel Characteristics	States
Number of male catkins per cluster	Heavy	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Low(<2)	Kernel percentage	Medium(40-50)
Stigma colour	Red	Kernel veins (%)	Low(<30)
Hull dehiscence	Dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-49



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-50			
Genus-Species: <i>Juglans regia</i> L			
Accession No.IC-0617703			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour(cm)	Intermediate (50-100)	Nut Shape	Ovate
Growth habit	Spreading	Shape in cross section	Oblate
Density of branches	Dense	Shape of base perpendicular to suture	Truncate
Bearing habit	Terminal	Shape of apex perpendicular to suture	Emarginated
Leaf Characteristics	States	Prominence of apical tip	Medium
Leaflet length (cm)	Medium(10-15)	Position of pad on suture	On upper 2/3 of nut
Leaf shape	Elliptic	Nut diameter (mm)	Small(<30)
Leaflet margin	Entire	Nut length (mm)	Medium(30-40)
Leaflet colour	Dark green	Nut weight (g)	Light(<15)
Leaf serration	Absent	Prominence of pad on suture	Strong
Rachis colour	Red	Shell surface	Smooth
Rachis persistence	Few	Shell colour	Light
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Slightly pubescent	Shell seal	Intermediate
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protoandrous	Packing tissue thickness	Intermediate
Initiation of 10% Female flowering	Late	Kernel Characteristics	States
Number of male catkins per cluster	Intermediate	Kernel weight (g)	Light(<6)
Number of female flowers per cluster	Medium(2-4)	Kernel percentage	Low(<40)
Stigma colour	Red	Kernel veins (%)	Low(<30)
Hull dehiscence	Dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		kernel colour	Amber

CITH-WALNUT-50



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-51			
Genus-Species: <i>Juglans regia</i> L			
Accession No.IC-0617704			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour(cm)	Intermediate (50-100)	Nut Shape	Ovate
Growth habit	Spreading	Shape in cross section	Round
Density of branches	Intermediate	Shape of base perpendicular to suture	Truncate
Bearing habit	Terminal	Shape of apex perpendicular to suture	Truncate
Leaf Characteristics	States	Prominence of apical tip	Medium
Leaflet length (cm)	Medium(10-15)	Position of pad on suture	On upper of nut
Leaf shape	Elliptic	Nut diameter (mm)	Large (>40)
Leaflet margin	Entire	Nut length (mm)	Large (>40)
Leaflet colour	Dark green	Nut weight (g)	Heavy(>20)
Leaf serration	Absent	Prominence of pad on suture	Strong
Rachis colour	Green	Shell surface	Rough
Rachis persistence	Few	Shell colour	Medium
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Slightly pubescent	Shell seal	Weak
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protoandrous	Packing tissue thickness	Intermediate
Initiation of 10% Female flowering	Late	Kernel Characteristics	States
Number of male catkins per cluster	Intermediate	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Medium(2-4)	Kernel percentage	Medium(40-50)
Stigma colour	Yellow	Kernel veins (%)	Low(<30)
Hull dehiscence	Dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-51



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-52

Genus-Species: *Juglans regia* L

Accession No. IC-587092

Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour(cm)	Intermediate (50-100)	Nut Shape	Elliptic
Growth habit	Spreading	Shape in cross section	Elliptic
Density of branches	Dense	Shape of base perpendicular to suture	Rounded
Bearing habit	Terminal	Shape of apex perpendicular to suture	Pointed
Leaf Characteristics	States	Prominence of apical tip	Strong
Leaflet length (cm)	Medium(10-15)	Position of pad on suture	On upper 2/3 of nut
Leaf shape	Elliptic	Nut diameter (mm)	Medium(30-40)
Leaflet margin	Entire	Nut length (mm)	Large(>40)
Leaflet colour	Dark green	Nut weight (g)	Heavy(>20)
Leaf serration	Absent	Prominence of pad on suture	Medium
Rachis colour	Green	Shell surface	Rough
Rachis persistence	Few	Shell colour	Medium
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Slightly pubescent	Shell seal	Weak
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protoandrous	Packing tissue thickness	Intermediate
Initiation of 10% Female flowering	Late	Kernel Characteristics	States
Number of male catkins per cluster	Intermediate	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Medium(2-4)	Kernel percentage	Medium(40-50)
Stigma colour	Green	Kernel veins (%)	Low(<30)
Hull dehiscence	Dehiscent	Kernel plumpness	Plump
		Ease of removal of kernel halves	Easy
		Kernel colour	Amber

CITH-WALNUT-52



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-53

Genus-Species: *Juglans regia* L

Accession No. IC-587192

Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour(cm)	Intermediate (50-100)	Nut Shape	Long trapezoid
Growth habit	Spreading	Shape in cross section	Round
Density of branches	Dense	Shape of base perpendicular to suture	Truncate
Bearing habit	Terminal	Shape of apex perpendicular to suture	Rounded
Leaf Characteristics	States	Prominence of apical tip	Medium
Leaflet length (cm)	Medium(10-15)	Position of pad on suture	On whole nut
Leaf shape	Elliptic	Nut diameter (mm)	Medium(30-40)
Leaflet margin	Entire	Nut length (mm)	Large(>40)
Leaflet colour	Dark green	Nut weight (g)	Heavy(>20)
Leaf serration	Absent	Prominence of pad on suture	Weak
Rachis colour	Green	Shell surface	Medium
Rachis persistence	Few	Shell colour	Medium
Time of leaf fall	Early	Shell strength	Intermediate
Shoot pubescence	Glabrous	Shell seal	Strong
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protoandrous	Packing tissue thickness	Medium
Initiation of 10% Female flowering	Late	Kernel Characteristics	States
Number of male catkins per cluster	Intermediate	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Low(<2)	Kernel percentage	Medium(40-50)
Stigma colour	Green	Kernel veins (%)	Low(<30)
Hull dehiscence	Dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Amber

CITH-WALNUT-53



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-54			
Genus-Species: <i>Juglans regia</i> L			
Accession No.IC-0617705			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour(cm)	Intermediate (50-100)	Nut Shape	Cordate
Growth habit	Spreading	Shape in cross section	Oblate
Density of branches	Dense	Shape of base perpendicular to suture	Emarginated
Bearing habit	Terminal	Shape of apex perpendicular to suture	Rounded
Leaf Characteristics	States	Prominence of apical tip	Medium
Leaflet length (cm)	Medium(10-15)	Position of pad on suture	On upper half of nut
Leaf shape	Elliptic	Nut diameter (mm)	Medium(30-40)
Leaflet margin	Entire	Nut length (mm)	Medium(30-40)
Leaflet colour	Dark green	Nut weight (g)	Heavy(>20)
Leaf serration	Absent	Prominence of pad on suture	Strong
Rachis colour	Green	Shell surface	Medium
Rachis persistence	Few	Shell colour	Light
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Glabrous	Shell seal	Strong
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protoandrous	Packing tissue thickness	Medium
Initiation of 10% Female flowering	Early	Kernel Characteristics	States
Number of male catkins per cluster	Intermediate	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Low(<2)	Kernel percentage	Medium(40-50)
Stigma colour	Green	Kernel veins (%)	Low(<30)
Hull dehiscence	Partly-dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Amber

CITH-WALNUT-54



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-55			
Genus-Species: <i>Juglans regia</i> L			
Accession No.IC-587139			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour(cm)	Intermediate (50-100)	Nut Shape	Round
Growth habit	Semi Erect	Shape in cross section	Round
Density of branches	Dense	Shape of base perpendicular to suture	Rounded
Bearing habit	Terminal	Shape of apex perpendicular to suture	Rounded
Leaf Characteristics	States	Prominence of apical tip	Weak
Leaflet length (cm)	Long(>15)	Position of pad on suture	On whole length
Leaf shape	Broad elliptic	Nut diameter (mm)	Medium(30-40)
Leaflet margin	Entire	Nut length (mm)	Medium(30-40)
Leaflet colour	Dark green	Nut weight (g)	Heavy(>20)
Leaf serration	Absent	Prominence of pad on suture	Strong
Rachis colour	Green	Shell surface	Medium
Rachis persistence	Few	Shell colour	Medium
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Slightly pubescent	Shell seal	Strong
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protogynous	Packing tissue thickness	Medium
Initiation of 10% Female flowering	Late	Kernel Characteristics	States
Number of male catkins per cluster	Low	Kernel weight (g)	Light(<6)
Number of female flowers per cluster	Low(<2)	Kernel percentage	Low(<40)
Stigma colour	Yellow	Kernel veins (%)	Low(<30)
Hull dehiscence	Partly-dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Amber

CITH-WALNUT-55



Tree vigour



Leaf colour



Male catkin



Female flower



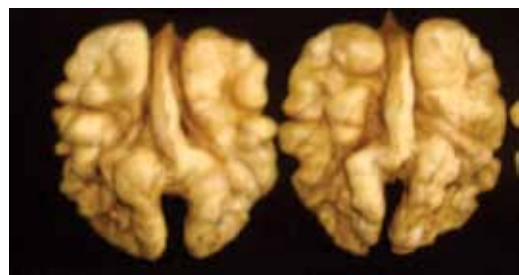
Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-56

Genus-Species: *Juglans regia* L

Accession No. IC-587142

Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	Low(<50)	Nut Shape	Broad elliptic
Growth habit	Semi Erect	Shape in cross section	Elliptic
Density of branches	Intermediate	Shape of base perpendicular to suture	Cuneate
Bearing habit	Terminal	Shape of apex perpendicular to suture	Pointed
Leaf Characteristics	States	Prominence of apical tip	Medium
Leaflet length (cm)	Medium(10-15)	Position of pad on suture	On whole length
Leaf shape	Elliptic	Nut diameter (mm)	Large (>40)
Leaflet margin	Entire	Nut length (mm)	Large(>40)
Leaflet colour	Dark green	Nut weight (g)	Heavy(>20)
Leaf serration	Absent	Prominence of pad on suture	Strong
Rachis colour	Yellow	Shell surface	Rough
Rachis persistence	Few	Shell colour	Medium
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Slightly pubescent	Shell seal	Strong
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protogynous	Packing tissue thickness	Medium
Initiation of 10% Female flowering	Late	Kernel Characteristics	States
Number of male catkins per cluster	Heavy	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Low(<2)	Kernel percentage	Medium(40-50)
Stigma colour	Green	Kernel veins (%)	High(>40)
Hull dehiscence	Dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		kernel colour	Light

CITH-WALNUT-56



Tree vigour



Leaf colour



Male catkin



Female flower



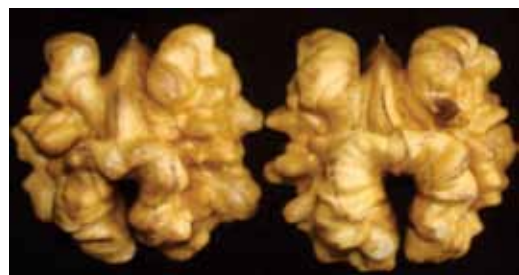
Hulled fruit



Fruit dehiscence



Nut shape



Kernel Colour

CITH-WALNUT-57

Genus-Species: *Juglans regia* L

Accession No. IC-0617706

Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	High (>100)	Nut shape	Narrow elliptic
Growth habit	Spreading	Shape in cross section	Elliptic
Density of branches	Dense	Shape of base perpendicular to suture	Cuneate
Bearing habit	Terminal	Shape of apex perpendicular to suture	Pointed
Leaf Characteristics	States	Prominence of apical tip	Strong
Leaflet length (cm)	Long(>15)	Position of pad on suture	On whole length
Leaf shape	Broad elliptic	Nut diameter (mm)	Medium(30-40)
Leaflet margin	Entire	Nut length (mm)	Large (>40)
Leaflet colour	Dark green	Nut weight (g)	Heavy(>20)
Leaf serration	Absent	Prominence of pad on suture	Medium
Rachis colour	Yellow	Shell surface	Rough
Rachis persistence	Few	Shell colour	Light
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Pubescent	Shell seal	Intermediate
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Thick(>2)
Dichogamy	Protandrous	Packing tissue thickness	Medium
Initiation of 10% Female flowering	Late	Kernel Characteristics	States
Number of male catkins per cluster	Heavy	Kernel weight (g)	Light(<6)
Number of female flowers per cluster	Low(<2)	Kernel percentage	Low(<40)
Stigma colour	Green	Kernel veins (%)	Low(<30)
Hull dehiscence	Partly-dehiscent	Kernel plumpness	Thin
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-57



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-58

Genus-Species: *Juglans regia* L

Accession No. IC-0617707

Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour(cm)	Intermediate (50-100)	Nut Shape	Round
Growth habit	Semi Erect	Shape in cross section	Oblate
Density of branches	Intermediate	Shape of base perpendicular to suture	Truncate
Bearing habit	Terminal	Shape of apex perpendicular to suture	Rounded
Leaf Characteristics	States	Prominence of apical tip	Medium
Leaflet length (cm)	Long(>15)	Position of pad on suture	On Whole Length
Leaf shape	Elliptic	Nut diameter (mm)	Medium(30-40)
Leaflet margin	Entire	Nut length (mm)	Large(>40)
Leaflet colour	Green	Nut weight (g)	Heavy(>20)
Leaf serration	Absent	Prominence of pad on suture	Medium
Rachis colour	Red	Shell surface	Medium
Rachis persistence	Few	Shell colour	Light
Time of leaf fall	Early	Shell strength	Intermediate
Shoot pubescence	Pubescent	Shell seal	Intermediate
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protandrous	Packing tissue thickness	Medium
Initiation of 10% Female flowering	Late	Kernel Characteristics	States
Number of male catkins per cluster	Intermediate	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Low(<2)	Kernel percentage	Medium(40-50)
Stigma colour	Green	Kernel veins (%)	Low(<30)
Hull dehiscence	Partly-dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-58



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-59

Genus-Species: *Juglans regia* L

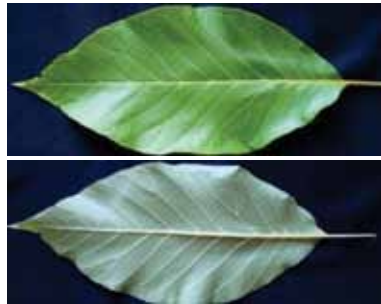
Accession No. IC-0617708

Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour(cm)	High(>100)	Nut Shape	Round
Growth habit	Spreading	Shape in cross section	Round
Density of branches	Dense	Shape of base perpendicular to suture	Oblate
Bearing habit	Terminal	Shape of apex perpendicular to suture	Truncate
Leaf Characteristics	States	Prominence of apical tip	Rounded
Leaflet length (cm)	Long(>15)	Position of pad on suture	Medium
Leaf shape	Broad elliptic	Nut diameter (mm)	Medium(30-40)
Leaflet margin	Entire	Nut length (mm)	Large(>40)
Leaflet colour	Dark green	Nut weight (g)	Heavy(>20)
Leaf serration	Absent	Prominence of pad on suture	Medium
Rachis colour	Red	Shell surface	Medium
Rachis persistence	Few	Shell colour	Light
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Slightly pubescent	Shell seal	Intermediate
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protandrous	Packing tissue thickness	Medium
Initiation of 10% Female flowering	Late	Kernel Characteristics	States
Number of male catkins per cluster	Heavy	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Medium(2-4)	Kernel percentage	Medium(40-50)
Stigma colour	Red	Kernel veins (%)	Low(<30)
Hull dehiscence	Dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-59



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-60			
Genus-Species: <i>Juglans regia</i> L			
Accession No.IC-561055			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	Intermediate (50-100)	Nut Shape	Elliptic
Growth habit	Spreading	Shape in cross section	Elliptic
Density of branches	Intermediate	Shape of base perpendicular to suture	Rounded
Bearing habit	Terminal	Shape of apex perpendicular to suture	Pointed
Leaf Characteristics	States	Prominence of apical tip	Strong
Leaflet length (cm)	Medium(10-15)	Position of pad on suture	On upper 2/3 of nut
Leaf shape	Elliptic	Nut diameter (mm)	Medium(30-40)
Leaflet margin	Entire	Nut length (mm)	Large(>40)
Leaflet colour	Dark green	Nut weight (g)	Heavy(>20)
Leaf serration	Absent	Prominence of pad on suture	Medium
Rachis colour	Green	Shell surface	Rough
Rachis persistence	Few	Shell colour	Light
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Glabrous	Shell seal	Intermediate
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protandrous	Packing tissue thickness	Medium
Initiation of 10% Female flowering	Early	Kernel Characteristics	States
Number of male catkins per cluster	Heavy	Kernel weight (g)	Light(<6)
Number of female flowers per cluster	Medium((2-4)	Kernel percentage	Low(<40)
Stigma colour	Green	Kernel veins (%)	Medium(30-40)
Hull dehiscence	Partly-dehiscent	Kernel plumpness	Plump
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-60



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-61

Genus-Species: *Juglans regia* L

Accession No. IC-0622814

Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour(cm)	Low(<50)	Nut Shape	Round
Growth habit	Spreading	Shape in cross section	Rounded
Density of branches	Dense	Shape of base perpendicular to suture	Truncate
Bearing habit	Terminal	Shape of apex perpendicular to suture	Rounded
Leaf Characteristics	States	Prominence of apical tip	Medium
Leaflet length (cm)	Medium(10-15)	Position of pad on suture	On whole length
Leaf shape	Elliptic	Nut diameter (mm)	Large(>40)
Leaflet margin	Entire	Nut length (mm)	Medium(30-40)
Leaflet colour	Dark green	Nut weight (g)	Heavy(>20)
Leaf serration	Absent	Prominence of pad on suture	Strong
Rachis colour	Green	Shell surface	Medium
Rachis persistence	Few	Shell colour	Light
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Slightly pubescent	Shell seal	Very Strong
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Thick(>2)
Dichogamy	Protogynous	Packing tissue thickness	Very Thick
Initiation of 10% Female flowering	Early	Kernel Characteristics	States
Number of male catkins per cluster	Heavy	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Medium(2-4)	Kernel percentage	Medium(40-50)
Stigma colour	Green	Kernel veins (%)	Low(<30)
Hull dehiscence	Partly-dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-61



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel Colour

CITH-WALNUT-62

Genus-Species: *Juglans regia* L

Accession No. IC-587085

Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	High(>100)	Nut Shape	Short trapezoid
Growth habit	Spreading	Shape in cross section	Oblate
Density of branches	Dense	Shape of base perpendicular to suture	Truncate
Bearing habit	Terminal	Shape of apex perpendicular to suture	Rounded
Leaf Characteristics	States	Prominence of apical tip	Medium
Leaflet length (cm)	Medium(10-15)	Position of pad on suture	On upper 2/3 of nut
Leaf shape	Elliptic	Nut diameter (mm)	Medium (30-40)
Leaflet margin	Entire	Nut length (mm)	Medium (30-40)
Leaflet colour	Dark green	Nut weight (g)	Heavy (>20)
Leaf serration	Absent	Prominence of pad on suture	Strong
Rachis colour	Yellow	Shell surface	Smooth
Rachis persistence	Few	Shell colour	Light
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Pubescent	Shell seal	Intermediate
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protogynous	Packing tissue thickness	Very Thick
Initiation of 10% Female flowering	Early	Kernel Characteristics	States
Number of male catkins per cluster	Intermediate	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Medium(2-4)	Kernel percentage	Medium(40-50)
Stigma colour	Green	Kernel veins (%)	Low(<30)
Hull dehiscence	Partly-dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-62



Tree vigour



Leaf Colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-63

Genus-Species: *Juglans regia* L

Accession No. IC-0617709

Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour(cm)	High(>100)	Nut shape	Round
Growth habit	Semi Erect	Shape in cross section	Round
Density of branches	Intermediate	Shape of base perpendicular to suture	Truncate
Bearing habit	Terminal	Shape of apex perpendicular to suture	Rounded
Leaf Characteristics	States	Prominence of apical tip	Medium
Leaflet length (cm)	Medium(10-15)	Position of pad on suture	On whole length
Leaf shape	Elliptic	Nut diameter (mm)	Medium(30-40)
Leaflet margin	Entire	Nut length (mm)	Medium(30-40)
Leaflet colour	Green	Nut weight (g)	Heavy(>20)
Leaf serration	Absent	Prominence of pad on suture	Strong
Rachis colour	Green	Shell surface	Rough
Rachis persistence	Few	Shell colour	Light
Time of leaf fall	Mid	Shell strength	Strong
Shoot pubescence	Glabrous	Shell seal	Strong
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Thick(>2)
Dichogamy	Protogynous	Packing tissue thickness	Very Thick
Initiation of 10% Female flowering	Late	Kernel Characteristics	States
Number of male catkins per cluster	Intermediate	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Medium	Kernel percentage	Medium(40-50)
Stigma colour	Green	Kernel veins (%)	Low(<30)
Hull dehiscence	Partly-dehiscent	Kernel plumpness	Plump
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-63



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-64

Genus-Species: *Juglans regia* L

Accession No. IC-0617710

Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	High(>100)	Nut shape	Short trapezoid
Growth habit	Spreading	Shape in cross section	Oblate
Density of branches	Dense	Shape of base perpendicular to suture	Truncate
Bearing habit	Terminal	Shape of apex perpendicular to suture	Rounded
Leaf Characteristics	States	Prominence of apical tip	Medium
Leaflet length (cm)	Medium(10-15)	Position of pad on suture	On upper 2/3 of nut
Leaf shape	Elliptic	Nut diameter (mm)	Large (>40)
Leaflet margin	Entire	Nut length (mm)	Large (>40)
Leaflet colour	Green	Nut weight (g)	Heavy (>20)
Leaf serration	Absent	Prominence of pad on suture	Strong
Rachis colour	Green	Shell surface	Medium
Rachis persistence	Few	Shell colour	Light
Time of leaf fall	Early	Shell strength	Strong
Shoot pubescence	Glabrous	Shell seal	Strong
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Thick (>2)
Dichogamy	Protogynous	Packing tissue thickness	Very Thick
Initiation of 10% Female flowering	Late	Kernel Characteristics	States
Number of male catkins per cluster	Intermediate	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Medium(2-4)	Kernel percentage	Medium(40-50)
Stigma colour	Red	Kernel veins (%)	Low(<30)
Hull dehiscence	Partly-dehiscent	Kernel plumpness	Moderate
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-64



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-65			
Genus-Species: <i>Juglans regia</i> L			
Accession No.IC-0617711			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour(cm)	High(>100)	Nut shape	Round
Growth habit	Semi Erect	Shape in cross section	Round
Density of branches	Dense	Shape of base perpendicular to suture	Oblate
Bearing habit	Terminal	Shape of apex perpendicular to suture	Truncate
Leaf Characteristics	States	Prominence of apical tip	Rounded
Leaflet length (cm)	Short(<10)	Position of pad on suture	On upper 2/3 of nut
Leaf shape	Narrow Elliptic	Nut diameter (mm)	Large (>40)
Leaflet margin	Entire	Nut length (mm)	Large (>40)
Leaflet colour	Green	Nut weight (g)	Heavy (>20)
Leaf serration	Absent	Prominence of pad on suture	Medium
Rachis colour	Green	Shell surface	Rough
Rachis persistence	Few	Shell colour	Light
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Slightly pubescent	Shell seal	Strong
Shoot colour	Brown	Shell integrity	Intermediate
Inflorescence Characteristics	States	Shell thickness (mm)	Medium
Dichogamy	Protogynous	Packing tissue thickness	Very Thick
Initiation of 10% Female flowering	Late	Kernel Characteristics	States
Number of male catkins per cluster	Heavy	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Medium(2-4)	Kernel percentage	Medium(40-50)
Stigma colour	Green	Kernel veins (%)	High(>40)
Hull dehiscence	Partly-dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-65



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-66			
Genus-Species: <i>Juglans regia</i> L			
Accession No.IC-0617712			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour(cm)	Intermediate (50-100)	Nut Shape	Round
Growth habit	Semi Erect	Shape in cross section	Round
Density of branches	Intermediate	Shape of base perpendicular to suture	Oblate
Bearing habit	Terminal	Shape of apex perpendicular to suture	Truncate
Leaf Characteristics	States	Prominence of apical tip	Rounded
Leaflet length (cm)	Medium(10-15)	Position of pad on suture	On whole length
Leaf shape	Elliptic	Nut diameter (mm)	Medium(30-40)
Leaflet margin	Entire	Nut length (mm)	Large(>40)
Leaflet colour	Green	Nut weight (g)	Heavy(>20)
Leaf serration	Absent	Prominence of pad on suture	Medium
Rachis colour	Dark green	Shell surface	Rough
Rachis persistence	Few	Shell colour	Medium
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Slightly Pubescent	Shell seal	Strong
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protogynous	Packing tissue thickness	Very Thick
Initiation of 10% Female flowering	Late	Kernel Characteristics	States
Number of male catkins per cluster	Heavy	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Medium(2-4)	Kernel percentage	Medium(40-50)
Stigma colour	Yellow	Kernel veins (%)	Low(<30)
Hull dehiscence	Dehiscent	Kernel plumpness	Plump
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-66



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape		Kernel colour	
CITH-WALNUT-67			
Genus-Species: <i>Juglans regia</i> L			
Accession No. IC-0617713			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour(cm)	High(>100)	Nut shape	Long trapezoid
Growth habit	Semi Erect	Shape in cross section	Oblate
Density of branches	Intermediate	Shape of base perpendicular to suture	Truncate
Bearing habit	Terminal	Shape of apex perpendicular to suture	Truncate
Leaf Characteristics	States	Prominence of apical tip	Medium
Leaflet length (cm)	Long (>15)	Position of pad on suture	on upper 2/3
Leaf shape	Broad elliptic	Nut diameter (mm)	Medium(30-40)
Leaflet margin	Entire	Nut length (mm)	Large(>40)
Leaflet colour	Green	Nut weight (g)	Heavy(>20)
Leaf serration	Absent	Prominence of pad on suture	Strong
Rachis colour	Green	Shell surface	Rough
Rachis persistence	Few	Shell colour	Light
Time of leaf fall	Mid	Shell strength	Weak
Shoot pubescence	Glabrous	Shell seal	Strong
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protogynous	Packing tissue thickness	Very Thick
Initiation of 10% Female flowering	Early	Kernel Characteristics	States
Number of male catkins per cluster	Intermediate	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Medium(2-4)	Kernel percentage	Medium(40-50)
Stigma colour	Yellow	Kernel veins (%)	Low(<30)
Hull dehiscence	Dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-67



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-68

Genus-Species: *Juglans regia* L

Accession No. IC-587294

Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	High(>100)	Nut Shape	Broad elliptic
Growth habit	Spreading	Shape in cross section	Elliptic
Density of branches	Intermediate	Shape of base perpendicular to suture	Cuneate
Bearing habit	Terminal	Shape of apex perpendicular to suture	Pointed
Leaf Characteristics	States	Prominence of apical tip	Medium
Leaflet length (cm)	Medium(10-15)	Position of pad on suture	On whole length
Leaf shape	Elliptic	Nut diameter (mm)	Medium(30-40)
Leaflet margin	Entire	Nut length (mm)	Large(>40)
Leaflet colour	Dark Green	Nut weight (g)	Heavy(>20)
Leaf serration	Absent	Prominence of pad on suture	Medium
Rachis colour	Green	Shell surface	Medium
Rachis persistence	Few	Shell colour	Light
Time of leaf fall	Mid	Shell strength	Weak
Shoot pubescence	Slightly Pubescent	Shell seal	Intermediate
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protogynous	Packing tissue thickness	Very Thick
Initiation of 10% Female flowering	Late	Kernel Characteristics	States
Number of male catkins per cluster	Heavy	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Medium(2-4)	Kernel percentage	Medium(40-50)
Stigma colour	Yellow	Kernel veins (%)	Low(<30)
Hull dehiscence	Dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-68



Tre vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-69

Genus-Species: *Juglans regia* L

Accession No. IC-0617715

Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour(cm)	Intermediate (50-100)	Nut shape	Ovate
Growth habit	Spreading	Shape in cross section	Oblate
Density of branches	Intermediate	Shape of base perpendicular to suture	Truncate
Bearing habit	Terminal	Shape of apex perpendicular to suture	Emarginated
Leaf Characteristics	States	Prominence of apical tip	Medium
Leaflet length (cm)	Medium(10-15)	Position of pad on suture	On upper 2/3 of nut
Leaf shape	Elliptic	Nut diameter (mm)	Small(<30)
Leaflet margin	Entire	Nut length (mm)	Large(>40)
Leaflet colour	Dark green	Nut weight (g)	Light(<15)
Leaf serration	Absent	Prominence of pad on suture	Weak
Rachis colour	Green	Shell surface	Rough
Rachis persistence	Few	Shell colour	Medium
Time of leaf fall	Late	Shell strength	Intermediate
Shoot pubescence	Glabrous	Shell seal	Strong
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protandrous	Packing tissue thickness	Very Thick
Initiation of 10% Female flowering	Late	Kernel Characteristics	States
Number of male catkins per cluster	Intermediate	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Low(<2)	Kernel percentage	Medium(40-50)
Stigma colour	Green	Kernel veins (%)	Low(<30)
Hull dehiscence	Dehiscent	Kernel plumpness	Moderate
		Ease of removal of kernel halves	Easy
		Kernel colour	Light Amber

CITH-WALNUT-69



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-70			
Genus-Species: <i>Juglans regia</i> L			
Accession No.IC-561062			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour(cm)	Low(<50)	Nut Shape	Round
Growth habit	Semi Erect	Shape in cross section	oblate
Density of branches	Intermediate	Shape of base perpendicular to suture	Truncate
Bearing habit	Terminal	Shape of apex perpendicular to suture	Truncate
Leaf Characteristics		Prominence of apical tip	Strong
Leaflet length (cm)	Medium	Position of pad on suture	On upper half nut
Leaf shape	Elliptic	Nut diameter (mm)	Small(<30)
Leaflet margin	Entire	Nut length (mm)	Large(30-40)
Leaflet colour	Green	Nut weight (g)	Light(<15)
Leaf serration	Absent	Prominence of pad on suture	Strong
Rachis colour	Green	Shell surface	Medium
Rachis persistancec	Few	Shell colour	Medium
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Glabrous	Shell seal	Strong
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protandrous	Packing tissue thickness	Very Thick
Initiation of 10% Female flowering	Late	Kernel Characteristics	States
Number of male catkins per cluster	Intermediate	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Medium(2-4)	Kernel percentage	Medium(40-50)
Stigma colour	Green	Kernel veins (%)	Low(<30)
Hull dehiscence	Dehiscent	Kernel plumpness	Moderate
		Ease of removal of kernel halves	Easy
		kernel colour	Light

CITH-WALNUT-70



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-71			
Genus-Species: <i>Juglans regia</i> L			
Accession No.IC-0617715			
Tree Characteristics	States	Fruit / Nut characteristics	States
Vigour(cm)	Intermediate (50-100)	Nut Shape	Round
Growth habit	Semi Erect	Shape in cross section	Round
Density of branches	Dense	Shape of base perpendicular to suture	Truncate
Bearing habit	Terminal	Shape of apex perpendicular to suture	Truncate
Leaf Characteristics	States	Prominence of apical tip	Weak
Leaflet length (cm)	Medium(10-15)	Position of pad on suture	On whole length
Leaf shape	Elliptic	Nut diameter (mm)	Large
Leaflet margin	Entire	Nut length (mm)	Small
Leaflet colour	Green	Nut weight (g)	Light
Leaf serration	Absent	Prominence of pad on suture	Strong
Rachis colour	Green	Shell surface	Medium
Rachis persistance	Few	Shell colour	Light
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Slightly pubescent	Shell seal	Strong
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Thick
Dichogamy	Protandrous	Packing tissue thickness	Very Thick
Initiation of 10% Female flowering	Early	Kernel Characteristics	States
Number of male catkins per cluster	Low	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Low(<2)	Kernel percentage	Medium((40-50)
Stigma colour	Red	Kernel veins (%)	Low(<30)
Hull dehiscence	Dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Light Amber

CITH-WALNUT-71



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-72			
Genus-Species: <i>Juglans regia</i> L			
Accession No.IC-0617716			
Tree Characteristics	States	Fruit / Nut characteristics	States
Vigour(cm)	Intermediate (50-100)	Nut Shape	Round
Growth habit	Semi Erect	Shape in cross section	Round
Density of branches	Dense	Shape of base perpendicular to suture	Rounded
Bearing habit	Terminal	Shape of apex perpendicular to suture	Truncate
Leaf Characteristics	States	Prominence of apical tip	Strong
Leaflet length (cm)	Medium(10-15)	Position of pad on suture	On whole length
Leaf shape	Elliptic	Nut diameter (mm)	Large(>40)
Leaflet margin	Entire	Nut length (mm)	Small(<30)
Leaflet colour	Dark green	Nut weight (g)	Light(<15)
Leaf serration	Absent	Prominence of pad on suture	Strong
Rachis colour	Green	Shell surface	Medium
Rachis persistanceec	Few	Shell colour	Light
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Glabrous	Shell seal	Intermediate
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protogynous	Packing tissue thickness	Very Thick
Initiation of 10% Female flowering	Early	Kernel Characteristics	States
Number of male catkins per cluster	Low	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Low(<2)	Kernel percentage	Medium(40-50)
Stigma colour	Red	Kernel veins (%)	Low(<30)
Hull dehiscence	Dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-72



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-73

Genus-Species: *Juglans regia* L

Accession No. IC-0617717

Tree Characteristics	States	Fruit / Nut characteristics	States
Vigour (cm)	Intermediate (50-100)	Nut shape	Long trapezoid
Growth habit	Semi Erect	Shape in cross section	Oblate
Density of branches	Intermediate	Shape of base perpendicular to suture	Truncate
Bearing habit	Terminal	Shape of apex perpendicular to suture	Rounded
Leaf Characteristics	States	Prominence of apical tip	Medium
Leaflet length (cm)	Long(>15)	Position of pad on suture	On whole length
Leaf shape	Broad elliptic	Nut diameter (mm)	Large(>40)
Leaflet margin	Entire	Nut length (mm)	Large(>40)
Leaflet colour	Dark green	Nut weight (g)	Light(<15)
Leaf serration	Absent	Prominence of pad on suture	Strong
Rachis colour	Green	Shell surface	Smooth
Rachis persistance	Few	Shell colour	Very Light
Time of leaf fall	Early	Shell strength	Intermediate
Shoot pubescence	Glabrous	Shell seal	Weak
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protogynous	Packing tissue thickness	Very Thick
Initiation of 10% Female flowering	Late	Kernel Characteristics	States
Number of male catkins per cluster	Intermediate	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Low(<2)	Kernel percentage	Medium(40-50)
Stigma colour	Green	Kernel veins (%)	Low(<30)
Hull dehiscence	Dehiscent	Kernel plumpness	Plump
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-73



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-74			
Genus-Species: <i>Juglans regia</i> L			
Accession No.IC-0617718			
Tree Characteristics	States	Fruit / Nut characteristics	States
Vigour(cm)	Intermediate (50-100)	Nut Shape	Long trapezoid
Growth habit	Spreading	Shape in cross section	Oblate
Density of branches	Dense	Shape of base perpendicular to suture	Truncate
Bearing habit	Terminal	Shape of apex perpendicular to suture	Rounded
Leaf Characteristics	States	Prominence of apical tip	Strong
Leaflet length (cm)	Long(>15)	Position of pad on suture	On whole length
Leaf shape	Broad elliptic	Nut diameter (mm)	Large(>40)
Leaflet margin	Entire	Nut length (mm)	Large(>40)
Leaflet colour	Dark green	Nut weight (g)	Light(<15)
Leaf serration	Absent	Prominence of pad on suture	Strong
Rachis colour	Green	Shell surface	Smooth
Rachis persistence	Few	Shell colour	Very Light
Time of leaf fall	Early	Shell strength	Intermediate
Shoot pubescence	Glabrous	Shell seal	Weak
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protogynous	Packing tissue thickness	Very Thick
Initiation of 10% Female flowering	Early	Kernel Characteristics	States
Number of male catkins per cluster	Heavy	Kernel weight (g)	Light(<6)
Number of female flowers per cluster	Low	Kernel percentage	Low(<40)
Stigma colour	Yellow	Kernel veins (%)	Low(<30)
Hull dehiscence	Dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Amber

CITH-WALNUT-74



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-75			
Genus-Species: <i>Juglans regia</i> L			
Accession No.IC-0617719			
Tree Characteristics	States	Fruit / Nut characteristics	States
Vigour(cm)	Intermediate (50-100)	Nut Shape	Round
Growth habit	Semi Erect	Shape in cross section	Round
Density of branches	Dense	Shape of base perpendicular to suture	Emarginated
Bearing habit	Terminal	Shape of apex perpendicular to suture	Truncate
Leaf Characteristics	States	Prominence of apical tip	Medium
Leaflet length (cm)	Medium(10-15)	Position of pad on suture	On whole length
Leaf shape	Elliptic	Nut diameter (mm)	Large(>40)
Leaflet margin	Entire	Nut length (mm)	Large(>40)
Leaflet colour	Dark green	Nut weight (g)	Light(<15)
Leaf serration	Absent	Prominence of pad on suture	Medium
Rachis colour	Yellow	Shell surface	Medium
Rachis persistance	Few	Shell colour	Light
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Pubescent	Shell seal	Weak
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protogynous	Packing tissue thickness	Very Thick
Initiation of 10% Female flowering	Late	Kernel Characteristics	States
Number of male catkins per cluster	Intermediate	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Medium(2-4)	Kernel percentage	Medium(40-50)
Stigma colour	Green	Kernel veins (%)	Low(<30)
Hull dehiscence	Dehiscent	Kernel plumpness	Plump
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-75



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-76			
Genus-Species: <i>Juglans regia</i> L			
Accession No.IC-0617720			
Tree Characteristics	States	Fruit / Nut characteristics	States
Vigour(cm)	Intermediate (50-100)	Nut shape	Round
Growth habit	Semi Erect	Shape in cross section	Round
Density of branches	Intermediate	Shape of base perpendicular to suture	Rounded
Bearing habit	Terminal	Shape of apex perpendicular to suture	Truncate
Leaf Characteristics	States	Prominence of apical tip	Strong
Leaflet length (cm)	Long(>15)	Position of pad on suture	On whole length
Leaf shape	Broad elliptic	Nut diameter (mm)	Large (>40)
Leaflet margin	Entire	Nut length (mm)	Large(>40)
Leaflet colour	Dark green	Nut weight (g)	Light(<15)
Leaf serration	Absent	prominence of pad on suture	Medium
Rachis colour	Green	Shell surface	Rough
Rachis persistence	Few	Shell colour	Light
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Glabrous	Shell seal	Weak
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protogynous	Packing tissue thickness	Very Thick
Initiation of 10% Female flowering	Early	Kernel Characteristics	States
Number of male catkins per cluster	Intermediate	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Medium(2-4)	Kernel percentage	Medium(40-50)
Stigma colour	Red	Kernel veins (%)	Low(<30)
Hull dehiscence	Dehiscent	Kernel plumpness	Plump
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-76



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-77

Genus-Species: *Juglans regia* L

Accession No. IC-0617721

Tree Characteristics	States	Fruit / Nut characteristics	States
Vigour(cm)	High(>100)	Nut shape	Ovate
Growth habit	Semi Erect	Shape in cross section	Oblate
Density of branches	Intermediate	Shape of base perpendicular to suture	Emarginated
Bearing habit	Terminal	Shape of apex perpendicular to suture	Truncate
Leaf Characteristics	States	Prominence of apical tip	Medium
Leaflet length (cm)	Long(>15)	Position of pad on suture	On whole length
Leaf shape	Broad elliptic	Nut diameter (mm)	Small(<30)
Leaflet margin	Entire	Nut length (mm)	Small(<30)
Leaflet colour	Dark green	Nut weight (g)	Light(15)
Leaf serration	Present	prominence of pad on suture	Strong
Rachis colour	Green	Shell surface	Smooth
Rachis persistence	Few	Shell colour	Light
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Slightly pubescent	Shell seal	Weak
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protogynous	Packing tissue thickness	Thin
Initiation of 10% Female flowering	Early	Kernel Characteristics	States
Number of male catkins per cluster	Intermediate	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Medium(2-4)	Kernel percentage	Medium(40-50)
Stigma colour	Green	Kernel veins (%)	Low(<30)
Hull dehiscence	Dehiscent	Kernel plumpness	Plump
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-77



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-78			
Genus-Species: <i>Juglans regia</i> L			
Accession No.IC-0617722			
Tree Characteristics	States	Fruit / Nut characteristics	States
Vigour(cm)	Low(<50)	Nut shape	Round
Growth habit	Spreading	Shape in cross section	Round
Density of branches	Intermediate	Shape of base perpendicular to suture	Truncate
Bearing habit	Terminal	Shape of apex perpendicular to suture	Truncate
Leaf Characteristics	States	Prominence of apical tip	Medium
Leaflet length (cm)	Medium(10-15)	Position of pad on suture	On whole length
Leaf shape	Elliptic	Nut diameter (mm)	Large(>40)
Leaflet margin	Entire	Nut length (mm)	Large(>40)
Leaflet colour	Dark green	Nut weight (g)	Light(<15)
Leaf serration	Present	prominence of pad on suture	Medium
Rachis colour	Green	Shell surface	Rough
Rachis persistancec	Few	Shell colour	Medium
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Slightly pubescent	Shell seal	Weak
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protogynous	Packing tissue thickness	Thin
Initiation of 10% Female flowering	Late	Kernel Characteristics	States
Number of male catkins per cluster	Heavy	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Low(<2)	Kernel percentage	Medium(40-50)
Stigma colour	Yellow	Kernel veins (%)	Low(<30)
Hull dehiscence	Dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-78



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-79

Genus-Species: *Juglans regia* L

Accession No. IC-0617723

Tree Characteristics	States	Fruit / Nut characteristics	States
Tree vigour (cm)	Intermediate (50-100)	Nut shape	Round
Growth habit	Spreading	Shape in cross section	Round
Density of branches	Dense	Shape of base perpendicular to suture	Rounded
Bearing habit	Terminal	Shape of apex perpendicular to suture	Truncate
Leaf Characteristics	States	Prominence of apical tip	Strong
Leaflet length (cm)	Medium(10-15)	Position of pad on suture	On whole length
Leaf shape	Elliptic	Nut diameter (mm)	Small(<30)
Leaflet margin	Entire	Nut length (mm)	Small(<30)
Leaflet colour	Dark green	Nut weight (g)	Light(<15)
Leaf serration	Absent	Prominence of pad on suture	Weak
Rachis colour	Green	Shell surface	Medium
Rachis persistanceec	Few	Shell colour	Light
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Glabrous	Shell seal	Weak
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protogynous	Packing tissue thickness	Very Thick
Initiation of 10% Female flowering	Late	Kernel Characteristics	States
Number of male catkins per cluster	Intermediate	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Low(<2)	Kernel percentage	Medium(40-50)
Stigma colour	Yellow	Kernel veins (%)	Low(<30)
Hull dehiscence	Dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-79



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



Kernel colour

CITH-WALNUT-80

Genus-Species: *Juglans regia* L

Accession No. IC-0617724

Tree Characteristics	States	Fruit / Nut characteristics	States
Vigour (cm)	Intermediate (50-100)	Nut shape	Ovate
Growth habit	Spreading	Shape in cross section	Round
Density of branches	Dense	Shape of base perpendicular to suture	Emarginated
Bearing habit	Terminal	Shape of apex perpendicular to suture	Rounded
Leaf Characteristics	States	Prominence of apical tip	Medium
Leaflet length (cm)	Medium(10-15)	Position of pad on suture	On whole length
Leaf shape	Elliptic	Nut diameter (mm)	Small(<30)
Leaflet margin	Entire	Nut length (mm)	Small(<30)
Leaflet colour	Dark green	Nut weight (g)	Light(<15)
Leaf serration	Absent	prominence of pad on suture	Strong
Rachis colour	Green	Shell surface	Medium
Rachis persistanceec	Few	Shell colour	Light
Time of leaf fall	Early	Shell strength	Intermediate
Shoot pubescence	Glabrous	Shell seal	Weak
Shoot colour	Brown	Shell integrity	Strong
Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Dichogamy	Protogynous	Packing tissue thickness	Thin
Initiation of 10% Female flowering	Late	Kernel Characteristics	States
Number of male catkins per cluster	Low	Kernel weight (g)	Medium(6-10)
Number of female flowers per cluster	Low(<2)	Kernel percentage	Medium(40-50)
Stigma colour	Yellow	Kernel veins (%)	High(50-60)
Hull dehiscence	Dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Light

CITH-WALNUT-80



Tree vigour



Leaf colour



Male catkin



Female flower



Hulled fruit



Fruit dehiscence



Nut shape



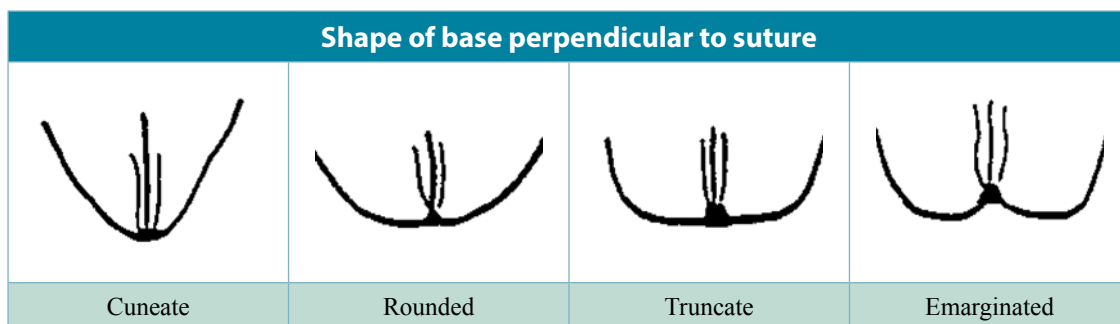
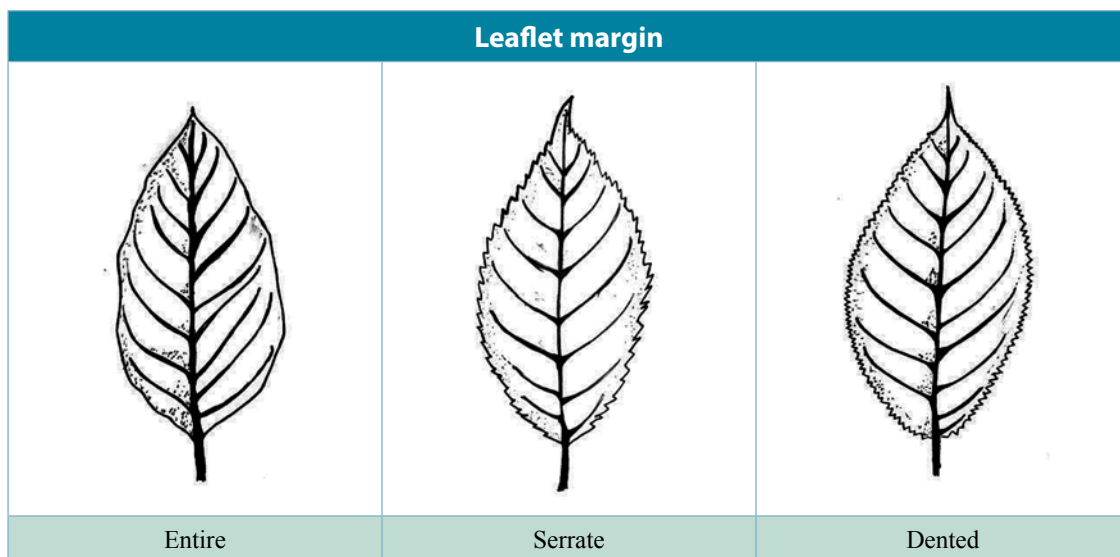
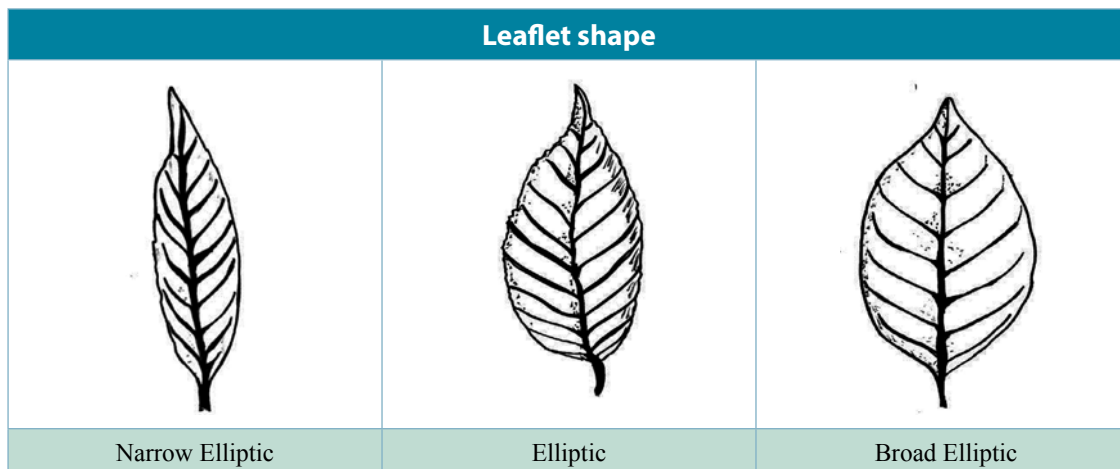
Kernel colour

Terminology of morphological characteristics of Walnut diversity

Characteristics	States	Characteristics	States
Tree vigour(cm)	Low Intermediate High	Nut shape	Round Triangular Cordate Ovate Short Trapezoid Long Trapezoid Broad Elliptic Elliptic Narrow Elliptic
Tree: Growth habit	Erect Semi Erect Spreading	Nut: Shape in cross section	Oblate Round Elliptic
Tree: Density of branches	Sparse Intermediate Dense	Nut: Shape of base perpendicular to suture	Cuneate Rounded Truncate
Bearing habit	Terminal Lateral	Nut: Shape of apex perpendicular to suture	Pointed Rounded Truncate
Leaflet length (cm)	Short Medium Long	Nut: Prominence of apical tip	Weak Medium Strong
Leaf shape	Narrow Elliptic Elliptic Broad Elliptic	Nut: Position of pad on suture	On upper half on upper 2/3 On whole length
Leaflet margin	Entire Serrate Dentate	Nut diameter (mm)	Small Medium Large
Leaflet colour	Light Green Green Dark Green	Nut length (mm)	Small Medium Large
Leaf serration	Absent Present	Nut weight (g)	Light Medium Heavy
Rachis colour	Green Yellow Red	Prominence of pad on suture	Weak Medium Strong
Rachis persistence	Few Intermediate Many	Shell surface	Smooth Moderately Smooth Rough
Time of leaf fall	Early Mid Late	Shell colour	Very Light Light Medium

Characteristics	States	Characteristics	States
Shoot pubescence	Glabrous Pubescent Slightly Pubescent	Shell strength	Weak Intermediate Strong
Shoot colour	Green Brown Dark Brown	Shell integrity	Weak Intermediate Strong
Dichogamy	Protandrous Protogynous	Shell thickness (mm)	Medium Thin Thick
Flower : Initiation of 10% Female flowering	Early Mid Late	Packing tissue thickness	Thin Medium Thick
Flower: Number of female flowers per cluster	Low Medium (2-4) High (High) (>2)	Kernel weight (g)	Light Medium Heavy
Stigma colour	Green Yellow Red	Kernel percentage	Low Medium High
Hull dehiscence : Type	Non-Dehiscent Partly-dehiscent Dehiscent	Kernel veins (%)	Low Medium High
		Kernel colour	Extra Light Light Amber Dark Amber

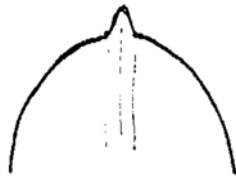
Diagrammatize explanations for the morphological characteristics of walnut



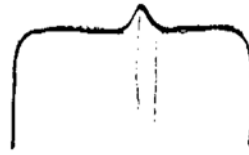
Shape of apex perpendicular to suture



Pointed



Rounded



Truncate



Emarginated

Prominence of apical tip



Weak

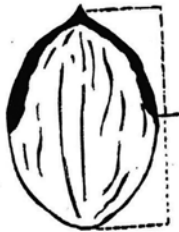


Medium



Strong

Position of pad on suture



on upper half of nut



on upper 2/3 of nut



on whole length

Prominence of pad on suture



Weak



Medium



Strong

Width of pad on suture



Narrow



Medium



Broad

Shape in cross section



Oblate

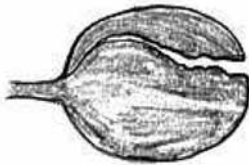


Circular



Elliptic

Hull dehiscence



Non-dehiscent



Partly dehiscent



Dehiscent

Shell surface



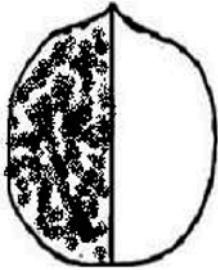
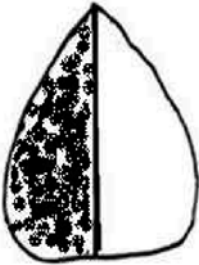
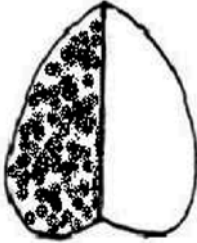
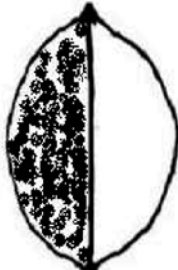
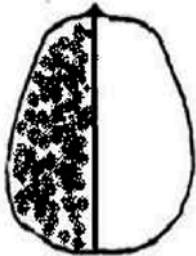
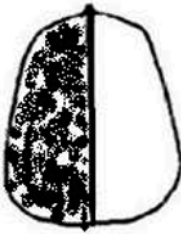
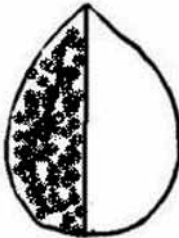


Smooth



Moderately smooth



Rough

Nut: Shape			
			
Round	Triangular	Cordate	Ovate
			
Short trapezoid	Long Trapezoid	Broad Elliptic	Elliptic
			
Narrow Elliptic			

