# (Edition-1)



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



ICAR- CENTRAL INSTITUTE OF TEMPERATE HORTICULTURE

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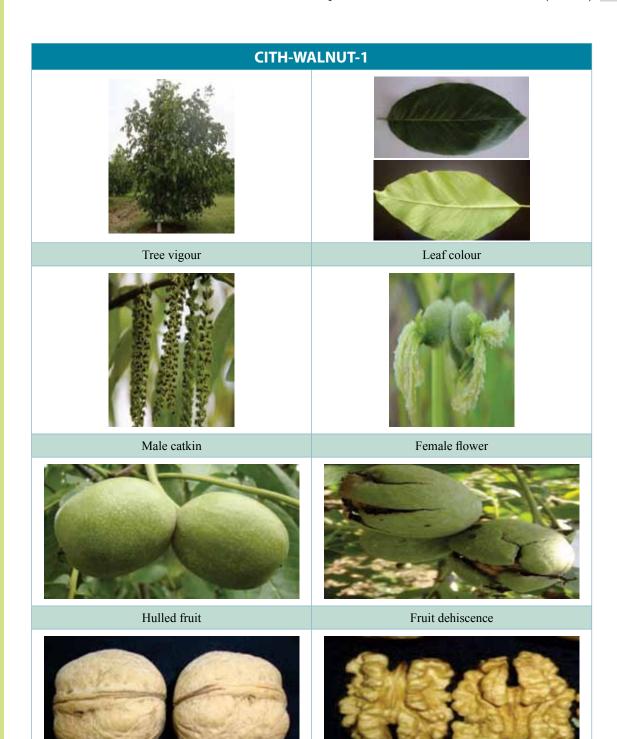


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## PREFACE

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, Udhampur 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.

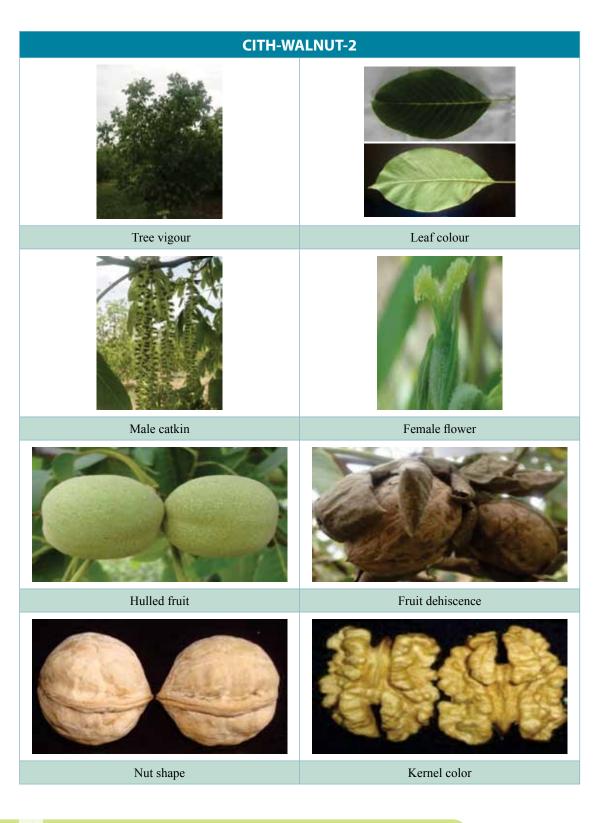
CITH-WALNUT-1				
Genus-Species: Juglans regia L				
Accession No.IC-561050				
Tree Characteristics	States	Fruit / Nut Characteristics	States	
Vigour (cm)	High (>100)	Nut Shape	Long trapezoid	
Growth habit	Semi erect	Shape in cross section	Oblate	
Density of branches	Dense	Shape of base perpendicular 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 persistancec	Many	Shell colour	Light	
Time of leaf fall	Mid	Shell strength	Intermediate	
Shoot pubescence	Slighty 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	



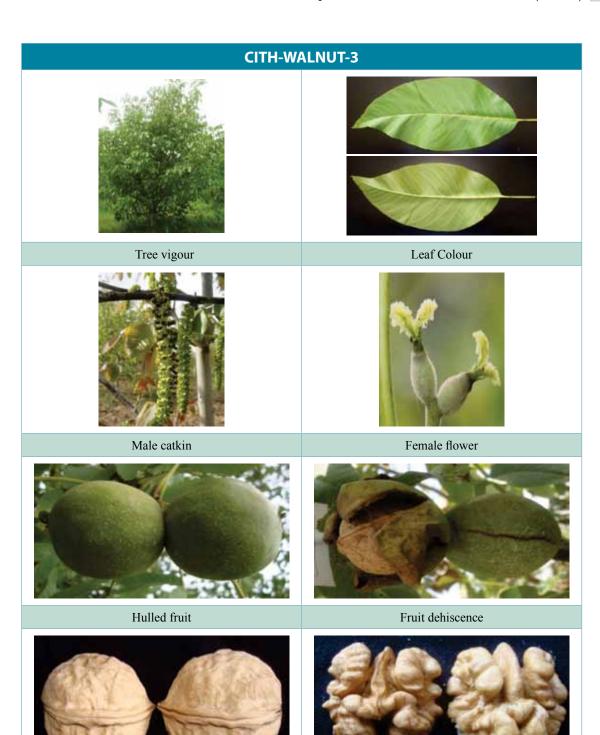
Nut shape

Kernel colour

#### **CITH-WALNUT-2** Genus-Species: Juglans regia L Accession No.IC-561049 **Tree Characteristics** States Fruit / Nut States Characteristics Vigour (cm) Intermediate (50-Nut Shape Ovate 100) Growth habit Semi erect Round Shape in cross section Density of branches Intermediate Shape of base Truncate perpendicular to suture Bearing habit Terminal Shape of apex Pointed perpendicular to suture Leaf Characteristics States Prominence of apical Medium tip Leaf let length (cm) Short (< 10)Position of pad on On upper half suture 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 Prominence Weak Absent of pad on suture Rachis colour Yellow Shell surface Rough Intermediate Shell colour Rachis persistancec Light Time of leaf fall Intermediate Mid Shell strength Medium (1-2) Pubescent Shoot pubescence Shell seal Shoot colour Brown Shell integrity Strong Inflorescence characteristics States Shell thickness (mm) Medium(1-2)Dichogamy Protogynous Packing tissue Thick thickness Initiation of 10% Female flowering Early Kernel States Characteristics Number of male catkins per cluster Many Kernel weight (g) Heavy(>10)Medium( 40-50) Number of female flowers per cluster Medium (2-4) Kernel percentage Stigma colour Green Kernel veins (%) Low Hull dehiscence Dehiscent Kernel plumpness Plumpy Ease of removal of Easy kernel halves Kernel colour Light



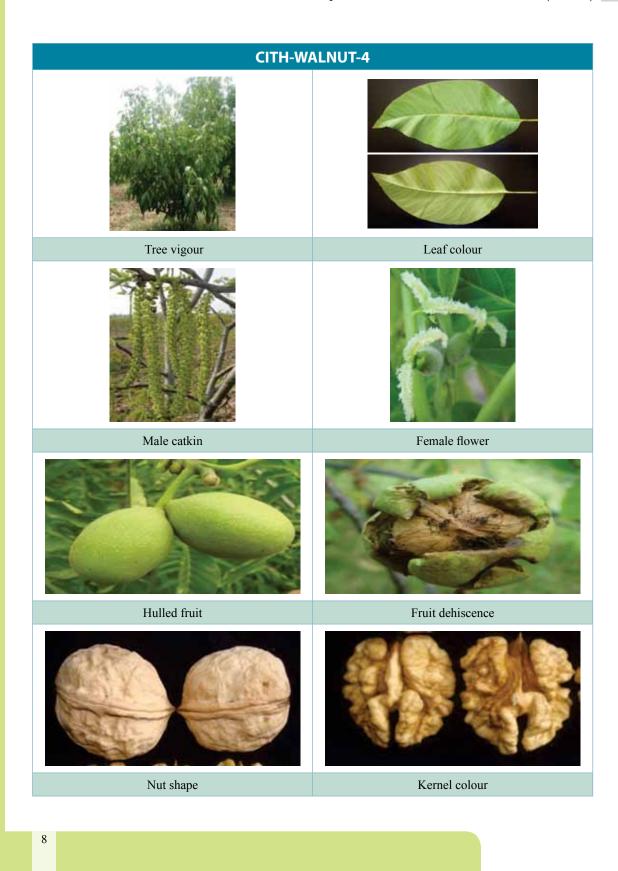
#### **CITH-WALNUT-3** Genus-Species: Juglans regia L Accession No.IC-587184 **Tree Characteristics States** Fruit / Nut States Characteristics Low ( <50) Nut Shape Ovate Vigour (cm) Growth habit Spreading Shape in cross section Elliptic Density of branches Intermediate Shape of base Rounded perpendicular to suture Bearing habit Terminal Shape of apex Pointed perpendicular to suture Leaf Characteristics States Prominence of apical Medium tip Short (< 10)Position of pad on On whole nut Leaflet length (cm) suture 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 Medium Absent Prominence of pad on suture Rachis colour Green Shell surface Rough Shell colour Rachis persistancec Many 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 States Characteristics Dichogamy Protogynous Packing tissue Thick thickness Number of male catkins per cluster Intermediate Number of female flowers per cluster Medium (3-4) Kernel weight (g) Heavy(>10)Stigma colour Green Medium( 40-50) Kernel percentage Hull dehiscence Dehiscent Kernel veins (%) Low Kernel plumpness Plump Ease of removal of Moderate kernel halves Kernel colour Light



Nut shape

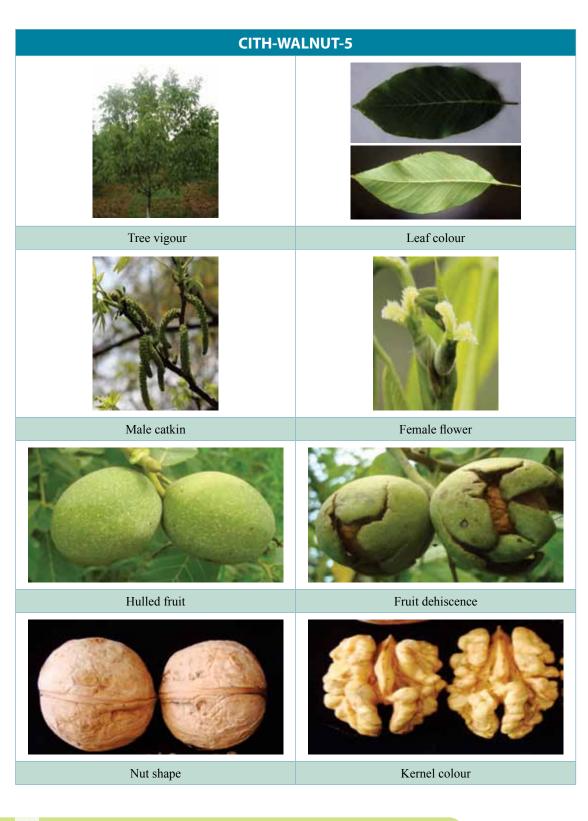
Kernel colour

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 persistancec	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-WALNU	J <b>T-5</b>
	J I J

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 persistancec	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	Plumy
		Ease of removal of kernel halves	Easy
		Kernel colour	Extra Light

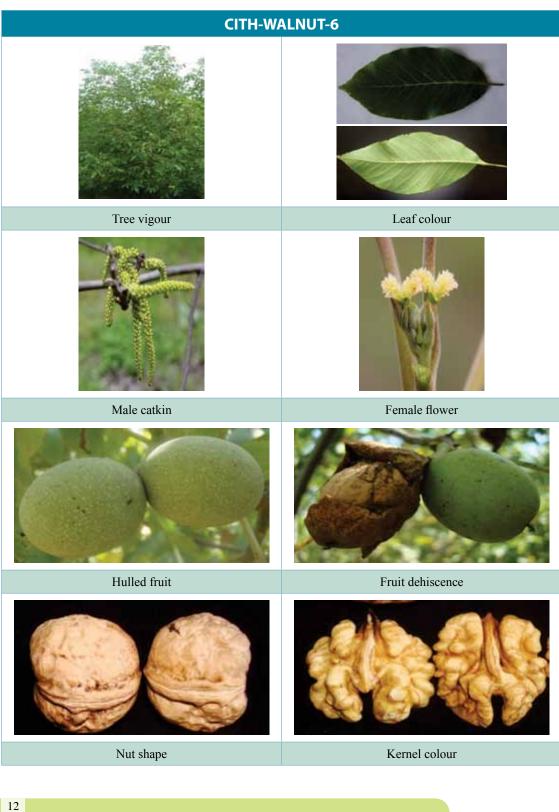


### CITH-WALNUT-6

### Genus-Species: Juglans regia L

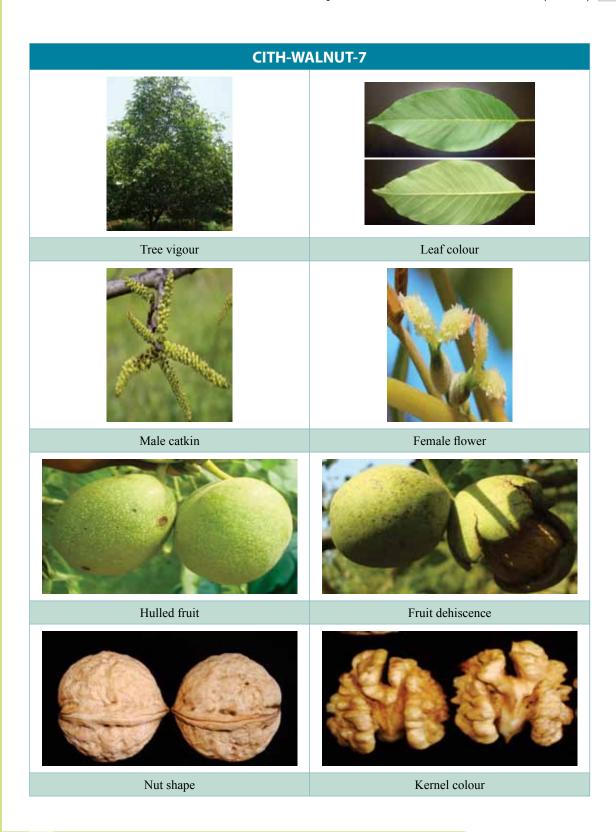
#### Accession No.IC-587141

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 persistancec	Slighty 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

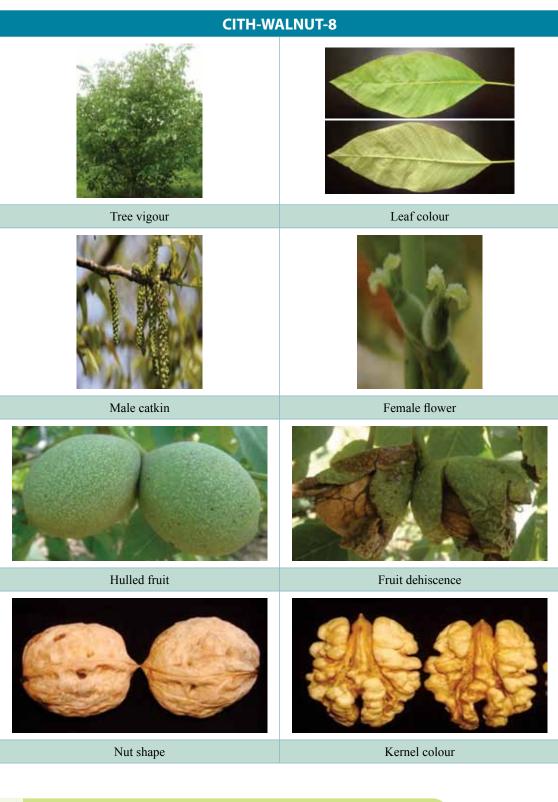


CITH-WALNUT-7	
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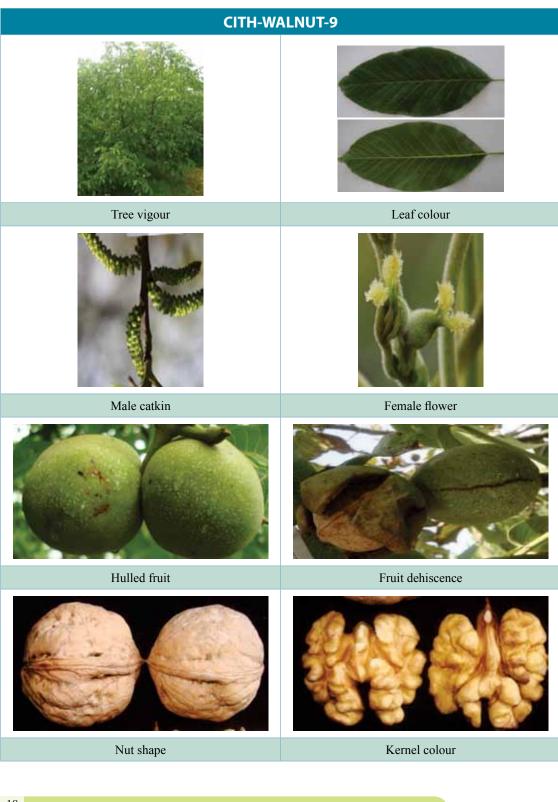
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Genus-Species: Juglans regia L			
Accession No.IC-561057			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour(cm)	High (> 100)	Nut Shape	Elliptic
Growth habit	Semi erect	Shape in cross section	Elliptic
Density of branches	Intermediate	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	Slighty 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-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 persistancec	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-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 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	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-10				
Genus-Species: Juglans regia 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 persistancec	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

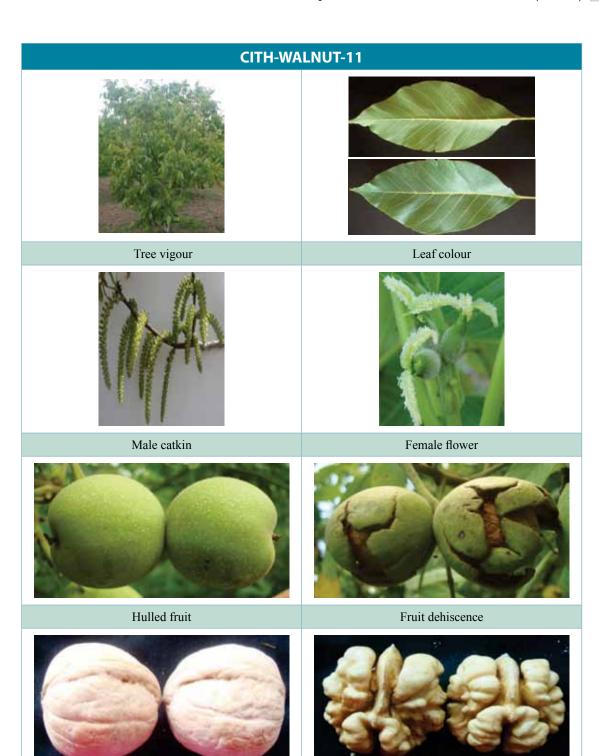


### CITH-WALNUT-11

### Genus-Species: Juglans regia L

#### Accession No.IC-587310

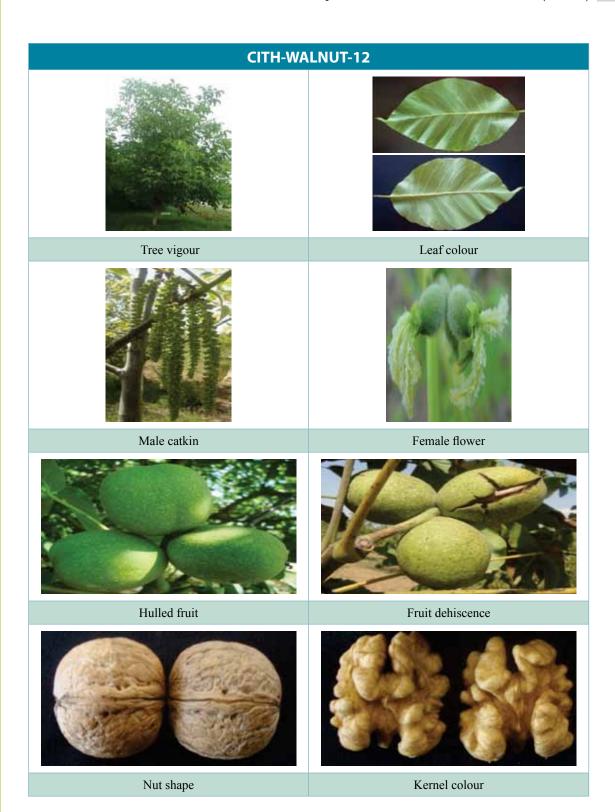
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	Intermediate (50- 100)	Nut Shape	Round
Growth habit	Semi erect	Shape in cross section	Oblate
Density of branches	Dense	Shape of base perpendicular to suture	Rounded
Bearing habit	Terminal	Shape of apex perpendicular to suture	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



Nut shape

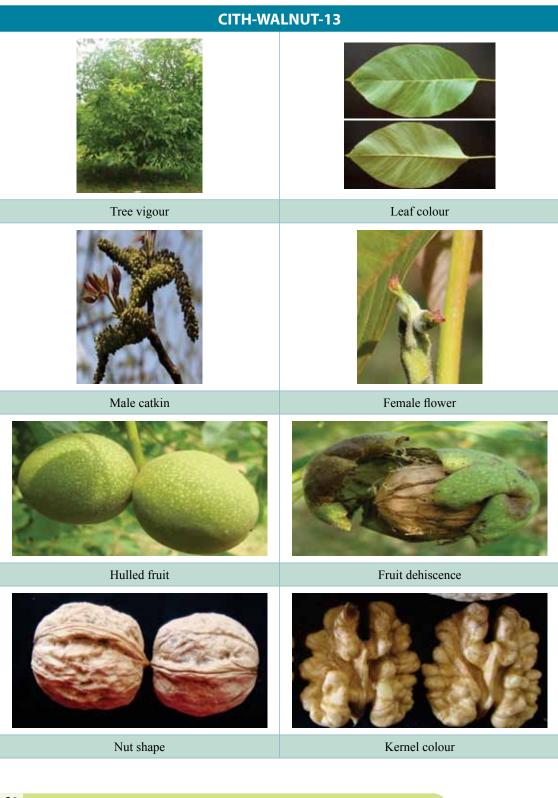
Kernel colour

#### **CITH-WALNUT-12** Genus-Species: Juglans regia L Accession No.IC-622807 **Tree Characteristics** States Fruit / Nut States Characteristics Vigour (cm) Intermediate (50-Nut Shape Broad Ovate 100) Growth habit Erect Shape in cross section Round Density of branches Intermediate Shape of base Emarginate perpendicular to suture Bearing habit Terminal Shape of apex Rounded perpendicular to suture Leaf Characteristics States Prominence of apical Weak tip Leaflet length (cm) Short (<10) Position of pad on On upper half of suture nut Leaf shape Elliptic Nut diameter (mm) Medium(30-40) Leaflet margin Entire Medium(30-40) Nut length (mm) Leaflet colour Dark green Medium(15-20) Nut weight (g) Leaf serration Weak Absent Prominence of pad on suture Rachis colour Green Shell surface Medium Rachis persistancec Many Shell colour Light Time of leaf fall Intermediate Mid Shell strength 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 Thin thickness Kernel States Initiation of 10% Female flowering Early Characteristics Medium (6-10) Number of male catkins per cluster Many Kernel weight (g) 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 Easy kernel halves Kernel colour Amber

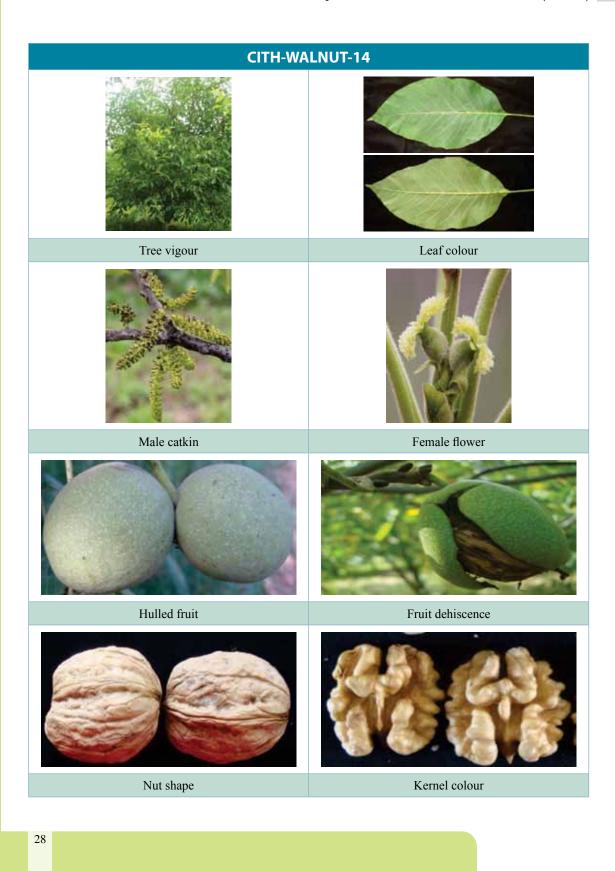


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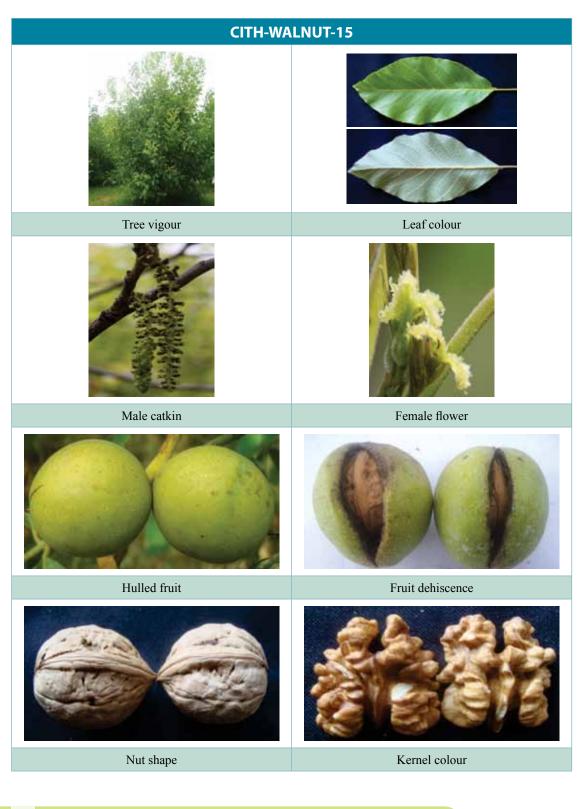
Genus-Species: Juglans regia L     Accession No.IC-587115   States   Fruit / Nut Characteristics   States     Tree Characteristics   States   Fruit / Nut Characteristics   States     Vigour (cm)   Intermediate (50-100)   Nut shape   Round     Density of branches   Dense   Shape of base perpendicular to suture   Irrucate     Bearing habit   Terminal   Shape of apex perpendicular to suture   Rounded     Leaf Characteristics   States   Prominence of apical to suture   Medium     Leaf let length (cm)   Long (>15)   Position of pad on suture   On Whole Length suture     Leaflet colour   Dark green   Nut weight (g)   Heavy (>20)     Leaflet colour   Dark green   Nut weight (g)   Heavy (>20)     Leaf serration   Adscent   Shell surface   Strong     Rachis persistance   Attached   Shell colour   Light     Time of leaf fall   Mid   Shell surfaces   Strong     Shoot colour   Brown   Shell thickness (mm)   Medium (1-2)     Dichogamy   Protogynous   Packing tissue   Thin     Initiation of 10% Female flow	CITH-WALNUT-13					
Tree CharacteristicsStatesFruit / Nut CharacteristicsStatesVigour (cm)Intermediate (50- 100)Nut shapeLong trapezoidGrowth habitSpreadingShape in cross sectionRoundDensity of branchesDenseShape of base perpendicular to sutureTruncateBearing habitTerminalShape of apex perpendicular to sutureRoundedLeaf CharacteristicsStatesProminence of apical tipMediumLeaf let length (cm)Long (>15)Position of pad on sutureOn Whole Length sutureLeaf shapeBroad ellipticNut length (rmm)Large (>40)Leaftet colourDark greenNut weight (g)Heavy (>20)Leaft colourGreenShell surfaceSmoothRachis colourGreenShell surfaceStrongShoot colourBrownShell surfaceStrongShoot colourBrownShell surfaceStrongInime of leaf fallMidShell surfacesStrongInitiation of 10% Female floweringLateStreneStatesNumber of male catkins per clusterManyKernel weight (g)Medium (6-0)Number of famale floweringLateKernel weight (g)Medium (1-2)Signa colourRedKernel weight (g)Medium (1-2)DichogamyCustStatesShell thickness (mm)Medium (1-2)DichogamyReityStatesShell thicknessShellNumber of male catkins per clusterManyK	Genus-Species: Juglans regia L					
Index and the set of the set	Accession No.IC-587115					
Io0)InterventionGrowth habitSpreadingShape in cross sectionRoundDensity of branchesDenseShape of base perpendicular to sutureTruncateBearing habitTerminalShape of apex perpendicular to sutureRoundedLeaf CharacteristicsStatesProminence of apical tipMediumLeaf characteristicsLong (>15)Position of pad on sutureOn Whole LengthLeaf shapeBroad ellipticNut diameter (mm)Large (>40)Leaf the marginEntireNut length (mm)Medium (30-40)Leaf errationDark greenNut weight (g)Heavy (>20)Leaf serrationGreenShell surfaceSmoothRachis colourGreenShell surfaceStrongShoot pubescenceSighty pubescentShell thickness (mm)Medium (1-2)Shoot colourBrownShell thickness (mm)Medium (1-2)DichogamyProtogynousShell thickness (mm)Medium (1-2)DichogamyLateKernel CharacteristicsStatesShell thickness (mm)Number of male catkins per clusterManyKernel weight (g)Medium (6-10)Number of female floweringLow (<2)Kernel percentageMedium (0-40)-03Stigma colour <th>Tree Characteristics</th> <th>States</th> <th></th> <th>States</th>	Tree Characteristics	States		States		
Density of branchesDenseShape of base perpendicular to sutureTruncateBearing habitTerminalShape of apex perpendicular to sutureRoundedLeaf CharacteristicsStatesProminence of apical tipMediumLeaflet length (cm)Long (>15)Position of pad on sutureOn Whole LengthLeaflet length (cm)EntireNut diameter (mm)Large (>40)Leaflet narginEntireNut length (mm)Medium (30-40)Leaflet colourDark greenNut weight (g)Heavy (>20)Leaf serrationGreenShell surfaceStrongRachis colourGreenShell surfaceSmoothRachis persistancecAltachedShell sealStrongShoot colourBrownShell integrityStrongInflorescence CharacteristicsStatesShell integrityStrongInflorescence CharacteristicsLateKernel CharacteristicsThinInitiation of 10% Female floweringLateKernel percentageMedium (40-50)Number of female flowers per clusterManyKernel weight (g)Medium (6-10)Number of female flowers per clusterLow (<2)	Vigour (cm)		Nut shape	Long trapezoid		
Indexperpendicular to sutureperpendicular to sutureRoundedBearing habitTerminalShape of apex perpendicular to sutureRoundedLeaf CharacteristicsStatesPosition of pad on sutureMediumLeaflet length (cm)Long $>15$ )Position of pad on sutureOn Whole LengthLeaf shapeBroad ellipticNut diameter (mm)Large (>40)Leaflet marginEntireNut length (mm)Medium (30-40)Leaflet colourDark greenNut weight (g)Heavy (>20)Leaf serrationAbsentProminence of pad on sutureStrongRachis colourGreenShell surfaceIntermediateShoot pubescenceSlightly pubescenShell surfaceIntermediateShoot colourBrownShell surfaceMidoun (1-2)DichogamyProtogynousShell thickness (mm)Medium (1-2)Number of finale floweringLateKernel percentageStatesNumber of finale floweringLateKernel percentageMedium (30-40)Number of finale floweringLateKernel percentageMedium (3-2)Number of finale floweringLateKernel percentageMotour (1-2)Number of finale floweringLateKernel percentageMedium (3-2)Number of finale floweringLateKernel percentageMedium (3-2)Number of finale floweringLateKernel percentageMedium (3-2)Number of finale floweringLateKernel percentageMedium (3-2)<	Growth habit	Spreading	Shape in cross section	Round		
Image: Particular to sutureperpendicular to sutureLeaf CharacteristicsStatesProminence of apical tipMediumLeaf the length (cm)Long $>15$ )Position of pad on sutureOn Whole LengthLeaf shapeBroad ellipticNut diameter (mm)Large (>40)Leaflet marginEntireNut length (mm)Medium (30-40)Leaflet colourDark greenNut weight (g)Heavy (>20)Leaf serrationGreenNut weight (g)SmoothRachis colourGreenShell surfaceSmoothRachis persistanceAttachedShell surfaceItingShoot pubescenceSlightly pubescentShell strengthStrongShoot colourBrownShell integrityStrongInflorescence CharacteristicsStatesShell thickness (mm)Medium (1-2)DichogamyProtogynousPacking tissue thicknessThinNumber of male catkins per clusterManyKernel weight (g)Medium (40-50)Number of female flowersLow (<2)	Density of branches	Dense		Truncate		
inpinpinpLeaflet length (cm)Long (>15)Position of pad on sutureOn Whole LengthLeaf shapeBroad ellipticNut diameter (mm)Large (>40)Leaflet marginEntireNut length (mm)Medium (30-40)Leaflet colourDark greenNut weight (g)Heavy (>20)Leaf serrationAbsentProminence of pad on sutureStrongRachis colourGreenShell surfaceSmoothRachis persistancecAttachedShell colourLightTime of leaf fallMidShell strengthIntermediateShoot pubescenceSlightly pubescentShell integrityStrongShoot colourBrownShell thickness (mm)Medium (1-2)DichogamyProtogynousPacking tissue thicknessThinInitiation of 10% Female floweringLateKernel CharacteristicsStatesNumber of female flowers per clusterLow (<2)	Bearing habit	Terminal		Rounded		
Index and the statesuturesutureLeaf shapeBroad ellipticNut diameter (mm)Large (>40)Leaflet marginEntireNut length (mm)Medium (30-40)Leaflet colourDark greenNut weight (g)Heavy (>20)Leaf serrationAbsentProminence of pad on sutureStrongRachis colourGreenShell surfaceSmoothRachis persistancecAttachedShell surfaceIntermediateShoot pubescenceSlightly pubescentShell strengthIntermediateShoot colourBrownShell integrityStrongInflorescence CharacteristicsStatesShell thickness (mm)Medium (1-2)DichogamyProtogynousRacking tissue thicknessThinNumber of male catkins per clusterManyKernel weight (g)Medium (6-10)Number of female flowers per clusterLow (<2)	Leaf Characteristics	States		Medium		
Leaflet marginEntireNut length (mm)Medium (30-40)Leaflet colourDark greenNut weight (g)Heavy (>20)Leaf serrationAbsentProminence of pad on sutureStrongRachis colourGreenShell surfaceSmoothRachis persistancecAttachedShell colourLightTime of leaf fallMidShell strengthIntermediateShoot pubescenceSlightly pubescentShell sealStrongShoot colourBrownShell integrityStrongInflorescence CharacteristicsStatesShell thickness (mm)Medium (1-2)DichogamyProtogynousPacking tissue thicknessThinInitiation of 10% Female floweringLateKernel CharacteristicsStatesNumber of male catkins per clusterManyKernel percentageMedium (40-50)Stigma colourRedKernel veins (%)Medium(30-40)Hull dehiscenceDehiscentKernel plumpnessPlumpy	Leaflet length (cm)	Long (>15)	•	On Whole Length		
Leaflet colourDark greenNut weight (g)Heavy (>20)Leaf serrationAbsentProminence of pad on sutureStrongRachis colourGreenShell surfaceSmoothRachis persistancecAttachedShell colourLightTime of leaf fallMidShell strengthIntermediateShoot pubescenceSlightly pubescentShell sealStrongShoot colourBrownShell integrityStrongInflorescence CharacteristicsStatesShell thickness (mm)Medium (1-2)DichogamyProtogynousPacking tissue thicknessThinInitiation of 10% Female floweringLateKernel CharacteristicsStatesNumber of male catkins per clusterManyKernel weight (g)Medium (6-10)Number of female flowers per clusterLow (<2)	Leaf shape	Broad elliptic	Nut diameter (mm)	Large (>40)		
Leaf serrationAbsentProminence of pad on sutureStrongRachis colourGreenShell surfaceSmoothRachis persistancecAttachedShell colourLightTime of leaf fallMidShell strengthIntermediateShoot pubescenceSlightly pubescentShell sealStrongShoot colourBrownShell integrityStrongInflorescence CharacteristicsStatesShell thickness (mm)Medium (1-2)DichogamyProtogynousPacking tissue thicknessThinInitiation of 10% Female floweringLateKernel CharacteristicsStatesNumber of male catkins per clusterManyKernel weight (g)Medium(40-50)Stigma colourRedKernel veins (%)Medium(30-40)Hull dehiscenceDehiscentKernel plumpnessPlumpyKernel plumpnessPlumpyEase of removal of kernel halvesEasy	Leaflet margin	Entire	Nut length (mm)	Medium (30-40)		
Image: A stand of paid on sutureImage: A stand of paid on sutureRachis colourGreenShell surfaceSmoothRachis persistancecAttachedShell colourLightTime of leaf fallMidShell strengthIntermediateShoot pubescenceSlightly pubescentShell sealStrongShoot colourBrownShell integrityStrongInflorescence CharacteristicsStatesShell thickness (mm)Medium (1-2)DichogamyProtogynousPacking tissue thicknessThinInitiation of 10% Female floweringLateKernel CharacteristicsStatesNumber of male catkins per clusterManyKernel percentageMedium (0-10)Stigma colourRedKernel veins (%)Medium(30-40)Hull dehiscenceDehiscentKernel plumpnessPlumpyFase of removal of kernel halvesEasyFasy	Leaflet colour	Dark green	Nut weight (g)	Heavy (>20)		
Rachis persistancecAttachedShell colourLightTime of leaf fallMidShell strengthIntermediateShoot pubescenceSlightly pubescentShell sealStrongShoot colourBrownShell integrityStrongInflorescence CharacteristicsStatesShell thickness (mm)Medium (1-2)DichogamyProtogynousPacking tissue thicknessThinInitiation of 10% Female floweringLateKernel CharacteristicsStatesNumber of male catkins per clusterLow (<2)	Leaf serration	Absent		Strong		
Time of leaf fallMidShell strengthIntermediateShoot pubescenceSlightly pubescentShell sealStrongShoot colourBrownShell integrityStrongInflorescence CharacteristicsStatesShell thickness (mm)Medium (1-2)DichogamyProtogynousPacking tissue thicknessThinInitiation of 10% Female floweringLateKernel CharacteristicsStatesNumber of male catkins per clusterManyKernel weight (g)Medium (6-10)Number of female flowers per clusterLow (<2)	Rachis colour	Green	Shell surface	Smooth		
Shoot pubescenceSlightly pubescentShell sealStrongShoot colourBrownShell integrityStrongInflorescence CharacteristicsStatesShell thickness (mm)Medium (1-2)DichogamyProtogynousPacking tissue thicknessThinInitiation of 10% Female floweringLateKernel CharacteristicsStatesNumber of male catkins per clusterManyKernel weight (g)Medium (6-10)Number of female flowers per clusterLow (<2)	Rachis persistancec	Attached	Shell colour	Light		
Shoot colourBrownShell integrityStrongInflorescence CharacteristicsStatesShell thickness (mm)Medium (1-2)DichogamyProtogynousPacking tissue thicknessThinInitiation of 10% Female floweringLateKernel CharacteristicsStatesNumber of male catkins per clusterManyKernel weight (g)Medium (6-10)Number of female flowers per clusterLow (<2)	Time of leaf fall	Mid	Shell strength	Intermediate		
Inflorescence CharacteristicsStatesShell thickness (mm)Medium (1-2)DichogamyProtogynousPacking tissue thicknessThinDichogamyLateKernel CharacteristicsStatesInitiation of 10% Female floweringLateKernel CharacteristicsStatesNumber of male catkins per clusterManyKernel weight (g)Medium (6-10)Number of female flowers per clusterLow (<2)	Shoot pubescence	Slightly pubescent	Shell seal	Strong		
DichogamyProtogynousPacking tissue thicknessThinInitiation of 10% Female floweringLateKernel CharacteristicsStatesNumber of male catkins per clusterManyKernel weight (g)Medium (6-10)Number of female flowers per clusterLow (<2)	Shoot colour	Brown	Shell integrity	Strong		
Initiation of 10% Female floweringLateKernel CharacteristicsStatesNumber of male catkins per clusterManyKernel weight (g)Medium (6-10)Number of female flowers per clusterLow (<2)	Inflorescence Characteristics	States	Shell thickness (mm)	Medium (1-2)		
CharacteristicsCharacteristicsNumber of male catkins per clusterManyKernel weight (g)Medium (6-10)Number of female flowers per clusterLow (<2)	Dichogamy	Protogynous		Thin		
Number of female flowers per clusterLow (<2)Kernel percentageMedium(40-50)Stigma colourRedKernel veins (%)Medium(30-40)Hull dehiscenceDehiscentKernel plumpnessPlumpyEase of removal of kernel halves	Initiation of 10% Female flowering	Late		States		
Stigma colourRedKernel veins (%)Medium(30-40)Hull dehiscenceDehiscentKernel plumpnessPlumpyEase of removal of kernel halvesEasy	Number of male catkins per cluster	Many	Kernel weight (g)	Medium (6-10)		
Hull dehiscence Dehiscent Kernel plumpness Plumpy   Ease of removal of kernel halves Easy	Number of female flowers per cluster	Low (<2)	Kernel percentage	Medium(40-50)		
Ease of removal of Easy kernel halves	Stigma colour	Red	Kernel veins (%)	Medium(30-40)		
kernel halves	Hull dehiscence	Dehiscent	Kernel plumpness	Plumpy		
Kernel colour Light				Easy		
			Kernel colour	Light		



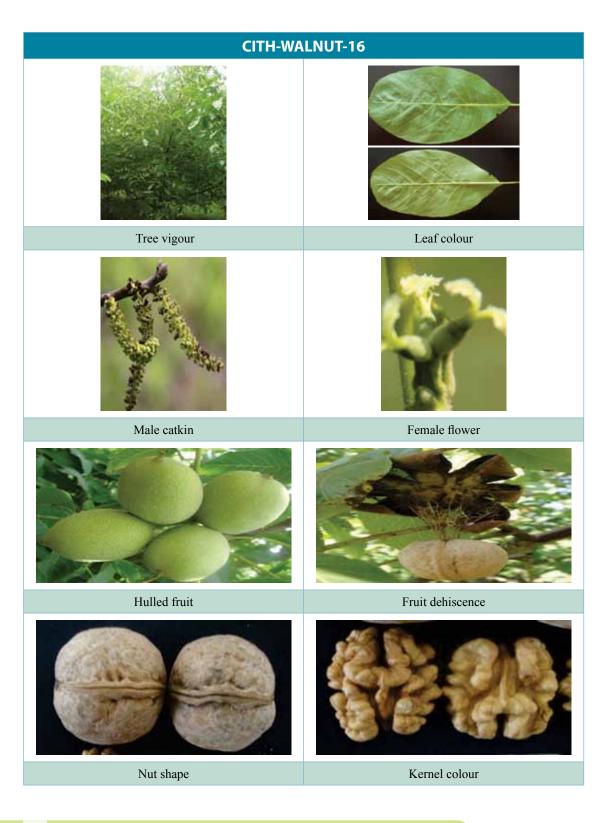
CITH-WALNUT-14					
Genus-Species: Juglans regia L					
Accession No.IC-0617692					
Tree Characteristics	States	Fruit / Nut Characteristics	States		
Vigour (cm)	Intermediate (50- 100)	Nut Shape	Long trapezoid		
Growth habit	Spreading	Shape in cross section	Oblate		
Density of branches	Dense	Shape of 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 persistancec	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		



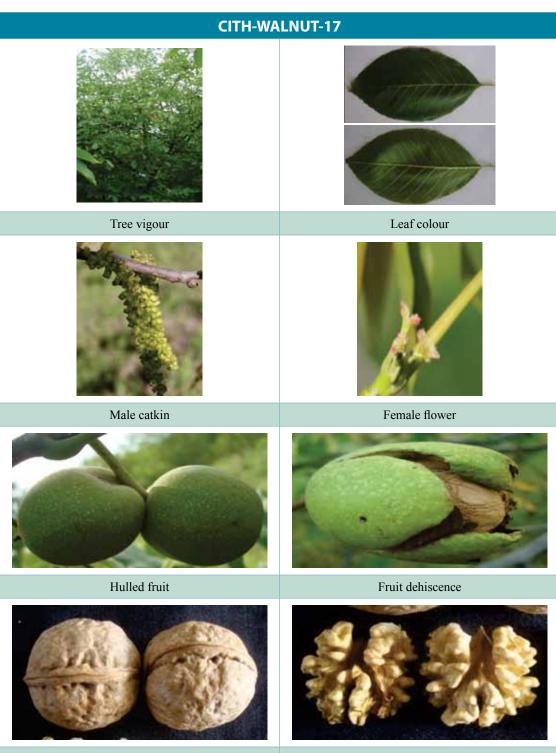
#### **CITH-WALNUT-15** Genus-Species: Juglans regia L Accession No.IC-587227 **Tree Characteristics** States Fruit / Nut States Characteristics Vigour (cm) Intermediate (50-Nut shape Long trapezoid 100)Growth habit Semi Erect Shape in cross section Round Density of branches Dense Shape of base Truncate perpendicular to suture Bearing habit Terminal Shape of apex Rounded perpendicular to suture Leaf Characteristics States Prominence of apical Medium tip On upper half of Leaflet length (cm) Long (>15) Position of pad on suture nut Leaf shape Broad elliptic Nut diameter (mm) Large (>40)Leaflet margin Entire Medium (30-40) Nut length (mm) Leaflet colour Dark green Heavy (>20) Nut weight (g) Leaf serration Absent Prominence Medium of pad on suture Rachis colour Green Shell surface Medium Rachis persistancec Attached Shell colour Light Time of leaf fall Mid Intermediate Shell strength 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 Thin thickness Kernel States Initiation of 10% Female flowering Late Characteristics Heavy (>10) Number of male catkins per cluster Many Kernel weight (g) 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 Easy kernel halves Kernel colour Extra Light



CITH-WALNUT-16			
Genus-Species: Juglans regia 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 persistancec	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



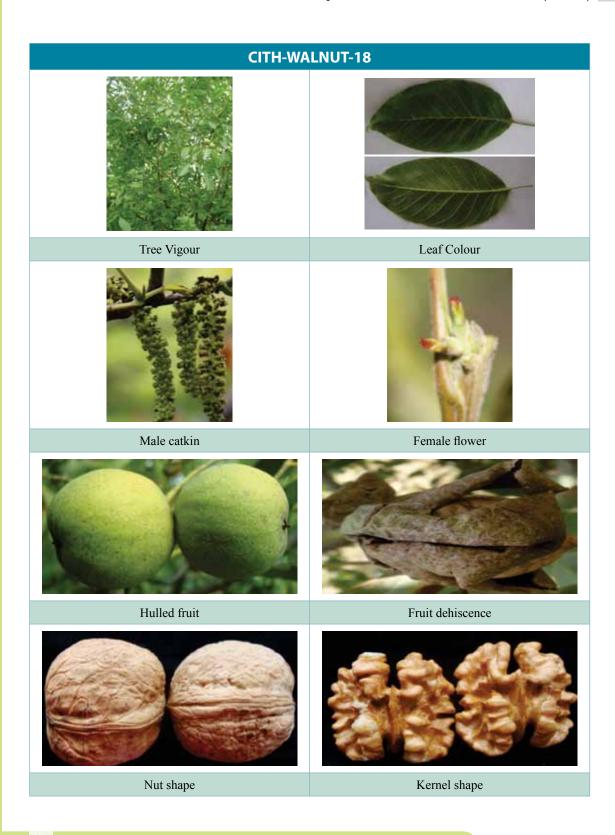
CITH-WALNUT-17				
Genus-Species: Juglans regia L				
Accession No.IC-587071				
Tree Characteristics	States	Fruit / Nut Characteristics	States	
Vigour (cm)	Intermediate (50- 100)	Nut Shape	Elliptic	
Growth habit	Spreading	Shape in cross section	Oblate	
Density of branches	Dense	Shape of base perpendicular 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 persistancec	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	



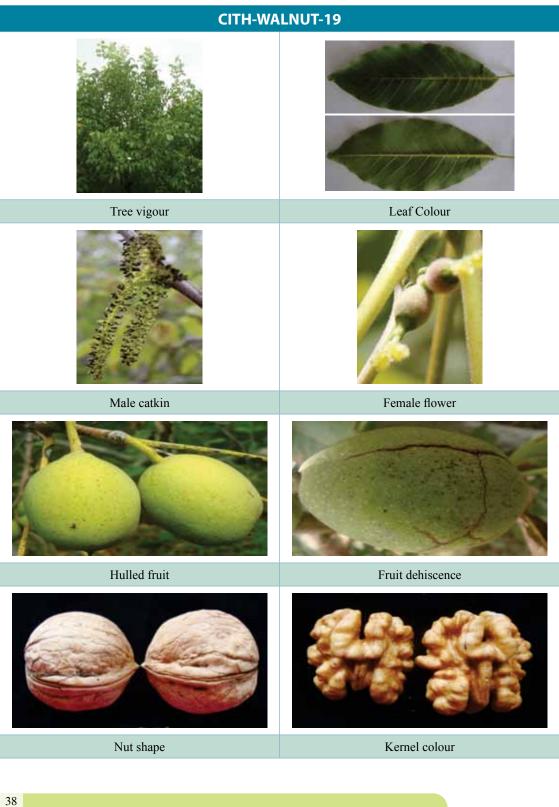
Nut shape

Kernel colour

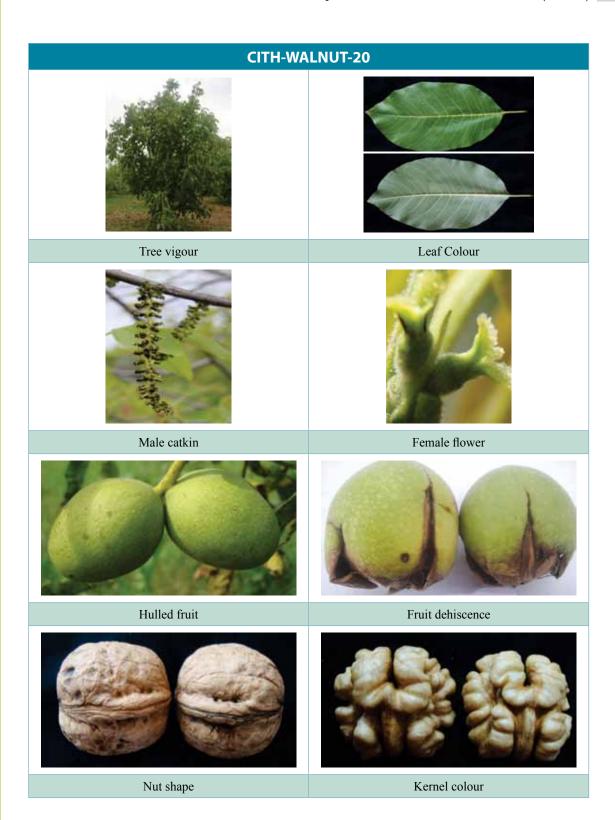
CITH-WALNUT-18			
Genus-Species: Juglans regia L			
Accession No.IC-587163			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	High(>100)	Nut Shape	Round
Growth habit	Spreading	Shape in cross section	Oblate
Density of branches	Dense	Shape of base perpendicular to suture	Truncate
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 persistancec	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-19				
Genus-Species: Juglans regia L	Genus-Species: Juglans regia 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 persistancec	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-20			
Genus-Species: Juglans regia 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



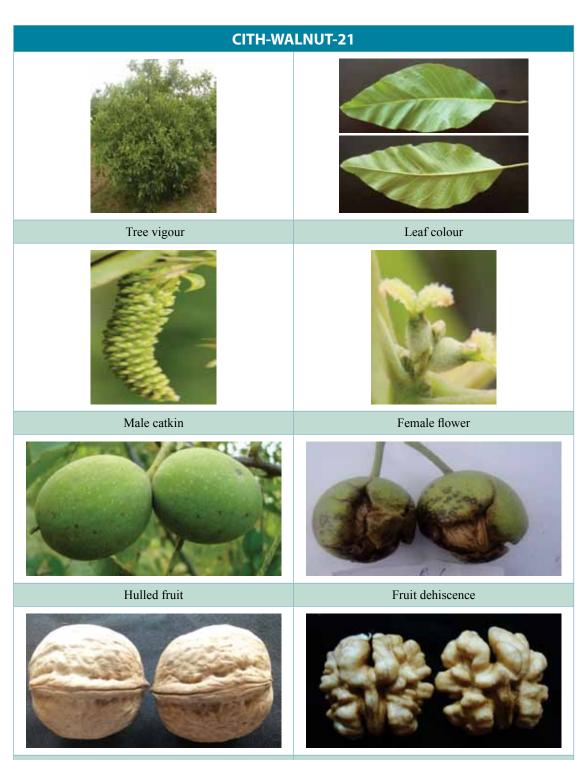
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CITH-WALNUT-21	l
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<b>Genus-Species:</b>	Juglans	regia L
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Accession No.IC-622810	
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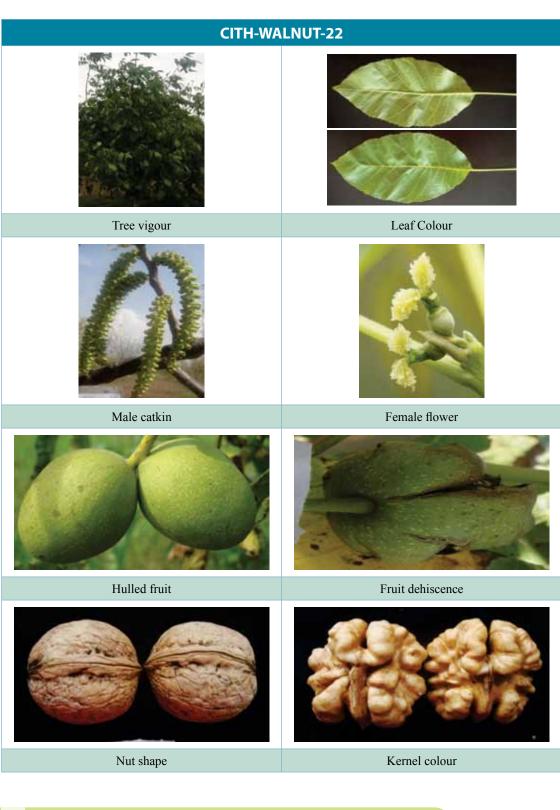
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour(cm)	Intermediate (50- 100)	Nut Shape	Round
Growth habit	Spreading	Shape in cross section	Oblate
Density of branches	Dense	Shape of base perpendicular to suture	Truncate
Bearing habit	Terminal	Shape of apex perpendicular to suture	Rounded
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 persistancec	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



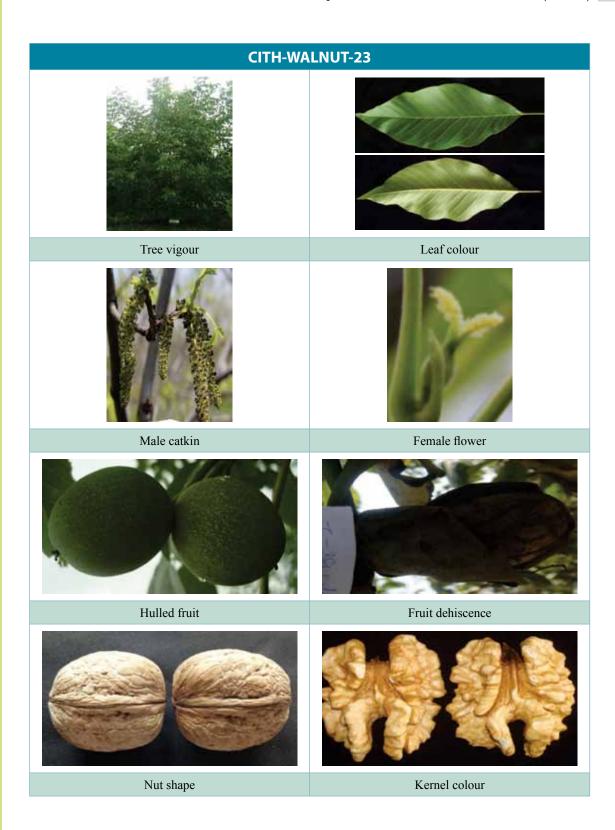
Nut shape

Kernel colour

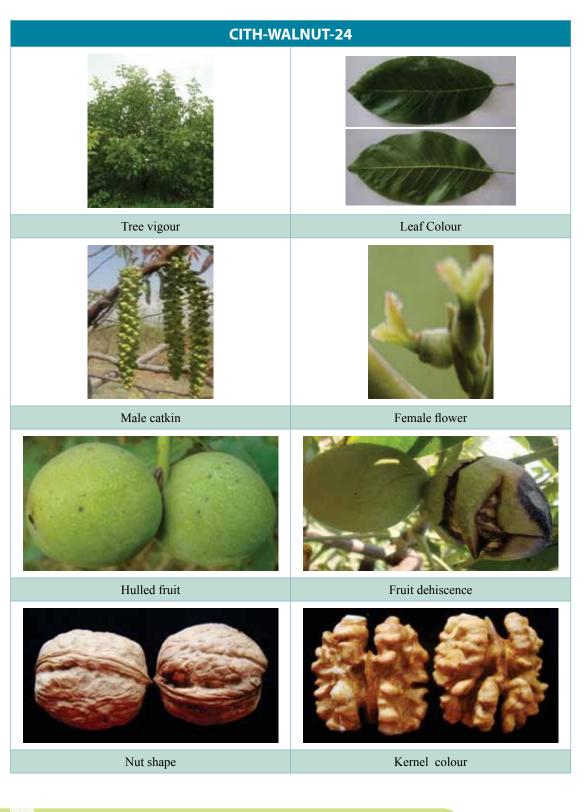
CITH-WALNUT-22				
Genus-Species: Juglans regia L				
Accession No.IC-587354				
Tree Characteristics	States	Fruit / Nut Characteristics	States	
Vigour(cm)	Intermediate (50- 100)	Nut Shape	Broad ovate	
Growth habit	Spreading	Shape in cross section	Round	
Density of branches	Dense	Shape of base perpendicular 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 persistancec	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	



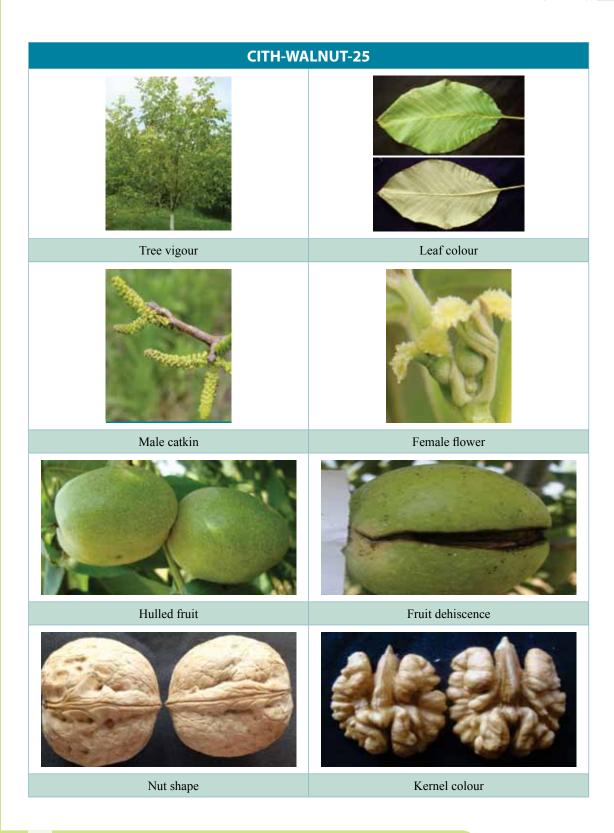
CITH-WALNUT-23				
Genus-Species: Juglans regia L				
Accession No.IC-587091				
Tree Characteristics	States	Fruit / Nut Characteristics	States	
Vigour (cm)	Intermediate (50- 100)	Nut Shape	Broad Ovate	
Growth habit	Semi Erect	Shape in cross section	Round	
Density of branches	Dense	Shape of base perpendicular 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 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	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	



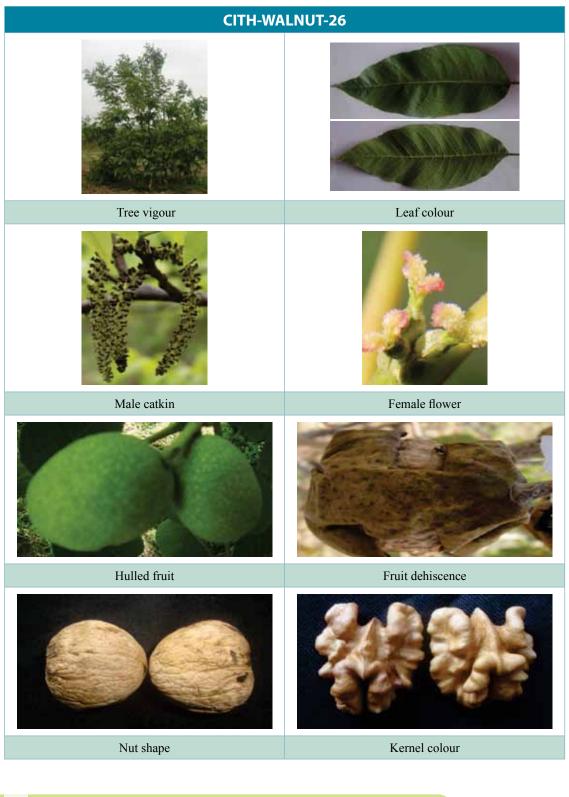
Accession No.IC-587230			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	High(>100)	Nut Shape	Long trapezoid
Growth habit	Spreading	Shape in cross section	Round
Density of branches	Dense	Shape of base perpendicular to suture	Truncate
Bearing habit	Terminal	Shape of apex perpendicular 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 nu
Rachis colour	Red	Shell surface	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)	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



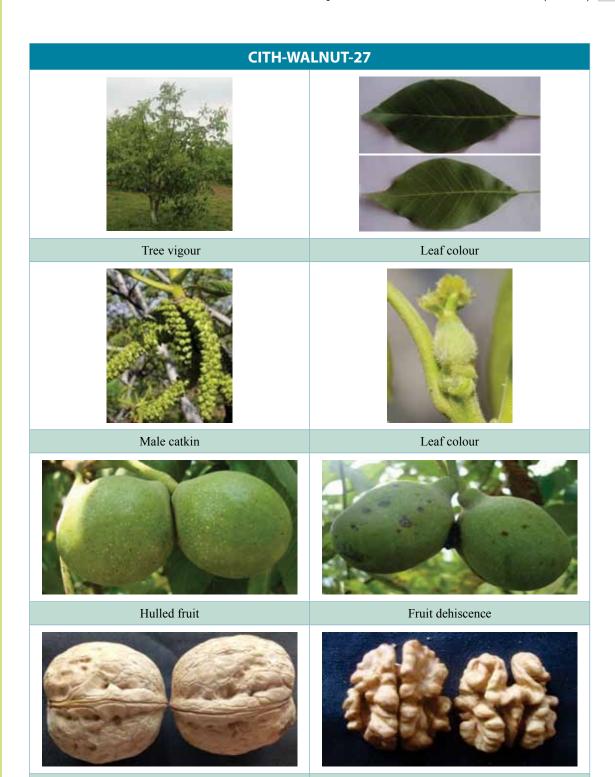
Accession No.IC-622811StatesFruit / Nut CharacteristicsStates'ree CharacteristicsHigh(>100)Nut ShapeRound'igour (cm)High(>100)Nut ShapeRoundirowth habitSemi ErectShape in cross sectionOblateDensity of branchesIntermediateShape of base perpendicular to sutureRoundedDensity of branchesIntermediateShape of apex perpendicular to sutureRoundedDensity of branchesTerminalShape of apex perpendicular to sutureRoundedDensity of branchesStatesProminence of apical tipRoundedDensity of branchesShort(<10)Position of pad on sutureOn whole lengt sutureDeaf shapeEllipticNut diameter (mm)Medium (30-40 apical tipDeaf staracteristicsShort(<10)Position of pad on sutureOn whole lengt sutureDeaf starationEntireNut length (mm)Large (>40)Deaf starationGreenShell surfaceRoughEachis colourGreenShell surfaceRoughEachis persistancecIntermediateShell colourLightIme of leaf fallMidShell strengthIntermediateIndoctoclourBrownShell integrityStrongInforescence CharacteristicsStatesShell thickness (mm)Thick(>2)DichogamyPortoandrousPacking tissue thicknessThinDichogamyLateKernel CharacteristicsStates		CITH-WALNUT-25		
Free CharacteristicsStatesFruit / Nut CharacteristicsStates/igour (cm)High(>100)Nut ShapeRoundorowth habitSemi ErectShape in cross sectionOblatebensity of branchesIntermediateShape of base perpendicular to sutureRoundedBearing habitTerminalShape of apex perpendicular to sutureRoundedBearing habitTerminalShape of apex perpendicular to sutureRoundedBearing habitStatesProminence of apical tipMedium apical tipe.eaf CharacteristicsShort(<10)Position of pad on sutureOn whole lengt suturee.eaf shapeEllipticNut diameter (mm)Medium (30-40 eaflet colourbeastif scolourDark greenNut weight (g)Medium (15-20 stronge.afst solourGreenShell surfaceRoughe.achis persistancecIntermediateShell surfaceRoughime of leaf fallMidShell strengthIntermediatehoot pubescenceSlightly pubescentShell strengthVery Strongnflorescence CharacteristicsStatesShell thickness (mm)Thick(>2)bichogamyProtroandrousPacking tissue thicknessThinnitiation of 10% Female floweringLateKernel characteristicsStatesAumber of male catkins per clusterIntermediateKernel centageMedium(40-50)Aumber of female flowers per clusterIntermediateKernel centageMedium(40-50)<	Genus-Species: Juglans regia L			
indexIntermediateCharacteristicsFigour (cm)High<100)Nut ShapeRoundGrowth habitSemi ErectShape in cross sectionOblateDensity of branchesIntermediateShape of base perpendicular to sutureRoundedBearing habitTerminalShape of apex perpendicular to sutureRoundedead CharacteristicsStatesProminence of apical tipMediumead flat length (cm)Short(<10)Position of pad on sutureOn whole lengt sutureead flat shapeEllipticNut diameter (mm)Medium (04-00)ead flat shapeEntireNut weight (g)Medium (15-20)ead flat solutionGreenShell surfaceRoughtachis colourGreenShell surfaceRoughtachis persistancecIntermediateShell surfaceRoughtachis persistancecSightly pubescentShell surfaceRoughthoot pubescenceSightly pubescentShell strengthIntermediatehoot colourBrownShell integrityStrongthoot colourPromanderShell strengthIntermediatehoot colourProvandrousShell strengthThick(>2)hoot colourProvandrousShell strengthThick(>2)hoot colourProvandrousShell strengthIntermediatehoot colourProvandrousShell strengthThick(>2)hoot colourProvandrousShell strengthIntermediatehoot colourP	Accession No.IC-622811			
Browth habitSemi ErectShape in cross sectionOblateDensity of branchesIntermediateShape of base perpendicular to sutureRoundedDensity of branchesIntermediateShape of apex perpendicular to sutureRoundedDensity of branchesTerminalShape of apex perpendicular to sutureRoundedDensity of branchesTerminalShape of apex perpendicular to sutureRoundedDensity of branchesStatesProminence of apical tipRoundedDensity of branchesStatesProminence of apical tipMediumDensity of branchesShort(<10)Position of pad on sutureOn whole lengt sutureDeafet length (cm)Short(<10)Nut diameter (mm)Medium (30-40 Medium (30-40)Deafet colourEntireNut wight (g)Medium (15-20 Medium (15-20 of pad on sutureDeafet colourDark greenNut weight (g)Medium (15-20 Medium (15-20 M	Tree Characteristics	States		States
Density of branchesIntermediatesectionDensity of branchesIntermediateShape of base perpendicular to sutureRoundedDensity of branchesTerminalShape of apex perpendicular to sutureRoundedDensity of branchesTerminalShape of apex perpendicular to sutureRoundedDensity of branchesStatesProminence of apical tipMediumDensity of the set of th	Vigour (cm)	High(>100)	Nut Shape	Round
Performationperpendicular to sutureBearing habitTerminalShape of apex perpendicular to sutureRoundedCeaf CharacteristicsStatesProminence of apical tipMediumLeaf CharacteristicsShort(<10)	Growth habit	Semi Erect	1	Oblate
Performance sutureperformance of apical tipMedium defiumeaf CharacteristicsStatesProminence of apical tipMedium (Medium apical tip)eaflet length (cm)Short(<10)	Density of branches	Intermediate	perpendicular to	Rounded
indexapical tipapical tipeaflet length (cm)Short(<10)	Bearing habit	Terminal	perpendicular to	Rounded
suturesuturesutureseaf shapeEllipticNut diameter (mm)Medium (30-40)seaflet marginEntireNut length (mm)Large (>40)seaflet colourDark greenNut weight (g)Medium (15-20)seaflet colourAbsentProminence of pad on sutureStrongstachis colourGreenShell surfaceRoughtachis persistancecIntermediateShell colourLighttime of leaf fallMidShell strengthIntermediateshoot colourBrownShell integrityStrongnflorescence CharacteristicsStatesShell thickness (mm)Thick(>2)DichogamyProtroandrousPacking tissue thicknessThinnitiation of 10% Female floweringLateKernel CharacteristicsStatessumber of male catkins per clusterIntermediateKernel weight (g)Medium(6-10)sumber of female flowers per clusterLow(<2)	Leaf Characteristics	States		Medium
Leaflet marginEntireNut length (mm)Large (>40)Leaflet colourDark greenNut weight (g)Medium (15-20)Leaf serrationAbsentProminence of pad on sutureStrongLachis colourGreenShell surfaceRoughLachis persistancecIntermediateShell colourLightLime of leaf fallMidShell strengthIntermediateNoto pubescenceSlightly pubescentShell sealVery StrongInhoot colourBrownShell integrityStrongInforescence CharacteristicsStatesShell thickness (mm)Thick(>2)DichogamyProtroandrousPacking tissue thicknessThinInitiation of 10% Female floweringLateKernel CharacteristicsStatesJumber of male catkins per clusterIntermediateKernel percentageMedium(6-10)Number of female flowers per clusterLow(<2)	Leaflet length (cm)	Short(<10)	-	On whole length
Leaflet colourDark greenNut weight (g)Medium (15-20)Leaflet colourAbsentProminence of pad on sutureStrongLachis colourGreenShell surfaceRoughLachis persistancecIntermediateShell colourLightLime of leaf fallMidShell strengthIntermediateLoot colourSlightly pubescentShell strengthIntermediateLoot colourBrownShell integrityStrongInforescence CharacteristicsStatesShell thickness (mm)Thick(>2)DichogamyProtroandrousPacking tissue thicknessThinIntiation of 10% Female floweringLateKernel CharacteristicsStatesJumber of male catkins per clusterIntermediateKernel percentageMedium(6-10)Lumber of female flowers per clusterLow(<2)	Leaf shape	Elliptic	Nut diameter (mm)	Medium (30-40)
AbsentProminence of pad on sutureStrongBachis colourGreenShell surfaceRoughBachis persistancecIntermediateShell colourLightBachis persistancecIntermediateShell strengthIntermediateChoot pubescenceSlightly pubescentShell strengthIntermediateBrownShell integrityStrongBrownShell integrityStrongInforescence CharacteristicsStatesShell thickness (mm)Thick(>2)DichogamyProtroandrousPacking tissue thicknessThinDichogamyLateKernel CharacteristicsStatesStatesJumber of male catkins per clusterIntermediateKernel weight (g)Medium(6-10)Aumber of female flowers per clusterLow(<2)	Leaflet margin	Entire	Nut length (mm)	Large (>40)
IndextIntermediateof pad on sutureStrongBachis colourGreenShell surfaceRoughBachis persistancecIntermediateShell colourLightBine of leaf fallMidShell strengthIntermediateShoot pubescenceSlightly pubescentShell sealVery StrongShoot colourBrownShell integrityStrongInforescence CharacteristicsStatesShell thickness (mm)Thick(>2)DichogamyProtroandrousPacking tissue thicknessThinInitiation of 10% Female floweringLateKernel CharacteristicsStatesSumber of male catkins per clusterIntermediateKernel percentageMedium(6-10)Mumber of female flowers per clusterLow(<2)	Leaflet colour	Dark green	Nut weight (g)	Medium (15-20)
Rachis persistancecIntermediateShell colourLightTime of leaf fallMidShell strengthIntermediateWhoot pubescenceSlightly pubescentShell sealVery StrongWhoot colourBrownShell integrityStrongInforescence CharacteristicsStatesShell thickness (mm)Thick(>2)DichogamyProtroandrousPacking tissue thicknessThinInitiation of 10% Female floweringLateKernel CharacteristicsStatesNumber of male catkins per clusterIntermediateKernel weight (g)Medium(6-10)Mumber of female flowers per clusterLow(<2)	Leaf serration	Absent		Strong
Time of leaf fallMidShell strengthIntermediatehoot pubescenceSlightly pubescentShell sealVery Stronghoot colourBrownShell integrityStrongnflorescence CharacteristicsStatesShell thickness (mm)Thick(>2)DichogamyProtroandrousPacking tissue thicknessThinnitiation of 10% Female floweringLateKernel CharacteristicsStatesNumber of male catkins per clusterIntermediateKernel weight (g)Medium(6-10)Number of female flowers per clusterLow(<2)	Rachis colour	Green	Shell surface	Rough
Shoot pubescenceSlightly pubescentShell sealVery Strongshoot colourBrownShell integrityStrongInflorescence CharacteristicsStatesShell thickness (mm)Thick(>2)DichogamyProtroandrousPacking tissue thicknessThinDichogamyLateKernel CharacteristicsStatesNumber of male catkins per clusterIntermediateKernel weight (g)Medium(6-10)Number of female flowers per clusterLow(<2)	Rachis persistancec	Intermediate	Shell colour	Light
shoot colourBrownShell integrityStronginflorescence CharacteristicsStatesShell thickness (mm)Thick(>2)DichogamyProtroandrousPacking tissue thicknessThinDichogamyLateKernel CharacteristicsStatesNumber of male catkins per clusterIntermediateKernel weight (g)Medium(6-10)Number of female flowers per clusterLow(<2)Kernel percentageMedium(40-50)	Time of leaf fall	Mid	Shell strength	Intermediate
InformationIntermediateIntermediateInformationStatesShell thickness (mm)Thick(>2)DichogamyProtroandrousPacking tissue thicknessThinDichogamyProtroandrousPacking tissue thicknessThinDichogamyLateKernel CharacteristicsStatesNumber of male catkins per clusterIntermediateKernel weight (g)Medium(6-10)Number of female flowers per clusterLow(<2)	Shoot pubescence	Slightly pubescent	Shell seal	Very Strong
Image: Constraint of the second sec	Shoot colour	Brown	Shell integrity	Strong
thicknessthicknessinitiation of 10% Female floweringLateKernel CharacteristicsStatesNumber of male catkins per clusterIntermediateKernel weight (g)Medium(6-10)Number of female flowers per clusterLow(<2)	Inflorescence Characteristics	States		Thick(>2)
CharacteristicsJumber of male catkins per clusterIntermediateKernel weight (g)Medium(6-10)Jumber of female flowers per clusterLow(<2)	Dichogamy	Protroandrous	-	Thin
Jumber of female flowers per clusterLow(<2)Kernel percentageMedium(40-50)	Initiation of 10% Female flowering	Late		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)
tigma colour Yellow Kernel veins (%) High(>40)	Stigma colour	Yellow	Kernel veins (%)	High(>40)
Iull dehiscence     Partly-dehiscent     Kernel plumpness     Plumpy	Hull dehiscence	Partly-dehiscent	Kernel plumpness	Plumpy
Ease of removal of Easy kernel halves				Easy
Kernel colour Light			Kernel colour	Light



CITH-WALNUT-26			
Genus-Species: Juglans regia 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 persistancec	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



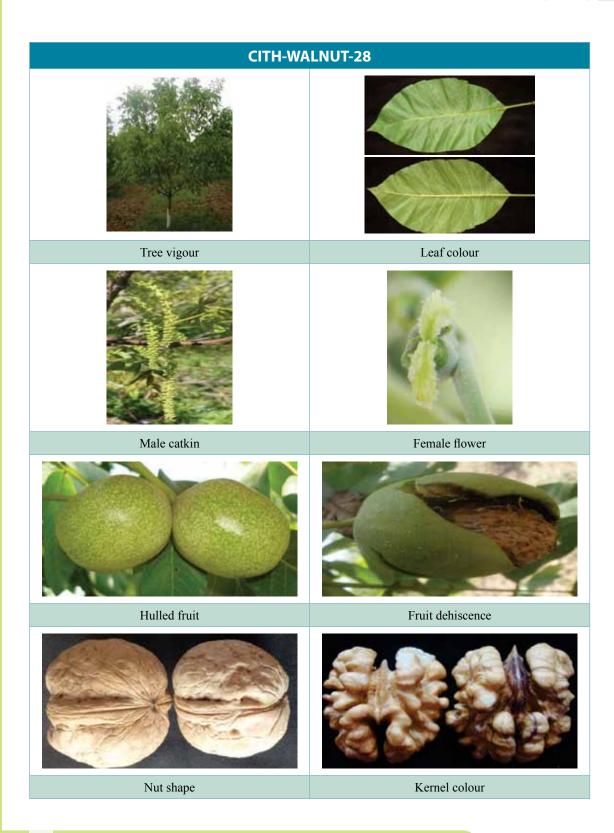
## **CITH-WALNUT-27** Genus-Species: Juglans regia L Accession No.IC-561056 **Tree Characteristics States** Fruit / Nut **States** Characteristics High(>100) Nut Shape Broad ovate Vigour (cm) Growth habit Spreading Shape in cross section Round Density of branches Intermediate Shape of base Rounded perpendicular to suture Bearing habit Terminal Shape of apex Rounded perpendicular to suture Leaf Characteristics States Prominence of apical Medium tip Medium(10-15) Nut: Position of pad on Leaflet length (cm) 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 Prominence Weak Absent of pad on suture Rachis colour Green Shell surface Medium Rachis persistancec Intermediate Shell colour Medium Intermediate Time of leaf fall Mid Shell strength Glabrous Weak Shoot pubescence Shell seal 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 Intermediate Medium(6-10) Number of male catkins per cluster Kernel weight (g) 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 Easy kernel halves Kernel colour Light



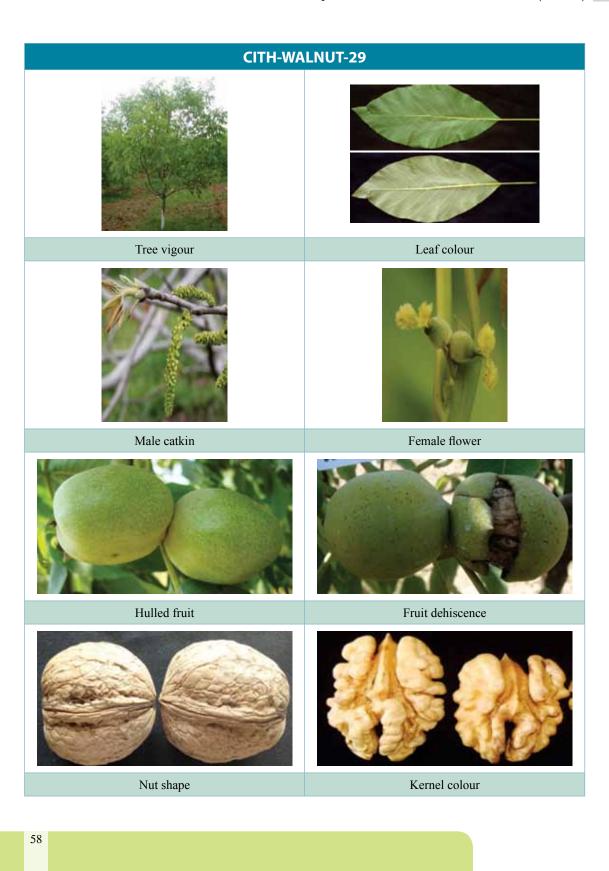
Nut shape

Kernel colour

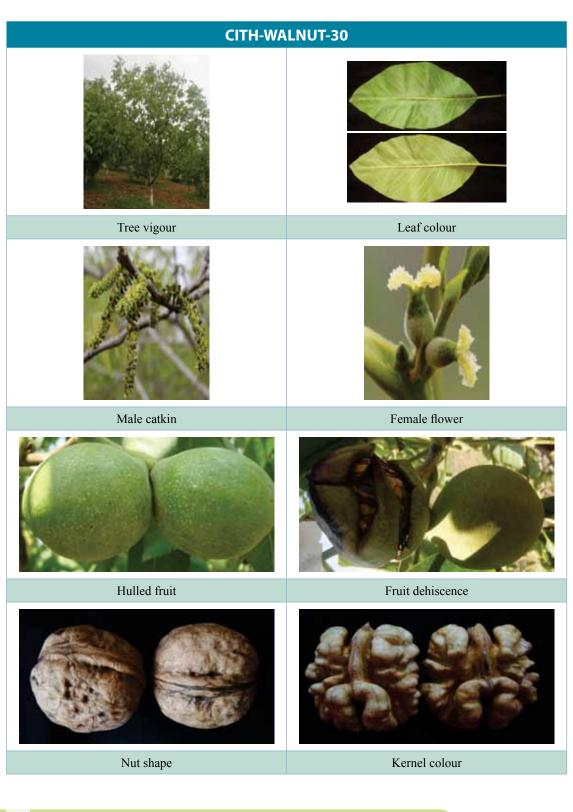
CITH-WALNUT-28			
Genus-Species: Juglans regia L			
Accession No.IC-0617694			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	Intermediate (50- 100)	Nut Shape	Round
Growth habit	Spreading	Shape in cross section	Oblate
Density of branches	Intermediate	Shape of base perpendicular 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 persistancec	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	Slony-dehiscent	Kernel plumpness	Plumpy
		Ease of removal of kernel halves	Easy
		Kernel colour	Amber



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

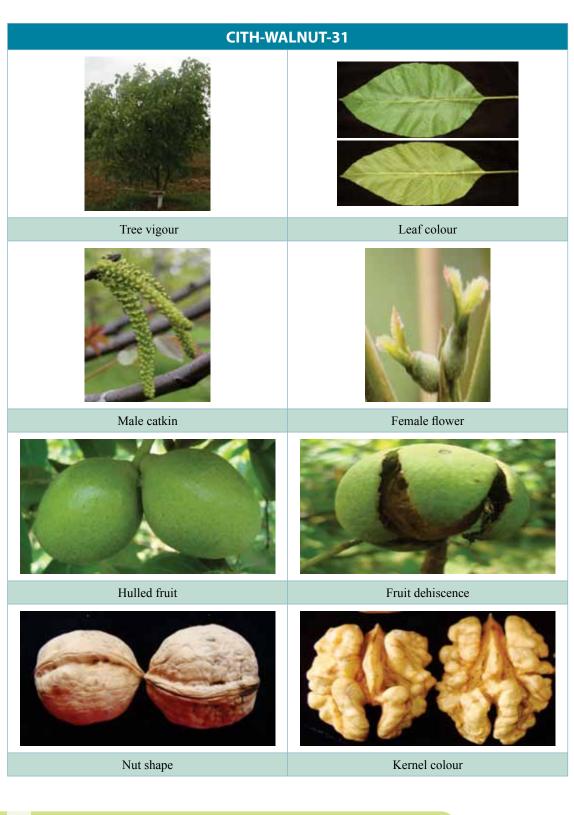


CITH-WALNUT-30			
Genus-Species: Juglans regia L			
Accession No.IC-622812			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	Intermediate (50- 100)	Nut shape	Ovate
Growth habit	Semi Erect	Shape in cross section	Oblate
Density of branches	Intermediate	Shape of base perpendicular 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 persistancec	Intermediate	Shell colour	Medium
Time of leaf fall	Mid	Shell strength	Intermediate
Shoot pubescence	Glabrous	Shell seal	Strong
Shoot colou	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



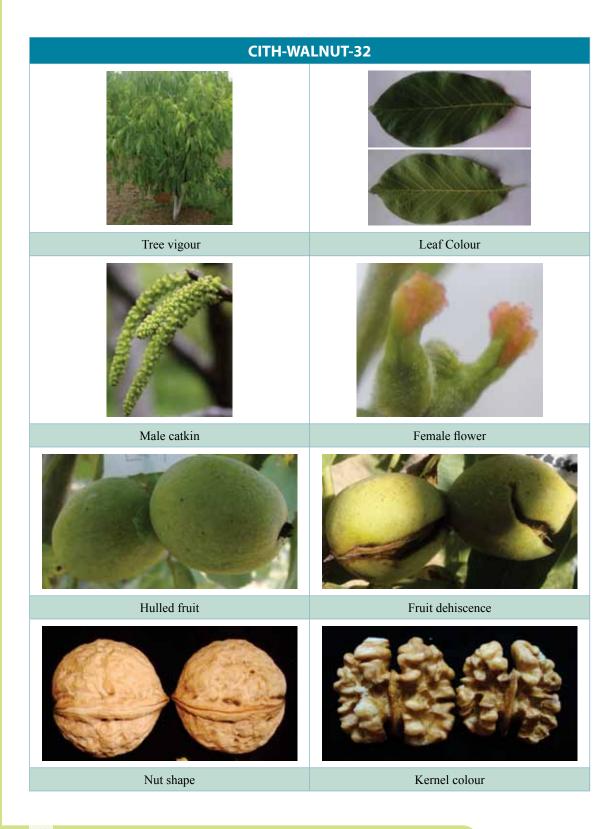
CITH-WALNUT-31	
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Genus-Species: Juglans regia L			
Accession No.IC-587352			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour(cm)	High(>100)	Nut shape	Elliptic
Growth habit	Semi Erect	Shape in cross section	Elliptic
Density of branches	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 persistancec	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

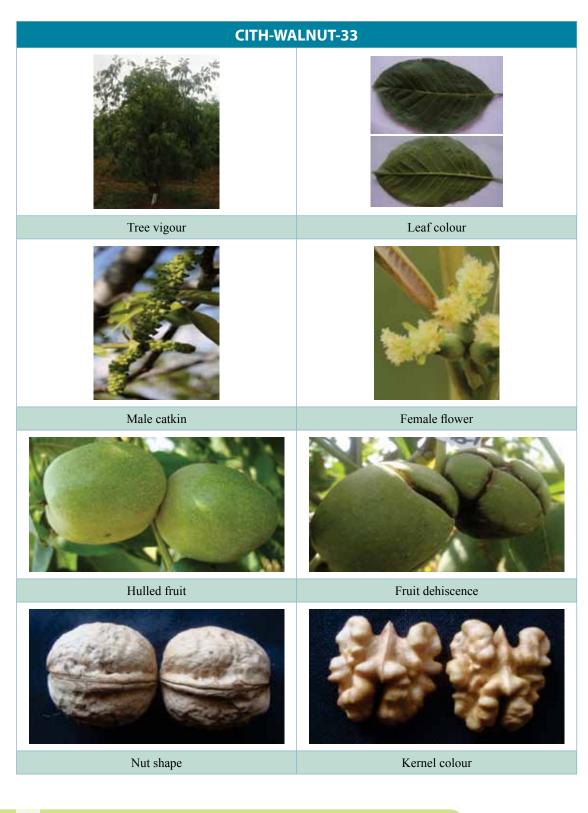


CITH-	WALNUT-32	
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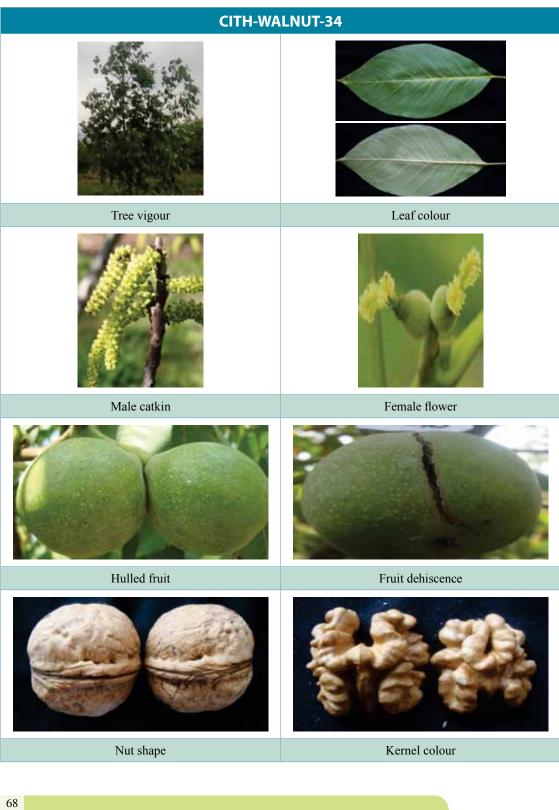
Genus-Species: Juglans regia L			
Accession No.IC-587160			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	High(>100)	Nut Shape	Broad Elliptic
Growth habit	Semi Erect	Shape in cross section	Oblong
Density of branches	Intermediate	Shape of base perpendicular to suture	Rounded
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



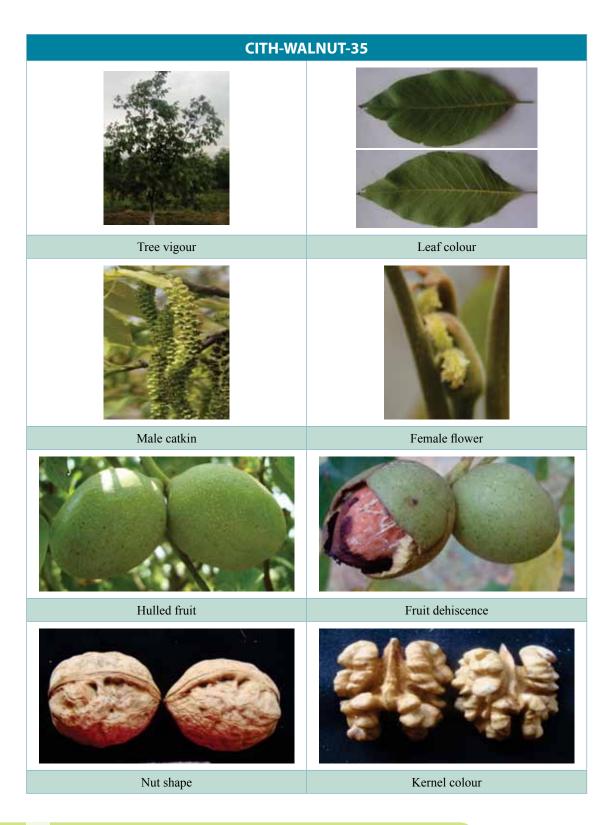
	CITH-WALNUT	<b>Г-33</b>	
Genus-Species: Juglans regia L			
Accession No.IC-561052			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	Intermediate (50- 100)	Nut Shape	Ovate
Growth habit	Semi Erect	Shape in cross section	Oblate
Density of branches	Intermediate	Shape of base perpendicular 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



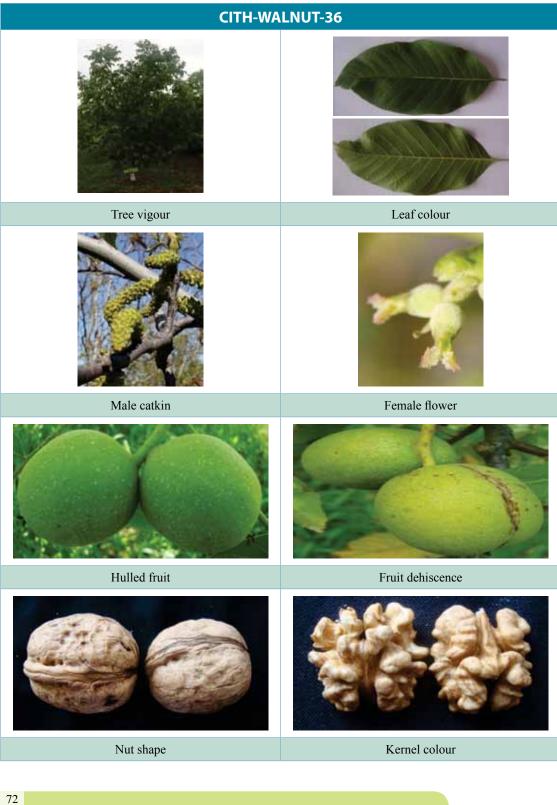
	CITH-WALNU	Г-34	
Genus-Species: Juglans regia L			
Accession No.IC-0617695			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	Intermediate (50- 100)	Nut Shape	Ovate
Growth habit	Semi Erect	Shape in cross section	Oblate
Density of branches	Dense	Shape of base perpendicular to 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



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 persistancec	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

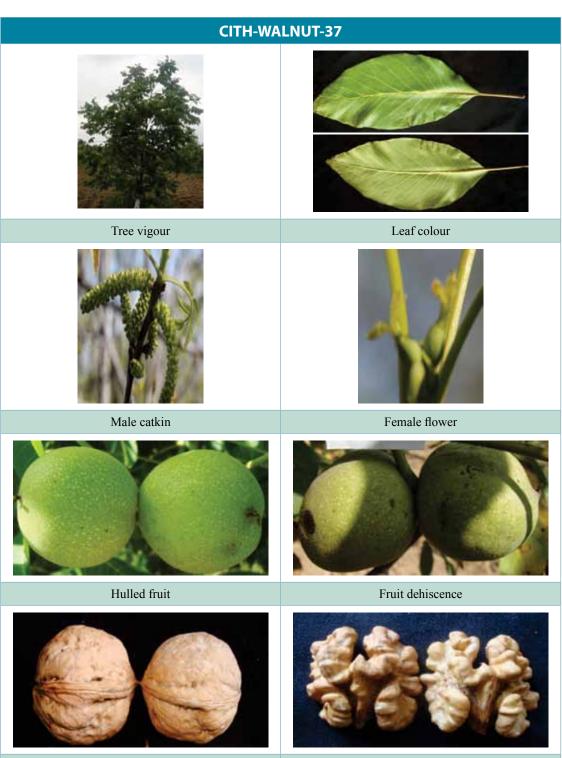


Genus-Species: Juglans regia L     Accession No.IC-587154   Fruit / Nut Characteristics   States     Tree Characteristics   States   Fruit / Nut Characteristics   States     Vigour (cm)   Intermediate (50-100)   Nut Shape   Ovate     Growth habit   Spreading   Shape of base perpendicular to suture   Truncate     Bearing habit   Terminal   Shape of apex perpendicular to suture   Truncate     Bearing habit   Terminal   Shape of apex perpendicular to suture   Truncate     Leaf Characteristics   States   Prominence of apical to suture   Strong     Leaf let length (cm)   Long(>15)   Position of pad on suture   On upper half of nut     Leaflet length (cm)   Light green   Nut weight (g)   Medium(15-20)     Leaflet shape   Elliptic   Nut weight (g)   Medium (15-20)     Leaflet solour   Light green   Nut weight (g)   Medium     Rachis colour   Green   Shell surface   Medium     Rachis colour   Green   Shell surface   Medium     Shoot pubescence   Slightly pubescent   Shell seragit   Strong     Shoot oclour	CITH-WALNUT-36			
Tree CharacteristicsStatesFruit / Nut CharacteristicsStatesVigour (cm)Intermediate (50- 100)Nut ShapeOvateGrowth habitSpreadingShape in cross sectionOblateDensity of branchesIntermediateShape of base perpendicular to sutureTruncateBearing habitTerminalShape of apex perpendicular to sutureTruncateLeaf CharacteristicsStatesProminence of apical tipStrongLeaflet length (cm)Long(>15)Position of pad on sutureOn upper half of nutLeaflet length (cm)Light greenNut length (mm)Large(>40)Leaflet olourLight greenNut weight (g)Medium(15-20)Leaflet olourGreenShell surfaceMediumRachis colourGreenShell surfaceMediumTime of leaf fallMidShell strengthIntermediateShoot colourBrownShell surfaceMediumTime of leaf fallMidShell surfacesVery hickShoot colourBrownShell integrityStrongInflorescence CharacteristicsStatesShell thickness (mm)HinDichogamyProtoandrousPacking tissue thicknessVery hickInitiation of 10% Female floweringEarlyKernel CharacteristicsStatesNumber of male catkins per clusterIntermediateKernel pumpnessHumpyNumber of female floweringEarlyKernel pumpnessHumpyNumber of female flowering per cluste	Genus-Species: Juglans regia L			
Intermediate (50- 100)Nut ShapeOvateGrowth habitSpreadingShape in cross sectionOblateDensity of branchesIntermediateShape of base perpendicular to sutureTruncateBearing habitTerminalShape of apex perpendicular to sutureTruncateBearing habitEafCharacteristicsStatesProminence of apical tipStrongLeaf CharacteristicsLong(>15)Position of pad on sutureOn upper half of nutLeaf shapeEllipticNut diameter (mm)Medium(30-40)Leaflet length (cm)Light greenNut weight (g)Medium(15-20)Leaflet colourLight greenNut weight (g)Medium(15-20)Leaf shapeIntermediateShell surfaceMediumRachis colourGreenShell surfaceMediumTime of leaf fallMidShell surfaceMediumShoot colourBrownShell surfaceStrongShoot colourBrownShell integrityStrongInition of 10% Female floweringEarlyKernel CharacteristicsStatesNumber of male cakins per clusterIntermediateKernel weight (g)Medium(40-50)Number of finale floweringEarlyKernel weight (g)Medium(40-50)Number of finale floweringEarlyKernel weight (g)Medium(40-50)Number of finale floweringEarlyKernel weight (g)Medium(40-50)Number of finale floweringIntermediateKernel weight (g)Medium(40-50)	Accession No.IC-587154			
100)InterventionGrowth habitSpreadingShape in cross sectionOblateDensity of branchesIntermediateShape of base perpendicular to sutureTruncateBearing habitTerminalShape of apex perpendicular to sutureTruncateLeaf CharacteristicsStatesProminece of apical tipStrongLeaf let length (cm)Long(>15)Position of pad on sutureOn upper half of nutLeaf shapeEllipticNut diameter (mm)Medium(30-40)Leaflet colourLight greenNut length (mm)Izrge(>40)Leaf serrationAbsentProminece of pad on sutureStrongRachis colourGreenShell surfaceMedium(15-20)Rachis persistancecIntermediateShell colourMediumTime of leaf fallMidShell surfaceMediumShoot colourStrongStrongStrongInderescence CharacteristicsStatesShell integrityStrongShoot colourBrownShell sealStrongIndicoscenceStatesShell thickness (mm)HinDichogamyProtoandrousPacking tissue thicknesVery thickNumber of male cakins per clusterIntermediateKernel VeracteristicsStatesNumber of female flowers per clusterLow (<2)Kernel PercentageMedium(4-0)Number of female flowers per clusterLow (<2)Kernel PercentageMedium(4-0)Number of female flowers per clusterLow (<2)Kernel Percenta	Tree Characteristics	States		States
Density of branchesIntermediateShape of base perpendicular to sutureTruncateBearing habitTerminalShape of apex perpendicular to sutureTruncateLeaf CharacteristicsStatesProminence of apical tipStrongLeaflet length (cm)Long(>15)Position of pad on sutureOn upper half of nutLeaflet length (cm)EnlipticNut diameter (mm)Medium(30-40)Leaflet marginEntireNut length (mm)Large(>40)Leaflet colourLight greenNut weight (g)Medium(15-20)Leaf serrationAbsentProminence of pad on sutureStrongRachis colourGreenShell surfaceMediumTime of leaf fallMidShell strengthIntermediateShoot colourBrownShell integrityStrongInflorescence CharacteristicsStatesShell thickness (mm)thinDichogamyProtondrousPacking tissue thicknessVery thickInitiation of 10% Female floweringEarlyKernel Veright (g)Medium(40-50)Number of male catkins per clusterIntermediateKernel weight (g)Medium(40-50)Stigma colourRedKernel veins (%)Low (<30)	Vigour (cm)		Nut Shape	Ovate
Indexperpendicular to sutureBearing habitTerminalShape of apex perpendicular to sutureTruncateLeaf CharacteristicsStatesProminence of apical ipStrongLeaf characteristicsLong(>15)Position of pad on sutureOn upper half of nutLeaf shapeEllipticNut diameter (mm)Medium(30-40)Leaf shapeEntireNut length (mm)Large(>40)Leaflet colourLight greenNut weight (g)Medium(15-20)Leaf serrationGreenStell surfaceMediumRachis colourGreenShell surfaceMediumShoot pubescenceSightly pubescentStell surfaceMediumShoot colourStightly pubescentShell strengthStrongShoot colourFrongStrongStrongIntermediateShell integrityStrongShoot colourFrongStrongShoot colourFrongStrongShoot colourFrongStrongIntermediateShell integrityStrongShoot colourFrongStrongShoot colourFrongStrongShoot colourFrongStrongIntermediateShell integrityStrongShoot colourFrongStrongShoot colourFrongStrongShoot colourStrongStrongShoot colourFrongStrongShoot colourStrongStrongShoot colourStrongStrongShoo	Growth habit	Spreading	Shape in cross section	Oblate
Leaf CharacteristicsStatesperpendicular to sutureLeaf CharacteristicsStatesProminence of apical tipStrongLeaflet length (cm)Long(>15)Position of pad on sutureOn upper half of nutLeaf shapeEllipticNut diameter (mm)Medium(30-40)Leaflet marginEntireNut length (mm)Large(>40)Leaflet colourLight greenNut weight (g)Medium(15-20)Leaf serrationAbsentProminence of pad on sutureStrongRachis colourGreenShell surfaceMediumTime of leaf fallMidShell colourMediumShoot colourBrownShell strengthIntermediateShoot colourBrownShell lintegrityStrongInitiation of 10% Female floweringEarlyKernel CharacteristicsStatesNumber of female flowers per clusterLow (<2)	Density of branches	Intermediate		Truncate
indexipinLeaflet length (cm)Long(>15)Position of pad on sutureOn upper half of nutLeaf shapeEllipticNut diameter (mm)Medium(30-40)Leaflet marginEntireNut length (mm)Large(>40)Leaflet colourLight greenNut weight (g)Medium(15-20)Leaf serrationAbsentProminence of pad on sutureStrongRachis colourGreenShell surfaceMediumRachis persistancecIntermediateShell colourMediumShoot pubescenceSlightly pubescentShell sealStrongShoot colourBrownShell strengthHinDichogamyProtoandrousPacking tissue thicknessVery thickNumber of male flowers per clusterIntermediateKernel CharacteristicsStatesNumber of female flowers per clusterLow (<2)	Bearing habit	Terminal	1 1	Truncate
Leaf shapeEllipticsuturenutLeaf shapeEllipticNut diameter (mm)Medium(30-40)Leaflet marginEntireNut length (mm)Large(>40)Leaflet colourLight greenNut weight (g)Medium(15-20)Leaf serrationAbsentProminence of pad on sutureStrongRachis colourGreenShell surfaceMediumTime of leaf fallMidShell strengthIntermediateShoot pubescenceSlightly pubescentShell sealStrongShoot colourBrownShell integrityStrongInflorescence CharacteristicsStatesShell thickness (mm)thinDichogamyProtoandrousPacking tissue thicknesVery thickNumber of male catkins per clusterIntermediateKernel PercentageMedium(6-10)Number of female floweringRedKernel seins (%)Low (<30)	Leaf Characteristics	States		Strong
Leaflet marginEntireNut length (mm)Large(>40)Leaflet colourLight greenNut weight (g)Medium(15-20)Leaf serrationAbsentProminence of pad on sutureStrongRachis colourGreenShell surfaceMediumRachis persistancecIntermediateShell colourMediumTime of leaf fallMidShell strengthIntermediateShoot pubescenceSlightly pubescentShell sealStrongShoot colourBrownShell integrityStrongInflorescence CharacteristicsStatesShell thickness (mm)thinDichogamyProtoandrousPacking tissue thicknessVery thickNumber of male catkins per clusterIntermediateKernel PercentageMedium(40-50)Stigma colourRedKernel percentageIow (<30)	Leaflet length (cm)	Long(>15)		**
Leaflet colourLight greenNut weight (g)Medium(15-20)Leaf serrationAbsentProminence of pad on sutureStrongRachis colourGreenShell surfaceMediumRachis persistancecIntermediateShell colourMediumTime of leaf fallMidShell strengthIntermediateShoot pubescenceSlightly pubescentShell sealStrongShoot colourBrownShell integrityStrongInflorescence CharacteristicsStatesShell thickness (mm)thinDichogamyProtoandrousPacking tissue thicknessVery thickInitiation of 10% Female floweringEarlyKernel CharacteristicsStatesNumber of female flowers per clusterLow (<2)	Leaf shape	Elliptic	Nut diameter (mm)	Medium(30-40)
Leaf serrationAbsentProminence of pad on sutureStrongRachis colourGreenShell surfaceMediumRachis persistancecIntermediateShell colourMediumTime of leaf fallMidShell strengthIntermediateShoot pubescenceSlightly pubescentShell sealStrongShoot colourBrownShell integrityStrongInflorescence CharacteristicsStatesShell thickness (mm)thinDichogamyProtoandrousPacking tissue thicknessVery thickInitiation of 10% Female floweringEarlyKernel CharacteristicsStatesNumber of male catkins per clusterIntermediateKernel veing (g)Medium(40-50)Stigma colourRedKernel veins (%)Low (<30)	Leaflet margin	Entire	Nut length (mm)	Large(>40)
InternationInternationInternationRachis colourGreenShell surfaceMediumRachis persistancecIntermediateShell colourMediumTime of leaf fallMidShell strengthIntermediateShoot pubescenceSlightly pubescentShell sealStrongShoot colourBrownShell integrityStrongInflorescence CharacteristicsStatesShell thickness (mm)thinDichogamyProtoandrousPacking tissue thicknessVery thickNumber of male catkins per clusterIntermediateKernel Weight (g)Medium(40-50)Stigma colourRedKernel veins (%)Low (<30)	Leaflet colour	Light green	Nut weight (g)	Medium(15-20)
Rachis persistanceIntermediateShell colourMediumTime of leaf fallMidShell strengthIntermediateShoot pubescenceSlightly pubescentShell sealStrongShoot colourBrownShell integrityStrongInflorescence CharacteristicsStatesShell thickness (mm)thinDichogamyProtoandrousPacking tissue thicknessVery thickNumber of male catkins per clusterIntermediateKernel PercentageMedium(6-10)Number of female flowers per clusterLow (<2)	Leaf serration	Absent		Strong
Time of leaf fallMidShell strengthIntermediateShoot pubescenceSlightly pubescentShell sealStrongShoot colourBrownShell integrityStrongInflorescence CharacteristicsStatesShell thickness (mm)thinDichogamyProtoandrousPacking tissue thicknessVery thickInitiation of 10% Female floweringEarlyKernel CharacteristicsStatesNumber of male catkins per clusterIntermediateKernel weight (g)Medium(6-10)Stigma colourRedKernel veins (%)Low (<30)	Rachis colour	Green	Shell surface	Medium
Shoot pubescenceSlightly pubescentShell sealStrongShoot colourBrownShell integrityStrongInflorescence CharacteristicsStatesShell thickness (mm)thinDichogamyProtoandrousPacking tissue thicknessVery thickInitiation of 10% Female floweringEarlyKernel CharacteristicsStatesNumber of male catkins per clusterIntermediateKernel weight (g)Medium(6-10)Number of female flowers per clusterLow (<2)	Rachis persistancec	Intermediate	Shell colour	Medium
Shoot colourBrownShell integrityStrongInflorescence CharacteristicsStatesShell thickness (mm)thinDichogamyProtoandrousPacking tissue thicknessVery thickInitiation of 10% Female floweringEarlyKernel CharacteristicsStatesNumber of male catkins per clusterIntermediateKernel weight (g)Medium(6-10)Number of female flowers per clusterLow (<2)	Time of leaf fall	Mid	Shell strength	Intermediate
Inflorescence CharacteristicsStatesShell thickness (mm)thinDichogamyProtoandrousPacking tissue thicknessVery thickInitiation of 10% Female floweringEarlyKernel CharacteristicsStatesNumber of male catkins per clusterIntermediateKernel weight (g)Medium(6-10)Number of female flowers per clusterLow (<2)	Shoot pubescence	Slightly pubescent	Shell seal	Strong
DichogamyProtoandrousPacking tissue thicknessVery thickInitiation of 10% Female floweringEarlyKernel CharacteristicsStatesNumber of male catkins per clusterIntermediateKernel weight (g)Medium(6-10)Number of female flowers per clusterLow (<2)	Shoot colour	Brown	Shell integrity	Strong
Initiation of 10% Female floweringEarlyKernel CharacteristicsStatesNumber of male catkins per clusterIntermediateKernel weight (g)Medium(6-10)Number of female flowers per clusterLow (<2)	Inflorescence Characteristics	States	Shell thickness (mm)	thin
Number of male catkins per clusterIntermediateKernel weight (g)Medium(6-10)Number of female flowers per clusterLow (<2)	Dichogamy	Protoandrous	Packing tissue thickness	Very thick
Number of female flowers per clusterLow (<2)Kernel percentageMedium(40-50)Stigma colourRedKernel veins (%)Low (<30)	Initiation of 10% Female flowering	Early	Kernel Characteristics	States
Stigma colour Red Kernel veins (%) Low (<30)   Hull dehiscence Dehiscent Kernel plumpness Plumpy   Ease of removal of kernel halves Easy Easy	Number of male catkins per cluster	Intermediate	Kernel weight (g)	Medium(6-10)
Hull dehiscence Dehiscent Kernel plumpness Plumpy   Ease of removal of kernel halves Easy	Number of female flowers per cluster	Low (<2)	Kernel percentage	Medium(40-50)
Ease of removal of Easy kernel halves	Stigma colour	Red	Kernel veins (%)	Low (<30)
kernel halves	Hull dehiscence	Dehiscent	Kernel plumpness	Plumpy
Kernel colour Light				Easy
			Kernel colour	Light



CITH-WALNUT-37	
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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 persistancec	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	<b>Kernel Characteristics</b>	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	

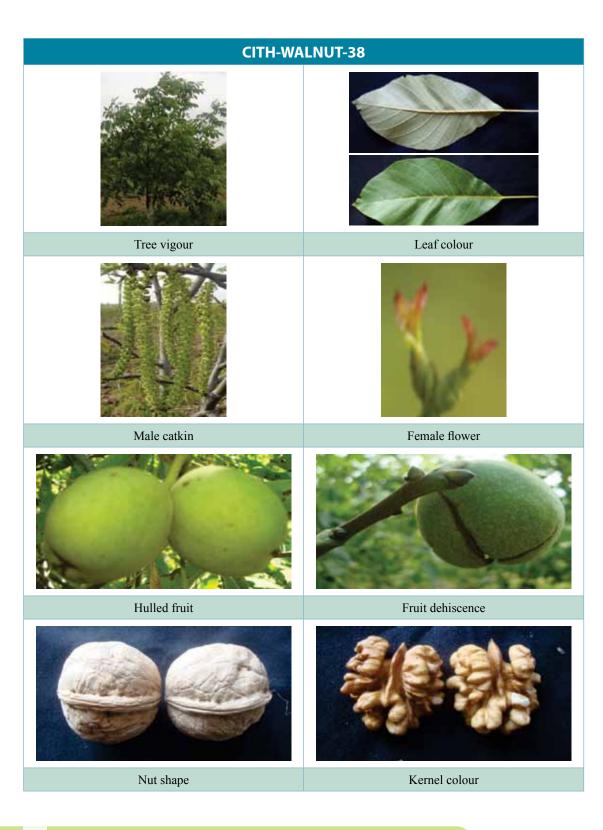


Nut shape

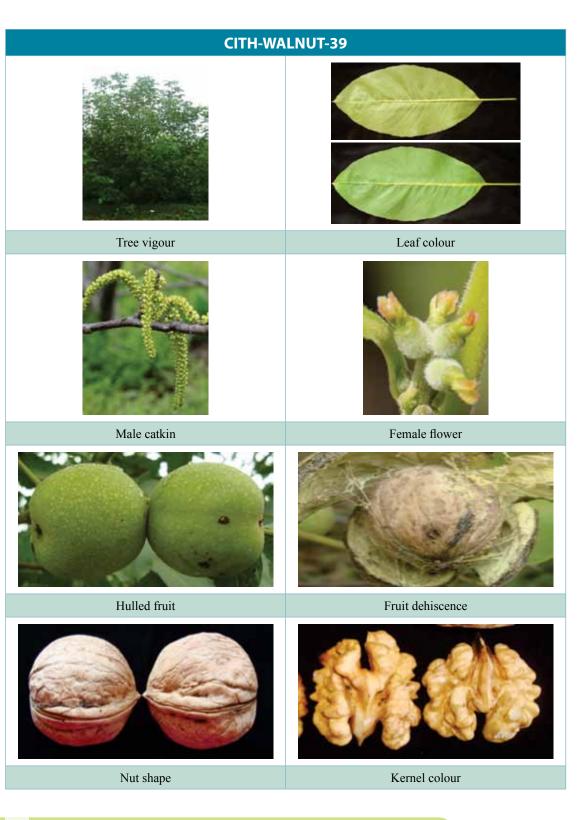
Kernel colour

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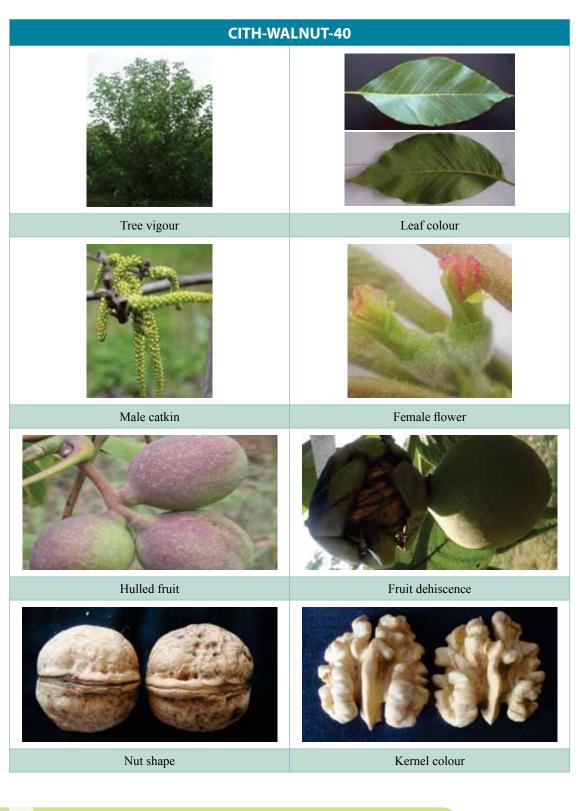
Genus-Species: Juglans regia L				
Accession No.IC-0617698				
Tree Characteristics	States	Fruit / Nut Characteristics	States	
Vigour(cm)	High(>100)	Nut Shape	Round	
Growth habit	Spreading	Shape in cross section	Oblate	
Density of branches	Intermediate	Shape of base perpendicular to suture	Rounded	
Bearing 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 persistancec	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	



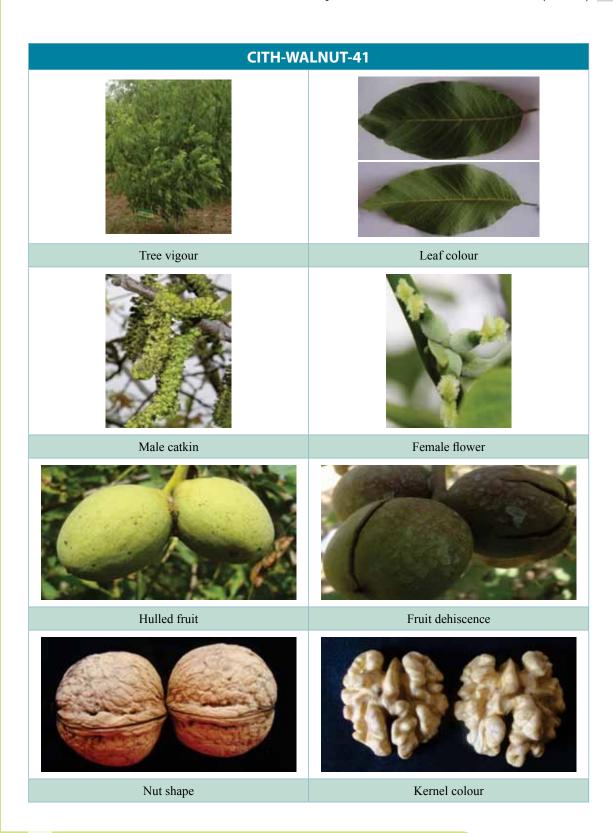
CITH-WALNUT-39			
Genus-Species: Juglans regia L			
Accession No.IC-587072			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour(cm)	Intermediate (50- 100)	Nut Shape	Broad ovate
Growth habit	Spreading	Shape in cross section	Round
Density of branches	Intermediate	Shape of base perpendicular 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 persistancec	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-WALNU	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 persistancec	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		

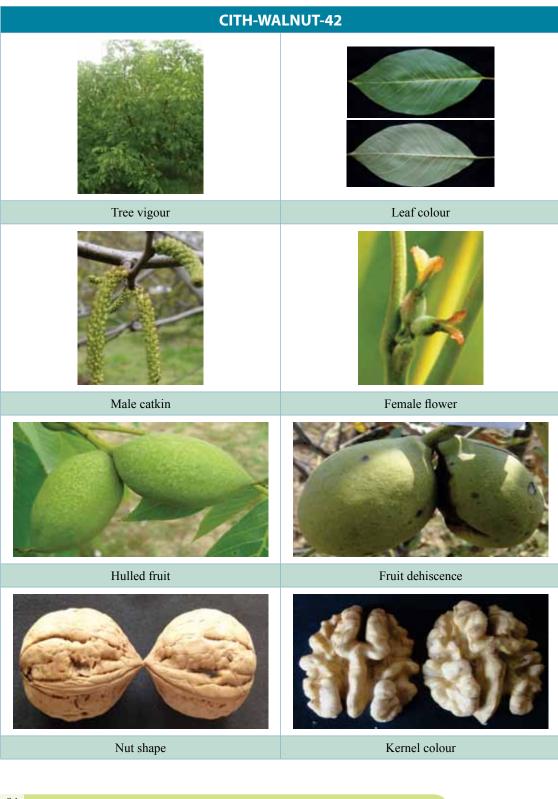


# **CITH-WALNUT-41** Genus-Species: Juglans regia L Accession No.IC-587231 **Tree Characteristics States** Fruit / Nut **States** Characteristics Low(<50) Nut Shape Broad Ovate Vigour (cm) Growth habit Spreading Shape in cross section Oblate Density of branches Intermediate Shape of base Rounded perpendicular to suture Bearing habit Terminal Shape of apex Rounded perpendicular to suture Leaf Characteristics States Prominence of apical Medium tip Medium (10-15) Position of pad on On upper 2/3 of nut Leaflet length (cm) suture Leaf shape Elliptic Nut diameter (mm) Medium (30-40) Leaflet margin Entire Large (>40) Nut length (mm) Leaflet colour Dark green Nut weight (g) Medium (15-20) Leaf serration Weak Absent Prominence of pad on suture Rachis colour Green Shell surface Rough Rachis persistancec 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 Easy kernel halves Kernel colour Amber

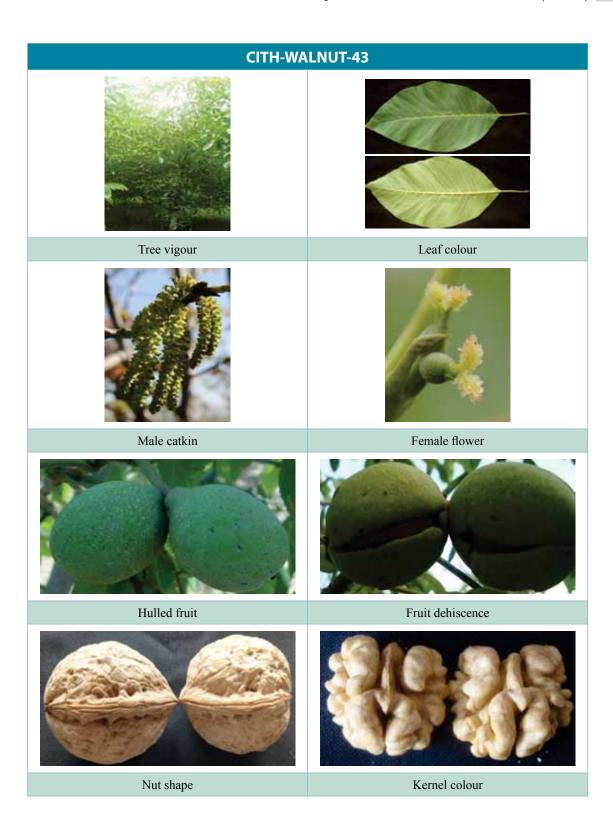


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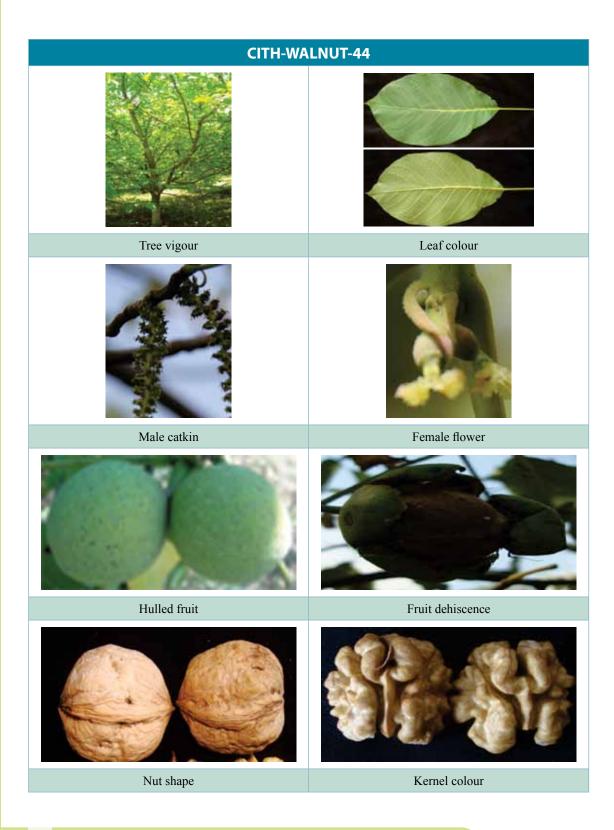
Genus-Species: Juglans regia L				
Accession No.IC-0622813				
Tree Characteristics	States	Fruit / Nut Characteristics	States	
Vigour(cm)	Intermediate (50- 100)	Nut Shape	Elliptic	
Growth habit	Semi Erect	Shape in cross section	Elliptic	
Density of branches	Dense	Shape of base perpendicular to suture	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 persistancec	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	



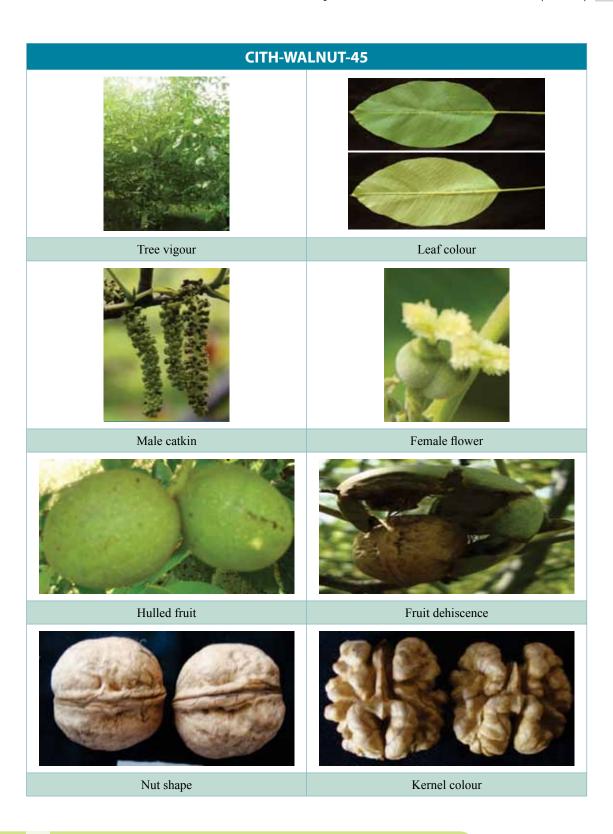
# **CITH-WALNUT-43** Genus-Species: Juglans regia L Accession No.IC-0617699 **Tree Characteristics** States Fruit / Nut **States** Characteristics Vigour(cm) Intermediate (50-Nut Shape Broad elliptic 100)Growth habit Semi Erect Round Shape in cross section Density of branches Intermediate Shape of base Rounded perpendicular to suture Bearing habit Terminal Shape of apex Rounded perpendicular to suture Leaf Characteristics States Prominence of apical On whole length tip Leaflet length (cm) Medium(10-15) Position of pad on Weak suture 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 Prominence Absent Strong of pad on suture Rachis colour Yellow Shell surface Rough Intermediate Shell colour Medium Rachis persistancec 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 Kernel weight (g) Medium(6-10) Heavy Medium Kernel percentage Number of female flowers per cluster Medium(40-50) Stigma colour Green Kernel veins (%) Low(<30) Hull dehiscence Partly-dehiscent Kernel plumpness Plumpy Ease of removal of Easy kernel halves Kernel colour Amber



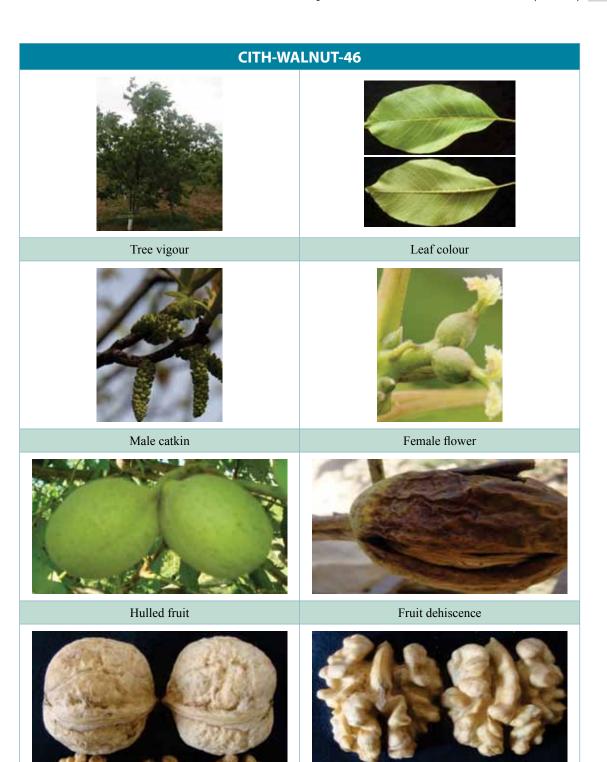
### **CITH-WALNUT-44** Genus-Species: Juglans regia L Accession No.IC-587113 **Tree Characteristics States** Fruit / Nut **States** Characteristics Low(<50) Nut Shape Short trapezoid Vigour(cm) Growth habit Semi Erect Shape in cross section Oblate Density of branches Intermediate Shape of base Truncate perpendicular to suture Bearing habit Terminal Shape of apex Rounded perpendicular to suture Leaf Characteristics States Prominence of apical Medium tip Medium(10-15) Position of pad on On upper half of Leaflet length (cm) suture 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 strong of pad on suture Rachis colour Green Shell surface Medium Rachis persistancec 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)Medium(2-4) Kernel percentage Number of female flowers per cluster Medium(40-50) Green Stigma colour Kernel veins (%) Medium(30-40) Hull dehiscence Partly-dehiscent Kernel plumpness Plumpy Ease of removal of Easy kernel halves Kernel colour Light



Genus-Species: Juglans regia 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 persistancec	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



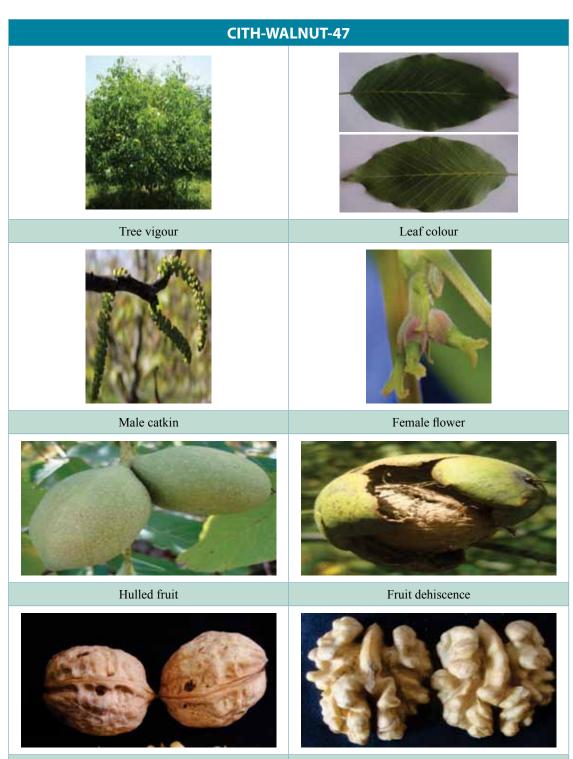
Accession No.IC-50617700StatesFruit / Nut CharacteristicsStatesTree CharacteristicsStatesFruit / Nut CharacteristicsStatesVigour(cm)Intermediate (50- 100)Nut ShapeShort trapezoidGrowth habitSpreadingShape of asse perpendicular to sutureOblateDensity of branchesDenseShape of apex perpendicular to sutureFruncateBearing habitTerminalShape of apex perpendicular to sutureEmarginatedLeaf CharacteristicsStatesProminence of apical tipMediumLeaflet length (cm)Medium(10-15)Position of pad on sutureOn upper 2/3 of nut sutureLeaflet length (cm)EntrieNut diameter (mm)Large(>40)Leaflet colourDark greenNut weight (g)Medium(15-20)Leaflet colourGreenShell surfaceMediumRachis colourGreenShell surfaceMediumShoot pubescenceSlightly pubescentShell sealStrongShoot colourBrownShell strengthStrongInforescence CharacteristicsStatesShell integrityStrongInforescence CharacteristicsStatesShell thickness (mm)MediumDichogamyProtogynousPacking tissue thicknessMedium	CITH-WALNUT-46			
Tree CharacteristicsStatesFruit / Nut CharacteristicsStatesVigour(cm)Intermediate (50- 100)Nut ShapeShort trapezoidGrowth habitSpreadingShape in cross sectionOblateDensity of branchesDenseShape of base perpendicular to sutureTruncateBearing habitTerminalShape of apex perpendicular to sutureEmarginatedLeaf CharacteristicsStatesProminence of apical tipMediumLeaffet length (cm)Medium(10-15)Position of pad on sutureOn upper 2/3 of nut sutureLeaflet colourEllipticNut diameter (mm)Large(>40)Leaffet colourDark greenNut weight (g)Medium(15-20)Leaf shapeEllipticNut weight (g)MediumLeaflet colourGreenShell surfaceMediumRachis colourGreenShell surfaceMediumTime of leaf fallMidShell strengthIntermediateShoot pubescenceSlightly pubescentShell strengthStrongShoot colourBrownShell integrityStrongInforescence CharacteristicsStatesShell thickness (mm)MediumDichogamyProtogynousPacking tissue thicknessMediumInitiation of 10% Female floweringEarlyKernel CharacteristicsStates	Genus-Species: Juglans regia L			
Intermediate (50- 100)CharacteristicsShort trapezoidVigour(cm)Intermediate (50- 100)Nut ShapeShort trapezoidGrowth habitSpreadingShape of base perpendicular to sutureOblateDensity of branchesDenseShape of base perpendicular to sutureTruncateBearing habitTerminalShape of apex perpendicular to sutureMediumLeaf CharacteristicsStatesProminence of apical tipMediumLeaflet length (cm)Medium(10-15)Position of pad on sutureOn upper 2/3 of nut sutureLeaflet colourEntireNut diameter (mm)Large(>40)Leaflet colourDark greenNut weight (g)Medium(15-20)Leaf serrationGreenShell surfaceMediumRachis colourGreenShell surfaceMediumTime of leaf fallMidShell strengthIntermediateShoot pubescenceSlightly pubescentShell strengthStrongShoot colourBrownShell integrityStrongInforescence CharacteristicsStatesShell thickness (mm)MediumDichogamyProtogynousPacking tissue thicknessMediumInitiation of 10% Female floweringEarlyKernel CharacteristicsStates	Accession No.IC-50617700			
100)IntermediateIntermediateGrowth habitSpreadingShape in cross sectionOblateDensity of branchesDenseShape of base perpendicular to sutureTruncateBearing habitTerminalShape of apex perpendicular to sutureEmarginatedLeaf CharacteristicsStatesProminence of apical tipMediumLeaf length (cm)Medium(10-15)Position of pad on sutureOn upper 2/3 of nut sutureLeaf shapeEllipticNut diameter (mm)Large(>40)Leaflet colourDark greenNut weight (g)Medium(15-20)Leaf shareccolourGreenShell surfaceMediumRachis colourGreenShell surfaceMediumTime of leaf fallMidShell strengthIntermediateShoot colourBrownShell sitesStrongInflorescence CharacteristicsStatesShell thickness (mm)MediumDichogamyProtogynousPacking tissue thicknessMediumInitiation of 10% Female floweringEarlyKernel CharacteristicsStates	Tree Characteristics	States		States
Density of branchesDenseShape of base perpendicular to sutureTruncateBearing habitTerminalShape of apex perpendicular to sutureEmarginatedLeaf CharacteristicsStatesProminence of apical tipMediumLeaflet length (cm)Medium(10-15)Position of pad on sutureOn upper 2/3 of nut sutureLeaf shapeEllipticNut diameter (mm)Large(>40)Leaflet narginEntireNut length (mm)Large(>40)Leaflet colourDark greenNut weight (g)Medium(15-20)Leaf serrationGreenShell surfaceMediumRachis colourGreenShell surfaceMediumTime of leaf fallMidShell strengthIntermediateShoot colourBrownShell integrityStrongShoot colourProtogynousShell integrityStrongInflorescence CharacteristicsStatesShell thickness (mm)MediumDichogamyProtogynousPacking tissue thicknessMediumInitiation of 10% Female floweringEarlyKernel CharacteristicsStates	Vigour(cm)	•	Nut Shape	Short trapezoid
Image: series of the series	Growth habit	Spreading	Shape in cross section	Oblate
Image: constraint of the second sec	Density of branches	Dense	-	Truncate
ipipLeaflet length (cm)Medium(10-15)Position of pad on sutureOn upper 2/3 of nut sutureLeaf shapeEllipticNut diameter (mm)Large(>40)Leaflet marginEntireNut length (mm)Large(>40)Leaflet colourDark greenNut weight (g)Medium(15-20)Leaf serrationAbsentProminence of pad on sutureStrongRachis colourGreenShell surfaceMediumImernediateShell colourLightTime of leaf fallMidShell strengthIntermediateShoot pubescenceSlightly pubescentShell strengthStrongShoot colourBrownShell integrityStrongInflorescence CharacteristicsStatesShell thickness (mm)MediumDichogamyProtogynousPacking tissue thicknessMediumInitiation of 10% Female floweringEarlyKernel CharacteristicsStates	Bearing habit	Terminal	1 1	Emarginated
Leaf shapeEllipticNut diameter (mm)Large(>40)Leaflet marginEntireNut length (mm)Large(>40)Leaflet colourDark greenNut weight (g)Medium(15-20)Leaf serrationAbsentProminence of pad on sutureStrongRachis colourGreenShell surfaceMediumTime of leaf fallMidShell strengthIntermediateShoot pubescenceSlightly pubescentShell sealStrongShoot colourBrownShell integrityStrongInflorescence CharacteristicsStatesShell thickness (mm)MediumDichogamyProtogynousPacking tissue thicknessStatesInitiation of 10% Female floweringEarlyKernel CharacteristicsStates	Leaf Characteristics	States		Medium
Leaflet marginEntireNut length (mm)Large(>40)Leaflet colourDark greenNut weight (g)Medium(15-20)Leaf serrationAbsentProminence of pad on sutureStrongRachis colourGreenShell surfaceMediumRachis persistancecIntermediateShell colourLightTime of leaf fallMidShell strengthIntermediateShoot pubescenceSlightly pubescentShell strengthStrongInflorescence CharacteristicsStatesShell thickness (mm)MediumDichogamyProtogynousPacking tissue thicknessMediumInitiation of 10% Female floweringEarlyKernel CharacteristicsStates	Leaflet length (cm)	Medium(10-15)	-	On upper 2/3 of nut
Leaflet colourDark greenNut weight (g)Medium(15-20)Leaf serrationAbsentProminence of pad on sutureStrongRachis colourGreenShell surfaceMediumRachis persistancecIntermediateShell colourLightTime of leaf fallMidShell strengthIntermediateShoot pubescenceSlightly pubescentShell sealStrongShoot colourBrownShell integrityStrongInflorescence CharacteristicsStatesShell thickness (mm)MediumDichogamyProtogynousPacking tissue thicknessMediumInitiation of 10% Female floweringEarlyKernel CharacteristicsStates	Leaf shape	Elliptic	Nut diameter (mm)	Large(>40)
Leaf serrationAbsentProminence of pad on sutureStrongRachis colourGreenShell surfaceMediumRachis persistancecIntermediateShell colourLightTime of leaf fallMidShell strengthIntermediateShoot pubescenceSlightly pubescentShell sealStrongShoot colourBrownShell integrityStrongInflorescence CharacteristicsStatesShell thickness (mm)MediumDichogamyProtogynousPacking tissue thicknessMediumInitiation of 10% Female floweringEarlyKernel CharacteristicsStates	Leaflet margin	Entire	Nut length (mm)	Large(>40)
Achis colourGreenof pad on sutureRachis colourGreenShell surfaceMediumRachis persistancecIntermediateShell colourLightTime of leaf fallMidShell strengthIntermediateShoot pubescenceSlightly pubescentShell sealStrongShoot colourBrownShell integrityStrongInflorescence CharacteristicsStatesShell thickness (mm)MediumDichogamyProtogynousPacking tissue thicknessMedium	Leaflet colour	Dark green	Nut weight (g)	Medium(15-20)
Rachis persistancecIntermediateShell colourLightTime of leaf fallMidShell strengthIntermediateShoot pubescenceSlightly pubescentShell sealStrongShoot colourBrownShell integrityStrongInflorescence CharacteristicsStatesShell thickness (mm)MediumDichogamyProtogynousPacking tissue thicknessMediumInitiation of 10% Female floweringEarlyKernel CharacteristicsStates	Leaf serration	Absent		Strong
Time of leaf fallMidShell strengthIntermediateShoot pubescenceSlightly pubescentShell sealStrongShoot colourBrownShell integrityStrongInflorescence CharacteristicsStatesShell thickness (mm)MediumDichogamyProtogynousPacking tissue thicknessMediumInitiation of 10% Female floweringEarlyKernel CharacteristicsStates	Rachis colour	Green	Shell surface	Medium
Shoot pubescenceSlightly pubescentShell sealStrongShoot colourBrownShell integrityStrongInflorescence CharacteristicsStatesShell thickness (mm)MediumDichogamyProtogynousPacking tissue thicknessMediumInitiation of 10% Female floweringEarlyKernel CharacteristicsStates	Rachis persistancec	Intermediate	Shell colour	Light
Shoot colourBrownShell integrityStrongInflorescence CharacteristicsStatesShell thickness (mm)MediumDichogamyProtogynousPacking tissue thicknessMediumInitiation of 10% Female floweringEarlyKernel CharacteristicsStates	Time of leaf fall	Mid	Shell strength	Intermediate
Inflorescence CharacteristicsStatesShell thickness (mm)MediumDichogamyProtogynousPacking tissue thicknessMediumInitiation of 10% Female floweringEarlyKernel CharacteristicsStates	Shoot pubescence	Slightly pubescent	Shell seal	Strong
DichogamyProtogynousPacking tissue thicknessMediumInitiation of 10% Female floweringEarlyKernel CharacteristicsStates	Shoot colour	Brown	Shell integrity	Strong
Initiation of 10% Female flowering Early Kernel Characteristics States	Inflorescence Characteristics	States	Shell thickness (mm)	Medium
	Dichogamy	Protogynous	Packing tissue thickness	Medium
Number of male catkins per cluster Low(<2) Kernel weight (g) Medium(6-10)	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 clusterIntermediateKernel percentageMedium(40-50)	Number of female flowers per cluster	Intermediate	Kernel percentage	Medium(40-50)
Stigma colourGreenKernel veins (%)Low(<30)	Stigma colour	Green	Kernel veins (%)	Low(<30)
Hull dehiscence Dehiscent Kernel plumpness Moderate	Hull dehiscence	Dehiscent	Kernel plumpness	Moderate
Ease of removal of Easy kernel halves				Easy
kernel colour Light			kernel colour	Light



Nut shape

Kernel colour

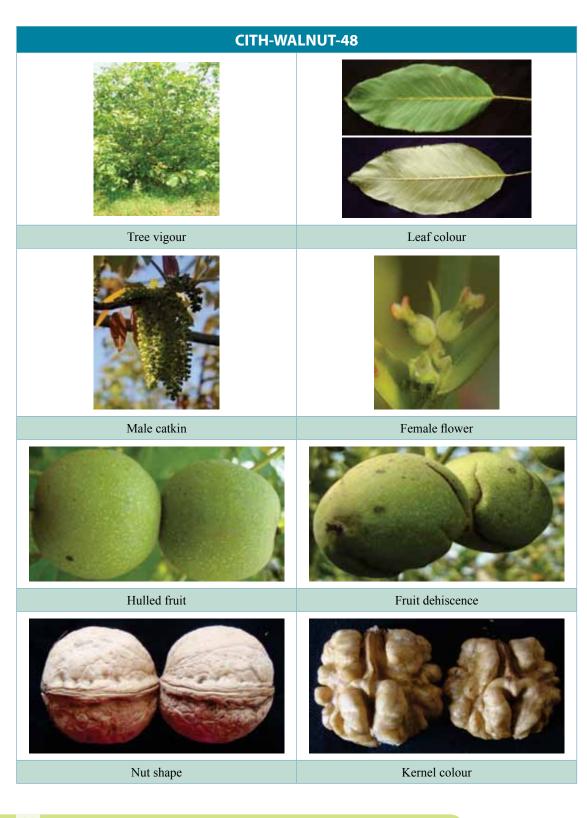
CITH-WALNUT-47			
Genus-Species: Juglans regia L			
Accession No.IC-0617701			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour(cm)	Intermediate (50- 100)	Nut Shape	Broad elliptic
Growth habit	Spreading	Shape in cross section	Elliptic
Density of branches	Dense	Shape of base perpendicular 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 persistancec	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



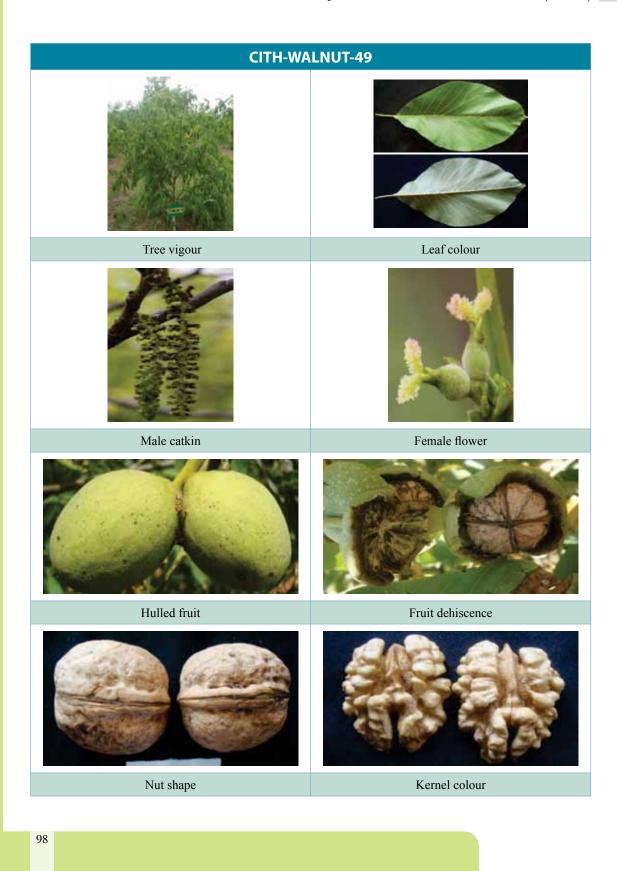
Nut shape

Kernel colour

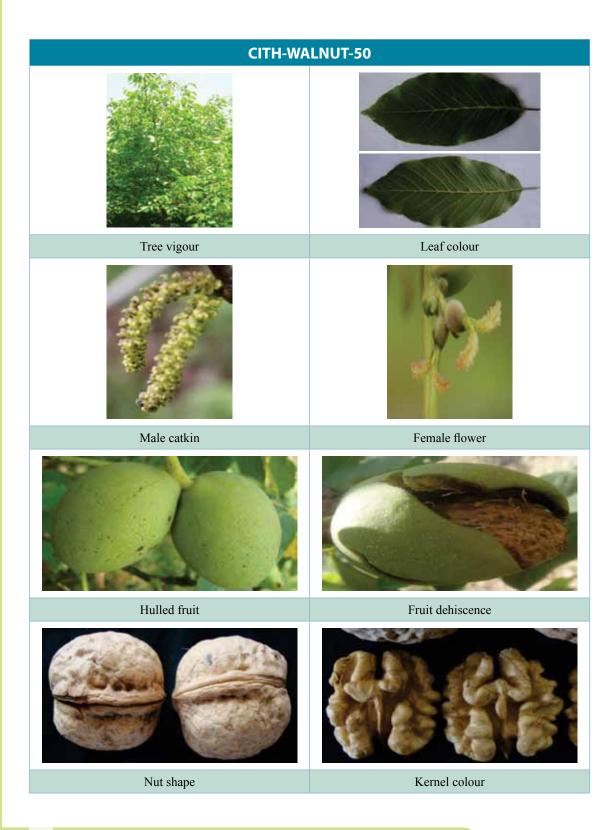
CITH-WALNUT-48			
<b>Genus-Species:</b> Juglans regia L			
Accession No.IC-0617701			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour(cm)	High(>100)	Nut Shape	Round
Growth habit	Spreading	Shape in cross section	Round
Density of branches	Dense	Shape of base perpendicular to suture	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 persistancec	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



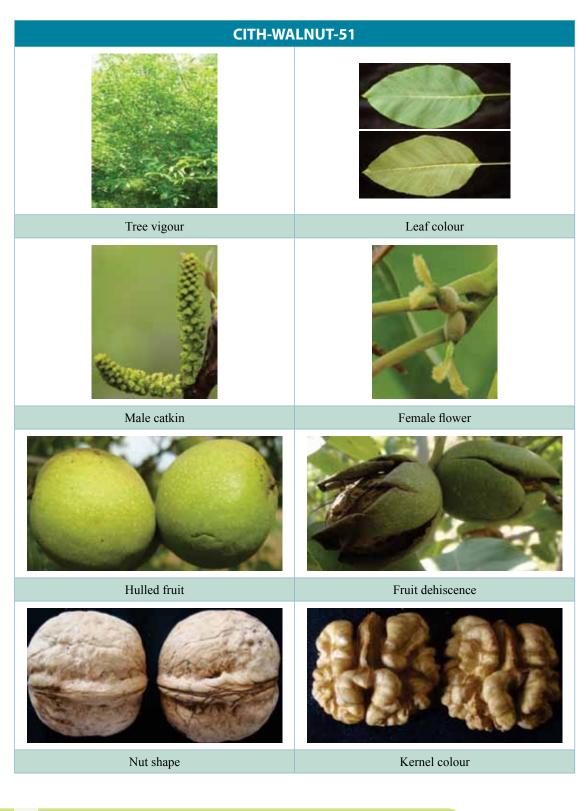
CITH-WALNUT-49			
Genus-Species: Juglans regia L			
Accession No.IC-0617702			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	High(>100)	Nut Shape	Ovate
Growth habit	Spreading	Shape in cross section	Oblate
Density of branches	Dense	Shape of base perpendicular to suture	Truncate
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 persistancec	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



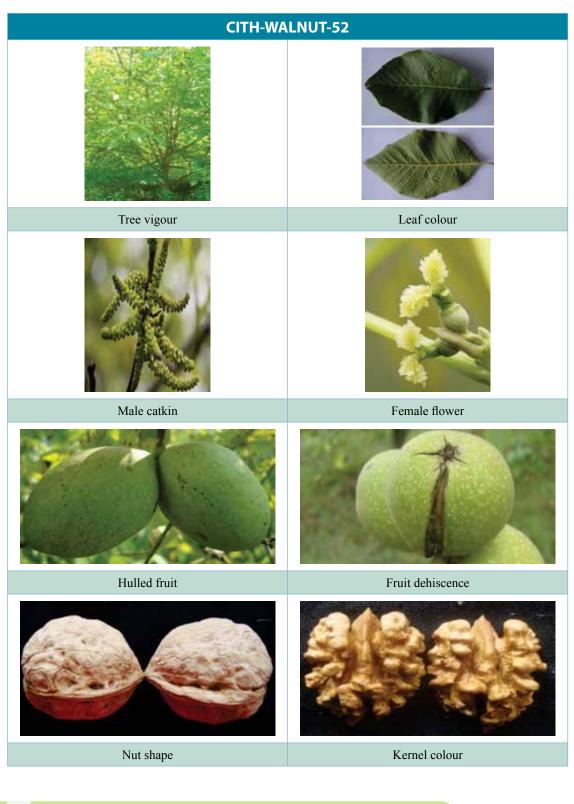
CITH-WALNUT-50			
Genus-Species: Juglans regia L			
Accession No.IC-0617703			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour(cm)	Intermediate (50- 100)	Nut Shape	Ovate
Growth habit	Spreading	Shape in cross section	Oblate
Density of branches	Dense	Shape of base perpendicular to 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 persistancec	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
		kernal colour	Amber



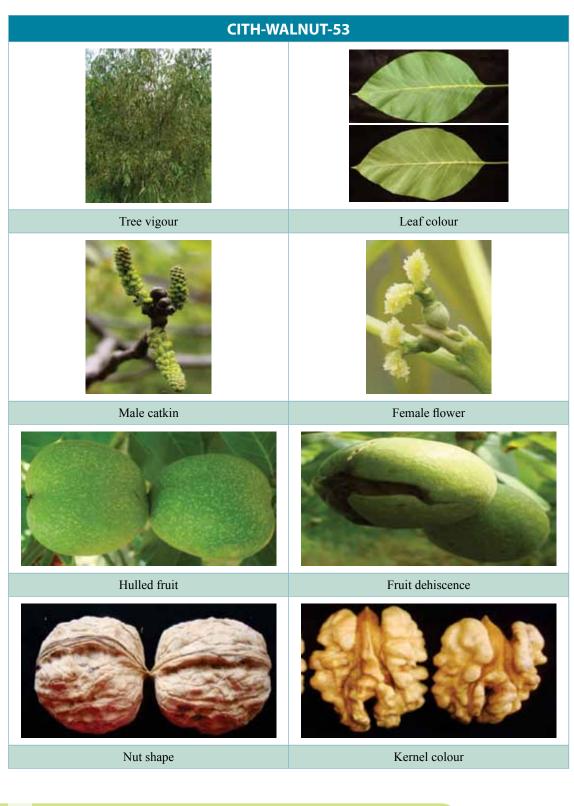
# **CITH-WALNUT-51** Genus-Species: Juglans regia L Accession No.IC-0617704 **Tree Characteristics** States Fruit / Nut States Characteristics Vigour(cm) Intermediate (50-Nut Shape Ovate 100) Growth habit Spreading Round Shape in cross section Density of branches Intermediate Shape of base Truncate perpendicular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



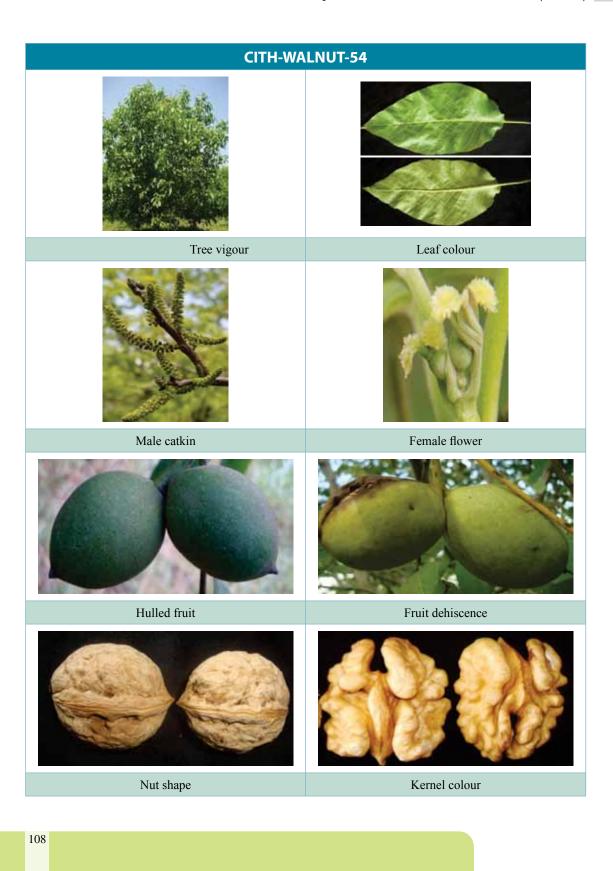
CITH-WALNUT-52				
Genus-Species: Juglans regia L				
Accession No.IC-587092				
Tree Characteristics	States	Fruit / Nut Characteristics	States	
Vigour(cm)	Intermediate (50- 100)	Nut Shape	Elliptic	
Growth habit	Spreading	Shape in cross section	Elliptic	
Density of branches	Dense	Shape of base perpendicular 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 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	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	



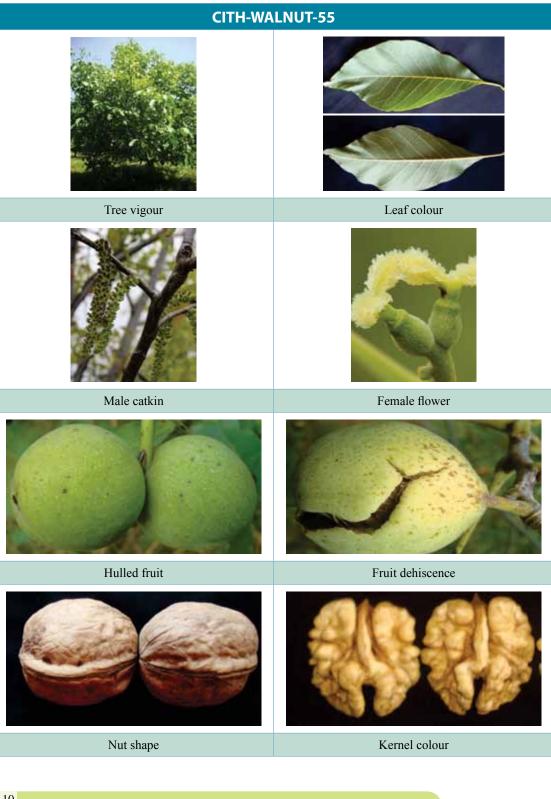
CITH-WALNUT-53					
Genus-Species: Juglans regia L					
Accession No.IC-587192					
Tree Characteristics	States	Fruit / Nut Characteristics	States		
Vigour(cm)	Intermediate (50- 100)	Nut Shape	Long trapezoid		
Growth habit	Spreading	Shape in cross section	Round		
Density of branches	Dense	Shape of base 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 persistancec	Few	Shell colour	Medium		
Time of leaf fall	Early	Shell strength	Intermediate		
Shoot pubescence	Globrous	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-54				
Genus-Species: Juglans regia 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 persistancec	Few	Shell colour	Light	
Time of leaf fall	Mid	Shell strength	Intermediate	
Shoot pubescence	Globrous	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	

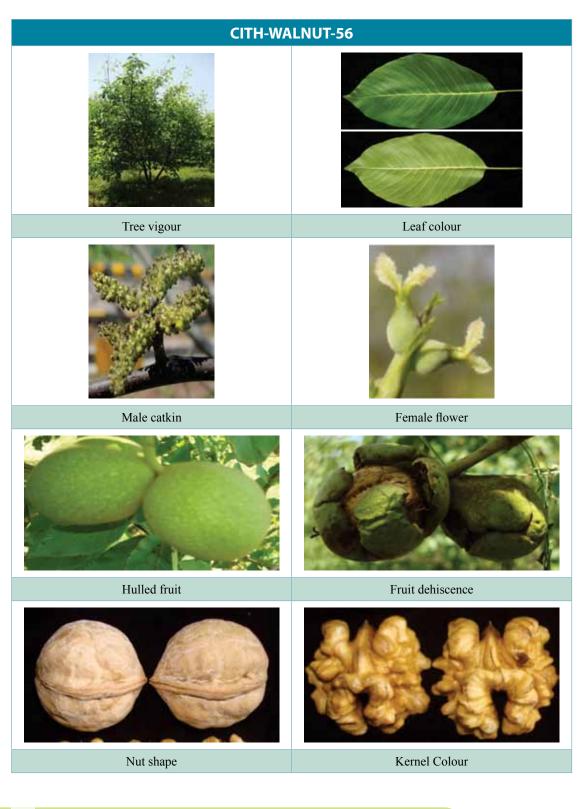


CITH-WALNUT-55					
Genus-Species: Juglans regia L					
Accession No.IC-587139					
Tree Characteristics	States	Fruit / Nut Characteristics	States		
Vigour(cm)	Intermediate (50- 100)	Nut Shape	Round		
Growth habit	Semi Erect	Shape in cross section	Round		
Density of branches	Dense	Shape of base perpendicular 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 persistancec	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		



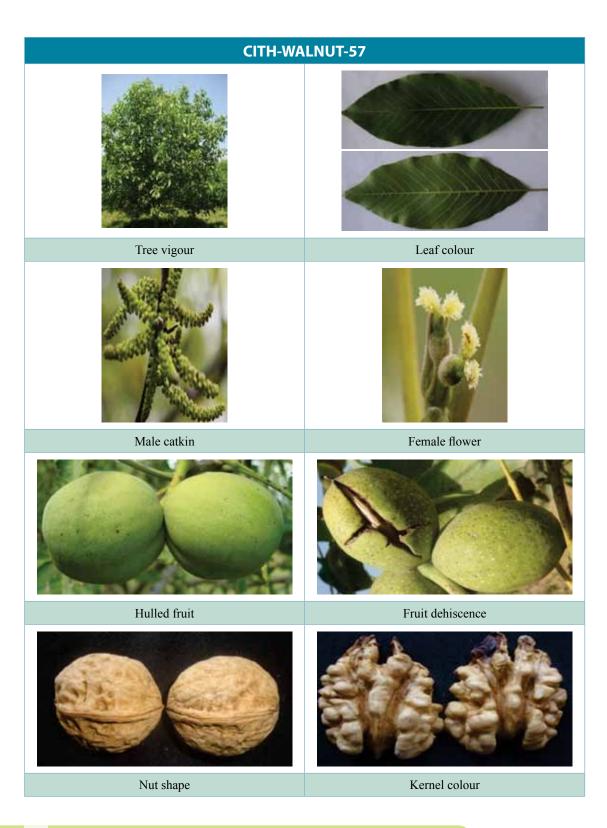
CITH-WALNUT-56			
Genus-Species: Juglans regia L			
Accession No.IC-587142			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	Low(<50)	Nut Shape	Broad elliptic
Growth habit	Semi Erect	Shape in cross section	Elliptic
Density of branches	Intermediate	Shape of base perpendicular 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 persistancec	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

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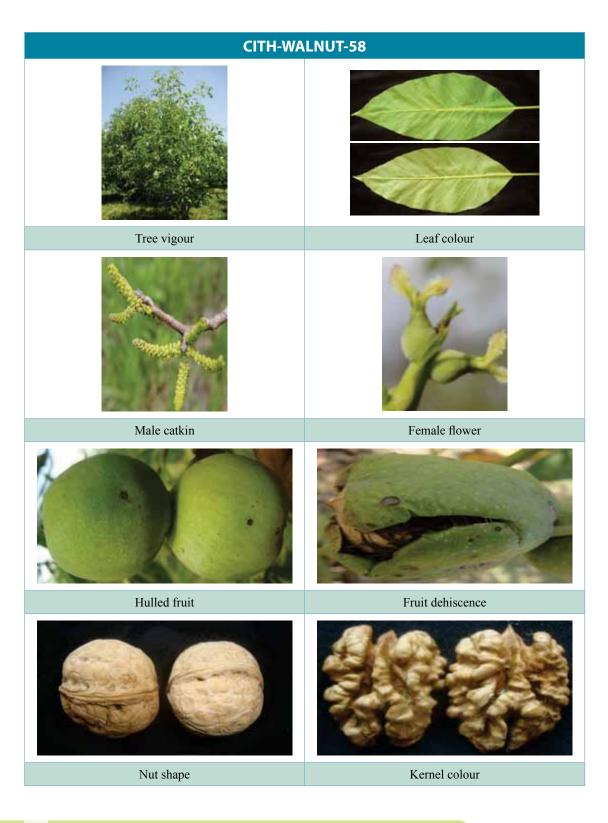


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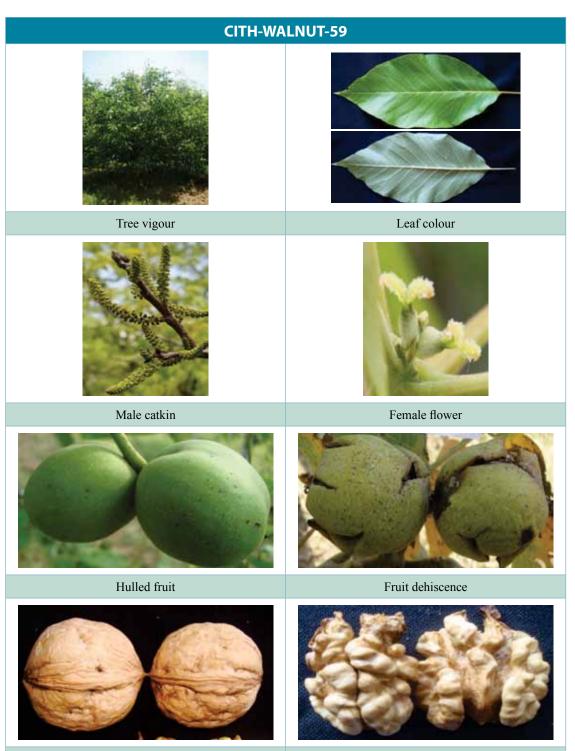
Genus-Species: Juglans regia L				
Accession No.IC-0617706				
Tree Characteristics	States	Fruit / Nut Characteristics	States	
Vigour (cm)	High (>100)	Nut shape	Narrow elliptic	
Growth habit	Spreading	Shape in cross section	Elliptic	
Density of branches	Dense	Shape of base perpendicular to suture	Cuneate	
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 persistancec	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-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 persistancec	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	



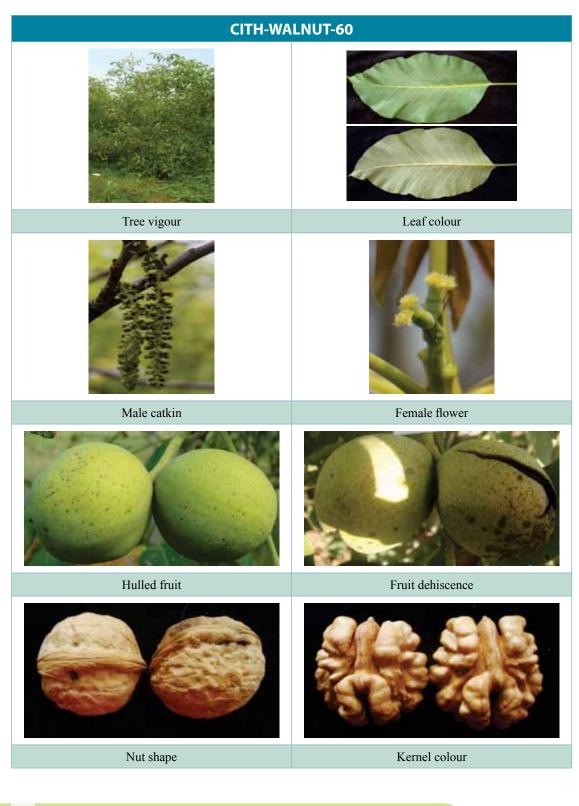
Genus-Species: Juglans regia L			
Accession No.IC-0617708			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour(cm)	High(>100)	Nut Shape	Round
Growth habit	Spreading	Shape in cross section	Round
Density of branches	Dense	Shape of base perpendicular to suture	Oblate
Bearing habit	Terminal	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 persistancec	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



Nut shape

Kernel colour

CITH-WALNUT-60				
Genus-Species: Juglans regia 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 persistancec	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	

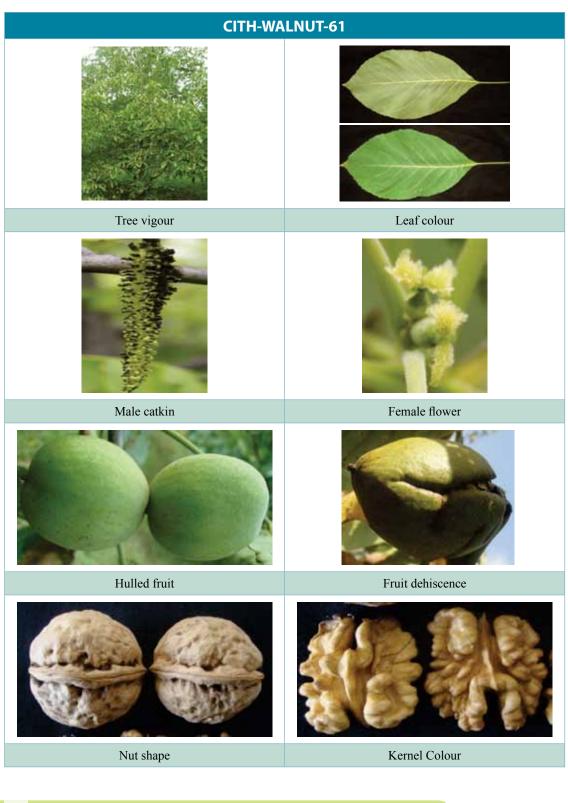


## CITH-WALNUT-61

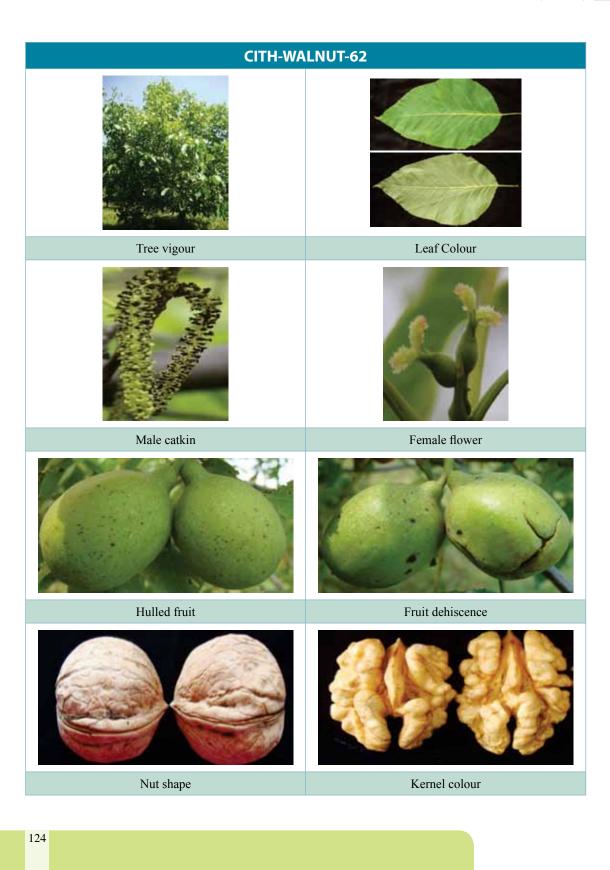
# Genus-Species: Juglans regia ${\rm L}$

## 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 persistancec	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

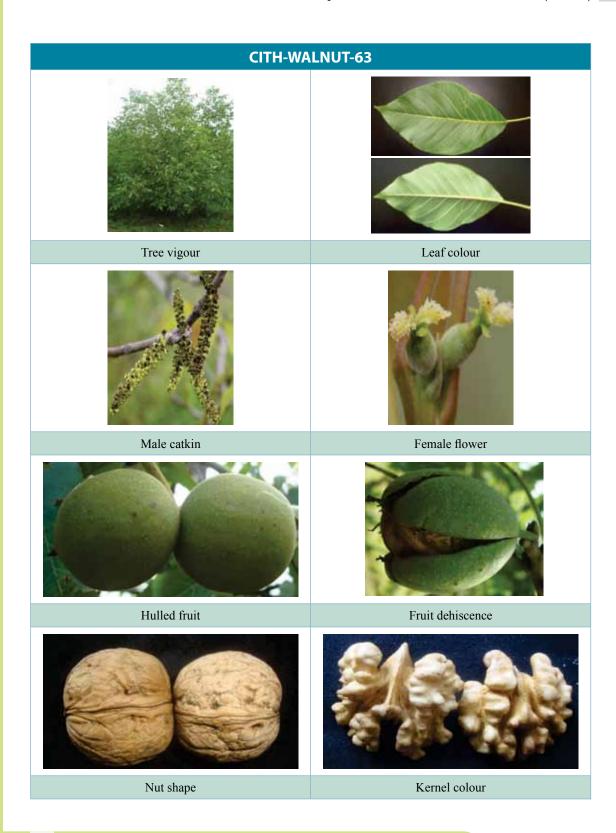


CITH-WALNUT-62			
Genus-Species: Juglans regia L			
Accession No.IC-587085			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	High(>100)	Nut Shape	Short trapezoid
Growth habit	Spreading	Shape in cross section	Oblate
Density of branches	Dense	Shape of base perpendicular to suture	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 persistancec	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

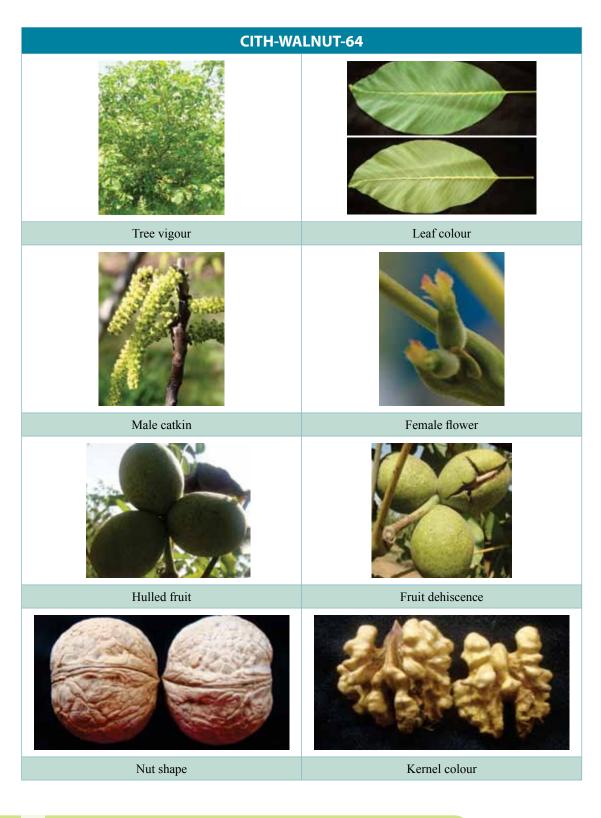


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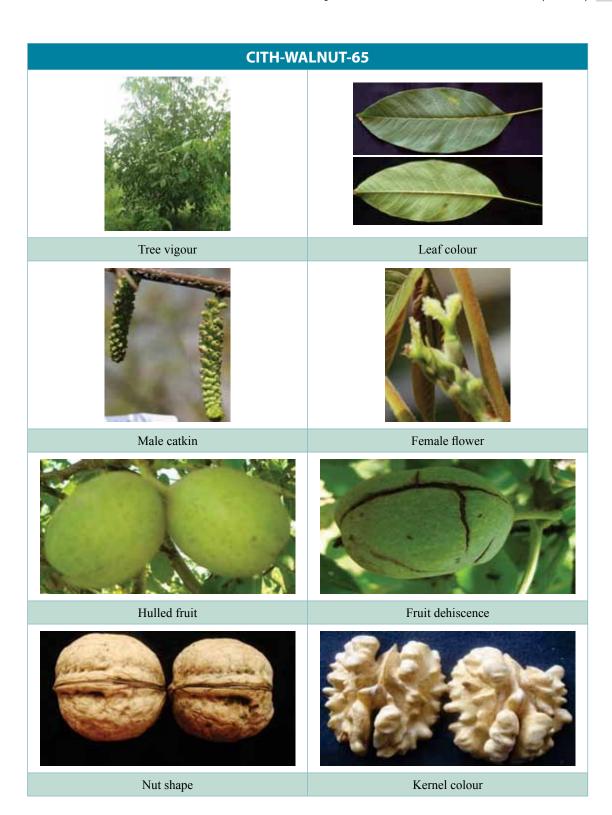
Genus-Species: Juglans regia L			
Accession No.IC-0617709			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour(cm)	High(>100)	Nut shape	Round
Growth habit	Semi Erect	Shape in cross section	Round
Density of branches	Intermediate	Shape of base perpendicular to suture	Truncate
Bearing 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 persistancec	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



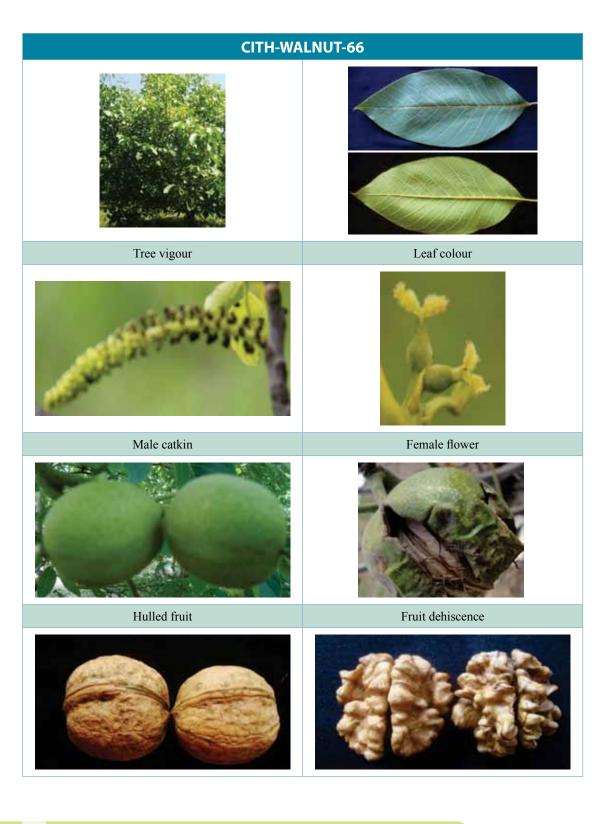
CITH-WALNUT-64			
Genus-Species: Juglans regia L			
Accession No.IC-0617710			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour (cm)	High(>100)	Nut shape	Short trapezoid
Growth habit	Spreading	Shape in cross section	Oblate
Density of branches	Dense	Shape of base perpendicular to 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 persistancec	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-65			
Genus-Species: Juglans regia 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 persistancec	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-66			
Genus-Species: Juglans regia 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 persistancec	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

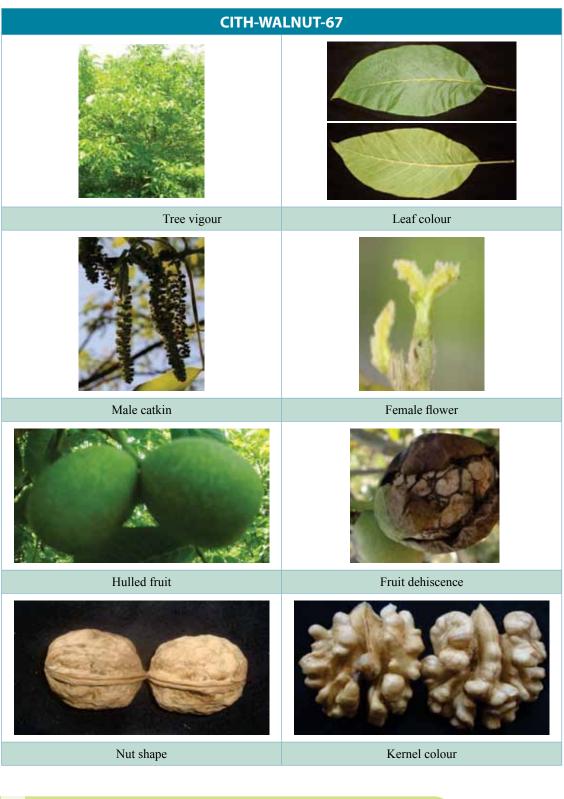


Nut shape

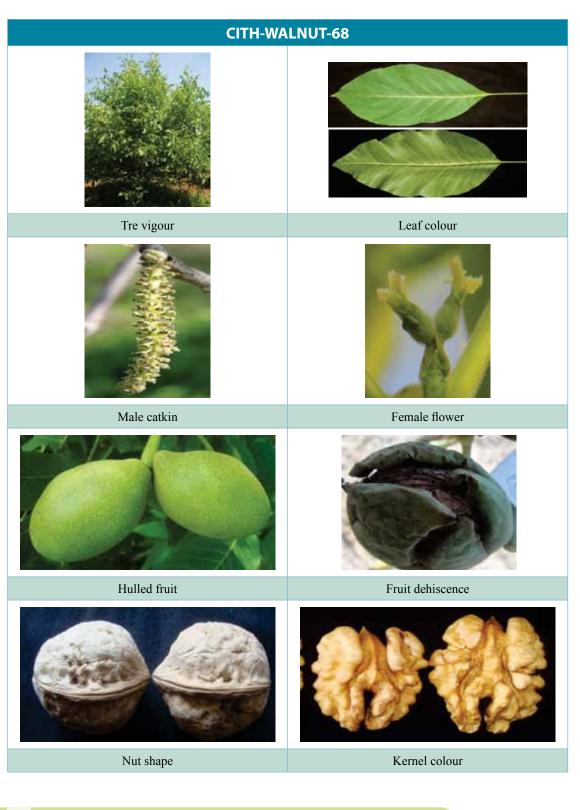
Kernel colour

CITH-WALNUT-67	
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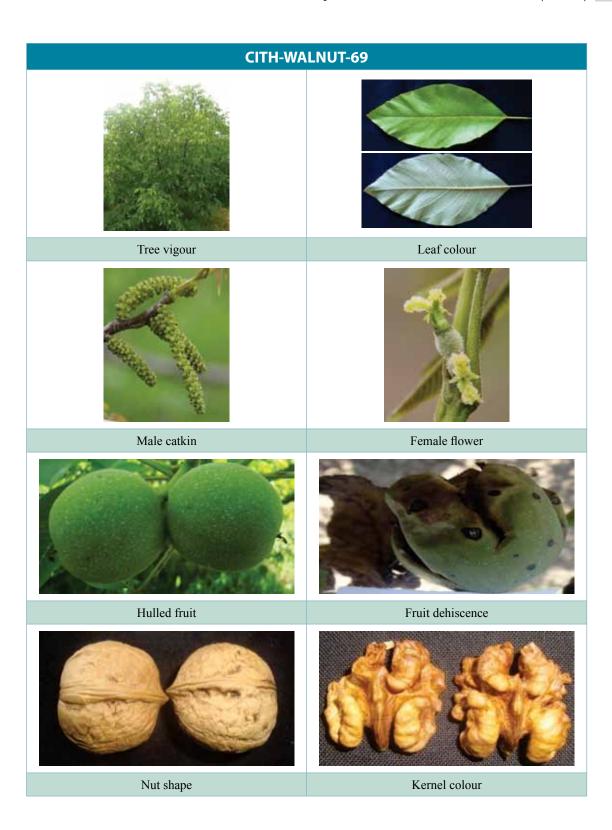
Genus-Species: Juglans regia L			
Accession No.IC-0617713			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour(cm)	High(>100)	Nut shape	Long trapezoid
Growth habit	Semi Erect	Shape in cross section	Oblate
Density of branches	Intermediate	Shape of base perpendicular to suture	Truncate
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 persistancec	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-68** Genus-Species: Juglans regia L Accession No.IC-587294 **Tree Characteristics States** Fruit / Nut **States** Characteristics High(>100) Nut Shape Broad elliptic Vigour (cm) Growth habit Spreading Shape in cross section Elliptic Density of branches Intermediate Shape of base Cuneate perpendicular to suture Bearing habit Terminal Shape of apex Pointed perpendicular to suture Leaf Characteristics States Prominence of apical Medium tip Medium(10-15) Position of pad on On whole length Leaflet length (cm) suture 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 persistancec Few Shell colour Light Time of leaf fall Mid Shell strength Weak Intermediate Shoot pubescence Slightly Pubescent Shell seal 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 Medium(6-10) Heavy Kernel weight (g) 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 Easy kernel halves Kernel colour Light

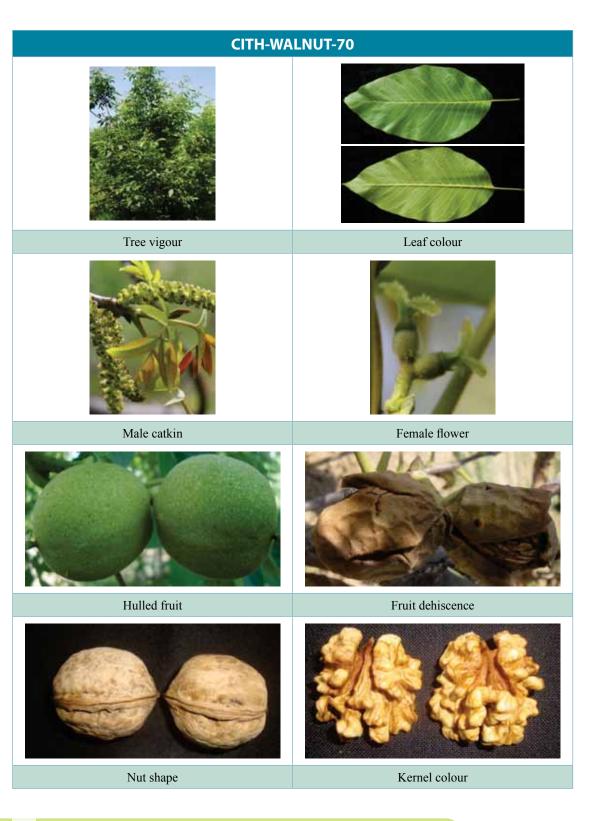


CITH-WALNUT-69			
Genus-Species: Juglans regia L			
Accession No.IC-0617715			
Tree Characteristics	States	Fruit / Nut Characteristics	States
Vigour(cm)	Intermediate (50- 100)	Nut shape	Ovate
Growth habit	Spreading	Shape in cross section	Oblate
Density of branches	Intermediate	Shape of base perpendicular 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 persistancec	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

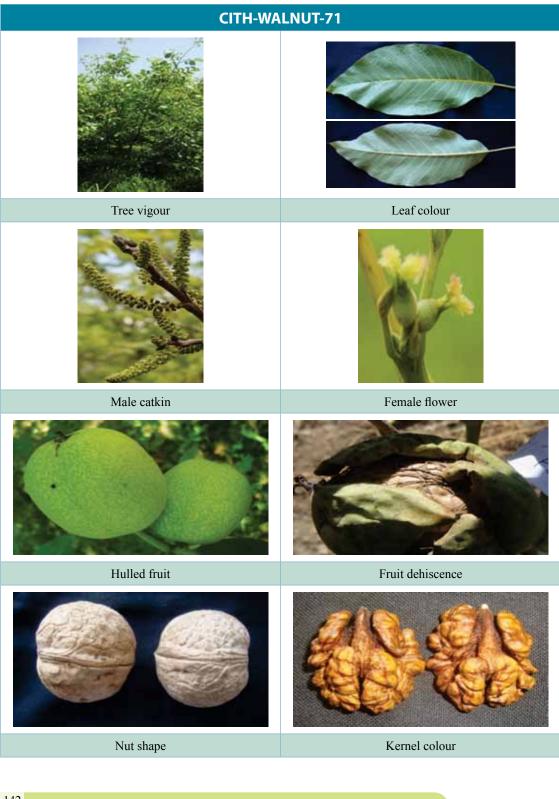


# CITH-WALNUT-70

Genus-Species: Juglans regia 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

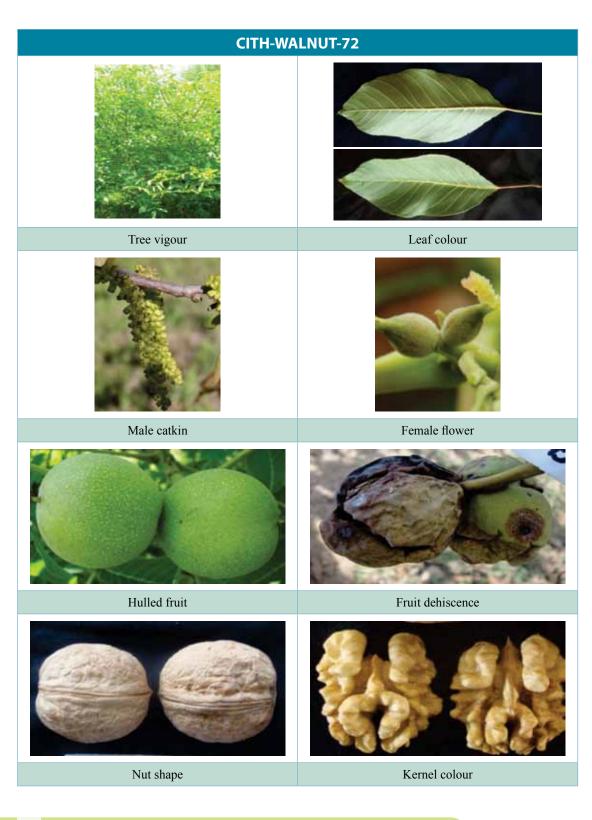


CITH-WALNUT-71			
Genus-Species: Juglans regia L			
Accession No.IC-0617715			
Tree Characteristics	States	Fruit / Nut characteristics	States
Vigour(cm)	Intermediate (50- 100)	Nut Shape	Round
Growth habit	Semi Erect	Shape in cross section	Round
Density of branches	Dense	Shape of base perpendicular to 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 persistancec	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	LigntAmber



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

Light

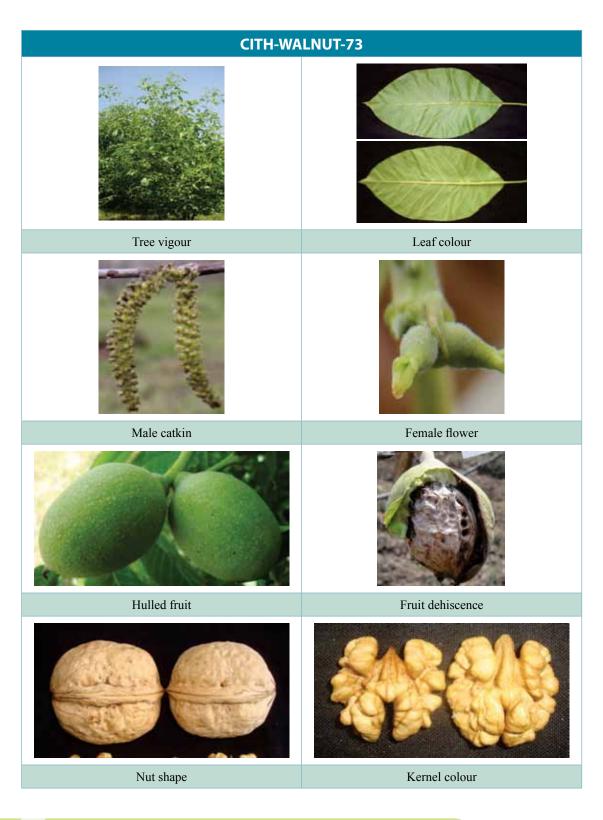


### CITH-WALNUT-73

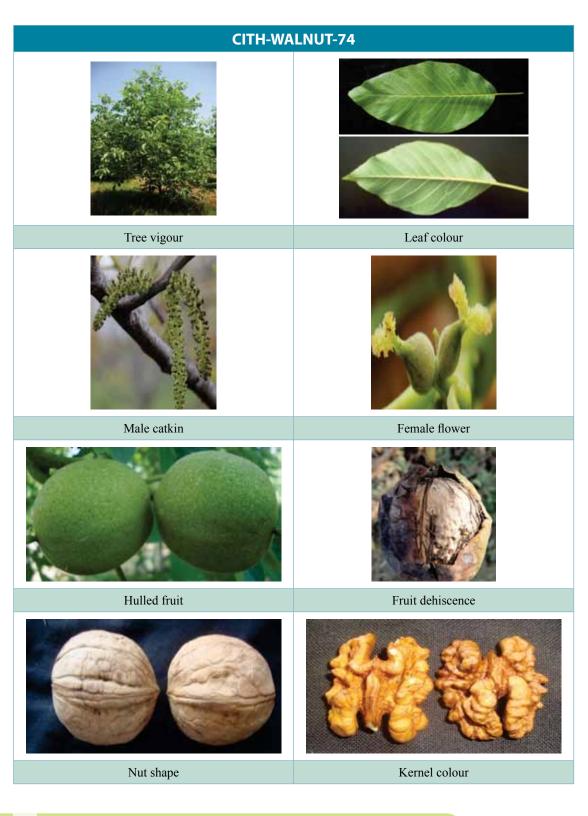
# Genus-Species: Juglans regia L

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

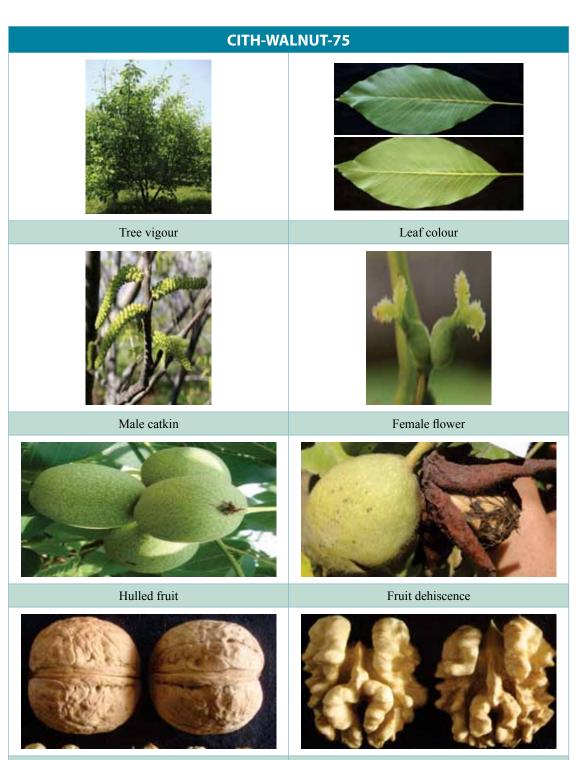


CITH-WALNUT-75
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## Genus-Species: Juglans regia L

Accession	No.IC-0617719	
1 ICCC 351011	110.10-001//1/	

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 persistancec	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



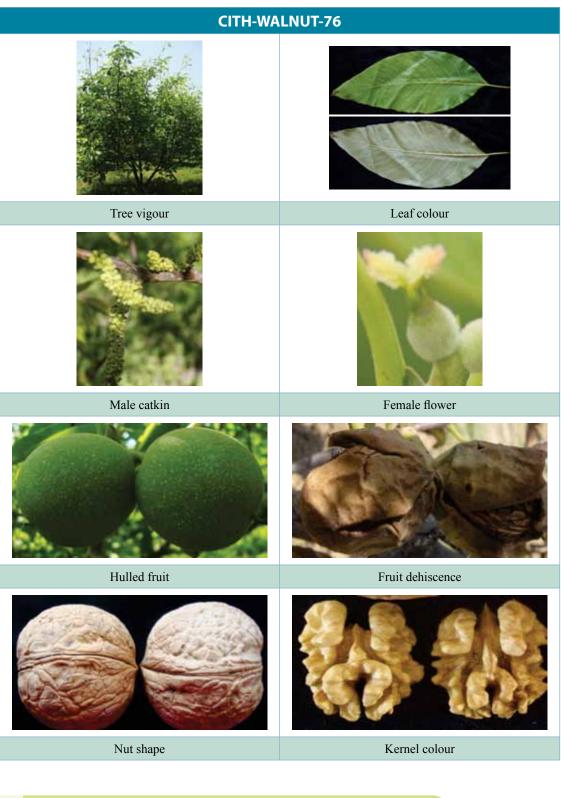
Nut shape

Kernel colour

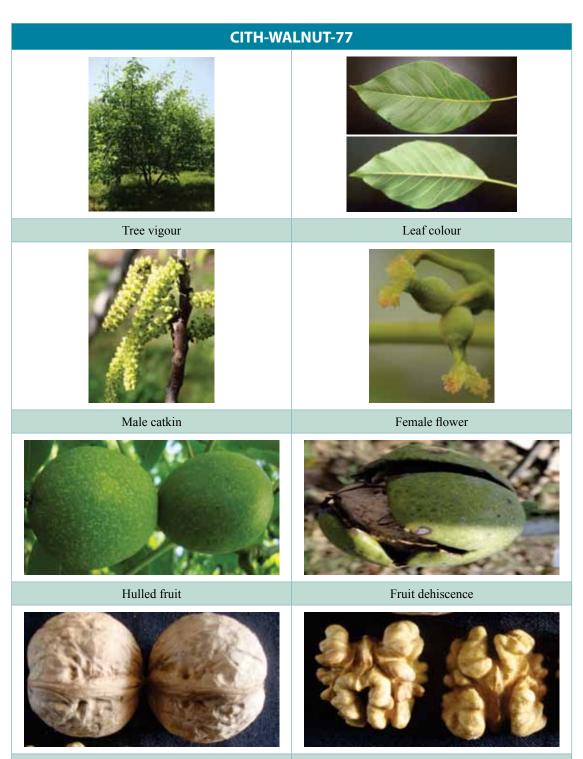
## Genus-Species: Juglans regia L

#### Accession No.IC-0617720

Accession No.IC-0617720 Tree Characteristics	States	Fruit / Nut	States
	States	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 persistancec	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-77** Genus-Species: Juglans regia L Accession No.IC-0617721 **Tree Characteristics** States Fruit / Nut States characteristics Vigour(cm) High(>100) Ovate Nut shape Growth habit Semi Erect Shape in cross section Oblate Intermediate Shape of base Density of branches perpendicular to suture Emarginated Terminal Bearing habit Shape of apex Truncate perpendicular to suture Leaf Characteristics States Prominence of apical Medium tip Leaflet length (cm) Long(>15)Position of pad on On whole length suture Broad elliptic Leaf shape Nut diameter (mm) Small(<30)Leaflet margin Entire Small(<30) Nut length (mm) Leaflet colour Dark green Nut weight (g) Light(15)Leaf serration Present prominence of pad on suture Strong Rachis colour Green Shell surface Smooth Shell colour Rachis persistancec Few Light Mid Intermediate Time of leaf fall Shell strength Shoot pubescence Slightly pubescent Shell seal Weak Shoot colour Brown Shell integrity Strong **Inflorescence Characteristics** States Shell thickness (mm) Medium(1-2)Packing tissue Thin Dichogamy Protogynous thickness Initiation of 10% Female flowering States Early Kernel Characteristics Intermediate Number of male catkins per cluster 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 Easy kernel halves Kernel colour Light



Nut shape

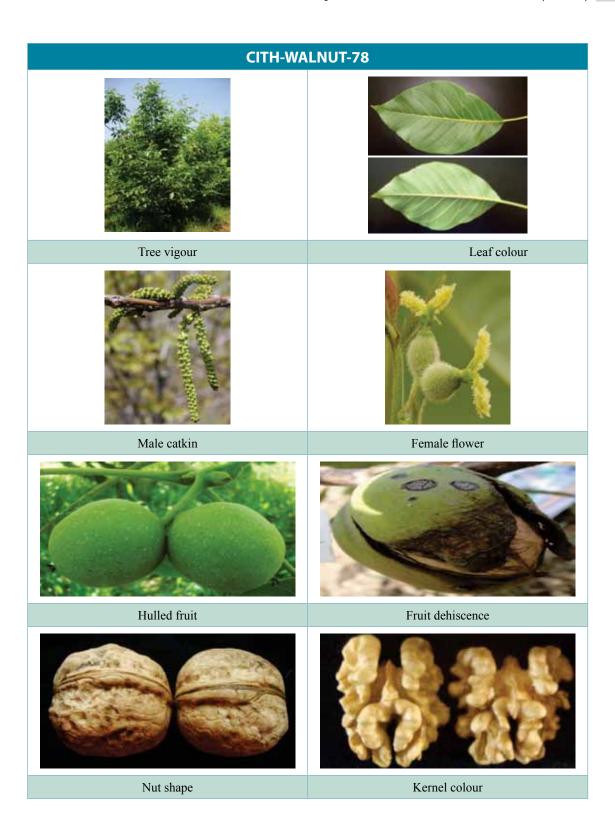
Kernel colour

# CITH-WALNUT-78

Genus-Species: Jugl	ans regia L
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	Accession	No.	IC-06	17722
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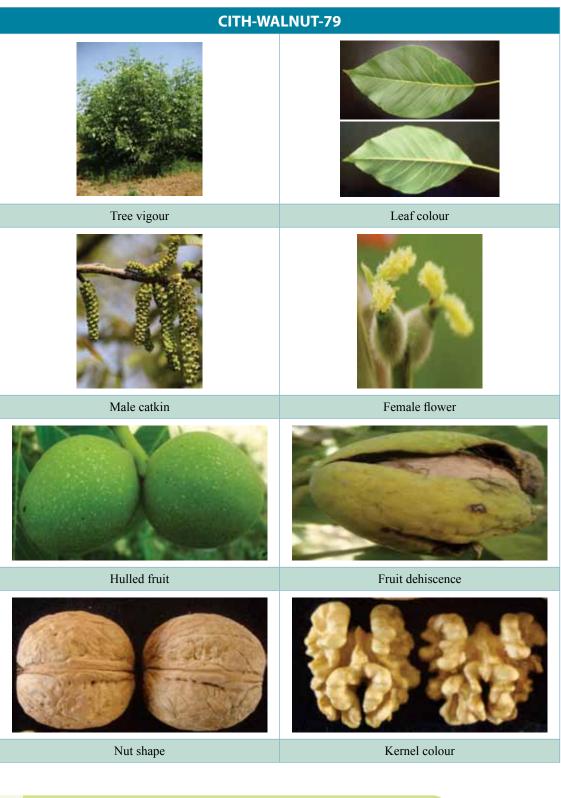
Tree Characteristics	States	Fruit / Nut characteristics	States
Vigour(cm)	Low(<50)	Nut shape	Round
Growth habit	Spreading	Shape in cross section	Round
Density of branches	Intermediate	Shape of base perpendicular to suture	Truncate
Bearing habit	Terminal	Shape of apex perpendicular to suture	Truncate
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



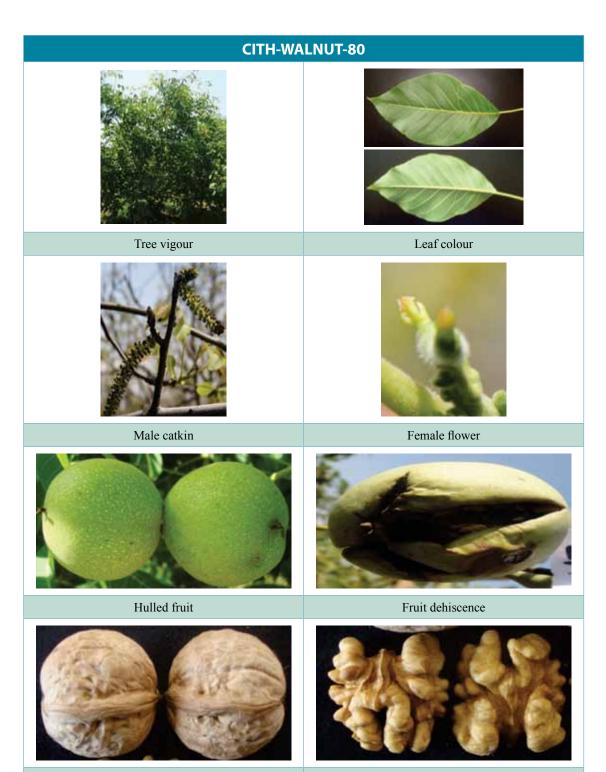
CITH-WALNUT-79
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Genus-Species:	Juglans regia L	
Accession No IC 0(17722		

Tree CharacteristicsStatesFruit / Nut characteristicsStatesTree vigour (cm)Intermediate (50- 100)Nut shapeRoundGrowth habitSpreadingShape in cross sectionRoundDensity of branchesDenseShape of base perpendicular to sutureRoundedBearing habitTerminalShape of apex perpendicular to sutureTruncateLeaf CharacteristicsStatesProminence of apical tipStrongLeaflet length (cm)Medium(10-15)Position of pad on sutureOn whole lengthLeaflet colourEntireNut diameter (mm)Small(<30)Leaflet colourDark greenNut weight (g)Light(<15)Leaf serrationGreenShell surfaceMediumRachis colourFewShell sclourLightTime of leaf fallMidShell sclourLightShoot colourBrownShell integrityStrongInterrescence CharacteristicsStatesShell integrityStrongIntorescence CharacteristicsStatesShell integrityStrongIntorescence CharacteristicsStatesShell integrityStrongIntorescence CharacteristicsStatesShell hickness (mm)Medium(1-2)DichogamyProtogynousPacking tissue thicknessYery ThickNumber of male catkins per clusterIntermediateKernel Kernel Kernel Kernel Kernel weight (g)Medium(6-10)	Accession No.IC-0617723			
International forwith habitInternational performancesInternational performanceRoundedDensity of branchesDenseShape of base perpendicular to sutureRoundedBearing habitTerminalShape of apex perpendicular to sutureTruncateLeaf CharacteristicsStatesProminence of apical tipStrongLeaf shapeEllipticNut diameter (mm)Small<30)Leaf shapeEllipticNut length (mm)Small<30)Leaf strationDark greenNut weight (g)Light(<15)Leaf serrationGreenShell surfaceMediumRachis persistancecFewShell surfaceMediumShoot pubescenceGlabrousShell surfaceWeakShoot colourBrownShell surfaces (mm)Medium(1-2)DichogamyProtogynousProtogynousShell thickness (mm)Medium(1-2)Initiation of 10% Female floweringLateKernel CharacteristicsStates	Tree Characteristics	States		States
Density of branchesDenseShape of base perpendicular to sutureRoundedBearing habitTerminalShape of apex perpendicular to sutureTruncateLeaf CharacteristicsStatesProminence of apical tipStrongLeaflet length (cm)Medium(10-15)Position of pad on sutureOn whole lengthLeaf shapeEllipticNut diameter (mm)Small(<30)	Tree vigour (cm)	· · · · · · · · · · · · · · · · · · ·	Nut shape	Round
Indexperpendicular to sutureBearing habitTerminalShape of apex perpendicular to sutureTruncateLeaf CharacteristicsStatesProminence of apical tipStrongLeaflet length (cm)Medium(10-15)Position of pad on sutureOn whole length sutureLeaf shapeEllipticNut diameter (mm)Small(<30)	Growth habit	Spreading	Shape in cross section	Round
Leaf CharacteristicsStatesProminence of apical tipStrongLeaf CharacteristicsMedium(10-15)Position of pad on sutureOn whole lengthLeaf length (cm)Medium(10-15)Position of pad on sutureOn whole lengthLeaf shapeEllipticNut diameter (mm)Small(<30)	Density of branches	Dense	1	Rounded
tiptipLeaflet length (cm)Medium(10-15)Position of pad on sutureOn whole lengthLeaf shapeEllipticNut diameter (mm)Small(<30)	Bearing habit	Terminal		Truncate
Index and Leaf shapeEnlipticsuturesutureLeaf shapeEllipticNut diameter (mm)Small(<30)	Leaf Characteristics	States	*	Strong
Leaflet marginEntireNut length (mm)Small(<30)Leaflet colourDark greenNut weight (g)Light(<15)	Leaflet length (cm)	Medium(10-15)	•	On whole length
Leaflet colourDark greenNut weight (g)Light(<15)Leaf serrationAbsentProminence of pad on sutureWeakRachis colourGreenShell surfaceMediumRachis persistancecFewShell colourLightTime of leaf fallMidShell strengthIntermediateShoot pubescenceGlabrousShell integrityStrongInflorescence CharacteristicsStatesShell thickness (mm)Medium(1-2)DichogamyProtogynousPacking tissue thicknessVery ThickInitiation of 10% Female floweringLateKernel CharacteristicsStates	Leaf shape	Elliptic	Nut diameter (mm)	Small(<30)
Leaf serrationAbsentProminence of pad on sutureWeakRachis colourGreenShell surfaceMediumRachis persistancecFewShell colourLightTime of leaf fallMidShell strengthIntermediateShoot pubescenceGlabrousShell sealWeakShoot colourBrownShell integrityStrongInflorescence CharacteristicsStatesShell thickness (mm)Medium(1-2)DichogamyProtogynousPacking tissue thicknessVery ThickInitiation of 10% Female floweringLateKernel CharacteristicsStates	Leaflet margin	Entire	Nut length (mm)	Small(<30)
Indexof pad on sutureWeakRachis colourGreenShell surfaceMediumRachis persistancecFewShell colourLightTime of leaf fallMidShell strengthIntermediateShoot pubescenceGlabrousShell sealWeakShoot colourBrownShell integrityStrongInflorescence CharacteristicsStatesShell thickness (mm)Medium(1-2)DichogamyProtogynousPacking tissue thicknessVery ThickInitiation of 10% Female floweringLateKernel CharacteristicsStates	Leaflet colour	Dark green	Nut weight (g)	Light(<15)
Rachis persistancecFewShell colourLightTime of leaf fallMidShell strengthIntermediateShoot pubescenceGlabrousShell sealWeakShoot colourBrownShell integrityStrongInflorescence CharacteristicsStatesShell thickness (mm)Medium(1-2)DichogamyProtogynousPacking tissue thicknessVery ThickInitiation of 10% Female floweringLateKernel CharacteristicsStates	Leaf serration	Absent		Weak
Time of leaf fallMidShell strengthIntermediateShoot pubescenceGlabrousShell sealWeakShoot colourBrownShell integrityStrongInflorescence CharacteristicsStatesShell thickness (mm)Medium(1-2)DichogamyProtogynousPacking tissue thicknessVery ThickInitiation of 10% Female floweringLateKernel CharacteristicsStates	Rachis colour	Green	Shell surface	Medium
Shoot pubescenceGlabrousShell sealWeakShoot colourBrownShell integrityStrongInflorescence CharacteristicsStatesShell thickness (mm)Medium(1-2)DichogamyProtogynousPacking tissue thicknessVery ThickInitiation of 10% Female floweringLateKernel CharacteristicsStates	Rachis persistancec	Few	Shell colour	Light
Shoot colourBrownShell integrityStrongInflorescence CharacteristicsStatesShell thickness (mm)Medium(1-2)DichogamyProtogynousPacking tissue thicknessVery ThickInitiation of 10% Female floweringLateKernel CharacteristicsStates	Time of leaf fall	Mid	Shell strength	Intermediate
Inflorescence CharacteristicsStatesShell thickness (mm)Medium(1-2)DichogamyProtogynousPacking tissue thicknessVery ThickInitiation of 10% Female floweringLateKernel CharacteristicsStates	Shoot pubescence	Glabrous	Shell seal	Weak
DichogamyProtogynousPacking tissue thicknessVery ThickInitiation of 10% Female floweringLateKernel CharacteristicsStates	Shoot colour	Brown	Shell integrity	Strong
Initiation of 10% Female floweringLateKernel CharacteristicsStates	Inflorescence Characteristics	States	Shell thickness (mm)	Medium(1-2)
Characteristics	Dichogamy	Protogynous	-	Very Thick
Number of male catkins per cluster Intermediate Kernel weight (g) Medium(6-10)	Initiation of 10% Female flowering	Late		States
	Number of male catkins per cluster	Intermediate	Kernel weight (g)	Medium(6-10)
Number of female flowers per clusterLow(<2)Kernel percentageMedium(40-50)	Number of female flowers per cluster	Low(<2)	Kernel percentage	Medium(40-50)
Stigma colourYellowKernel veins (%)Low(<30)	Stigma colour	Yellow	Kernel veins (%)	Low(<30)
Hull dehiscence Dehiscent Kernel plumpness Plumpy	Hull dehiscence	Dehiscent	Kernel plumpness	Plumpy
Ease of removal of Easy kernel halves				Easy
Kernel colour Light			Kernel colour	Light



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 persistancec	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



Nut shape

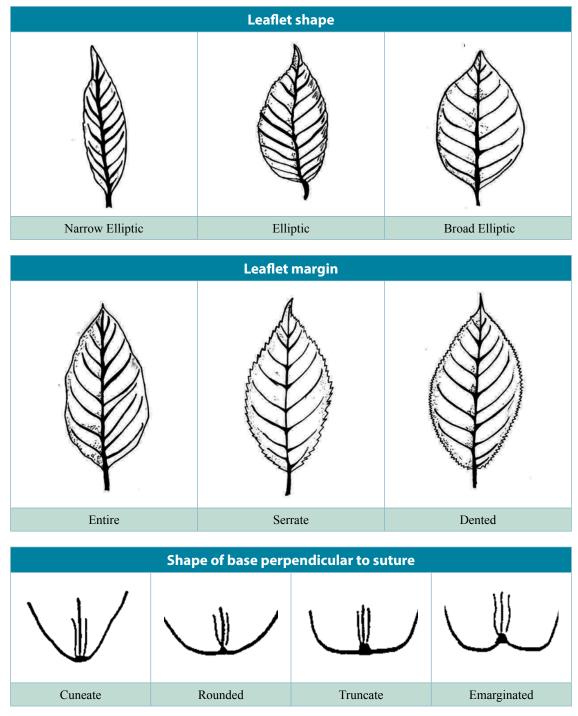
Kernel colour

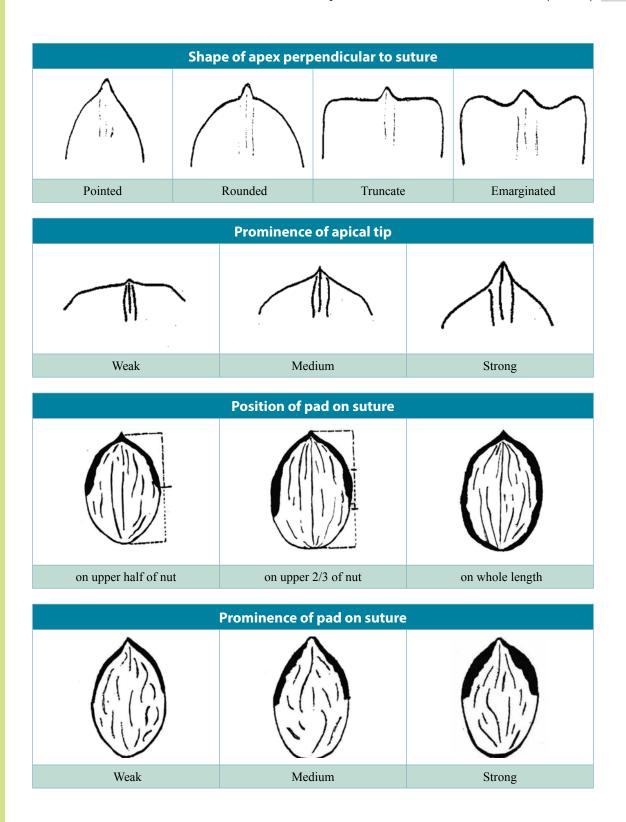
Characteristics	States	Characteristics	States
Tree vigour(cm)	Low Intermediate High	Nut shape	Round Triangular Cordate Ovate Short Trapezoid Long Trapezoid Broad Elliptic Elliptic Narrow Elliptic
Tree: Growth habit	Erect Semi Erect Spreading	Nut: Shape in cross section	Oblate Round Elliptic
Tree: Density 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 persistancec	Few Intermediate Many	Shell surface	Smooth Moderately Smooth Rough
Time of leaf fall	Early Mid Late	Shell colour	Very Light Light Medium

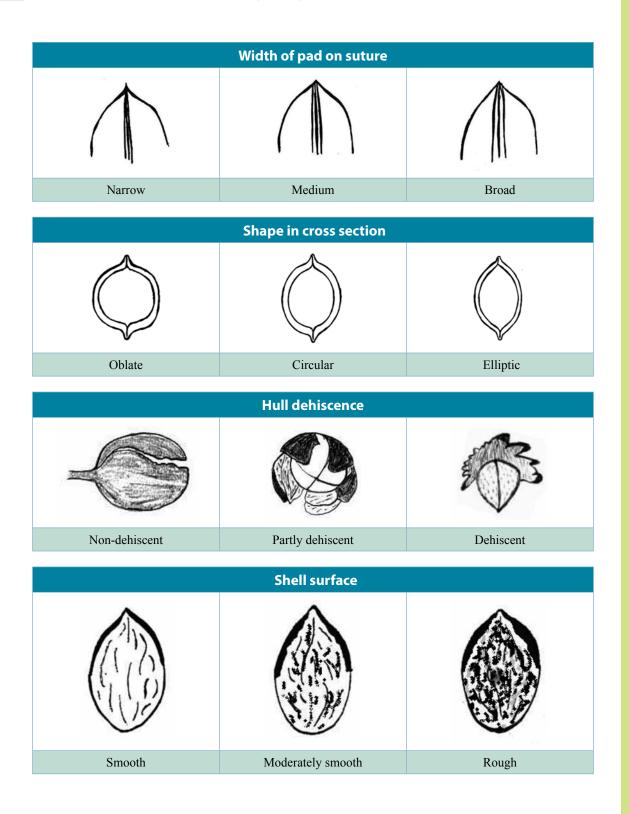
# Terminology of morphological characteristics of Walnut diversity

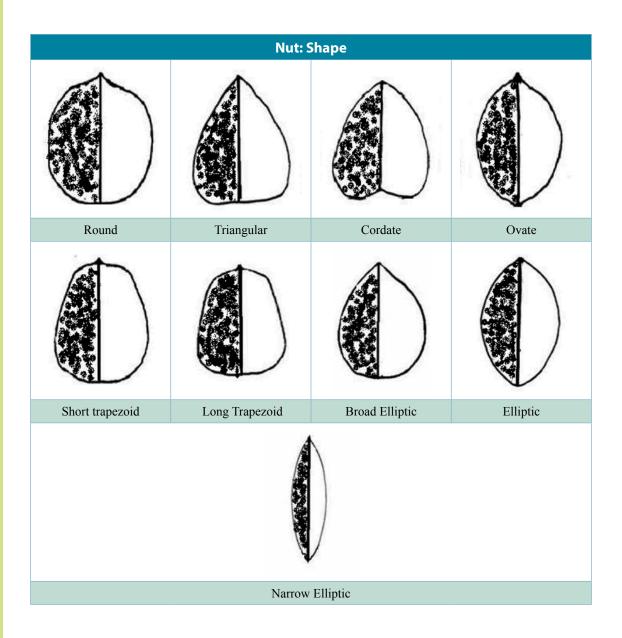
Characteristics	States	Characteristics	States
Shoot pubescence	Glabrous Pubescent Slightly Pubescent	Shell strength	Weak Intermediate Strong
Shoot colour	Green Brown Dark Brown	Shell integrity	Weak Intermediate Strong
Dichogamy	Protandrous Protogynous	Shell thickness (mm)	Medium Thin Thick
Flower : Initiation 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









Morphological Description of Walnut Genotypes under	
Agro climatic Conditions of Jammu and Kashmir (Edition-	1)

Notes

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Morphological Description of Walnut Genotypes under	
Agro climatic Conditions of Jammu and Kashmir (Edition-	1)

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