

Table S1: List of Malus domestica accessions used for the association mapping

Accession Name	CountryCode	FemaleParent	MaleParent	BROGFLESHFirmness	Coarseness	Crispness	Hardness
Skovfoged	Unknown	Unknown	Unknown	Firm	fine		
Finkenwerder Prinz	DEU	Unknown	Unknown	fairly Firm	fairly fine		
Fireside	USA	Unknown	Unknown	Firm	coarse	crisp	
Ildrod Pigeon	DNK	Unknown	Unknown	Firm	fine	crisp	
Frau Margarete von Stosch	Unknown	Unknown	Unknown	Firm		crisp	
Katja	Unknown	James Grieve	Worcester Pearmain	Firm			
Newtown Pippin	Unknown	Unknown	Unknown	Firm	fine	crisp	tender
Bushey Grove	GBR	Queen	Bismarck	Firm	coarse		
Peasgood's Nonsuch	GBR	Catshead	Unknown	Firm	coarse	crisp	
Molleskov	DNK	Unknown	Unknown	Firm	fine		tender
Carmignole Musquee	FRA	Unknown	Unknown	Firm			fairly tender
White Winter Pearmain	USA	Unknown	Unknown	Firm	fine	crisp	tender
Sowman's Seedling	Unknown	Grenadier	Ecklinville	fairly Firm	fine		
Stina Lohmann	DEU	Unknown	Unknown	Firm	fine		
Crelesc de Breaza	ROM	Unknown	Unknown	Firm	fine	crisp	
Patte de Loup	FRA	Unknown	Unknown	Firm	fine		
Ernst Bosch	Unknown	Ananas Reinette	Mank's Codlin	Firm	coarse		
Erwin Baur	Unknown	Geremheit Dr Oldenburg	Unknown	Firm	fairly fine		
Mobbs Royal	Unknown	Unknown	Unknown	Firm	fine		
Tropical Beauty	ZAF	Unknown	Unknown	Firm	rather coarse		
Thomas Rivers	GBR	American Mother	Unknown	Firm		crisp	
Neue Goldparmane	DEU	Golden Winter Pearmain	Parker's Grey Pippin	Firm	fine		
Cola	ITA	Unknown	Unknown	Firm	coarse		
Harang Alma	HUN	Unknown	Unknown	Firm	coarse	crisp	
Kemp	Unknown	Unknown	Unknown	Firm	coarse		
Fukutami	JPN	Jonathan	Ralls Janet	Firm	fine		
Groninger Kroon	NLD	Unknown	Unknown	very Firm	very fine		
Reinette Rouge Etoilee	BEL/NLD	Unknown	Unknown	fairly Firm	fine		
Hunt's Early	Unknown	Unknown	Unknown	very Firm	coarse	crisp	hard
Feltham Beauty	Unknown	Cox's Orange Beauty	Gladstone	Firm		crisp	tender
Kitchovka	Unknown	Unknown	Unknown	Firm	rather coarse		
Hounslow Wonder	GBR	Dumelow's Seedling	Unknown	Firm	fine	crisp	
Wagener	USA	Unknown	Unknown	fairly Firm		quite crisp	tender
Old Fred	GBR	Allington Pippin	Court Pendu Plat	Firm	fine		
Thurgauer Weinapfel	CHE	Unknown	Unknown	Firm	coarse	crisp	
Kandile	BGR	Unknown	Unknown	Firm	fine		
Caravel	Unknown	Unknown	Crimson Beauty	Firm			
George Carpenter	GBR	Blenheim Orange	King of the Pippins	Firm	fine	crisp	tender
Jefferis	USA	Unknown	Unknown	Firm		crisp	tender
Lawfam	CAN	Lawver	Fameuse	Firm	fine	crisp	
Pfirsichroter Sommerapfel	Unknown	Unknown	Unknown	Firm	fine		
Eight Square	Unknown	Unknown	Unknown	Firm		crisp	
Gustavs Dauerapfel	Unknown	Unknown	Unknown	Firm	fine		
Friedrich der Grosse	DEU	Unknown	Unknown	Firm	fine		hard
Adersleber Calville	DEU	Calville Blanc d'Hiver	Gravenstein	Firm	fine		
Pewaukee	USA	Duchess of Oldenburg	Northern Spy	fairly Firm	rather coarse		tender
Gian Andre	ITA	Unknown	Unknown	Firm	fine		tender
Canvada	ZAF	Unknown	Unknown	Firm	coarse		tender
Ben's Red	Unknown	Devonshire Quarrenden	Farleigh Pippin	Firm	fine	crisp	
Gibbon's Russet	IRL	Unknown	Unknown	Firm	fine		tender
Julgrans	SWE	Unknown	Unknown	Firm	fine		
Karastoyanka	BGR	Unknown	Unknown	Firm	fine		
Merton Knave	Unknown	Unknown	Unknown	Firm			
Widdup	Unknown	Unknown	Unknown	Firm	fine	crisp	
Fiessers Erstling	Unknown	Bismarck	Unknown	Firm	fine	crisp	tender
Macwood	CAN	McIntosh	Forest	Firm	somewhat coarse		
Gyogyi piros	HUN/ROM	Unknown	Unknown	fairly Firm	fine		
Prince Nicolas	CHE	Unknown	Unknown	Firm	fine	crisp	
Schofogeable	DNK	Unknown	Unknown	Firm	somewhat coarse		
Beregi Sovari	HUN	Unknown	Unknown	Firm	fine		

Red Astrachan	Unknown	Unknown	Unknown	Firm	coarse		
Golden Melon	JPN	Golden Delicious	Indo	soft			
Giant Geniton	NZL	Unknown	Unknown	Firm	fine	crisp	
Tare de Ghinda	ROM	Unknown	Unknown	Firm			
Wilkenburger							
Herbstreinette	Unknown	Unknown	Unknown	Firm	fine	crisp	
Taunton Cross	Unknown	Wealthy	Unknown	Firm	coarse	crisp	
Earl Cowper	Unknown	Unknown	Unknown	fairly Firm	fine		
Miskolci Kormos	HUN	Unknown	Unknown	Firm	fine		
Legana	AUS	Democrat	Delicious	Firm	fine		
Belvoir Seedling	GBR	Annie Elizabeth	Dumelow's Seedling	Firm	fine		
Szechenyi Renet	HUN	Unknown	Unknown	Firm			
Reale d'Entraygues	FRA	Unknown	Unknown	very Firm			
Astrachan Large Fruited	Unknown	White Astrachan	Unknown	Firm	coarse		tender
Desseffy Arisztid	HUN	Unknown	Unknown	Firm	fine		
Golden Knob (1)	Unknown	Unknown	Unknown	Firm			
Tellina	ITA	Unknown	Unknown	Firm	fine		
Dunning	Unknown	Early McIntosh	Cox's Orange Pippin	Firm	fine	crisp	
Thompson's Apple	Unknown	Unknown	Unknown	Firm	fine	crisp	
Norfolk Beauty	Unknown	Warner's King	Walton Abbey	Firm			tender
Present van Holland	NLD	Present van Engeland	Brabant Bellefleur	Firm	coarse		
McLellan	USA	Unknown	Unknown	fairly Firm	fine		tender
Spigold	Unknown	Unknown	Unknown	Firm			
Szabadkai Szercsika	Unknown	Unknown	Unknown	Firm			
Reinette de France	FRA	Unknown	Unknown	Firm	fine	crisp	
Stark's Earliest	Unknown	Unknown	Unknown	Firm			
Domnicele	ROM	Unknown	Unknown	Firm	somewhat coarse		
Grosse Mignonne d'Herbassy	FRA	Unknown	Unknown	fairly Firm	fine		
Franc Roseau	unknown	Unknown	Unknown	Firm	fine	crisp	
Garnet	Unknown	Rival	Worcester Pearmain	Firm	fine	crisp	hard
Peche Melba	Unknown	Unknown	Unknown	Firm	coarse		
Bebe Rose	Unknown	Unknown	Unknown	Firm	fine		tender
Red Granny Smith	AUS	Granny Smith	Jonathan	Firm			tender
Hunt's Duke of Gloucester	GBR	Nonpareil	Unknown	Firm	fairly fine	crisp	
Stoncrop	CAN	Stone	Unknown	Firm	fine	crisp	tender
Violetta	ITA	Unknown	Unknown	Firm	fine		
Doree de Tournai	BEL	Unknown	Unknown	Firm		crisp	
Antonovka	Unknown	Unknown	Unknown	soft	coarse		
Washington Strawberry	USA	Unknown	Unknown	soft	coarse		tender
Calville Rouge du Mont d'Or	FRA	Unknown	Unknown	soft	rather coarse		
Lorna Doone	GBR	Unknown	Unknown	soft		mealy	
Joyce	Unknown	McIntosh	Unknown	soft	coarse		
Gold Medal	Unknown	unknown	Unknown	soft			
Golden Bittersweet	Unknown	Unknown	Unknown	very soft			
Summer Apple	Unknown	Unknown	Unknown	soft	fine	mealy	
Notarisappel	Unknown	Alant	Unknown	soft	coarse		
Winter Codlin	GBR	Unknown	Unknown	soft			tender
Elton Beauty	GBR	James Grieve	Worcester Pearmain	rather soft	fine		
Redwing	GBR	Unknown	Unknown	soft		mealy	
Tordai alma	Unknown	Unknown	Unknown	soft	coarse		
Beacon	USA	Malinda	Unknown	soft			
Cornish Honeypin	GBR	Unknown	Unknown	soft	fine		
Merton Joy	Unknown	Unknown	Unknown	Soft			
Maidstone Favourite	Unknown	Alexander	Beauty of Bath	soft	fine		
Lord Rosebery	Unknown	Unknown	Unknown	soft		crisp	
Hood's Supreme	Unknown	Unknown	Unknown	soft	ery coarse		
Sussex Mother	Unknown	Unknown	Unknown	soft			tender
Rock (2)	Unknown	Unknown	Unknown	Soft			
Orbai Alma	HUN	Unknown	Unknown	soft	coarse		
Knobby Russet	GBR	Unknown	Unknown	soft	fine	mealy	
Rosa del Caldaro	ITA	Unknown	Unknown	soft	fine		
Emneth Early	Unknown	Unknown	Unknown	Soft			
Texola	USA	Ben Davis	Unknown	soft			
Corolca	ROM	Unknown	Unknown	soft			
Minnehaha	USA	Malinda	Unknown	rather soft	coarse		
Snovit	Unknown	Stenbock	Pfirsichroter Sommerapfel	very soft			
Miller's Seedling (LA 69A)	Unknown	Unknown	Unknown	Soft			
Just Gyula	Unknown	Unknown	Unknown	soft	fine		
Domnesc	Unknown	Unknown	Unknown	soft	coarse		
Alexander	Unknown	Unknown	Unknown	soft			
Edelroter	ITA	Unknown	Unknown	soft	fine		
Lundbytorp	DNK	Unknown	Unknown	fairly soft	fine		

Schoner aus External	DEU	Unknown	Unknown	soft	coarse		
Scilly Pearl	Unknown	Unknown	Unknown	soft		crisp	tender
American Golden Russet	USA	Unknown	Unknown	soft	fine		
Coo's River Beauty	GBR	Unknown	Unknown	soft			
Mrs. Barron	Unknown	Unknown	Unknown	soft			tender
Thorle Pippin	Unknown	Unknown	Unknown	soft			
Oriole	Unknown	Unknown	Unknown	soft	coarse		
Maren Nis	Unknown	Unknown	Unknown	rather soft			
Nobil de Geoagiu	Unknown	Unknown	Unknown	soft	fine		
Calville Duquesne	BEL	Unknown	Unknown	soft	coarse		
Graue Herbstrenette	Eur/GBR	Unknown	Unknown	soft	fine		
Oberlausitzer Muskatrenette	DEU	Unknown	Unknown	soft	coarse		
Schurapfel	DEU	Unknown	Unknown	soft	coarse		
Venus Pippin	Unknown	Unknown	Unknown	soft	coarse		tender
Hamvas alma	HUN	Unknown	Unknown	soft	fairly fine		
Glebe Gold	GBR	Yellow Ingestrie	Cellini	soft			
Rome Beauty	USA	Unknown	Unknown	soft	fairly coarse		
Tordai Piros Kalvil	Unknown	Unknown	Unknown	soft	coarse		
Redhook	Unknown	McIntosh	Carlton	rather soft	fine		
Golden Royal	Unknown	Unknown	Unknown	soft	fine		
Clydeside	Unknown	unknown	unknown	soft		slightly mealy	
Crowned Pippin	unknown	Unknown	Unknown	soft		mealy	
Macy	USA	Northwestern Greening	Wealthy	soft			
Primus	GBR	Reinette Rouge Etoilee	Cox's Orange Pippin	soft	coarse		
Steyne Seedling	GBR	Unknown	Unknown	soft		crisp	tender
Beeley Pippin	Unknown	Unknown	Unknown	rather soft	fine		
Lucullus	NLD	Jonathan	Cox's Orange Pippin	fairly soft			
Edwards	USA	Hall	Unknown	soft	coarse		
Wilstedter	DEU	Unknown	Unknown	soft	coarse		
Welcome	Unknown	Unknown	Unknown	soft	fine		tender
Transparente de Bois- Guillaume	Unknown	Unknown	Unknown	soft		mealy	
Langley Pippin	Unknown	Cox's Orange Pippin	Gladstone	soft	coarse		
Hannan Seedling	Unknown	Unknown	Unknown	soft	coarse		
Signe Tillisch	DNK	Calville Blanc d'Hiver	Unknown	soft			
Mareda	GBR	Winesap	Unknown	rather soft			
Runse	ITA	Unknown	Unknown	soft	coarse		
Dillington Beauty	NZL	Unknown	Unknown	soft	coarse		
Duegne	Unknown	Unknown	Unknown	soft			
Marienwerder Gulderling	DEU	Unknown	Unknown	rather soft	coarse		
Idagold	USA	Esopus Spitzenburg	Wagener	soft	fine		
Appel van Paris	NLD	Brabant Bellefleur	Jonathan	fairly soft	fairly coarse		
Duchess of Bedford	Unknown	Cellini	Beauty of Bath	rather soft	fine		
Ye Old Peasgood	Unknown	Unknown	Unknown	soft	coarse		
Mio	Unknown	Worcester Pearmain	Oranie	soft			
Kronprinz Rudolf	Unknown	Unknown	Unknown	soft	fine		
Transparente de Croncels	FRA	Unknown	Unknown	soft	rather coarse		
Coul Blush	GBR	Unknown	Unknown	soft	fairly fine		
Zelyonka Kharkovskaya	Unknown	Unknown	Unknown	Soft			
Galeuse	FRA	Unknown	Unknown	soft			
Red Transparent	Unknown	Unknown	Unknown	soft			
May Beauty	GBR	Newton Pippin	Golden Pippin	soft	fairly coarse		
Gambafina	ITA	Unknown	Unknown	soft			
Peacemaker	GBR	Houblon	Rival	rather soft	fine		
Forpear	Unknown	Forest	Unknown	soft			
Benenden Early	Unknown	Saint Edmund's Pippin	Lady Sudeley	soft	coarse		
Saint Ailred	Unknown	Unknown	Unknown	soft		crisp	
Mead's Broading	Unknown	Unknown	Unknown	soft	coarse		
Gloria Mundi	DEU/USA	Unknown	Unknown	soft	coarse		
Foulkes' Foremost	GBR	Unknown	Unknown	rather soft			
Milton	USA	White Transparent	McIntosh	soft	fine		
Stark EarliBlaze	USA	Unknown	Unknown	rather soft	coarse		