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Apple Accessions of Low Priority Targeted for Removal from The National Plant Germplasm System

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The National Germplasm Repository (NGR) for Apple and Grape in Geneva, NY is part of the National Plant Germplasm System (NPGS). It was established in 1983 after initial planning in the 1970s (1, 5). Procedures for establishing each of the repositories for clonally propagated crops were developed (7). In 1992, each of the repositories prepared site-specific procedures manuals that are maintained at the headquarters offices of the NPGS in Beltsville, MD and at the specific sites.

Activities at the NGR for Apple and Grape in Geneva, NY have been described (2). The collection in Geneva contains 2600 clones of *Malus* along with 500 seed/seedling populations of wild species. Genetic variation of the holdings at the NGR is being studied using morphological, biochemical and molecular techniques (4). The collection is constrained by financial support. The investigations as described (4) and still to be published indicate that many of the 2600 clones are very similar and add little to the diversity of the collection. At least 2100 of the 2600 clones are of the classification *Malus x domestica* (3) which appears to have a very narrow genetic base. There have been at least 35 species of

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Apples to be Removed from National Germplasm Repository, Geneve, NY.

ID No.	Species	Cultivar	Origin	Remarks
GMAL 408	domestica	Adams Jonathan	USA	2-2-4 Chimera
GMAL 1334	domestica	Allington Pippin	UK	King of Pippins x Cox's Orange Pippin
GMAL 1040	domestica	Anderson Jonathan	USA	Identical w/Jonathan, diploid
GMAL 583	domestica	Anderson Twenty	USA	Red mutation of Twenty Ounce
GMAL 1280	domestica	Anson Delicious	USA	Red-fruit mutation of Delicious
GMAL 1100	domestica	Ashworth Old McIntosh	USA	Synonym—McIntosh
GMAL 469	domestica	Aunt Lucy	USA	Large, yellow-green
GMAL 1321	domestica	Australian Gravenstein	AUS	Red-fruited mutation of Gravenstein
GMAL 567	domestica	Australian Rome	AUS	Indistinguishable from Rome Beauty
GMAL 806	domestica	Baille Rome	USA	Indistinguishable from Rome Beauty
GMAL 975	domestica	Ballarat	AUS	Dunn Sdlg. x ?
GMAL 655	domestica	Bancroft	CAN	Forest x McIntosh
GMAL 929	domestica	Banks Gravenstein	CAN	Red-fruited mutation of Gravenstein
GMAL 916	domestica	Bender Spy	USA	Indistinguishable from Northern Spy
GMAL 1337	domestica	Black Mickey McIntosh	USA	Red-fruited bud mutation of McIntosh
GMAL 1117	domestica	Blackjon	USA	Red-fruited mutation of Jonathan
GMAL 1326	domestica	Blangsted Cox	DEN	Blush colored Cox
GMAL 1190	domestica	Blood Red Gravenstein	DEN	Indistinguishable from Gravenstein
GMAL 1110	domestica	Borchert #1	USA	Probably sdlg. of McIntosh
GMAL 603	domestica	Boswell Starking	USA	Indistinguishable from Starking Delicious
GMAL 514	domestica	Bottle Greening	USA	Chance sdlg.
GMAL 1160	domestica	Bridgham Delicious	USA	Faintly red-fruited bud mutation of Delicious
GMAL 999	domestica	Burke Sweet	USA	
GMAL 1082	domestica	C & O Winesap	USA	Red-fruited mutation of Winesap
GMAL 559	domestica	Cain Delicious	USA	Red-fruited mutation of Delicious
GMAL 855	domestica	California Sweet	USA	Med/large, dull red
GMAL 634	domestica	Carla	ITALY	Med. size, yellow-green
GMAL 1086	domestica	Carlson Rome	USA	Bud mut. of Rome Beauty
GMAL 456	domestica	Case Wealthy	USA	Bud mut. of Wealthy
GMAL 523	domestica	Cherri-Red Delicious	USA	Red-fruited mutation of Delicious
GMAL 939	domestica	Cherry Cox	DEN	Red-fruited mutation of of Cox
GMAL 987	domestica	Cho You	JAP	Golden Delicious x Esopus Spitzenburg
GMAL 1276	domestica	Clarkrich Delicious	USA	Starking Delicious limb sport
GMAL 910	domestica	Classic Delicious	USA	Starking Delicious limb sport
GMAL 470	domestica	Cockle	UK	Greenish-yellow
GMAL 571	domestica	Colora York	USA	Red-fruited mutation of York Imperial
GMAL 612	domestica	Conical Rome	USA	Indistinguishable from Rome Beauty

Apples to be Removed from National Germplasm Repository (Cont.).

ID No.	Species	Cultivar	Origin	Remarks
GMAL 1037	domestica	Cornell McIntosh	USA	Red-fruited mutation of McIntosh
GMAL 628	domestica	Coulon	BEL	Large; yellowish green
GMAL 778	domestica	Cox Rome	USA	Rome Beauty bud mutation
GMAL 638	domestica	Crimson Spy	CAN	Northern Spy bud mutation
GMAL 801	domestica	Currie	CAN	Northern Spy seedling
GMAL 1175	domestica	Daintop	JAP	Cho You (Golden Delicious x Esopus) x Starking
GMAL 582	domestica	Dalzell Rome	USA	Red-fruited mutation of Rome Beauty
GMAL 1085	domestica	Davey	USA	McIntosh x (o.p.)
GMAL 1033	domestica	De Roche St. Lawrence	CAN	Synonym of St. Lawrence
GMAL 1283	domestica	Debbie	USA	Red, striped, attractive
GMAL 578	domestica	Delawine	USA	Delicious x Stayman Winesap
GMAL 807	domestica	Dilatush #1	USA	Yellow-green
GMAL 857	domestica	Donald	CAN	Northern Spy x (o.p.)
GMAL 1123	domestica	Dooley #1	USA	Red, striped, attractive
GMAL 577	domestica	Downing #2	USA	Golden Delicious x Red Rome
GMAL 945	domestica	Duke of Clarence	AUS	Large, red, no value
GMAL 1281	domestica	Duke of Devonshire	UK	Green, unproductive
GMAL 890	domestica	Dunn's Seedling	AUS	Large, pink blushed
GMAL 1347	domestica	Earlijon	USA	Yellow ground, dark red
GMAL 947	domestica	Earlired Delicious	USA	Limb mutation of Starking Delicious
GMAL 597	domestica	Earlistripe Delicious	USA	Limb mutation of Wellspur Delicious
GMAL 862	domestica	Earlistripe Spur Delicious	USA	Spur mutation of Earlistripe Delicious
GMAL 1079	domestica	Early Maturing McIntosh	CAN	Indistinguishable from McIntosh
GMAL 694	domestica	Eastman Sweet	USA	Yellow, scarlet striping
GMAL 971	domestica	Ebenezer Lambkin	USA	Very large, red, striped
GMAL 529	domestica	Edgar	CAN	McIntosh x Forest
GMAL 407	domestica	Elmer	CAN	Northern Spy x (o.p.)
GMAL 642	domestica	English Redstreak	USA	Medium, red, some russet
GMAL 965	domestica	Epicurean	UK	Red-fruited mutation of Epicure
GMAL 588	domestica	Etter's Gold	USA	Large, yellow
GMAL 774	domestica	Eustace #1	USA	Prob. sdlg. of Delicious
GMAL 1129	domestica	Excells Delicious	USA	Whole-tree mutation of Starking Delicious
GMAL 842	domestica	Fairwood	CAN	Reported to be Northern Spy x Tompkins King
GMAL 455	domestica	Farley McIntosh	USA	McIntosh bud mutation
GMAL 447	domestica	Faurot	USA	Ben Davis x Jonathan
GMAL 411	domestica	Franklin	USA	McIntosh x Delicious
GMAL 841	domestica	Freeborn Jonared	USA	Large fruited mutation of Jonared
GMAL 613	domestica	Freeman #1	USA	Pound Sweet x (o.p.)
GMAL 1173	domestica	Frimley Rome	NZ	Red-fruited mutation of Rome Beauty
GMAL 665	domestica	Fukutami	JAP	Jonathan x Ralls Janet
GMAL 525	domestica	Fyan	USA	Ben Davis x Jonathan

Apples to be Removed from National Germplasm Repository (Cont.).

ID No.	Species	Cultivar	Origin	Remarks
GMAL 609	domestica	Galbraith Baldwin	USA	Red-fruited mutation of Baldwin
GMAL 1093	domestica	Galton	CAN	Northern Spy x (o.p.)
GMAL 712	domestica	Gano	USA	Red-fruited mutation of Ben Davis
GMAL 1257	domestica	Garage	USA	Medium, dark red blush
GMAL 989	domestica	Gardner Delicious	USA	Red-fruited mutation of Delicious
GMAL 507	domestica	Geneva McIntosh	USA	McIntosh bud mutation
GMAL 431	domestica	German Rome	GER	Red-fruited mutation of Rome Beauty (redder)
GMAL 669	domestica	Glenton	CAN	Northern Spy x (o.p.)
GMAL 798	domestica	Glovier Delicious	USA	Indistinguishable from Delicious
GMAL 1066	domestica	Goldo	USA	Duchess of Oldenberg x Grimes Golden
GMAL 751	hybrid	Goolsbey	USA	Dolgo seedling
GMAL 424	domestica	Governor Carr	USA	Large, dull red blush
GMAL 1267	domestica	Graham Spy	USA	Whole-tree red-fruited mutation of Northern Spy
GMAL 698	domestica	Greasy Pippin (ORTLEY)	USA	Yellow-green
GMAL 1147	domestica	Green Delicious	USA	Green-skin mutation of Delicious
GMAL 713	domestica	Green Peak Spy #2	USA	Synonymous w/Northern Spy Diploid
GMAL 627	domestica	Greene Spy	USA	Red fruited mutation of Northern Spy
GMAL 473	domestica	Groth Delicious	USA	Red-fruited mutation of Delicious
GMAL 1242	domestica	Grove	USA	Ingram x Delicious
GMAL 858	domestica	Hardanger Rosenstrips	NOR	Red stripe, low quality
GMAL 740	domestica	Hardeman Delicious	USA	Red-fruited, whole-tree mutation of Delicious
GMAL 683	domestica	Hardispur Delicious	USA	Starking Delicious bud mutation
GMAL 889	domestica	Hargrave's Spur Delicious	USA	Red-fruited, limb mutation of Starking Delicious
GMAL 1302	domestica	Harrold Delicious	USA	Red-fruited, limb mutation of Starking Delicious
GMAL 637	domestica	Harvey (Maine)	USA	Different from Harvey (England)
GMAL 722	domestica	Haugmann	NOR	Med. size, red, striped
GMAL 425	domestica	Hawley	USA	Glossy greenish yellow
GMAL 526	domestica	Helderman's Favorite	USA	Stayman Winesap, Red June, Delicious believed to be parentage
GMAL 715	domestica	Henry Clay	USA	Large, yellowish-green
GMAL 962	domestica	Hi Early Delicious	USA	Red-fruited, whole-tree mutation of Starking Delicious
GMAL 1166	domestica	Hi Red Delicious	USA	Red-fruited, limb mutation of Starking Delicious
GMAL 871	domestica	Holdfast	USA	Sdlg. of unknown parentage
GMAL 706	domestica	Hollow Log	USA	Large, greenish-yellow
GMAL 1297	domestica	Horei	JAP	Ralls Janet x Golden Delicious
GMAL 1218	domestica	Horton Twenty Ounce	USA	Red-fruited mutation of Twenty Ounce

Apples to be Removed from National Germplasm Repository (Cont.).

ID No.		Species	Cultivar	Origin	Remarks
GMAL	631	domestica	Hume	CAN	McIntosh sdlg.
GMAL	874	domestica	Huntsman Favorite	USA	Large, yellow, unattractive
GMAL	610	domestica	Idaho Spur Delicious	USA	Red-fruited, spur habit mutation of Delicious
GMAL	1271	domestica	Ildrod Pigeon	DEN	Med. size, red, late
GMAL	601	domestica	Imperial Delicious	USA	Starking Delicious whole-tree mutation
GMAL	1112	domestica	Imperial McIntosh	USA	Forced adventious growth from Imperial All Red McIntosh
GMAL	959	domestica	Improved Red McIntosh	USA	Red-fruited mutation of McIntosh
GMAL	927	domestica	Jenkins #1	USA	Large, red, striped
GMAL	786	domestica	Jersey Black	USA	Large, dark bluish red
GMAL	1144	domestica	Jonadel	USA	Jonathan x Delicious
GMAL	727	domestica	Jon-A-Late	USA	Same as Jonathan; not late
GMAL	606	domestica	Jongrimes (Stark)	USA	Yellow w/red streaks
GMAL	884	domestica	Jono	USA	Summer Champion x Jonathan
GMAL	1106	domestica	Jonwin	USA	Jonathan x Baldwin
GMAL	845	domestica	Joyce	CAN	McIntosh sdlg.
GMAL	1296	domestica	Jubilee	CAN	McIntosh x Grimes Golden
GMAL	763	domestica	Kasha	USA	Sdlg. of Wolf River which is sdlg. of Alexander
GMAL	770	domestica	Kaupanger	NOR	Large, red, striped
GMAL	1096	domestica	Kernohan #l	CAN	Sdlg. of unknown parentage
GMAL	596	domestica	Kibbe Spy	USA	Indistinguishable from Northern Spy
GMAL	891	hybrid	Killand	USA	McIntosh x Dolgo
GMAL	1092	domestica	King Acre Pippin	UK	Sturmer Pippin x Ribston Pippin
GMAL	800	domestica	King Luscious	USA	Chance sdlg., very large
GMAL	1179	domestica	Knuthenborg Gravenstein	DEN	Same as Gravenstein; not redder
GMAL	1299	domestica	Kress McIntosh	USA	Reported to be sdlg. of McIntosh
GMAL	592	domestica	Kuppens Spy	USA	Red-fruited mutation of Northern Spy
GMAL	1035	domestica	Kyokko	JAP	Ralls Janet x McIntosh
GMAL	685	domestica	Lady Carrington	NZ	Med., dark red, attractive
GMAL	876	domestica	Lady Sudeley	UK	Med., red, attractive
GMAL	942	domestica	Laking	CAN	King x Northern Spy
GMAL	1158	domestica	Lalla Delicious	AUS	Delicious bud mutation
GMAL	1155	domestica	LaSalle	CAN	Med., red, unattractive
GMAL	955	domestica	Late Sweet McIntosh	USA	Not McIntosh type
GMAL	860	domestica	Laxton's Fortune	UK	Syn. Fortune
GMAL	742	domestica	Levering Limbertwig	USA	Large-fruited mutation of Limbertwig
GMAL	1028	domestica	Lewis #l	USA	Worthless
GMAL	828	domestica	Lisovich #1	USA	Large, half red, striped
GMAL	915	domestica	Loachapoka	USA	Med., red, unattractive
GMAL	1184	domestica	Lodi (Starkspur)	USA	Sdlg.-not bud mutation of Lodi
GMAL	819	domestica	Loop Red Baldwin	USA	Red-fruited mutation of Baldwin
GMAL	791	domestica	Loop Striped Rome	USA	Rome bud mutation
GMAL	415	domestica	Lord Kitchner	UK	(o.p.) sdlg. of Peasgood Nonsuch
GMAL	1027	domestica	Lyons	USA	Chance sdlg.

Apples to be Removed from National Germplasm Repository (Cont.).

ID No.	Species	Cultivar	Origin	Remarks
GMAL 1233	domestica	Maidstone Favorite	UK	Alexander x Beauty of Bath
GMAL 1255	domestica	Mandan 56-4	USA	Duchess of Oldenburg x Starking Delicious
GMAL 1268	domestica	McCoy Red Winter	USA	Resembles Paragon
GMAL 1138	domestica	McIntosh	USA	Synonymous with McIntosh
GMAL 964	domestica	McIntosh 10C-15-29-5	CAN	Bud mutation induced by irradiating dormant McIntosh scions with gamma rays
GMAL 898	domestica	McIntosh 652	USA	Red-fruited mutation of McIntosh
GMAL 623	domestica	McLicious	USA	Early McIntosh x Golden Delicious
GMAL 1053	domestica	Megumi	JAP	Ralls Janet x Jonathan
GMAL 1352	domestica	Merton Charm	UK	McIntosh x Cox's Orange Pippin
GMAL 644	domestica	Merton Delight	UK	Cox x Golden Russet
GMAL 1322	domestica	Merton Prolific	UK	Northern Greening x Cox's Orange Pippin
GMAL 605	domestica	Miami Stark	USA	Limb red-fruited mutation of Stark
GMAL 1213	domestica	Michael Henry Pippin	USA	Light green, orange blush
GMAL 662	domestica	Midland	USA	Resembles Red Astrachan
GMAL 1059	domestica	Midttun	NOR	Red, mid-season, drops
GMAL 796	domestica	Miller Sturdy Spur Delicious	USA	Whole-tree, spur-type of Starking Delicious
GMAL 435	domestica	Mills Rome	USA	Red-fruited mutation of Rome Beauty
GMAL 1282	domestica	Minjon	USA	Probably Wealthy x Jonathan
GMAL 850	domestica	Missouri Pippin	USA	Old American, lost favor
GMAL 1124	domestica	Monarch	UN	Peasgood Nonsuch x Dumelow's Sdlg.
GMAL 1258	domestica	Morden 363	CAN	Haralson x Melba
GMAL 820	domestica	Morse #2	USA	McIntosh Sdlg.
GMAL 547	domestica	Morse Beauty	USA	McIntosh Sdlg.
GMAL 410	domestica	Morse Late	USA	McIntosh Sdlg.
GMAL 799	domestica	Mosa 64	USA	Resembles Jonared
GMAL 743	domestica	Myrtle Delicious	USA	Red-fruited mutation of Delicious
GMAL 1013	hybrid	NY 73785-6	USA	Ottawa 7 x Novole
GMAL 719	domestica	Newell	USA	Large, striped, good, late
GMAL 573	domestica	Newton Wonder	UK	Dumelow Sdlg. x Blenheim Orange
GMAL 906	domestica	Newtosh	CAN	McIntosh x Newton
GMAL 852	domestica	Niobe	CAN	Northern Spy Sdlg.
GMAL 1187	domestica	Nova Red Cortland	CAN	Radiation induced mutation
GMAL 482	domestica	Nured Rome	USA	Originally C & O Red Rome 262
GMAL 972	domestica	Oberle Spy	USA	Indistinguishable from Northern Spy
GMAL 433	domestica	Ohio Rome	USA	Red-fruited mutation of Rome
GMAL 1150	domestica	Okanoma Delicious	USA	First spur-type Delicious
GMAL 767	domestica	Orenco	USA	Bright red
GMAL 1060	domestica	Ozark Ruby	USA	Resembles Idared
GMAL 564	domestica	Pacific Pride	USA	Resembles Gravenstein

Apples to be Removed from National Germplasm Repository (Cont.).

ID No.	Species	Cultivar	Origin	Remarks
GMAL 1031	domestica	Peducah	USA	Rome Beauty Sdlg.
GMAL 1083	domestica	Paladino Spur McIntosh	USA	No spur growth habit
GMAL 724	domestica	Papierowka Polska	POL	Same as Yellow Transparent
GMAL 1212	domestica	Paradise Sweet	USA	Large, red, sweet, late
GMAL 687	domestica	Paynter Delicious	CAN	Spur whole-tree mutation of Starking Delicious
GMAL 474	domestica	Peace Garden	USA	Malinda x Duchess of Oldenburg
GMAL 897	domestica	Penrome	USA	Red-fruited mutation of Rome
GMAL 556	hybrid	Piotosh	CAN	Pioneer Crab (Malus baccata x Tetofsky) x McIntosh
GMAL 1104	domestica	Platts Melba	CAN	Red-fruited mutation of Melba
GMAL 1199	domestica	Pocomoke	USA	Large, red, mid-season
GMAL 779	domestica	Poe Stayman	USA	Red-fruited mutation of Stayman Winesap
GMAL 576	domestica	Pollock Stark	USA	Red-fruited mutation of Stark
GMAL 1358	domestica	Polly Eades	USA	Resembles Maiden Blush
GMAL 572	domestica	Pomme Pierre	FRA	Late flowering
GMAL 634	domestica	Porter's Perfection	UK	PI 161844 European cider type
GMAL 949	domestica	Primegold	USA	Golden Delicious Sdlg.
GMAL 704	domestica	Puritan	USA	McIntosh x Red Astrachan
GMAL 639	hybrid	Quaker Beauty	CAN	Flowering Crab
GMAL 1274	domestica	Radiance	NZ	Resembles Kidd's Orange Red
GMAL 749	domestica	Raritan	USA	(Melba x Sonora) x [Melba x (Williams x Starr)]
GMAL 960	domestica	Red Beauty Delicious	USA	Red-fruited spur-growth mutation of Delicious
GMAL 562	domestica	Red Bouquet Delicious	USA	Pink-flowered mutation of Starking Delicious
GMAL 667	domestica	Red Codling	USA	Same as Forest and Monmouth Beauty
GMAL 1250	domestica	Red Cortland (Lobo-Barber)	USA	
GMAL 772	domestica	Red Goudreinette	NET	Red-fruited mutation of Belle de Boskoop PI 199662
GMAL 590	domestica	Red Ingrid Marie	DEN	Red-fruited mutation of Ingrid Marie
GMAL 885	domestica	Red King Delicious	USA	Red-fruited limb mutation of Starking Delicious
GMAL 1301	domestica	Red Limbertwig	USA	Claimed to be red-fruited mutation of Limbertwig
GMAL 709	domestica	Red Prince Delicious	USA	Red-fruited limb mutation of Delicious
GMAL 741	domestica	Red Queen Delicious	USA	Red-fruited, limb mutation of Starking Delicious
GMAL 666	domestica	Red Scarlet	USA	Red Bellflower x Baldwin
GMAL 595	domestica	Red Stark Earliest	USA	Fruit & tree identical with Stark Earliest
GMAL 593	domestica	Red Statesman	NZ	Red-fruited mutation of Statesman, PI 251567
GMAL 689	domestica	Red Thorle	NZ	Red-fruited, bud mutation of Thorle Pippin
GMAL 825	domestica	Red Warrior	USA	Red, blushed, striped, attractive

Apples to be Removed from National Germplasm Repository (Cont.).

ID No.	Species	Cultivar	Origin	Remarks
GMAL 1194	domestica	Red Wenatchee Delicious	USA	Red-fruited mutation of Delicious
GMAL 1009	domestica	Red Willow Twig	USA	Red-fruited mutation of Willow Twig
GMAL 690	domestica	Red Wing	USA	Malinda open-pollinated
GMAL 646	domestica	Redchief Delicious	USA	Red-fruited limb mutation of Starkrimson Delicious
GMAL 1336	domestica	Redspur Delicious	USA	Whole-tree red-fruited, spur growth habit mutation of Starking Delicious
GMAL 624	domestica	Redsumbo	USA	Red-fruited mutation of Summer Rambo
GMAL 872	domestica	Redwin Spy	CAN	Red-fruited mutation of Northern Spy
GMAL 977	domestica	Regal Chelan Spur Delicious	USA	Red-fruited, limb mutation of Wellspur Delicious
GMAL 878	domestica	Reinar	NOR	PI 101886, very dark red
GMAL 880	domestica	Reineta Emarnada	SPA	PI 245144
GMAL 710	domestica	Rhoda	USA	Malinda sdlg.
GMAL 607	domestica	Rings Wealthy	USA	Red-fruited mutation of Wealthy
GMAL 1245	domestica	Roanoke	USA	Red Rome x Schoharie
GMAL 1125	domestica	Rodney	USA	Okabena sdlg.
GMAL 477	domestica	Roman Stem	USA	Yellow-green, late
GMAL 402	domestica	Rondo	CAN	PI 148426, (o.p.) sdlg. of Salome
GMAL 759	hybrid	Rosilda	CAN	Prince x McIntosh
GMAL 928	domestica	Rosthern 18	CAN	PI 144027
GMAL 602	domestica	Royal Red Delicious	USA	Red-fruited, early-coloring limb mutation of Richared Delicious
GMAL 725	domestica	Ruby	USA	Gallia Beauty x Starking Delicious
GMAL 784	domestica	Ruby Rome Beauty	USA	Red-fruited limb mutation of Rome Beauty
GMAL 748	domestica	Ryan Red Delicious	USA	Red-fruited limb mutation of Starking Delicious
GMAL 1178	domestica	St. Cecilia	UK	Cox's Orange x
GMAL 1056	domestica	Sandow	CAN	Northern Spy sdlg.
GMAL 461	domestica	Sangrado	USA	Pink flesh; poor quality
GMAL 1143	domestica	Saugahatchee	USA	Gravenstein type
GMAL 569	domestica	Scarlet Staymared	USA	Red-fruited mutation of Stayman
GMAL 1137	domestica	Schoharie	USA	Ralls x Northern Spy
GMAL 617	domestica	Schoner aus Nordhausen	GER	Med. size; half red; late
GMAL 737	domestica	Scott Winter	USA	Med. size; red stripe; acid; very late
GMAL 1109	domestica	Sears #1	USA	Grooved surface; worthless
GMAL 1026	domestica	Sergeant Delicious	USA	Red-fruited mutation of Delicious
GMAL 1263	domestica	Shaw Gravenstein	USA	Red-fruited mutation of Gravenstein
GMAL 696	domestica	Shenandoah	USA	Winesap x Opalescent
GMAL 803	domestica	Shiawassee	USA	Pale yellow, carmine streaks, aromatic

Apples to be Removed from National Germplasm Repository (Cont.).

ID No.	Species	Cultivar	Origin	Remarks
GMAL 702	domestica	Shotwell Delicious	USA	Red-fruited, limb mutation of Delicious
GMAL 442	domestica	Sigafus #1	USA	Delicious type; fleshy stems
GMAL 1140	domestica	Simons Russet Golden Delicious	USA	Golden Delicious mutated totally russetted skin
GMAL 1121	domestica	Simpson Starking	USA	Reported large-fruited Starking
GMAL 594	domestica	Skinner Seedling	USA	Large; red stripe; very good; mid-season
GMAL 1270	domestica	Skyspur Delicious	USA	Whole-tree spur mutation of Skyline Delicious
GMAL 853	domestica	Skyline Delicious	USA	Whole tree red-fruited mutation of Starking
GMAL 1186	domestica	Speckled McIntosh	USA	Same as McIntosh; no speckles
GMAL 652	domestica	Spicap	CAN	Northern Spy sdlg.
GMAL 1249	domestica	Spur McIntosh #9	USA	Same as McIntosh; no spur growth
GMAL 1246	domestica	Starkspur Earliblaze	USA	Spur growth-habit mutation of Stark Earliblaze
GMAL 565	domestica	Starkspur PrimeRed Delicious	USA	Spur-growth mutation of Topred Delicious
GMAL 697	domestica	Starkspur Supreme Delicious	USA	Limb, spur mutation of Delicious Starking
GMAL 815	domestica	Starkspur Ultrared Delicious	USA	Red-fruited mutation of Starking
GMAL 546	domestica	Starkspur Winesap	USA	Whole-tree spur mutation of Winesap
GMAL 780	domestica	Starr	USA	Large; yellowish-green; early
GMAL 555	domestica	Stirling	CAN	Yellow Newtown Sdlg.
GMAL 954	domestica	Stone Ridge Golden Delicious	USA	10-90% surface russet mutation
GMAL 1051	domestica	Summer Champion	USA	Large; red; mid-summer
GMAL 1128	domestica	Summer Delicious (Stark)	USA	Large; red; fair quality
GMAL 1232	domestica	Summerglo	USA	Med. size; half red; early
GMAL 616	domestica	Summerland	CAN	McIntosh x Golden Delicious
GMAL 413	domestica	Summer Scarlet	USA	Large; red; early
GMAL 926	domestica	Sutton	USA	Said to be Hubbardston Nonsuch x
GMAL 598	domestica	Sweet Winesap	USA	Pale yellow/carmine stripes
GMAL 504	domestica	Szampanska	RUS	20% pink stripe; oblate; poor quality; late
GMAL 856	domestica	Tack Ben Davis	USA	Red-fruited mutation of Ben Davis
GMAL 994	domestica	Tangier	USA	Delicious sdlg.; very early
GMAL 653	domestica	Taunton Cross	UK	Wealthy sdlg.; early
GMAL 711	domestica	Thew Gold	USA	Less russet than Golden Delicious
GMAL 1278	domestica	Thorberg	USA	Duchess of Oldenburg x Starking
GMAL 1211	hybrid	Toba	CAN	Crab; large; long ovate; red
GMAL 1146	domestica	Tonasket Delicious	USA	Red-fruited mutation of Delicious
GMAL 1156	domestica	Topred Delicious	USA	Red-fruited mutation of Shotwell Delicious
GMAL 591	domestica	Torino #l	ITALY	Golden Delicious x Jonathan
GMAL 930	domestica	Tyler	USA	Red; triploid
GMAL 922	domestica	Utter	USA	Large/yellow w/red streaks

Apples to be Removed from National Germplasm Repository (Cont.).

ID No.	Species	Cultivar	Origin	Remarks
GMAL 445	domestica	Van Buren Duchess	USA	Red-fruited mutation of Duchess
GMAL 645	domestica	Vance Delicious	USA	Red-fruited mutation of Delicious
GMAL 993	hybrid	Veitch Scarlet	UK	English Cider
GMAL 1206	domestica	Vermont Spur Delicious	USA	Spur mutation of Delicious
GMAL 680	domestica	Warder	USA	Rome Beauty sdlg.
GMAL 729	domestica	Watson #1	USA	Early; 100% red; poor quality; hangs
GMAL 1163	domestica	Wayne Spur Delicious	USA	Spur mutation of Starking
GMAL 1111	domestica	Wellspur Delicious	USA	Whole-tree, spur mutation Starking
GMAL 1338	domestica	Whetstone	USA	Conrad x Delicious
GMAL 1227	domestica	White Pippin	USA	More than one White Pippin
GMAL 1072	domestica	Whitney Russet King	USA	Russet mutation Tompkins King
GMAL 1239	domestica	Willis Williams	USA	Red-fruited mutation Williams Red
GMAL 805	domestica	Wilson #1	USA	Large; attractive; hangs
GMAL 1080	domestica	Wilson Red June	USA	Old American; dark purplish; early
GMAL 1275	hybrid	Winehist	USA	Red-fleshed
GMAL 827	domestica	Worcester Pearmain	UK	Important in England
GMAL 826	domestica	Worcester Cross	UK	Cox x Wealthy
GMAL 421	domestica	Wright Rome	USA	Whole-tree, red-fruited mutation Rome
GMAL 1197	domestica	X-cellent	USA	Red-fruited mutation of Delicious
GMAL 658	domestica	Yellow Gravenstein	USA	Same as Gravenstein
GMAL 1345	domestica	Zorza	USSR	Aport x Dancigskoe Rebristoe
GMAL 1204	domestica	Zusoff	USSR	Large; unattractive color

Malus described, but the domestic apple likely evolved from only one to three species.

At its inception in 1983, the NGR propagated one of the world's largest apple variety collections (6). In subsequent years, the NPGS organized Crop Advisory Committees (CAC) for each major commodity. The CAC for Apple convened in 1985. In that meeting and more recent ones, it has been determined that at least 325 of the 2100 clones of *Malus x domestica* will be removed from the collection to make room for more unique and useful germplasm.

The deaccession list follows for your information. For each clone, we have listed catalog number, species, cultivar name, country of origin and brief remarks. Many of those on the list are sports of standard varieties that are maintained in the collection. We plan to maintain very few sports. Others on the list of discards are named varieties for which we have little information and our observations show them to have little phenotypic uniqueness.

Data on the biochemical analysis of clones targeted for removal are being compared to the data from those clones that will be maintained at Geneva. This will give us some indication of genotypic variation. If these results show clones having unique characters, they will not be removed. We have

records on the distribution of some of the 325 clones. Thus, even if they are removed from the collection, they will not be totally lost. Those targeted for removal from the collection will be maintained until we have had input from this journal's audience. Many have already received the catalog of items available from the NGR. Please compare the present list with the entire list of holdings. If you do not have the entire list for comparison, please contact the authors.

We plan to hold the material until April 1994. If there are some accessions that you absolutely feel should be maintained by the NGR, present your reasons to the authors who will consult the CAC. If anyone would like scions of those on the discard list, please contact us before March 31, 1994.

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Cultivar and Crop Load Influence Cold Damage of Pecan

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Abstract

A severe freeze during November 1991 injured pecan trees [Carya illinoensis (Wangenh.) C. Koch]. The severity of the damage was related to cultivar and crop load. Cultivars that had structural damage or were killed included 'Barton,' 'Graking,' 'Mahan,' 'Mohawk' and USDA 41-19-20. 'Dodd,' 'Hayes,' 'Hirschi,' 'Nuggett,' 'Peruque,' 'Gormely,' USDA 55-11-11, USDA 64-11-17 and OK 753 were not injured by the fall freeze. In 'Mohawk,' freeze damage was curvilinearly related to crop load.

Introduction

Cold damage to pecan trees in Oklahoma has been reported eleven times between 1899 and 1991; an average of every 8.4 years. Cold temperatures may have injured trees in other years that were not reported in the literature. Tree injury caused by cold temperatures has been reported from all areas of the U.S. 'pecan-belt.'

Cold damage to pecan trees usually occurs during the autumn before trees have acclimated to cold temperatures (4, 9, 16), or during the winter while trees are dormant (1, 7, 12, 17). Mild damage during the fall or winter may advance budbreak (15), or if severe, cause death of part or all of the tree (12).

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