

Role of Rootstocks in Fruit Production

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The different criteria for selection of an effective rootstock

1. It should be compatible with the diverse scion genotypes and soil types.
2. It should be able to establish well and transfer soil nutrients to scion to improve its genetic potential of fruit production and quality characteristics.
3. It should be well adapted, hence need thorough evaluation with local scion varieties to avoid later stage problems.
4. It should be suitable for adoption in a range of pH, mineral content, nematode tolerance, salinity or alkalinity tolerance, limited water availability, pathogen load and soil type.
5. It should be easy to propagate clonally through vegetative methods.
6. It should not have profuse suckering habit and late compatibility symptoms.

Some important recommended rootstocks for different fruit crops

Fruit crop	Rootstock	Distinct features
Mango	Creeping or Latara	Dwarfing
	Kurukkan	Polyembryonic and salt tolerant
	Olour	Dwarfing
	Rumani	Dwarfing
	Totapuri red small	Dwarfing
	Vellaikolumban	Polyembryonic, dwarfing and Allopolyploid
	Turpentine	Salt tolerant and dwarfing
	13 -1	Salt tolerant
	Gomera – 1	Polyembryonic and salt tolerant
Grape	Dogridge	Resistant to phylloxera, nematodes and salts
	Salt creek	Resistant to salt and nematodes

	St. George	Salt tolerant
	Riparia Glorie	Phylloxera resistant
	Temple	Resistant to pierce's disease of grape
	110 R	Resistant to drought and salt
	Fercal	An INRA hybrid rootstock, is highly resistant to phylloxera, nematodes and resistant to chlorosis.
Ber	<i>Zizyphus nummularia</i>	Give rise to inverted bottleneck disorder, which have been utilized for induction of dwarfing for HDP.
Guava	<i>Psidium friedrichsthalianum</i>	Dwarfing, resistant to wilt and nematode.
	Pusa srijan	Dwarfing and resistant to wilt.
	<i>Psidium pumilum</i>	Dwarfing
Jamun	<i>Syzygium densiflora</i>	Resistant to termite attack.
Sapota	<i>Manilkara hexandra</i>	Salt tolerance for dry region.
Annona	<i>Annona glabra</i>	Dwarf and resistant to wet and damp soil conditions.
	<i>Annona reticulata</i>	It can withstand adverse conditions and grows well in dry and arid regions.
Fig	<i>Ficus glomerata</i>	Resistant to nematodes.
Avocado	Mexican race	Winter hardy
Citrus	<i>Citrus unshiu</i>	Freeze tolerant
	Cleopatra mandarin	Salt tolerant
	Flying dragon	Dwarfing and suitable for HDP
	Rangapur lime	Salt tolerant
	<i>Severinia buxifolia</i>	Salt tolerant
	Trifoliolate orange	Dwarfing and resistant to nematodes.
Apple	Alnarp -2	Semi – vigorous rootstock and winter hardy
	Jork – 9	Dwarfing
	M – 9	The best known dwarfing rootstock. It is

		known as the ‘Paradise’ rootstock of Europe. It is a cross between French tree, ‘Jaune de Metz’ and ‘Paradise’ apple of ancient Persia.
	M 27	Ultra dwarfing rootstock of apple. It is a cross between M 9 × M 13.
	M 20	Dwarfing. Unfit for HDP because of emergence of large number of suckers.
	Bemali	Dwarfing
	MAC – 1	Dwarfing
	MAC – 9	Semi – dwarfing
	Merton – 793	Semi - dwarfing
	Robusta – 5	Resistant to fire blight
	MM – 104, MM – 106, MM – 109, MM – 111	Resistant to wooly apple aphids.
	Northern spy	Resistant to wooly apple aphids.
	EMLA Rootstocks	Free from viruses
	BUD – 9	Dwarfing
	Pusa apple rootstock 101 (<i>Malus baccata</i> ‘Shillong’)	Low chilling type, high yield potential (25 tonnes / ha) and induces precocity.
Pear	Bartlett	This is the most widely used rootstock for pears.
	Quince A	Most satisfactory rootstock
	Quince B	Semi – vigorous
	Quince C	Very dwarfing
	Oregon – 211	Dwarfing
	Oregon – 249	Dwarfing
	Mahaleb (<i>Prunus mahaleb</i>)	Slightly dwarfing.

	Mazzard (<i>Prunus avium</i>)	Vigorous.
	Gisela – 6	Semi – dwarfing
	Gisela – 12	Semi – dwarfing. Precocious.
Peach	Halford	Compatible with all commercially grown varieties.
	Chi Lum Tao	Very cold hardy.
	Tzim Pee Tao	Very cold hardy.
	Lovel	Compatible with all peach varieties.
	Bailey	It is considered one of the best rootstocks for peaches in Ontario.
	Harrow blood	It is reported to standard peach clones by 20 %.
	Siberian C	It is reported as dwarf standard peach clones by 10 – 15 %.
	GF 677	It is a hybrid rootstock (<i>Prunus persica</i> × <i>Prunus amygdalus</i>) selected by INRA, Grande Ferrede, Bordeaux (France). Resistant to calcareous soils and drought conditions.
	GF 557	Nematode resistant
	Garnem	Tolerant to root – knot nematode. It is a hybrid between Spanish Almond ‘Garfi’ and Peach ‘Nemared’.
	Nemaguard	It is a root – knot nematode resistant rootstock.
	Nemared	It is a root – knot nematode resistant rootstock.
	Rubira	It is a root – knot nematode resistant rootstock.
	Okinava	It is a root – knot nematode resistant rootstock.
	Sharpe	
	Krymsac 86	Highly resistant to lesion nematode.
Greenpac	<i>Prunus persica</i> × <i>Prunus davidiana</i>	
Flordaguard		

Plum	Pixy	Dwarfing rootstock
	St. Julien	Dwarfing rootstock
	Myrobalan	Drought tolerant
	Marianna 2624	Resistant to nematodes Brompton
	Brompton	Vigorous rootstock.
Almond	Alnem – 1	Resistant to nematodes
	Alnem – 38	Resistant to nematodes
	Alnem – 201	Resistant to nematodes
	GF 677	Tolerant to high soil pH
	GF 557	Tolerant to high soil pH
	Ishtara	Semi – dwarfing and precocious
	Behmi	Semi – vigorous
Apricot	Prunus besseyi	Dwarfing rootstock
	Torinel	Semi - dwarfing
	Haggith	Cold hardy
	Marianna 2624	Resistant to bacterial wilt
	Marianna – GF 8/1	Resistant to bacterial gummosis
	Hybrid P – 2308	Dwarfing rootstock.
Cherry	Gisela – 10	Dwarfing rootstock
	Colt	Semi – vigorous
	F12/1	Vigorous
	Gisela 6	Improved fruit quality
	Gisela 5	Semi – vigorous
	Weihroot – 10	Semi – vigorous
Walnut	Paradox	Tolerant to drought and salts
Persimmon	<i>Diospyros virginiana</i>	Tolerant to salts and drought.

(Source: Sharma and Srivastav, 2004, Sharma, 2006)