

Walnut Trees in the Nursery Trade: Understanding Terminology, How they are Propagated, Availability and Clonal Rootstock Pest Interactions

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Helpful Terminology in Understanding Walnut Plant Material

Cultivar (cultivated variety) - A named group of plants within a cultivated species that is distinguished by a group of characteristics, e.g. 'Chandler.', 'Howard'

Genotype - The genetic constitution of an individual.

Clone - A group of plants (cultivar or rootstock) reproduced from a single individual by vegetative methods (grafting, cuttings, layering, micropropagation) which therefore have the same genotype. Variation can exist among individuals of a given clone because of their interaction with the environment.

Micropropagation- Multiplication of plants under sterile *invitro* conditions in a lab followed by hardening off in a greenhouse. *Most of the clonal and own-rooted walnut plant material in the trade is micropropagated.*

Grafted plant - A plant whose roots are of one genotype and the shoots are of a different genotype. It is obtained by grafting or budding a cultivar onto a rootstock.

Own-rooted (also known as self-rooted) plant - A plant whose roots are of the same genotype as the shoots. It is obtained by micropropagation or rooting stem cuttings.

Seedling - A plant propagated from seed.

Plantlet – A plant propagated by vegetative methods e.g. micropropagation.

Liners – Young plant material that is of adequate size to plant in a nursery.

Walnuts are purchased as:

- **Rootstock** - A seedling or plantlet (clone), subsequently field grafted or budded to the desired English variety (cultivar). Until recently, most rootstocks have been seedlings: Seedling black, seedling Paradox (black x English hybrid), seedling English (no longer available). Clonal Paradox rootstocks with selected characteristics are available from many nurseries.
- **Grafted tree** – A two-year old tree on which the English variety (scion) has been grafted onto the rootstock and is ready for planting.
- **Patch budded tree** – A two-year old tree on which the English variety has been budded onto the rootstock and is ready for planting.
- **June budded tree** – A one-year old tree on which the English variety has been budded onto the rootstock and is ready for planting.
- **Own-rooted (also known as self-rooted) tree** - A two-year old English variety tree on its own roots ready for planting. There is no graft or bud union.

Available in Nursery Trade

Rootstock*	Nursery Grafted or Budded Trees	Own-Rooted English Trees
Seedlings: Paradox or Black	On seedling Paradox or black rootstock	‘Chandler’
Clones**: Paradox		‘Vina’
‘Vlach’	2010 and 2011	‘Serr’
‘VX211’	2010 and 2011	‘Howard’
‘RX1’	2010 and 2011	

*sold as individual plants, either as a seedling or as a clone

**possibly others

Responses to Selected Nematode and Disease Pathogens by Clonal Paradox Walnut Rootstocks Available Based on UC and USDA-ARS Screening Tests to Date ¹

Category	‘Vlach’	‘VX211’	‘RX1’
Inherent Rootstock Vigor	Vigorous	Highly vigorous	Moderately vigorous
<i>Phytophthora citricola</i> Root/crown Rot	LR	MR	MR
<i>Phytophthora cinnamomi</i> Root/crown Rot	LR	LR	MR
<i>Agrobacterium tumefaciens</i> Crown Gall	MR	LR	LR
LR = low resistance		MR = moderate resistance	
Root Knot Nematode	S-IT	S-ST	
Root Lesion Nematode (<i>Pratylenchus vulnus</i>)	HS-IT	HS-ST	HS-IT
	Nematode’s ability to reproduce	HS = highly susceptible	
		S = susceptible	
	Tree response to nematode	ST = some tree tolerance to nematode presence	
		IT = tree intolerance to nematode presence	

¹Data are tentative and trials are ongoing

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