

Refia®

pear decline resistant pear rootstocks with excellent orcharding properties

Pear decline resistant *Pyrus* rootstocks

Parentage	<i>Pyrus x michauxii</i> / <i>Pyrus communis</i>
Selection	Petruschke in a trial at KOB Bavendorf/Germany, 2014
Variety denomination	ViruTherm-1 ^(S) / ViruTherm-2 ^(S)
Variety right holder	ViruTherm, Rheinstetten
Exclusive licensee worldwide	Consortium Deutscher Baumschulen GmbH

Pear decline (*Candidatus Phytoplasma pyri*) is one of the most economically important diseases in pear cultivation worldwide.

Rootstocks that reduce the phytoplasmas overwintering in the roots are suitable for combating it. Even after infection, the pear varieties grafted onto them remain vital and healthy. In a regional trial at the Kompetenzzentrum Obstbau Bodensee (KOB= Competence Centre Lake Constance), Bavendorf/Germany, two new pear rootstocks with the aforementioned properties were selected from fifteen rootstocks tested:

Refia® ViruTherm-1^(S) and Refia® ViruTherm-2^(S)

The first 40,000 In-Vitro propagated plants were produced

in 2021. In addition to their phytoplasma resistance, both also have excellent orcharding properties.

Due to their vigor, they are particularly suitable for large-volume tree forms in combination with strong-growing varieties (extensive orchards). For the weaker-growing table pears, planting on trellis is also highly interesting for commercial cultivation. We recommend planting trees with two axes, which are fixed horizontally to the lower wire. In subsequent years, the shoots that develop from this are guided vertically upwards, fixed to wires and trained like spindles or Fruitwalls. The trees should be planted 3 to 3,5 m apart.



pear decline resistant pear rootstocks with excellent orcharding properties

	Refia®VirusTherm-1 ^(S)	Refia®VirusTherm-2 ^(S)
Special characteristics		
Growth rate induction	medium to strong, approx. 20 % - 25 % weaker than seedling, more or less like rootstock BA 29 C	strong, approx. 10 % weaker than seedling
Anchorage / Root system	very good / fine root system, fibrous	very good / fine root system, fibrous
Suckering tendency	none	
Grafting compatibility	compatible with all pear varieties (tested with 80 varieties)	
Grafting unit	smooth transition, very good fusion	

Yield		
Yielding potential	high	
Precocity and yield generation	depending on the variety; for high-yielding varieties such as „Condo“, „Conference“, „Delicieux de Charneu“, „Williams“, etc. from the second year onwards	
Fruitsize	slightly lower than on quinces	
Combination with very fertile / self-fertile varieties	particularly suitable	

Site - Climate		
Soil quality requirements	none special, lime-tolerant, but also on acidic soils (up to pH 5,5), also suitable for dry, hot, sandy or gravelly sites	none special, lime-tolerant
Geographical region	Central Europe / suitable for temperate and continental climate zones, so far in trial cultivation (Central Europe)	
Climate requirements	tolerant to high/very high temperatures	suitable for Central European climates
Winterhardiness	very good winter hardiness (-20° C)	

Production management		
Demands on production management	suitable for high stem/trunk cultures, in commercial cultivation only for trellis systems (UFO, palmette, diagonal hedge)	
Varietal suitability	ideal for high-stem cultivation with pears for distilling, drying and cider; for table pear cultivation weak-growing large-fruited varieties („Uta“, „Williams“, „Abate Fetel“, „Novembra“)	
Suitability / Cultivation intensity	depending on intensity and pruning system, 100 to 400 trees/ha; especially for regions with high infection pressure from pear decline	
Planting density	in intensive orchards with trellis cultivation row spacing 3,5-5 m; in the row 2,5 to 3,5 m, in extensive orchards tree spacing 8-10 m	in intensive orchards with trellis cultivation row spacing 4- 5 m; in the row 3 to 3,5 m, in extensive orchards tree spacing 8-10 m
Irrigation demand <small>(in relation to temperate Central European climate 600-700mm annual precipitation)</small>	only in the first few years, tolerant to drought	only in the first few years, similar to pear seedling
Fertilization / Fertigation	depending on soil type and cultivation intensity, fertigation advantageous	lower than VirusTherm-1 ^(S) , depending on soil type and cultivation intensity, fertigation advantageous
Covered cultivation	No experience to date, less suitable due to the growth vigor	
Replanting	very well appropriate	

Disease response / Tolerances		
Chlorosen	no pH-related chlorosis	
Monillia	no data available	
<i>Candidatus Phytoplasma pyri</i>	resistent	
<i>Phytophthora</i>	no data available	
<i>Pseudomonas</i>	no data available	
Agrobacterium	due to In-Vitro propagation all CDB-rootstocks are EU-certified and disease free; Agrobacterium infection comes from contaminated soils / sites	