Effect of Rootstock on Fire Blight in Several Apple Cultivars[1]

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Abstract. **Under conditions of natural infection in the third year of planting, fire blight disease caused by *Erwinia amylovora* (Burr.) Winsl. et al. was less severe on the same cultivars grafted on seedling roots than on 'EM VII', 'MM 104' and MM 106'. The most susceptible cultivars appeared to be 'Tydeman's Red' and 'Raritan'. 'Williams Red' was the only cultivar that escaped fire blight entirely.**

Fire blight first occurred in a 624-tree test orchard with 104 apple stions at the Southeastern Fruit and Tree Nut Research Station, Byron, Georgia, during the second growing season (July, 1967). Two adjacent trees on the east side of the orchard, 'Tydeman's Red' and 'Summer Rambo' on 'EM VII' rootstock had new twig-blight infections. We did not combat the disease because one of the objectives of this planting was the elimination of susceptible cultivars.

Fire blight spread unchecked throughout this orchard during the following year. Infection means found on August 2, 1968, for each 6-tree block are presented in Table 1. After 1 year, 47% of the trees in 76% of the blocks showed symptoms ranging from occasional blighted twigs on some cultivars to 11 dead trees of 'Tydeman's Red', 'Raritan', and 'Mariborka' cultivars. All "0" readings are classified as escapes. The only cultivar to escape completely was 'Williams Red'. The low reinfection levels during 1969 and 1970 did not justify continuation of this study.

The rootstock appeared to have an effect on fire blight development in most cultivars. It usually developed more readily in a given cultivar on 'EM VII' than on seedlings. It tended to be intermediate in cultivars on 'MM 104' and 'MM 106', but often was nearly as severe on them as on 'EM VII'. It appeared to be independent of rootstock in 'Lodi' and 'NJ 32'.

Table 1. Effect of cultivar and rootstock combinations of apples on the development of fire blight (August 1968).

Scion cultivar	Rootstock			
	Seedling	MM 104	MM 106	EM VII
Julyred	0.2[a]	1.0	1.0	1.0
Mutsu	0.0	0.0	0.2	1.3
Blaze	0.0	0.2	0.6	0.7
Greendale	0.0	0.8	2.0	1.2
Jongrimes	0.2	0.2	0.0	0.0
Mollie's Delicious	0.0	0.3	0.2	0.0
July Delicious (Ala.)	0.2	0.0	0.0	0.0
St. Clair	0.0	0.0	0.0	1.0
Lodi	1.3	0.8	1.3	1.0
Detroit Red	0.7	0.4	0.4	0.8
Golden Delicious	0.0	0.0	0.3	0.2
Summer Rambo	0.2	2.2	1.5	2.3
Tydeman's Red	1.6	4.5	3.4	4.7
Raritan	0.2	4.2	3.7	4.3
Mariborka	0.0	1.4	1.7	1.8
NJ 36	0.3	1.3	2.8	2.5
NJ 32	1.8	1.3	1.7	2.0
NJ 37	0.0	1.0	0.8	0.5
NJ 31	1.0	2.8	2.3	2.2
Sel 133555	0.0	0.5	1.3	1.3
Sel 128144	0.0	0.2	1.3	0.8
Sel 157555	0.7	1.4	1.0	2.0
NJ 33	0.5	0.3	0.4	2.0
NJ 38	0.5	1.0	0.8	1.8
Williams Red	0.0	0.0	0.0	0.0
Crandall	0.0	0.8	0.2	0.5
Mean	0.36 ± .10	1.03 ± .24	1.11 ± .21	1.38 ± .23

[a]Trees were evaluated for fire blight individually but only the block means are presented here. Rating of approximate percentage of blighted twigs: 0 = Escape, 1 = 6¼%, 2 = 12¼%, 4 = 50%, 5 = 100%.

Cultivar differences in susceptibility to fire blight are well known (1, 2), but the modifying influence of the rootstock upon these differences was first reported by Mowry (3). His findings and those reported here are comparable to the extent that the same rootstocks produced similar results in both tests. No cultivars were common to both tests.

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Vaccinium Clones Resistant to *Phytophthora cinnamomi*[1]

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Abstract. **Two clones of *Vaccinium* showed high field-resistance to *Phytophthora cinnamomi* and remained unaffected during 3 years of observation in naturally infested soil: Me-US 32, a productive, cultivated highbush selection (*V. australe*), and a selection from the wild of the diploid species (*V. atrococcum*). However, the clone, E-22 selection of *V. australe*, growing in adjacent row to the resistant clones was severely damaged by the pathogen. *Phytophthora cinnamomi* was readily isolated from soil surrounding both resistant and susceptible clones.**

In 1961, Raniere (4) isolated a species of *Phytophthora* from highbush blueberry plants, *Vaccinium australe* Small cv. 'Coville' and 'Earliblue' grown in New Jersey. Royle and Hickman (5) identified the isolate in 1963, as *Phytophthora cinnamomi* Rands, and established its pathogenicity on 'Dixi', 'Jersey' and 'Pemberton' highbush cultivars, all of which were susceptible. In 1962, Clayton and Haasis (1) isolated *P. cinnamomi* from roots of blueberry plants from commercial plantings in North Carolina. 'Wolcott' and 'Weymouth' when inoculated with *P. cinnamomi* isolates from commercial plantings were severely damaged showing symptoms of stunted terminal growth, root necrosis, yellowing of

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