Influence of Rootstock on Susceptibility of Peach to Peach Canker

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Perennial canker was first recognized in 1908 by Caesar (1) as a major disease problem in Ontario peach orchards. The principal investigation of the nature and pathogenicity of the disease was conducted by Willison (3, 4, 5) with the result that *Valsa cincta* Fr. was identified as the major pathogenic fungus. *Valsa leucostoma* (pers.) Fr. was also isolated consistently from diseased tissues, but pathogenicity tests revealed a low rate of virulence for this species. From detailed observations on the influence of various sources of tree wounds, e.g., pruning cuts, stubs, brown rot cankers, fruit moth and borer injuries, on the incidence of perennial canker, Willison drafted a series of cultural recommendations (3) which emphasized the necessity of precise cultural practices to keep the incidence of canker to a minimum level.

In recent years, however, the peach canker problem seems to have developed beyond the control of the better growers. As a consequence, the productive life of many orchards has not exceeded 10–13 years, thus leading to a high replanting rate.

Two factors may have contributed significantly to this situation. District orchards suffered severe setbacks in the winter of 1957–58 and again the following year due to extensive damage to roots as a result of low soil moisture and unusual deep penetration of the soil by frost. Such debilitation was followed by a marked upward surge in the incidence of perennial canker. Another important factor has been the extensive changeover to early-ripening, basket trade varieties such as Cardinal, Dixired and Redhaven which appear to approach the susceptibility of Jerseyland, in contrast to the established hardy tree characteristics of such varieties as Veteran and Elberta.

As a result of the observations described below a third factor, the rootstock variety, should also be taken into account.

Concern over district peach replant failures, as reported by Koch (2), led to the establishment of several rootstock variety trials under the direction of Mr. T. B. Harrison. Among these was a carefully replicated trial (established in 1955 at Ruthven, Ontario) in which Dixired was budded to seedling stock of 12 peach and apricot varieties.

Observations on growth expressed as increase in trunk cross sectional area were made annually on each of the five individual replicates, and a rating of the number of cankers per tree was determined at the termination of the growth observations in 1959. These data are summarized in Table 1.

Differences in tree growth were considerable among the several rootstock varieties tested, with seedlings of Kalamazoo, Lovell, Sheprak and Lemon Free supporting the most vigorous trees. Yunnan sustained extensive root damage during the winter of 1957–58 as reflected in the following years of recovery. Correlation was not readily evident, however, between growth rate and the incidence of per-

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Table I. Effect of peach rootstock variety on the growth and cankering of Dixired.

Rootstock variety	*Increase in Cross Sectional Area (sq. cm.)*				*Average No. Cankers per tree*
	1956	*1957*	*1958*	*1959*	
Kalamazoo	12.01	21.78	27.87	21.24	34.8
Lovell	9.85	20.41	25.64	27.60	29.4
Sheprak (apricot)	12.20	18.35	23.97	27.10	23.0
Lemon Free	10.39	27.49	15.67	24.39	22.4
Yunnan	18.47	23.54	18.14	7.95	18.3
Gold Drop	10.35	17.84	24.30	20.50	36.5
Rutgers Red Leaf	12.33	20.63	24.79	10.57	10.3
Valiant	10.19	18.90	19.75	21.89	17.0
S37	11.73	18.22	17.08	18.26	16.7
Golden Jubilee	8.19	14.99	19.47	21.38	28.0
Secord (apricot)	10.81	16.28	15.19	19.43	17.7
Banner	8.84	16.99	14.77	19.76	29.4
Average	11.45	19.62	20.55	20.01	

ennial canker. The maximum reduction in canker was obtained with Dixired budded to seedlings of Rutgers Red Leaf, and the difference was statistically significant at the 5% level when compared to the means recorded for Gold Drop and Kalamazoo seedlings. Although differences were not significant at the 5% level, there was an indication that Valiant, Secord, S37 and Yunnan rootstocks conferred some resistance to susceptible scion varieties.

No light can be shed at present on the nature of the rootstock influence. However, the understock would appear to function either through earlier hardening of exposed tissues or through production and translocation of an unknown chemical protectant.

The combined attributes of canker resistance, the red foliage detector and the adequate tree growth and vigor encourages increased interest in nursery propagation of peach on the Rutgers Red Leaf seedling rootstock for orchard plantings in southwestern Ontario.

Literature Cited

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Leo Klein Memorial Fund

The New York State Agricultural Experiment Station Club, at Geneva, New York has established a memorial fund to provide a means by which friends of the late Leo Klein can help in the education of his surviving seven children. Anyone wanting to contribute should make their checks out to the Klein Memorial Fund, and send them to the Experiment Station Club, Geneva, New York.