OCCURRENCE OF BACTERIAL CANKER OF SWEET CHERRY AND PLUM IN ONTARIO"

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Abstract

Bacterial canker caused by Pseudomonas spp. is reported on sweet cherry and plum in important stone fruit growing areas of Ontario. Symptoms of this disease are similar to those described for bacterial canker on the west coast of the United States and in England. This is the first report of bacterial canker on sweet cherry and plum in Ontario.

Introduction

Bacterial canker is a major disease of sweet cherry and plum in England, New South Wales, California, and Oregon. The history, symptomatology, host range, geographical distribution, etiology and economic importance of this disease have been reviewed recently by Cameron **(2).** Since then, its known geographical distribution has been extended to Ireland and many parts of Europe (1), southeastern United States (6), Missouri (5), and Nova Scotia, Canada (4).

In England the causal bacteria have been grouped under Pseudomonas syringae van Hall and P. mors-prunorum Wormald, the former being ubiquitous with a wide host range, and the latter being regarded as more specialized; recent work indicates that the pathogens may be considered different ecotypes, if not separate species **(3).** Bacterial canker of stone fruits in the United States has been attributed to P. syringae, and the only reported occurrence of P. mors-prunorum in North America has been in Nova Scotia, Canada (4).

During the spring and summer of 1968, our attention was called to an unusual dying of terminal twigs and branches accompanied by profusely gumming cankers in the sweet cherry (Prunus avium L.) orchards of Kent Country. Although many bacterial diseases appeared to have been encouraged by unusually heavy rain during the summer of 1968, these symptoms were **also** present in the preceding years andpathogenic pseudomonads had been isolatedfrom them in 1966 and 1967. There had been cause for confusion, pending extensive isolations and identification of the causal agent, inasmuchas sweet cherry and plum are within the host range of the Cytospora **spp.** that cause peach canker in Ontario, and because bacterial canker of sweet cherry had not previously been reported to be caused by Pseudomonas **sp.** in Ontario

Disease survey, symptoms, and isolations

A survey was undertaken to determine the extent of occurrence of canker on sweet cherry, plum and other stone fruits in Essex, Kent, and Lambton Counties of southwestern Ontario and in Lincoln County of the Niagara Peninsula where most of Ontario's stone fruits are grown. Orchards were inspected at Niagara-on-the-Lake, St. Davids, Virgil and Vineland (Lincoln Co.); Cedar Springs and Blenheim (Kent Co.); Ruthven and Harrow (Essex Co.); and Reece's Corners, Forest, and Arkona (Lambton Co.) (Fig. 1).

On sweet cherry, cankers occurred on the trunk and scaffold branches, in the crotches, and at spurs (Fig. *2).* In many instances the cankers could be traced to infected spurs. The cankers exuded profuse amber-coloured gum. The cankered tissue was sunken (Fig. **3)** and, where it tended to girdle, the parts above were dead or dying (Fig. 4). As a result, the buds failed to develop, or else, after shoot development, the leaves wilted or turned brown and hung down. The latter symptoms, seen in early summer, have been referred to as "shoot withering". Leaf spots were common on affected trees (Fig. 5). The younger spots were purplish pin-points surrounded by a halo of chlorosis, later turning reddish brown and becoming somewhat irregular in outline, 1-3 mm in diameter. Often the leaf spots dehisced, leaving a shot hole. The leaf-spot symptoms were not unlike those caused by Xanthomonas **pruni** (E. F. Sm.) Dows. but, unlike the latter, did not cause ready defoliation. In a few instances leaf spots due to Pseudomonas and X. pruni occurred on the same leaf. The disease was generally found on older trees, but in Kent and Essex Counties relatively young trees and new plantings were also affected. Sweet cherry varieties affected included 'Bing', 'Early Lyons', 'Schmidt', 'Seneca', 'Vista', and 'Venus'. On plums the symptoms were similar but there was very little exudation of gum from the cankers, which had a tendency to extend more along the longitudinal axis. Plum varieties affected included 'Stanley', 'Damson', 'Italian', and 'Peach'. The leaf spot phase was severe in Lambton Co., and moderate to severe in Essex and Kent Counties and in the Niagara Peninsula. Tree mortality that might

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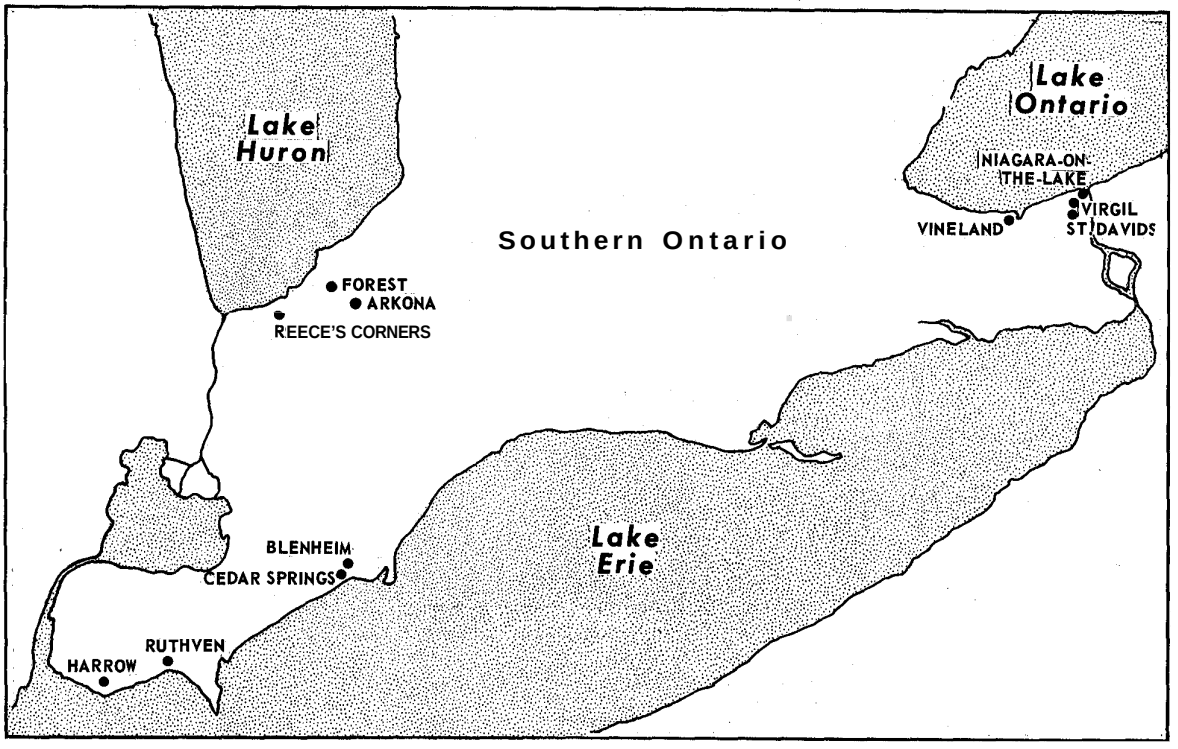
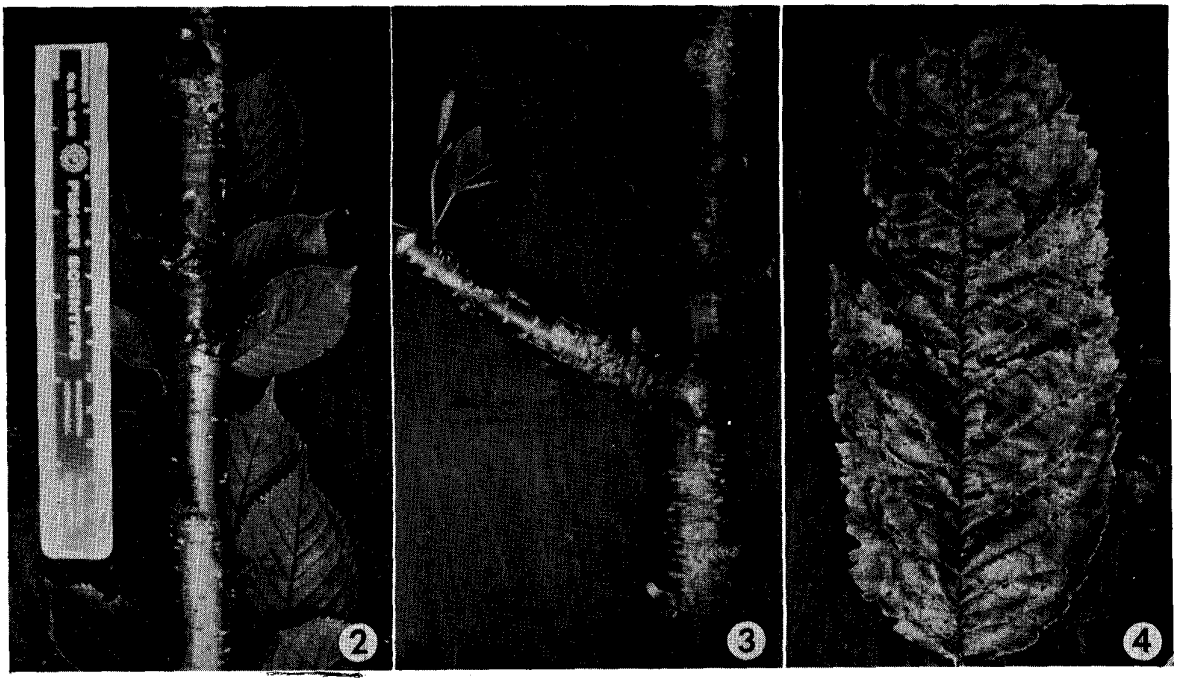


Figure 1. Locations in southern Ontario where bacterial canker of sweet cherry and plum was observed during the spring and summer of *1968.*



Figures 2–4. Symptoms of bacterial canker an sweet cherry: 1) An infected spur, 2) Gumming and sunken canker on twigs, 3) Leaf spots ond shothole effect.

be attributed to this disease was evident in a few orchards in the Niagara Peninsula and Lambton Co. It has been reported that leaf spotting is particularly severe in England, where shoot and spur withering is also common, but that such leaf spots are rare in California and Oregon (2). In this respect, the symptomatology of the bacterial canker of sweet cherry and plum in Ontario is more like that in England than that on the west coast of the United States.

Isolations carried out extensively from diseased tissue of samples from all the orchards inspected yield pathogenic pseudomonads, and on that basis and on the over-all symptomatology, we call the disease of sweet cherry and plum described here "bacterial canker". Cameron (2) advocates the use of this name in preference to several others, i.e. gummosis, blast of stone fruits, sour-sap, cherry gummosis, and bacteriosis, as recent usage in many parts of the world seems to favor it and also as it is of advantage to use a uniform terminology. In addition to Cytospora spp., which are most frequently isolated from peach cankers, and which are undoubtedly the usual cause of peach canker in Ontario, pathogenic pseudomonads have been isolated occasionally from peach in the last two years from relatively small cankers not unlike those caused by Xanthomonas pruni. The characteristics of the bacteria isolated, and their conformity or lack of it with the published descriptions of P. syringae and P. mors-prunorum will be published elsewhere.

These investigations have added another important stone fruit growing area to the known geographical range of bacterial canker in North America. It is not claimed that it is a new disease in Ontario, because it has probably been present for some time but not reported. The facts that many of the affected trees were usually older and that the growers appear to have been familiar with the symptoms described on sweet cherry and plum support this contention. The implications of these investigations are that the sweet cherry industry in Ontario has now to contend with yet anothex disease which is difficult to control. The peach industry will also have to take into account the realities of the presence in their close neighbourhood of a pathogen that has been a factor in causing widespread injury and mortality in the peach orchards of California and southeastern United States.

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