

THE RELATIVE IMPORTANCE OF SPRING AND SUMMER CANKER PHASES OF BACTERIAL SPOT OF PEACH IN SOUTHWESTERN ONTARIO

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Abstract

Twigs of the previous year's growth of peach trees that had been severely affected by *Xanthomonas pruni* in 1966 developed spring cankers at the internodes and apices when the twigs were brought into the greenhouse in March, 1967, and held under warm, humid conditions for a week. Similar spring canker symptoms appeared in the orchard in April and May. Summer cankers were not found in southwestern Ontario in 1965, 1966, or 1967.

Introduction

The symptoms of bacterial spot of peach caused by *Xanthomonas pruni* (E. F. Sm.) Dows. are leaf and fruit spots, defoliation, and spring and summer cankers on twigs (1). The importance of these different phases in the epidemiology of this disease in southwestern Ontario has been under investigation and the results of studies made in 1965 and 1966 have been reported (4). This paper reports the observations and results obtained in 1967.

Materials and Methods

In March, twigs on which cankers were not visible were removed from trees severely affected with the disease in the previous summer and fall and were held in moist chambers for a week or more to see if spring cankers would develop.

From late April till early June, twigs on which spring cankers appeared in the orchard were brought into the laboratory. The outer bark from the margins of the cankers was peeled away with sterile forceps, and pieces of underlying cortical tissue were removed aseptically and dropped into test tubes containing sterile distilled water. Bacteria were allowed to exude into the water for 15-20 min. and then drops of the suspension were streaked on potato-dextrose-peptone agar (PDPA). The plates were incubated at room temperature (23 ± 2°C) for a few days and isolates of *X. pruni* were identified by the characteristic morphology and color of the colonies on PDPA. The identifications were supported by sensitivity tests with a bacteriophage isolated by Dr. M. D. Sutton, Cell Biology Research Institute, Ottawa, from the soil of a peach orchard at Harrow, Ontario, in 1966. Phage sensitivity was tested by the spot test method (6) by placing a drop of phage suspension at the routine test dilution on soft agar layer plates seeded with cells of the bac-

terial isolates. The plates were examined for zones of lysis after incubation for 24 hours at 28°C.

Results and discussion

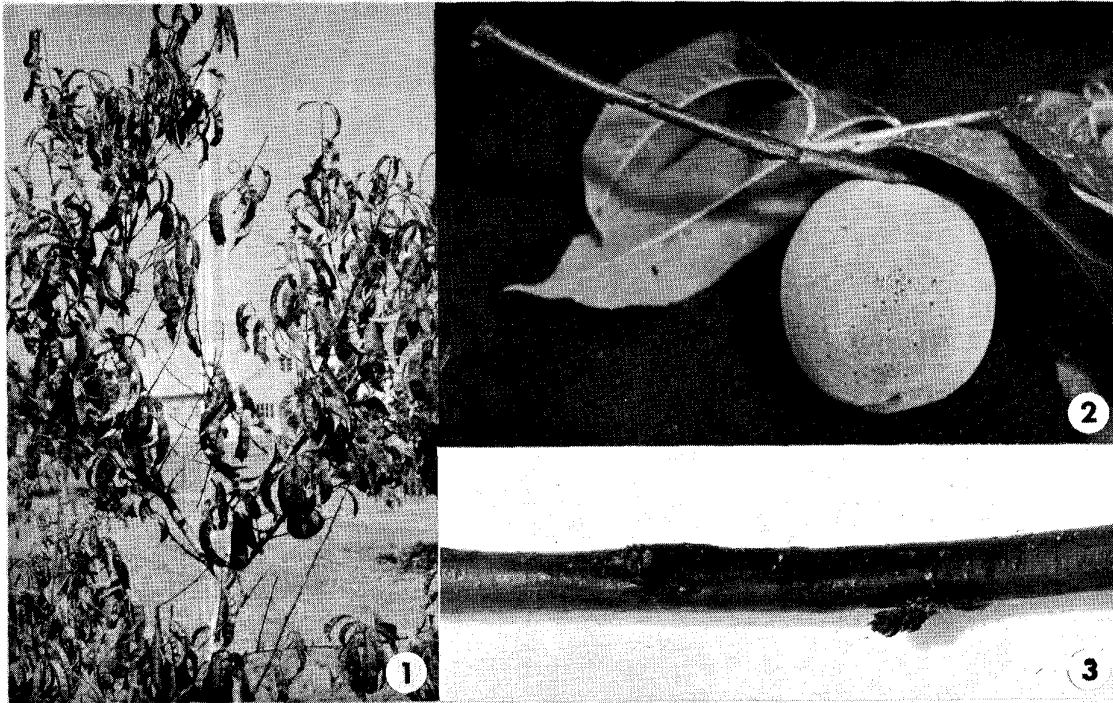
Cuttings of the past year's growth sampled in March developed cankers at internodes and twig apices 7 to 10 days after being placed in moist chambers. The purplish-black cankers at the internodes were somewhat depressed, 3 to 4 cm long, and had diffuse margins. Cankers at the twig apex completely girdled the stem, but those at the internodes did not. Similar symptoms were observed in the orchard from late April till June (Fig. 3). Lesions that developed in the moist chamber as well as those that formed under orchard conditions showed blister-like openings. *X. pruni* was isolated

Table 1. Frequency of isolation of *Xanthomonas pruni* from cankered twigs of peach in southwestern Ontario in the spring of 1967

Cultivar	Locality	Date	No. of cankers* yielding sampled	No. of cankers* yielding <i>X. pruni</i>
Kalhaven	Harrow	April 28	97	35
Kalhaven	Colchester	May 12	44	15
Kalhaven	Harrow	May 12	11	4
Sunhaven	Ruthven	May 17	10	0
Kalhaven	Harrow	May 17	35	4
Babygold-7	Ruthven	May 17	10	10
Early Elberta	Colchester	June 1	7	7

* Cankers formed during the spring on growth produced the previous season.

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Figures 1-3. Symptoms of bacterial spot of peach caused by *Xanthomonas pruni*, showing (1) defoliation of a 'Washington' peach tree

in late August, 1967; (2) fruit spot of 'Washington' peach; (3) spring canker on an internode of the previous year's growth of 'Kalhaven'.

from many of these cankers (Table 1). Some cankers remained sterile while others yielded diverse organisms, including some common saprophytic bacteria and fungi.

The spring canker phase was followed by the development of leaf spots, the earliest of which appeared during the first week of June. Defoliation (Fig. 1) occurred during July, August, and September. Fruit spots (Fig. 2) were not common but occurred on the cultivars 'Kalhaven' and 'Washington'. Summer cankers were not found even on severely affected trees. Summer cankers are found in abundance in Illinois (1); they also occur in New Jersey (3) and South Carolina (5) and are considered by Klos (personal communication) to be relatively scarce in Michigan. In Canada, Kelly (2) reported the occurrence of numerous lesions of bacterial spot on fruits and young bark of peach trees in Lincoln County, Ontario. The latter were presumably summer cankers. Although Thornberry and Anderson (7) were unable to recover viable bacteria from summer cankers after the first of December in Illinois, *X. pruni* is reported to overwinter in such cankers in southern New Jersey (3) and South Carolina (5), and the summer cankers are considered to be an important source of primary inoculum the following spring. In southwestern Ontario, summer cankers have not been found in 1965, 1966, or 1967. However, the spring canker phase does occur, and

it is an important source of primary inoculum at the beginning of the growing season.

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