OCCURRENCE OF THE GOLDEN NEMATODE ON VANCOUVER ISLAND, BRITISH COLUMBIA'

W. R. Orchard2

The golden nematode, Heterodera rostochiensis Woll. 1923, was found for the first time infesting a growing crop on Vancouver Island when it was discovered June 17, 1965, by the author inacommercinl 3. 5-acreplanting of 'Warba' potatoes on the Saanich peninsula at the southern tip of the island. Identity of the nematode was confirmed June 21, 1965, by Mr. R. H. Mulvey, Chief, Nematology Section, Entomology Research Institute, Canada Department of Agriculture, Ottawa, Canada.

At discovery, 92 days from planting, field symptoms and signs of nematode infection were sufficiently marked to indicate a well established infestation. It was learned that the infested field had a crop history of continuous potato production for the past 17 years. Infected plants occurred in roughly circular to oblong zones with the longer axes in the line of natural or tile drainage or with the direction of cultivation. The larger zones were approximately 25 feet in diameter. Infected plants were stunted and were 20 cm high compared to 80 cm for healthy plants. The foliage spread of infected plants was similarly reduced as was the root development and yield. These effects became progressively less from the center to the perimeter of infested zones.

Cysts of the nematode were very numerous on the roots of infected plants and could be seen without aided vision. They were distinguished in the white, yellow, golden, tan and in the chestnut-brown stages with the aid of a X14 hand lens. In lifting potato plants, the disturbance to the root system resulted in the detachment of many cysts which fell from the roots to the soil surface

Soil samples taken from the root zone of infested plants and processed by the Cobb gravity screening technique yielded gravid females, cysts; males, and larvae of H. rostochiensis. Microscopically, the cysts proved to be near spherical in shape (. 542 mm long x ,521 mm wide, average dimensions of 20 cysts following overnight immersion in formol solution 10%. The cysts were shiny and carried a body wall pattern with punctations typical for the species as described by Franklin 1951. Examination of perineal sections showed the hatching pore to be circumfenestrate and the anal pore "V" shaped as described for H. rostochiensis by Cooper 1955. The male specimens proved typical of the genus Heterodera and were judged H. rostochiensis on the basis of spicule detail as described by Franklin.

The golden nematode of potatoes was discovered in Newfoundland in October 1962 but heretofore was not known to occur on a growing crop elsewhere in Canada.

Under the direction of the Plant Protection Division, Canada Department of Agriculture, an extensive survey is being carried out to establish the limits of occurrence of this pest in Canada.

Literature cited

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1 Contribution No. 207, Experimental Farm, Research Branch, Canada Department of Agriculture, Saanichton, British Columbia.

2 Nematologist. Experimental Farm, Canada Department of Agriculture, Saanichton, British Columbia.

FRECKLE PIT - A VIRUS DISEASE OF ANJOU PEAR[1]

Jack M. Wilkes and Maurice F. Welsh [2]

Introduction

In 1960 freckle pit, a shallow, green-pigmented pittingwas observed on 'Anjou' pear fruits in several orchards in the Okanagan Valley of British Columbia. Surveys conducted in 1960 and in subsequent years established that this disease is widely distributed in Okanagan Valley orchards. The senior author has also seen affected 'Anjou' fruits on trees in the northern interior portion of the State of Washington, which borders on the British Columbia fruit-growing region.

Symptoms of a disorder in the White Salmon district of southern Washington that were described by Kienholz (3) resemble those observed in British Columbia and northern Washington. No other published records of the occurrence of this syndrome have been found, and no tests to determine its cause have been reported.

Symptoms

Mild symptoms of the disease become apparent in late August (about 1 month before picking). They become increasingly severe toward the harvesting season, at which time affected fruits bear numerous, slightly sunken, dark green pits about 1/8-inch in diameter (Fig. 1). These pits are underlaid by a network of dark green strands that penetrate the flesh 1/8 to 1/4 inch (Fig. 2). Pitting is more concentrated and severe at the calyx end. As the fruit ripens, the greenpigment in the pits becomes lighter but still can be distinguished from the golden yellow ground color of unaffected skin. During this ripeningperiod the green strands in the flesh turn brown. In fruits that are mildly or moderately affected, the skin and flesh symptoms become less apparent, or disappear, during ripening. No foliage or tree abnormalities have been associated with these fruit symptoms.

Transmission tests

Between 1960 and 1962 budwood from 4 affected 'Anjou' trees in 3 Okanagan Valley orchards was used to inoculate healthy test trees of 'Anjou', 'Bosc', 'Bartlett', and 'Flemish Beauty', either by spring or summer budding.

Four of the 5 inoculated 'Anjou' trees displayed symptoms, three full growing seasons after inoculation. No symptoms have been observed in 5 fruiting trees of 'Bartlett', 4 of 'Bosc', and 3 of 'Flemish Beauty', all of which have been inoculated for three or more years.

Nine affected 'Anjou' trees in a commercial orchard were top-worked by the owner to 'Bartlett' in 1960. In three subsequent years of cropping none of the 'Bartlett' fruits have displayed symptoms.

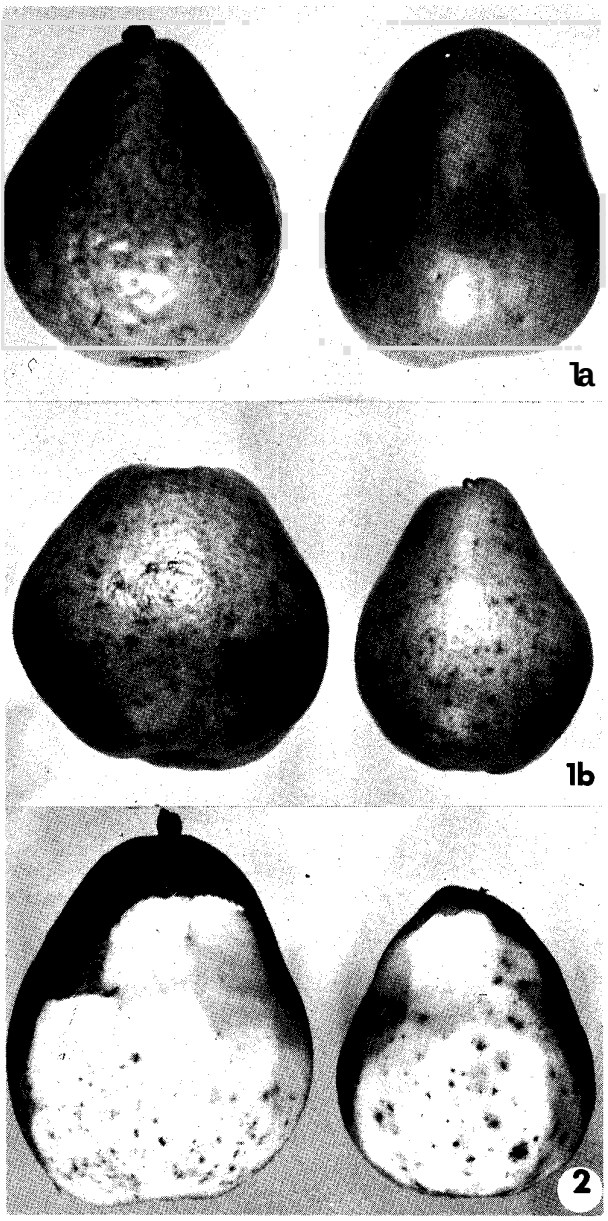

Fig. 1 External symptoms of freckle pit on Anjou pear fruit, (a) pitting on fruit at picking maturity, (b) pitting on ripening fruit, with colour differences evident.

Fig. 2. Peeled Anjou pear fruit showing the dark green strands that penetrate the flesh beneath areas affected with freckle pit.

Natural spread

Surveys have been conducted annually in 4 affected blocks of 'Anjou' pear trees for 4 to 5 years (Table 1). Symptoms have recurred each year in affected trees, but no spread has been observed.

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1 Contribution No. 171, Canada Agriculture Research Station, Summerland, British Columbia.

2 Plant Pathologists.

Table 1. Incidence of freckle pit in grower orchards that have been surveyed annually.

Orchard No.	No. of years surveyed	No. of trees infected	Total No. of trees	% Jnfection	Age of trees (years)
1	5	9	67	13.4	15
2	5	46	68	67.6	14 trees about 50 52 trees about 20
3	5	10	12	83.3	15
4	4	23	104	22.1	12-15
Totals		88	251		

Conclusions

The virus etiology of freckle pit has been demonstrated by the successful experimental transmission from 'Anjou' to 'Anjou'. Among the varieties of pears grown commercially in British Columbia, and included in the transmission tests, apparently only 'Anjou' displays symptoms. Tests are in progress to determine whether 'Bartlett', 'Bosc' and 'Flemish Beauty' are resistant or tolerant.

This disease can be distinguished from other reported virus-induced, fruit-pitting diseases of pear (1, 2) by the type of symptoms on 'Anjou', as well as by the failure of the causal virus to induce symptoms in 'Bosc', and 'Flemish Beauty'.

The absence of natural spread during a 4-5 year period, in pear plantings that total 251 trees, and that are 13%to 83% infected, provides substantial evidence that dissemination of the virus must have resulted from the use of infected pear scionwood.

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