

Eighty pieces of tissue from wilted Chippewa seedlings in field soil were cultured in water agar and three of them yielded *Phytophthora*. No other fungus was isolated from stem lesions. Small pieces of mycelium from pure cultures of the fungus were inserted into stems of 20 seedling plants of each of the varieties Harosoy, Harosoy 63, Chippewa, and Chippewa 64. All 20 Chippewa seedlings wilted within 2 days and the stems collapsed within 4 days (Fig. 2); 17 of the 20 Harosoy plants died. Not a single plant was lost among the inoculated Harosoy 63 or Chippewa 64 seedlings.

Results from these tests, observations of field symptoms, and examination of the organism in pure culture identify the pathogen as *Phytophthora*. By growing the fungus on dilute V-8 juice agar the following morphological characters were noted: coenocytic mycelium, frequent hyphal swelling, inconspicuous papillate sporangia, spherical smooth-walled oogonia and oospores, and antheridia which were mostly paragynous.

The extent of *Phytophthora* root rot in Minnesota soybean fields is not known. It probably is restricted to heavy wet soils in the south-central portion of the State. Resistance of the new numbered varieties Harosoy 63 and Chippewa 64 to this isolate of the pathogen is virtually complete.

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INFECTION OF POTENTILLA BY XANTHOMONAS FRAGARIAE¹

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In 1959, a bacterial disease on strawberry (*Fragaria virginiana* x *Fragaria chiloensis*) was described for the first time in Minnesota (1) and epidemiological aspects of the malady were elucidated shortly thereafter (4) and the causal organism described (2, 3). Linford (5) described a similar disease in Utah in 1927 but no pathogen was isolated. He noted symptoms of the disease and pointed out that it was apparently bacterial in origin -- an observation which led him to name it "bacterial angular leaf spot."

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Table 1. Potentilla species tested for susceptibility to Xanthomonas fragariae.

Species	Origin	Susceptibility
<u>P. atrosanguinea</u>	Saier Seed Co.	-
<u>P. argentea</u>	Minnesota (Ramsey Co.)	-
<u>P. aurea</u>	Saier Seed Co.	-
<u>P. blaschkeana</u>	Saier Seed Co.	-
<u>P. fragiformis</u>	Saier Seed Co.	-
<u>P. fruticosa</u>	Saier Seed Co.	+
<u>P. glandulosa</u>	Colorado (Clear Creek Co.)	+
(hybrids-French)	Saier Seed Co.	-
<u>P. nepalensis</u>		
<u>willmottiae</u>	Saier Seed Co.	-
<u>P. norvegica</u>	Minnesota (Ramsey Co.)	-
<u>P. pulcherrima</u>	Colorado (Gunnison Co.)	-
<u>P. vecta warrensis</u>	Saier Seed Co.	-
Control (<u>Fragaria virginiana</u> 'Robinson')		+

Of some 64 varieties of strawberries tested in field and greenhouse in Minnesota, Fragaria vesca and Minnesota 1716 were relatively resistant while the varieties Gem. Robinson, Sparkle, and Trumpeter were relatively susceptible. With the exception of plants in the genus Fragaria, none of 35 plant species and varieties in the field and greenhouse was susceptible. Although several of the species tested for pathogenicity were in Rosaceae (Prunus, Pyrus, and Rubus), it later became of interest to know if species of Potentilla, a more closely related genus with several wild species native to Minnesota, might be susceptible.

Two wild species of Potentilla were collected in Minnesota, eight species obtained from Saier Seed Co., Dimondale, Michigan, and two additional species (originating in Colorado but obtained from Dr. R. Converse at Beltsville, Maryland). Three to 15 plants of each were potted on wet sand in benches and several leaves on each plant were inoculated by spraying with suspensions of bacteria until leaves became water-soaked. Water congestion was evident on leaves as scattered dark green, translucent angular spots that disappeared a few minutes after inoculation and caused no visible mechanical damage to leaves. For inoculum, bacteria from actively growing cultures on beef extract-peptone agar plus 1% glucose were washed off with water and suspensions then adjusted nephelometrically to contain approximately $1-5 \times 10^6$ bacteria per ml. The culture used was originally isolated from a diseased strawberry plant in Minnesota in 1960.

Neither of two species of Potentilla native to Minnesota became infected. However, both P. fruticosa and P. glandulosa were as severely diseased as the Robinson strawberry control and symptoms were indistinguishable from those on strawberry. The Potentilla species tested, their origin, and their disease reaction are tested in Table 1. It is not known if either of the two species that were susceptible in the greenhouse are "natural" hosts in the field.

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