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Fire Blight Resistance of Several Wild Pear Seedlings Collected in Southwestern Ontario

H. A. QUAMME[1]

Abstract

Fire blight resistance of 8 wild pear seedlings (*Pyrus communis* L.) found growing in Southwestern Ontario was measured and 5 were found to be significantly more resistant than Bartlett, 2 were significantly as resistant as Kieffer and 1 was significantly as resistant as Old Home. The most resistant seedling, called Iler, was over hundred years old and has a stem circumference of 5.4 m and a height of 17.1 m. It is probably derived from the Mission or Jesuit pears that were brought to this region by the French settlers in the eighteenth century. The fruit of all seedlings is inferior in quality to that of commercially grown cultivars.

In southern Ontario, seedling pear trees (*Pyrus communis* L.) are commonly found growing in backyard lots, along roadsides, and in abandoned fields. Many are found near the old French settlement along the Detroit River. These are often referred to as the Mission or Jesuit pears and are believed to have originated from seed brought to this area by the French settlers during the early eighteenth century. Others are found near the settlements of more recent origin and appear to be derived from modern cultivars. Many of these seedling pear trees appear to be healthy and free of fire blight caused by *Erwinia amylovora* (Burr.) Winslow et al., although this disease is prevalent in local apple and pear orchards. The healthy seedling trees may have escaped fire blight infection, but, on the other hand, they may be truly resistant and represent a potential germplasm source for pear resistance breeding programs.

In 1978, a collection of 8 pear seedlings was made along the Detroit River and northwestern shore of Lake Erie and budded on Bartlett seedling rootstock. These clones were designated by their location or by the property owner on whose site they were found. In 1979, 2 to 4 trees of each clone were planted in a completely randomized design. Three cultivars, Old Home, Kieffer, and Bartlett, were included as standards. On the basis of previous observations (2,3), Old Home was selected as being resistant; Kieffer, moderately resistant; and Bartlett, susceptible.

In 1980, the pear seedlings and standards were evaluated for fire blight resistance after needle inoculation. The procedure was similar to that described previously by Quamme (2). Six isolates from orchards near Harrow were grown individually on slants of nutrient-yeast dextrose agar. Eight to 22 actively growing shoots of each clone were inoculated with 10 to 20 uL of the aqueous suspension (1×10^7 cells/ml) of a composite of these stains. The inoculum was injected into the plant just below the first or second node from the shoot apex with microsyringe and dispensing attachment (Hamilton Co., Reno, Nevada). Fire blight resistance was estimated by measuring the length of the visible infection and expressing it as a percentage of the total current season growth. Analysis of variance was carried out on the total sample of

[1] Agriculture Canada, Research Station, Summerland, British Columbia V0H 1Z0.

shoots, as the variation among trees of each cultivar was low. The percentage data was transformed using an arc sin transformation to reduce the heterogeneity of the sample variances.

According to the analysis of variance, the seedling Iler was not significantly more fire blight resistant than the resistant standard, Old Home, but it was significantly more fire blight resistant than the seedlings Mori and Kent County I and the moderately resistant standard, Kieffer (Table 1). The seedlings Mori, Kent County I, and Waldron were significantly more fire blight resistant than the seedlings Dessenbach, and Kent County II, and the susceptible standard, Bartlett. The seedling Marc Gignon was significantly more fire blight resistant than Kent County II and Bartlett. The seedlings Viscount, Dessenbach, and Kent County II were not significantly different in fire blight resistance than Bartlett.

The inoculation test indicates that fire blight resistance is present in some seedlings found growing wild in southwestern Ontario. These fire blight resistant seedlings may be useful in breeding programs.

The Iler pear seedling is of interest not only because of its fire blight resistance but because of its size (Fig. 1) and age. This pear tree was found on a farm which has been owned by the Iler family for four generations. Mr. E. Iler, present owner, said that his grandfather recalled that the Iler seedling was a large tree in the late nineteenth century. Its age, therefore, must be well over one hundred years. It is 15.3 m high, and has a trunk circumference of 5.4 m. The fruit is about 5 cm in diameter, turbinate in shape, and low in quality. The fruit shape, size and quality, and tree vigor and longevity of the Iler pear tree are typical of Mission pear trees (1) from which it may be derived.

Table 1. Fire blight resistance of several wild pear seedlings found growing in southwestern Ontario determined by measurement of the percentage length of current seasons showing infection after artificial inoculation.

Clone	Mean percentage length of shoot showing infection
Iler	1 a[2]
Old Home[1]	7 ab
Mori	11 bc
Kieffer[1]	13 bc
Kent County I	29 bc
Waldron	34 c
Marc Gignon	38 cd
Viscount	44 cde
Dessenbach	47 de
Kent County II	58 e
Bartlett[1]	69 e

[1]Standard cultivars.
[2]Separation of the mean arc sin transformations by Duncan's multiple range test, 5% level.

Fig. 1. the Iler pear tree showing the size of the trunk and lower branches.

Other seedlings appear neither to be as old nor as large as the Iler pear tree. Fruit from other seedlings has not been fully assessed, but fruit quality is inferior to that of commonly grown cultivars. More work is required to evaluate the full potential of this germplasm source, but this study indicates that pear seedlings found in abandoned fields, roadsides, and backyard lots of southwestern Ontario are a potential source of fire blight resistance.

Literature Cited

1. Hendrick, U. P., G. H. Howe, O. M. Taylor, E. H. Francis, and H. B. Tukey. The pears of New York. N.Y. Dept. Agr. 29th Ann. Rpt., Vol 2, part 2.
2. Quamme, H. A. 1977. Resistance to naturally and artificially induced fire blight in the Harrow pear collection. Can. Plant Dis. Survey, 57:9-12.
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APS ANNUAL MEETING

AUGUST 14, 1986

7:00 P.M. WILLMAN ROOM 119

Luther Burbank Elected to National Inventors Hall of Fame

Luther Burbank, the "Plant Wizard" of the early 1900's, was inducted into the National Inventors Hall of Fame, Sunday, February 9, 1986.

Burbank, whose name became known as the "by-word" for plant improvement," is the first person inducted into this Hall of Fame for inventions relating to various plant varieties. During his working life (1873-1926), Burbank discovered and developed more than 1,000 new plant varieties—including fruits, vegetables, flowers and grasses. According to the National Inventors Hall of Fame Foundation, Inc., Burbank was elected particularly for his patented July Elberta Peach (U.S. Plant Patent No. 15).

Clay Stark Logan, President of Stark Bro's Nurseries and Orchards Co., Louisiana, Missouri, will accept Burbank's award. Burbank worked closely with Stark Bro's from 1893-1926. Many of his fruit and plant hybrids were purchased and introduced to the public by Stark Bro's.

Prior to Burbank's death, he selected Stark Bro's to carry on his research work. "The horticultural legacy passed by Burbank to Stark Bro's was indeed great," said Logan. "It included a great number of exciting new varieties of fruits and flowers which Burbank developed but never marketed—120 types of plums, 18 varieties of peaches, 28 apple varieties, 500 hybrid roses, 30 cherries, 34 pears, 52 gladioli and many others."

The Hall of Fame award and other Burbank memorabilia will be housed in the Luther Burbank Center located at Stark Bro's headquarters in Louisiana, Missouri.