Tobacco Blackfire Disease in Wisconsin

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ABSTRACT

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In August 1978, tobacco blackfire disease caused by *Pseudomonas angulata* was found in a number of fields of Havana 503 tobacco in Wisconsin. Isolates from four fields caused infection in tobacco with TL 106 resistance to *P. tabaci*, supporting the conclusion that *P. angulata* arises as a mutant of *P. tabaci*.

Tobacco wildfire disease, caused by *Pseudomonas tabaci* (Wolf & Foster) Stevens, has occurred for many years in Wisconsin, both in seedbeds and in the field. Although occurrence has been sporadic, crop losses have been high in years with abundant rainfall.

In 1963, a resistant cultivar of tobacco, Havana 501, was released (3). Later, an improved cultivar, Havana 503, replaced it. These cultivars derive their resistance from *Nicotiana longiflora* by way of a *N. tabacum* × *N. longiflora* hybrid, TL 106 (2). After Havana 503 was released, typical wildfire symptoms were occasionally found on the cultivar. In recent years, the incidence has increased, necessitating investigation.

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Isolates of *P. tabaci* from Havana 503 were found to infect this cultivar and others with the TL 106 parentage as heavily as they infected older cultivars without such resistance (4). A breeding program was initiated to incorporate resistance derived from *N. rustica* to both the formerly common and the virulent strains of *P. tabaci* (5).

Most of the tobacco now grown in Wisconsin is Havana 503. Where wildfire has been found on older cultivars, such as Havana 142, that lack the TL 106-derived resistance, the strain of *P. tabaci* has been the virulent type. Although the numbers of isolates are small, the evidence suggests that the virulent strain of *P. tabaci* is selectively perpetuated in the tobacco crop rather than in the roots of grasses and cereals, as suggested by Valleau et al (6) for the common type.

The organism causing tobacco blackfire disease, *P. angulata* (Fromme & Murray) Holland, is thought to be a nontoxin-producing mutant of *P. tabaci* (1). This disease was not common enough in Wisconsin during the past 8–10 yr to attract notice. Then, in August 1978 it was found in a number of fields of Havana 503 tobacco. Each of six isolates from four fields caused infection in tobacco with TL 106 resistance to *P. tabaci*. The isolates failed, however, to infect breeding lines with resistance to *P. tabaci* derived from *N. rustica*. Lines derived from TL 106 were shown to be resistant to the strain of *P. angulata* available to Clayton (2).

The evidence supports the conclusion that *P. angulata* arises as a mutant of *P. tabaci*, in this case a mutant of the strain infecting the TL 106-derived varieties.

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