

Progress Report: Identification of reservoir hosts for the Pierce's disease bacterium (*Xylella fastidiosa*) in winegrape production areas of North Carolina

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Objectives: To identify plant species in NC winegrape production areas that may serve as reservoirs of inoculum for the Pierce's disease bacterium, *Xylella fastidiosa* (*Xf*).

Justification: One potentially very important approach to managing Pierce's disease in NC vineyards involves reducing or eliminating local sources of the pathogen in and around vineyards through vegetation management. Before this approach can be evaluated, it is necessary to identify the plant species that serve as important sources for spread of *Xf*.

Methodologies: In August and September of 2002, native vegetation with scorched leaf symptoms was collected from around three vineyards with Pierce's disease-infected vines. The samples were assayed using standard testing procedures (ELISA kits from AgDia, Inc., Elkhart, IN).



Fig. 1. *Miscanthus* sp. and blackberry samples infected by the *Xf* bacterium in NC.

Results: Plant species listed in the Table 1 were sampled and tested with ELISA kits for the presence of the *Xf* bacterium. Those marked with (+) were infected with the bacterium and therefore identified as potential reservoir hosts of *Xylella fastidiosa*. Species designated as (-) were tested, but were negative, indicating that the *Xf* bacterium was not present, or was present in numbers too low to be detected by the ELISA test.

Table 1. ELISA test kit results for potential *Xf* reservoir hosts in three NC counties.

Vineyard 1: Polk		Vineyard 2: Forsyth		Vineyard 3: Chatham	
Oak	+	Sycamore	+	Bermuda grass	+
Pokeweed	+	Hickory	+	<i>Eleagnus</i> sp. (?)	+
<i>Miscanthus</i> sp.	+	Crabapple	+	Sumac	+
Wild rose	+	Oak	+	Maypop	-
Persimmon	+	Virginia creeper	+	Redbud	-
Wild grape	+	Cherry	+		
Cherry	+	Beech	+		
Blackberry	+	Sweet gum	+		
Black gum	-	Sourwood	+		
Blueberry	-	Wild grape	-		
Hickory	-	Sumac	-		
Dogwood	-	Bermuda grass	-		
Maple	-				

Conclusions: The results from this survey indicate that plants of different habits may potentially be reservoirs of inoculum for the *Xf* bacterium surrounding diseased vineyards. Vines, shrubs, trees and grasses all resulted in positive ELISA test readings.

Impact Statement: The results from our survey coincide with preliminary findings (Bill Hanlin, *personal communication*) from a vector survey conducted simultaneously around the same vineyards in which sharpshooters were found on hardwoods (oak, sycamore, maple, wild cherry), undergrowth (wild grape, blackberry), and broadleaf weeds in ditchbanks (dandelions, plantains, ragweeds). However it is not known whether the *Xf* strains infecting these species will infect grape. To determine whether these *Xf* strains can infect grape, pathogenicity tests need to be conducted with purified cultures of the strains on grape.

Further expansion of the winegrape industry in the Piedmont and Mountain regions of the Southeast may be inhibited by Pierce's disease. In order for the winegrape industry to expand, it is essential that we learn how to manage Pierce's disease, especially in mid-elevation areas. Multiple strategies will be necessary for managing the disease, including management of the vegetation surrounding the vineyards that may harbor the pathogenic bacterium. The information provided by this survey will be useful in helping to establish a vegetation management program for Pierce's disease.