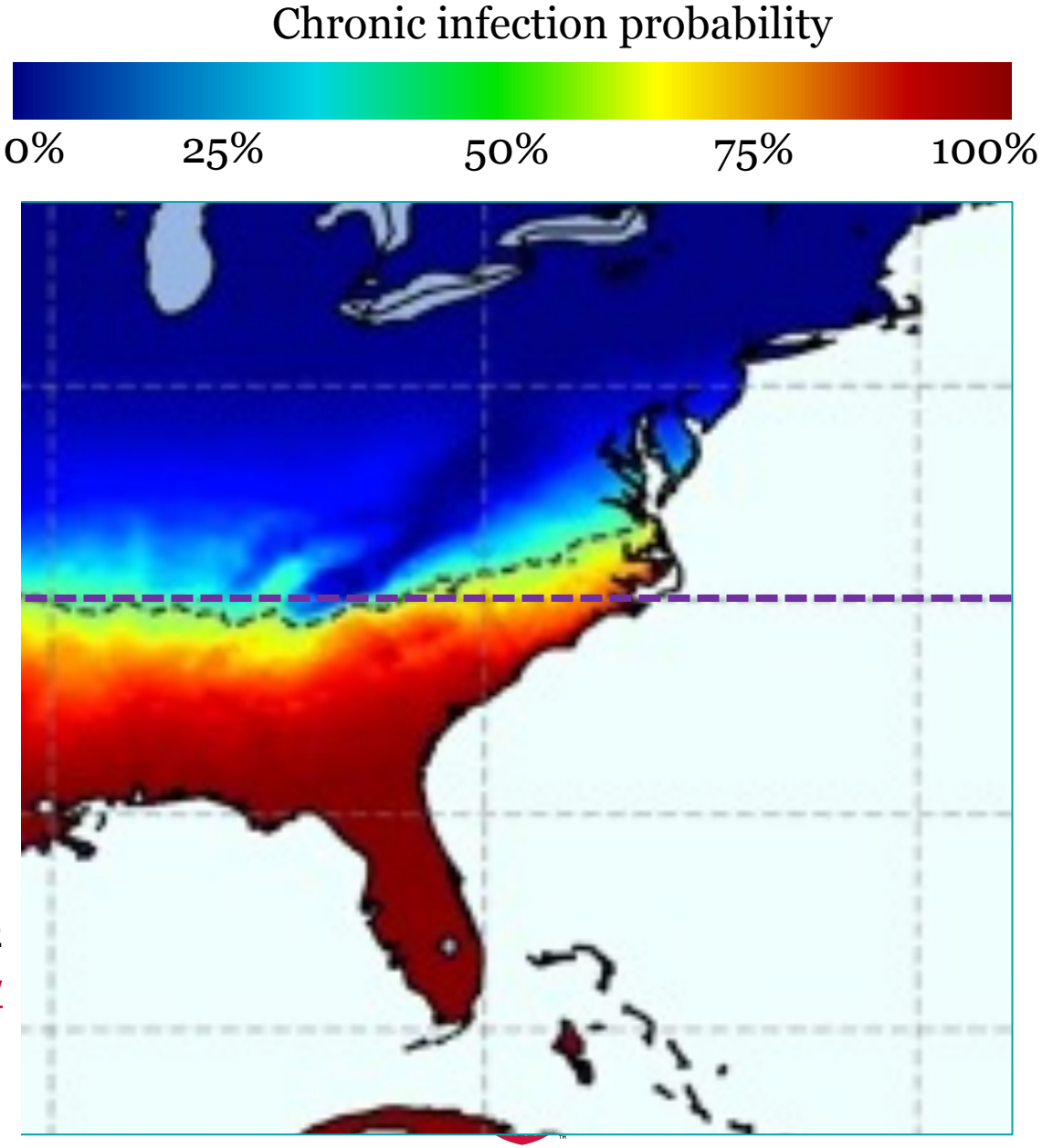
College of Agricultural & Environmental Sciences
UNIVERSITY OF GEORGIA

Pierce's Disease Bacteriophage Trial 2023

Clark MacAllister
UGA Extension Agent
Dawson & Lumpkin Counties

PD risk

- Purple dash line is 35 N (latitude) approx. on northern border of GA
- Black dotted line (in yellow/green transition) marks 50% likelihood of chronic PD infection based on temperature
- Based on temps from 1981-2019



Gimenez-Romero et al. 2022
https://doi.org/10.1038/s42003-022-04358-w

XylPhi-PD®

Bactericide for use in grapevines.

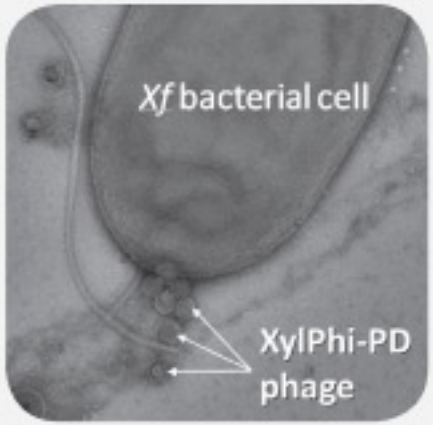
OMRI LISTED For Organic Use

For ***BIOLOGICALLY BASED*** reduction of Pierce's Disease (PD) in grapevines.

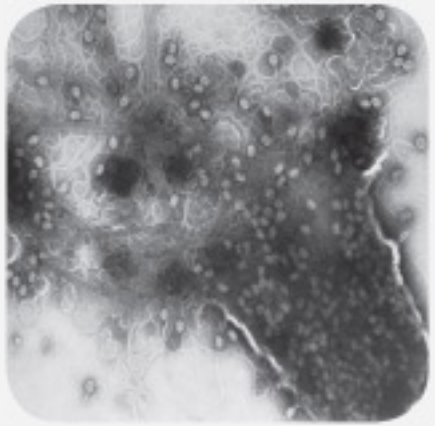
A&P Inphatec

College of Agricultural & Environmental Sciences
UNIVERSITY OF GEORGIA

- A cocktail of viral ***bacteriophages*** (phages) that enter, attack, and kill *Xylella fastidiosa (Xf)* bacteria, the cause of PD.
- Uses the selective biological activity of phages to destroy targeted bacteria in treated grapevines.
- Apply as a ***treatment*** when early stage disease symptoms appear, or as a ***preventative*** to



Viral bacteriophage particles of XylPhi-PD® precisely targeting a bacterial host.



Death and rupture of a bacterial cell, releasing newly created phage particles to seek and destroy more *Xf* cells.

College of Agricultural & Environmental Sciences
UNIVERSITY OF GEORGIA

How to apply

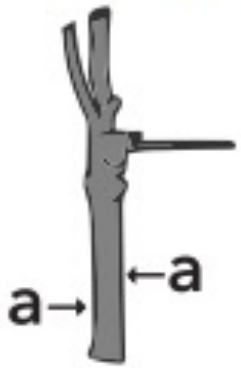
- XylPhi-PD® is applied by ***injection*** into the vascular system (xylem) of grapevines.
- The Pulse Xyleject™ pressurized injection device (from Pulse Biotech) is used for precise injection of XylPhi-PD.®
- Training is available for vineyard staff.

College of Agricultural & Environmental Sciences
UNIVERSITY OF GEORGIA

Injector

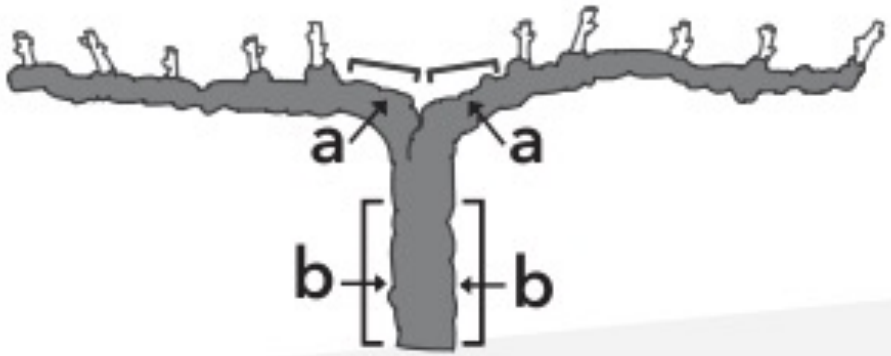
e of Agricultural &
nmental Sciences
SITY OF GEORGIA

▶ *Replants and young vines*



- 2 injections in opposite sides of the trunk (a)

▶ *Mature vines*



- 1 injection in each cordon (a)
- 2 injections in the trunk (b)

College of Agricultural & Environmental Sciences
UNIVERSITY OF GEORGIA

When to apply

Make 2 or 3 applications of XylPhi-PD® per season, at 4- to 6-week intervals.

Application #1

- At or near flowering

4-6 weeks later

Application #2

- A total of **2 seasonal applications** for areas with low/moderate PD pressure (less than 30% historical infection rate) or vectors like the blue-green sharpshooter

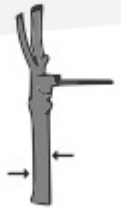
4-6 weeks later

Application #3

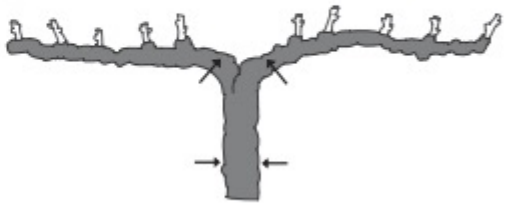
- **3 applications** recommended for 30% or higher historical PD incidence or presence of aggressive vectors like the glassy-winged sharpshooter

1

= ***~600*** ***replants/young vines***



or ***~300*** ***mature vines***



College of Agricultural & Environmental Sciences
UNIVERSITY OF GEORGIA

Field Demonstration – 11 April 2023

College of Agricultural & Environmental Sciences
UNIVERSITY OF GEORGIA

Field Trial – 2023 Growing Season

- Three Sisters Vineyards – Dahlonega, GA

- 2 Vidal blanc blocks - hybrid, known to be highly PD-susceptible
- (1650 vines total, 345 treated)

- Vines– mature, 3-5 year replants, new replants – 60% were 5 years old or less

- Established history of PD

Why Vidal blanc?

- High yielding variety in good years – 6 tons/ac.
- PD infection rates were high, coupled with immense deer damage
- Considering ripping out the vines anyway – so why not test on them?

College of Agricultural & Environmental Sciences
UNIVERSITY OF GEORGIA

Project timeline

- 25 May – 1st trunk injection (bloom)
- 29 June – 2nd trunk injection
- 7 Aug. – 3rd trunk injection

College of Agricultural & Environmental Sciences
UNIVERSITY OF GEORGIA

- PD incidence was visually observed and rated

- PD also confirmed with in-office testing at the Lumpkin County Extension Office with AgDia AmplifyRP quick test kits

College of Agricultural & Environmental Sciences
UNIVERSITY OF GEORGIA

College of Agricultural & Environmental Sciences
UNIVERSITY OF GEORGIA

Results/Conclusions/Initial thoughts

- Incidence
  - Untreated Young – 40%
  - Treated Young – 24%

  - Untreated Mature – 51%
  - Treated Mature – 36%

- Severity
  - Untreated Young – 18%
  - Treated Young – 16%

  - Untreated Mature – 22%
  - Treated Mature – 18%

- Treated plants had lower incidence and lower severity
- Systemic infections are not easily cured

College of Agricultural & Environmental Sciences
UNIVERSITY OF GEORGIA

Factors affecting use

- Cost
- Time/labor – bending down, refilling injector
- Variety – susceptibility, yield potential, young vs. mature
- Securing an injector

- Helena Chemical is the local dealer/distributor