

XylPhi-PD™



Bactericide for use in grapevines
Biologically-based reduction of Pierce's Disease in grapevines
For Use in Organic Production



Active Ingredient:

Bacteriophage active against *Xylella fastidiosa**0.00013%

Other Ingredients:.....99.99987%

Total:.....100.00000%

*Contains a minimum of 5×10^9 plaque forming units (PFU) per milliliter of product

KEEP OUT OF REACH OF CHILDREN

HOTLINE NUMBER

For general information on this product, call **1-650-337-0350** during normal business hours, 8 am to 5 pm (Pacific Time). Contact **1-800-222-1222** for emergency medical treatment information.

EPA Reg. No. 93909-1
EPA Est. No. 94441-MD-1

Produced for: A&P Inphatec, LLC
1060 E Meadow Circle
Palo Alto, CA 94303

PRECAUTIONARY STATEMENTS

PERSONAL PROTECTIVE EQUIPMENT (PPE):

Applicators and other handlers must wear:

- Long-sleeved shirt
- Long pants
- Shoes plus socks

Follow the manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

USER SAFETY RECOMMENDATIONS

Users should:

Remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.

Remove PPE immediately after handling this product. As soon as possible, wash thoroughly and change into clean clothing.

Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.

ENVIRONMENTAL HAZARDS

Do not contaminate water when disposing of equipment washwater or rinsate.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

PRODUCT INFORMATION

Bacteriophage selectively target and attack bacteria. Bacteriophage typically target specific ranges of bacteria. Once the phage come in contact with their targeted bacteria, they enter and destroy their targets, all while they are generating more phage that go on to attack more targeted bacteria.

Pierce's Disease in grapevines is caused by the bacterium called *Xylella fastidiosa*. XylPhi-PD™ is comprised of bacteriophage that are designed to attack this bacterium. XylPhi-PD™ uses the specific nature of these phage to find and eliminate the bacteria within grapevines that the phage contact, decreasing the amount of *Xylella fastidiosa* that can cause the symptoms of Pierce's Disease in the grapevines.

XylPhi-PD™ can be used as a preventative and curative solution for reducing the symptoms of Pierce's Disease in grapevines by targeting the bacterium that causes Pierce's Disease, *Xylella fastidiosa*.

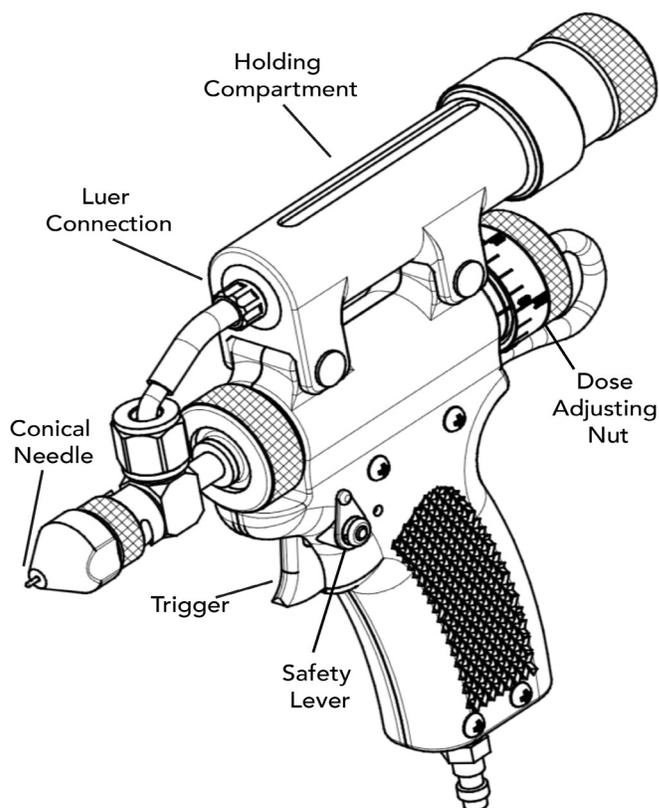
XylPhi-PD™ can be applied as a preventative to protect growing vines, as a curative when disease symptoms become visible, or when conditions may lead to disease pressure. Apply XylPhi-PD™ with the specified injection device (see Application Instructions).

APPLICATION INSTRUCTIONS

Preparation of Plants for Application: Inject XylPhi-PD™ when uptake of water or product into the xylem vessels, the plant's vascular system, is optimal. Do not inject XylPhi-PD™ when plants' xylem is saturated or shortly after heavy rainfall or irrigation.

Application by Injection: XylPhi-PD™ applications are made by injection of the product into the vascular system of grapevines. Applications are made directly into the active xylem tissue of the plant. This section describes the following: the injection locations on the vines; the injection device to be used; the appropriate procedures to be followed to ensure optimal effectiveness of XylPhi-PD™; and the application process.

Injection Device: Applications of XylPhi-PD™ are to be made with a pressurized injection device that can deliver the application volumes described in this section, utilizing the needle gauge and length that enables consistent and effective delivery into the vascular systems of the treated plants.



An injection device such as a Pulse *Xyleject*[™] Injection System (Pulse Biotech, LLC; Lenexa, KS), or an equivalent, as configured to accept a needle using an 18- or 20-gauge conical needle is required. A 20-gauge needle is typically only needed when injecting into a newly planted vine or within newly grown suckers of severely affected plants. For the remainder of applications, use an 18-gauge needle. The injection device must be able to inject XylPhi-PD[™] into the vine using pressurized injections at a needle penetration depth between 0.08 in. (2 mm) and 0.39 in. (10 mm), depending on the diameter and age of the plant tissue as detailed in this section.

Priming Holding Compartment and Injection Device: Introduce XylPhi-PD[™] into the injection device's holding compartment as specified by the manufacturer. The entire capacity of the holding compartment does not need to be filled with XylPhi-PD[™] if the anticipated number of injections is limited. In such cases, the amount of XylPhi-PD[™] added to the holding compartment may match the number of injections to be performed with the device, with addition of extra liquid volume as necessary to fill the injection device fluid path and prime the injection device.

Prime Holding Compartment: Once XylPhi-PD[™] is within the injection device's holding compartment, air must be removed from the holding compartment. Position the holding compartment's outlet port upward, and manually press the holding compartment plunger to expel excess air from the holding compartment until all air pockets in the holding compartment are filled with XylPhi-PD[™]. It is important to remove all air from the holding compartment before installing the holding compartment on the injection device.

Prime Injection Device: After the primed holding compartment is installed on the injection device following the manufacturer's directions, the injection device must be primed. Set the injection device dose volume to the maximum dose volume. Place the

injection device upward (needle pointed upward) and compress the trigger or actuate the injection device several times until a steady stream of liquid is expelled out of the needle. Once a steady stream of liquid is expelled, hold the injection device in its normal position. Select the desired injection device dose volume setting. The injection device is now ready to inject XylPhi-PD™ into the vines.

Injection Site Locations: Select the application locations for XylPhi-PD™ based on the age of the plant, pruning style, and the training system utilized for the plant. Inject XylPhi-PD™ into the active xylem vascular tissue, and only inject XylPhi-PD™ above ground. An overview of the appropriate locations for injections into grapevines for different types of grapevine training and age is provided in the first table below. Apply 2 or 3 injections in the arms based on the vine pruning style. Two injections can be applied at the crown of the trunk in mature vines, where pruning and branching have occurred. It is most critical, however, to apply XylPhi-PD™ in the cordons and spurs, per the details on pruning style, where there are active xylem vessels.

Cordon Training: Apply 1 injection in each cordon above the bifurcation but within the cordon arm and before the first spur.

Alternative Training Methods (e.g., goblet or head, vertical cordon, 6-arm Kniffen or similar): Apply 1 injection into each 1-year spur at each arm. It is ideal to apply an injection at each arm; however, at a minimum, inject up to 3 arms per vine. If all arms are not covered in initial application, consider application into different arms upon subsequent treatments.

For young, recently planted, or radically pruned vines, apply 1 to 2 injections into the crown of the trunk approximately 180° apart.

Injection Depth and Pressure: Inject XylPhi-PD™ at a needle penetration depth between 0.08 in. (2 mm) and 0.39 in. (10 mm), depending on the diameter and age of the plant tissue. Inject XylPhi-PD™ using the injection device's required pressure settings. After inserting the needle into the plant, hold the injection device firmly against the plant and depress the device actuator to deliver the injection. The needle penetration depth is controlled by changing the needle retention nut. A set of needle retention nuts is included with the device. The different needle retention nuts allow for varying lengths of the needle to be exposed beyond the needle retention nut. For deeper injections, select a needle retention nut that exposes a longer portion of the needle beyond the needle retention nut. For shallow injections, select a needle retention nut that exposes a shorter portion of the needle beyond the needle retention nut.

APPLICATION LOCATIONS, FREQUENCY, AND RATES

XylPhi-PD™ applications are made by direct injection into grapevines, as summarized in the following tables:

Types of Grapevine Training	Diagrams of Grapevines	Number of Applications Needle Size Injection Locations Injection Volume
Uni-, Bi-, and Quadri-Lateral Cordon Vines; Cane Pruned Vines		<p>Make 3 applications of XylPhi-PD™ per year <i>Use an 18-gauge needle</i> For each application, apply a minimum of 1 injection into each cordon just after the T (a) plus 1-2 injections into the trunk (b) Apply 0.0014 fl. oz. (40 µL) - 0.0027 fl. oz. (80 µL) of XylPhi-PD™ per injection</p>
Head - Trained Vines		<p>Make 3 applications of XylPhi-PD™ per year <i>Use an 18-gauge needle</i> For each application, apply 1 injection into each arm at location of 1-year old spur with a minimum of 3 arms (c) plus 2 injections at trunk 180° from each other (d) Apply 0.0014 fl. oz. (40 µL) - 0.0027 fl. oz. (80 µL) of XylPhi-PD™ per injection</p>
Cut Down, Retrained Vines		<p>FOR NEW SHOOTS: Make 3 applications of XylPhi-PD™ per year <i>Use a 20-gauge needle</i> For each application, apply 1-2 injections into each shoot event (e) Apply 0.0014 fl. oz. (40 µL) of XylPhi-PD™ per injection</p> <p>FOR THE TRUNK: Make 2 applications of XylPhi-PD™ per year <i>Use an 18-gauge needle</i> For each application, apply 2 injections into the trunk on both sides and below new shoot growth (f) Apply 0.0027 fl. oz. (80 µL) of XylPhi-PD™ per injection</p>
Replants; New Vines		<p>Make 2 applications of XylPhi-PD™ per year <i>Use a 20-gauge needle</i> For each application, apply 2-3 injections into shoot at 180° from each other (g) Apply 0.0014 fl. oz. (40 µL) - 0.0027 fl. oz. (80 µL) of XylPhi-PD™ per injection</p>

RATE	TIMING	FREQUENCY
<p>Use 0.0014 fl. oz. (40 µL) - 0.0027 fl. oz. (80 µL) of XylPhi-PD™ per injection.</p> <p>For mature plants, apply XylPhi-PD™ as detailed above.</p> <p>For newly planted, young vines, or vines that have been trimmed to 2 in. (5 cm) - 6 in. (15 cm) above the ground, apply XylPhi-PD™ as detailed above.</p>	<p>Primary Injection: 6 - 8 weeks after new flush from dormancy.</p> <p>Secondary Injection: 4 - 6 weeks after primary injection.</p> <p>Tertiary Injection: As appropriate, 4 - 6 weeks after second injection.</p>	<p>Conduct 2 - 3 treatments per growing season depending on disease pressure.</p>

Cleaning Injection Device: Upon completion of applications or at the end of an application day, clean the injection device in accordance with the injection device instructions. These instructions will include cleaning the injection device to ensure that XylPhi-PD™ residue is thoroughly removed from the injection device, that the injection device is free of plant debris and that the injection device is stored appropriately in between uses.

STORAGE AND DISPOSAL

Do not contaminate water, food, or feed by storage or disposal.

PESTICIDE STORAGE Store in original container. Store this product in a dry area at either room temperature or under refrigerated conditions (36 - 80°F, 2 - 27°C), away from direct sunlight and extreme heat. Inappropriate storage may cause degradation of the product and that would decrease product efficacy.

PESTICIDE DISPOSAL To avoid waste, use all material in this container by application according to label directions. If wastes cannot be avoided, offer remaining product to a waste disposal facility or pesticide disposal program (often such programs are run by state or local governments or by industry).

CONTAINER HANDLING Nonrefillable container. Do not reuse or refill this container. Offer for recycling if available or dispose of in a sanitary landfill or by other procedures approved by state and local authorities.

IMPORTANT

READ BEFORE USE

Read the entire Directions for Use, Conditions, Disclaimer of Warranties and Limitations of Liability before using this product. If terms are not acceptable, return the unopened product container at once.

By using this product, user or buyer accepts the following Conditions, Disclaimer of Warranties and Limitations of Liability.

CONDITIONS

The directions for use of this product are believed to be adequate and must be followed. However, it is impossible to eliminate all risks associated with the use of this product. Ineffectiveness or other unintended consequences may result because of such factors as, including, but not limited to, the extent of the existing symptoms of Pierce's Disease in the treated grapevines, the pressure of further introduction of disease by vectors such as sharpshooters, the overall health of the grapevines, weather conditions, presence of other materials and the challenges of the method of application, all of which are beyond the control of A&P Inphatec, LLC. All such risks shall be assumed by the user or buyer.

DISCLAIMER OF WARRANTIES

To the extent consistent with applicable law, A&P Inphatec, LLC makes no other warranties, express or implied, of merchantability or of fitness for a particular purpose or otherwise, that extend beyond the statements made on this label. No agent of A&P Inphatec, LLC is authorized to make any warranties beyond those contained herein or to modify the warranties contained herein. To the extent consistent with applicable law, A&P Inphatec, LLC disclaims any liability whatsoever for special, incidental or consequential damages resulting from the use or handling of this product.

LIMITATIONS OF LIABILITY

To the extent consistent with applicable law, the exclusive remedy of the user or buyer for any and all losses, injuries or damages resulting from the use or handling of this product, whether in contract, warranty, tort, negligence, strict liability or otherwise, shall not exceed the purchase price paid or at A&P Inphatec, LLC's election, the replacement of product.

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