

# **Bacteriophages of *Xanthomonas campestris* pv. *vesicatoria* (006449) & Bacteriophages of *Pseudomonas syringae* pv. *tomato* (006521) Fact Sheet**

**Active Ingredient:** Bacteriophages of *Xanthomonas campestris* pv. *vesicatoria* OPP Chemical Code: 006449

**Active Ingredient:** Bacteriophages of *Pseudomonas syringae* pv. *tomato* OPP Chemical Code: 006521

## **Summary**

Bacteriophages of *Xanthomonas campestris* pv. *vesicatoria* and *Pseudomonas syringae* pv. *tomato* attack the plant pathogenic bacteria they are named after. (NOTE: Bacteriophages, or phages, are a category of viruses that infect only bacteria, with each phage being relatively specific for its target bacterium.) The *Xanthomonas* phage controls bacterial spot on tomatoes and peppers; the *Pseudomonas* phage controls bacterial speck on tomatoes. A mixture of the two phages constitutes the active ingredient, which can be applied to plants and the surrounding soil throughout the growing season. No adverse effects to humans, wildlife, or the environment are expected because the phages 1) attack only specific bacterial plant pathogens, 2) are ubiquitous in the environment, and 3) biodegrade to harmless substances within 48 hours of application.

## **I. Description of the Active Ingredient**

These two new active ingredients target the two bacterial plant pathogens *Xanthomonas campestris* pv. *vesicatoria* and *Pseudomonas syringae* pv. *tomato*. After infection, the phages replicate in the pathogenic bacteria, eventually killing them by rupturing the cell wall. For commercial purposes, each phage is grown in a culture of its host bacterium, and then harvested when all the bacteria have been killed. These phages are found in soil, water, and food, and survive less than 48 hours in the environment.

## **II. Use Sites, Target Pests, and Application Methods**

- **Use sites:** Tomato and pepper crops
- **Target pests:** *Xanthomonas campestris* pv. *vesicatoria*, which causes bacterial spot disease in peppers and tomatoes, and *Pseudomonas syringae* pv. *tomato*, which causes bacterial speck disease in tomatoes.

- **Application methods:** The liquid product can be applied to soil pre-planting, and to soil and plants throughout the growing season by drench, spray, or chemigation.

### **III. Assessing Risks to Human Health**

Whether or not a substance poses a risk to humans or other organisms depends on two factors: how toxic the substance is, and how much of it an organism is exposed to. Therefore, the EPA considers toxicity data and exposure data in determining whether to approve a pesticide for use.

No harmful health effects to humans are expected from use of these two active ingredients because these two phages can infect only their target plant pathogenic bacteria. Phages are ubiquitous, commonly found in foods and feed, and harmless to mammals. Required personal protective equipment (PPE) protects applicators.

### **IV. Assessing Risks to the Environment**

No adverse environmental effects are expected from use of pesticide products containing phages of *Xanthomonas campestris* pv. *vesicatoria* and *Pseudomonas syringae* pv. *tomato*. The phages attack only the target bacteria and biodegrade 24 to 48 hours after application.

### **V. Regulatory Information**

August 1994 EPA grants a two-year Experimental Use Permit (EUP) for testing bacteriophages of *Xanthomonas campestris* pv. *vesicatoria* for control of bacterial spot in peppers and tomatoes in Florida. (EPA # 67986-EUP-1)

December 9, 2005 EPA registers (with conditions) the first pesticide product containing as active ingredients bacteriophages of *Xanthomonas campestris* pv. *vesicatoria* and *Pseudomonas syringae* pv. *tomato*. "AgriPhage" EPA Registration # 67986-1

### **VI. Producer Information**

**OmniLytics**

PO Box 4296  
Logan, UT 84323-4296  
ph: 801-746-3600

**VIII. Additional Contact Information:**

Ombudsman, Biopesticides and Pollution Prevention Division (7511P)  
Office of Pesticide Programs  
Environmental Protection Agency  
1200 Pennsylvania Avenue, NW  
Washington, D.C. 20460