College of Agriculture, Food and Environment
Cooperative Extension Service

Plant Pathology Fact Sheet **PPFS-VG-24**

Biological Products for Tomato Disease Management

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Disease management products with biologically-based active ingredients are often labeled for numerous diseases, but can vary markedly in their efficacy. This Extension publication summarizes factors to consider when choosing biological controls and data available pertaining to tomato disease management efficacy.

The first step to choosing agrichemicals for management is based on disease identification through diagnosis or production experience. Consult your local county Extension agent and the Extension publications listed below for diagnostic assistance. Not all products are effective for all diseases, and unless indicated, product compatibility in tank mixes should be trialed. Refer to previously applied tank mixes, read product labels, and conduct jar tests of unknown tank mixes to evaluate physical, chemical, and biological compatibility. Even though many bio-based products have a lower risk of pathogen resistance development, rotating products is still recommended, since multiple diseases frequently co-occur and efficacy is rarely broad-spectrum.

Biologically-based products are most effective when applied preventively, that is, before disease symptoms develop.

Refer to previous years' production records to identify tomato diseases common to your system and location. Efficacy of both biological and chemical controls is largely dependent on implementation of appropriate cultural controls, including resistant varieties, minimization of overall crop stresses, insect and weed management, and sanitation. For more information on these and other tomato production topics, see the UK Extension publications listed at the end of this publication.

Consider the following when choosing a biologically-based product:

- Crop/disease history of the area
- Recent weather and environmental conditions
- Variety disease resistance
- Compatibility with other products
- Planned application frequency

These tables summarize efficacy of registered biological control products against select tomato diseases. Other bio-based products are labeled for use on tomato, but efficacy data from University research were unavailable as of November 2018, and thus, they were not included.

Table 1. Root and Stem Diseases

Product	Active ingredient	Greenhouse use	OMRI-listed	Fusarium wilt	Verticillium wilt	Southern blight
Actigard	Acibenzolar-S-Methyl	no	no	--*	ND*	ND*
Actinovate AG	*Streptomyces lydicus*	yes	yes	ND	ND	+[1]*
Double Nickel	*Bacillus amyloliquefaciens* D747	yes	yes	--*	ND	ND*
Mycostop	*Streptomyces griseoviridis*	yes	yes	--	ND	ND
Oxidate	Hydrogen peroxide	yes	yes	ND	ND*	+[1]*
SoilGard 12G	*Gliocladium virens* GL-21	yes	yes	--	ND*	ND

+ Efficacy indicated in at least one trial
-- Not effective as indicated by currently available data
ND No data available
***** Not labeled for this specific disease
[1] In high tunnels or greenhouses

TABLE 2. FOLIAR DISEASES

Product	Active ingredient	Greenhouse use	OMRI-listed	Early blight	Septoria leaf spot	Bacterial diseases (spot, speck, canker)	Gray mold	Powdery mildew	Other diseases (tested)
Actigard	Acibenzolar-S-Methyl	no	no	+	+*	+	ND*	ND	Target spot (+)*
Actinovate AG	*Streptomyces lydicus*	yes	yes	ND	--*	+	--*	ND	Late blight (+) & Southern blight (+) [1]
AgriPhage	Bacteriophage	yes	no	ND*	ND*	+	ND*	ND*	
MilStop	Potassium bicarbonate	yes	yes	+*	ND	ND	+	ND	Target spot (+) *
Cease	*Bacillus subtilis* QST713	yes (only)	yes	ND	ND*	--	+[2]	ND	
Companion	*Bacillus subtilis* GB03	yes	yes	ND*	+	ND	ND	+	
Double Nickel	*Bacillus amyloliquefaciens* D747	yes	yes	+*	ND	+	+[1]	ND	
Oxidate	Hydrogen peroxide	yes	yes	ND	+[2]*	--	+	ND	
Regalia	*Reynoutria sachalinensis*	yes	yes	+	--	+[1]	+	ND	Late blight (+)
Serenade Opti	*Bacillus subtilis* QST713	yes	yes	ND*	ND*	--	ND	ND	
Sil-MATRIX	Potassium silicate	yes	yes	ND*	ND*	--*	ND	ND	
Sonata	*Bacillus pumilus* QST2808	yes	yes	ND	ND*	+	ND	--	
Sporatec	Oils (clove, rosemary, thyme)	yes	no	+	+*	ND	ND	+	
Trilogy	Neem oil	yes	yes	--	ND	--*	--	ND	

\+ Efficacy indicated in at least one trial
-- Not effective as indicated by currently available data
* Not labeled for this specific disease
ND No data available
[1] In high tunnels or greenhouses
[2] In combination or alternation with other products

ADDITIONAL RESOURCES

- Vegetable Production Guide for Commercial Growers (ID-36) http://www2.ca.uky.edu/agcomm/pubs/id/id36/id36.pdf
- An IPM Scouting Guide for Common Pests of Solanaceous Crops in Kentucky (ID-172) http://www2.ca.uky.edu/agcomm/pubs/id/id172/id172.pdf
- Vegetable Disease Management: Solanaceous Disease Management (video) https://www.youtube.com/watch?v=6z5Qjb34Mo0
- Sustainable Management of Solanaceous Crops in the Home Garden (PPFS-VG-21) https://plantpathology.ca.uky.edu/files/ppfs-vg-21.pdf

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Tables summarize data from Plant Disease Management Reports from the following research groups: Alexander Lab, Virginia Tech, 2001; Babadoost Lab, Univ. Illinois, 2016; Bost Lab, Univ. Tennessee, 2013; Everts Lab, Univ. Maryland, 2011; Hausbeck Lab, Michigan State, 1999; Jacobsen Lab, Montana State, 2006; McGrath Lab, Cornell, 2008-2009; McNab Lab, Penn State, 1999-2000; Miller Lab, Ohio State, 2001; Pernezny Lab, Univ. Florida, 2001-2002; Rahman Lab, West Virginia, 2015; Smart Lab, Cornell, 2000-2017; Roberts Lab, Univ. Florida, 2004-2005; Shoemaker Lab, NC State, 2002-2003; Sikora Lab, Auburn, 1999; Zitter Lab, Cornell, 2000-2009; Vallad Lab, Univ. Florida, 2015.

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