

Fungicides for Managing Phytophthora Blight in Cucurbits and Other Vegetables

Margaret Tuttle McGrath, Plant Pathology and Plant-Microbe Biology Section, Cornell University
 Long Island Horticultural Research and Extension Center, 3059 Sound Avenue, Riverhead, NY 11901
 mtm3@cornell.edu; <http://blogs.cornell.edu/livegpath/>; <http://vegetablemdonline.ppath.cornell.edu/>

Fungicide	FRAC group	Application + other use restrictions			REI (hr)	PHI (day)	Other labeled vegetables	Comments
		sequential ¹	max ²	other				
Orondis Ultra	49 + 40	2	4 or 33% of applications, whichever is fewer		4	0	pepper, eggplant, tomato	Use either Orondis Ultra applied to foliage or Orondis Gold applied to soil.
Orondis Gold 200	49	2			4	0		
Omega	29	no limit	4-7	4 at high rate	12	7/30	pepper, eggplant	PHI is 30 days for cucumbers and melons
Gavel	22 + M3	no limit	8		48	5		
Presidio	43	none	2	tank-mix	12	2	pepper, eggplant	Use when downy mildew is not a concern (e.g. early in season)
Ranman	21	3	6	use organo-silicone surfactant	12	0	bean, pepper, eggplant	
Zampro	40 + 45	2	3	no LI use	12	0	pepper, eggplant	
Forum	40	2	5	tank-mix	12	0	pepper, eggplant	
Revus	40	none	4	use surfactant	12	0	pepper, eggplant	
Tanos	27	none	4	tank-mix	12	3	pepper	Must be tank-mixed with contact fungicide (copper)
phosphorous acid	33	no limit	none		4	0	pepper, eggplant	Recommended applied at low rate combined with other fungicides
biopesticides		no limit	none			0	varies	See section below.
copper fungicides	M1	no limit			48	2		2(ee) in NY to use tank-mixed with other fungicides: Champ, Champion, Cuprofix Disperss, Kocide

¹ Maximum number of sequential applications that can be made before must switch to other fungicide(s) in different FRAC group. This restriction is for resistance management. Switch for at least as many applications; this is a stated requirement on the Ranman label. So if Ranman is applied 3 times in a row, the maximum allowed, the next 3 applications must be different chemistry. No sequential applications permitted with Presidio (recent label change), Revus and Tanos.

² Max refers to the maximum number of applications that can be applied to a cucurbit crop. See also next column.

Additional information about these fungicides

Classified for “restricted use” in New York: Gavel, Omega, Presidio, Zampro, and some phosphorous acid fungicides. Not: biopesticides, Forum, Ranman, Revus, Tanos, and most phosphorous acid fungicides.

Biopesticides. There are several products with a microbial organism (bacterium or fungus) as the active ingredient that are labeled for application to soil and/or foliage to manage the blight pathogen, *Phytophthora capsici*. They are approved for organic production. In a crop that will be treated with conventional fungicides, more effective control might be achieved by adding applications of these early in production to soil and the crown area of pepper, eggplant, and cucurbit crops. Research has not been conducted yet to document this. Biopesticides are recommended applied at low rate frequently rather than high rate once. They are also suggested used in combination based on the organism: *Bacillus* (Double Nickel, Serenade, Taegro), *Gliocladium* (SoilGard), *Streptomyces* (Actinovate), and *Trichoderma* (Bio-Tam, RootShield Plus). These biofungicides are also labeled for managing *Fusarium*, which has been detected causing root and crown rot in pumpkin in some fields on LI, as well as *Pythium* and *Rhizoctonia*.

Products listed by labeled use pattern:

1. broadcast apply to soil up to 7 days before planting; immediately incorporate with irrigation (best) or light cultivation: Bio-Tam.
2. seed treatment as a spray or dry coating: Actinovate.
3. drench to seedlings before transplanting: Bio-Tam, RootShield Plus (in greenhouse), Serenade ASO (pepper), SoilGard, Taegro
4. in-furrow during planting: Actinovate, Bio-Tam, Double Nickel, RootShield Plus, Serenade ASO, Taegro
5. in transplant water: RootShield Plus, SoilGard
6. banded over the row: Bio-Tam, Taegro
7. basal directed spray: Bio-Tam, SoilGard, Taegro
8. through drip irrigation: Actinovate, Bio-Tam, Double Nickel, RootShield Plus, SoilGard, Taegro
9. foliage: Actinovate, Double Nickel, Serenade

Conventional fungicides that can be applied directly to soil as well as to foliage.

Omega. first application may be made at 1.5 pt/A as a banded soil drench at transplant or when the plants have the first true leaves.

Orondis Gold 200. Can be applied in furrow at planting, in transplant water, or through drip irrigation.

Phosphorous acid fungicides. There are several products; not all labeled for soil applications.

Check the label carefully as use directions vary a lot. ProPhyt is labeled for application to cucurbit and pepper seedlings before transplanting (1 pint/25 gal water) and in furrow during seeding (5 fl oz/1000 row ft). Rampart can be applied as a root dip to pepper and eggplant. Several phosphorous acid fungicides, including K-Phite and Rampart, also can be applied through drip irrigation after planting.

Presidio. Can be applied through drip irrigation.

Updated April 2018