

## Quantifying benefits of biofungicides in cucurbit powdery mildew management using novel disease detection methods – Year 1 Summary

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### Project goals

- Quantify efficacy and economic impacts of biofungicides for cucurbit powdery mildew
- Evaluate utility of NDVI sensors for measuring plant health and detecting disease early



**Cucurbit powdery mildew treatments** (using ‘Honey Bear’ bush acorn squash; intermediate powdery mildew resistance; expect 3-4 fruit/plant, 1-1.25 lb each)

Treatment	Every 7-10 days starting at 2nd leaf	Every 7-10 days starting when disease detected
Control	-	-
Conventional	-	Vivando (15 fl oz/A), Quintec (6 fl oz/A), Luna Experience (10 fl oz/A)* rotation
Organic	LifeGard (4 oz/100 gal)	MilStop (3 lb/A), Serifel (8 oz/A), Suffoil-X or JMS Stylet oil (1% v/v) rotation
Conventional + LifeGard	LifeGard (4 oz/100 gal)	<b>Add</b> Vivando (15 fl oz/A), Quintec (6 fl oz/A), Luna Experience (10 fl oz/A)* rotation
Conventional + Regalia	Regalia (2 qt/A)	<b>Add</b> Vivando (15 fl oz/A), Quintec (6 fl oz/A), Luna Experience (10 fl oz/A)* rotation
Conventional + Serifel	Serifel (8 oz/A)	<b>Add</b> Vivando (15 fl oz/A), Quintec (6 fl oz/A), Luna Experience (10 fl oz/A)* rotation

\*NOTE: Luna Experience is not allowed on Long Island

### Biofungicide modes of action (based on product labels and information provided by the project registrant)

Product	Active ingredient	Eats pathogen	Makes antimicrobial compounds	Grows on plant, excludes pathogen	Induces plant resistance	Promotes plant growth/ stress tolerance
LifeGard WG	<i>Bacillus mycooides</i> isolate J				X	
Regalia	<i>Reynoutria sachalinensis</i> extract (giant knotweed plant)				X	X
Serifel	<i>Bacillus amyloliquefaciens</i> strain MBI 600		X	X	X	X

The following information was collected from product labels, company websites, and information provided by project registrants:

Product name	Active ingredient	FRAC	Where to apply	When to apply	Temperature tolerance in field
LifeGard WG	Bacillus mycooides isolate J	P06	Healthy, actively growing foliage, non-stressed plants	≥ 3-5 days before disease onset; any time of day	Any temperatures typical of NY growing season
Regalia	Reynoutria sachalinensis (giant knotweed plant) extract	P05	Foliage, soil, pre-plant dip	≥ 48 hrs before disease onset; first application requires 48 hrs for full plant defense activation, subsequent applications take 3-4 hrs	Any temperatures typical of NY growing season
Serifel	Bacillus amyloliquefaciens MBI 600	44	Foliage; not greenhouses or transplant production	4 days before disease onset in cool weather (50's °F); 1 day in warm weather (70's °F)	50-120 °F

Product name	Rainfastness	UV tolerance	Tank mix & application compatibility	How to store	Shelf life
LifeGard WG	Bacteria need to be on the leaf for 3 hrs to induce plant resistance	Not a concern, since bacteria only need to stay alive for 3 hrs	Do not tank mix with antibiotics, peracetic acids, or hydrogen peroxides; compatible with many fertilizers, insecticides, herbicides, and fungicides. Avoid silicon spreaders.	Below 77 °F	2 years if exposed to extreme heat; 3 years at room temperature
Regalia	Needs 3-4 hrs to dry and works best with a spreader sticker	Not a concern	Compatible with many commonly used pesticides, fertilizers, adjuvants, and surfactants; keep pH of spray mixture between 6 and 8	35-100 °F	At least 3 years when stored at 35-100 °F
Serifel	Within 3 hrs	Up to 7 days; prefers low UV exposure	Do not tank mix with metalaxyl/mefenoxam, ethylene bisdithiocarbamates (e.g., mancozeb), or chlorothalonil	Cool dry place (room temperature)	3 years if unopened and stored correctly

### Things to know about all of these products

- Apply preventatively
- Use as part of IPM strategy (including other pesticides)
- Mix only what you need; don't leave in spray tank overnight
- Don't expose to excessive heat when storing (see details above)
- 0 day PHI, 4 hr REI
- When tank mixing, follow label instructions for all products. Check with company rep if you have questions. Do a "jar test" if you are mixing two products for the first time to check for physical compatibility.

**The information on this handout is not meant to be a substitute for reading the label. Always read and follow all pesticide labels.**