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COLLEGE OF FOOD, AGRICULTURAL,  
AND ENVIRONMENTAL SCIENCES

# Vegetable Disease Management Update 2015

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## Cucurbit Downy Mildew

Cucurbit	First Report in 2013	First Report in 2014
Cucumber	July 3	Aug 15 (Wayne) Aug 25 (Huron)
Cantaloupe	August 2	Sep 8 (Clark)
Pumpkin	August 19	Sep 3 (Ross)
Watermelon	August 22	
Squash	?	Sep 12 (Guernsey)

See VegNet for updates: <http://vegnet.osu.edu/>

Follow me on Twitter: @OhioVeggieDoc



## Cucurbit Downy Mildew Management

- Still no highly resistant cucumber or cantaloupe cultivars available
- Timely fungicide application – before infection – required
- Fungicide insensitivity development in the pathogen is a problem



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## Cucurbit Downy Mildew Fungicides

Product	PHI (days)	FRAC code	Comments
Chlorothalanil e.g. Bravo Weather Stik	0	M5	Protectant: tank mix with targeted fungicides below
Mancozeb e.g. Dithane or Manzate	5	M3	Protectant: tank mix with targeted fungicides below
Ranman	0	21	
Previcur Flex	2	28	Reduced efficacy suspected
Tanos	3	11+27	Up to 2 days curative activity but low residual (3-5 days)
Gavel	5	22+M3	Zoxamid + mancozeb
Zing!	0	22+M5	Zoxamid + chlorothalanil
Presidio	2	43	Reduced efficacy observed
Curzate	3	27	Up to 2 days curative activity but low residual (3-5 days)
Zampro	0	40+45	Moderate efficacy in Eastern US





## Cucumber DM Seedling Bioassay 2014





## Downy Mildew Seedling Cucumber Fungicide Bioassay 2014

Treatment and rate	% Downy mildew		
	Wooster	Celeryville	Fremont
Previcur Flex 1.2 pt/A	0.4 d	1.0 c	0.3 c
Presidio 4 SC 4 fl oz/A	3.6 c	1.9 b	2.4 bc
Ranman 400SC 2.75 fl oz/A	0.3 d	0.1 ef	0.0 c
Manzate Pro-Stick 75WG 2lb/A	0.8 d	0.0 f	0.6 c
Bravo Weather Stik 6SC 2 pt/A	0.0 d	0.0 f	0.0 c
Gavel 75DF 2.0 lb/A	0.6 d	0.0 f	0.6 c
Tanos 8 oz/A	1.4 d	0.0 f	0.6 c
Zampro 11 oz/A	0.5 d	0.9 cd	0.6 c
Ridomil Gold EC 2 pt/A	5.6 b	0.5 de	8.1 b
Non-treated (water) control	23.8 a	7.5 a	21.3 a
<i>P</i> value	<.0001	<.0001	<.0001

Final rating 15 September





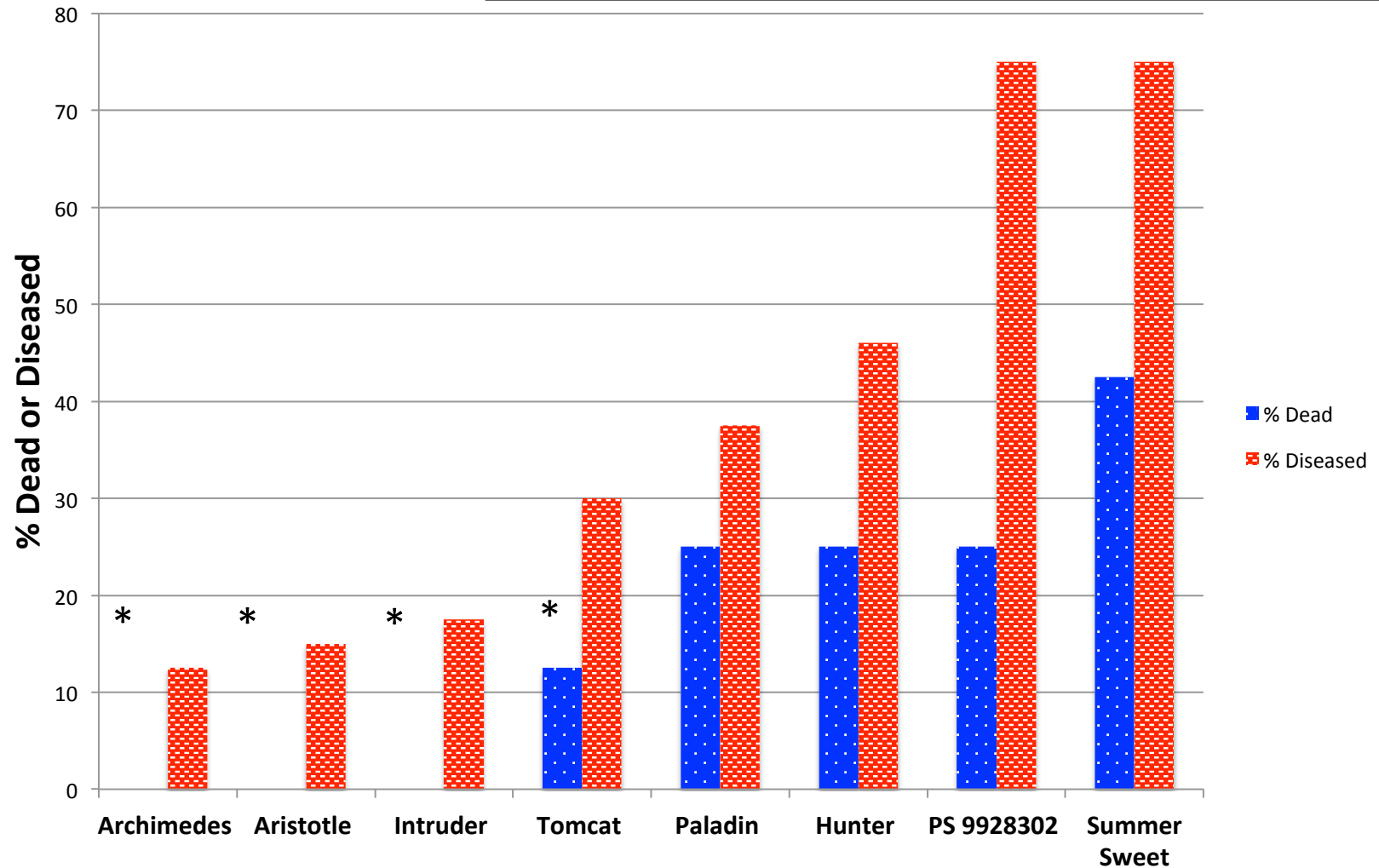
## Phytophthora Blight Update

- Severe in 2014 in areas where excessive rainfall events/flooding occurred
- No new chemistries for control
- No resistant varieties for cucurbits
- Limited number and efficacy for pepper





## Peppers: Susceptibility to Phytophthora





## Phytophthora Blight Update

- Cultural management
- Water management
- Surface waters commonly infested – avoid if possible
- Use high ridges/beds; fields with good drainage
- Sanitation
- Cull piles/discarded fruit in field are a source of inoculum; destroy





## Phytophthora Blight Update

- Cultural management
- Trellis production of cucumbers may reduce the number of rotted fruit
- Power-wash equipment after using in infested fields
- Remove diseased plants and adjacent healthy plants





## Phytophthora Blight Fungicides

Fungicide	Cucum- ber	Melon	Summer squash	Winter squash	Pumpkin	Pepper
Gavel 75DF	✓	✓	✓			
Zing!	✓	✓	✓	✓	✓	
Presidio 4SC	✓	✓	✓	✓	✓	✓
Revus 2.08SC	✓	✓	✓	✓	✓	✓
Ridomil Gold SL						✓
Forum 4.18SC	✓	✓	✓	✓	✓	✓





# Tomato Early Blight Management



- Cultivars with high degree of resistance not common
- Early blight pathogen – *Alternaria solani* and *A. tomatophila*
  - Reduced sensitivity to strobilurin fungicides reported
  - Potato *A. solani* isolates from northern OH identified in 2014 with reduced sensitivity to azoxystrobin
- Use a fungicide resistance management program



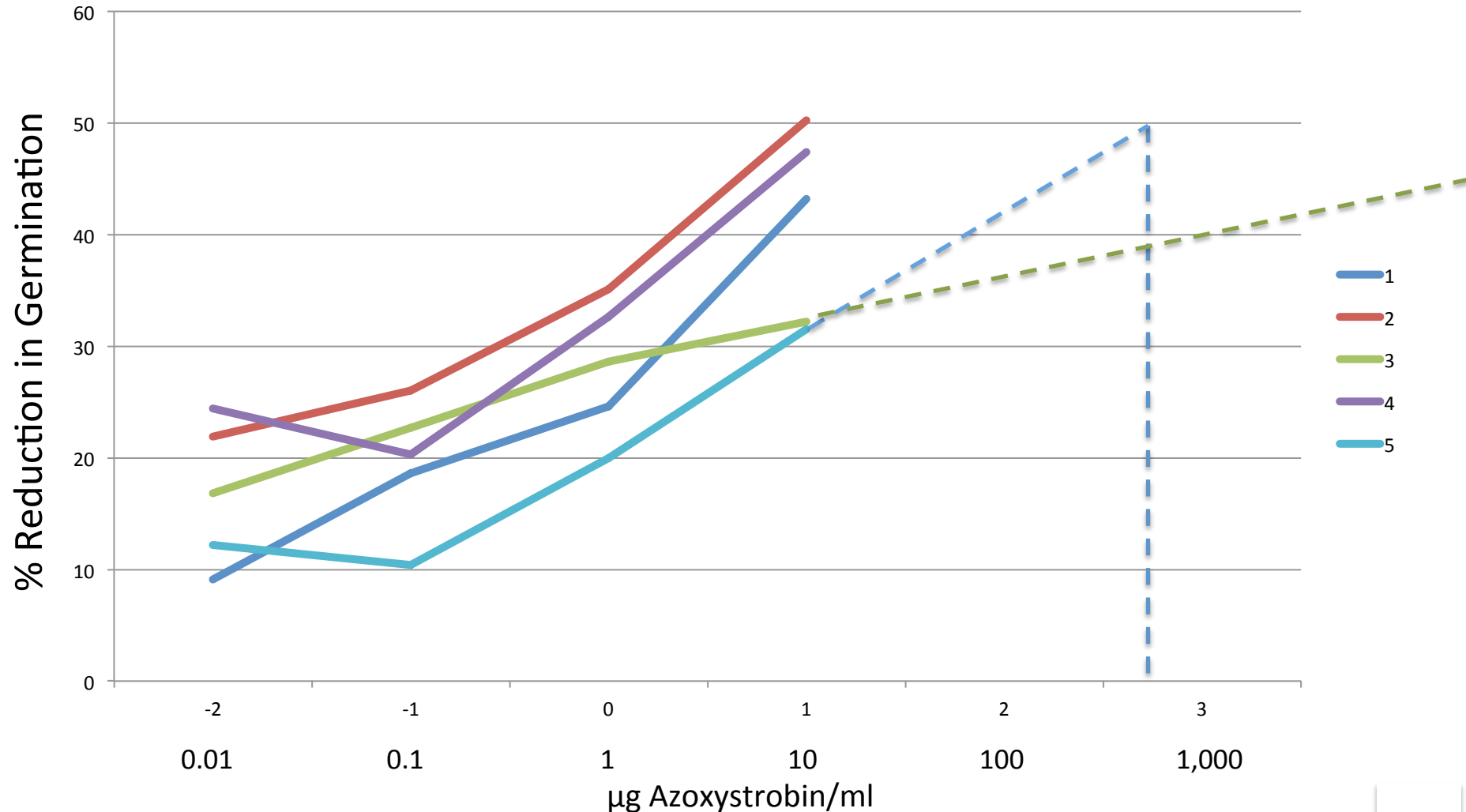
A19334 = Solatenol

## Tomato Early Blight Management: Fungicides

Treatment and rate/A	Early blight severity (%)	Marketable yield (ton/A)
A19334A 10.5 fl oz + Activator 90 (1,3,5,7) alt Bravo Weather Stik 2 pt (2,4,6,8)	5.3 b	54.8 a
A19334A 194.5EC 13.5 fl oz + Activator 90 (1,3,5,7) alt Bravo Weather Stik 2 pt (2,4,6,8)	6.0 b	51.1 a
Equation 5 fl oz (1-10)	21.0 ab	42.2 a
Equation 6.2 fl oz (1-10)	16.0 b	44.1 a
Quadris 6.2 fl oz (1-10)	18.7 ab	41.3 a
Zing 36.0 fl oz + Activator 90 (1-10)	4.3 b	41.6 a
Bravo Weather Stik 2 pt (1,3,5,7,9) alt F9110-1 2.12SL 24.5 fl oz + Activator 90 (2,4,6,8,10)	3.3 b	47.5 a
Bravo Weather Stik 6SC 2 pt (1,2,5,6,9,10) alt F9110-1 2.12SL 24.5 fl oz + Activator 90 SL 0.25% v/v (3,4,7,8)	8.3 b	44.6 a
Ignite S2 64 fl oz (drench) fb Quadris Top 325SC 8 fl oz + FoliarBlend 16 fl oz (1,3,5,7,9) + Nutri-Gro 64 fl oz (5,7,9) alt Bravo Weather Stik 2 pt + FoliarBlend 16 fl oz (2,4,6,8,10)	4.7 b	41.4 a
Quadris Top 8 fl oz (1,3,5,7) alt Bravo Weather Stik 2 pt (2,4,6,8)	17.7 ab	42.6 a
Non-treated control	36.7 a	44.1 a
P Value	0.0615	0.6550



## *A. solani* Germination in Presence of Azoxystrobin





# New Tomato Fungicides

- Solatenol (Syngenta)
  - Early blight
- Zing! (Gowan)
  - Early blight, late blight, Septoria leaf spot
  - Potato early blight, late blight, black dot, Botrytis vine rot
- Fracture (FMC)
  - Early blight, bacterial spot





## Resources

- Midwest Vegetable Production Guide
- VegNet Newsletter ([vegnet.osu.edu](http://vegnet.osu.edu))
- Twitter @OhioVeggieDoc
- [u.osu.edu](http://u.osu.edu) posts
  - [u.osu.edu/miller.769](http://u.osu.edu/miller.769) (OhioVeggie Disease News)
  - <http://u.osu.edu/vegetablediseasefacts/>

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Updates on vegetable diseases and  
management

HOME

**16**  
September 2014

**September 16, 2014. Cucurbit Downy Mildew Outbreaks Continue**

Although the cucurbit growing season is winding down, we continue to see new outbreaks of downy mildew. We found downy mildew in pumpkins in our sentinel plot in Fremont, OH (Sandusky County) on Friday, September 12. Yesterday we found the disease in butternut squash in our sentinel plot in Celeryville, OH (Huron County). At this point growers need to decide whether or not fungicide application is a good idea from an economic standpoint. In southern Ohio, frost may occur for some time, so keeping cucurbit foliage protected from downy mildew with fungicides may be a good idea. Downy mildew affects leaves, not fruit, so if pumpkins or winter squash are ripe and curing in the field, it may not be necessary to apply fungicides to control the disease. However, control measures for powdery mildew and other diseases that affect handles or fruit need to continue. See my July 3, 2014 post for [fungicide recommendations](#) for downy mildew management.

For more information on cucurbit downy mildew and a map of outbreaks in Ohio and the US, see the [Cucurbit Downy Mildew Forecasting website](#). The map below was captured today.



Posted by [Sally Miller](#) at 9:41am

[Leave a comment](#)

RECENT POSTS

September 16, 2014. Cucurbit Downy Mildew Outbreaks Continue

September 10, 2014. Tomato Late Blight in Summit County, OH

September 10, 2014. More Downy Mildew in Ohio Counties: Pumpkin (Holmes) and Zucchini (Guernsey) Downy Mildew

September 2, 2014. Tomato Late Blight Now in Wayne County, Ohio

August 31, 2014. Downy Mildew on Pumpkins in Ross County, Ohio

RECENT COMMENTS

Tito L Zuniga (Guatemala) on [July 3, 2014: Cucurbit Downy Mildew Watch](#)

[U.OSU.EDU](#) on [July 2, 2014: Phytophthora Blight Coming on Strong in Peppers and Cucurbits](#)



## Vegetable Pathology Lab Resources



### Diagnostics

Contact Sally Miller  
([miller.769@osu.edu](mailto:miller.769@osu.edu))  
or Fulya Baysal-Gurel  
([gurel.2@osu.edu](mailto:gurel.2@osu.edu))

No charge for Ohio  
samples

### Websites

[www.oardc.osu.edu/sallymiller](http://www.oardc.osu.edu/sallymiller)  
[u.osu.edu/miller.769](http://u.osu.edu/miller.769)

### VegNet

[Vegnet.osu.edu](http://Vegnet.osu.edu)

Thanks to OVSFRDP and crop protection  
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