

# Ornamental Fungicide Update 2018



# New Fungicides

- Astun (7)
- BotryStop (na)
- Broadform (7-11)
- EcoSwing (P 05)
- Magus (IRAC 21)
- Mural (7-11)
- Orkestra Intrinsic (7-11)
- Segovis (49)



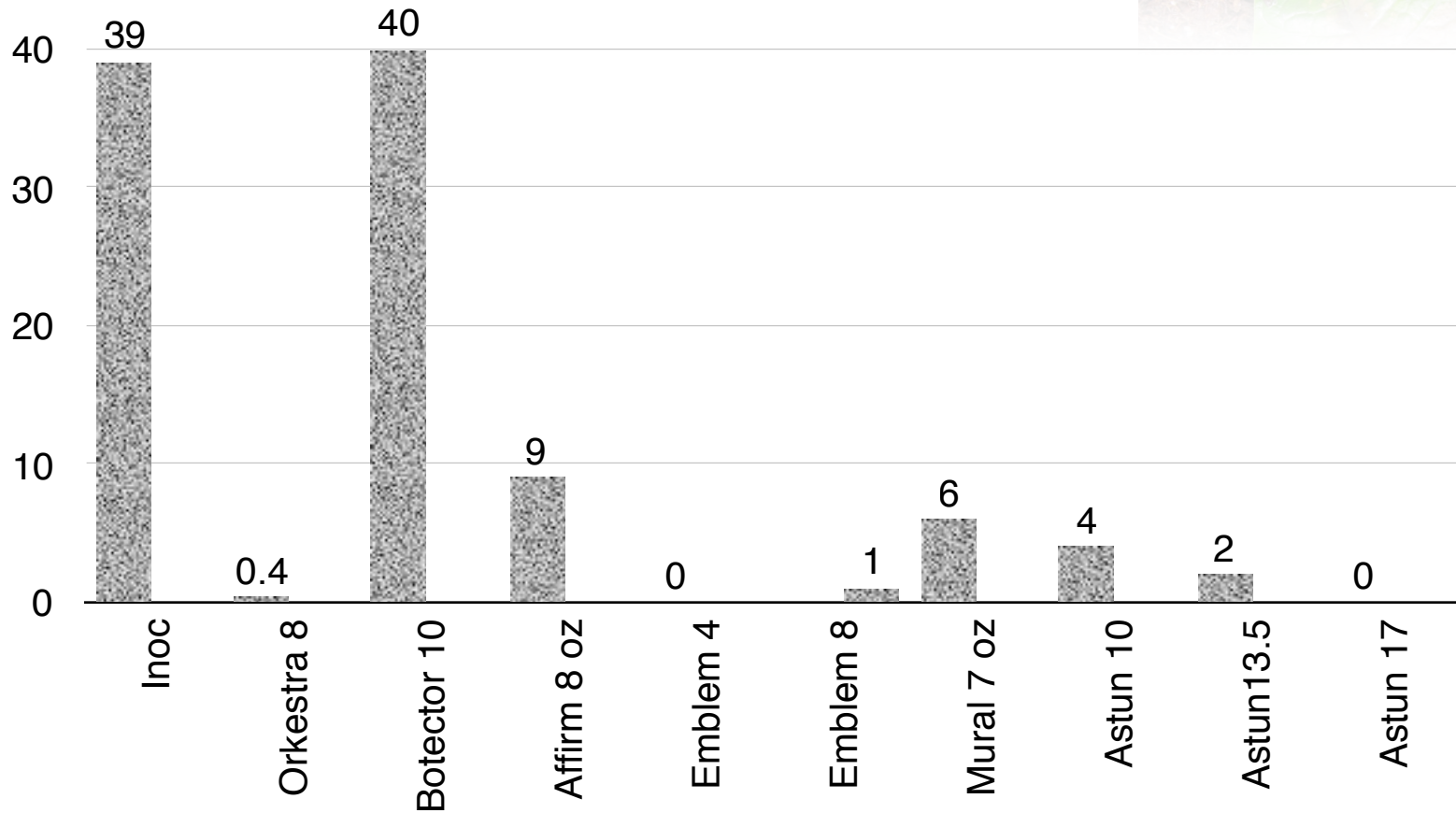


- The only FRAC group 7 (SDHI) stand alone fungicide for ornamentals
- active ingredient - isofetamid
- REI is 12 hr
- CAUTION signal word
- Protects against Botrytis
- Rapid rain-fastness allows for efficient foliar applications
- Excellent plant safety including flowers



# Botrytis blight on poinsettia

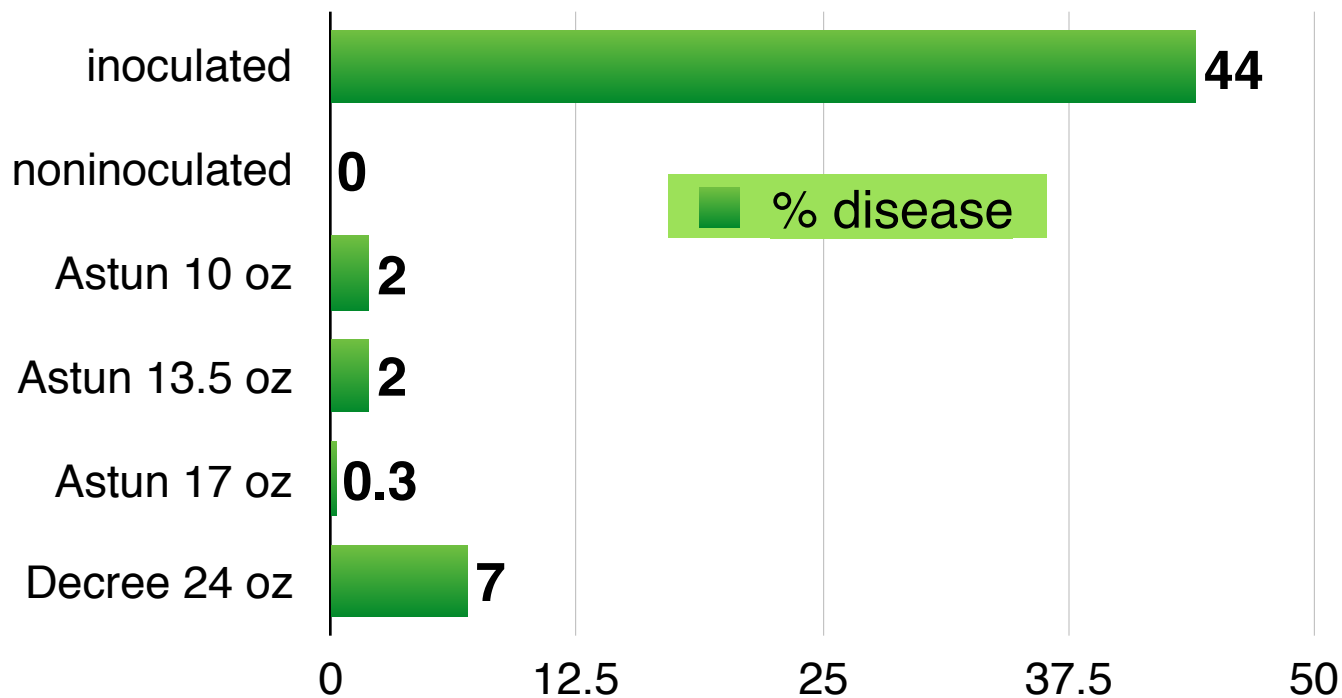
Hausbeck, MSU





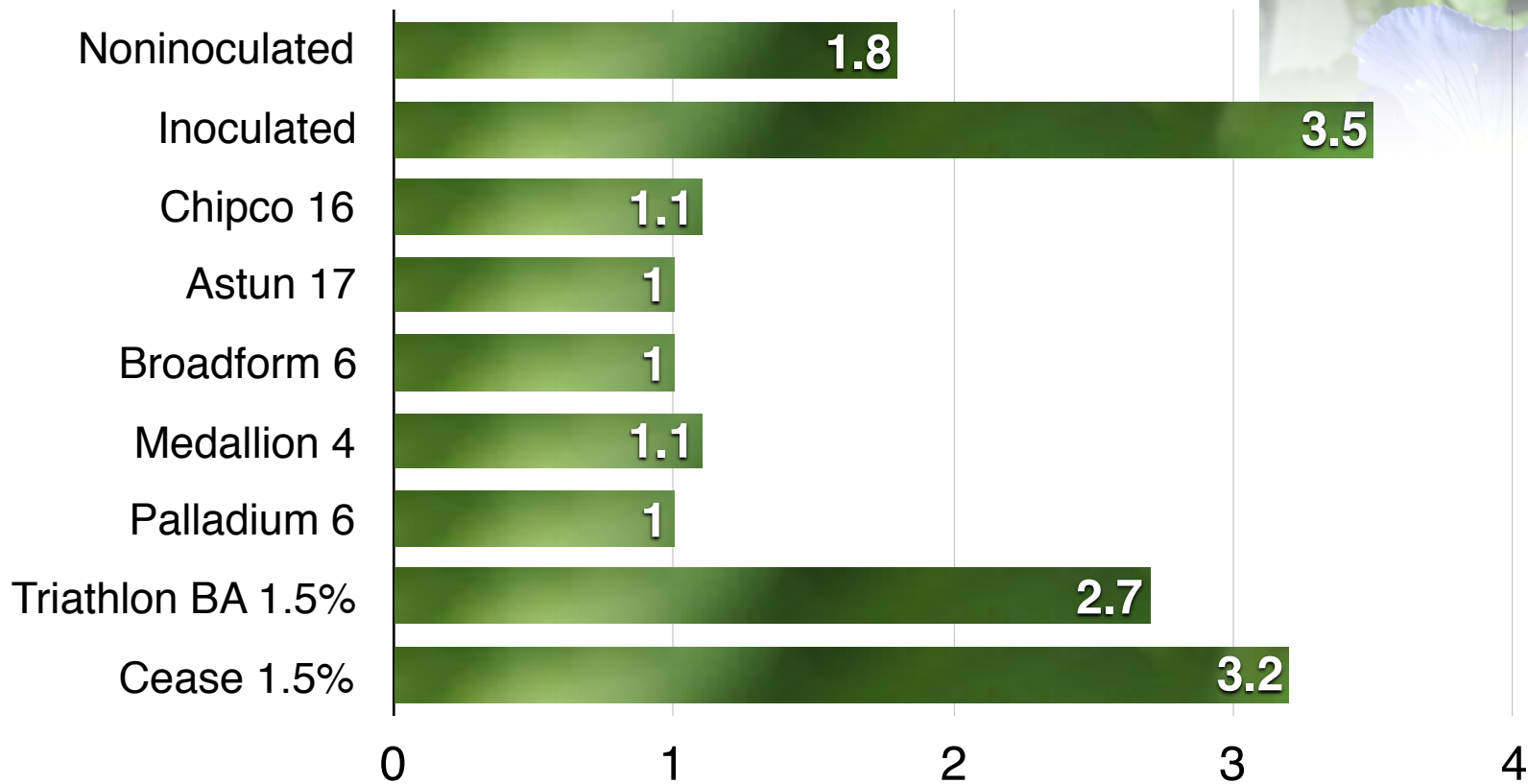
# Efficacy of Astun on Botrytis blight on Hydrangea

## Basal-Gurel, UT



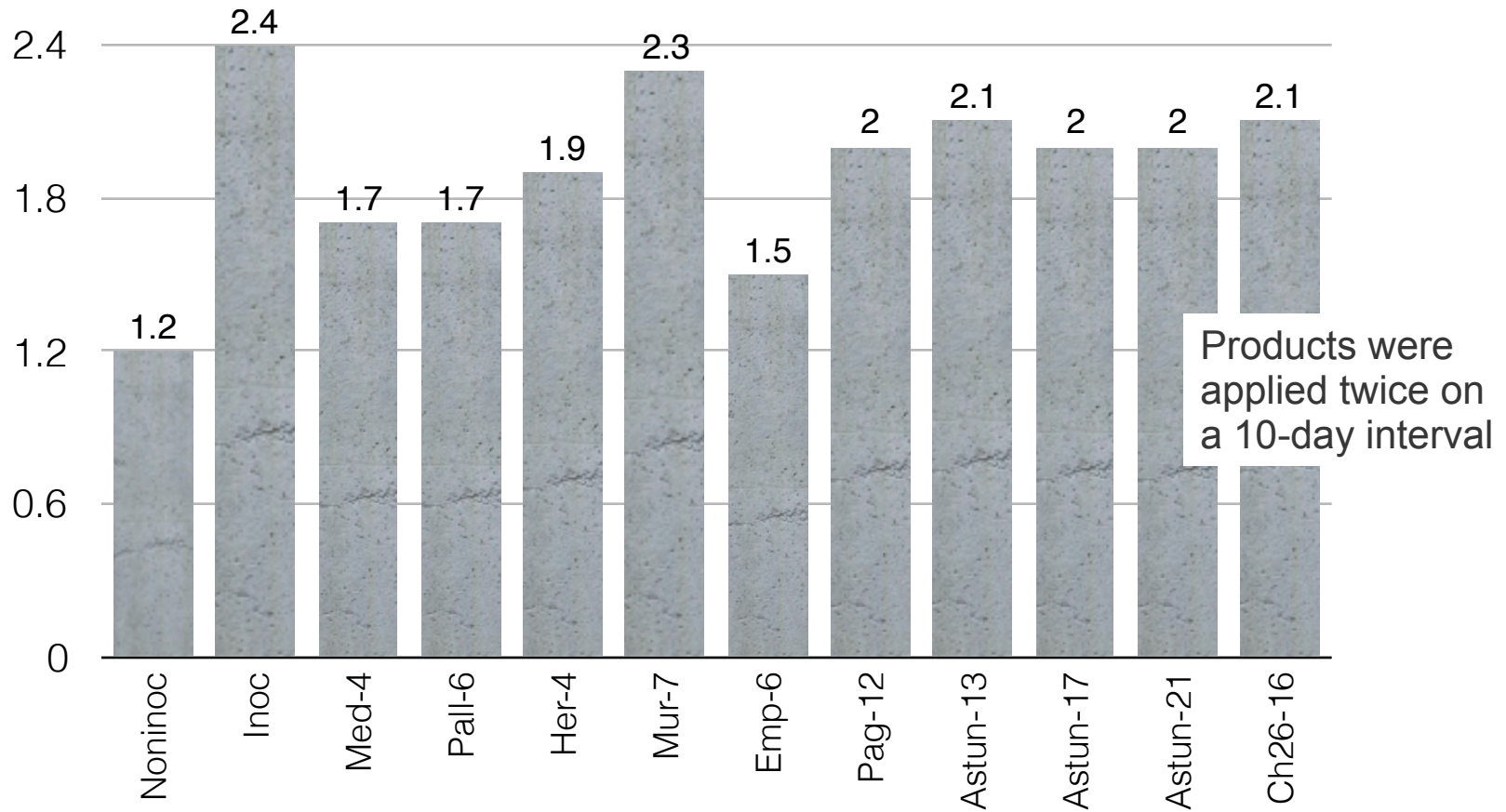


## Botrytis blight on Pansy Flowers

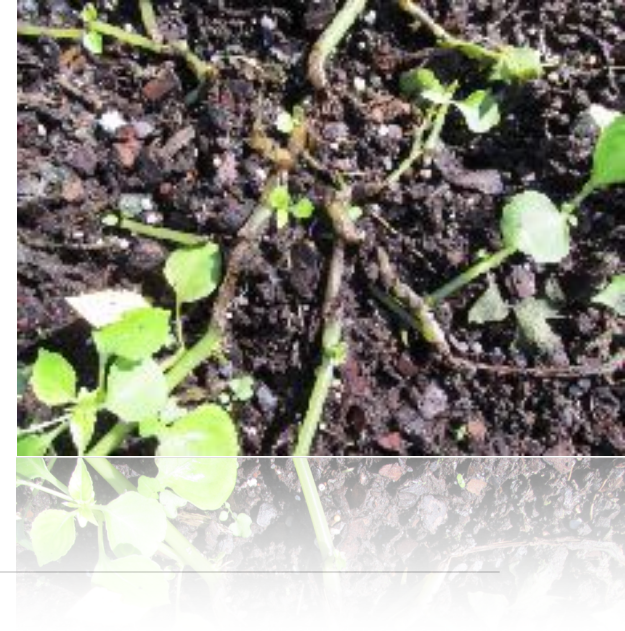




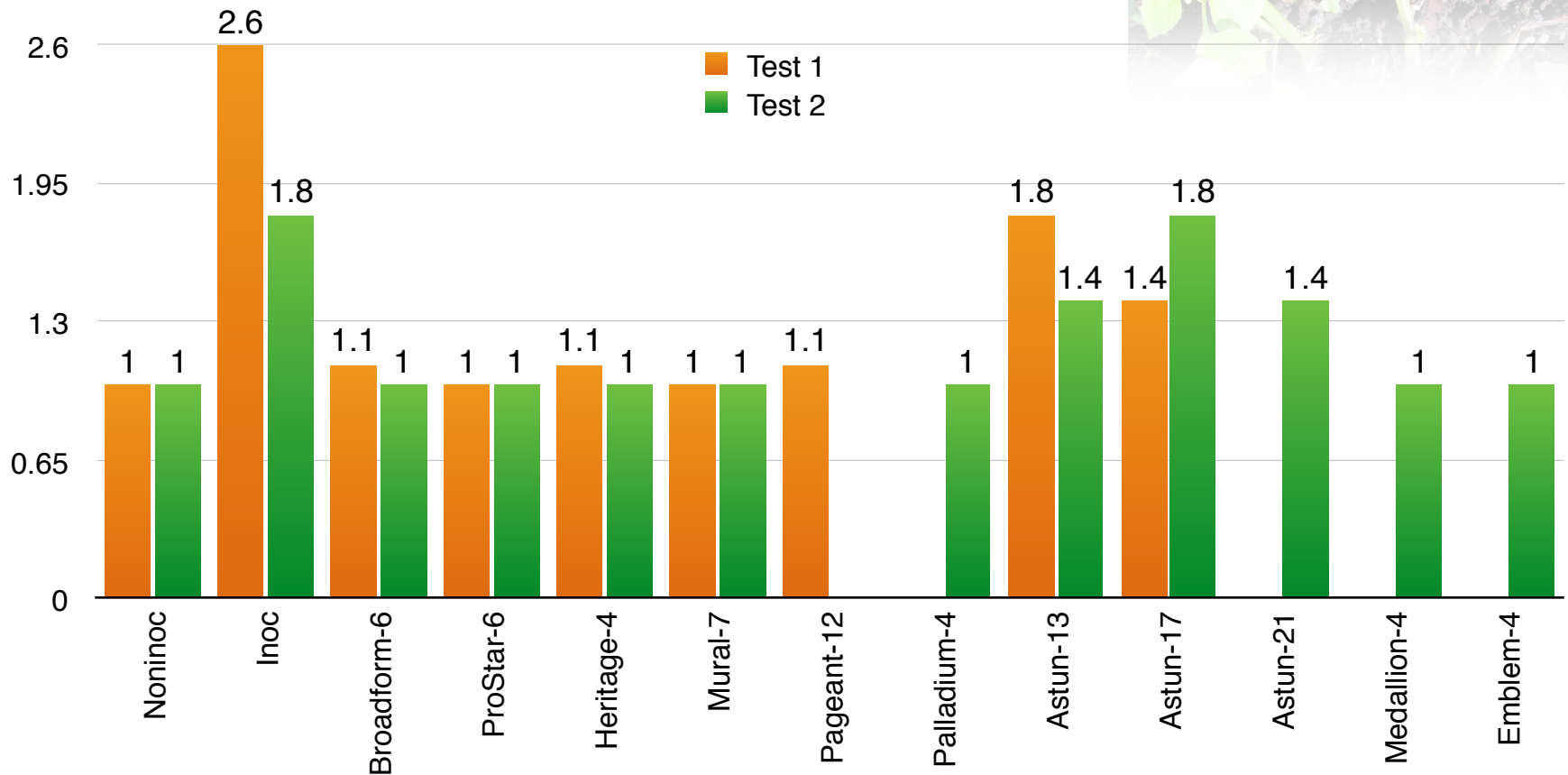
# Fusarium Rot on Holiday Cacti



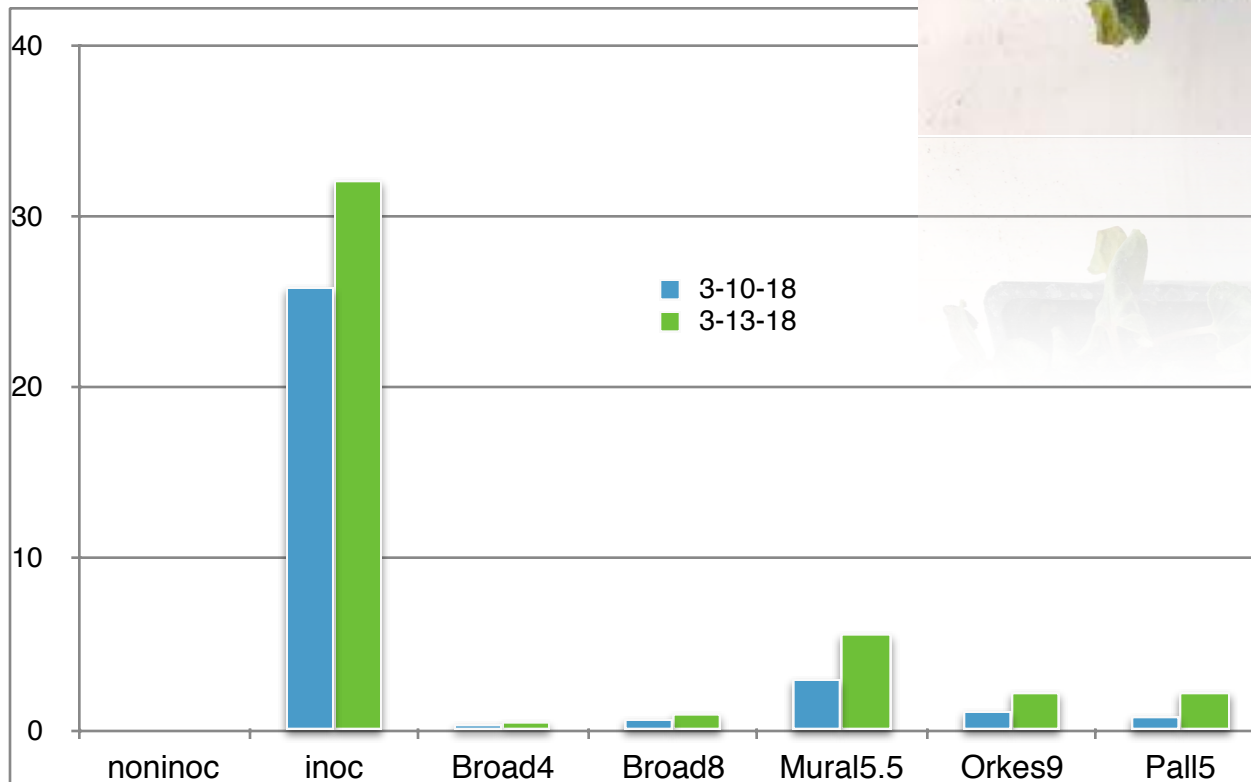




# Rhizoctonia stem rot on Impatiens

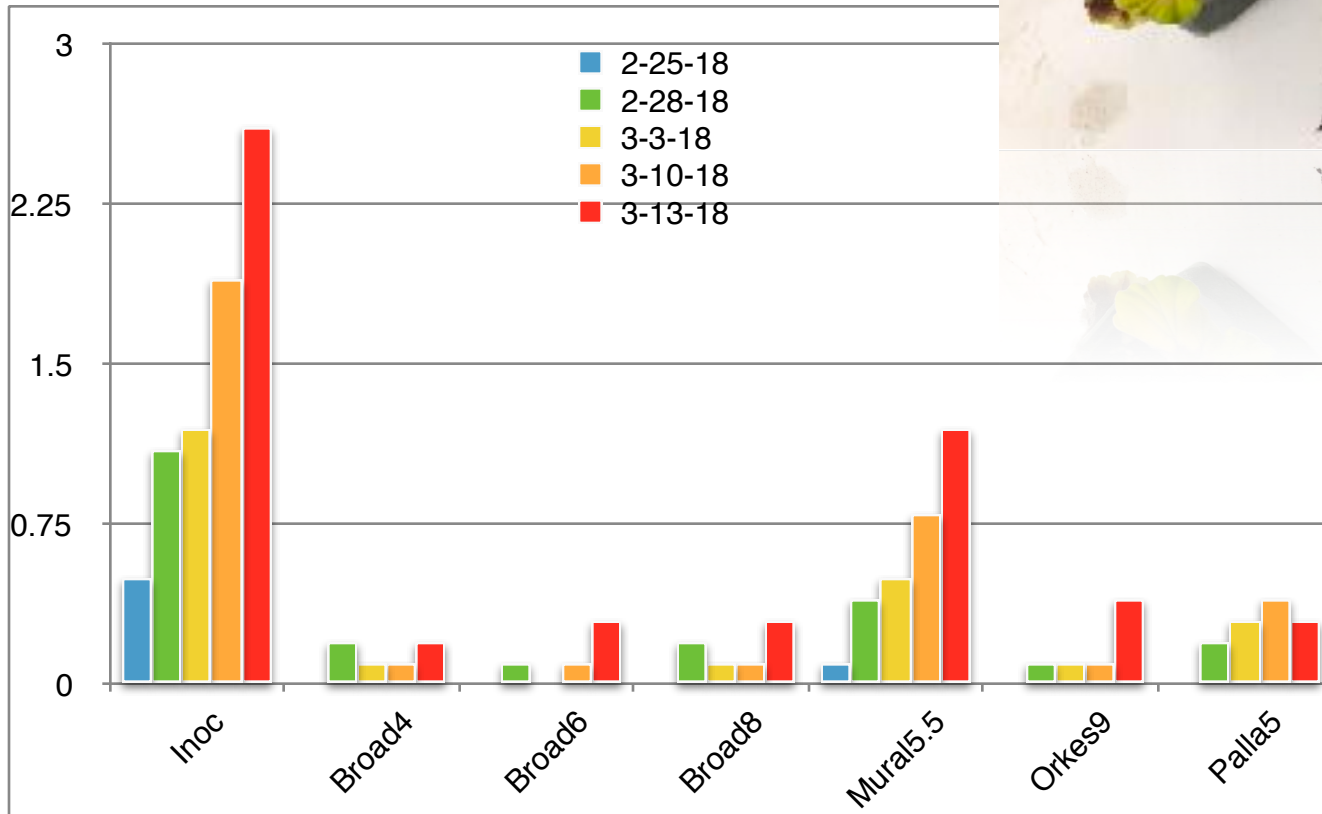


## Anthracnose on Cyclamen



Products were applied twice on a 14-day interval

# Botrytis on Geranium



Products were applied twice on a 14-day interval



# Broadform

- Bayer Environmental Science
- active ingredients - trifloxystrobin (FRAC 11) and fluopyram (FRAC 7)

Pathogen	Plant	Results
Alternaria	parsley	excellent
Botrytis	pansy, geranium	excellent
Botrytis	geranium	some curative, excellent preventative
Cercospora	Bell's of Ireland	excellent
Colletotrichum	cyclamen	very good to excellent
Erysiphe	zinnia	good to excellent
Podosphaera	melon, cherry, pumpkin	very good, very good, excellent
Rhizoctonia	Impatiens	excellent
Sclerotinia	lettuce	some
Septoria	parsley	excellent

# BotryStop

*Ulocladium oudemansii* (strain U3) - alive, saprophytic  
100% preventative ONLY

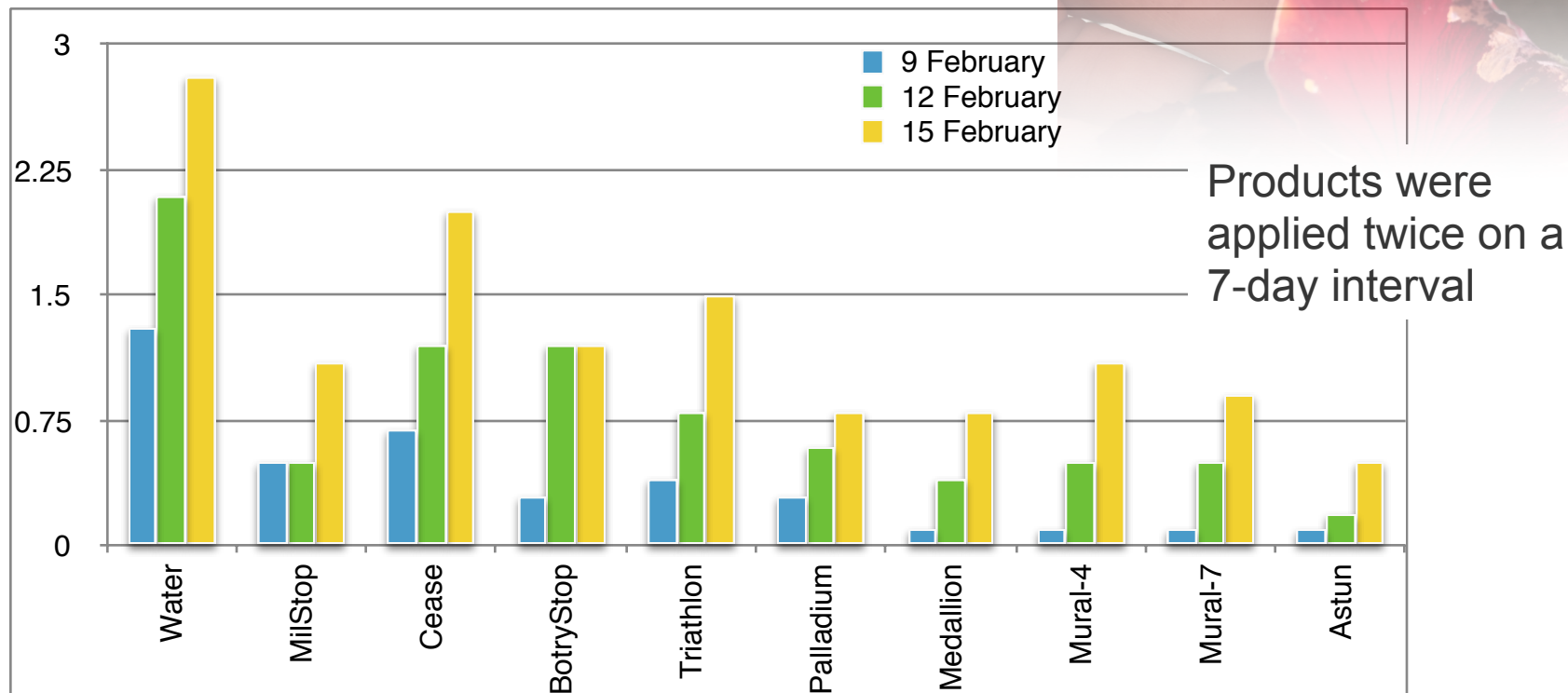
Grows on plant surface (flowers, leaves and even dead plant tissue) and excludes pathogens

- 4-hour REI
- OMRI listed
- Shelf life - 12 months when refrigerated
- Product must be refrigerated or kept below 68F
- Do not freeze
- Spores begin losing viability after 48 hours at 77F or above (above 86F this is rapid)



# BotryStop and Botrytis Blight on Pansy

BLIGHT ON PANSY





# BotryStop Summary

Disease	Crop	Efficacy compared to standard	Overall efficacy
Botrytis	Begonia	equal to Cease but lasted longer	very good
Botrytis	Strawberry	equal to chemical standard rotations	very good
Botrytis	Strawberry	4 lb equal to fludioxonil plus cyprodinil	very good
Botrytis	Ginseng	equal to fludioxonil	very good to excellent
Sclerotinia	Lettuce	equal to standard	some to good
Monilinia	Cherry	2 lb better than iprodione	very good to excellent
Monlinia	Almond	4 lb equal to standard	very good to excellent
Monilinia	Almond	4 lb equal to iprodione	very good to excellent
Monilinia	Apricot	all rates better than iprodione	excellent
Pseudomonas	Mum	copper was very good in this trial	some
Rhizopus	Raspberry	2 lb equal to fenhexamid	good



**EcoSwing™**  
BOTANICAL FUNGICIDE

## **Mode of Action**

EcoSwing's primary mode of action is to act as a contact desiccant and cell wall disruptor to the fungal hyphae.

Preliminary research also suggests that EcoSwing may aid in triggering innate plant responses to help boost plant's natural defense mechanisms against fungal pathogens.

**FRAC Code:** P 05 (Plant Extract, no known resistance)

**Signal word** - CAUTION

## **Features and Benefits**

- 4-hour re-entry interval & 0-day pre-harvest Interval

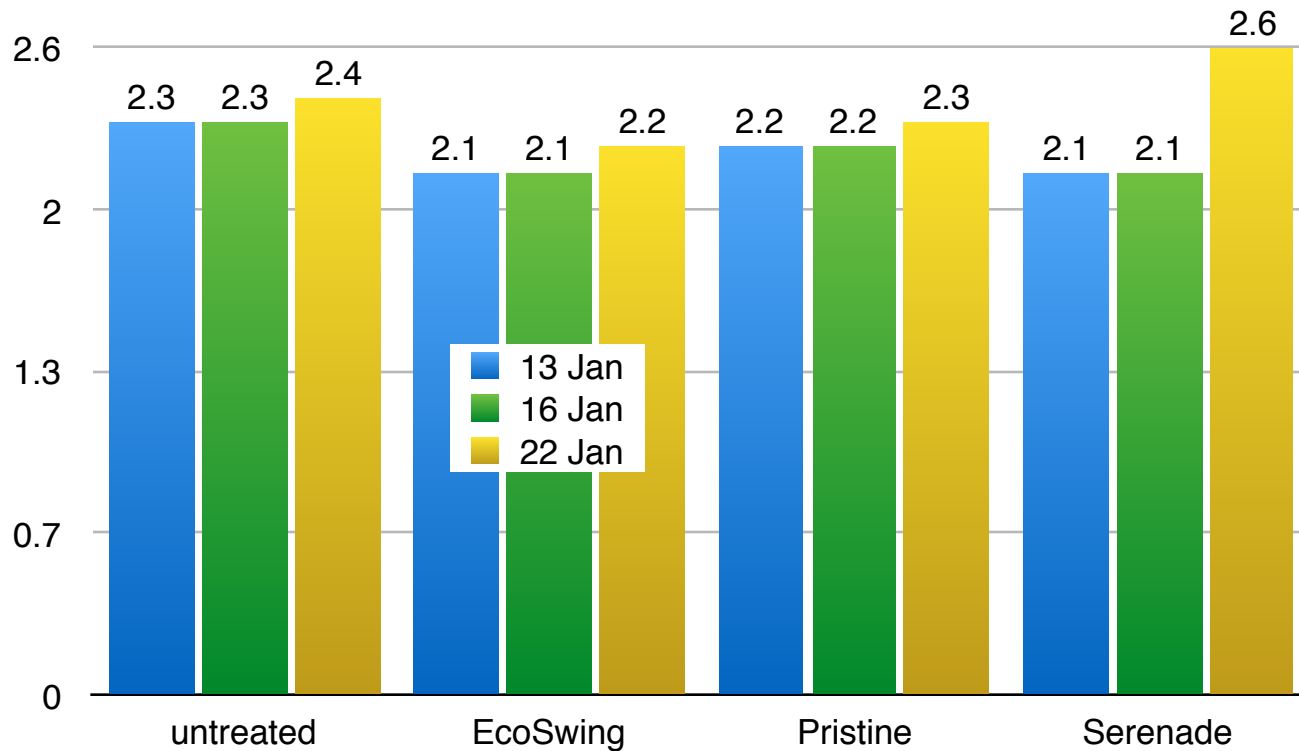


**Powdery Mildew on Zinnia  
 Palmateer, TREC-UF**

Treatment	Rate/volume	Severity
Untreated, non-inoculated	_____	52 a
Untreated, inoculated	_____	55 a
EcoSwing	28 oz/20 gal	22 bc
EcoSwing	28 oz/50 gal	32 ab
EcoSwing	28 oz/100 gal	18 bc
EcoSwing	28 oz/200 gal	37 ab
EcoSwing	28 oz/500 gal	33 ab
Banner MAXX	6.5 oz/100 gal	23 bc
Kleengrow	13 oz/100 gal	12 bc
Orkestra	8 oz/100 gal	0 c



## Eradication of Botrytis Blight on Ranunculus



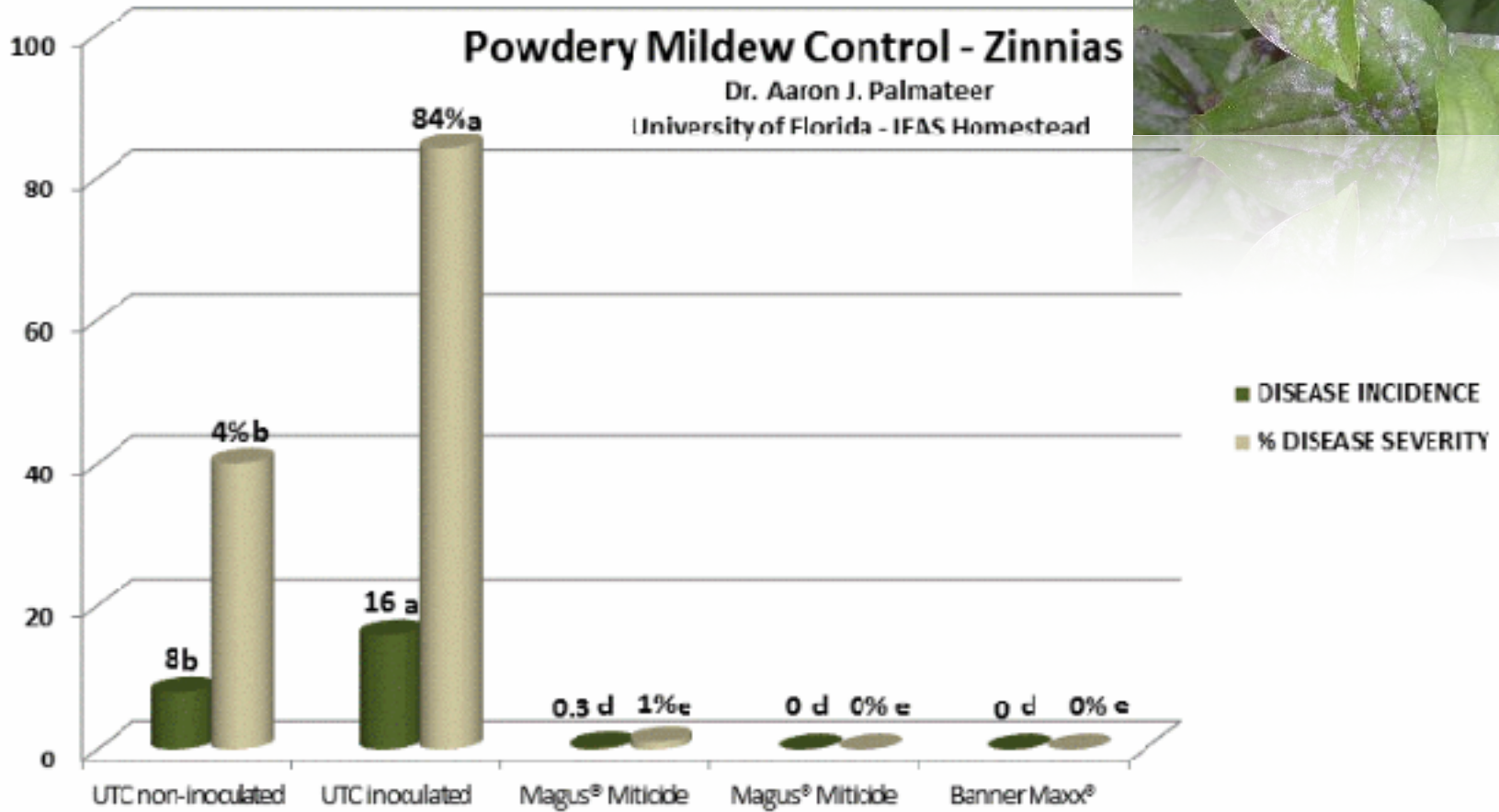
products were applied as sprays  
three times on a four-day interval

# EcoSwing

Pathogen	crop	rate (interval)	efficacy
Erysiphe	zinnia (3 trials)	34 oz (7 day)	excellent
Erysiphe	gerber daisy	34 oz	excellent
Monilinia	almond	24-32 oz	very good
Peronospora	spinach	28 oz (7-10 day)	slight
Podosphaera	strawberry	24 oz	some
Rust	almond	24-32 oz	excellent
Sphaerotheca	squash	32 oz	some
Wilsonomyces	almond	32 oz	excellent

# Magus

- Magus miticide is an IRAC group 21 and contains fenazaquin.
- It has an REI of 12 hours
- Magus is labeled for mites (tetranychid, eriophyid, and other key mite pests) and whiteflies.
- The use rate is 12 to 24 oz/acre (100 gal).
- FIFRA 2(ee) RECOMMENDATION FOR DISTRIBUTION AND USE ONLY WITHIN THE STATE OF CALIFORNIA





## Powdery Mildew on Coreopsis Uber, CA

Effect of fungicide on powder mildew severity on Coreopsis  
(DAT=days after treatment)

Treatment	Rate/100 gal	7 DAT	14 DAT	21 DAT
Untreated		5.9 a	6.8 a	5.8 a
Magus	12 oz	1.4 b	1.2 b	1.3 b
Magus	16 oz	1.5 b	1.5 b	1.4 b
Magus	20 oz	1.6 b	1.3 b	1.4 b
Pageant Intrinsic	8 oz	2.3 b	1.9 b	2.4 b

Numbers in the same column followed by the same letter are not statistically different.





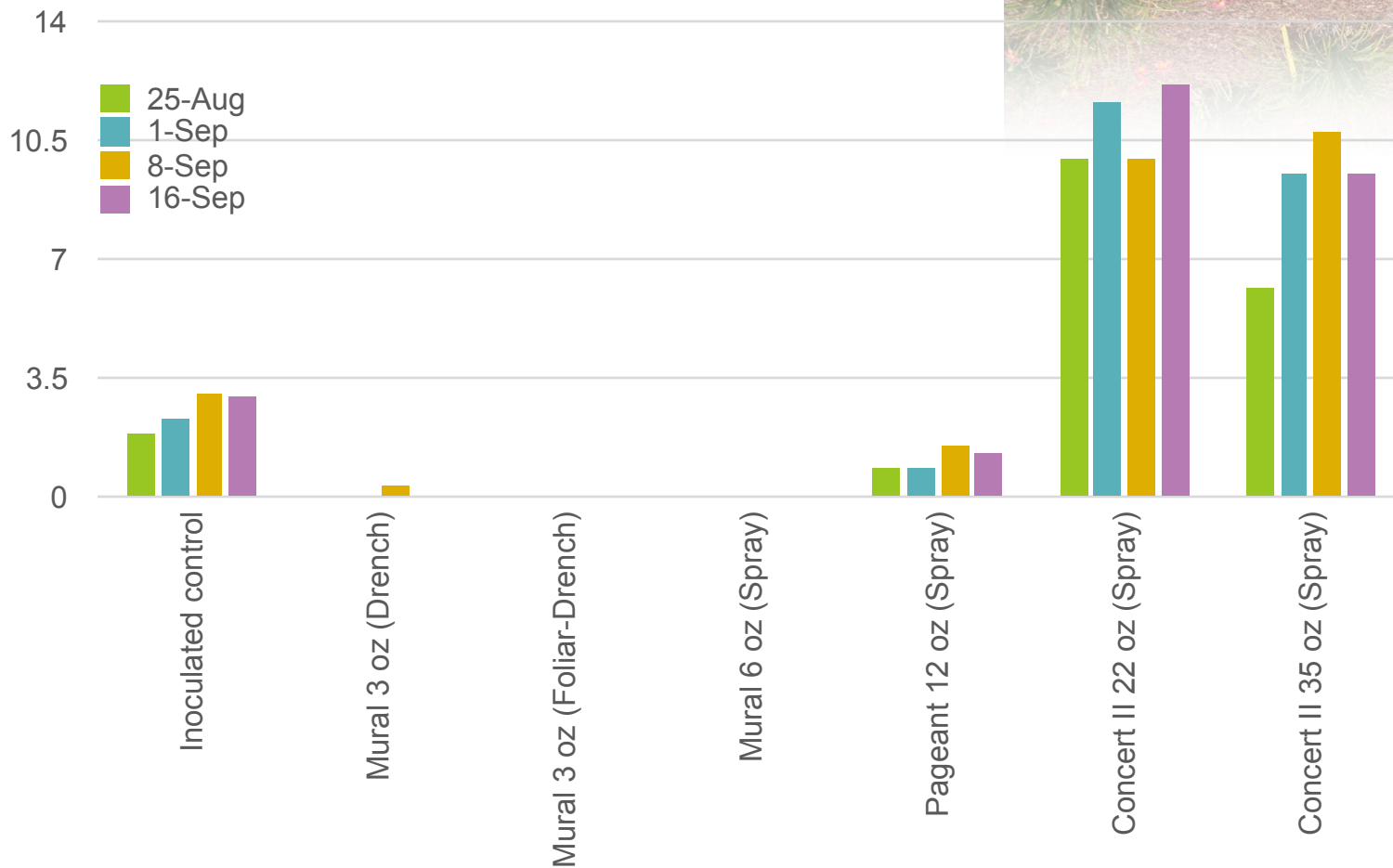
- Combination of azoxystrobin (the ai in Heritage, FRAC 11) and a new carboxamide-solatenol (same FRAC group as boscalid, FRAC 7).
- CAUTION - signal word.
- 12 hour REI

## Boxwood Blight - *Cylindrocladium* Baudoin, VPI



Treatment	Rate/100 gal	% severity
Noninoculated	————	98 a
Inoculated	————	94 a
Mural 45WG	4 oz	55 bc
Mural 45WG	7 oz	46 cd
Pageant 38 WG	14 oz	21 d
3336 50WP	16 oz	84 ab
Palladium 62.5WG	6 oz	82 ab
Daconil WeatherStik	22 fl oz	18 d

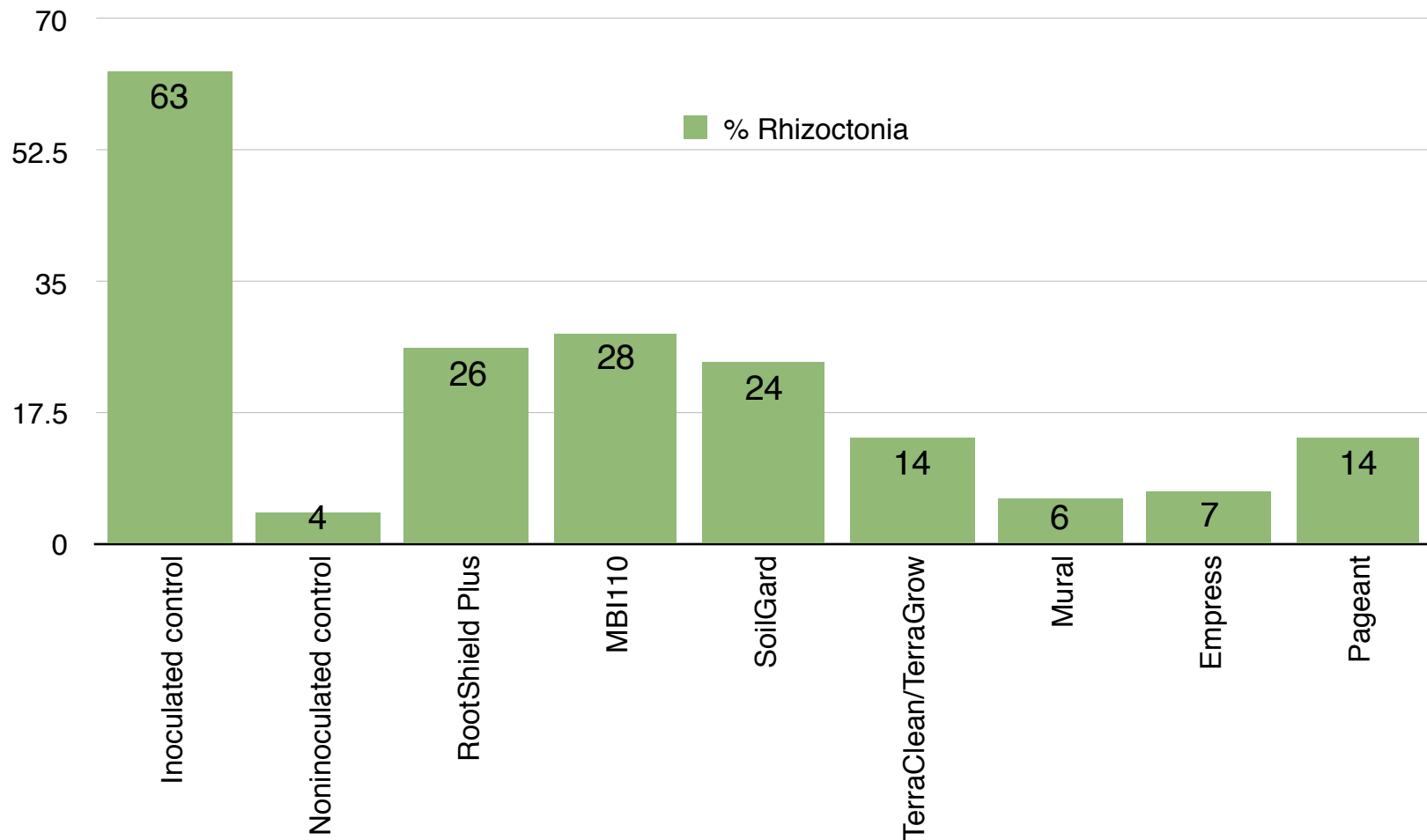
# Fungicides on Daylily Rust Buck, UGA







## Rhizoctonia Root Rot on Viburnum Baysal-Gurel, UT



# Mural Summary Foliar Diseases

Pathogen	Disease	plant	results
<i>Botrytis cinerea</i>	Gray mold	zinnia, geranium, peony	good to very good
<i>Botrytis elliptica</i>	Fire	Lilium	excellent
<i>Colletotrichum</i>	Anthracnose	impatiens, dieffenbachia, sansevieria	some to excellent
<i>Cylindrocladium</i>	Boxblight	Buxus, spathiphyllum	very good
<i>Corynespora</i>	Target spot	hydrangea	excellent
<i>Oidium</i>	Powdery mildew	verbena	excellent
<i>Podosphaera</i>	Powdery mildew	petunia	excellent
<i>Microsphaera</i>	Powdery mildew	lilac	excellent
<i>Helminthosporium (Drechslera)</i>	Helminthosporium leaf spot	Calathea	excellent
<i>Myrothecium</i>	Myrothecium leaf spot	Spathiphyllum	excellent
<i>Peronospora</i>	Downy mildew	rose	very good
<i>Coleosporium</i>	Rust	plumeria, annual vinca, goldenrod	excellent
<i>Puccinia</i>	Rust	switchgrass	very good to excellent
<i>Sclerotinia</i>	white mold	zinnia	some



- Combination of pyraclostrobin (FRAC 11) and fluxapyroxad (FRAC 7).
- The REI 12 hours
- WARNING signal word.



## Cercospora leaf spot on Ligustrum Palmateer, TREC-UF

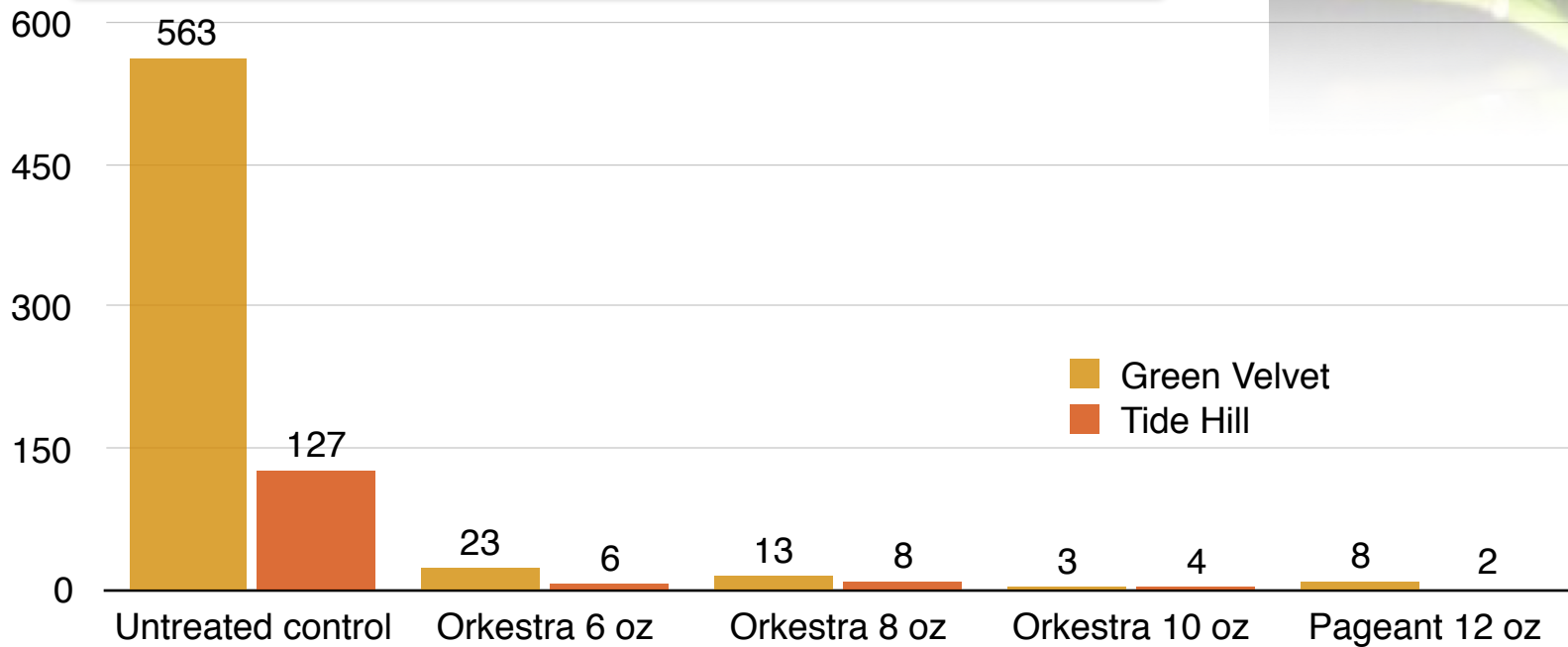
Treatment	Rate/100 gal	Disease Incidence	% Disease Severity
Non-inoculated control	---	13 a	73 a
Inoculated control	---	12 a	75 a
Orkestra Intrinsic	6 oz	9 ab	35 b
Orkestra Intrinsic	8 oz	3 cd	7 c
Orkestra Intrinsic	10 oz	1 d	3 c
Pageant Intrinsic	12 oz	1 d	3 c

Fungicide treatments were applied on a 14-day schedule with a total of three applications on 7/24, 8/7 and 8/21.

Plants were inoculated on 7/25.

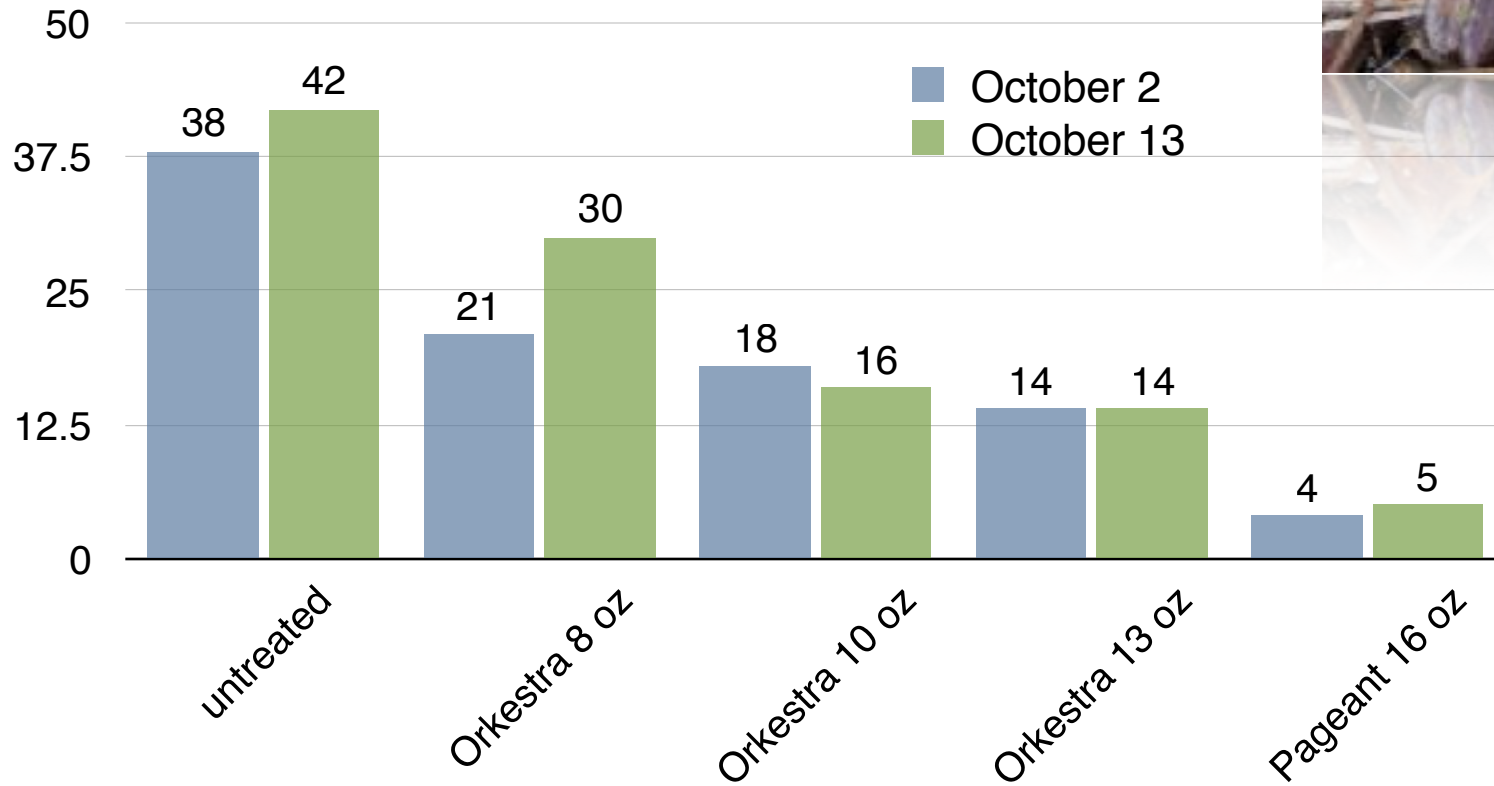


## Boxblight leaf spot on Boxwood LaMondia, CT Ag Expt Stn

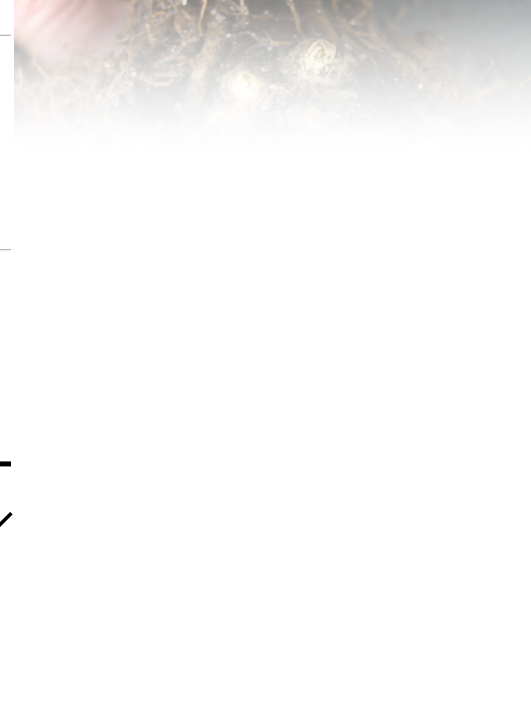
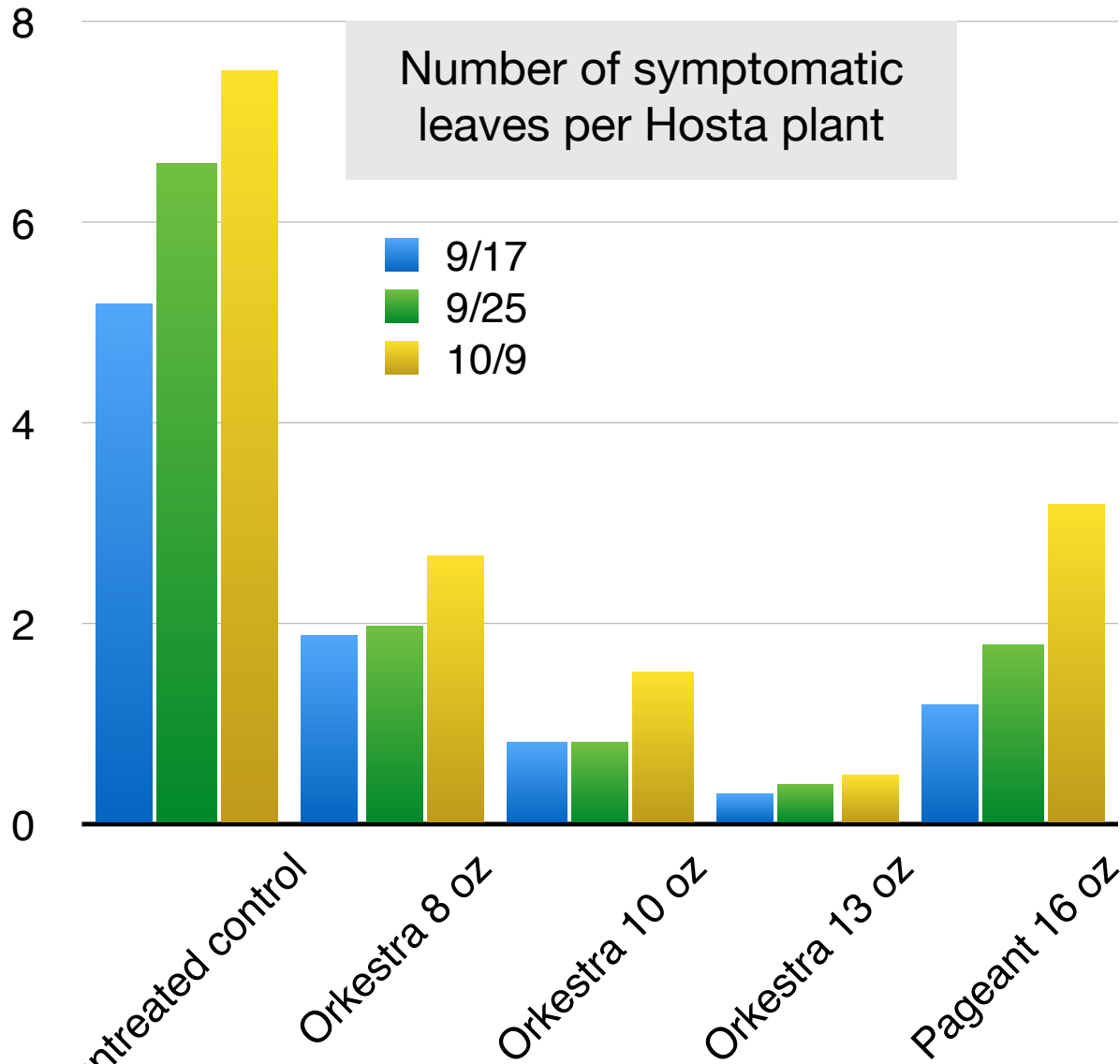


Fungicides were applied three times on approximately a 21 day interval.

# Southern Blight Control on Hosta Buck, UGA



# Fusarium Crown Rot on Hosta Buck, UGA



# Orkestra Intrinsic Summary

Pathogen	Disease	plant	labeled rate/100 gal	results
<i>Alternaria</i>	Alternaria leaf spot	coneflower, impatiens	4-6 oz	excellent
<i>Botrytis cinerea</i>	Gray mold	rose, peony, geranium	8 oz	some-excellent
<i>Botrytis elliptica</i>	Fire	Lilium	8 oz	excellent
<i>Botrytis tulipae</i>	Fire	tulip, tulip	8 oz	excellent
<i>Cercospora</i>	Cercospora leaf spot	ligustrum, mollucella	8-10 oz	excellent
<i>Coleosporium</i>	Rust	frangipani	4-11 oz	excellent
<i>Colletotrichum</i>	Anthracnose	sansevieria	8-10 oz	excellent
<i>Cylindrocladium</i>	Root and crown rot	Spathiphyllum	8-10 oz	very good
<i>Golovinomyces</i>	Powdery mildew	zinnia, zinnia	6-8 oz	excellent
<i>Microsphaera</i>	Powdery mildew	lilac	6-8 oz	excellent
<i>Helminthosporium</i>	Helminthosporium leaf spot	Calathea	8-10 oz	some
<i>Myrothecium</i>	Myrothecium leaf spot	dieffenbachia	8-10 oz	very good
<i>Peronospora</i>	Downy mildew	coleus	8-10 oz	excellent
<i>Plasmopara</i>	Downy mildew	impatiens	10 oz	excellent
<i>Uredo</i>	Rust	Flax lily	6-8 oz	excellent
<i>Sclerotium</i>	southern blight	hosta	8-10 oz	good





- The active ingredient is oxathiapiprolin - new FRAC 49.
- Segovis is effective on Phytophthora and downy mildew disease.
- The REI 4 hours.
- WARNING caution word

**Phytophthora foliar blight on Ivy**  
 Norman, TREC-UF

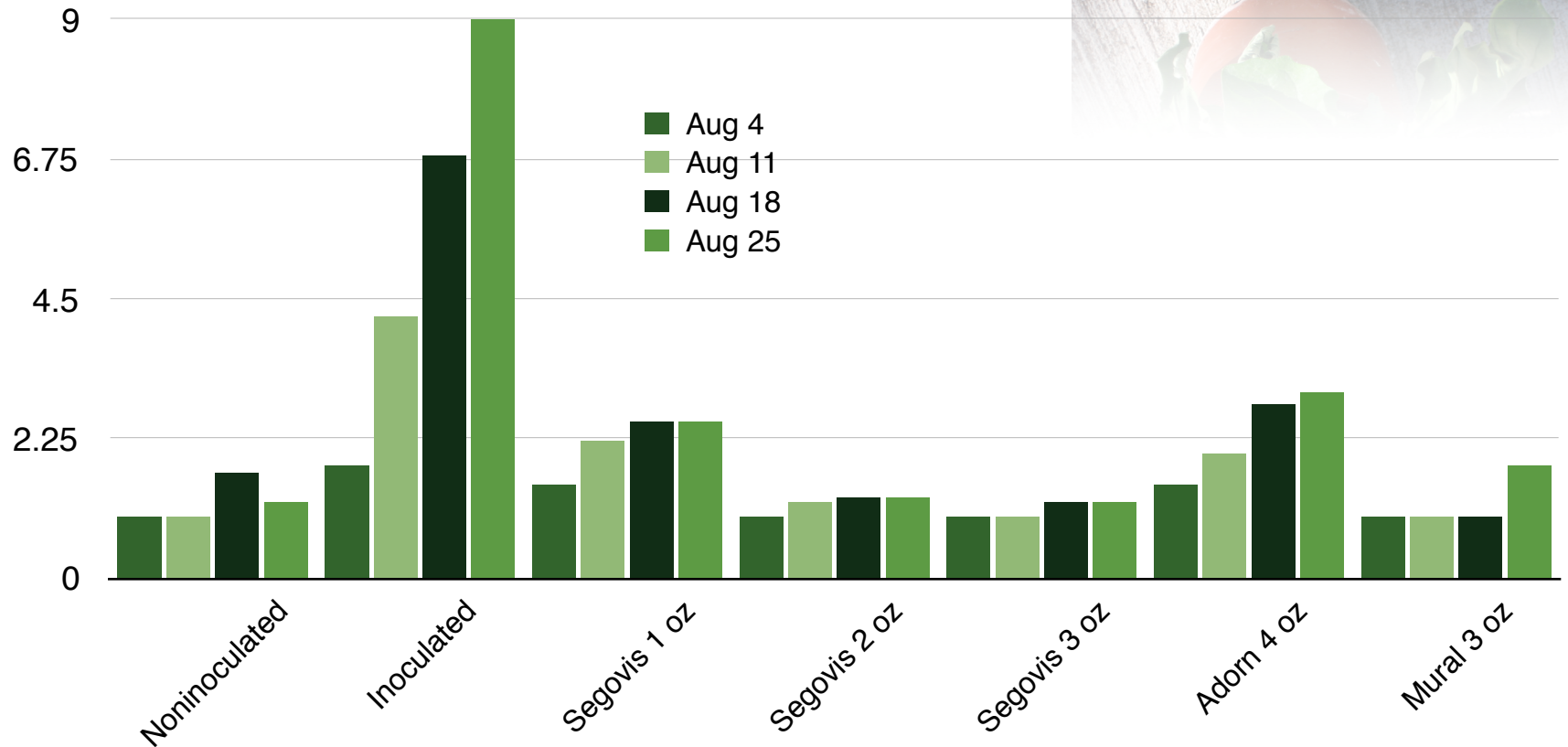


Treatment	rate/100 gal	% damaged foliage
Noninoculated control	—	0
Inoculated control	—	66
Segovis	1 oz	0
Segovis	2 oz	0
Segovis	3 oz	0
Subdue MAXX	1 oz	88
Micora	8 oz	0



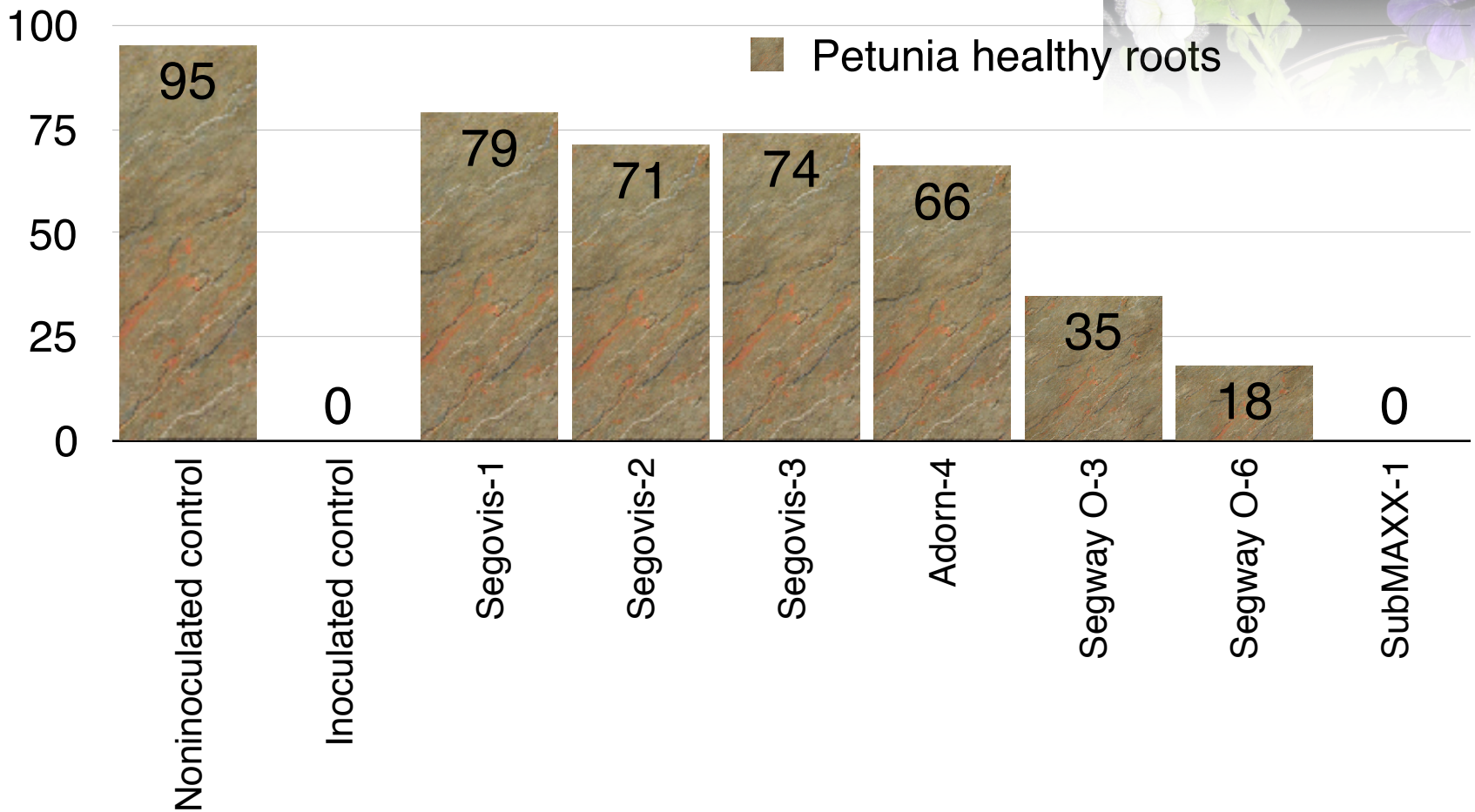
# Gerber daisy - Phytophthora crown rot

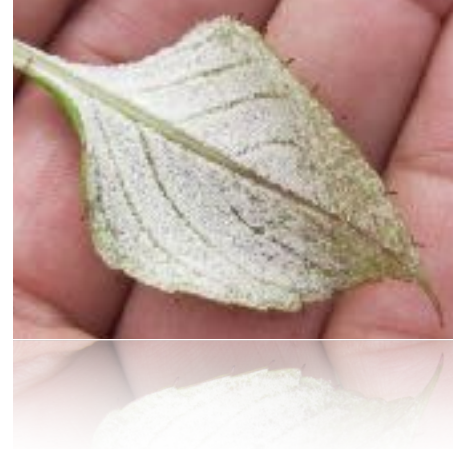
Peduto-Hand, OSU



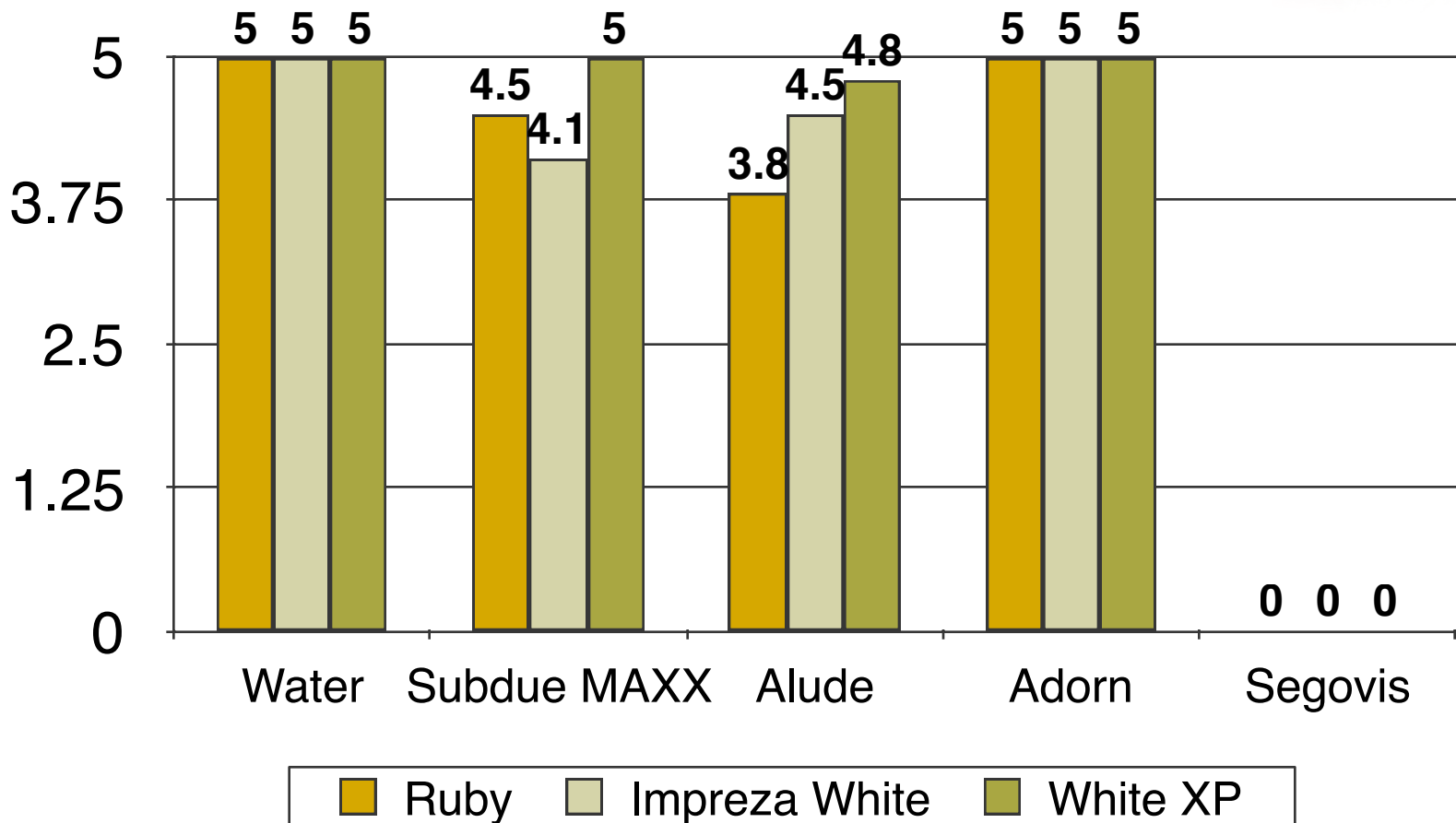
# Phytophthora root rot on Petunia

Jeffers, Clemson





Effect of fungicides on Impatiens downy mildew - one month after final application - Suarez, TREC-UF





# Segovis Summary

Pathogen	plant	result
<b>Phytophthora capsici</b>	watermelon	very good
<b>Phytophthora cryptogea</b>	gerbera daisy gerbera daisy	very good very good-excellent
<b>Phytophthora nicotianae</b>	vinca, petunia	very good to excellent
<b>Phytophthora tropicalis</b>	Hedera	excellent
<b>Hyaloperonospora parasitica</b>	kale	good-excellent
<b>Peronospora behlbarii</b>	basil (4 trials)	excellent at highest rate, very good, good, excellent
<b>Plasmopara obducens</b>	impatiens (2 trials)	excellent, excellent



- **MOA unknown - complex - lipoproteins that destroy cell membranes, colonization of leaf and root spaces crowing out the pathogens and SAR.**
- **REI 4 hr**
- **Organic**



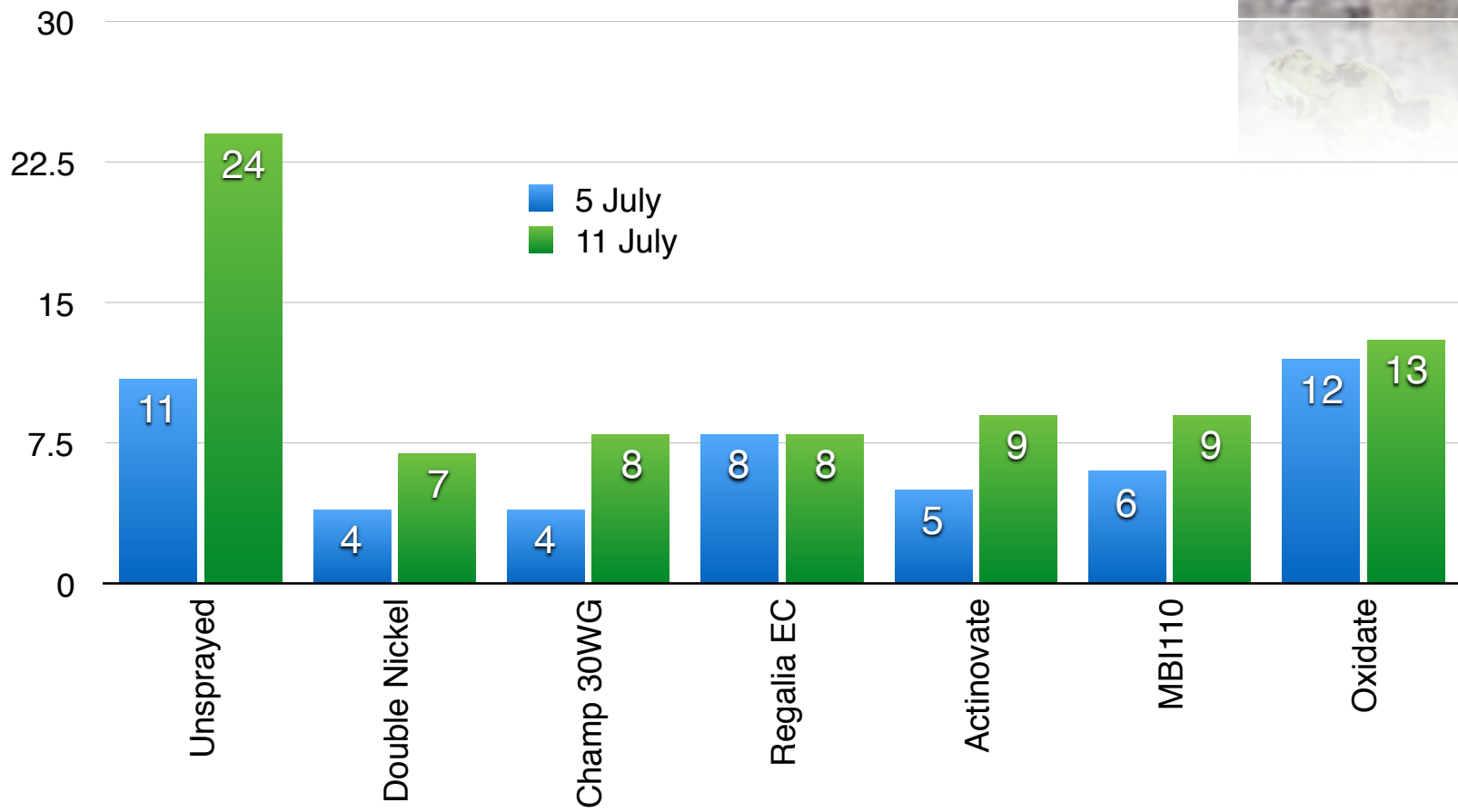
# Xanthomonas blight on geranium

## Norman, MREC-UF

Treatment	Active ingredient	Rate/100 gal	# leaf spots
Noninoculated control	— — —	— — —	0 a
Inoculated control	— — —	— — —	88 f
Triathlon BA	<i>Bacillus amyloliquifaciens</i>	6 quarts	32 bcde
GreenClean Pro	Sodium carbonate peroxyhydrate	50 oz	38 cde
GreenClean Pro	Sodium carbonate peroxyhydrate	150 oz	27 bcd
ZeroTol	hydrogen dioxide and peroxyacetate	2 gal	42 de
OxiPhos	phosphonate	42 oz	49 e
OxiPhos	phosphonate	128 oz	35 cde
CuPro	copper hydroxide	2 lb	17 abc



## Control of Bacterial Speck on Tomato Severity (% infection) Cornell



# Triathlon BA Summary

Disease target	plants	results
<b>alternaria</b>	tomato, cabbage, collards, cole crops	some, none, good, none, none
<b>blue mold</b>	tobacco	some
<b>botrytis</b>	grape, tomato, blueberry, strawberry	excellent, very good, good, very good, good
<b>clavibacter (canker)</b>	tomato	some, none
<b>cylindrocladium</b>	spathiphyllum	very good
<b>downy mildew</b>	grape, basil, cucumber	some, none, slight, none, none, slight
<b>fireblight</b>	apple	none, good
<b>fusarium</b>	New Guinea impatiens, tomato	some-good, none
<b>monilinia</b>	blueberry	excellent, excellent
<b>passalora</b>	tomato	some
<b>phomopsis</b>	strawberry	excellent
<b>powdery mildew</b>	squash, grape	some, very good
<b>pseudomonas</b>	lilac, tomato	good, good
<b>rhizoctonia</b>	bean, cotton, spinach	none, good, very good, very good, some
<b>rust</b>	quince, cedar apple	excellent, none, none
<b>sclerotium</b>	tomato	some
<b>xanthomonas</b>	cabbage, tomato, citrus, ficus, strawberry, geranium	excellent, very good, very good, good, excellent, very good



# 2018 Guide to Ornamental Fungicides

The information presented is the result of research trials published in the US (many by Chase Agricultural Consulting, LLC). The product label will dictate specific instructions on use and rates for all applications. The label presents what is required by law.

FOLIAR DISEASES																								
Product	FRAC Code	REI hours	Alternaria	Bacteria	Black Spot	Bipolaris Drechslera	Botryosphaeria	Botrytis	Ceratocystis	Cercospora	Colletotrichum (Anthracnose)	Coniothyrium	Corynespora	Cylindrocladum (leaf spot)	Downy Mildew	Entomosporium	Gloecladium (stem rot)	Myrothecium	Phyllosticta	Phytophthora (aerial blight)	Powdery Mildew	Rhizoctonia	Rust	Sphaeolum (scab)
26/36 <sup>®</sup> fungicide	1 and 2	12						some/exc		vgood	good											excellent		
Actinovate <sup>®</sup>	nc	1	none	none/some				none			none/some			some	none/some						none/some		none/some	
Adom <sup>®</sup>	43	12													vgood/exc					vgood/exc				
Affirm™ WDG	19	4						some/good			poor/good			excellent										
Allette <sup>®</sup> WDG	33	12	none	fair				some							excellent					vgood/exc	poor/some			
Alude™	33	4		poor											excellent					vgood/exc	vgood			
Astun™	7	12						vgood/exc														some		
<b>BannerMaxx</b> <sup>®</sup>	3	12	fair/vgood		some		good/vgood		poor	good/vgood	some/good		none/good			vgood/exc		good	some/good			vgood/exc	good/exc	
BotryStop™	nc	4						vgood/exc																
Camelot™ O	M1	4	good	good				none/fair			good		vgood	some	poor/vgood					poor/good	poor/vgood		poor/good	vgood/exc
Cease <sup>®</sup>	nc	4	none/good	vgood/some	poor			some/good		some/exc	none/good		none		none/vgood						good/vgood			
Cleary 3336 <sup>®</sup> , OHP-6672 <sup>®</sup>	1	12	none/poor		some			poor/some	good	some/exc	some/exc			good/exc		some/vgood		poor/vgood	none	none	poor/vgood	good/exc	vgood/exc	vgood
Compass <sup>®</sup> O 50WDG	11	12	good/exc		good			poor	poor	some/exc	none	vgood		vgood/exc	good/vgood	some/good	vgood/exc	some/good	none	none/vgood	vgood/exc	good	fair/exc	excellent
<b>ConcertII</b> <sup>®</sup>	3 and M5	12			good			some/good		excellent	vgood/exc		vgood		excellent						excellent			good
CuPRO™ 5000/kocide <sup>®</sup> TNO	M1	48		good				fair		some				some	poor/vgood							some	none	
<b>DaconilULTREX</b> <sup>®</sup>	M5	12	vgood/exc		vgood/exc	vgood/exc		vgood/exc		vgood/exc	some/exc	vgood			some	vgood/exc	good/vgood	vgood/exc	good	none/vgood		excellent	some	
<b>DaconilWeatherstik</b> <sup>®</sup>	17	12	fair					vgood/exc						fair	none						fair/vgood		fair/good	
Dithane <sup>®</sup> Rainshield <sup>®</sup> 75DF	M3	24	vgood/good	none/vgood		vgood/exc		good/exc			vgood				good/vgood						some	poor/fair	vgood/exc	
Eagle <sup>®</sup> 20EW	3	24	good/exc		vgood/exc				poor	vgood/exc	none/vgood					vgood/exc		some/good	vgood/exc			vgood/exc	vgood/exc	vgood/exc
Emblem <sup>®</sup>	12	12	good			excellent		vgood/exc			some													
FenStop <sup>®</sup>	11	12													vgood/exc					vgood/exc				
Fosphite <sup>®</sup>	33	4	none												good					vgood/exc	some/vgood			
<b>Heritage</b> <sup>®</sup>	11	4	vgood/exc			vgood/exc	good/vgood	fair/good	poor	vgood/exc	none/exc	some	vgood/exc	vgood	vgood/exc	vgood	good/exc	vgood/exc	none/good	vgood	vgood/exc	vgood/exc	excellent	vgood/exc
Junction <sup>®</sup>	M1 and M3	24	good	good				fair							none/vgood			none			fair/vgood		good	vgood
KleenGrow™	nc	48	vgood/exc	vgood/exc				good/vgood		vgood/exc	none			some	good/vgood						some/vgood			
<b>Medallion WDG</b> <sup>®</sup>	12	12	excellent		none	vgood/exc	good/vgood	vgood/exc		some/exc	none/good	good		vgood/exc	none	none	vgood/exc	vgood/exc	some/vgood	none	none			
<b>Micora</b> <sup>®</sup>	40	4													vgood/exc					vgood/exc				
MilStop <sup>®</sup>	nc	1	none/good	none/some				some/exc		vgood/exc	poor/good		none/some		some/exc	none					vgood/exc		some/vgood	some
<b>Mural</b> <sup>®</sup>	7 and 11	12	vgood/exc			good/exc		good/exc		vgood	excellent		excellent	vgood/exc	vgood			excellent	vgood/exc		excellent			
OHP Chipco <sup>®</sup> 26019 N/G	2	12	vgood/exc			some	good	excellent		some	none/some	good		good/vgood			good	vgood						
Orkestra™ Intrinsic <sup>®</sup>	7 and 11	12	excellent		some/good	some		vgood/exc		vgood/exc	excellent			vgood/exc						vgood				excellent
Orvego <sup>®</sup>	40 and 45	12													vgood/exc									
Pigant™ Intrinsic <sup>®</sup>	7 and 11	12	vgood/exc		good/vgood	good/vgood	vgood/exc	vgood/exc	vgood	vgood	vgood/exc	good/exc		vgood/exc	vgood/exc	good/exc		some/exc	excellent		vgood/exc	vgood/exc	good/exc	
<b>Palladium</b> <sup>®</sup>	9 and 12	12	vgood/exc					vgood		good	poor/exc		some	good/exc		poor		vgood/exc			good	excellent	none	





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