



Cornell Cooperative Extension Vegetable Program

New York Update: Featuring Managing Stemphylium Leaf Blight in Onion with Fungicides

Christy Hoepting

Cornell Cooperative Extension Vegetable Program

Empire Expo, Syracuse, NY: January 20, 2016



Acknowledgements

**Funding for this project was
provided by:**

- Bayer Crop Protection
- BASF
- DuPont
- Syngenta

Grower Cooperator:

- Chuck Barie & Emma Long,
CY Farms, Elba, NY

CVP Program Assistants:

- Elizabeth Buck & Missy Call



Introduction: Stemphylium Leaf Blight in New York

- Caused by *Stemphylium vesicarium*



↑
Tan and black lesions ➡



Introduction: Stemphylium Leaf Blight in New York

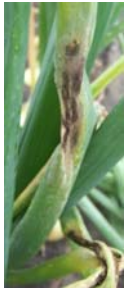


onion "dying standing up"



Introduction: Stemphylium Leaf Blight in New York

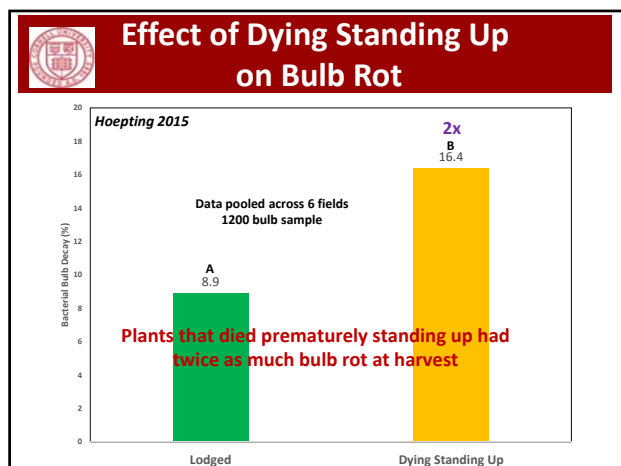
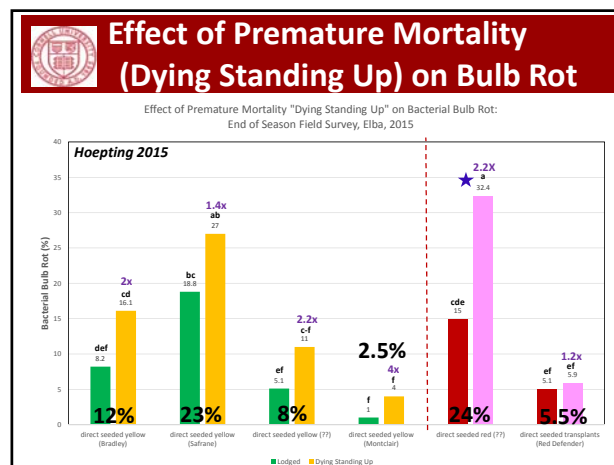
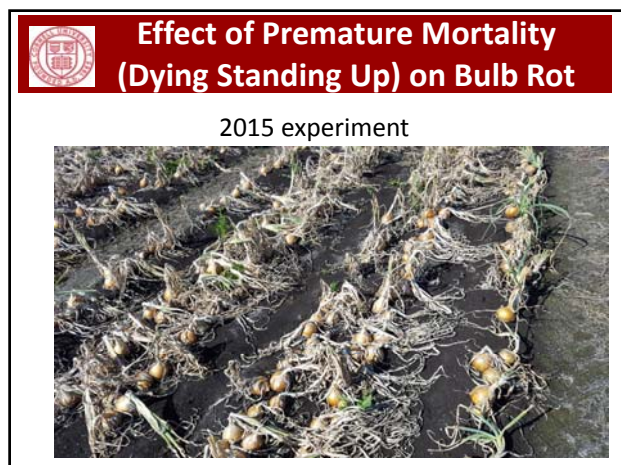
- SLB is a secondary invader of downy mildew which ultimately becomes a very aggressive leaf defoliator



Introduction: Stemphylium Leaf Blight in New York

Severe downy mildew- Stemphylium leaf blight epidemic, 2015





Objectives

- To evaluate different fungicides and chemical classes for their efficacy against *Stemphylium* leaf blight (SLB).
 - FRAC Group 3, 7, 9, 11, 12, 22, 29 and M3
 - Quadris vs. Quadris Top
 - Inspire Super vs. Inspire
 - Pristine vs. Cabrio and Endura
- To optimize Scala for control of SLB.

Additional Thoughts

Treatments

Tradename & Rate/Acre	Active Ingredient	FRAC group
Scala 18 fl oz	pyrimethanil	9
Quadris 12 fl oz	azoxystrobin	11
Quadris Top 14 fl oz	azoxystrobin + difenoconazole	11 3
Pristine 18.5 oz	Pyraclostrobin + boscalid	11 7
Cabrio 12 oz	pyraclostrobin	11
Endura 6.8 oz	boscalid	7

All treatments applied with Induce 0.125% v/v

Treatments

Tradename & Rate/Acre	Active Ingredient	FRAC group
Inspire Super 20 fl oz	Cyprodinil + difenoconazole	9 3
Inspire 7 fl oz	difenoconazole	3
Merivon 9 fl oz	pyraclostrobin + fluapyroxad	11 7
Tilt 8 fl oz	propiconazole	3
Switch 14 fl oz	Cyprodinil + fludioxonil	9 12
Omega 1 pt	fluazinam	29

All treatments applied with Induce 0.125% v/v

Treatments		
Tradename & Rate/acre	Active Ingredient	FRAC group
Gavel 2 lb	Zoxamide + mancozeb	22 M3
Pipeline products:		
Luna Tranquility 16 fl oz (no Induce)	Fluopyram + pyrimethanil	7 9
Fontelis 1.5 pt	penthiopyrad	7
Untreated checks:		
DM & OT sprays	Phosphorus acid Radiant/Agri-Mek	33
No pesticides		

All treatments applied with Induce 0.125% v/v

Methods

- Commercial onion field, Elba, NY
- Pungent yellow direct seeded onion, cv. Gunisen
- RCBD with 18 treatments & 5 replications



Methods

- Weekly applications commencing at first sign of SLB
 - Jul-18, 24, Aug-1, 8, 13 (~50% lodging)
- CO₂ backpack sprayer; Teejet 8005 VS; 40 gpa; 31-38 psi



Methods: Data Collection

Aug-6 & 20:

- 6 randomly selected plants per plot
 - No. SLB lesions per plant
 - % leaf dieback

Aug-20 & 30:

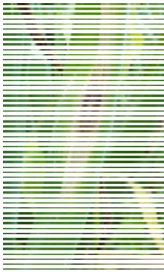
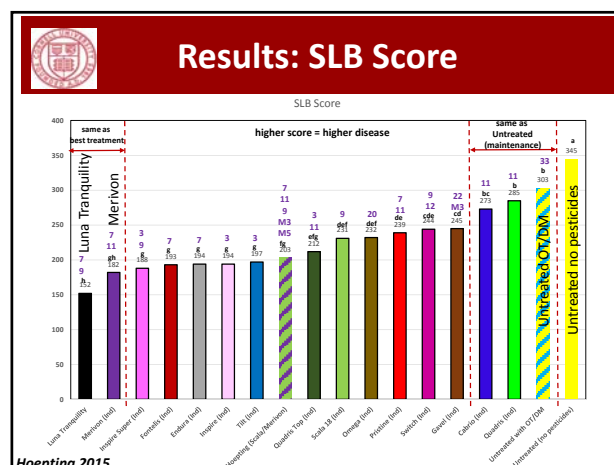
- Green rating per plot (scale 0-100)

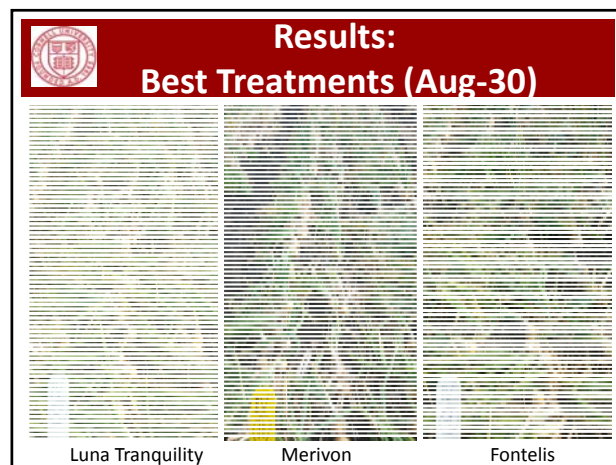
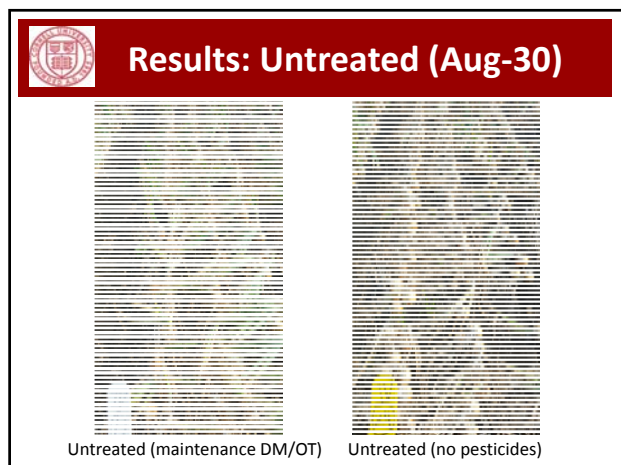
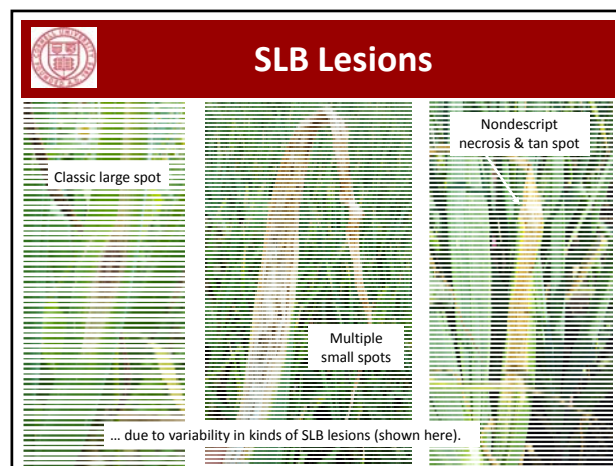
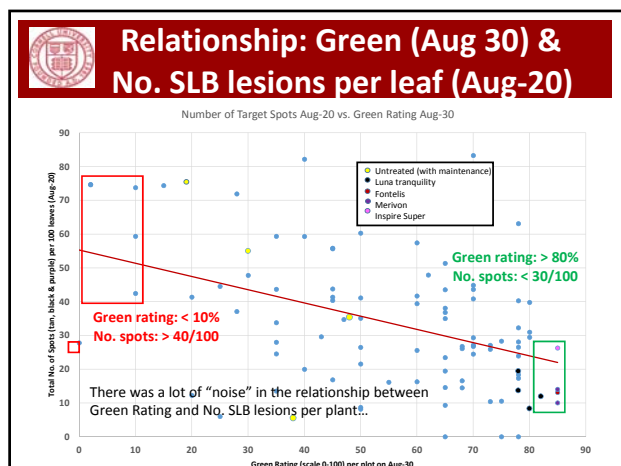
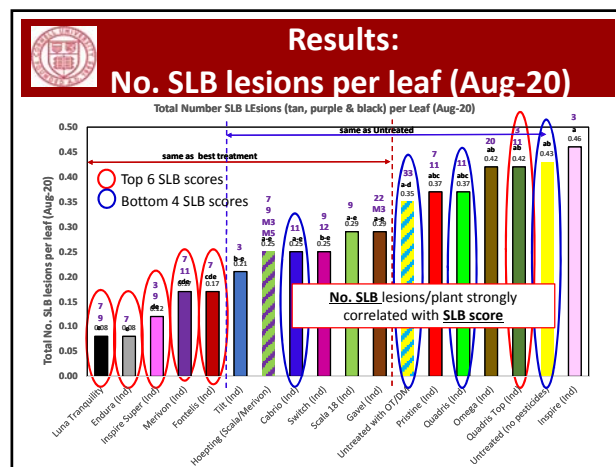
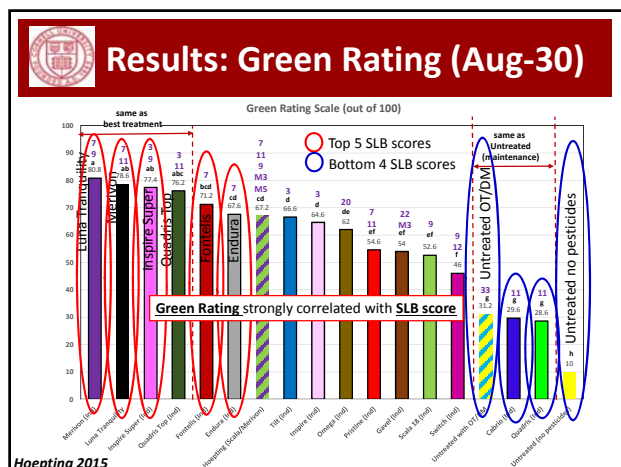


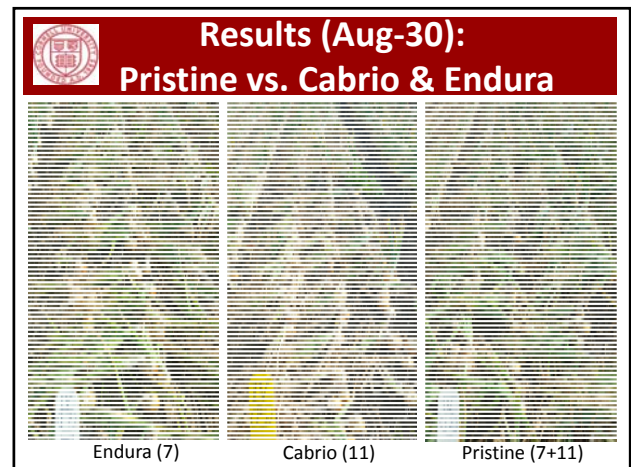
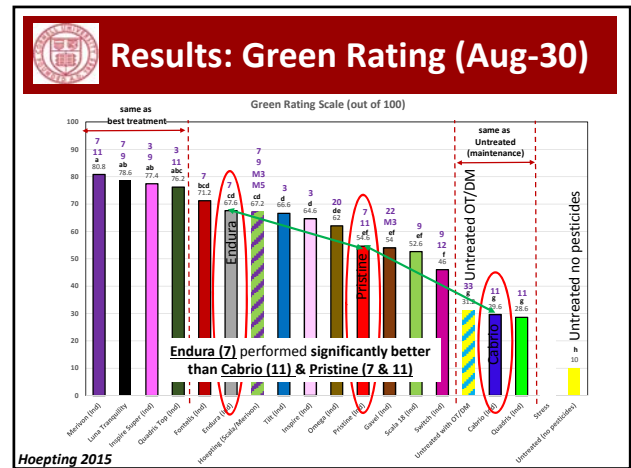
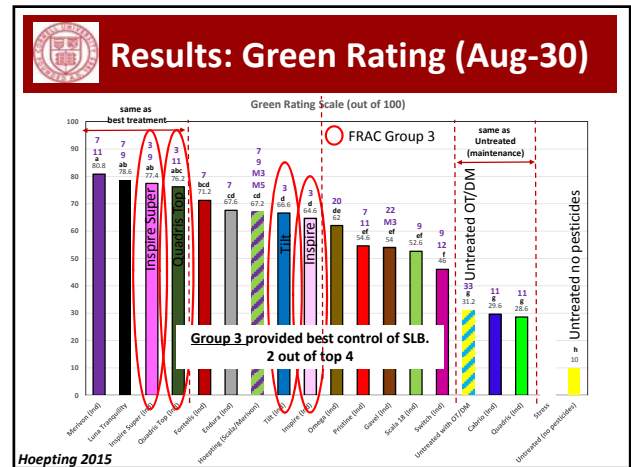
Methods: Data Collection

SLB Score:

- = [Aug-6 % leaf dieback/plant]
- + [Aug-6 Total spots per 10 plants]
- + [Aug-20 % leaf dieback/plant]
- + [Aug-20 Total spots per 100 leaves]
- + [100-Aug-20 green rate]
- + [100-Aug-30 green rate]
- High score means high disease
- Low score means low disease

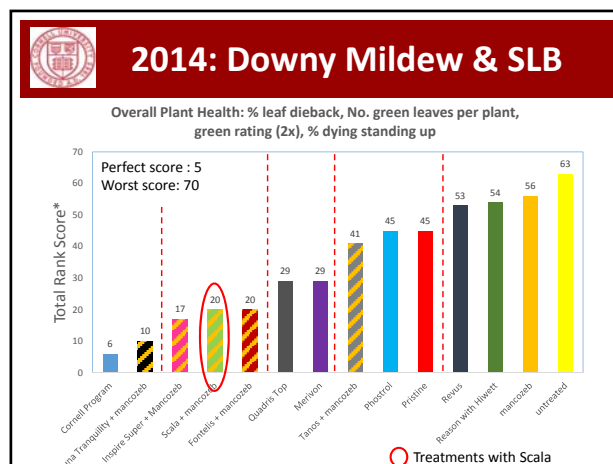
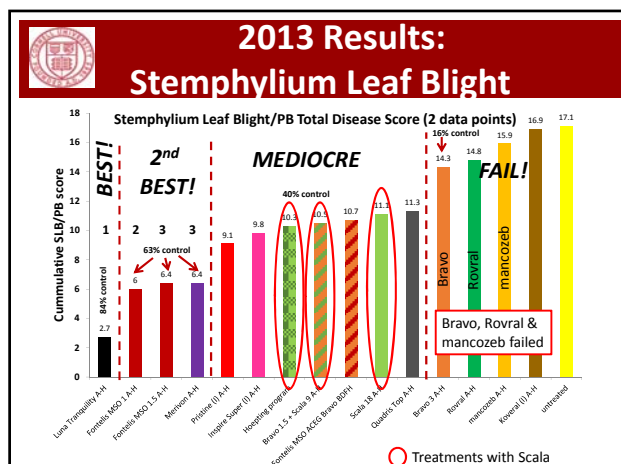







Optimizing Scala

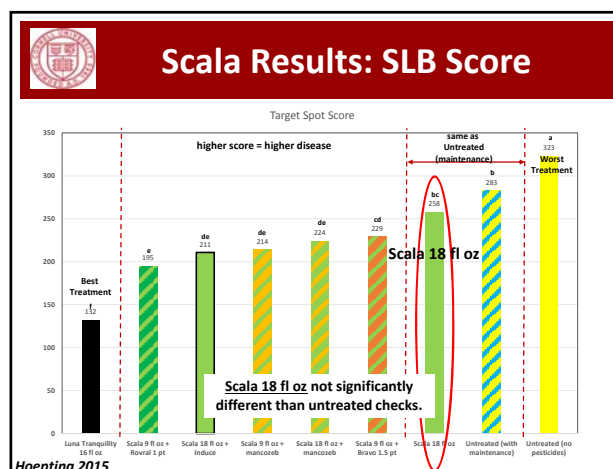
2004-2011 Relative Performance of Fungicides for BLB & PB		
Botrytis Leaf Blight		
Relative performance	Fungicide	Rank Score
BEST	1 Scala 9 fl oz + Bravo 1.5 pt	12
	2 Bravo 3 pt	13
2nd Best	3 Bravo 1.5 pt + Penncozeb 3 lbs	20
	4 Endura 6.8 fl oz	29
Mediocre	5 Rovral 1 pt	30
	6 Switch 14 oz	31
	7 Scala 18 fl oz	32
	8 Pristine 18.5 fl oz	39
POOR	9 Cabrio 12 fl oz	41
	9 Penncozeb 3 lbs	41
	10 Quadris 12.3 fl oz	48
Purple Blotch		
Relative performance	Fungicide	Rank Score
BEST	1 Scala 9 fl oz + Bravo 1.5 pt	15
	2 Scala 18 fl oz	23
2nd Best	3 Rovral 1 pt	24
	4 Switch 14 oz	26
Mediocre	5 Endura 6.8 fl oz	37
	6 Quadris 12.3 fl oz	40
	7 Pristine 18.5 fl oz	43
	8 Cabrio 12 fl oz	44
POOR	9 Bravo 3 pt	47
	9 Bravo 1.5 pt + Penncozeb 3 lbs	47
	10 Penncozeb 3 lbs	50

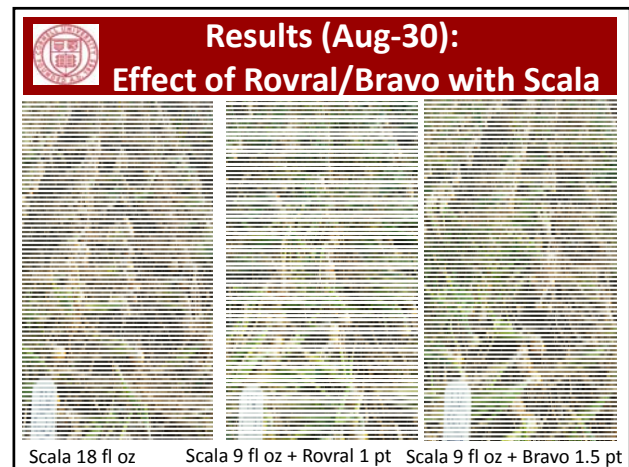
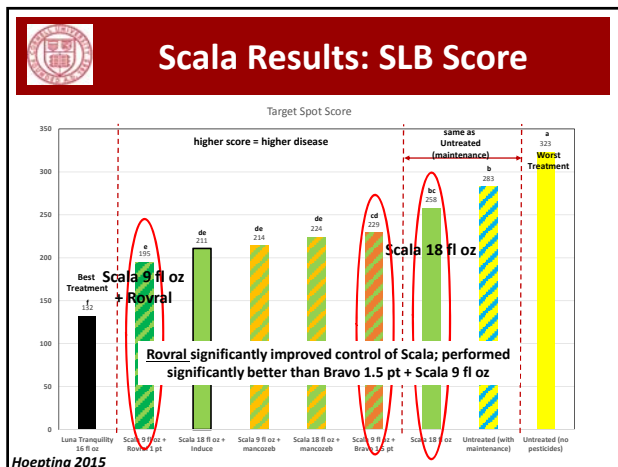
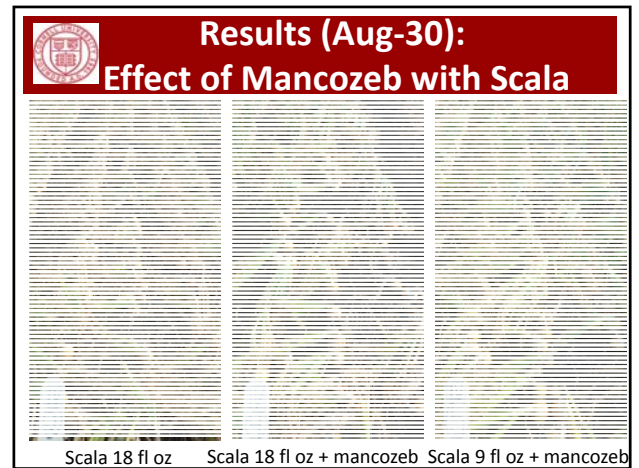
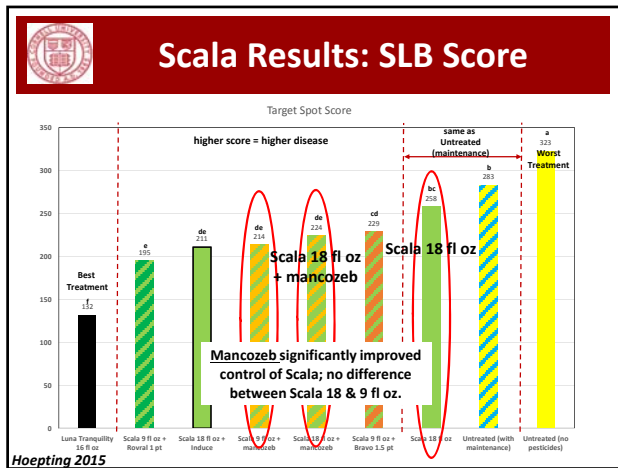
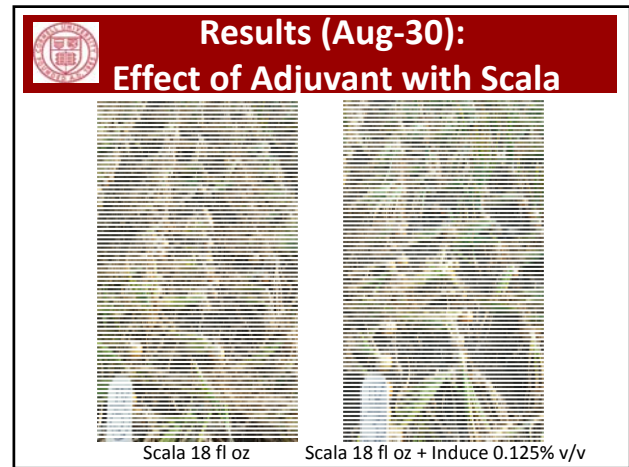
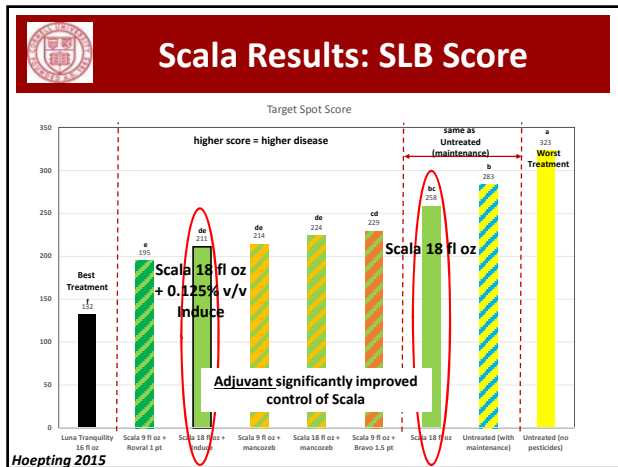


Optimizing Scala

2015 Treatments

Rate of Scala (per acre)	Tank mix partner
18 fl oz	
18 fl oz	Induce 0.125% v/v
18 fl oz	Mancozeb 3 lb
9 fl oz	Mancozeb 3 lb
9 fl oz	Bravo 1.5 pt
9 fl oz	Rovral
Luna Tranquility	Scala + FRAC 7







Scala Summary

Efficacy of Scala can be improved by:

- Using with an adjuvant
- Using with mancozeb
(no difference between 9 & 18 fl oz)
- Using with Rovral 1 pt

Other Considerations

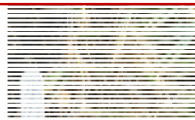


Results: Untreated (Aug-30)

Total SLB:
3.5
per 10 leaf

Total SLB:
4.3
per 10 leaf

Stress appears to be an important factor in development of SLB



Untreated (maintenance DM/OT)



Untreated (no pesticides)



Downy Mildew Fungicide Evaluation, 2015

Trial started at first detection of downy mildew



Downy Mildew Fungicide Evaluation, 2015

4 weeks later...



Why are the grower's onions still green?



Grower fungicide spray program					
Date	Fungicides	FRAC Group	DM control	SLB control	Foliar Feed
Jun-22	Mancozeb 3 lb	M3	Yes	No	
Jul-2	Viathon 32 fl oz + Scala 16 fl oz	3 + 33 9	Yes (33) No	Yes (3) Yes	Xtra Power 1 qt
Jul-10	Viathon 32 fl oz + Rovral 1 pt	3 + 33 E3	Yes (33) No	Yes (3) Yes	
Jul-17	Mancozeb 3 lb + Inspire Super 20 fl oz	M3 3 + 9	Yes No	No Yes	EleMax
Jul-24	Merivon 5.5 fl oz	7 + 11	Yes (11)	Yes	
Jul-31	Viathon 3 pt + Inspire Super 1.25 pt	3 + 33 3 + 9	Yes (33) No	Yes (3) Yes	EleMax
Aug-7	Ridomil Gold Bravo 2.5 pt + Scala 1 pt	4 9	Yes No	No Yes	EleMax
Aug-13	Ridomil Gold Bravo 2 pt Quadris 12.8 fl oz	4 11	Yes Yes	No Yes	EleMax
Aug-21	Viathon 3 pt	3 + 33	Yes (33)	Yes (3)	Xtra Power
Aug-28	Foliar phosphite 4 pts + Inspire Super 20 fl oz	33 3 + 9	Yes No	No Yes	
Sep-4	Mancozeb 3 lb + Rovral 1 pt	M3 E3	Yes No	No Yes	

Elba, NY, 2015

Grower fungicide spray program					
Date	Fungicides	FRAC Group	DM control	SLB control	Foliar Feed
Jun-22	Mancozeb 3 lb	M3	Yes	No	
Jul-2	Viathon 32 fl oz + Scala 16 fl oz	3 + 33 9	Yes (33) No	Yes (3) Yes	Xtra Power 1 qt
Jul-10	Viathon 32 fl oz + Rovral 1 pt	3 + 33 E3	Yes (33) No	Yes (3) Yes	
Jul-17	Mancozeb 3 lb + Inspire Super 20 fl oz	M3 3 + 9	Yes No	No Yes	EleMax
Jul-24	Merivon 5.5 fl oz	7 + 11	Yes (11)	Yes	
Jul-31	Viathon 3 pt + Inspire Super 1.25 pt	3 + 33 3 + 9	Yes (33) No	Yes (3) Yes	
Aug-7	Ridomil Gold Bravo 2.5 pt + Scala 1 pt	4 9	No	Yes	
Aug-13	Ridomil Gold Bravo 2 pt Quadris 12.8 fl oz	4 11	Yes	No	EleMax
Aug-21	Viathon 3 pt	3 + 33	Yes (33)	Yes (3)	Xtra Power
Aug-28	Foliar phosphite 4 pts + Inspire Super 20 fl oz	33 3 + 9	Yes No	No Yes	
Sep-4	Mancozeb 3 lb + Rovral 1 pt	M3 E3	Yes No	No Yes	

Elba, NY, 2015

Very good downy mildew fungicide program

Grower fungicide spray program					
Date	Fungicides	FRAC Group	DM control	SLB control	Foliar Feed
Jun-22	Mancozeb 3 lb	M3	Yes	No	
Jul-2	Viathon 32 fl oz + Scala 16 fl oz	3 + 33 9	Yes (33) No	Yes (3) Yes	Xtra Power 1 qt
Jul-10	Viathon 32 fl oz + Rovral 1 pt	3 + 33 E3	Yes (33) No	Yes (3) Yes	
Jul-17	Mancozeb 3 lb + Inspire Super 20 fl oz	M3 3 + 9	Yes No	No Yes	EleMax
Jul-24	Merivon 5.5 fl oz	7 + 11	Yes (11)	Yes	
Jul-31	Viathon 3 pt + Inspire Super 1.25 pt	3 + 33 3 + 9	Yes (33) No	Yes (3) Yes	EleMax
Aug-7	Ridomil Gold Bravo 2.5 pt + Scala 1 pt	4 9	No	Yes	
Aug-13	Ridomil Gold Bravo 2 pt Quadris 12.8 fl oz	4 11	Yes	No	EleMax
Aug-21	Viathon 3 pt	3 + 33	Yes (33)	Yes (3)	Xtra Power
Aug-28	Foliar phosphite 4 pts + Inspire Super 20 fl oz	33 3 + 9	Yes No	No Yes	
Sep-4	Mancozeb 3 lb + Rovral 1 pt	M3 E3	Yes No	No Yes	

Elba, NY, 2015

"Front-loaded" very good SLB fungicide program (group 3); weak on Aug 7 & 13, Sep-4. What else is going on?

Grower fungicide spray program					
Date	Fungicides	FRAC Group	DM control	SLB control	Foliar Feed
Jun-22	Mancozeb 3 lb	M3	Yes	No	
Jul-2	Viathon 32 fl oz + Scala 16 fl oz	3 + 33 9	Yes (33) No	Yes (3) Yes	Xtra Power 1 qt
Jul-10	Viathon 32 fl oz + Rovral 1 pt	3 + 33	Yes (33)	Yes (3)	
Jul-17	Mancozeb 3 lb + Inspire Super 20 fl oz	3 + 9	No	Yes	EleMax
Jul-24	Merivon 5.5 fl oz	7 + 11	Yes (11)	Yes	
Jul-31	Viathon 3 pt + Inspire Super 1.25 pt	3 + 33 3 + 9	Yes (33) No	Yes (3) Yes	EleMax
Aug-7	Ridomil Gold Bravo 2.5 pt + Scala 1 pt	4 9	Yes No	No Yes	EleMax
Aug-13	Ridomil Gold Bravo 2 pt Quadris 12.8 fl oz	4 11	Yes Yes	No Yes	EleMax
Aug-21	Viathon 3 pt	3 + 33	Yes (33)	Yes (3)	Xtra Power
Aug-28	Foliar phosphite 4 pts + Inspire Super 20 fl oz	33 3 + 9	Yes No	No Yes	
Sep-4	Mancozeb 3 lb + Rovral 1 pt	M3 E3	Yes No	No Yes	

Elba, NY, 2015

Six applications of foliar feed

Does foliar feeding help plant to fend off disease?

Feed a cold...



Next Steps

- More fungicide trials...
 - spray timing (when to start & finish)
 - do foliar nutrients help?
 - relationship to plant stress
 - Relationship to Botrytis leaf blight
- Develop a scouting protocol to quantify/rate SLB in grower fields
- Evaluate best performing SLB fungicides for their efficacy against Botrytis Leaf Blight