Cornell Cooperative Extension
Cornell Vegetable Program

The Complexities of Managing Stemphylium Leaf Blight and Botrytis Leaf Blight in Onion in New York

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National Allium Research Conference – Plant Pathology Session
Royal Sonesta Hotel, Kaua'i, Hawaii, USA: December 1, 2025

Acknowledgements

- Cornell Plant Pathology
  - **Frank Hay**
  - **Sarah J. Pethybridge**
  - Daniel Heck **(Post Doc)**
  - Audrey Klein
  - Natalia Piñeros Guerrero
  - Olga Khleminstki
  - Dru Waggoner

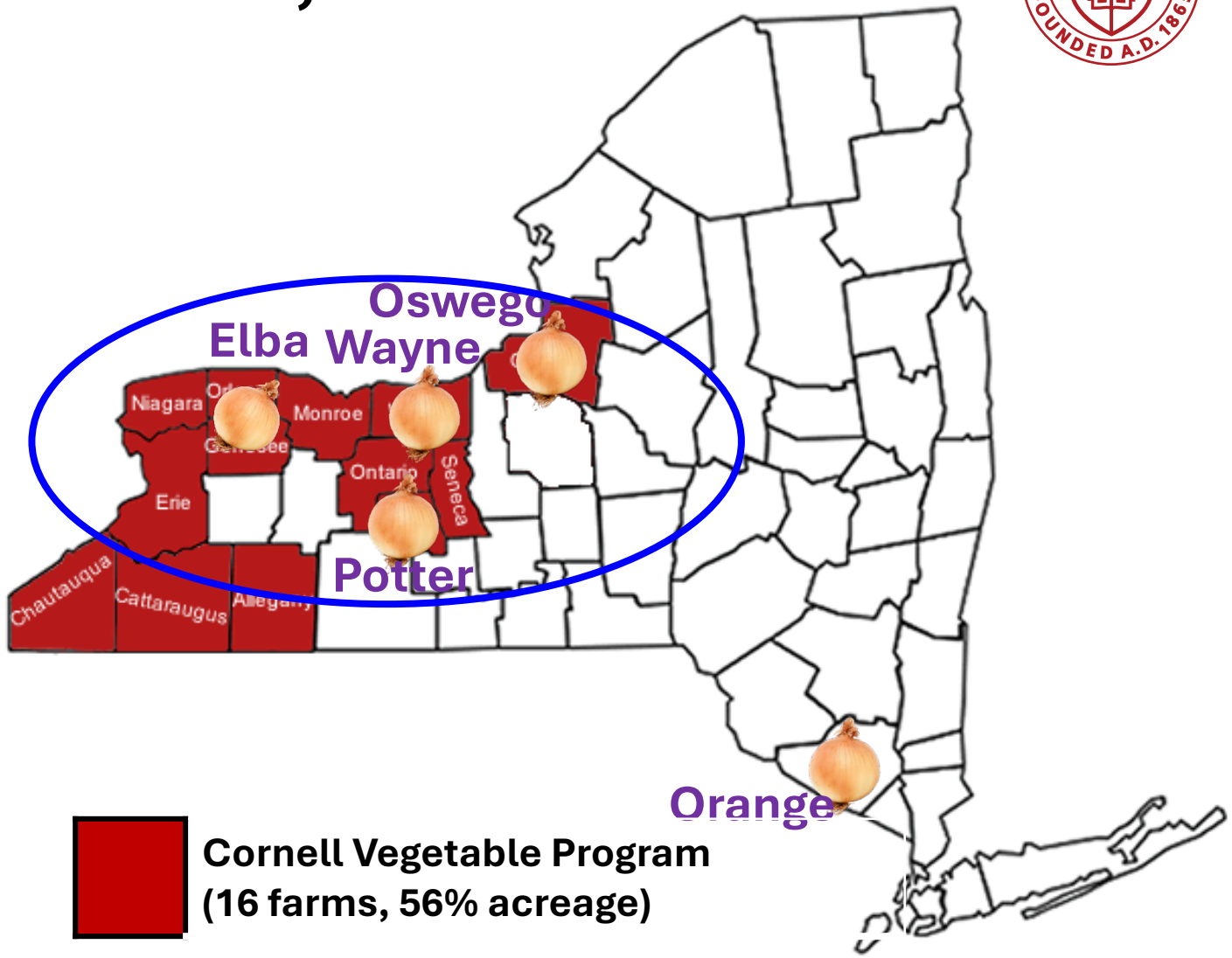
USDA
U.S. DEPARTMENT OF AGRICULTURE

Cornell AgriTech
New York State Agricultural Experiment Station

Muck Onion Production in New York is Intense

Muck Onion Growers, 56 farms, 7900 acres

- Elba Muck (Orleans/Genesee Cos.):
  - **4 farms**
  - **2,340 acres** (140, 160, 240, 1800)
- Potter Muck (Yates Co.):
  - **1 farm** (same as big farm in Elba)
  - **350 acres**
- Wayne Co.:
  - **5 farms**
  - **400 acres** (20, 50, 70, 120, 140)
- Oswego Co.
  - **6 farms**
  - **1310 acres** (150, 150, 200, 200, 230, 380)
- Most: 150 – 250 acre; largest: 2200 acre
- Orange Co.
  - **35 farms**
  - **3,500 acres** (6 >100, rest 5-80 acres)



Complexities of Managing SLB and BLB with Fungicides

 # 1: SLB has developed fungicide resistance to FRAC groups 2, 3, 7, 9 and 11.

#2: BLB halo lesions and BLB necrotic spots respond differently to different fungicides

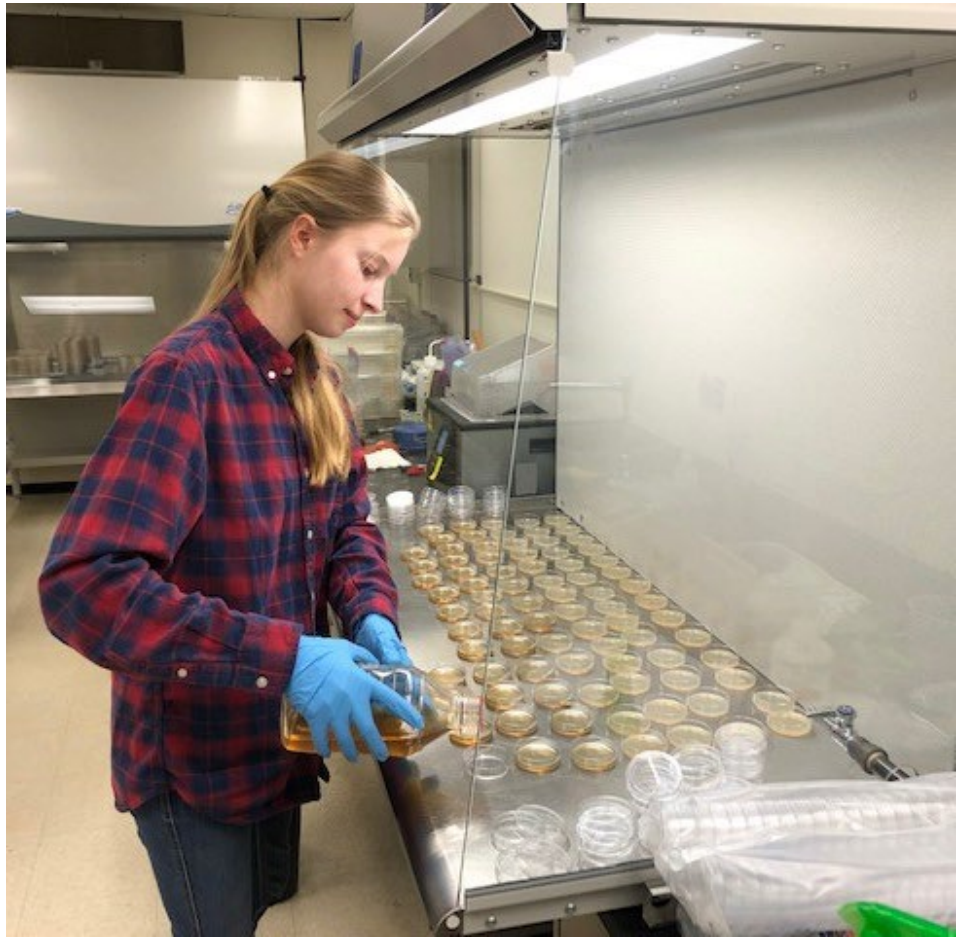
#3: Too much Bravo can drag yield

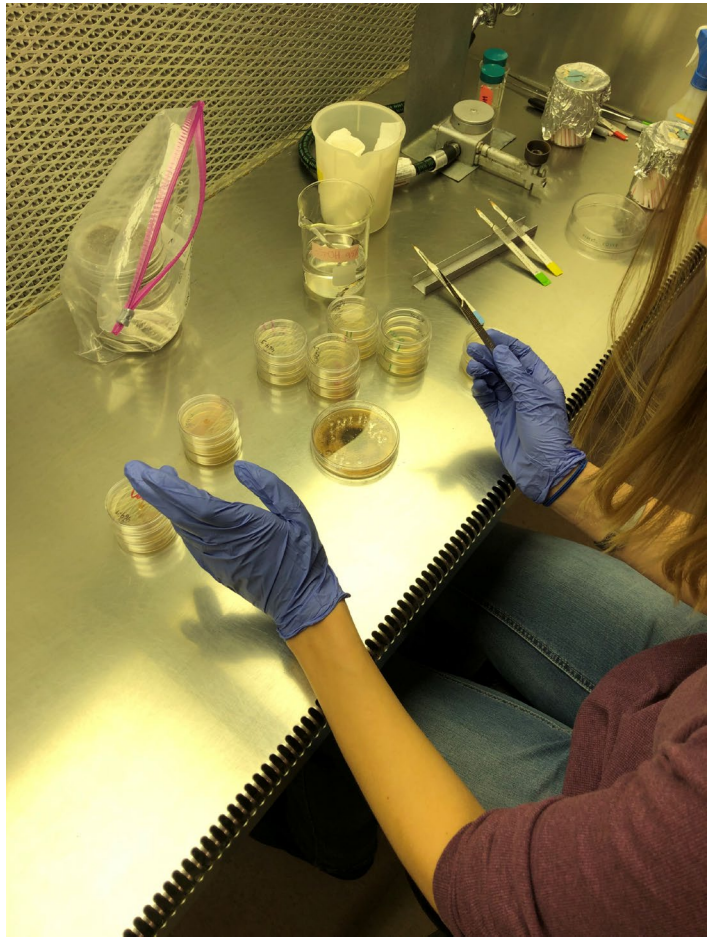
#4: Use as much FRAC P07 as possible?

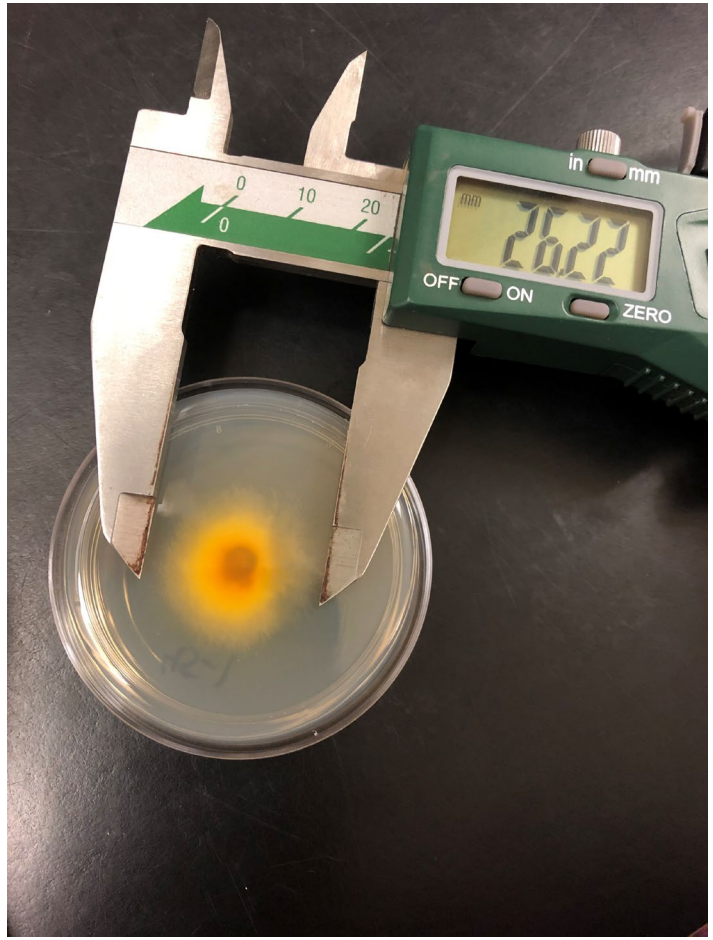
#5: Bravo incompatible with thrips insecticides

On-Farm Fungicide Research Trials

Fungicide Sensitivity Testing (Hay)





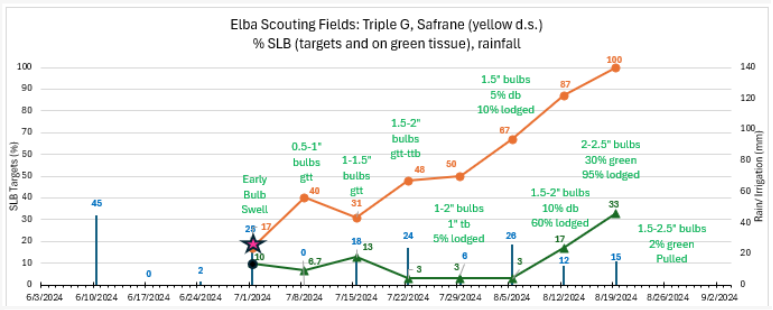


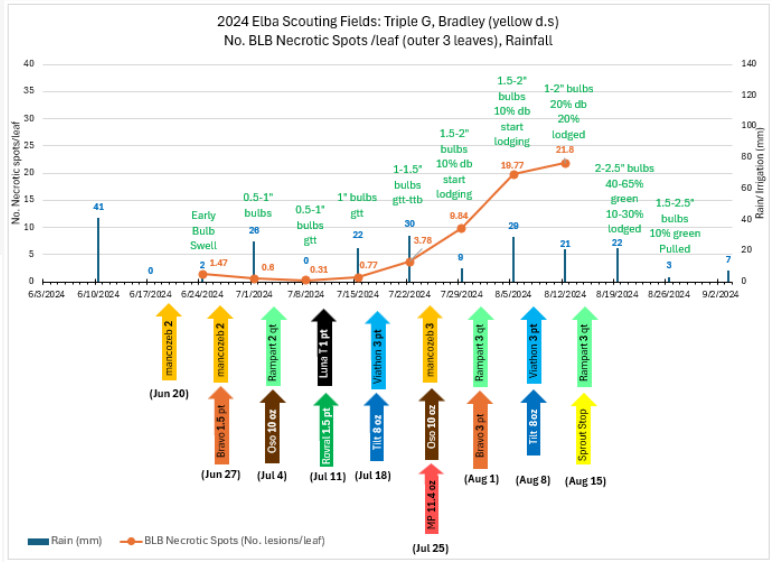
Onion Scouting Program

14 farms, 17 fields, 14 weeks, 42 reports

SCOUTING REPORTS (in order fields scouted in)

1. Triple G – Central Muck – Burn Barrel – Field No. 3 – yellow direct seeded – Bradley (132 days)
Planted: April 18, 2025
Rain gauge: Aug 11-18: **9 mm/ 0.36"**. Aug 4-11: 11 mm/0.46". Jul 28- Aug 4: 0 mm/0". Jul 21-28: 2mm/0.08" Jul 14-21: 2 mm/0.08". Jul 7-14: 0 mm/0". Jun 30-Jul 7: 4 mm/0.16". Jun 23-30: 21mm/0.84". Jun 16-23: 3 mm/0.12". Jun 9-16: 3 mm/0.12". Jun 2-9: 19 mm/0.76".
No plants scouted: 30
Crop stage: 6-7 leaf, 1.5-2" bulbs (some 2+", 1"), 20% db (some 30%), 50-70% lodging. **Last week:** 6 leaf, 1.5-2" bulbs (range 1-2+"), 10-20% db, 60% lodging.
PST: some regrowth, NE-MR – very minor. Odd LR missed by weeders. **Last week:** Just hand-weeded.
OT (onion thrips): 0.22/leaf, 12 out of 30 plants = 40.0%, **Decreased since last week** (0.5-0.3 /leaf, 66.7%) – below spray threshold
BLB halo lesions: Not collected. **Last week:** 0.4/leaf, 20 out of 30 plants = 67%
BLB necrotic spots: Not collected, **Last week:** 3.4/leaf, 30 out of 30 plants = 100%
SLB: Total (targets and tips) 28/30 = 93.3%, all targets 20/30 = **66.7% (TON, TOG, PON).** Primary targets on green tissue 1/30 = **3%**. 3 or more targets/plant = 1/30 = **3%. Mostly secondary, odd primary. Increased slightly since last week:** Total (targets and tips) 25/30 = 83%, all targets 11/30 = **37% (TON, TON+, TOG).** Primary targets on green tissue 1/30 = **3%**. 3 or more targets/plant = 1/30 = **3%. Mostly secondary, minor.**
IYSV: 14/30 scouted plants = 46.7%. **Last week:** 10/30 scouted plants = 33%, plus 1 hot spot.
Bacterial rot: 1 plant in scouting plant. **Last week:** not observed
Leaf minor: mines on every plant. **Last week:** mines on every plant.
Woodchuck holes!
Spray records:
PRE (Apr 28 – 10 DAP): Buctril 2E 1.5 pt + Prowl EC 2.5 pt
Flag-ish (May 12 - 14 DAT): Prowl EC 3 pt + Select EC 1 pt + LI700 0.25% v/v
Week of Jun 2 (2.5-leaf): Prowl H2O 4 pt for preemergent weed control. Chateau 2 oz for pre- and post-emergent weed control (specifically to put a "hold" on PST).
Week of Jun 9 (Jun 11, 3-4 leaf): Stinger 8 fl oz for post-emergent control of PST
Week of Jun 16 (4-5 leaf): **OT: 0.3.** Intensity 1 pt for barley-kill ***(Jun 16).*** Then, **Aza-Direct 1 pt + M-Pede 1%** + Choice Trio 0.25% v/v for adult thrips (and nymphs) ***(Jun 17).*** Then, Stinger 4 fl oz for post-emergent control of PST ***(Jun 20).***
Week of Jun 23 (5-6 leaf): **OT: 0.4/leaf.** **Movento 5 fl oz** + Lannate LV 2 pt + penetrating surfactant for onion thrips. Bravo 1.5 pt for BLB halos, BLB necrotic spots and some SLB.
Week of Jun 30 (6-7 leaf, swell-0.5" bulbs): **OT: 1.0/leaf.** **Movento 5 fl oz + Radiant 8 fl oz** + penetrating surfactant for onion thrips. Luna Tranquility 16 fl oz + Switch 14 oz for BLB halos, BLB necrotic spots and SLB.
Week of Jul 7 (8 leaf, 0.5-1" bulbs): **OT: 0.4/leaf.** **Radiant 8 fl oz** + penetrating surfactant for onion thrips. Oso 10 fl oz + Rampart 2 qt for BLB necrotic spots, SLB and DM protection.
Week of Jul 14 (8-9 leaf, 1-1.5" bulbs (some 2"), ttb): **OT: 0.35/leaf.** ***No insecticide.*** Viathon 3 pt + Tilt 8 fl oz + Bravo 3 pt (= BEST) for BLB halos, BLB necrotic spots, SLB, plant health and DM protection.
Week of Jul 21 (7 leaf, 1.5" bulbs, some 1", ttb). **OT: 3.5-5.1/leaf. Trifecta** (Warrior 1.92 fl oz + AgriMek SC 3.5 fl oz + Lannate LV 3 pt) for onion thrips. Bravo 2 pt + Rampart 2 qt for BLB halos, BLB necrotic spots, SLB, plant health and DM protection.
Week of Jul 28 (6-8 leaf, 1.5" bulbs (1-2"), 1" tb - 10% db, 10% lodging). **OT: 2.6/leaf. Trifecta** (Warrior 1.92 fl oz + AgriMek SC 3.5 fl oz + Lannate LV 3 pt) for onion thrips. Viathon 3 pt + Tilt 8 fl oz + Bravo 3 pt (= BEST) for BLB halos, BLB necrotic spots, SLB, plant health and DM protection.
Week of Aug 4 (5-7 leaf, 1.5" bulbs (some 1", some 2"), 10% - 20% db, 30-60% lodging). **OT: 1.1-1.7/leaf.** Exirel 16 fl oz + penetrating surfactant for thrips. Luna Tranquility 16 fl oz + Switch 14 oz + Rampart 3 qt for BLB halos, BLB necrotic spots, SLB, plant health and DM protection.
Week of Aug 11 (6 leaf, 1.5-2" bulbs (range 1-2+"), 10-20% db, 60% lodging). **OT: 0.3-0.5/leaf. Sprout inhibitor 7 pt.**
Fungicide Spray Summary:
Week 1: M5(1.5)
Week 2: 7(1) + 9a, 9b + 12
Week 3: 19, P07
Week 4: 3c + P07. 3a. M5(3) (BEST)
Week 5: M5(2), P07
Week 6: 3c + P07, 3a, M5(3) (BEST)
Week 7: 7(1) + 9a, 9b + 12, P07
Week 8: Sprout inhibitor
Comments/Recommendations:
Overall, total 9.5 pt of Bravo (on target), 5 apps of P07 (on target), 2 apps of FRAC 3 & 7 (on target).
Still another app of Exirel, if you needed it. Well done!
This field looks similar to last week, wish the bulbs would put on more size.



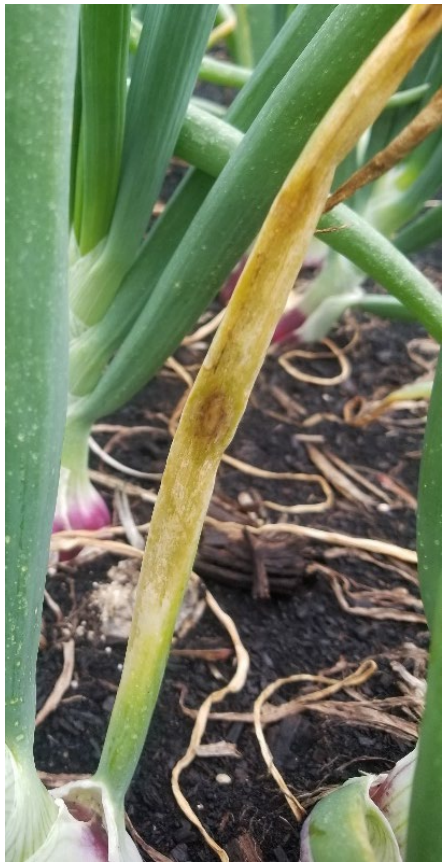


SLB Symptom Categories: Target Spots Color – Tan, Black or Purple

Black and **Purple**-colored target spots are considered **primary**

Photos: C. Hoepting

SLB Categories: Target Spots
Location – On Green or Necrotic Leaf Tissue



water-soaked spots are primary

other side of leaf is green

Target spots of any color **on <u>green</u> leaf tissue** are considered **primary**.

Photos: C. Hoepting & S. Caldwell

SLB Categories: Target Spots Location – On Geen or Necrotic Leaf Tissue





Target spots of any color **on <u>necrotic</u> leaf tissue** are considered **secondary**.

Photos: C. Hoepting & S. Caldwell

SLB Symptom Categories: Spore colonization of necrotic leaf tip tissue

Tan “dirty tips”

Tan & Black “dirty tips”

Photos: C. Hoepting

SLB Symptom Categories: Spore Colonization of Necrotic Leaf Tip Tissue

SLB Spore Colonization of Necrotic Leaf Tissue Scale 0-6:

0 – No SLB

1 – Very minor (tan sporulation < 25% coverage)

2 – Minor (tan spore colonization 26-50% coverage)

3 – **Minor-Moderate** (tan spore colonization > 50% coverage)

4 – Moderate (black spore colonization < 50% coverage)

5 – Moderate-Severe (black spore colonization 26-50% coverage)

6 – Severe (black spore colonization > 50%).

SLB is considered **primary** when **black** sporulation occurs (scale 4-6)

SLB Category: Excessive Leaf Dieback

- > 30% leaf dieback prior to lodging, onions may “die standing up”
- May double incidence of bacterial bulb rot (Hoepting, 2015)

Photos: C. Hoepting

Excessive leaf dieback is not always exclusively caused by SLB.

Two Phases of Botrytis Leaf Blight (BLB): 1) Halo Lesions

Express on young healthy green foliage

Tiny yellow necrotic spot surrounded by a silvery halo.
Sometimes silvery halos do not have necrotic centers.

Old BLB halo lesions:
Necrotic centers split & enlarge.
Halos become sunken.

Photos: C. Hoepting

Two Phases of Botrytis Leaf Blight (BLB): 2) Necrotic Spots

Express on older less healthy foliage

Pin-prick

Small lesions are yellow

1 to 3 mm, some larger

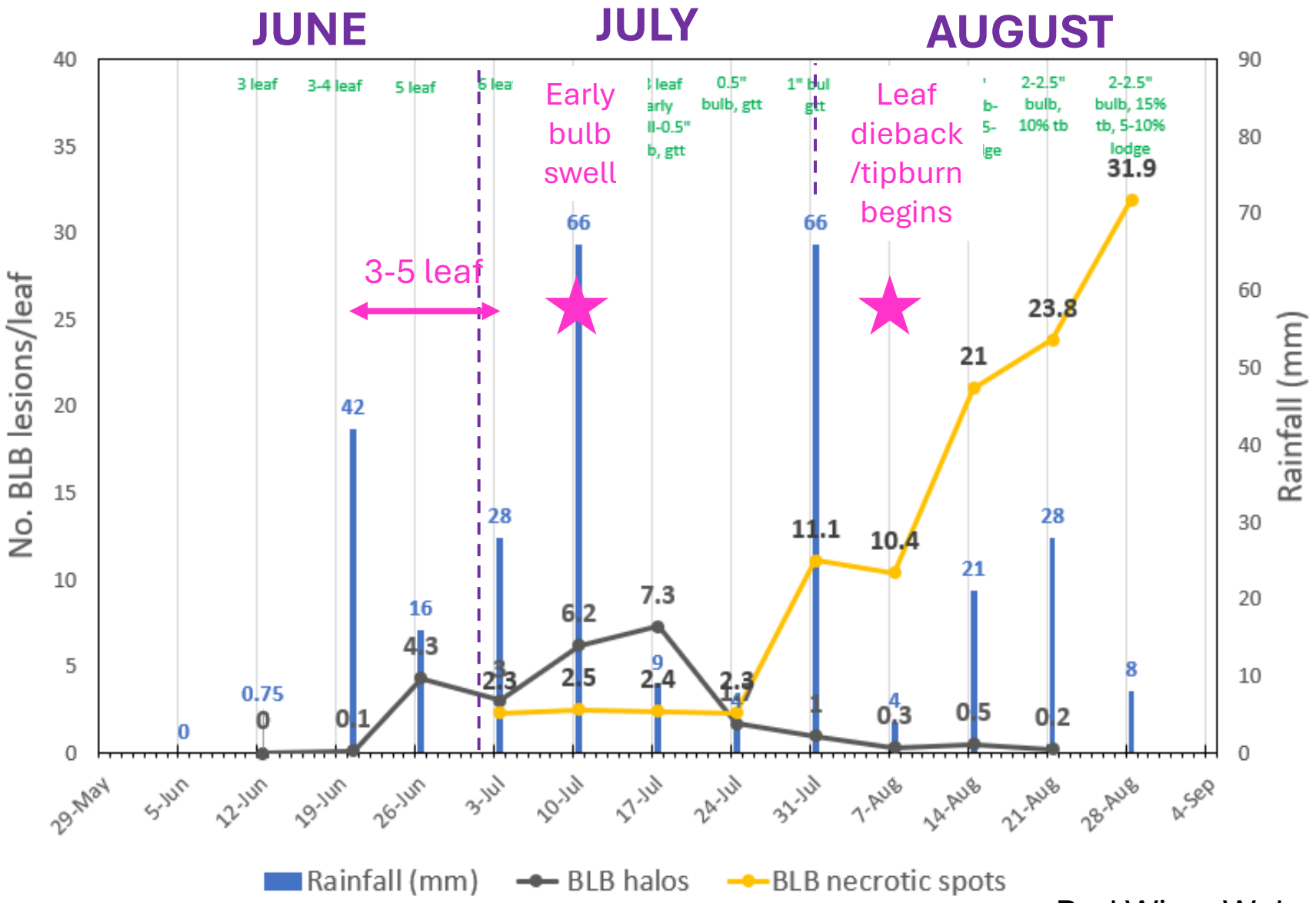
Larger lesions are more white

Photos: C. Hoepting

BLB Halos & Necrotic Spots: Timing

BLB halos
express on young & healthy leaves (June – July)

BLB necrotic spots
express on older & less healthy leaves (August)



c.v. Red Wing, Wolcott 2023

BLB Necrotic Spots Correlated with Yield Reduction in Onion

- In both 2023 and 2024 on-farm onion fungicide trials (Hoepting et. al), the strongest correlation with onion yield was leaf dieback on August 8 (r = -0.7552), which was most strongly correlated with Botrytis leaf blight (BLB) necrotic spots on July 27 (r = 0.8500).
- **As BLB necrotic spots increased, leaf dieback increased, and yield decreased.**
- Yield was also moderately correlated with several SLB variables.
- Need more research to figure out how many BLB necrotic spots are okay before we see a yield drag.

Other Pests and Pathogens to be Controlled

Downey Mildew



- Sporadic in New York
- Growers treat for DM preventatively.
- It is chased by SLB, which is difficult to control, so best to avoid DM outbreaks, because DM-SLB complex can be devastating.

Photos: C. Hoepting

Onion Thrips

- High pressure in Eba muck, annually, 6-8 insecticide sprays, insecticide resistance issues.
- Thrips vector IYSV in Elba, stresses onion plants, reduces yield.
- Other regions have less pressure and insecticide use.

8 (6-10) Foliar Pesticide Sprays from Mid- to Late-June to Mid- to Late-August for Leaf Diseases and Onion Thrips

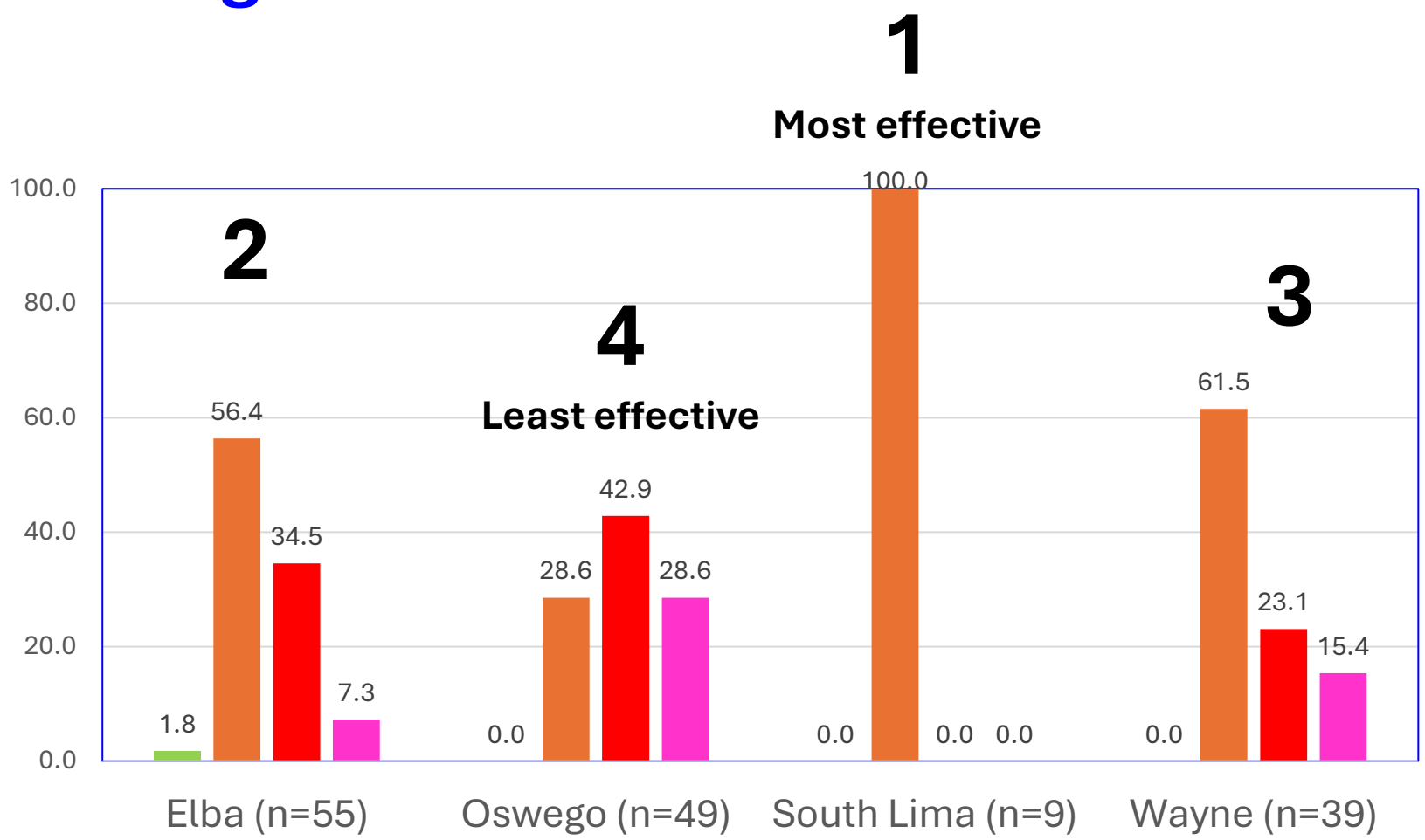
Week No.	Date	Crop Stage	Pesticide Treatment			Effectiveness Rating					Activity on DM
			Insecticide	Fungicides Product & Rate/A	FRAC Group	BLB halos	BLB necrotic spots	SLB target spots	SLB spores	SLB leaf dieback	
1	Jun 21	6 leaf, gtt	Movento	Manzate Max 2 .4 qt	M3	VG	Fail	Fail	Fail	Fail	YES
2	Jun 28	7 leaf, gtt Early bulb swell	Movento	Manzate Max 2.4 qt + Bravo 1.5 pt	M3 M5	VG F	Fail	Fail	Fail	Fail	YES NO
3	Jul 5	8-9 leaf, gtt 0.5" bulb	--	Bravo 3 pt	M5	VG	G-VG	Fail-P	Fail-P	Fail-P	NO
4	Jul 13	9-10 leaf gtt-ttb 1" bulb	Radiant	Luna Tranquility 16 fl oz + Cannonball 7 oz	7(1) + 9 12	??	G	F-P	VG	F-P	NO NO
5	Jul 20	8-10 leaf ttb 1.5" bulb	Radiant	Viathon 3 pt + Tilt 8 fl oz	3c + P07 3a	Fail	VG-G	F-G	VG-E	VG	YES NO
6	Jul 27	8-10 leaf ttb-1"tb 1.5-2" bulb	Exirel	Miravis Prime 11.4 fl oz + Oso 10 fl oz + Rampart 3 qt	7(4) + 12 19 P07	G Fail	P F-G	F-P F-P	F-VG Fail	G G	NO NO YES
7	Aug 3	8-10 leaf 1" tb – 10% db 2.5-3" bulb 50% lodging	Exirel	Viathon 3 pt + Tilt 8 fl oz	3c + P07 3a	Fail	VG-G	F-G	VG-E	VG	YES NO
8	Aug 10	8-leaf 10-15% db 2.5-3" bulb 70% lodging	Agri-Mek + Warrior + Lannate	Bravo 3 pt + Oso 10 fl oz + Rampart 3 qt	M5 19 P07	VG Fail	VG Fail	Fail-P F-P	Fail-P VG-G	Fail-P F-G	NO NO YES

Complexity #1: SLB Fungicide Resistance to 5 FRAC Groups

FRAC 2 (Rovral): iprodione

- 2024 mycelial plate growth bioassay (Hay): Variability among regions and among fields within a region (except in Elba), for fungicide sensitivity to Rovral.
- Generally, the **proportion of insensitive/highly insensitive SLB isolates was too high for Rovral to have much use for SLB**: Elba and Wayne - ~ 40%, Oswego - 71%.

2024 Fungicide Sensitivity Lab Bioassay: FRAC 2
Rovral – ALL Regions



ug/ml EC50

0-1	Sensitive (fungicides should work)	1-10	Moderately Insensitive (fungicides may work at higher rates)	10-25	Insensitive (fungicides do not work)	> 25	Highly Insensitive

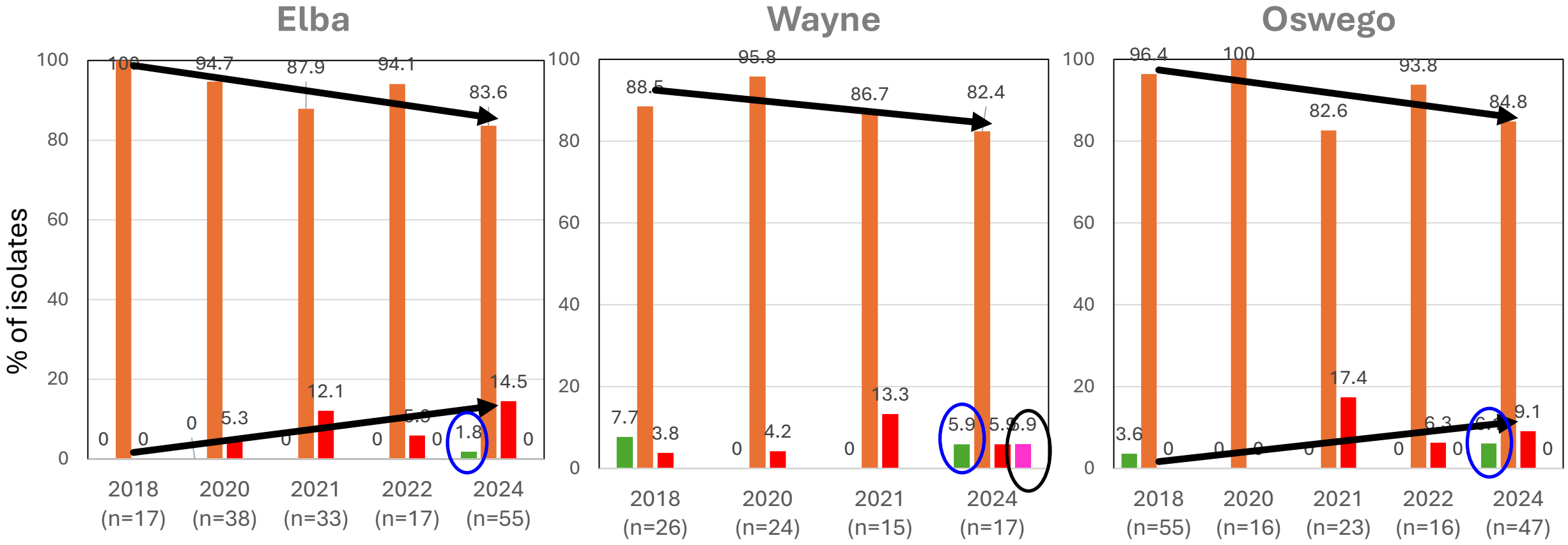
Complexity #1: SLB Fungicide Resistance to 5 FRAC Groups

FRAC 3: **Active ingredients developing resistance differently**

- In 2024, **FRAC 3a propiconazole in Tilt** was the only FRAC 3 a.i. with any activity on SLB.
  - Proportion of isolates that are moderately insensitive has decreased ~10% (from 95% to 84%) in 4 years (2020 to 2024).
  - **Good news:** There was a resurgence of sensitive isolates in 2024, which had not been detected since 2018.
    - It is hoped that this is a result of no more than 2 apps of FRAC 3 per season.
  - **Bad news:** The proportion of insensitive isolates was 9-14%, which has also increased since 2020.
    - On one farm, where 7 applications of FRAC 3 fungicides were made in 2024, highly insensitive isolates were detected.
- Mechanism of resistance unknown

2024 Fungicide Sensitivity Lab Bioassay: FRAC 3
3a – prothioconazole (in Tilt) 2018-2024

Slow decline across all regions, appearance of highly insensitive isolates in Wayne

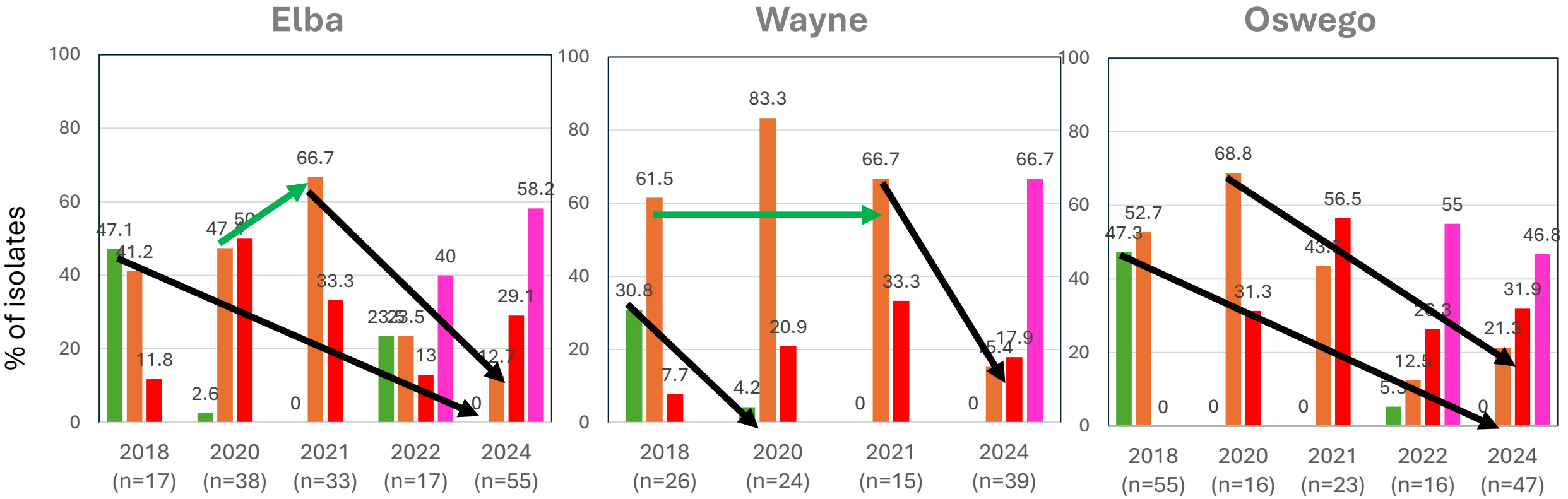


Did not test for highly insensitive isolates before 2022

ug/ml EC50

0-1	Sensitive (fungicides should work)	1-10	Moderately Insensitive (fungicides may work at higher rates)	10-25	Insensitive (fungicides do not work)	> 25	Highly Insensitive

2024 Fungicide Sensitivity Lab Bioassay: FRAC 3
3c – tebuconazole (in Viathon) 2018-2024



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Complexity #1: SLB Fungicide Resistance to 5 FRAC Groups

FRAC 3: Active ingredients developing resistance differently

Not Effective/Developed Resistance:

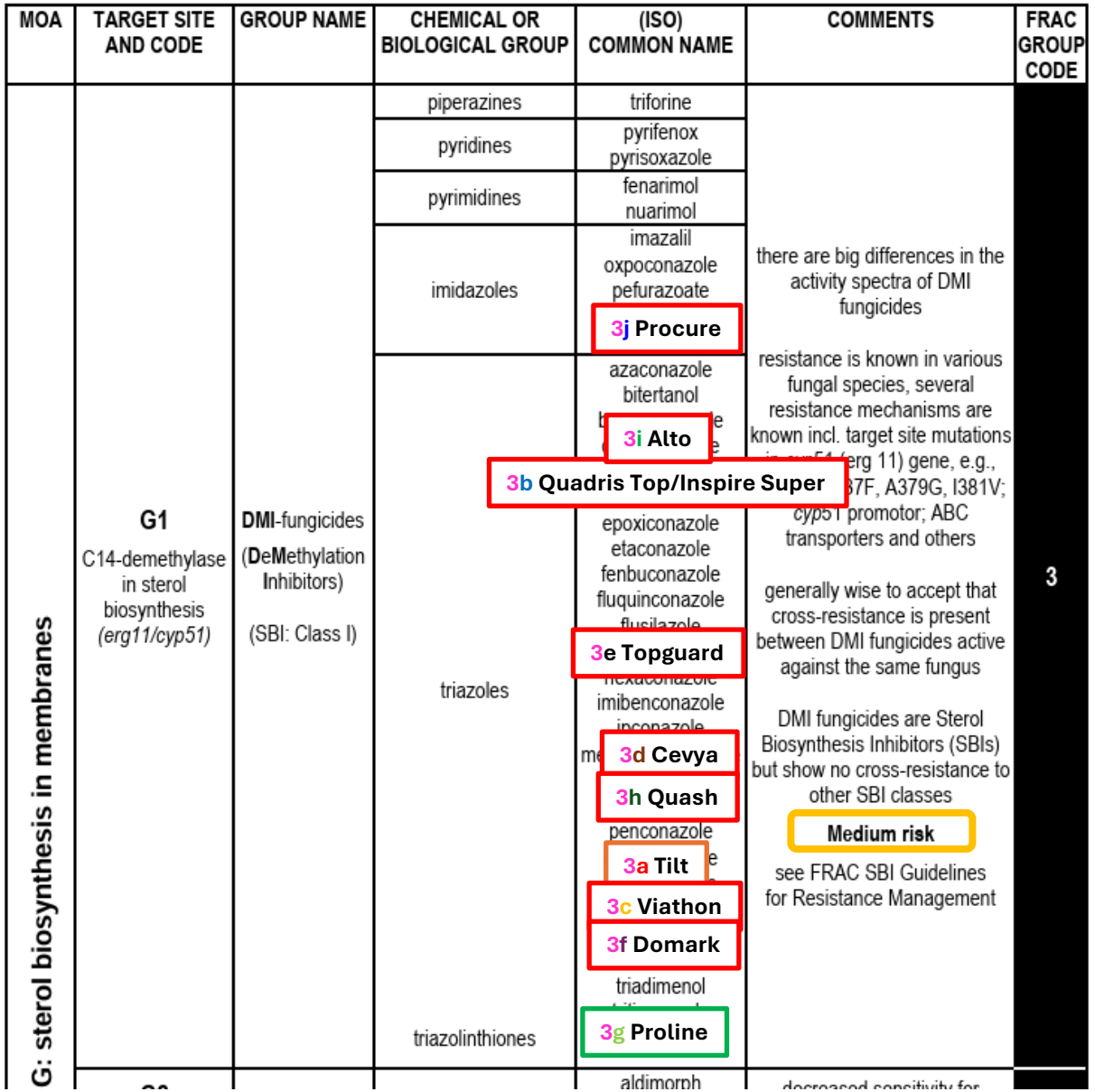
- FRAC 3b difenaconazole in Quadris Top/Inspire Super
- FRAC 3c tebuconazole in Viathon and Luna Experience
- FRAC 3d mefentrifluconazole in Cevya
- FRAC 3e flutriafol, trialed as Topguard (not labeled in onion)
- FRAC 3f tetraconazole, trialed as Domark (not labeled in onion)
- FRAC 3h metconazole, trialed as Quash (not labeled in onion)
- FRAC 3i cyroconazole, trialed as Alto (not labeled in onion)
- FRAC 3j triflumizole, trialed as Procure (not labeled in onion)

Complexity #1: SLB Fungicide Resistance to 5 FRAC Groups

FRAC 3: **Active ingredients developing resistance differently**

- In 2023, FRAC 3g prothioconazole, trialed as Proline, **not labeled in onion**, looked like a brand new fully functioning FRAC 3

FRAC 3 Fungicide Resistance Variable



MOA	TARGET SITE AND CODE	GROUP NAME	CHEMICAL OR BIOLOGICAL GROUP	(ISO) COMMON NAME	COMMENTS	FRAC GROUP CODE
G: sterol biosynthesis in membranes	G1 C14-demethylase in sterol biosynthesis *(erg11/cyp51)*	DMI-fungicides (DeMethylation Inhibitors) (SBI: Class I)	piperazines	triforine	there are big differences in the activity spectra of DMI fungicides resistance is known in various fungal species, several resistance mechanisms are known incl. target site mutations in *cyp51* (erg 11) gene, e.g., Y137F, A379G, I381V; *cyp51* promotor; ABC transporters and others generally wise to accept that cross-resistance is present between DMI fungicides active against the same fungus DMI fungicides are Sterol Biosynthesis Inhibitors (SBIs) but show no cross-resistance to other SBI classes Medium risk see FRAC SBI Guidelines for Resistance Management	3
			pyridines	pyrifenox pyrisoxazole		
			pyrimidines	fenarimol nuarimol		
			imidazoles	imazalil oxpoconazole pefurazoate 3j Procure		
			triazoles	azaconazole bitertanol 3i Alto 3b Quadris Top/Inspire Super epoxiconazole etaconazole fenbuconazole fluquinconazole 3e Topguard imibenconazole 3d Cevya 3h Quash penconazole 3a Tilt 3c Viathon 3f Domark triadimenol		
			triazolinthiones	3g Proline		
				aldimorph	decreased sensitivity for	

FRAC 3

Class: Demethylation Inhibitors (DMI-fungicides)

- Medium Risk of fungicide resistance

Sub-Class: Triazoles

- Trialed 8 active ingredients
- SLB insensitive to 7 of them (b-f, hi)
- **3a** (Tilt) moderately insensitive (some activity)

Sub-Class: Imidazoles

- SLB insensitive to 3j (Procure)

Sub-Class: Triazolinthiones

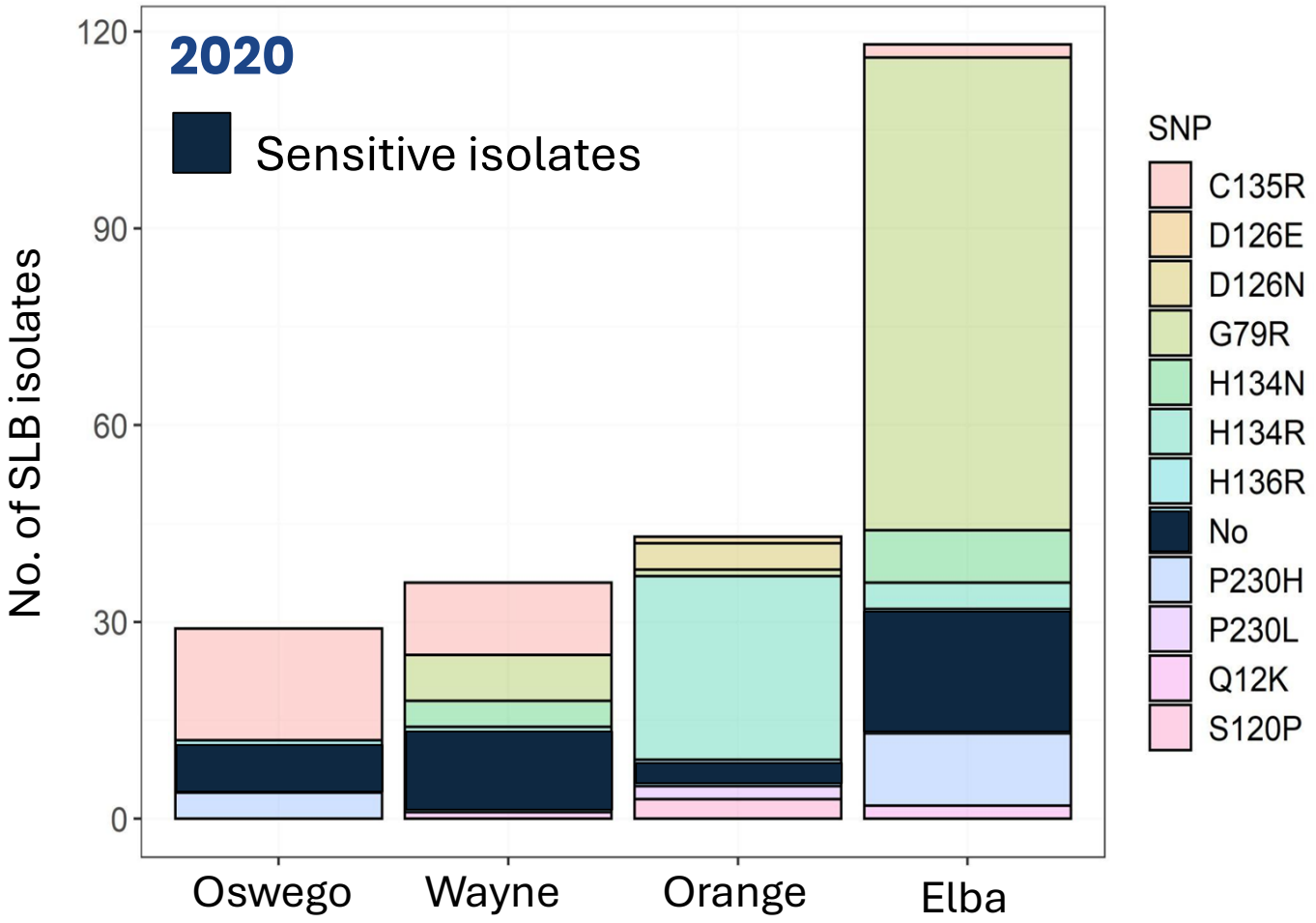
- **3g** (Proline) sensitive!

Complexity #1: SLB Fungicide Resistance to 5 FRAC Groups

FRAC 7: Target site gene mutations detected

- 2017: FRAC 7(2) boscalid (Endura) performed poorly in on-farm fungicide trials.
- 2018: FRAC 7(3) fluxapyroxad (in Merivon) performed poorly in on-farm trials.
- 2019: FRAC 7(1) fluopyram (in Luna products) and FRAC 7(4) pydiflumetofen (in Miravis Prime) performed poorly in on-farm trials.
- 2020: fungicide resistance confirmed – target site gene mutations

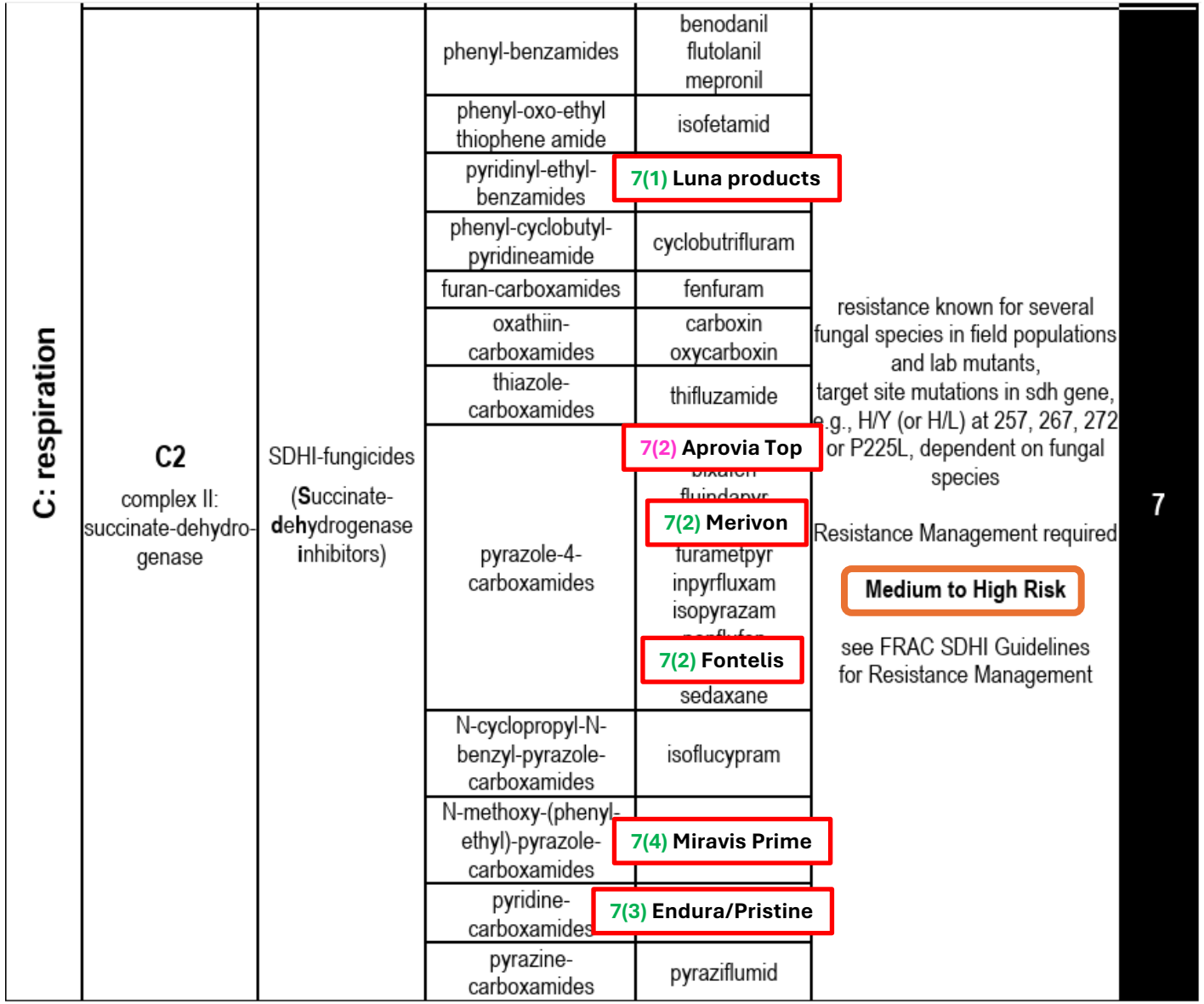
Fungicide Resistance to FRAC 7 Detected in SLB in 2020



- 11 types of FRAC 7 gene mutations were detected.
- Gene mutations that confer highest levels of fungicide resistance found in high frequency.
- Cross-resistance among FRAC 7 sub-classes detected.
- Frequency of FRAC 7 gene mutations varied by region.

Heck et. al. 2020

FRAC 7 Cross Resistance Among Sub-Classes



FRAC 7

Class: Succinate-dehydrogenase inhibitors (SDHI-fungicides

- Medium to High Risk of fungicide resistance

Sub-Class: 7(3)

- boscalid (Endura/Pristine)

Sub-Class: 7(1)

- Fluopyram (in Luna products)

Sub-Class: 7(2)

- Fluxapyroxad (Merivon)
- Benzovindiflupyr (Aprovia)
- Penthiopyrad (Fontelis)

Sub-Class: 7(4)

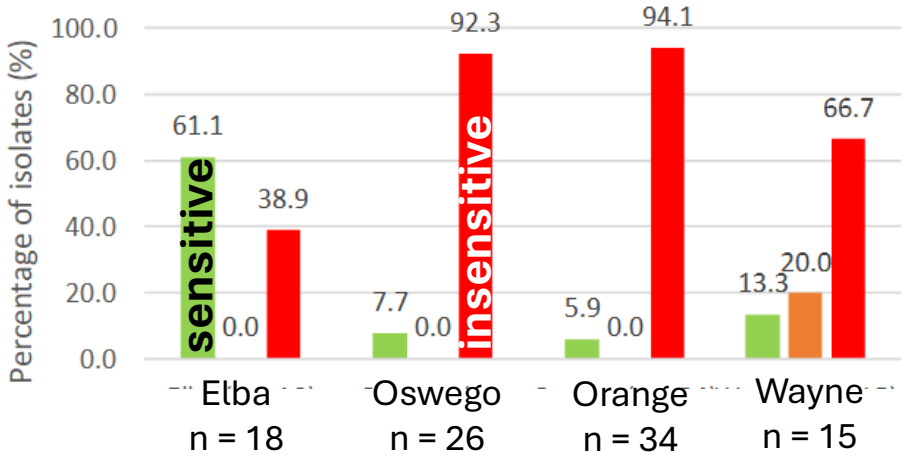
- Pydiflumetofen (Miravis Prime)

Complexity #1: SLB Fungicide Resistance to 5 FRAC Groups

FRAC 9: **Scala (pyrimethanil)**

- 2013: performed poorly in on-farm fungicide trials
- 2017: mycelial growth assays showed variability among regions.
- Scala failed to control SLB in on-farm fungicide trials for past several years.

Fungicide Sensitivity (Mycelial Growth Assay)
(Hay et. al. 2017)



Variability among regions

Complexity #1: SLB Fungicide Resistance to 5 FRAC Groups

FRAC 11: **Target site gene mutation**

- 2015: FRAC 11 azoxystrobin (in Quadris) resistance confirmed via conidial germination assays and detection of target site gene mutation in G143A (Pethybridge & Hay).

On-farm fungicide trial, 2015 (Hoepting)

Quadris 11 fl oz
(11)

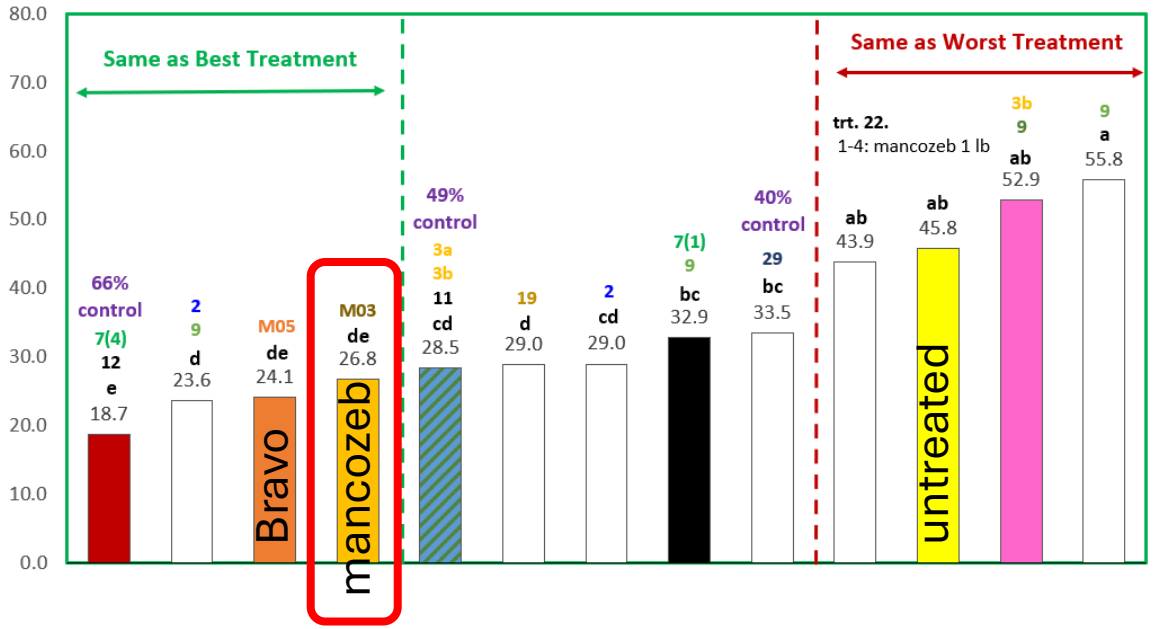
Quadris Top 14 fl oz
(11 + 3)

Complexity #1: SLB Fungicide Resistance to 5 FRAC Groups

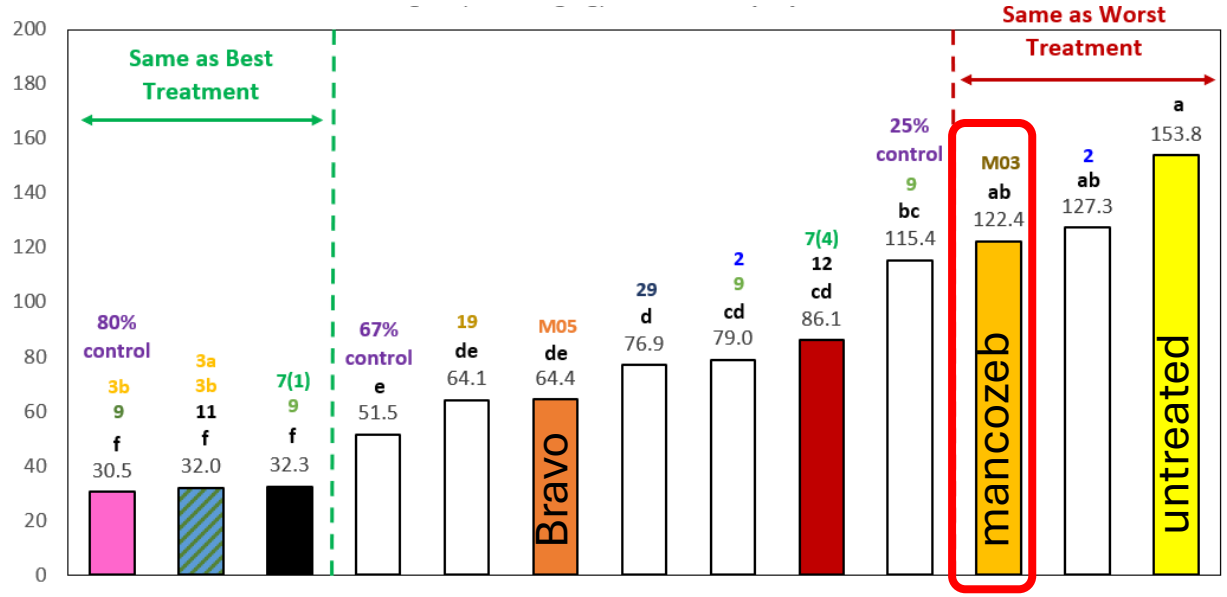
- SLB has developed resistance to varying degrees to five FRAC groups (2, 3, 7, 9 and 11)
- Currently, effective management of SLB requires **tank mixes of 2-3 active ingredients** that belong to FRAC groups M5, 3a, 12, 19 and P07, each with mediocre activity on SLB.
  - M5 – chlorothalonil in Bravo – **Very Low Risk**
  - 3a – propioconazole in Tilt – **Medium Risk**
  - 12 – fludioxonil in Switch (9b + 12) and Miravis Prime (7(4) + 12) – **Low-Medium Risk (12)**
  - 19 – polyoxin D zinc salt in Oso – **Medium Risk**
  - P07 – mono- & di- potassium salts of phosphorous acid in Rampart, potassium phosphite in Reveille – **Low Risk**

Complexity #2: BLB Halos & Necrotic Spots Respond Differently to Fungicides

BLB Halos (July 16)



BLB Necrotic Spots (Aug 20)



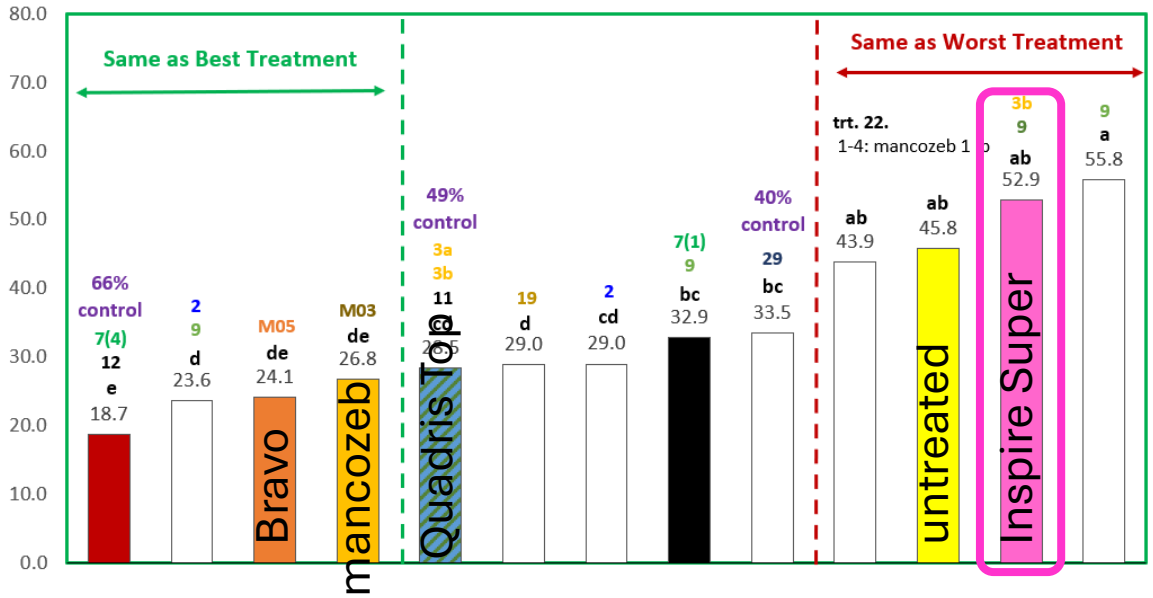
FRAC M3 Mancozeb – Only effective on BLB halos. No activity on BLB necrotic spots.

Note: Only effective on BLB halos when pressure is low (≤ 3 BLB halos/leaf).

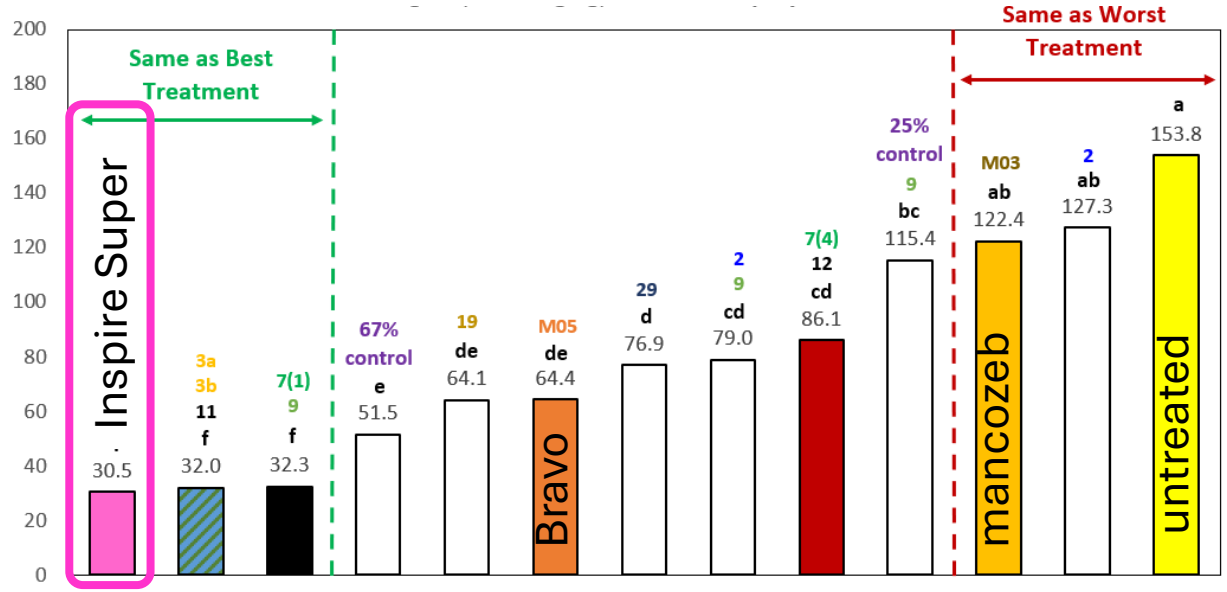
On-farm onion fungicide trial, Oswego, 2020 (Hoepting et. al)

Complexity #2: BLB Halos & Necrotic Spots Respond Differently to Fungicides

BLB Halos (July 16)



BLB Necrotic Spots (Aug 20)



FRAC 3b Inspire Super – Only effective on BLB necrotic spots. No activity on BLB halos.

On-farm onion fungicide trial, Oswego, 2020 (Hoepting et. al)

Complexity #2: BLB Halos & Necrotic Spots Respond Differently to Fungicides

Product	FRAC Group	Efficacy	
		BLB Halos	BLB Necrotic Spots
Bravo	M5	**YES – 2nd Best**	**YES – 2nd Best**
a.i. mancozeb	M3	YES (up to 3 BLB halo/leaf)	NO
Viathon + Tilt	3c + P07, 3a	NO	**YES – 2nd Best**
Tilt	3a	NO	YES
Proline	3g	NO	**YES - Best**
Quadris Top	3b + 11	YES	YES
FRAC 7 premixes Luna T, Miravis P	7(1-4) + 9, 12	YES *FRAC 7 not tested alone since 2021	YES
E.g. Rampart	P07	NO	YES
Oso + Rampart	19, P07	NO	YES
Omega (a.i. fluazinam)	29	**YES - Best**	YES

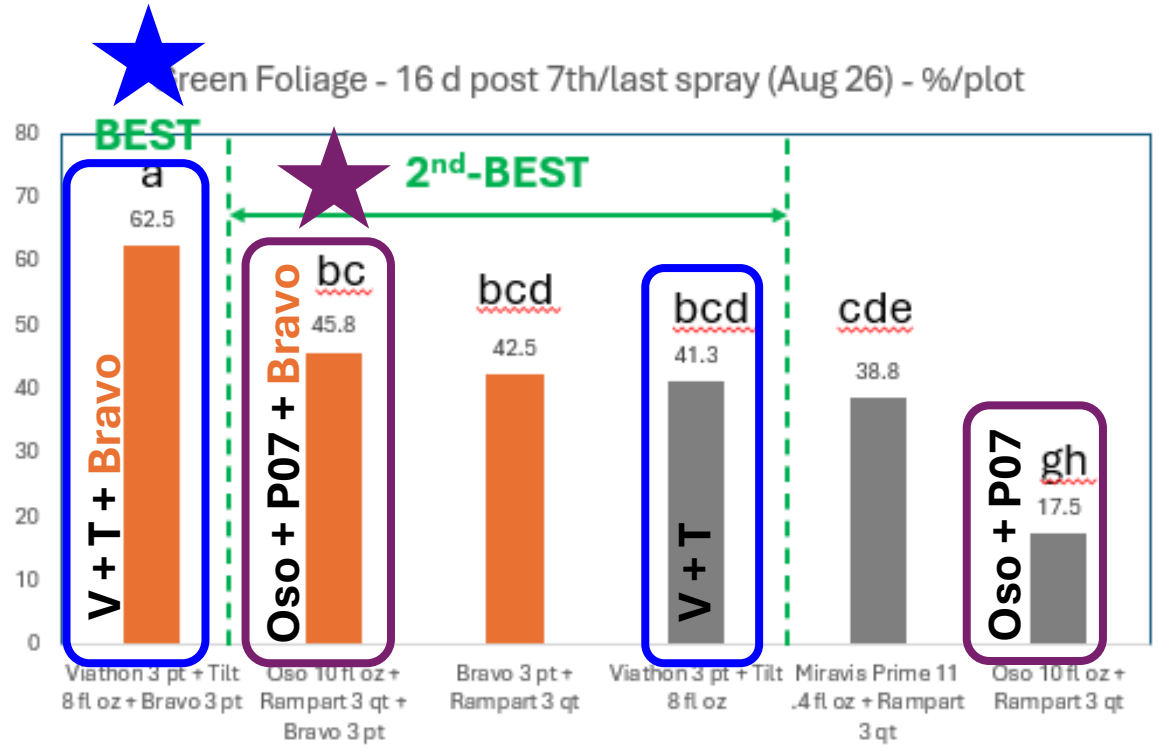
2024 Best Treatments in On-Farm Trials for SLB and BLB

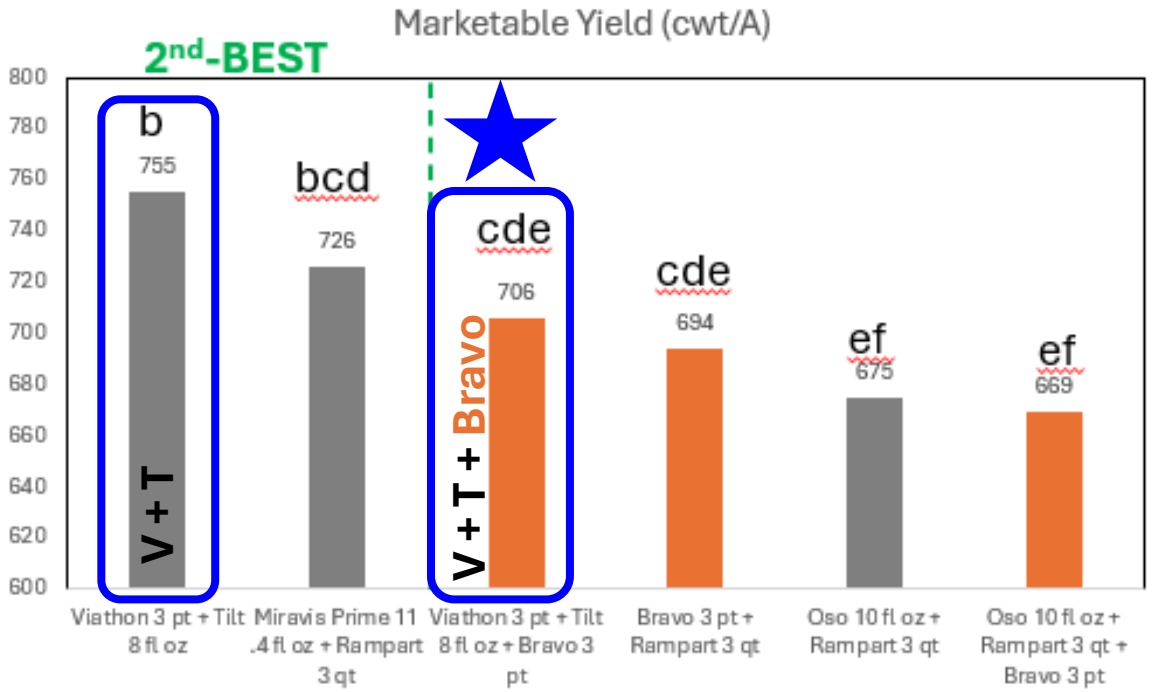
Treatment Product and Rate/A	FRAC group	BLB halo lesions	BLB necrotic spots	SLB target spots	SLB sporulation on necrotic leaf tissue	Preventing Leaf Dieback	Yield
Proline 5.7 fl oz[1]	3g	Fail	BEST! Excellent	BEST! Excellent	Fail	BEST! Excellent	BEST! Excellent
Viathon 3 pt + Tilt 8 fl oz + Bravo 3 pt	3c + P07b 3a M5	Fair	BEST! Excellent	BEST! Excellent	BEST! Fair	BEST! Excellent	Mediocre[2]
Miravis Prime 11.4 fl oz + Rampart 3 qt	7(4) + 12 P07a	BEST! VG	2nd-BEST VG	Moderate Fair-Poor	Moderate Fair	Good	2nd-BEST
Luna Tranquility 16 fl oz + Cannonball 7 oz[3]	7(1) + 9 12	Fair	2nd-BEST VG	2nd BEST VG	Best! Fair	Poor	2nd-BEST
Bravo 3 pt + Oso 10 fl oz + Rampart 3 qt	M5 19 P07	BEST! VG	2nd-BEST VG	Fair	Fair	Good	Fair-Poor[2]

[1] Proline not labeled in onion. [3] Cannonball not labeled for foliar application. Switch (9 + 12) may be used instead.

[2] Due to yield drag from Bravo

Complexity #3: Too Much Bravo Can Drag Yield





V + T + Bravo had significantly greener/healthier foliage than **V + T**.

Oso + P07 + Bravo had significantly healthier foliage than **Oso + P07**.

V + T + Bravo had significantly 6.5% (= 49 cwt/A) lower yield than **V + T.**

Treatments with Bravo had significantly less yield than best treatments.

Complexity #3: Too Much Bravo Can Drag Yield

- In this trial, treatments were applied for 7 consecutive weeks.
  - Bravo 3 pt/A x 7 apps = **21 pt/A** (1 pt over the labeled maximum use per season rate).
- In a study in Florida using 'Texas Early Grano 506' onion variety (Stoffella & Sonara, 1982):
  - 10 weekly apps of Bravo 2 pt (= total **20 pt**) significantly reduced bulb weight by **44%**
  - 5 bi-weekly apps of Bravo 2 pt (= total **10 pt**) significantly reduced bulb weight by **27%.**
- **Recommendation:** Growers strive for **no more than 10-12 pt/A of Bravo per season**, if possible, to avoid yield drag.

Complexity #4: Use As Much FRAC P07 as Possible?

% Green Foliage/plot – 16 d post 7th/last spray (Aug 27) – Elba, 2024

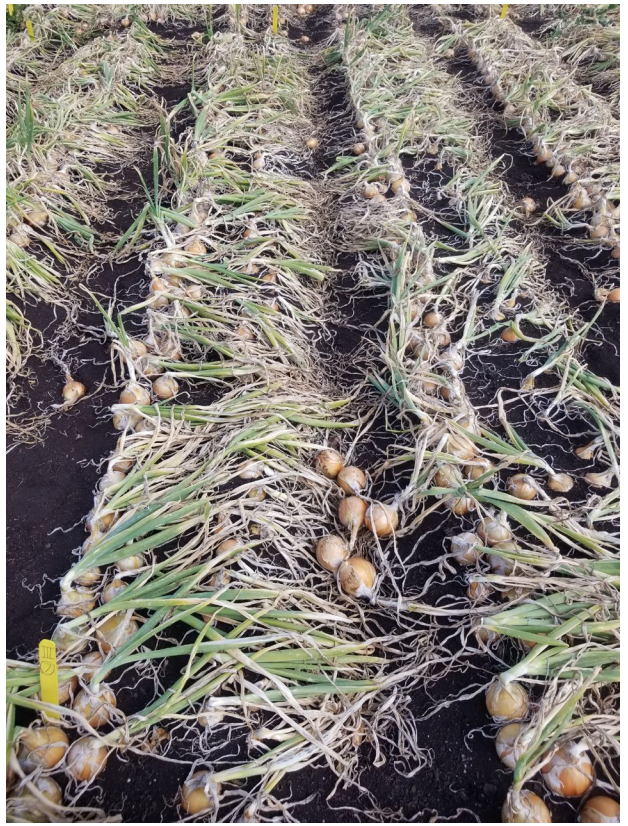
P07 3x

32.5% fg

P07 5x

41.3% b-f

P07 7x



51.3% b

~10% improvement for every 2 weeks earlier/more P07 applied.

Hoepting et. al., 2023

Complexity #4: Use As Much FRAC P07 as Possible?

P07 3x

Program:
V + T, P07 last 3x
A: M5 1.5 pt , M3 2 qt
B: M5 3 pt
C: 19
D: 7(1) + 9, 12
E: V + T + Bravo
(3c + P07, 3a, M5)
F: MP + Oso + Ramp.
7(4) + 12, 19, P07
G: V + T + Bravo
(3c + P07, 3a, M5)

P07 5x

Program:
V + T, P07 5x
A: M5 1.5 pt , M3 2 qt
B: M5 3 pt
C: 19 + P07
D: 7(1) + 9, 12, P07
E: V + T + Bravo
(3c + P07, 3a, M5)
F: MP + Oso + Ramp.
7(4) + 12, 19, P07
G: V + T + Bravo
(3c + P07, 3a, M5)

P07 7x

Program:
V + T, P07 7x
A: M5 1.5 pt , M3 2 qt, P07
B: M5 3 pt, P07
C: 19 + P07
D: 7(1) + 9, 12, P07
E: V + T + Bravo
(3c + P07, 3a, M5)
F: MP + Oso + Ramp.
7(4) + 12, 19, P07
G: V + T + Bravo
(3c + P07, 3a, M5)

Part of season-long fungicide programs

Complexity #4: Use As Much FRAC P07 as Possible?

What is risk of fungicide resistance to FRAC P07?

- In oomycetes, **phosphonate has two modes of action:**
  1. **Direct fungicidal activity** on mycelial growth and spore formation
     - Disease control increases as rate applied/plant tissue concentration increases.
  2. **Plant defense activator**
     - Often works best when phosphonate is applied prior to disease onset or under low disease pressure, and at lower rates (known as “priming”).
     - Multiple and complex pathways are involved in this mode of action.
- FRAC rated P07 as Low risk (due to plant defense MOA).

Complexity #4: Use As Much FRAC P07 as Possible?

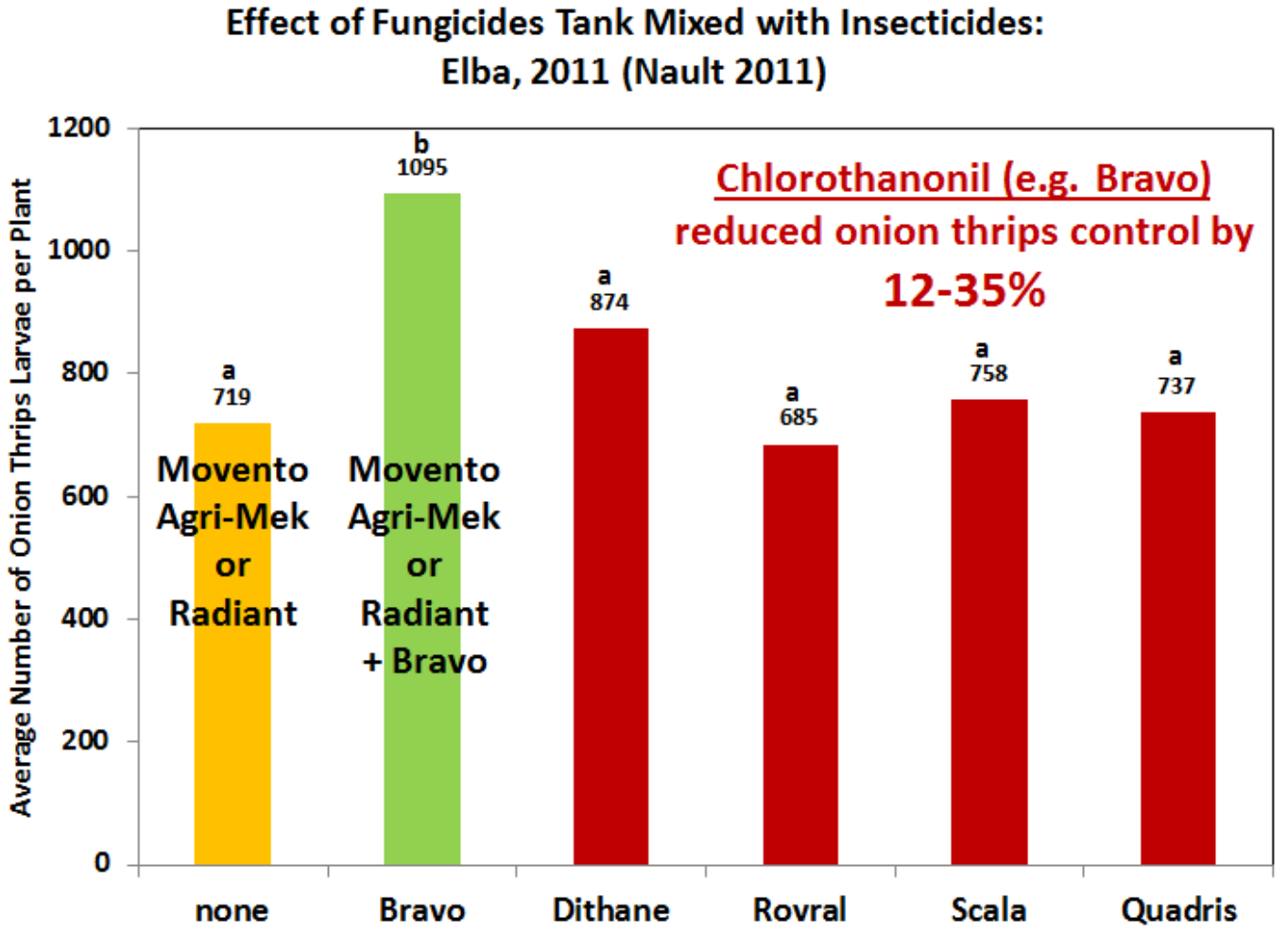
What is risk of fungicide resistance to FRAC P07?

- We suspect that its MOA on SLB and BLB is via direct fungicidal properties in NY.
  - Risk for fungicide resistance many be higher?
- FRAC P07 Recommendations:
  - Last 4 apps should include FRAC P07 (last 3 was not enough).
  - **Aim for no more than 5 apps of FRAC P07**
  - Maximum No. of high-rate apps is 7 for Reveille, Rampart does not have a limit
- Beginning to monitoring SLB fungicide resistance to FRAC P07 in 2025.

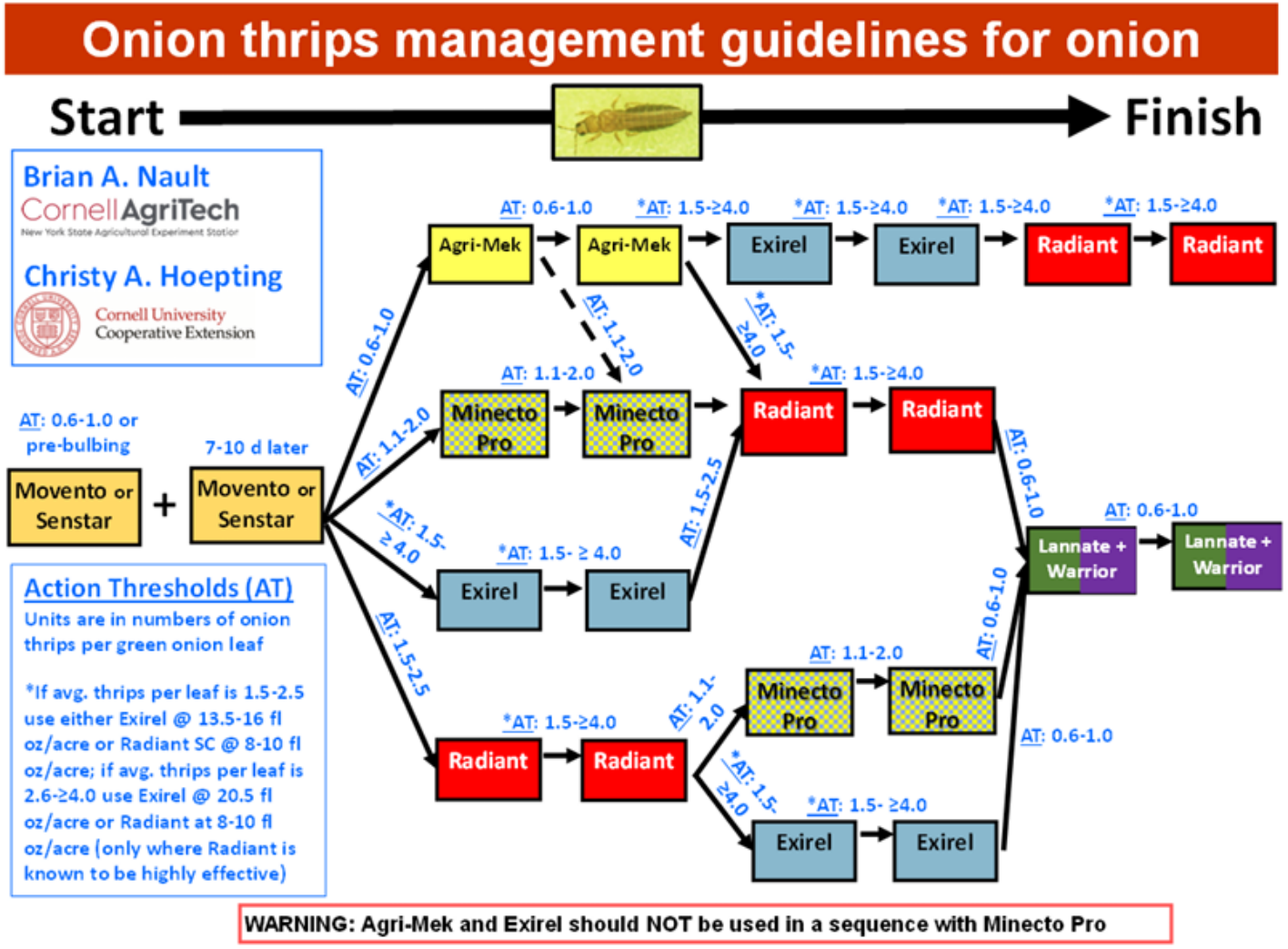
Complexity #5: Bravo Incompatible with Onion Thrips Insecticides

Predominantly a problem with insecticides with **translaminar** and **systemic** activity.

- Do not co-apply Bravo with:
  - Movento/Senstar
  - Agri-Mek
  - Radiant
  - Exirel
  - Minecto Pro

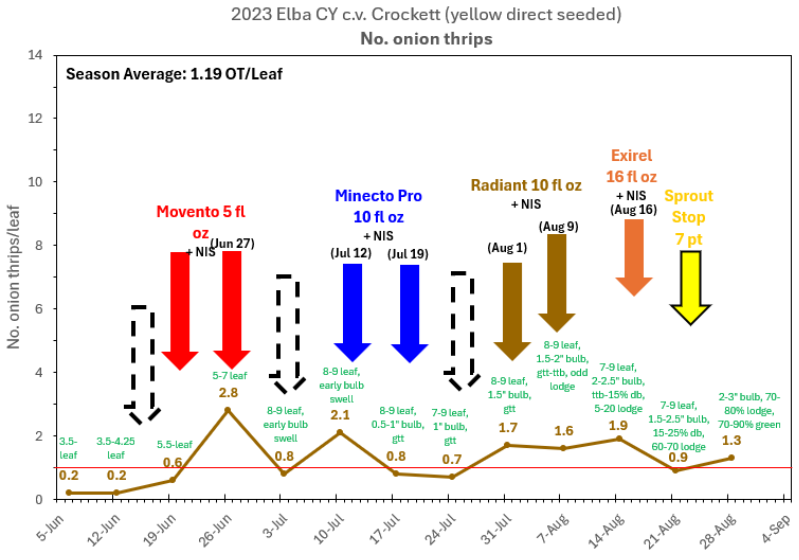


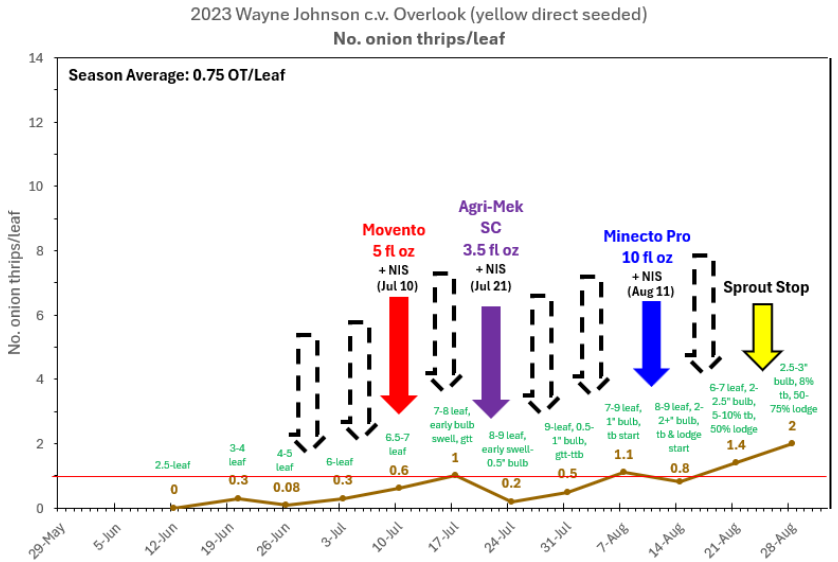
Complexity #5: Bravo Incompatible with Onion Thrips Insecticides

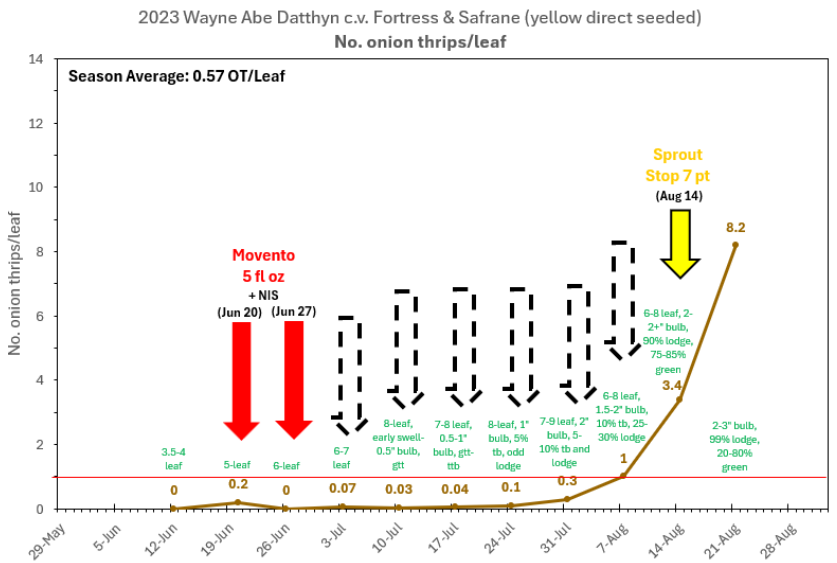


Complexity #5: Bravo Incompatible with Onion Thrips Insecticides

Onion Scouting Program, 2023: Weekly onion thrips pressure and insecticide use







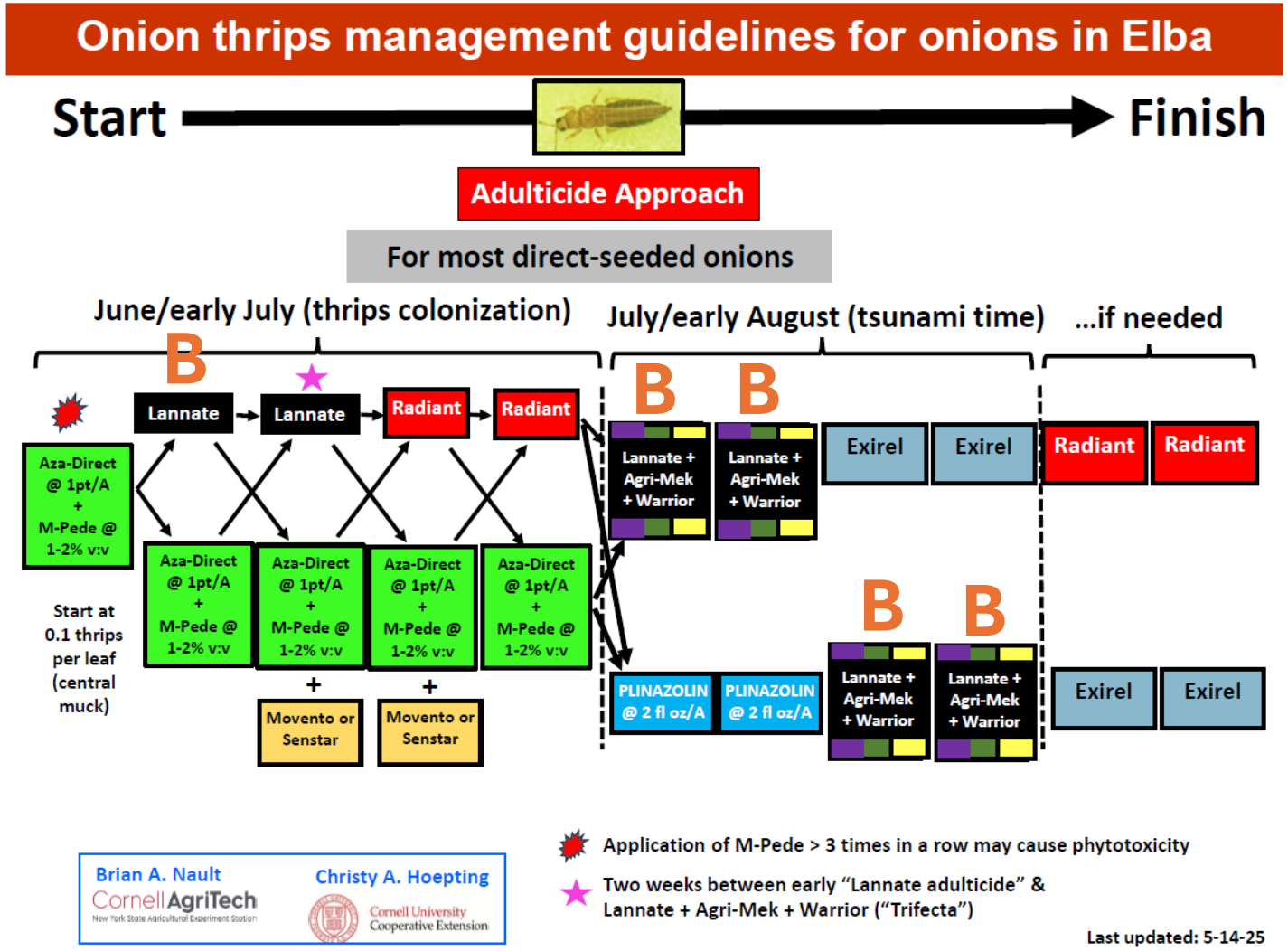
Opportunities to apply Bravo, thrips below spray threshold

Complexity #5: Bravo Incompatible with Onion Thrips Insecticides

High thrips pressure & IYSV in Elba:

- Control thrips early with adulticide from 0.1 OT/leaf through "ride with Movento"
- Radiant "slipping"
- New hammer: "Trifecta" – Lannate + Agri-Mek + Warror

B: Bravo can be used



Brian A. Nault
Cornell AgriTech
New York State Agricultural Experiment Station
Christy A. Hoepting
Cornell University Cooperative Extension

Complexities 1-5: 2025 Spray Program

Week	Date	Crop Stage	Insecticide	Fungicides Rate/A	Target Disease					FRAC Group
					BLB halo	BLB nec	SLB	Plant health	DM	
1	Jun 23	5-6 leaf	Lan + Agri	Omega 16 fl oz	E	F-P	X	P	**Yes**	29
2	Jun 30	**Early bulb swell**	Movento	Manzate Max 1.6 qt	VG	X	X	X	**Yes**	M3
3	**Jul 12**	gtt, 1" bulb	Movento	Luna Tranquility 16 fl oz + Switch 14 oz	G	G	F-G	P	No No	7(1) + 9a 9b + 12
4	**Jul 18**	**gtt**, 1.5" bulbs	--	Bravo 3 pt + Rampart 3 qt	VG	VG-G	F-P	G	No **Yes**	M5 P07a
5	Jul 26	**ttb**, 2" bulbs	Trifecta	Viathon 3 pt + Tilt 8 fl oz + Bravo 3 pt	F	E-VG	G-VG	E-VG	**Yes** No No	3c + P07b 3a M5
6	Aug 2	1" tb, 2-2+" bulbs	Trifecta	Miravis Prime 11.4 fl oz + Rampart 3 qt	G	VG-G	F-P	G	No **Yes**	7(4) + 12 P07a
7	Aug 9	2-3" bulbs, **start lodge**	--	Oso 10 fl oz + Rampart 3 qt + Bravo 3 pt	VG	VG-G	F	G	No **Yes** No	19 P07a M5
8	Aug 16	20% lodge	Exirel	Luna Tranquility 16 fl oz + Switch 14 oz + Rampart 3 qt	G	VG	G	VG	No No **Yes**	7(1) + 9a 9b + 12 P07a
9	Aug 23	10% db, **50% lodge**	Exirel	Viathon 3 pt + Tilt 8 fl oz + Bravo 3 pt	F	E-VG	G-VG	E-VG	**Yes** No No	3c + P07b 3a M5
10	Aug 30	70% lodging	--	Sprout Stop	--	--	--	--	--	--

Early Season:

- Focus on BLB halos (until mid-July)

Mid-July through August:

- Focus on SLB and BLB necrotic spots

Last 3-4 sprays:

- Focus on plant health (FRAC P07)

gtt: leaves **g**reen **t**o their **t**ips
ttb: leaves have **t**iny **t**ip**b**urn
db: leaf **d**ie**b**ack

Complexities 1-6: 2025 Spray Program

Week	Date	Crop Stage	Insecticide	Fungicides Rate/A	Target Disease					FRAC Group
					BLB halo	BLB nec	SLB	Plant health	DM	
1	Jun 23	5-6 leaf	Lan + Agri	Omega 16 fl oz	E	F-P	X	P	**Yes**	29
2	Jun 30	**Early bulb swell**	Movento	Manzate Max 1.6 qt	VG	X	X	X	**Yes**	M3
3	**Jul 12**	gtt, 1" bulb	Movento	Luna Tranquility 16 fl oz + Switch 14 oz	G	G	F-G	P	No No	7(1) + 9a 9b + 12
4	**Jul 18**	**gtt**, 1.5" bulbs	**Bravo**	+ **Bravo** qt	VG	VG-G	F-P	G	No **Yes**	M5 P07a
5	Jul 26	**ttb**, 2" bulbs	**Bravo**	Viathon 3 pt **Bravo**	F	E-VG	G-VG	E-VG	**Yes** No No	3c + P07b 3a M5
6	Aug 2	1" tb, 2-2+" bulbs	**Bravo**	Miravis Prime 11.4 fl oz + Rampart 3 qt	G	VG-G	F-P	G	No **Yes**	7(4) + 12 P07a
7	Aug 9	2-3" bulbs, **start lodge**	**Bravo**	Oso 10 fl oz + **Bravo** qt	VG	VG-G	F	G	No **Yes** No	19 P07a M5
8	Aug 16	20% lodge	Exirel	Luna Tranquility 16 fl oz + Switch 14 oz + Rampart 3 qt	G	VG	G	VG	No No **Yes**	7(1) + 9a 9b + 12 P07a
9	Aug 23	10% db, **50% lodge**	Exirel	Viathon 3 pt **Bravo**	F	E-VG	G-VG	E-VG	**Yes** No No	3c + P07b 3a M5
10	Aug 30	70% lodging	--	Sprout Stop	--	--	--	--	--	--

Opportunities to Use Bravo

- No insecticide
- Non-systemic/ translaminar insecticide
- Sometimes Bravo not used due to fungicide rotation (week #6).
- Sometimes used with insecticides (week #9)

gtt: leaves **g**reen **t**o their **t**ips
ttb: leaves have **t**iny **t**ip**b**urn
db: leaf **d**ie**b**ack

Complexities 1-6: 2025 Spray Program

Week	Date	Crop Stage	Insecticide	Fungicides Rate/A	Target Disease					FRAC Group
					BLB halo	BLB nec	SLB	Plant health	DM	
1	Jun 23	5-6 leaf	Lan + Agri	Omega 16 fl oz	E	F-P	X	P	**Yes**	29
2	Jun 30	**Early bulb swell**	Movento	Manzate Max 1.6 qt	VG	X	X	X	**Yes**	M3
3	**Jul 12**	gtt, 1" bulb	Movento	Luna Tranquility 16 fl oz + Switch 14 oz	G	G	F-G	P	No No	7(1) + 9a 9b + 12
4	**Jul 18**	**gtt**, 1.5" bulbs	--	Bravo 3 pt + Rampart 3 qt	VG	VG-G	F-P	G	No **Yes**	M5 P07a
5	Jul 26	**ttb**, 2" bulbs	Trifecta	Viathon 3 pt + Tilt 8 fl oz + Bravo 3 pt	F	E-VG	G-VG	E-VG	**Yes** No No	3c + P07b 3a M5
6	Aug 2	1" tb, 2-2+" bulbs	Trifecta	Miravis Prime 11.4 fl oz + Rampart 3 qt	G	VG-G	F-P	G	No **Yes**	7(4) + 12 P07a
7	Aug 9	2-3" bulbs, **start lodge**	--	Oso 10 fl oz + Rampart 3 qt + Bravo 3 pt	VG	VG-G	F	G	No **Yes** No	19 P07a M5
8	Aug 16	20% lodge	Exirel	Luna Tranquility 16 fl oz + Switch 14 oz + Rampart 3 qt	G	VG	G	VG	No No **Yes**	7(1) + 9a 9b + 12 P07a
9	Aug 23	10% db, **50% lodge**	Exirel	Viathon 3 pt + Tilt 8 fl oz + Bravo 3 pt	F	E-VG	G-VG	E-VG	**Yes** No No	3c + P07b 3a M5
10	Aug 30	70% lodging	--	Sprout Stop	--	--	--	--	--	--

BEST treatment:

- V + T + B
- save 1 app of this for last/2nd-last spray

2nd-BEST treatments

- MP + P07
- LT + Switch + P07
- Oso + P07 + B

gtt: leaves **g**reen **t**o their **t**ips
ttb: leaves have **t**iny **t**ip**b**urn
db: leaf **d**ie**b**ack

Complexities 1-6: 2025 Spray Program

Week	Date	Crop Stage	Insecticide	Fungicides Rate/A	Target Disease					FRAC Group
					BLB halo	BLB nec	SLB	Plant health	DM	
1	Jun 23	5-6 leaf	Lan + Agri	Omega 16 fl oz	E	F-P	X	P	**Yes**	29
2	Jun 30	**Early bulb swell**	Movento	Manzate Max 1.6 qt	VG	X	X	X	**Yes**	M3
3	**Jul 12**	gtt, 1" bulb	Movento	Luna Tranquility 16 fl oz + Switch 14 oz	G	G	F-G	P	No No	7(1) + 9a 9b + 12
4	**Jul 18**	**gtt**, 1.5" bulbs	--	**Bravo 3 pt**	VG	VG-G	F-P	G	No **Yes**	M5 P07a
5	Jul 26	**ttb**, 2" bulbs	Trifecta	Viathon 3 pt **Bravo 3 pt**	F	E-VG	G-VG	E-VG	**Yes** No No	3c + P07b 3a M5
6	Aug 2	1" tb, 2-2+" bulbs	Trifecta	Miravis Prime 11.4 fl oz + Rampart 3 qt	G	VG-G	F-P	G	No **Yes**	7(4) + 12 P07a
7	Aug 9	2-3" bulbs, **start lodge**	--	Oso 10 fl oz **Bravo 3 pt**	VG	VG-G	F	G	No **Yes** No	19 P07a M5
8	Aug 16	20% lodge	Exirel	Luna Tranquility 16 fl oz + Switch 14 oz + Rampart 3 qt	G	VG	G	VG	No No **Yes**	7(1) + 9a 9b + 12 P07a
9	Aug 23	10% db, **50% lodge**	Exirel	Viathon 3 pt **Bravo 3 pt**	F	E-VG	G-VG	E-VG	**Yes** No No	3c + P07b 3a M5
10	Aug 30	70% lodging	--	Sprout Stop	--	--	--	--	--	--

Resistance Management:

- ✔ Max 2 apps of FRAC 3
- ✔ Max 3 apps of FRAC 7
  - ✘ Ideally, Max 2.
- ✔ Max 3 apps of FRAC 19
- ✘ Aim for Max 5 apps of FRAC P07
- ✔ Aim for 10-12 pt Bravo

gtt: leaves **g**reen **t**o their **t**ips
ttb: leaves have **t**iny **t**ip**b**urn
db: leaf **d**ie**b**ack

Resources: Cornell Fungicide “Cheat Sheet”

Cornell Onion (Dry Bulb) Fungicide “Cheat Sheet” for Control of Leaf Diseases in New York, 2025

Compiled by Christy Hoepting, CCE Cornell Vegetable Program (June 2025). Results based mostly on on-farm field trials (Hoepting et al. 2024)

Product/Tank Mix and Rate/A	Active Ingredient	FRAC[1] Code[3]	FRAC[1] Risk of Fungicide Resistance Rating	Relative Performance E: Excellent; VG: Very Good; G: Good; F: Fair; P: Poor; Fail — BLB[4] halo lesions	BLB[4] necrotic spots	SLB[5] target spots	SLB sporulation of necrotic leaf tissue	SLB leaf dieback	Activity on DM[2]	Maximum Allowable/Season Rate/ Acre	Maximum Allowable/Season No. Apps (max. rate)
FRAC M5 and M3											
Bravo 3 pt[6]	chlorothalonil	M5	very low	**VG**	G	Fail	Fail-P	Fail-P	No	20 pts	6 (3 pt)
Bravo 1.5 pt	chlorothalonil	M5	very low	F	F-P	Fail	--[7]	Fail-P	No	20 pts	6 (3 pt)
e.g. Manzate Max[8]	manzozeb 1 lb	M3	very low	**VG**[8]	Fail	Fail	Fail	Fail	Yes	24 qts	10 (2.4 qt)
e.g. Manzate Max	mancozeb 3 lb	M3	very low	**VG**	Fail	Fail	Fail	Fail	Yes	24 qts	10 (2.4 qt)
FRAC 2											
Rovral 1.5 pt	iprodione	2	medium-high	G (Oswego)[9] Fail (Elba)	Fail (Wolcott) P (Elba)	Fail	Fail (Elba) P (Wolcott)	Fail (Elba) P (Wolcott)	No	7.5 pts	5 (1.5 pt)
FRAC P07											
Rampart[6]	Mono- & di- potassium salts of phosphorous acid	P07a	low	Fail	F-P	Fail-P	**VG** (Wolcott) Fail (Elba)	P	Yes	?	? (6 pt)
Reveille, etc.[6]	potassium phosphite	P07b	low	Fail	F-P	Fail-P	**VG** (Wolcott) Fail (Elba)	P	Yes	28 pt	7 (4 pt)
Bravo 3 pt + FRAC P07[6]	chlorothalonil + pot. salts of phosporous acid, or potassium phosphite	M5 P07a or, P07b	very low low low	**VG**	**VG-G**	F-P	F	G	No Yes Yes	--	6
FRAC 3											
Tilt 8 fl oz[6]	propiconazole	3a	medium	Fail	F-P	Fail	G-F	Fail	No	16 fl oz	2 (8 fl oz)
Tilt 8 fl oz + FRAC P07	propiconazole pot. salts of phosporous acid, or potassium phosphite	3a P07a or, P07b	medium low low	Fail	G	F-G	G	G-F	no yes yes	--	2
Viathon 3 pt + Tilt 8 fl oz	tebuconazole + pot. phosphite + propiconazole	3c + P07b 3a	medium + low medium medium	Fail	**VG-G**	F-G	F	G	Yes No	--	2
Viathon 3 pt + Tilt 8 fl oz + Bravo 3 pt	tebuconazole + pot. phosphite + propiconazole + chlorothalonil	3c + P07b 3a M5	medium + low medium medium very low	F	**E-VG**	**G-VG**	F	**E-VG**	Yes No No	--	2

* FRAC rates FRAC 7 as “medium-high”. Given our experience with FRAC 7 and SLB, we ranked it as “high” instead.

1 **FRAC**: Fungicide Resistance Action Committee
2 **DM**: Downy mildew. If fungicide treatment does not have activity on DM, grower may want to add a fungicide with activity on DM to tank mix.
3 **FRAC codes**. Numbers in brackets represent active ingredients that belong to different sub-classes of FRAC 7. The letters a, b, c, etc. following the FRAC 3 & P07 codes indicate different active ingredients within the same sub-class
4 **BLB**: Botrytis leaf blight. See photos for more on the difference between halo lesions and necrotic spots.
5 **SLB**: Stemphylium leaf blight. See photos for target spots and “dirty tips”. SLB has developed fungicide resistance of FRAC groups 2, 3, 7, 9 and 11 in New York muck-onion production.
6 Example trade name for products with these active ingredients; several products are available.
7 --: No trial data available to comment.
8 Mancozeb 1 lb/A only provides very good control when BLB halo pressure is low (e.g. < 3 BLB halo lesions/leaf).
9 Last trialed in 2022.

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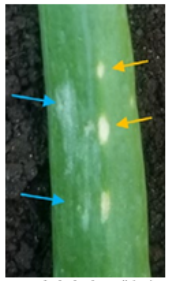
Product/Tank Mix and Rate/A	Active Ingredient	FRAC[1] Code[3]	FRAC[1] Risk of Fungicide Resistance Rating	Relative Performance E: Excellent; VG: Very Good; G: Good; F: Fair; P: Poor; Fail — BLB[4] halo lesions	BLB[4] necrotic spots	SLB[5] target spots	SLB sporulation of necrotic leaf tissue	SLB leaf dieback	Activity on DM[2]	Maximum Allowable/Season Rate/ Acre	Maximum Allowable/Season No. Apps (max. rate)
FRAC 7											
Miravis Prime 11.4 fl oz	pydiflumetofen + fludioxonil	7(4) 12	high* + low-medium	G	F	Fail	Fail-P	P	No	34.2 fl oz	3 (11.4 fl oz)
Miravis Prime 11.4 fl oz + Oso 10 fl oz	pydiflumetofen + fludioxonil + polyoxin D zinc salt	7(4) + 12 19	high* + low-medium medium	G	F	F-P	F	P-F	No No	--	3
Miravis Prime 11.4 fl oz + FRAC P07	pydiflumetofen + fludioxonil + pot. salts of phosporous acid, or potassium phosphite	7(4) + 12 P07a or, P07b	high* + low-medium low low	G	**VG-G**	F-P	F	G	No Yes Yes	--	3
Luna Tranquility 16 fl oz + Switch 62.5WG	fluopyram + pyrimethanil + cyprodinil + fludioxonil	7(1) + 9a 9b + 12	high* + medium medium + low-medium	G	G	F	G	P	No No	--	3
FRAC 29, 12 and 19											
Omega 16 fl oz	fluazinam	29	low	E	F-P	Fail	Fail	P	Yes	96 fl oz	6 (16 fl oz)
Cannonball 7 oz[10]	fludioxonil	12	low-medium	Fail	Fail-P	P	Fail-P	P-Fail	No	--	--
Oso 10 fl oz	polyoxin D zinc salt	19	medium	Fail	Fail	inconsistent	inconsistent	Fail	no	--	7 (10 fl oz)
Oso 10 fl oz + FRAC P07	polyoxin D zinc salt + pot. salts of phosporous acid, or potassium phosphite	19 P07a or, P07b	medium low low	Fail	F	F	F	P	No Yes Yes	--	6
Oso 10 fl oz + Bravo 3 pt + FRAC P07	polyoxin D zinc salt + chlorothalonil + pot. salts of phosporous acid, or potassium phosphite	19 M5 P07a or, P07b	medium very low low low	**VG**	**VG-G**	F	F	G	no no yes yes	--	6

* FRAC rates FRAC 7 as “medium-high”. Given our experience with FRAC 7 and SLB, we ranked it as “high” instead.

10 Not labeled in onion for foliar use. Included in this sheet to demonstrate efficacy of FRAC 12 on BLB and SLB.



BLB halo lesions (blue) and **BLB necrotic spots** (yellow).

SLB sporulation of necrotic leaf tips, **“dirty tips”**.

Tan, black and purple **SLB target spots**.

Photos by Christy Hoepting, CCE Cornell Vegetable Program

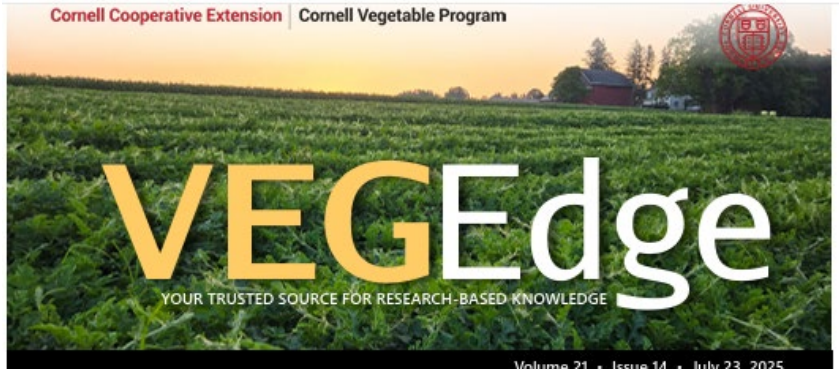
Cornell Cooperative Extension

2025 Cornell Onion (Dry Bulb) Fungicide “Cheat Sheet” for Control of Leaf Diseases in New York (compiled July 2025)

Updated annually in June, available on CVP website

Weekly Spray Recommendations Through Onion Scouting Program
Spray Decisions at Muck Donut Hour

Questions?



2025 Onion Fungicide Recommendations for Managing Botrytis Leaf Blight (BLB) Necrotic Spots and Stemphylium Leaf Blight (SLB) and 2024 Research Highlights

Christy Hoepting, CCE Cornell Vegetable Program, and Frank Hay, Cornell AgriTech, Plant Pathology and Plant Microbe-Biology

2025 Fungicide Recommendations for BLB and SLB in Onion

- Start BLB necrotic spot/SLB fungicide spray program with treatments that have at least "Fair" to "Good" activity (as opposed to "Poor" activity) at early bulb swell/0.5" bulbs (e.g. with 2nd Movento in last week of June).
  - Oso/Bravo + FRAC P07
  - Miravis Prime + FRAC P07
  - Luna Tranquility + Switch

Viathon + Tilt vs. Tilt + FRAC P07 for SLB, BLB Necrotic Spots and Plant Health

Christy Hoepting, Cornell Cooperative Extension, Cornell Vegetable Program

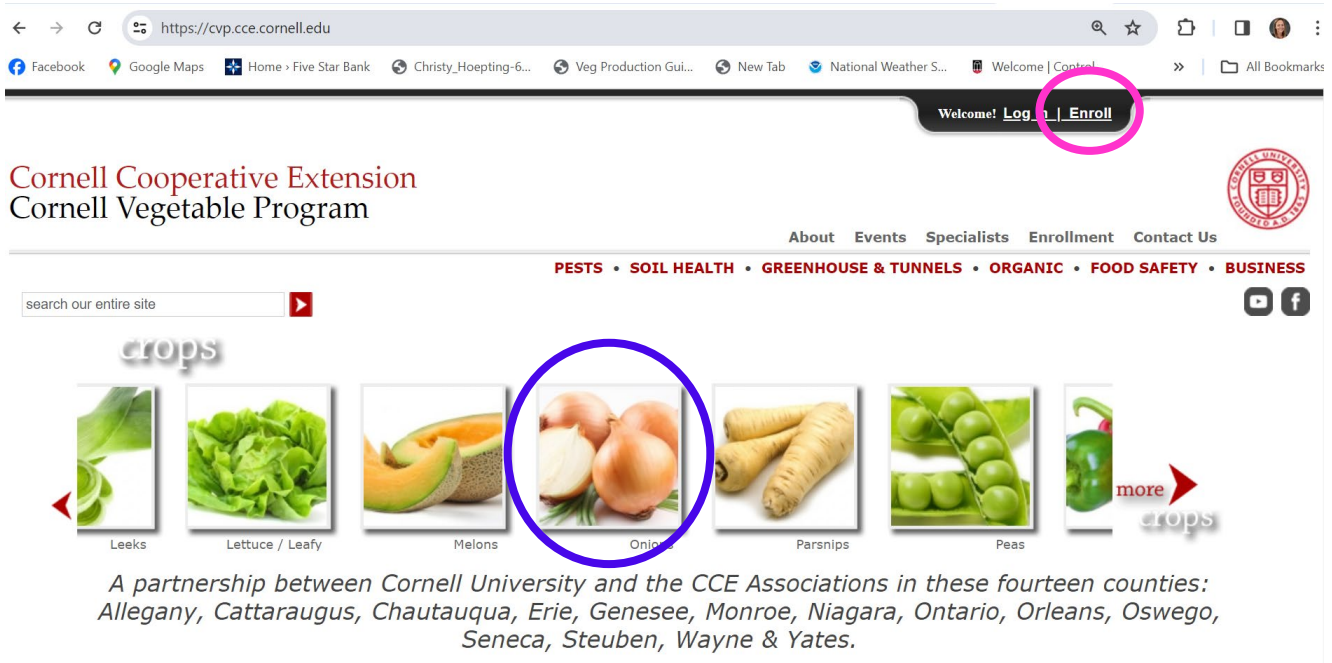
In 2023 and 2024 on-farm fungicide trials for control of Botrytis leaf blight (BLB) necrotic spots and Stemphylium leaf blight (SLB), Viathon 3 pt/A + Tilt 8 fl oz + Bravo 3 pt was the best treatment in the trial. Bravo has good activity on BLB necrotic spots, which is why it is better than Viathon + Tilt. The question is, is Viathon + Tilt (FRAC 3c + P07, 3a) better than Tilt (3a) + FRAC P07? In other words, does FRAC 3c have any activity on SLB, BLB necrotic spots or plant health?

Plan Ahead: How Much Bravo and FRAC P07 Fungicides Do You Want to Use for Managing BLB and SLB in Onion?

Christy Hoepting, CCE Cornell Vegetable Program, and Frank Hay, Dept. of Plant Pathology, Cornell AgriTech

The results from the 2024 on-farm onion (c.v. Bradley) fungicide trial for Botrytis leaf blight (BLB) and Stemphylium leaf blight (SLB) in Elba showed a yield drag in treatments with Bravo despite very good plant health/green foliage, and that the more FRAC P07 fungicide that could be used in a seasonal fungicide spray program, the better. But what is the risk of SLB developing fungicide resistance to FRAC P07? As many muck onion growers are in the middle of their fungicide spray programs, they need to decide how much Bravo and FRAC P07 fungicide they want to use and plan the rest of their fungicide spray program accordingly to not exceed their desired maximum use rates.

https://cvp.cce.cornell.edu/



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