

Efficacy Trials 2020

Srdjan Acimovic, Ph. D.
Senior Extension Associate

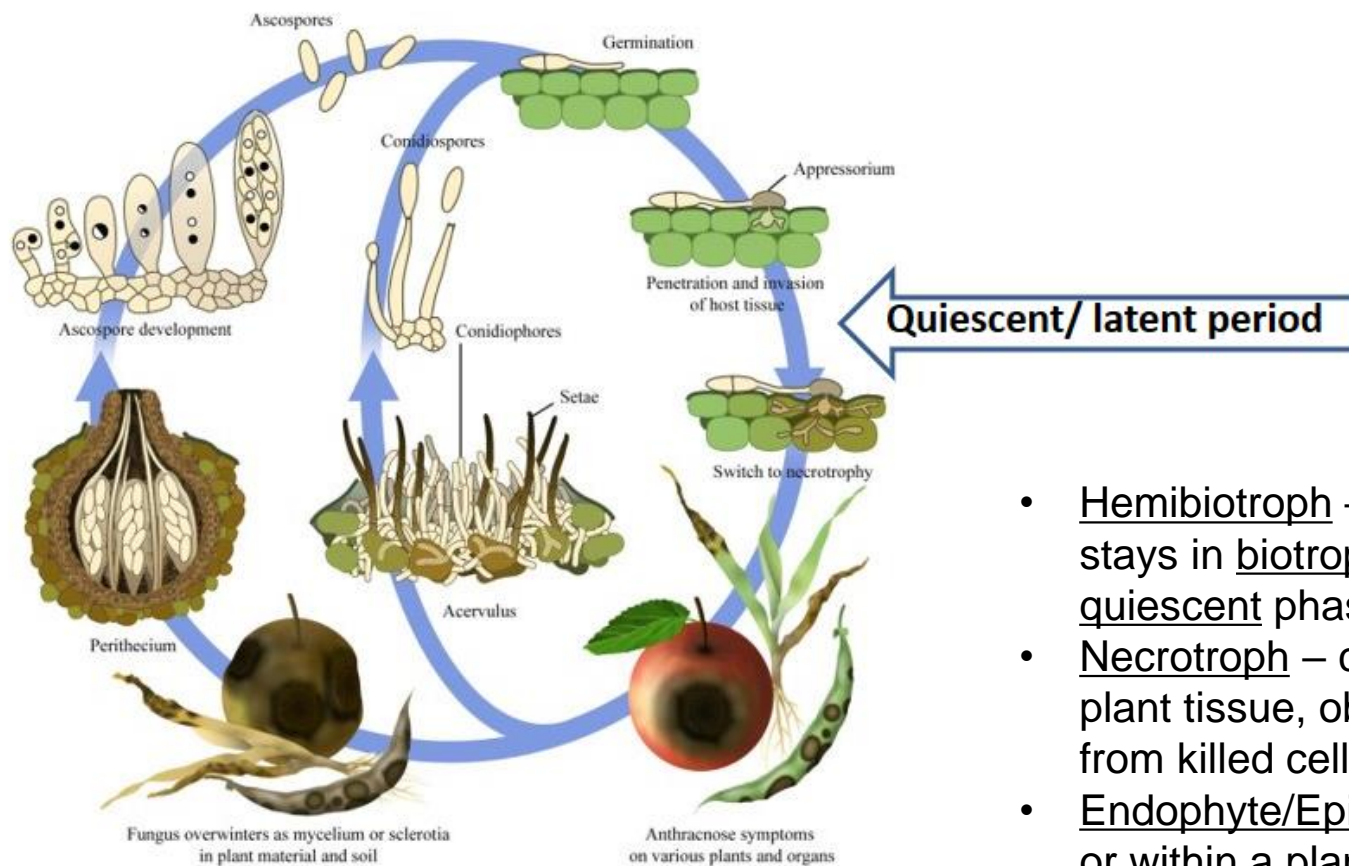
***Webinar at HVRL, Highland NY
5 March 2021***

Outline

- *Colletotrichum* Species Causing Apple Bitter Rot - Distribution, Habitat, Management
- *Diplocarpon coronariae* – Marssonina Leaf and Fruit Blotch an Emerging problem in NY
- Efficacy Trials From the Hudson Valley 2020: Apple Scab, Cedar Apple/Quince Rust, SB&FS, Bitter Rot, Fire Blight

Bitter Rot Life Cycle & Lifestyles

- Da Silva et al. 2017 -

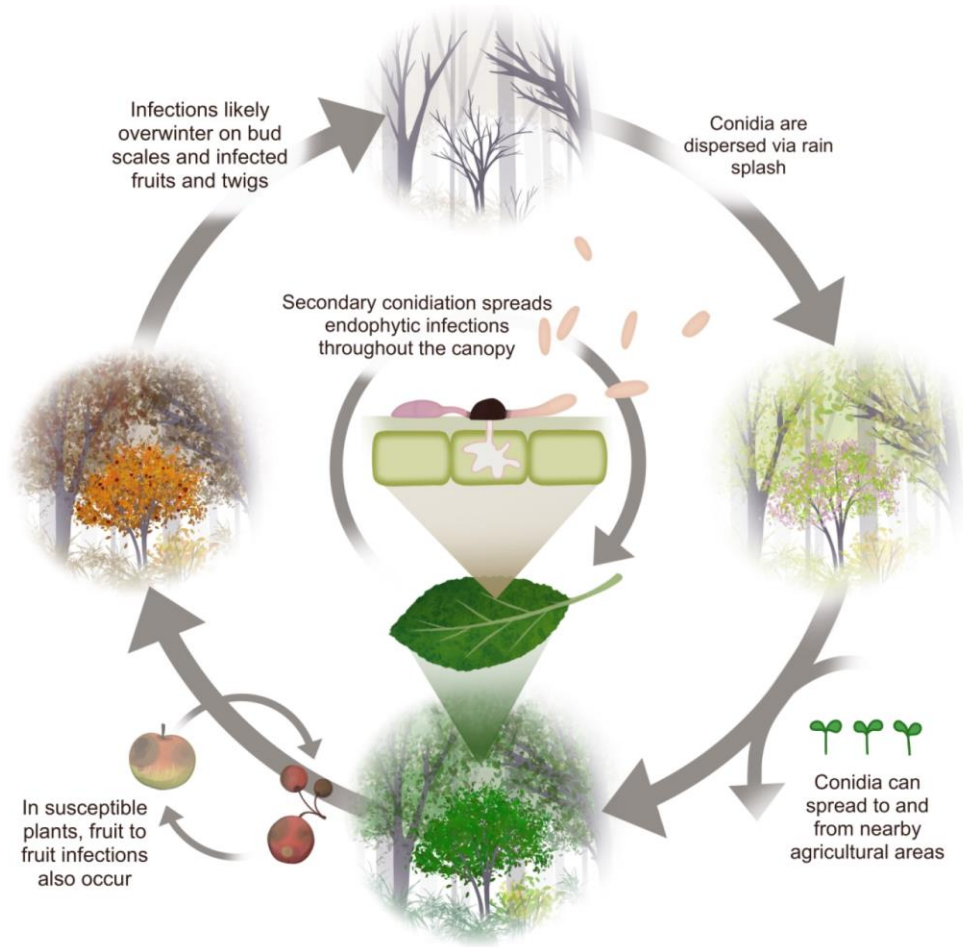


- Hemibiotroph – penetrates and stays in biotrophic, latent or quiescent phase
- Necrotroph – colonize living plant tissue, obtain nutrients from killed cells.
- Endophyte/Epiphyte – lives on or within a plant for part of its life.

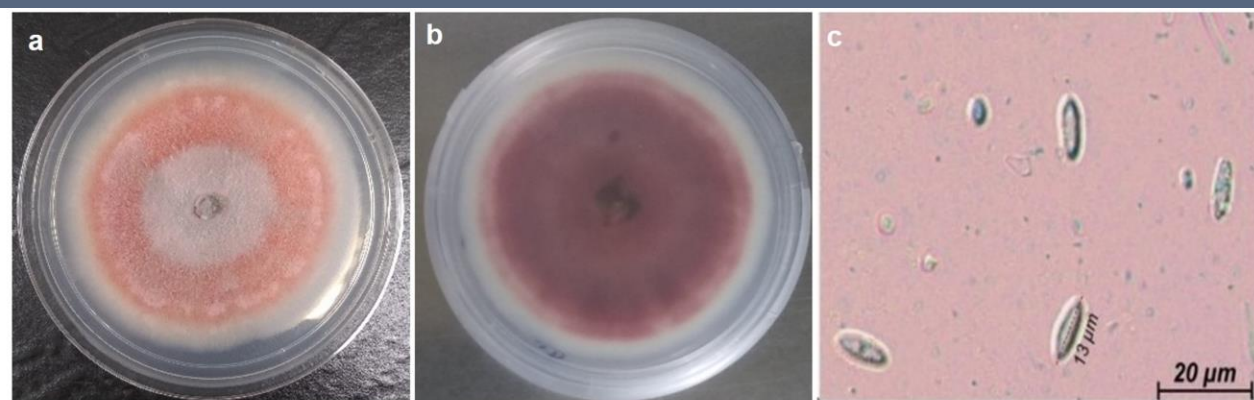


C. fioriniae Infection Cycle

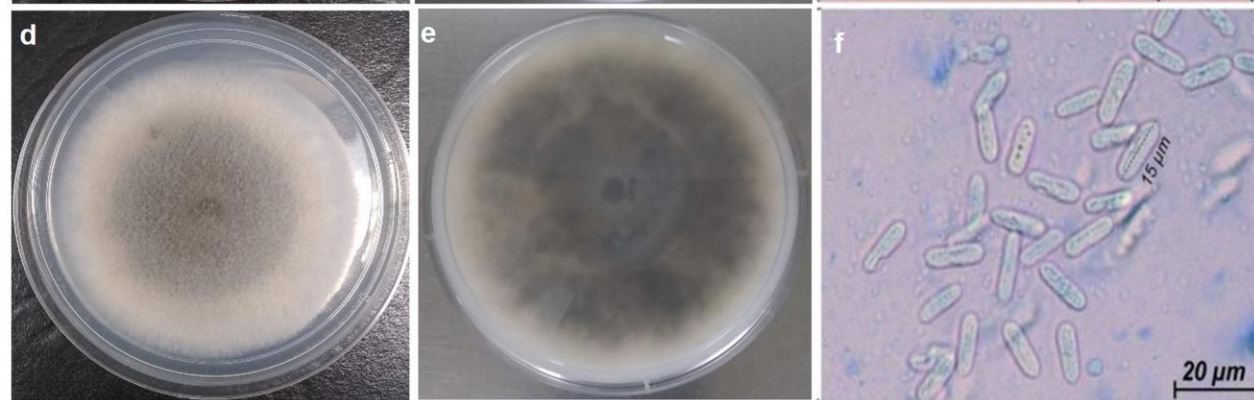
- Martin & Peter 2020 -



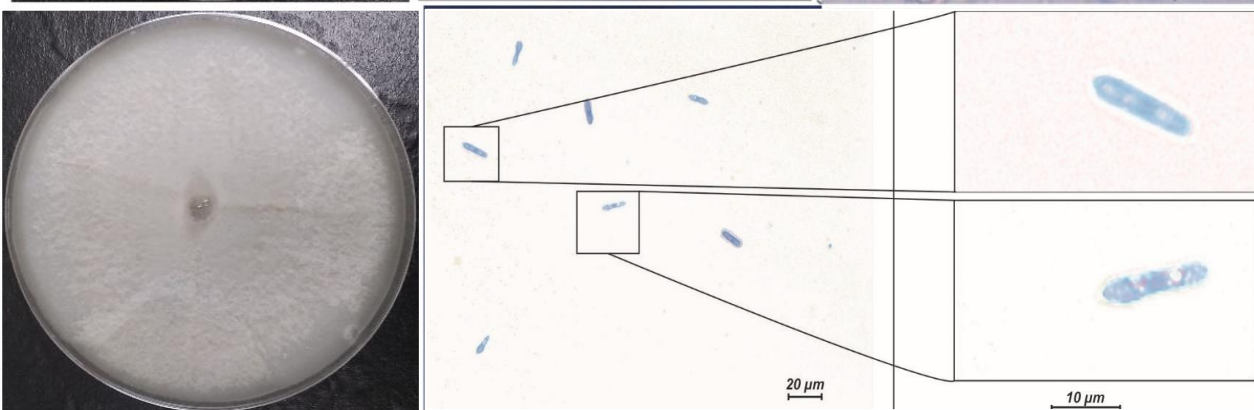
Morphology of Isolates from NY



60% *C. fioriniae* in CAS Complex

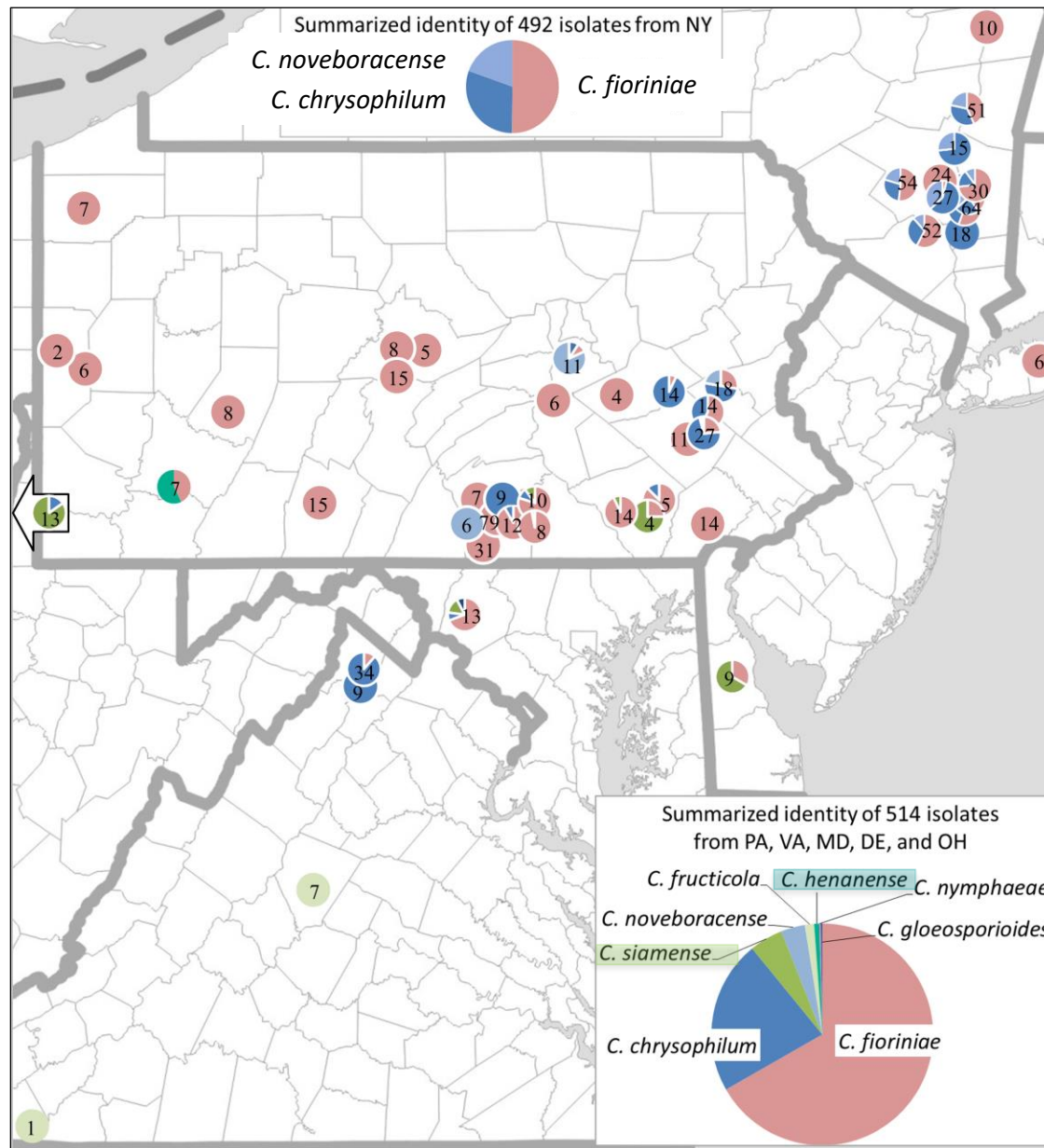


25% *C. chrysophilum* in CGS Complex



12.5%? *C. noveboracense* sp. nov. in CGS Complex

Geographical Distribution of *Colletotrichum* spp.



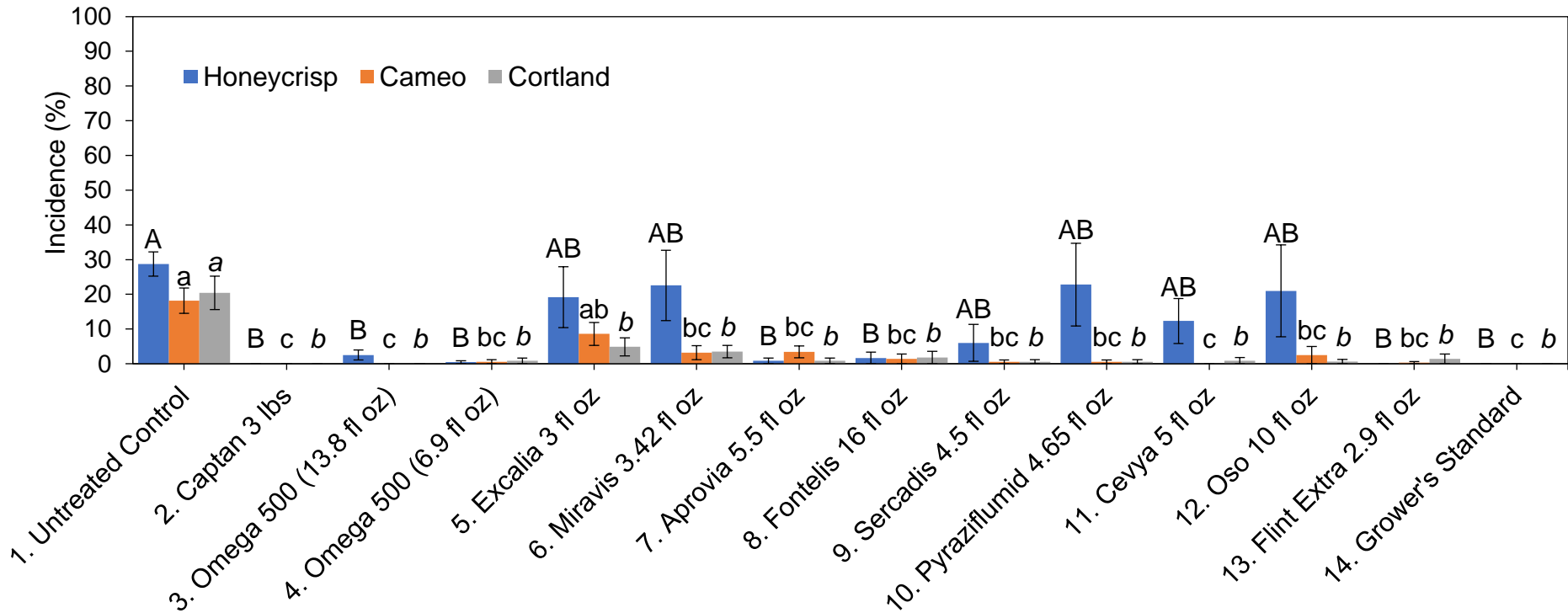
Acimovic et al. 2020
Fruit Quarterly

Martin et al. 2021
Phytopathology

1. *C. fioriniae* Bitter Rot Trial 2020

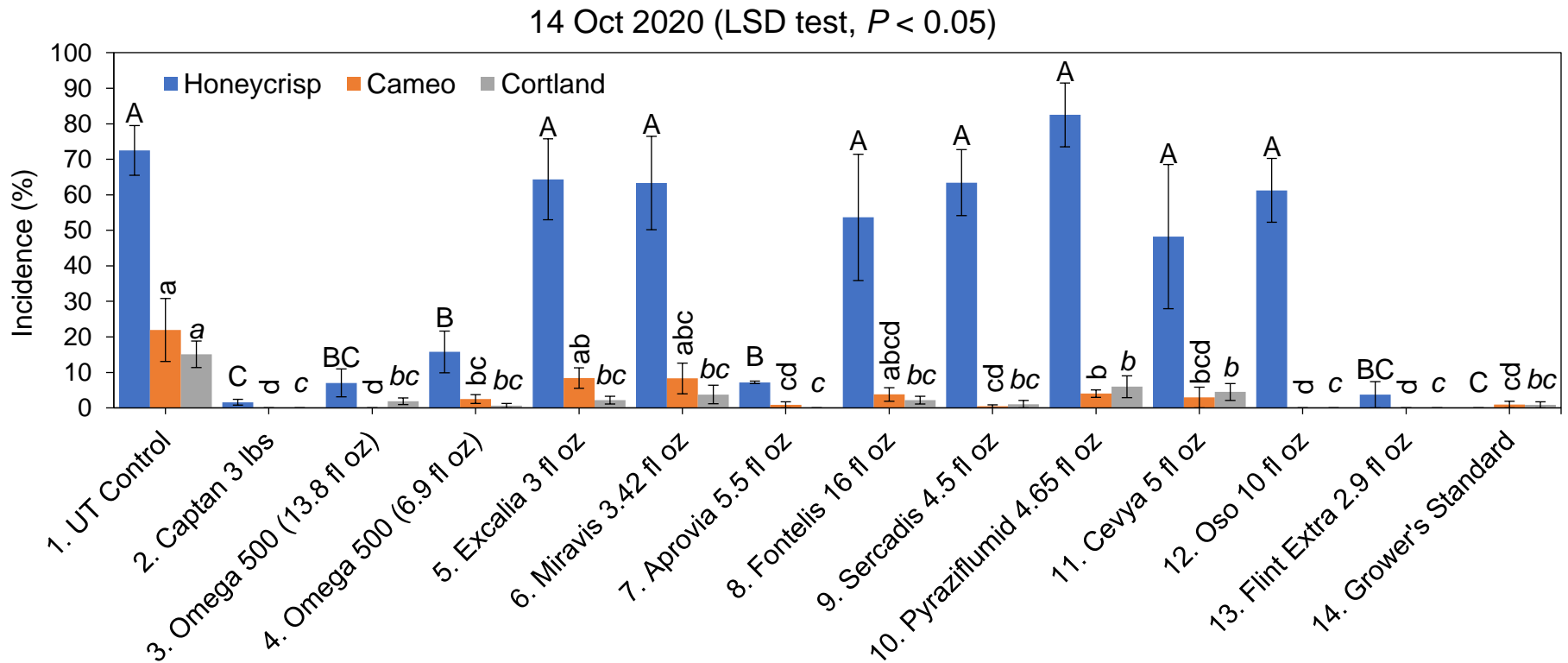
- Treatments started 4 June
- Inoculation 5 June (Honeycrisp, Cortland)
- Inoculation 7 July (Cameo)
- Jun 4, 13
- Jul 6, 21
- Aug 3, 20
- Sep 3
- Oct 1

9 Sep 2020 (Tukey's test, $P < 0.05$)



1. *C. fioriniae* Bitter Rot Trial 2020

- Treatments started 4 June
- Inoculation 5 June (Honeycrisp, Cortland)
- Inoculation 7 July (Cameo)
- Jun 4, 13
- Jul 6, 21
- Aug 3, 20
- Sep 3
- Oct 1



Acimovic et al. 2020, *Fruit Quarterly*, Winter 2020



Publications

www.nature.com/scientificreports

SCIENTIFIC
REPORTS

nature research

There are amendments to this paper

OPEN

Identification and characterization of *Colletotrichum* species causing apple bitter rot in New York and description of *C. noveboracense* sp. nov.

Fatemeh Khodadadi¹, Jonathan B. González², Phillip L. Martin³, Emily Giroux⁴, Guillaume J. Bilodeau⁴, Kari A. Peter³, Vinson P. Doyle⁵ & Srđan G. Ćimović^{1✉}

Apple bitter rot caused by *Colletotrichum* species is a growing problem worldwide. *Colletotrichum* spp. are economically important but taxonomically un-resolved. Identification of *Colletotrichum* spp. is critical due to potential species-level differences in pathogenicity-related characteristics. A 400-isolate collection from New York apple orchards were morphologically assorted to two groups, *C. acutatum* species complex (CASC) and *C. gloeosporioides* species complex (CGSC). A sub-sample of 44 representative isolates, spanning the geographical distribution and apple varieties, were assigned to species based on multi-locus phylogenetic analyses of *nrITS*, *GAPDH* and *TUB2* for CASC, and *ITS*, *GAPDH*, *CAL*, *ACT*, *TUB2*, *APN2*, *ApMat* and *GS* genes for CGSC. The dominant species was *C. fioriniae*, followed by *C. chrysophilum* and a novel species, *C. noveboracense*, described in this study. This study represents the first report of *C. chrysophilum* and *C. noveboracense* as pathogens of apple. We assessed the enzyme activity and fungicide sensitivity for isolates identified in New York. All isolates showed amyolytic, cellulolytic and lipolytic, but not proteolytic activity. *C. chrysophilum* showed the highest cellulase and the lowest lipase activity, while *C. noveboracense* had the highest amylase activity. Fungicide assays showed that *C. fioriniae* was sensitive to benzovindiflupyr and thiabendazole, while *C. chrysophilum* and *C. noveboracense* were sensitive to fludioxonil, pyraclostrobin and difenoconazole. All species were pathogenic on apple fruit with varying lesion sizes. Our findings of differing pathogenicity-

One Disease Many Causes: The Key *Colletotrichum* Species Causing Apple Bitter Rot in New York, Pennsylvania and Virginia, Their Distribution, Habitats and Management Options

Srđan G. Ćimović¹, Phillip L. Martin², Fatemeh Khodadadi¹, Kari A. Peter²

¹Section of Plant Pathology and Plant Microbe Biology, Cornell University, Cornell University's Hudson Valley Research Laboratory, Highland, NY, USA | ²Department of Plant Pathology and Environmental Microbiology, The Pennsylvania State University, Fruit Research and Extension Center, Biglerville, PA, USA

Keywords: Bitter rot, *Colletotrichum* species, fungicides, Honeycrisp, Mid-Atlantic region

Apple bitter rot is a widespread disease in the East coast and Midwest states of the USA, occurring as far north as Ontario, Canada (Sutton et al. 2014; Celetti 2016). It has been known from the late 1800s to plant pathologists in the U.S., who reported that bitter rot is a destructive disease that can infect apples during any period of the season when hot, humid weather prevails (Alwood 1894; Burrill 1907). Burrill (1907) estimated losses to apple bitter rot in the U.S. to \$276 million a year, expressed in today's dollar value (CPI Inflation Calculator). In New York (NY), apple fruit losses to bitter rot usually range between 14 to 25%, but in very wet years can reach 60% in poorly protected conventional orchards and up to 100% in organic orchards (Ćimović 2018; Iungerman 2013). The most affected cultivars in NY from 2017 to 2019 were Honeycrisp, Gala, Fuji, Empire, McIntosh, Enterprise, Idared and Crimson Crisp. Losses in NY in 2017 were up to 80% on Asian pear and between 2 to 10% on European pear (Pavlović et al. 2019). In 2018, losses to bitter rot in Pennsylvania (PA) ranged from 5 to 100%, with cv. Honeycrisp and Empire most affected (Peter, personal observa-

tion). Management strategies can differ significantly among these species and species complexes (Rosenberger 2016).

Colletotrichum species in southeastern US and Brazil can also cause a leaf disease called Glomerella leaf spot (GLS) which can rapidly defoliate Golden Delicious and Gala trees, although Pink Lady, Jonagold, Goldrush, Pristine and Granny Smith can also be severely infected (González et al. 2006; Rosenberger 2012; Velho

This research was supported by the New York Apple Research and Development Program. Bitter rot will continue to be an issue for growers for the foreseeable future considering the observed climate trends and consumer demand for susceptible cultivars like Honeycrisp. Our research has shown the most common species causing this disease in the mid-Atlantic is *Colletotrichum fioriniae* but other species are also present. We have also identified the most effective fungicides to keep this troublesome disease in check.



Cornell University

Hudson Valley Research Laboratory

Preserve Efficacy of Qol Fungicides for Bitter Rot

- Resistance, SDHI -

- Mancozeb spring, Captan summer
 - Use DMI-s for powdery mildew control (Rally, Rhyme, Indar, Procure)
 - Start at TC if you had mildew last year
 - Limit Qol-s to summer and 4 applications
 - Apply Qol-s before hot summer days followed by rain
1. Captan 80 WDG 3 LB/A + Inspire Super* 12 fl oz/A
 2. Captan 3 LB/A + Prophyt** 64 FL/A
 3. Captan 3 LB/A + Topsin M** 1 LB/A
 4. Captan 2.5 LB/A + Aprovia 5.5 fl oz/A to 7 fl oz/A
 5. Captan 2.5 LB/A + Ziram 6 lbs/A (**residue a problem**)
 6. Captan 2.5 LB/A + Ferbam 76 WDG or Ferbam Granuflo 4.6 lbs/A
 7. Captan 2.5 LB/A + Omega 13.8 fl oz/A
 8. Captan 2.5 LB/A + Flint Extra 2.9 fl oz/A, Luna Sensation 4-5.8 fl oz, Sovran 4-6.4 oz
 9. Captan 3 LB/A
- *Under high pressure, DMI-s not effective
**Thiophanate-methyl, phosphites not effective
- Use Merivon or Pristine before harvest (0 days PHI)
 - Reapply 2-inch rain

***Diplocarpon coronariae* - Marssonina Leaf & Fruit Blotch**

Emerging Issues





Cornell University
Department of Plant Pathology
and Plant-Microbe Biology



Hudson Valley
Research Laboratory

Efficacy Trials From the Hudson Valley 2020: Apple Scab, Cedar Apple/Quince Rust, SB&FS, Fire Blight

S. G. Acimovic, C. Meredith, D. Raskonda, K. Lam, F. Khodadadi
R. Delgado Santander

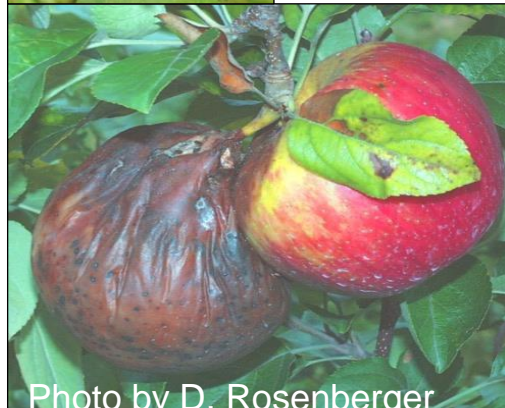
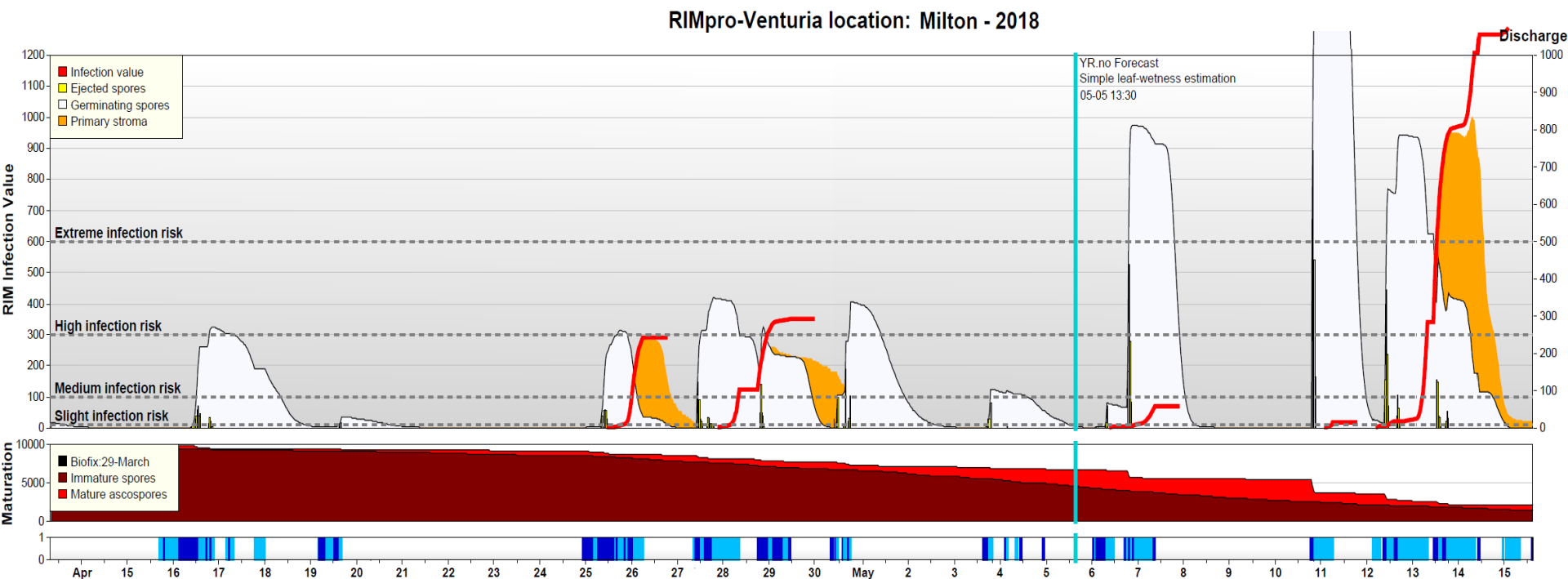


Photo by D. Rosenberger

***Apple Forum at HVRL
18 Dec 2020***

Partnership on RIMpro Apple Scab Model: NY, VT, NJ

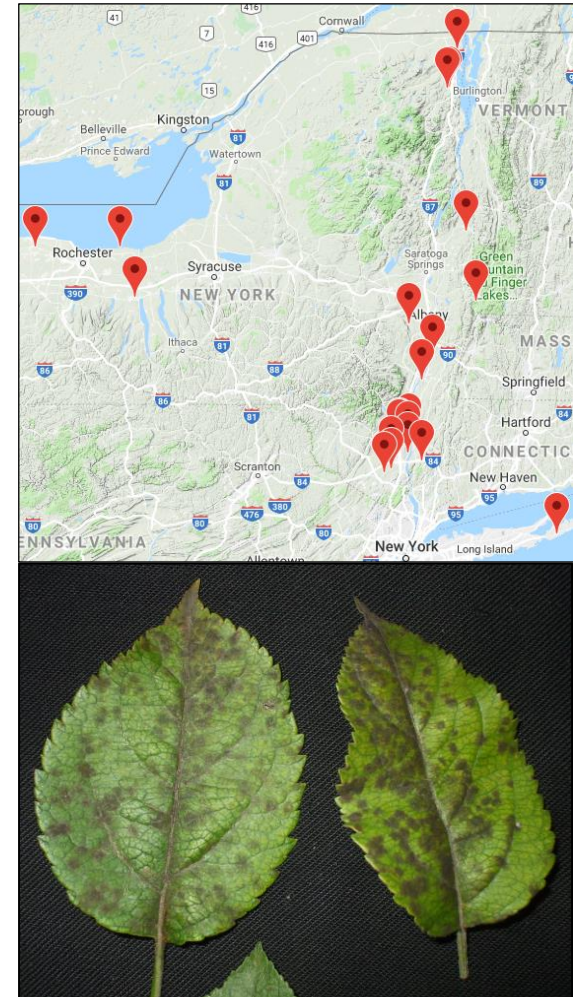
- From Netherlands -



Decision Support Network: NY, VT, NJ

- Twice a Week -

- Interpret **scab**, **fire blight**, **MLB** models with spray recommendations (e-mails):
 - 19 (2017)
 - 22 (2018)
 - 14 (2019)
 - **21 (2020)**
- Interpret **scab**, **fire blight**, **SBFS**, **MLB**, **blister spot** models & spray recs (blogs):
 - 43 (2017)
 - 44 (2018)
 - 43 (2019)
 - **48 (2020)**
- First disease symptoms
- Efficacy trial results




RIMpro Model Calibration

- Biofix Dates -

- Green tip date
- First ascospore release:
 - Highland
 - Rexford
 - Peru

ACIMOVIC LAB
FRUIT TREE PATHOLOGY AT CORNELL UNIVERSITY'S HUDSON VALLEY RESEARCH LABORATORY



HOME BACTERIAL DISEASES - SYMPTOMS FUNGAL DISEASES - SYMPTOMS FIRE BLIGHT RESEARCH PESTICIDE/CULTIVAR TRIALS
DISEASE PROFILES ABOUT S. G. ACIMOVIC CONTACT EXTENSION PUBLICATIONS VIDEOS BLOG ARCHIVES **CURRENT BLOGS**

CATEGORY ARCHIVES: 2020 GROWING SEASON

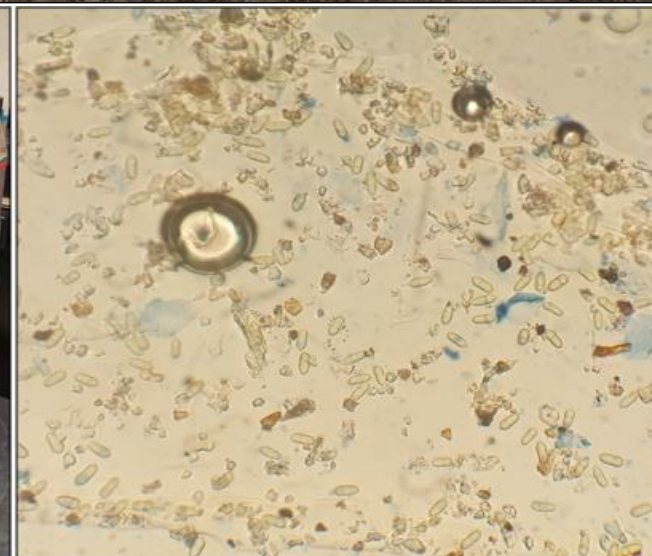
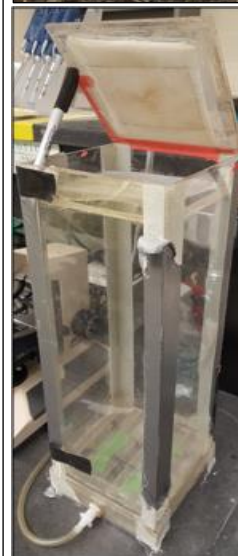
Preliminary Report on 2020 Apple Scab, Cedar Apple/Quince Rust & Fire Blight Efficacy Trials at Cornell's HVRL

by SA979 posted on SEPTEMBER 3, 2020

The part A of preliminary efficacy trial results conducted at HVRL in 2020 can be downloaded via this link (part B report on the SB&FS efficacy trial will be available near the end of 2020): Part A: Preliminary-Report-on-Fungicide-and-Bactericide-Trials-2020-HVRL

posted in 2020_GROWING_SEASON | COMMENTS OFF

Severe Thunderstorm Warning: Hail Possible in Ulster & Dutchess Counties 27 Aug, Fire Blight Risk



2. Apple Scab Trial 2020

3/22/2020 – GT
 4/6/2020 – HIG
 4/14/2020 – TC
 4/23/2020 – TC2
 4/29/2020 – PK
 4/29/2020 – EB
 5/4/2020 – MB
 5/16/2020 – PF
 5/26/2020 – 1C
 6/13/2020 – 2C
 7/7/2020 – 3C

- **Spur leaf scab**
Jul 10 – 14
- **Fruit scab**
Jul 14 – 15
- **Shoot leaf scab**
Jul 17 – Aug 4

Mefentrifluconazole Group 3 Fungicide

Cevya[®]
Fungicide

EXCALIA[™]
FUNGICIDE

Indiflin, FRAC 7

PYDIFLUMETOFEN GROUP 7 FUNGICIDE

 **Miravis**[®]

Indar[™]
75 WSP
AGRICULTURAL FUNGICIDE


Luna[®]
SENSATION

MICROTHIOL DISPERSS[™]
MICRONIZED WETTABLE SULFUR

ACTIVE INGREDIENT: Sulfur 80.00%
 OTHER INGREDIENTS: 20.00%
 TOTAL: 100.00%

USE: 1000-1000
 KEEP OUT OF REACH OF CHILDREN
CAUTION

FIRST AID

IF SWALLOWED OR IN EYES:

- Wash all contaminated clothing.
- Have skin immediately with plenty of water for 15-20 minutes.
- Get medical attention or call poison control center.

IF INHALED:

- Get medical attention or call poison control center.
- Have person stay calm and rest in fresh air.
- Do not use any breathing apparatus to breathe in the contaminated air.
- Do not use any breathing apparatus to breathe in the contaminated air.

IF SKIN CONTACT:

- Wash skin immediately with plenty of water for 15-20 minutes.
- Get medical attention or call poison control center.

FOR CHEMICAL EMERGENCY: Spill, leak, fire, exposure, or accident, call CHEMTREC 1-800-424-9300.

NET WEIGHT: POUNDS

Solvent: United Phosphorus, Inc. • 620 Franklin Avenue, Suite 400 • Jersey City, NJ 07310 U.S.A. • 1-800-424-9300



Stargus - 1×10^9 CFU
B. amyloliquefaciens
 F727, FRAC BM02

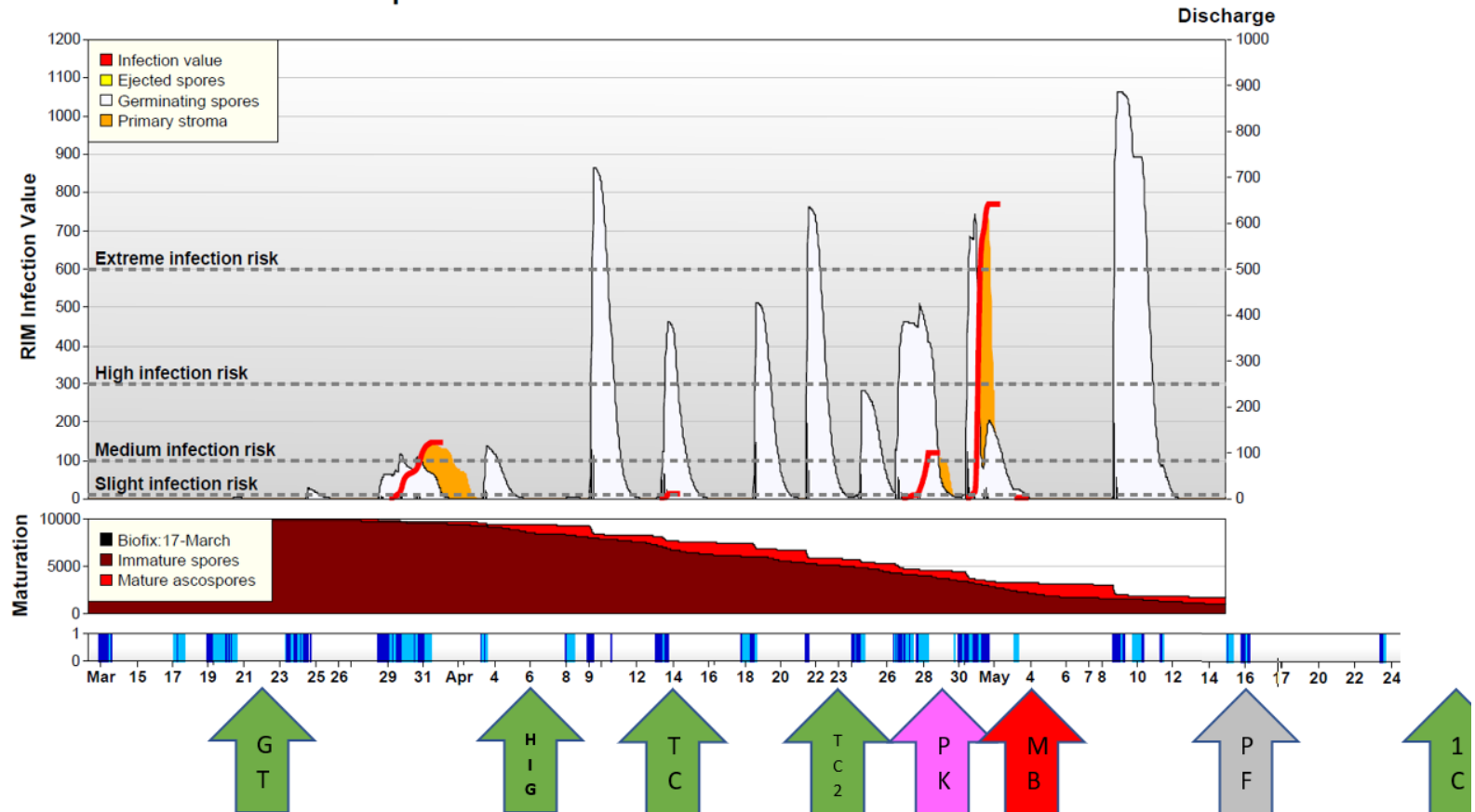
Nu-Film P
Spreader Sticker

Vacciplant[®]
plant defense stimulant



1. Apple Scab Trial 2020

RIMpro-Venturia location: New Paltz - 2020



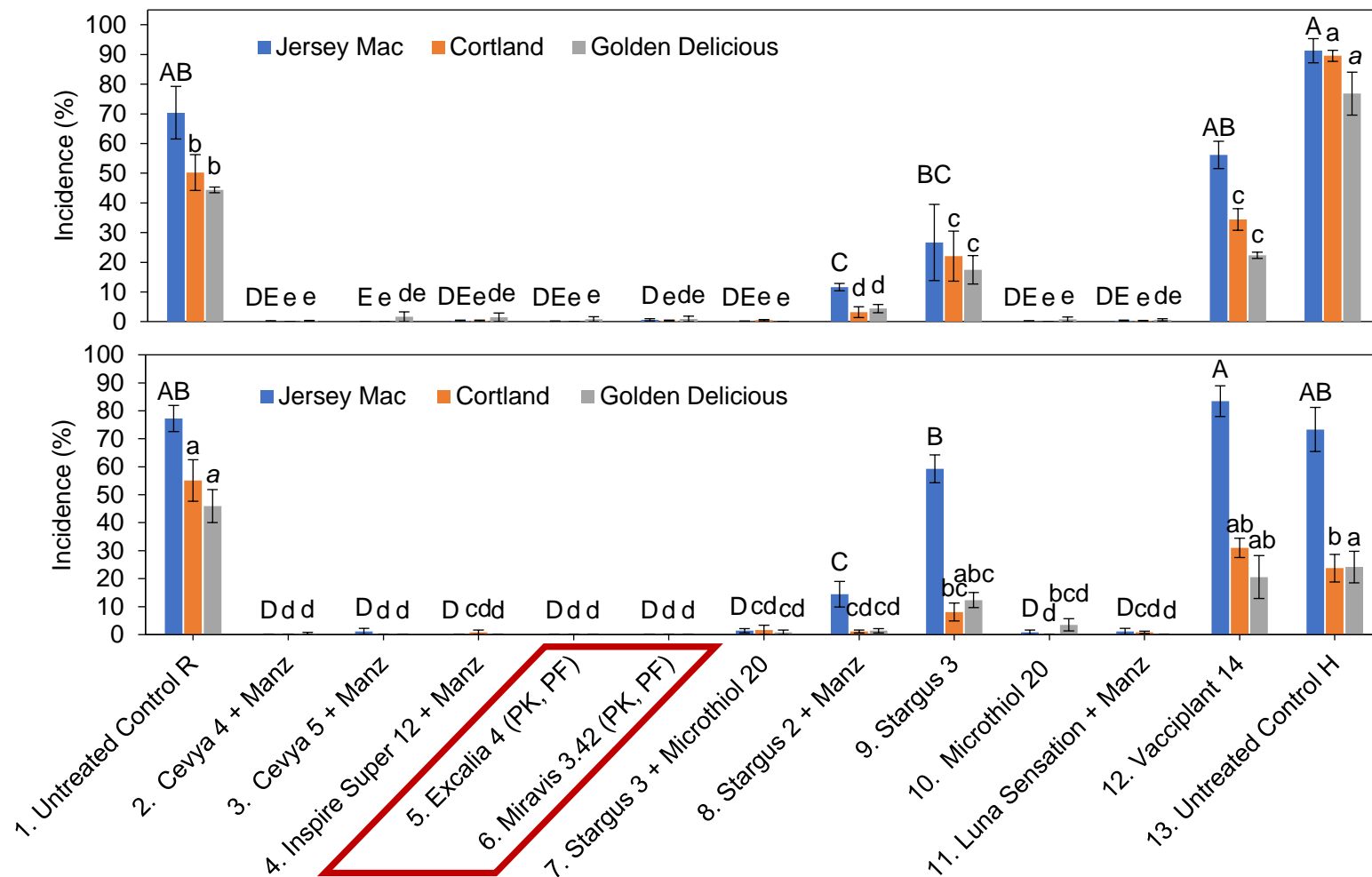
Spray Timing of Fungicides

1 Untreated control regular	/
2 Manzate Pro-stick 75 WG 3lb	HIG
Manzate Pro-stick 75 WG 3lb	TC
Manzate Pro-stick 75 WG 3lb	TC
Cevya 4 fl oz + Manzate Pro-stick 75 WG 3lb	PK, MB, PF
Manzate Pro-stick 75 WG 3lb	1C
Captan 80 WDG 3 lb	2C, 3C
3 Manzate Pro-stick 75 WG 3lb	HIG
Manzate Pro-stick 75 WG 3lb	TC
Manzate Pro-stick 75 WG 3lb	TC
Cevya 5 fl oz + Manzate Pro-stick 75 WG 3lb	PK, MB, PF
Manzate Pro-stick 75 WG 3lb	1C
Captan 80 WDG 3 lb	2C, 3C
4 Manzate Pro-stick 75 WG 3lb	HIG
Manzate Pro-stick 75 WG 3lb	TC
Manzate Pro-stick 75 WG 3lb	TC
Inspire Super 12 fl oz + Manzate Pro-stick 75 WG 3lb	PK, MB, PF
Manzate Pro-stick 75 WG 3lb	1C
Captan 80 WDG 3 lb	2C, 3C
5 Manzate Pro-stick 75 WG 3lb	GT
-	HIG
Manzate Pro-stick 75 WG 3lb	TC
Manzate Pro-stick 75 WG 3lb	TC
Excalia 4 fl oz	PK
Inspire Super 12 fl oz	MB
Excalia 4 fl oz	PF
Manzate Pro-stick 75 WG 3lb	1C
Captan 80 WDG 3 lb	2C, 3C

6 Manzate Pro-stick 75 WG 3lb	GT
-	HIG
Manzate Pro-stick 75 WG 3lb	TC
Manzate Pro-stick 75 WG 3lb	TC
Miravis 3.42 fl oz	PK
Inspire Super 12 fl oz	MB
Miravis 3.42 fl oz	PF
Manzate Pro-stick 75 WG 3lb	1C
Captan 80 WDG 3 lb	2C, 3C
7 Stargus 3 qts + Microthiol Disperss 20 lbs	GT
-	HIG
Stargus 3 qts + Microthiol Disperss 20 lbs + NuFilm P 32 fl oz/100 gal	TC, TC, PK, MB, PF, 1C
8 Stargus 2 qts + Manzate Pro-stick 75 WG 3lb	HIG
Stargus 2 qts + Manzate Pro-stick 75 WG 3lb	TC, TC
-	PK, MB,
Stargus 2 qts + Manzate Pro-stick 75 WG 3lb	PF, 1C
9 Stargus 3 qts	GT
-	HIG
Stargus 3 qts + NuFilm P 32 fl oz/100 gal	TC, TC, PK, MB, PF, 1C
10 Microthiol Disperss 20 lbs	GT
-	HIG
Microthiol Disperss 20 lbs + NuFilm P 32 fl oz/100 gal	TC, TC, PK, MB, PF, 1C
11 Indar 8 fl oz + Manzate Pro-stick 75 WG 3lb	TC, TC
Rally 8 oz + Manzate Pro-stick 75 WG 3lb	PK
Luna Sensation 4.17SC 5 fl oz + Manzate Pro-stick 75 WG 3lb	MB, PF
Manzate Pro-stick 75 WG 3lb	1C
Captan 80 WDG 2.5 lb	2C, 3C
12 Vacciplant 14 fl oz	TC, TC, PK, MB, PF, 1C
13 Untreated control high	/



1. Apple Scab Trial 2020



3. Cedar Apple Rust & Fire Blight Trial 2020

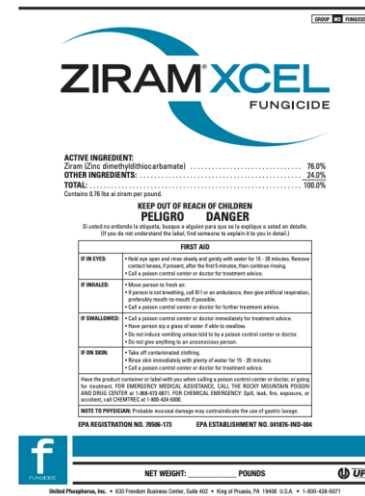
- 4/14/2019 – TC
- 4/23/2019 – TC
- 4/28/2019 – PK
- 5/4/2019 – Full bloom
- 5/16/2019 – PF
- Inoculation: 5 May, 80% king bloom, 5×10^6 CFU
- **Fire blight**
10 Jun
- **Spur Leaf Rust**
12 – 15 Jun
- **Fruit Rust**
15 – 18 Jun
- **Shoot Rust**
14 – 30 Jun



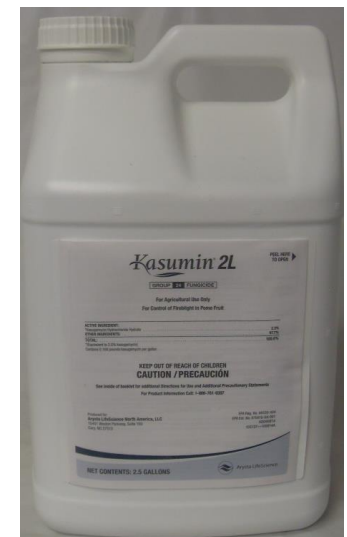
Plant defense stimulant: laminarin 3.51%



Triflumizole 42.14%



Ziram 76%



Kasugamycin 2%

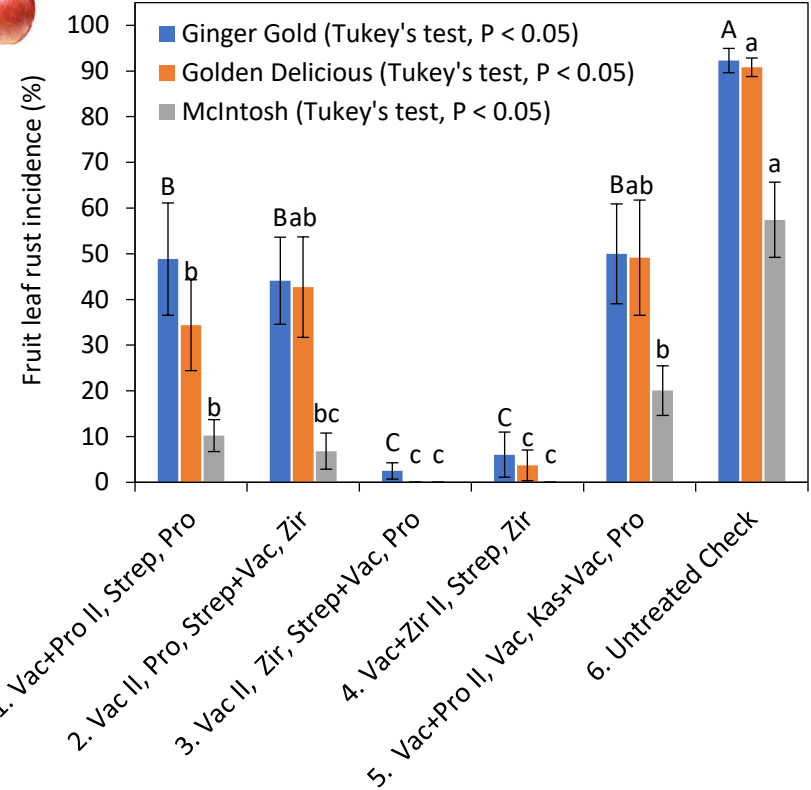
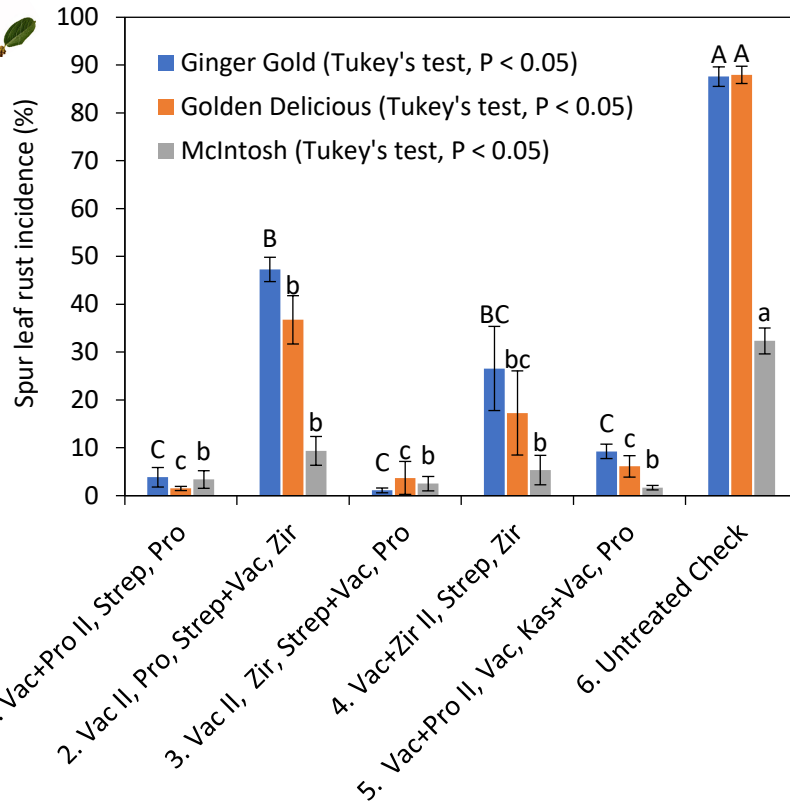


3. Cedar Apple Rust & Fire Blight Trial 2020

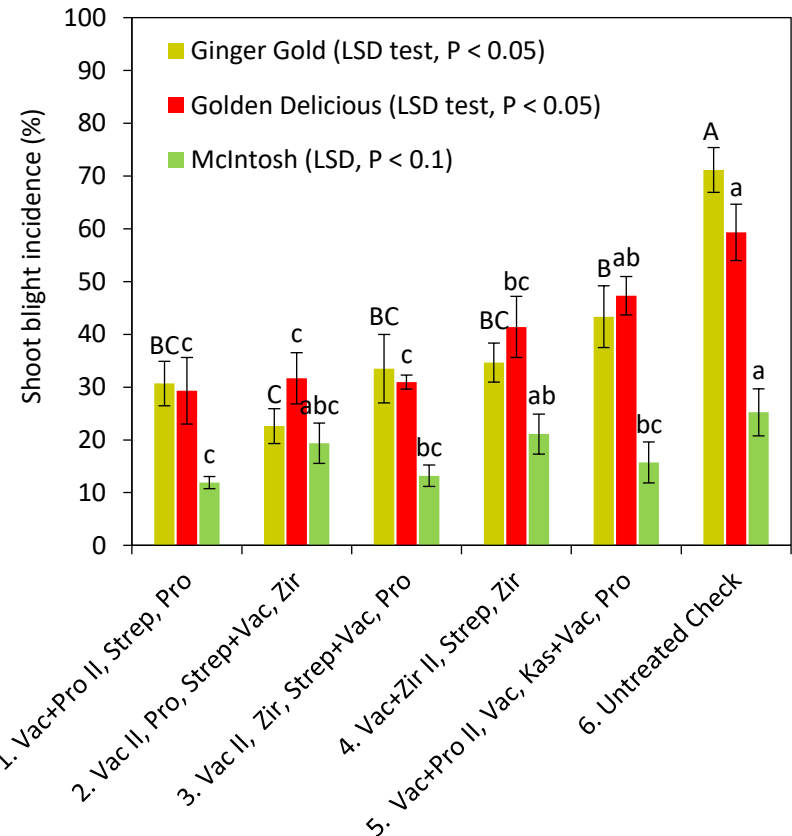
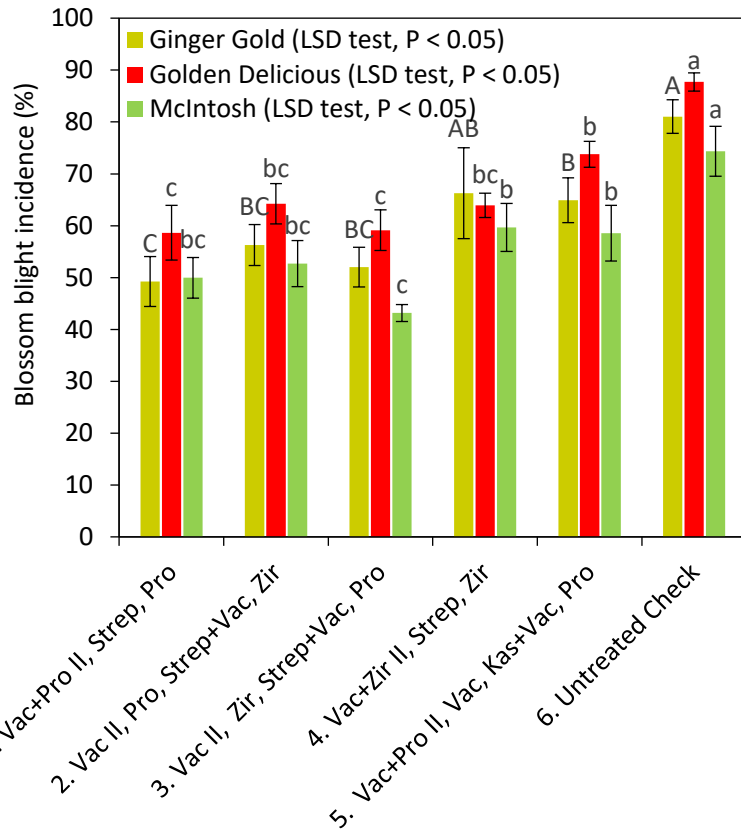
	4/14	4/23	4/28	5/4	5/16
	Tight Cluster	Tight Cluster	Pink	Full Bloom	Petal Fall
Treatment 1	Vacciplant 14 fl oz Procure 16 fl oz	Vacciplant 14 fl oz Procure 16 fl oz		Strep 1.5 lbs/A	Procure 16 fl oz
Treatment 2	Vacciplant 14 fl oz	Vacciplant 14 fl oz	Procure 16 fl oz	Strep 1.5 lbs/A Vacciplant 14 fl oz	ZIRAM XCEL 8 lbs
Treatment 3	Vacciplant 14 fl oz	Vacciplant 14 fl oz	ZIRAM XCEL 8 lbs	Strep 1.5 lbs/A Vacciplant 14 fl oz	Procure 16 fl oz
Treatment 4	Vacciplant 14 fl oz ZIRAM XCEL 8 lbs	Vacciplant 14 fl oz ZIRAM XCEL 8 lbs		Strep 1.5 lbs/A	ZIRAM XCEL 8 lbs
Treatment 5	Vacciplant 14 fl oz Procure 16 fl oz	Vacciplant 14 fl oz Procure 16 fl oz	Vacciplant 14 fl oz	Kasumin 2L 64 fl.oz Vacciplant 14 fl oz	Procure 16 fl oz

Laminarin 3.5%, host plant defense inducer	group P04
Triflumizole 42%, imidazole DMI	group 3
Ziram 76%, dithiocarbamate	group M03
Kasugamycin 2%	group 24

3. Cedar Apple Rust & Fire Blight Trial 2020



3. Fire Blight Trial 2020



3. Cedar Apple/Quince Rust Trial 2020

	4/14	4/23	4/28	5/4	5/16
	Tight Cluster	Tight Cluster	Pink	Full Bloom	Petal Fall
Treatment 1	Vacciplant 14 fl oz Procure 16 fl oz	Vacciplant 14 fl oz Procure 16 fl oz		Strep 1.5 lbs/A	Procure 16 fl oz
Treatment 2	Vacciplant 14 fl oz	Vacciplant 14 fl oz	Procure 16 fl oz	Strep 1.5 lbs/A Vacciplant 14 fl oz	ZIRAM XCEL 8 lbs
Treatment 3	Vacciplant 14 fl oz	Vacciplant 14 fl oz	ZIRAM XCEL 8 lbs	Strep 1.5 lbs/A Vacciplant 14 fl oz	Procure 16 fl oz
Treatment 4	Vacciplant 14 fl oz ZIRAM XCEL 8 lbs	Vacciplant 14 fl oz ZIRAM XCEL 8 lbs		Strep 1.5 lbs/A	ZIRAM XCEL 8 lbs
Treatment 5	Vacciplant 14 fl oz Procure 16 fl oz	Vacciplant 14 fl oz Procure 16 fl oz	Vacciplant 14 fl oz	Kasumin 2L 64 fl.oz Vacciplant 14 fl oz	Procure 16 fl oz



4. SBFS NEWA Model - just before 190 ALWH After Petal Fall

State:

Weather station:

Date of Interest:



Sooty Blotch and Flyspeck Risk Predictions for Highland HVL 2

Petal fall date for McIntosh:

Petal fall date above is estimated based on degree day accumulations or user input.

Enter the actual date for blocks of interest and the model will calculate the accumulated leaf wetness hours since 10 days after petal fall more accurately.

Most recent fungicide application date:

*If petal fall has passed, enter the date of your most recent fungicide application.
If no fungicide applications have been made, do not enter a date.*

In the Risk Summary table, note the accumulated leaf wetness hours since petal fall (Leaf Wetness Hours) and the Risk Level. Leaf wetness hours, rain events, and the last fungicide application date are taken into consideration in assessing risk level. To estimate risk in the near future, look at the probability of rain.

Consult the Risk Level IPM Guidelines below the **Risk Summary** table.

Sooty Blotch and Flyspeck Risk Summary - Northeastern US Model

	Past	Past	Current	Ensuing 5 Days				
Date	7/18	7/19	7/20	7/21	7/22	7/23	7/24	7/25
Days since petal fall	63	64	65	66	67	68	69	70
Accumulated Leaf Wetness Hours - ALWH	172	175	181	181	183	186	197	197
Risk Level	High	High	High	High	High	High	High	High
Rain Events								
Daily rain amount (inches)	0.00	0.27	0.03	0.00	0.08	0.06	0.02	0.00
Rain probability (%)			- -	- -	- -	- -	- -	- -
Night/Day <input data-bbox="1052 811 1072 832" type="button" value="?"/>								

NA - data not available.

Download Time: 7/26/2020 23:00

consideration in assessing risk level. To estimate risk in the near future, look at the probability of rain.

Consult the Risk Level IPM Guidelines below the **Risk Summary** table.

Sooty Blotch and Flyspeck Risk Summary - Northeastern US Model

	Past	Past	Current	Ensuing 5 Days				
Date	7/23	7/24	7/25	7/26	7/27	7/28	7/29	7/30
Days since petal fall	68	69	70	71	72	73	74	75
Accumulated Leaf Wetness Hours - ALWH	186	197	197	197	197	197	197	205
Risk Level	High	High	High	High	High	High	High	High
Rain Events								
Daily rain amount (inches)	0.06	0.02	0.00	0.00	0.00	0.00	0.00	0.03
Rain probability (%)			- -	- -	- -	- -	- -	- -
Night/Day <input data-bbox="1052 1370 1072 1392" type="button" value="?"/>								

NA - data not available.

Download Time: 7/31/2020 23:00

4. SBFS Trial 2020

Maintenance sprays: Apple scab and cedar apple rust at the beginning of the season.

Treatments/Programs (100 Gal/A):

7 and 21 Jul; 3, 18 Aug; 3, 21 Sep; 1 Oct

1. Untreated Control
2. **Buran 1.2% (v/v) + Agral 90 0.1% (v/v)**
3. **Buran 1.2% (v/v) + PureSpray GREEN 1% (v/v)**
4. PureSpray GREEN 1% (v/v)
5. Captan 2.67 lbs/A



Agral 90 – non-ionic liquid wetting and spreading agent: nonylphenoxy polyethoxy ethanol 90%



Garlic powder.....15%



PureSpray™ is an Intelligro brand.



PURESPRAY™
green

**A HORTICULTURAL SPRAY OIL
FOR LISTED INSECT, MITE
AND DISEASE CONTROL**

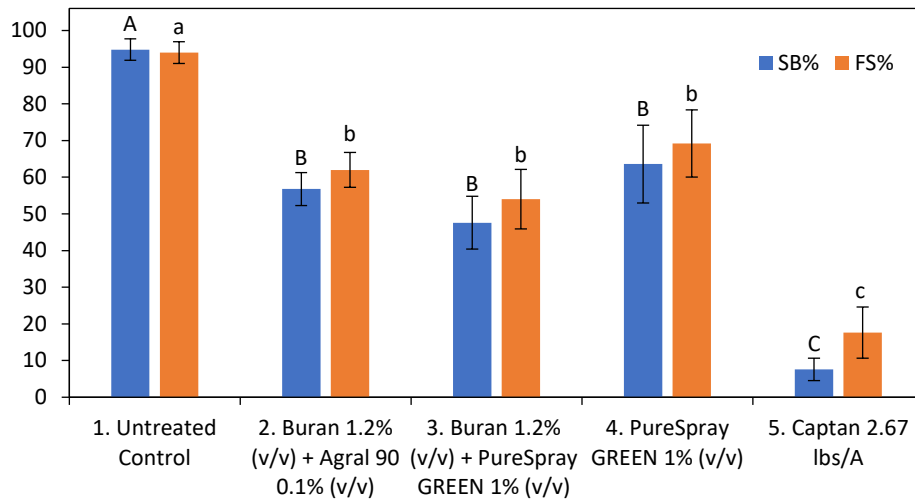
Mineral Oil 98%



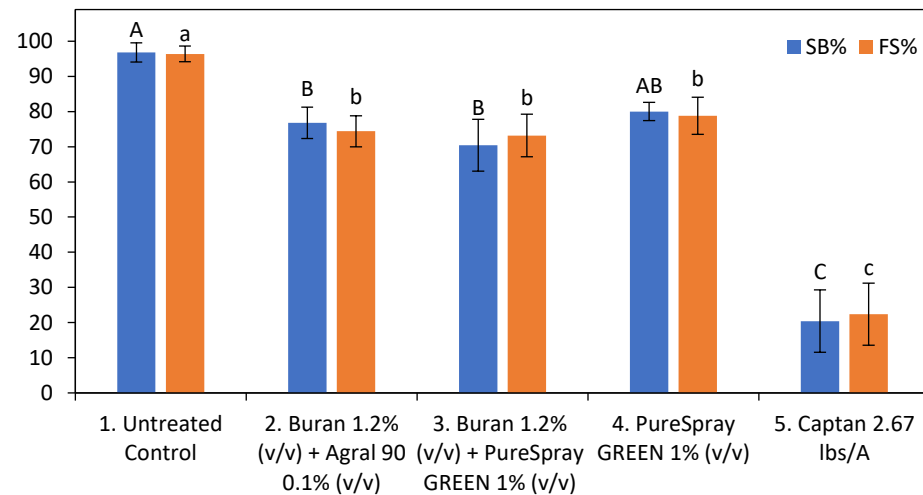
4. SBFS Trial 2020

- Ginger Gold -

Ginger Gold SB&FS Incidence % Harvest 2020 (LSD, $P < 0.05$)



Ginger Gold SB&FS Incidence % Two Weeks After Harvest in 2020 (LSD, $P < 0.05$)



Harvest: 9/1/2020



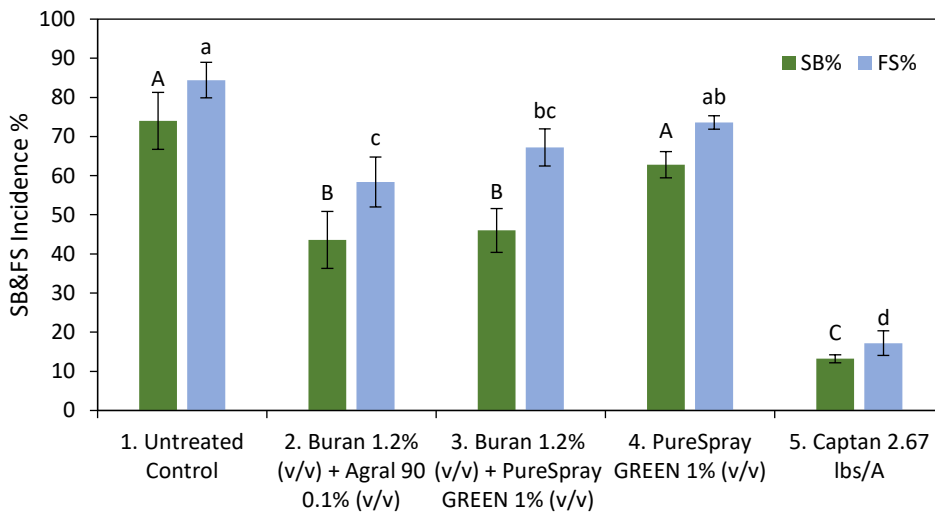
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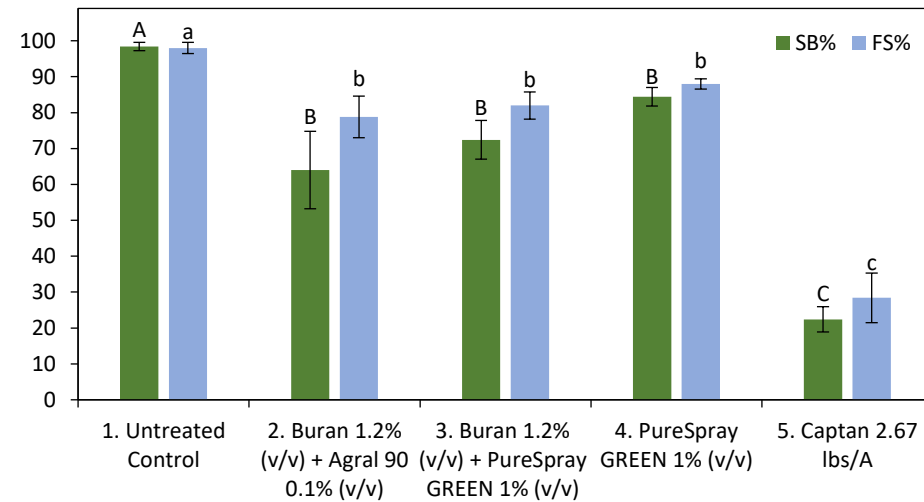
4. SBFS Trial 2020

- McIntosh -

McIntosh at Harvest 2020 (LSD, $P < 0.05$)



McIntosh 2 Weeks After Harvest 2020 (LSD, $P < 0.05$)



Harvest: 9/19/2020



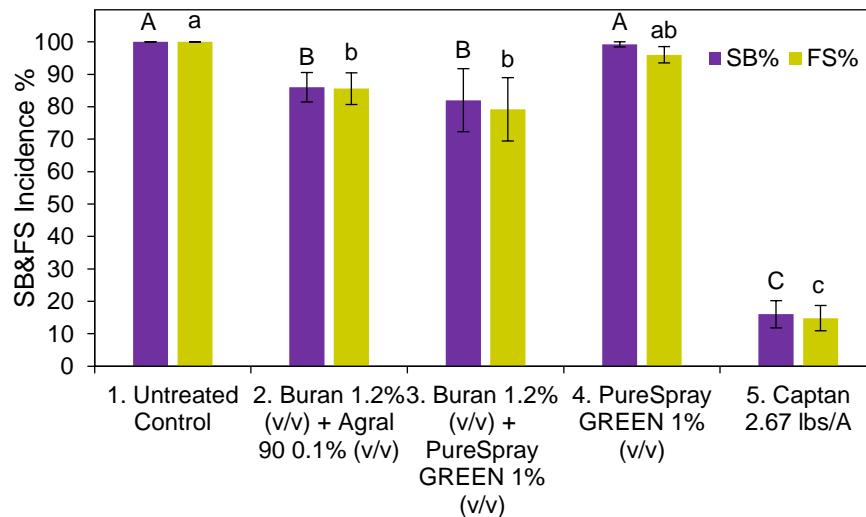
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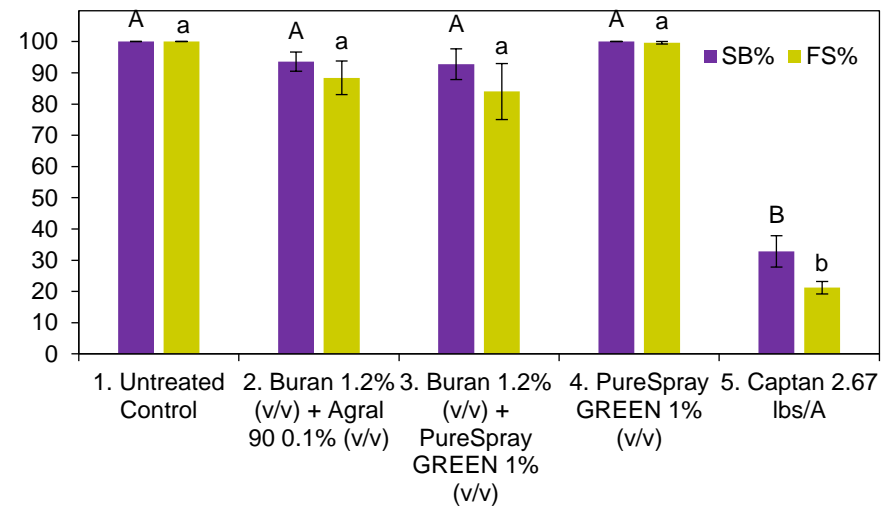
4. SBFS Trial 2020

- Golden Delicious -

Golden Delicious at Harvest (LSD, $P < 0.05$)



Golden Delicious 2-Weeks After Harvest (LSD, $P < 0.05$)



Harvest: 10/16/2020



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Acknowledgements



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ACIMOVIC LAB

FRUIT TREE PATHOLOGY AT CORNELL UNIVERSITY'S HUDSON VALLEY RESEARCH LABORATORY



Hudson Valley
Research Laboratory **F.A.R.M.**



Cornell University
Department of Plant Pathology
and Plant-Microbe Biology

Thank you for attention. . .

Questions?


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Questions . . .

ACIMOVIC LAB

FRUIT TREE PATHOLOGY AT CORNELL UNIVERSITY'S HUDSON VALLEY RESEARCH LABORATORY



HOME BACTERIAL DISEASES - SYMPTOMS FUNGAL DISEASES - SYMPTOMS FIRE BLIGHT RESEARCH PESTICIDE EFFICACY TRIALS
DISEASE PROFILES ABOUT S. G. ACIMOVIC CONTACT EXTENSION PUBLICATIONS VIDEOS BLOG ARCHIVES CURRENT BLOGS

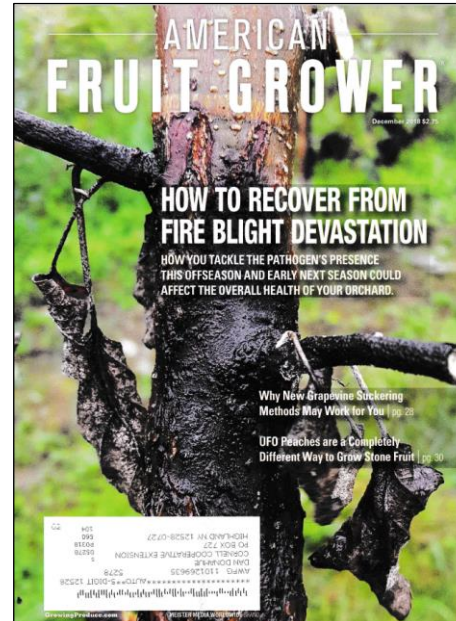
Welcome to the Acimovic Lab

The Acimovic lab is located at the [Hudson Valley Research Laboratory \(HVRL\)](#), in [Highland, NY](#). As a branch of [Plant Pathology and Plant-Microbe Biology Section](#) within [School of Integrative Plant Science](#) at [Cornell University](#), our program involves research and extension focused on diseases of fruit tree crops with emphasis on apple, pear, peach and grapevines. We investigate all components of the [disease triangle](#): pathogen, plant, and the environment in order to better understand their interactions that serve as a necessary basis to develop new disease management strategies.

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Bitter rot spotting in Northeast and Midwest

North Carolina researcher gives Northeast, Midwest growers a head start on fighting apple disease.

Leslie Mertz // Feb 27, 2019



Bitter rot is broken down into two main types in the Eastern United States. The type shown here in a Rome Beauty is more common in the Northeast and Midwest. Typical features include sunken lesions that are marked with small pimple-like structures (acervuli) that are filled with salmon- to orange-colored spores.

(Courtesy Sara Villani/NCBU)

In 2018, bitter rot began to rear its head in New York and Michigan apple orchards, but Northeast and Midwest growers have a better chance of fighting it thanks to new research in North Carolina.



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