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Crop Disease Management

Row Crop Short Course
Jackson County Agriculture Conference Center, Marianna, FL
March 7th, 2019

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Row Crops & Vegetables
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University of Florida

What diseases do you prepare for each year?

- Rusts
  - Common
  - Southern
- Leaf Spots
  - NCLB
  - SCLB
- Stalk Rots
- Ear Rots
  - Fusarium
  - Diplodia

Do you feel comfortable with the tools we have for managing disease?

Fungicide Efficacy for Control of Corn Diseases[1]

FUNGICIDE(S)				Anthracnose Leaf Blight	Common Rust	Eyespot	Gray Leaf Spot	Northern Leaf Blight	Southern Rust	Harvest Restriction[2]
Class	Active ingredient (%)	Trade Name	Rate/A (fl. oz.)							
QoI Strobilurins Group 11	azoxystrobin 22.9%	Quadris 2.08SC® multiple generics	6.0-15.5	VG	E	VG	E	G	G	7 days
	pyraclostrobin 23.6%	Headline 2.09EC/SC®	6.0-12.0	VG	E	E	E	VG	VG	7 days
	picoxystrobin 22.5%	Aproach 2.08SC®	3.0-12.0	VG	VG-E	VG	F-VG	VG	G	7 days
		Tilt 3.6EC®								
pyraclostrobin 28.58% fluxapyroxad 14.33%		Priaxor 4.17SC®	4.0-8.0	U	VG	U	VG	VG-E	G	21 days
pyraclostrobin 13.6% metconazole 5.1%		Headline AMP 1.68SC®	10.0-14.4	U	E	E	E	VG	G-VG	20 days
trifloxystrobin 32.3% prothioconazole 10.8%		Stratego YLD 4.18SC®	4.0-5.0	VG	E	VG	E	VG	G-VG	14 days
tetraconazole 7.48% azoxystrobin 9.35%		Affiance 1.5SC®	10.0-14.0	U	U	U	U	G-VG	G	7 days
	picoxystrobin 17.94%									
Mixed Modes of Action	flutriafol 19.3% fluoxastrobin 14.84%	Fortix 3.22SC® Preemptor 3.22SC®	4.0-6.0	U	U	U	E	VG-E	VG	R4 (dough)
	pyraclostrobin 28.58% fluxapyroxad 14.33%	Priaxor 4.17SC®	4.0-8.0	U	VG	U	VG	VG-E	G	21 days
	pyraclostrobin 13.6% metconazole 5.1%	Headline AMP 1.68SC®	10.0-14.4	U	E	E	E	VG	G-VG	20 days
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	tetraconazole 7.48% azoxystrobin 9.35%	Affiance 1.5SC®	10.0-14.0	U	U	U	U	G-VG	G	7 days

1 Efficacy ratings: F=fair. G=good. VG=very good. E=excellent. NL=not labeled for use against this disease. U=unknown efficacy or insufficient data to rank product.
2 Harvest restrictions are for field corn harvested for grain. Restrictions may vary for other types of corn (such as sweet, seed, popcorn), and corn for other uses (such as forage or fodder).

https://cropprotectionnetwork.org/library/

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Fungicide efficacy data available online

CROP PROTECTION NETWORK
A Product of Land Grant Universities

ABOUT PEOPLE RESOURCES LIBRARY BLOG SPONSORS

Publication Library

Crop Protection Network Publications

- CPN-1001 – Soybean – Scouting for Soybean Seed Diseases
- CPN-1002 – Soybean – Scouting for Soybean Stem Diseases
- CPN-1003 – Soybean – Vein Necrosis Virus
- CPN-1004 – Soybean – Charcoal Rot
- CPN-1005 – Soybean – White Mold
- CPN-1006 – Soybean – Stem Canker
- CPN-1007 – Soybean – Pod and Stem Blight and Phomopsis Seed Decay
- CPN-1008 – Soybean – Seedling Diseases
- CPN-1009 – Soybean – Scouting for Soybean Seedling Diseases
- CPN-1010 – Soybean – Scouting White Mold
- CPN-1011 – Soybean – Sudden Death Syndrome

https://cropprotectionnetwork.org/library/

https://cropprotectionnetwork.org/download/5702/ - Soybean

https://cropprotectionnetwork.org/download/5214/ - Corn

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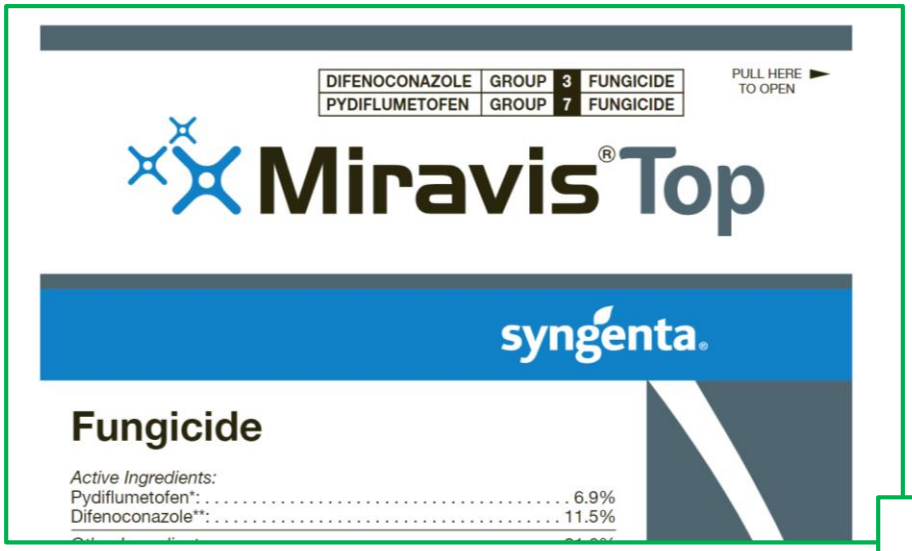
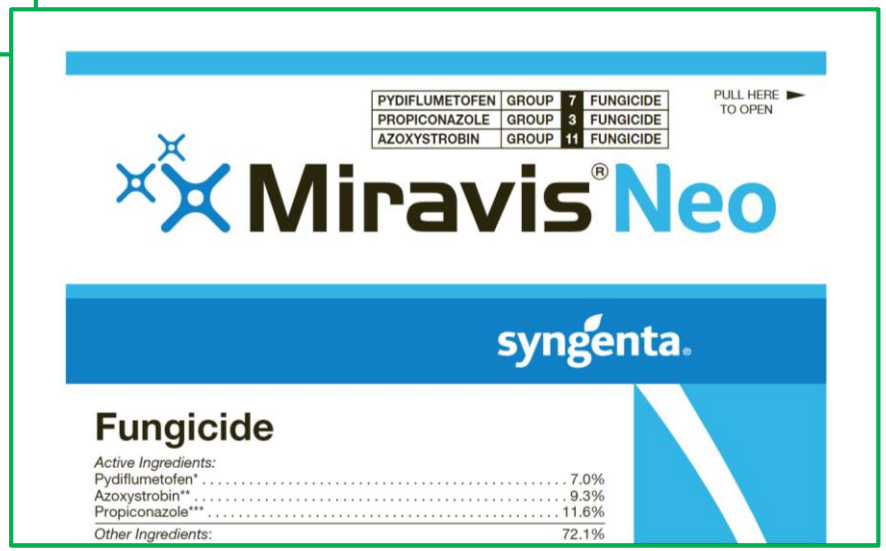
New product available for corn and soybean disease control.



Efficacy for multiple diseases.

Considered Very Good to Excellent on NCLB and Southern Rust



http://www.syngenta-us.com/current-label/miravis-top (Soybean)
http://www.syngenta-us.com/current-label/miravis-neo (Corn)

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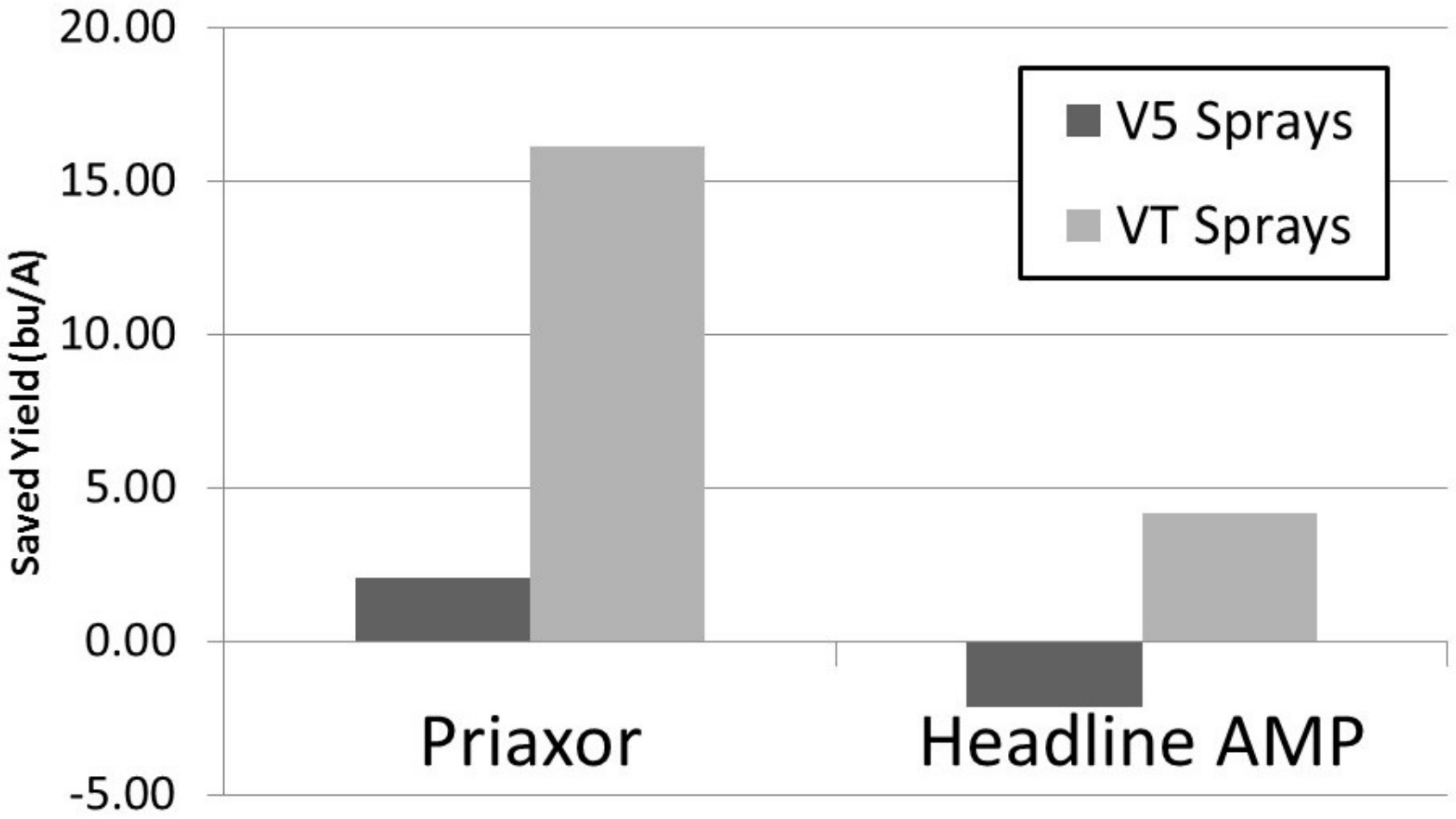
Timing is critical to corn & soybean sprays



Need a good ROI with the application

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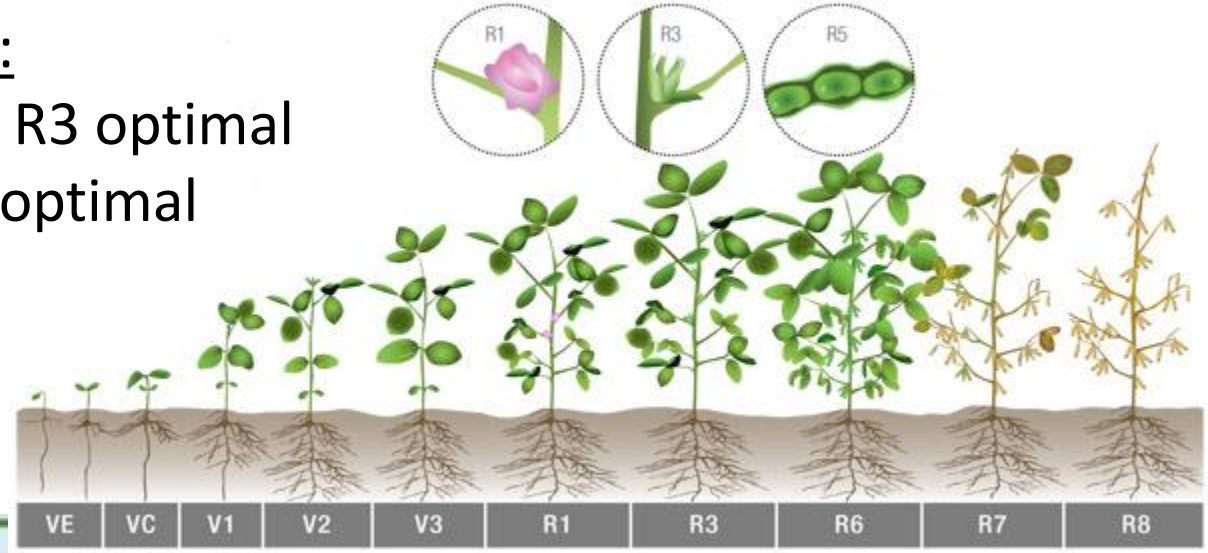
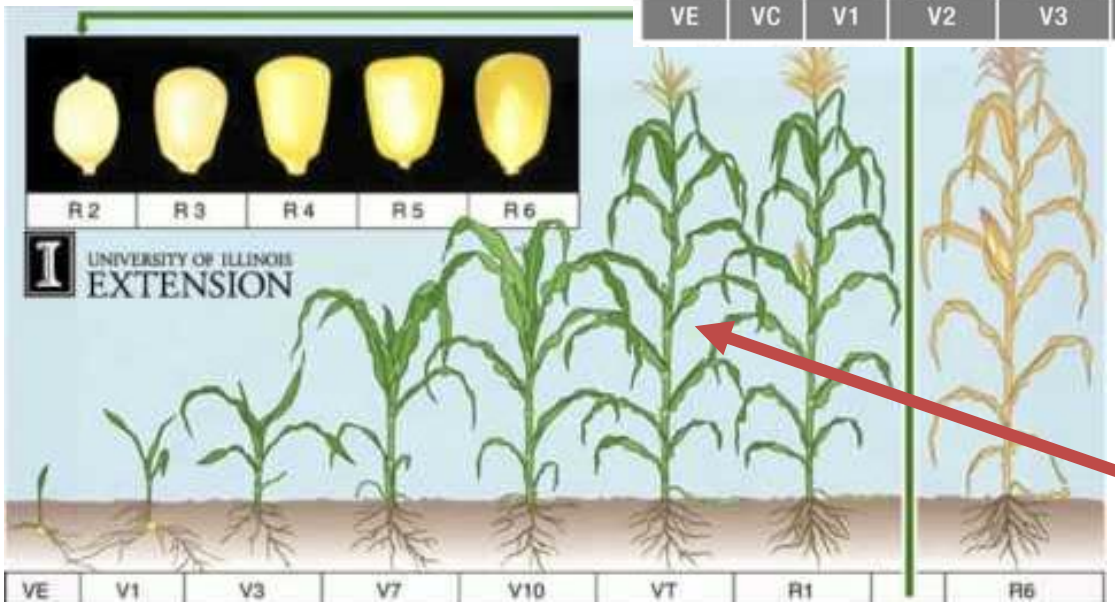
Timing depends on disease pressure

Recommended timings:

Soybean: R1 to R5 with R3 optimal

Corn: V8 to R1 with VT optimal





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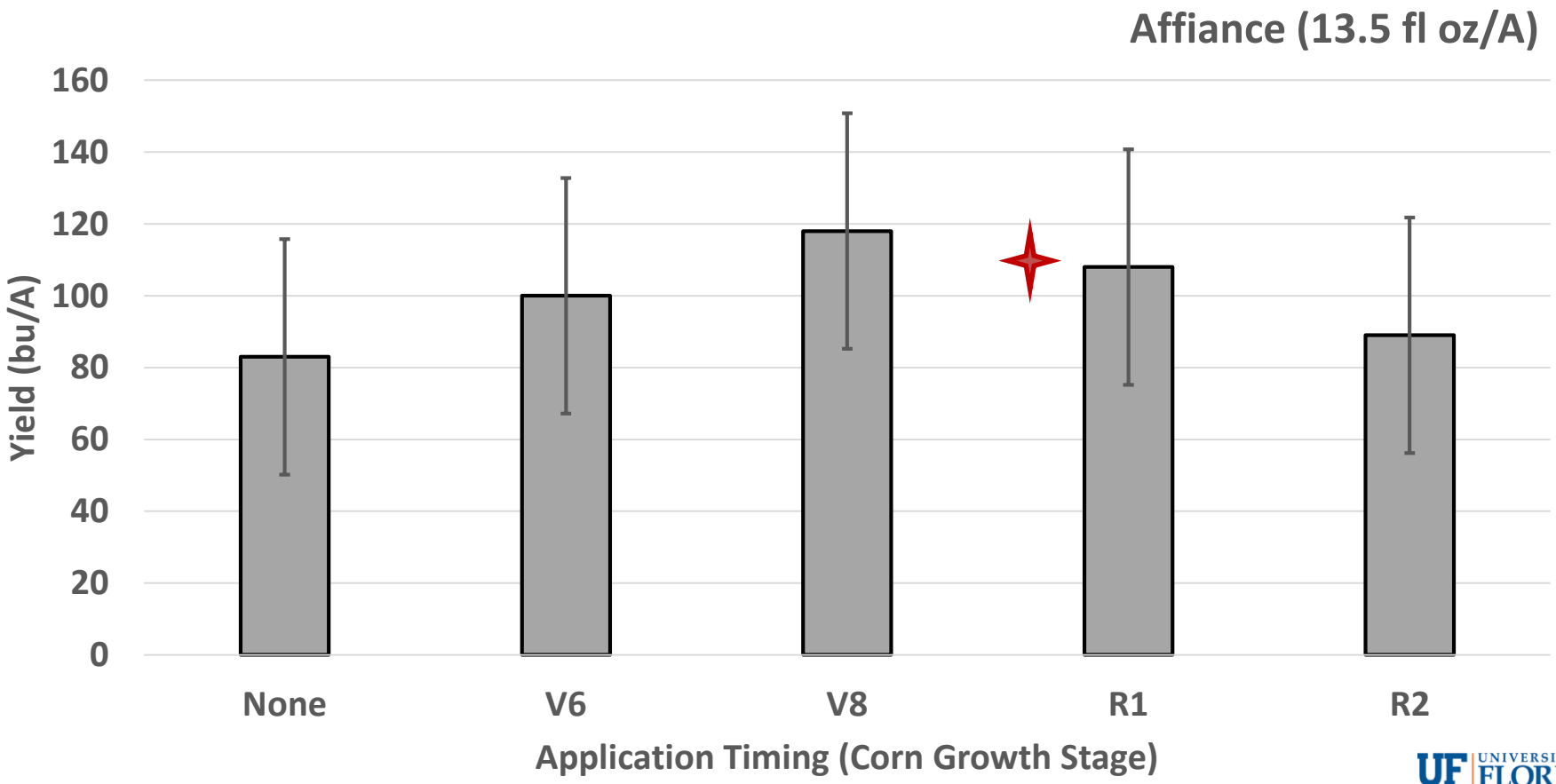
VT is optimal - most of the time

Let's say 80 to 90% of the time, what about the remaining 20 to 10%.



Price et al., LSU Agcenter, 2017

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Monitoring for diseases important.

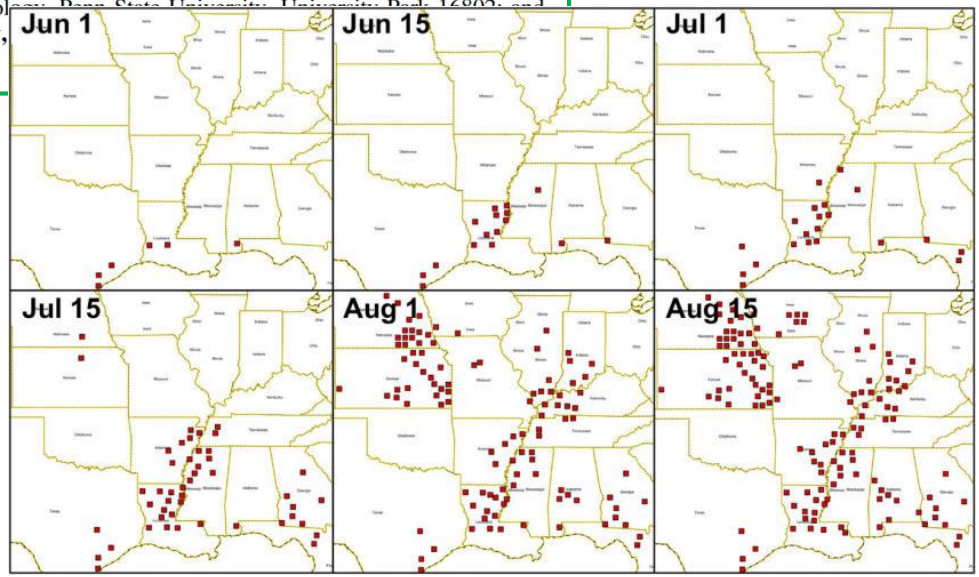
Plant Disease • 2018 • 102:1681-1686 • https://doi.org/10.1094/PDIS-11-17-1862-SR

Special Report

Scout, Snap, and Share: First Impressions of Plant Disease Monitoring Using Social Media

Daren S. Mueller,† **Adam J. Sisson,** and **Rachel Kempker,** Department of Plant Pathology and Microbiology, Iowa State University, Ames 50011; **Scott Isard,** Department of Plant Pathology and Environmental Microbiol... **Conner Raymond, Andrew J. Gennett, William Sheffer,** and **Carl A. Bradley,** Research and Education Center, Princeton 42445

Field Scouting and Social Exchange



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We can help with disease I.D.

Often you have more than one thing

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Disease I.D. is also important resistance management

http://iwilltakeaction.com/diseases/principles-of-resistance

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Peanut Disease Management

Which disease(s) do you prepare for each year in peanuts?

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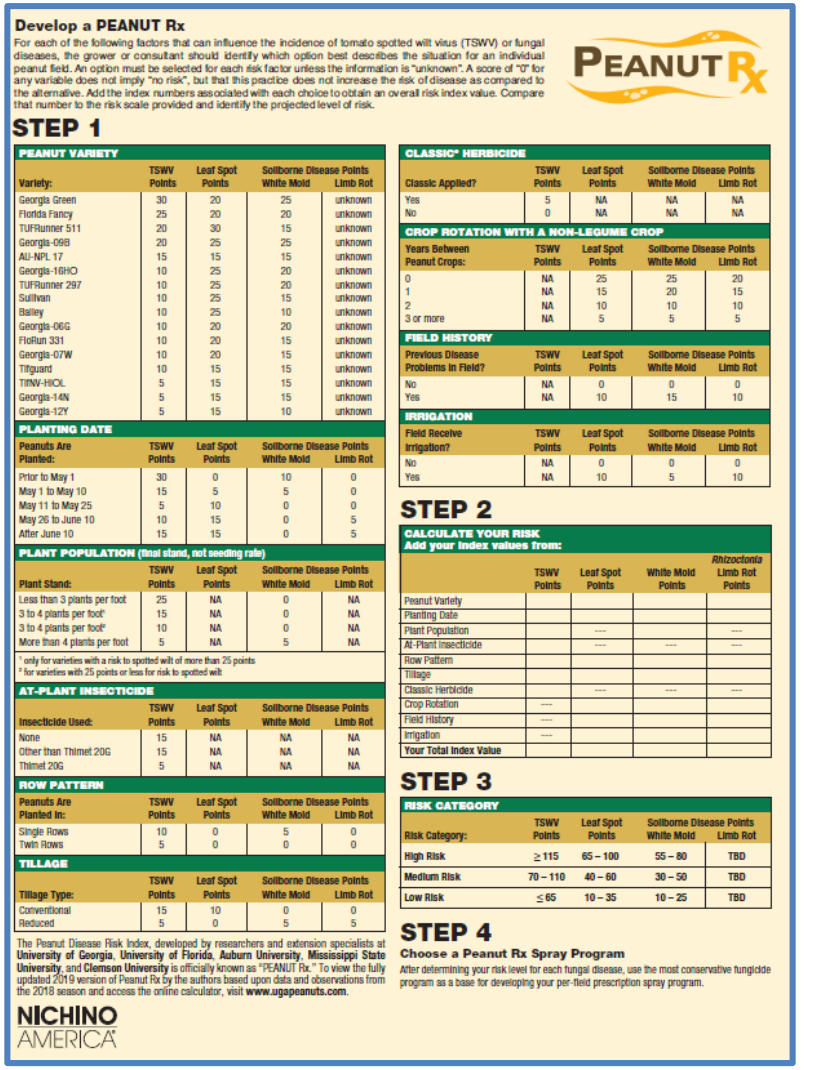
Factors to consider when looking to save on disease control.

- Rotation (avoid short)
- Planting Date
- Variety – diversify
- Certified vs Saved Seed
- Fungicides
  - Late start or behind
  - “Weaker” fungicides



Develop a PEANUT Rx

For each of the following factors that can influence the incidence of tomato spotted wilt virus (TSWV) or fungal diseases, the grower or consultant should identify which option best describes the situation for an individual peanut field. An option must be selected for each risk factor unless the information is “unknown”. A score of “0” for any variable does not imply “no risk”, but that this practice does not increase the risk of disease as compared to the alternative. Add the index numbers associated with each choice to obtain an overall risk index value. Compare that number to the risk scale provided and identify the projected level of risk.

PEANUT Rx

STEP 1

PEANUT VARIETY

Variety:	TSWV Points	Leaf Spot Points	Soilborne Disease Points White Mold	Soilborne Disease Points Limb Rot
Georgia Green	30	20	25	unknown
Florida Fancy	25	20	20	unknown
TUFRunner 511	20	30	15	unknown
Georgia-09B	20	25	25	unknown
AU-NPL 17	15	15	15	unknown
Georgia-16HO	10	25	20	unknown
TUFRunner 297	10	25	20	unknown
Sullivan	10	25	15	unknown
Bailey	10	25	10	unknown
Georgia-06G	10	20	20	unknown
FloRun 331	10	20	15	unknown
Georgia-07W	10	20	15	unknown
Tifguard	10	15	15	unknown
TIFNV-HOL	5	15	15	unknown
Georgia-14N	5	15	15	unknown
Georgia-12Y	5	15	10	unknown

PLANTING DATE

Peanuts Are Planted:	TSWV Points	Leaf Spot Points	Soilborne Disease Points White Mold	Soilborne Disease Points Limb Rot
Prior to May 1	30	0	10	0
May 1 to May 10	15	5	5	0
May 11 to May 25	5	10	0	0
May 26 to June 10	10	15	0	5
After June 10	15	15	0	5

PLANT POPULATION (final stand, not seeding rate)

Plant Stand:	TSWV Points	Leaf Spot Points	Soilborne Disease Points White Mold	Soilborne Disease Points Limb Rot
Less than 3 plants per foot	25	NA	0	NA
3 to 4 plants per foot[1]	15	NA	0	NA
3 to 4 plants per foot[2]	10	NA	0	NA
More than 4 plants per foot	5	NA	5	NA

[1] only for varieties with a risk to spotted wilt of more than 25 points
[2] for varieties with 25 points or less for risk to spotted wilt

AT-PLANT INSECTICIDE

Insecticide Used:	TSWV Points	Leaf Spot Points	Soilborne Disease Points White Mold	Soilborne Disease Points Limb Rot
None	15	NA	NA	NA
Other than Thimet 20G	15	NA	NA	NA
Thimet 20G	5	NA	NA	NA

ROW PATTERN

Peanuts Are Planted In:	TSWV Points	Leaf Spot Points	Soilborne Disease Points White Mold	Soilborne Disease Points Limb Rot
Single Rows	10	0	5	0
Twin Rows	5	0	0	0

TILLAGE

Tillage Type:	TSWV Points	Leaf Spot Points	Soilborne Disease Points White Mold	Soilborne Disease Points Limb Rot
Conventional	15	10	0	0
Reduced	5	0	5	5

CLASSIC® HERBICIDE

Classic Applied?	TSWV Points	Leaf Spot Points	Soilborne Disease Points White Mold	Soilborne Disease Points Limb Rot
Yes	5	NA	NA	NA
No	0	NA	NA	NA

CROP ROTATION WITH A NON-LEGUME CROP

Years Between Peanut Crops:	TSWV Points	Leaf Spot Points	Soilborne Disease Points White Mold	Soilborne Disease Points Limb Rot
0	NA	25	25	20
1	NA	15	20	15
2	NA	10	10	10
3 or more	NA	5	5	5

FIELD HISTORY

Previous Disease Problems In Field?	TSWV Points	Leaf Spot Points	Soilborne Disease Points White Mold	Soilborne Disease Points Limb Rot
No	NA	0	0	0
Yes	NA	10	15	10

IRRIGATION

Field Receive Irrigation?	TSWV Points	Leaf Spot Points	Soilborne Disease Points White Mold	Soilborne Disease Points Limb Rot
No	NA	0	0	0
Yes	NA	10	5	10

STEP 2

CALCULATE YOUR RISK
Add your index values from:

	TSWV Points	Leaf Spot Points	White Mold Points	*Rhizoctonia* Limb Rot Points
Peanut Variety				
Planting Date				
Plant Population		---		---
At-Plant Insecticide		---	---	---
Row Pattern				
Tillage				
Classic Herbicide		---	---	---
Crop Rotation	---			
Field History	---			
Irrigation	---			
Your Total Index Value				

STEP 3

RISK CATEGORY

Risk Category:	TSWV Points	Leaf Spot Points	Soilborne Disease Points White Mold	Soilborne Disease Points Limb Rot
High Risk	≥ 115	65 – 100	55 – 80	TBD
Medium Risk	70 – 110	40 – 60	30 – 50	TBD
Low Risk	≤ 65	10 – 35	10 – 25	TBD

STEP 4

Choose a Peanut Rx Spray Program

After determining your risk level for each fungal disease, use the most conservative fungicide program as a base for developing your per-field prescription spray program.

The Peanut Disease Risk Index, developed by researchers and extension specialists at **University of Georgia**, **University of Florida**, **Auburn University**, **Mississippi State University**, and **Clemson University** is officially known as “PEANUT Rx.” To view the fully updated 2019 version of Peanut Rx by the authors based upon data and observations from the 2018 season and access the online calculator, visit **www.ugapeanuts.com**.

NICHINO AMERICA

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All decisions for these diseases are made before the furrow closes.

Nematodes

Crown Rot

Spotted Wilt

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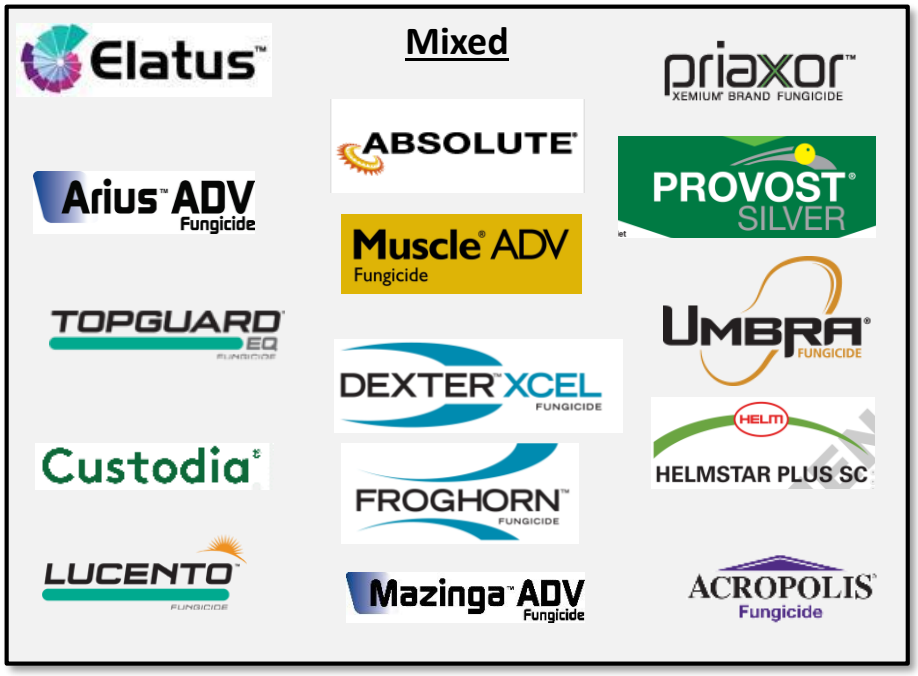
Available fungicides by FRAC grouping



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Stem rot/White mold fungicides

Group 3

Tebuconazole 3.6F

PROLINE

Group 1

Group 11

Headline Fungicide

Abound Flowable Fungicide

Group M

?

MICROTHIOL DISPERSS MICRONIZED WETTABLE SULFUR

Mixed

Elatus

PROVOST OPTI

Muscle ADV Fungicide

UMBRA FUNGICIDE

DEXTER XCEL FUNGICIDE

Custodia

HELM HELMSTAR PLUS SC

FROGHORN FUNGICIDE

LUCENTO FUNGICIDE

ACROPOLIS Fungicide

Group 7

DuPont Fontelis Fungicide

CONVOY FUNGICIDE

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Leaf spot fungicides

Group 3

- Alto®
- PROLINE®
- TOPGUARD® FUNGICIDE

Group 1

- TOPSIN 4.5FL FUNGICIDE
- Incognito®

Group 11

Group M

- Bravo WeatherStik®
- ELAST 400 FLOWABLE FUNGICIDE
- Manzate Pro-Stick T&O
- MICROTHIOL DISPERSS® MICRONIZED WETTABLE SULFUR

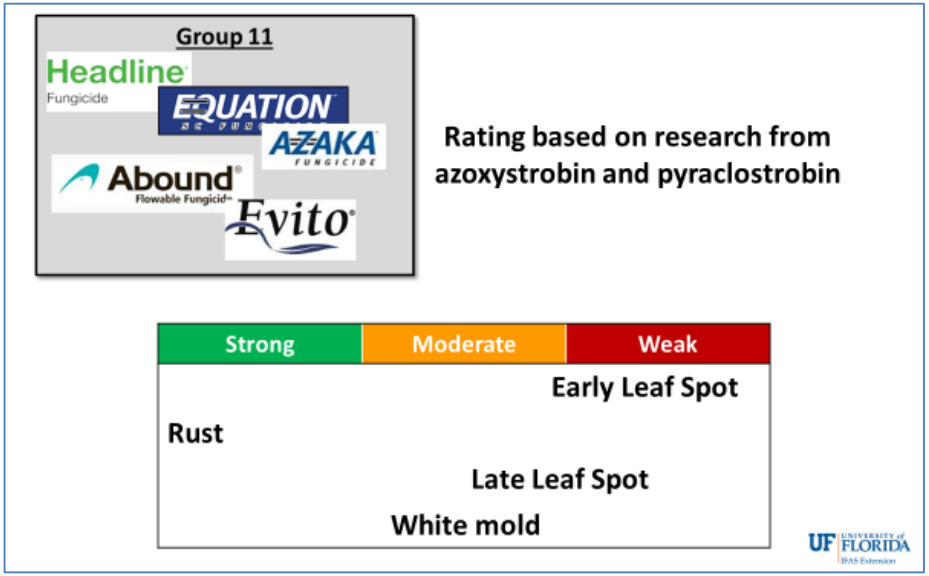
Mixed

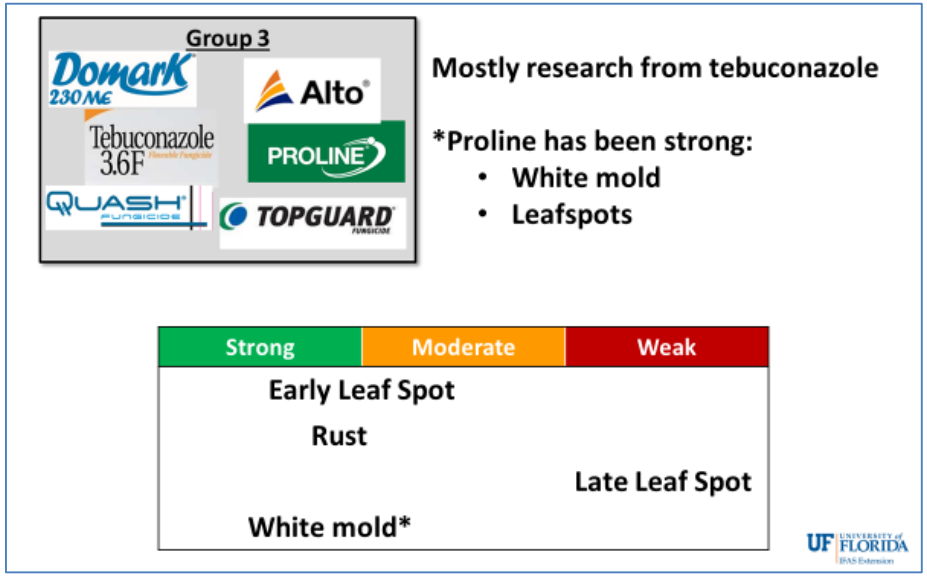
- Elatus™
- priaxor™ XEMIUM® BRAND FUNGICIDE
- ABSOLUTE®
- Arius™ ADV Fungicide
- PROVOST® OPTI
- Muscle® ADV Fungicide
- TOPGUARD® EQ FUNGICIDE
- UMBRA® FUNGICIDE
- DEXTER® XCEL FUNGICIDE
- Custodia®
- HELM HELMSTAR PLUS SC
- FROGHORN™ FUNGICIDE
- LUCENTO® FUNGICIDE
- Mazinga™ ADV Fungicide
- ACROPOLIS® Fungicide

Group 7

- DuPont™ Fontelis™ Fungicide
- Miravis®

All the fungicides will have activity for pathogens on the labels.





Limitations do exist, but depends a lot of the pathogen present in your field

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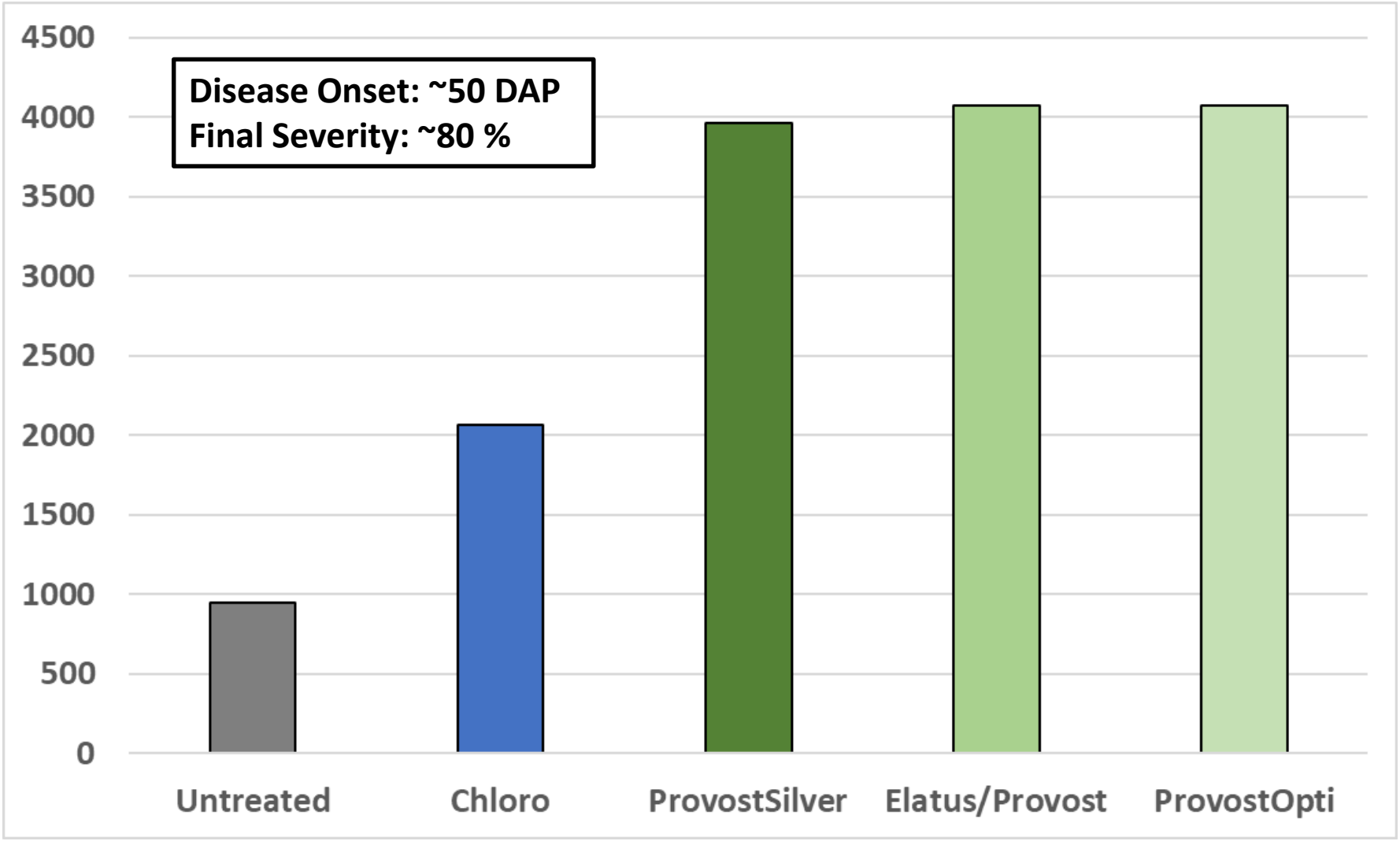
Some 2018 trial results

Locations:
NFREC, Live Oak
NFREC, Marianna
PSREU, Citra, FL
Hamilton Co.

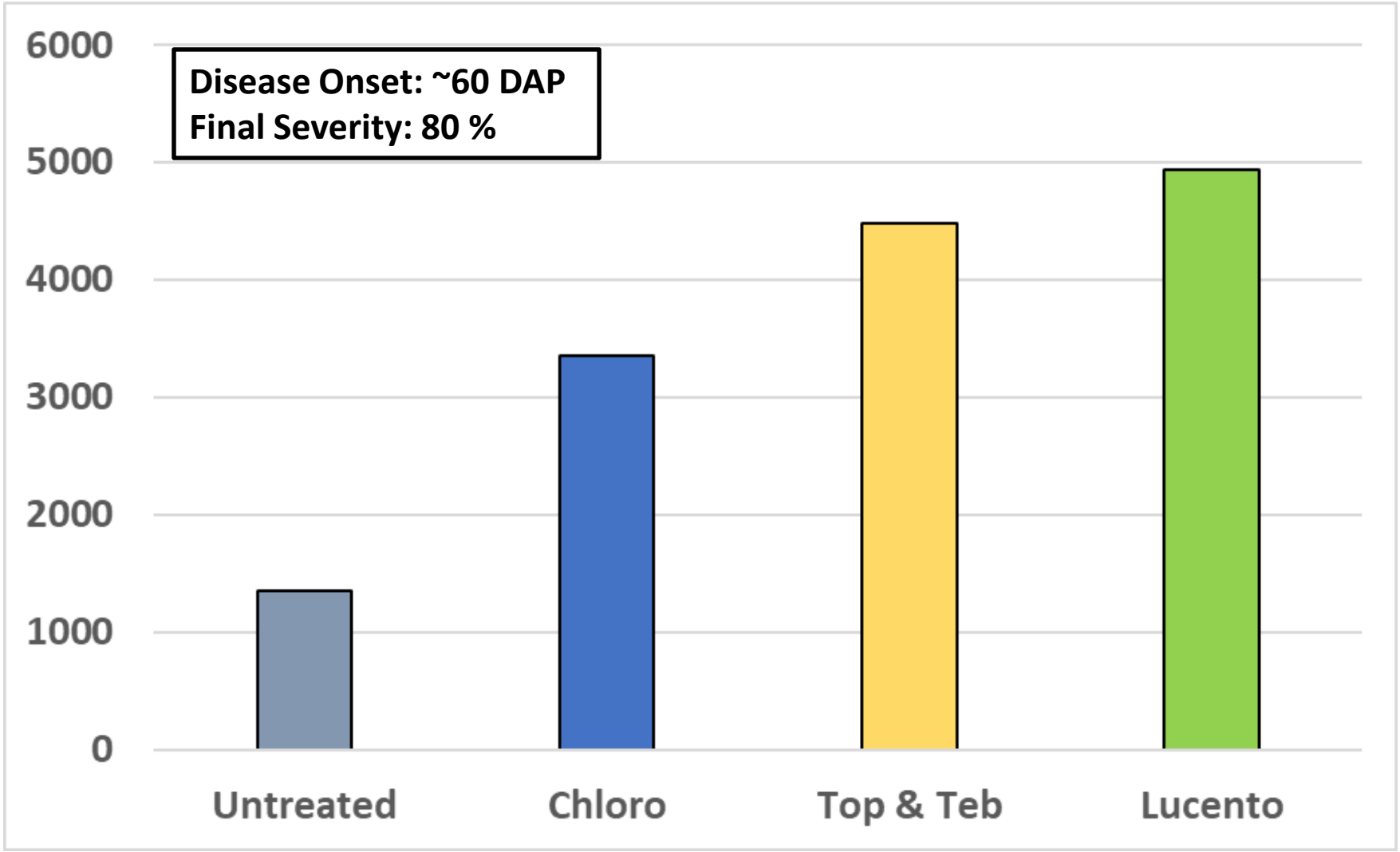
Disease:
Low white mold, Leaf spot varied

June Planting, PSREU



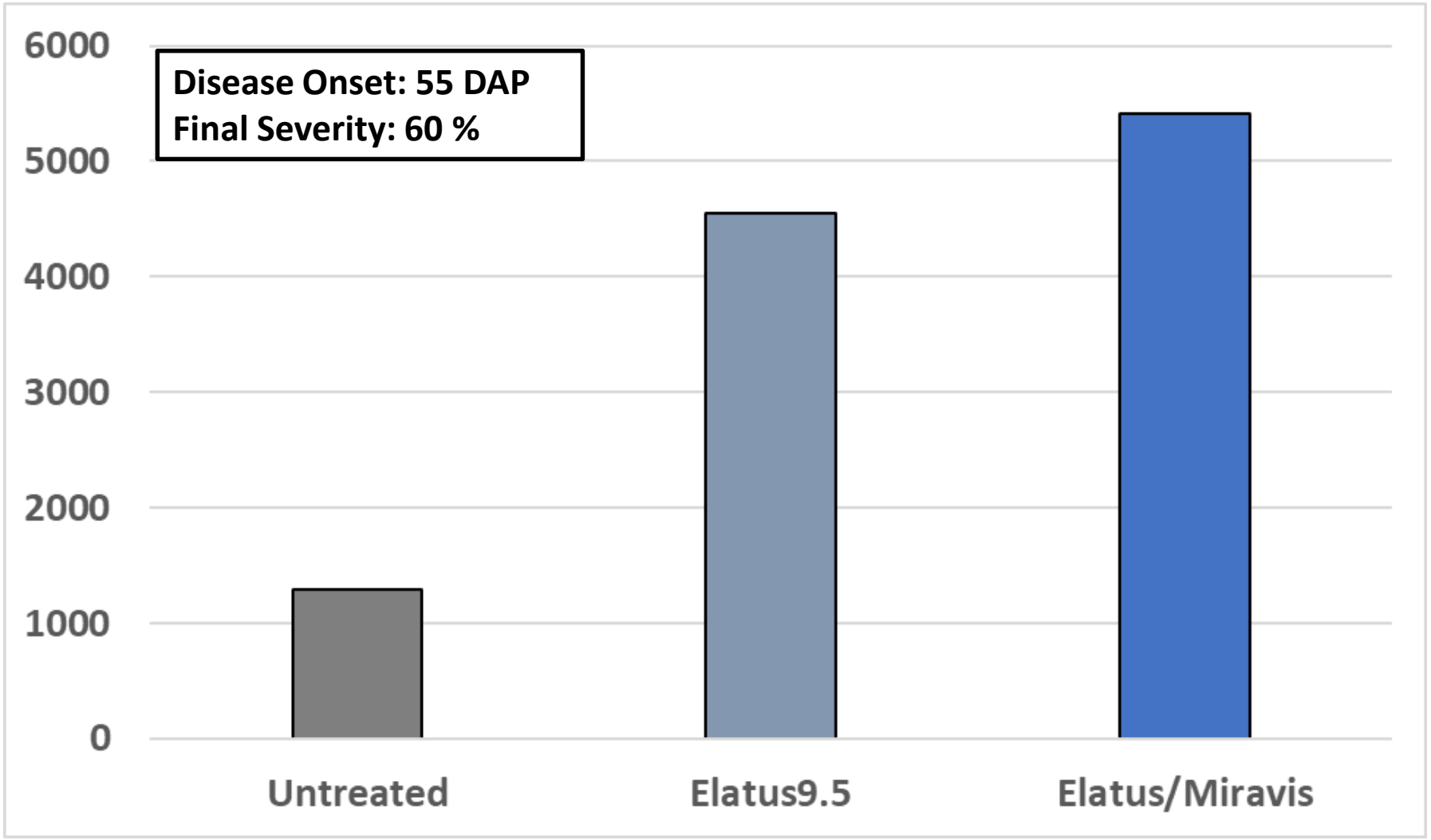
LSD = 1019

May Planting, PSREU



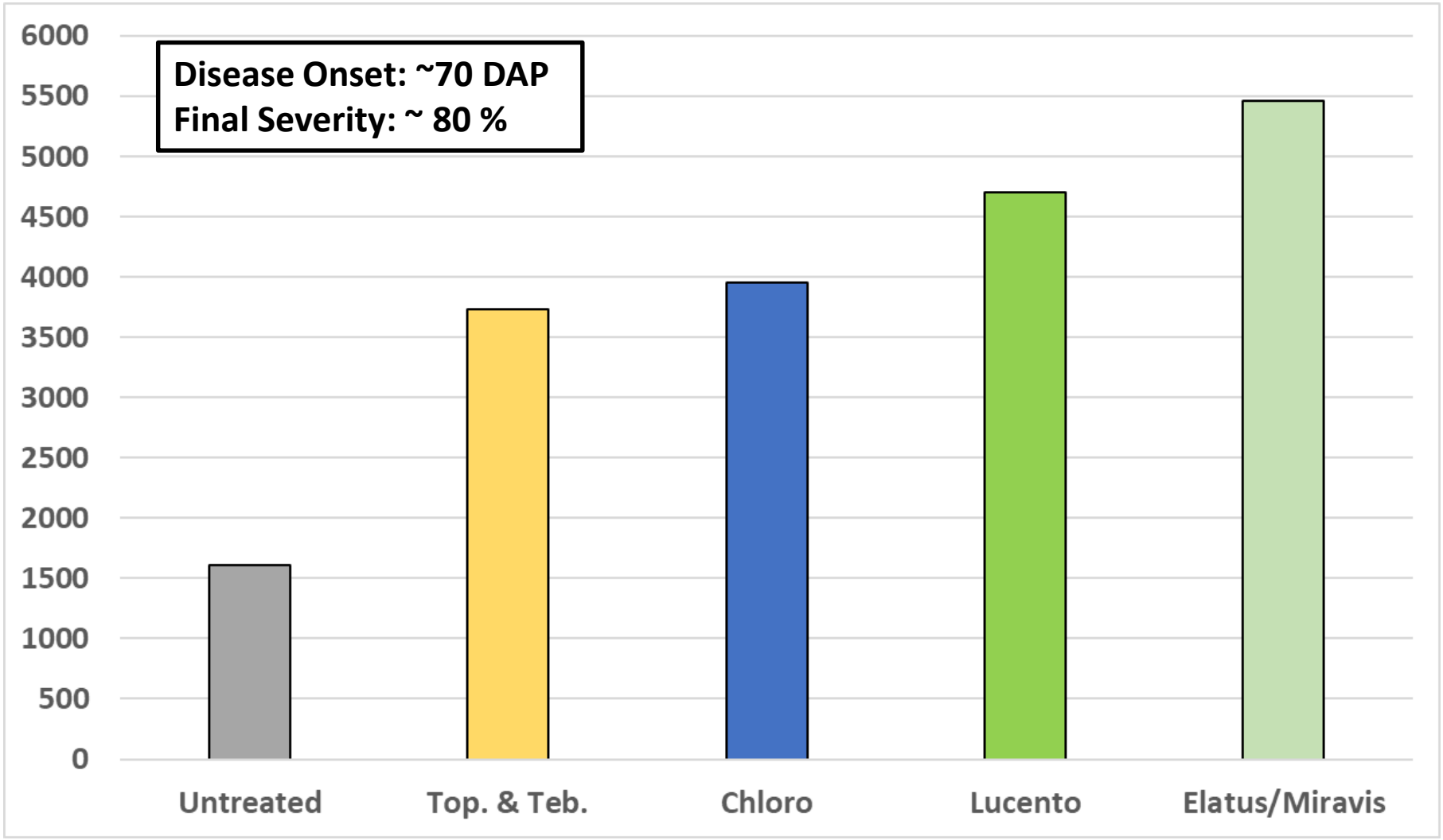
LSD = 725

May Planting, PSREU



LSD = 511

May Planting, NFREC Live Oak



LSD =540

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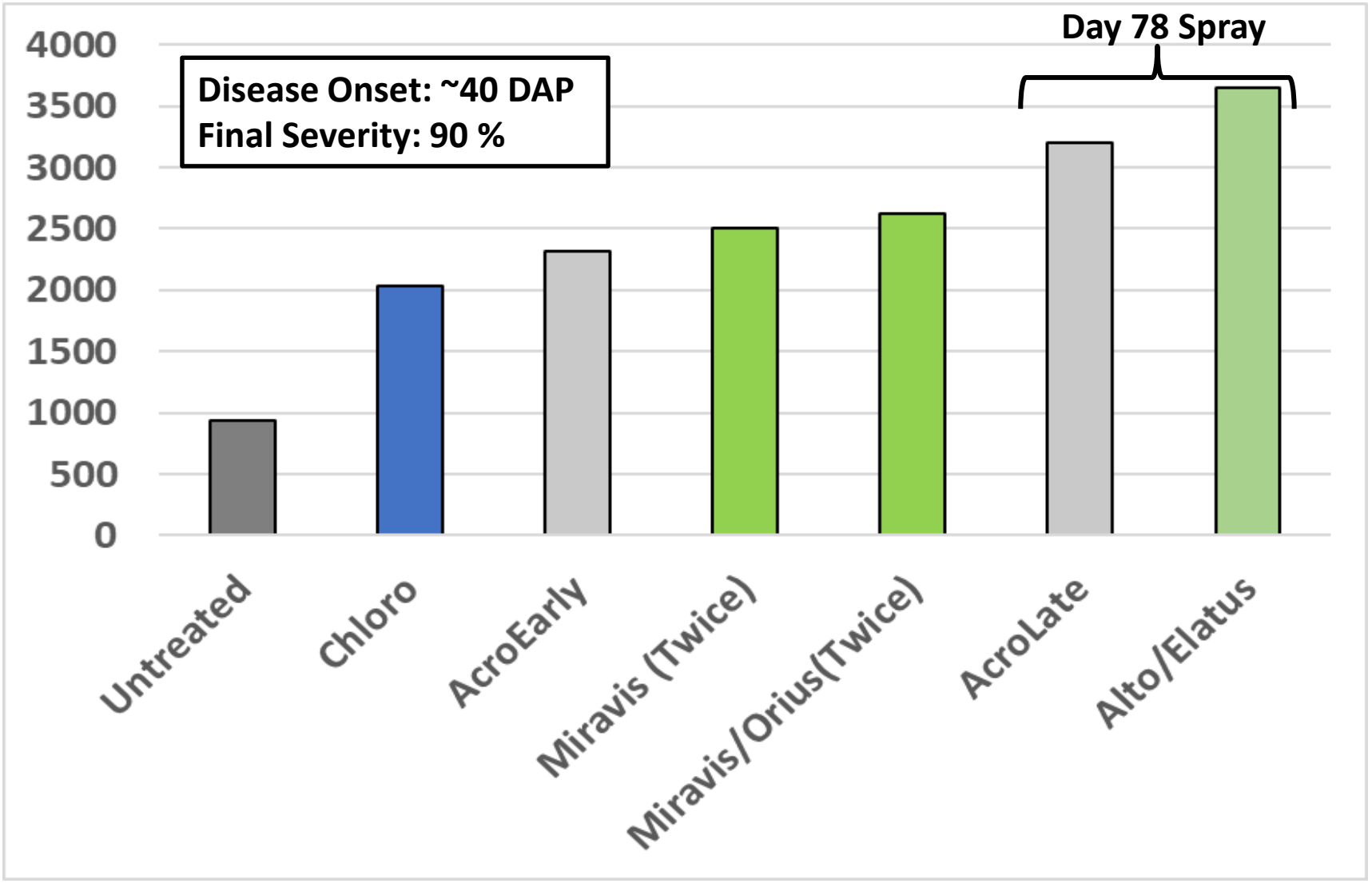
June Planting, PSREU

Miravis® 44 & 92 DAP

ACROPOLIS® Fungicide



LSD =658

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Based on these results, what do you think about…

The new fungicides can be useful

- **Lucento** could be a good leaf spot fungicide, but more data is needed.
- **Miravis** is effective and does provide a longer window between sprays (leaf spot only)
- **Acropolis** can be a good leaf spot rotational fungicide

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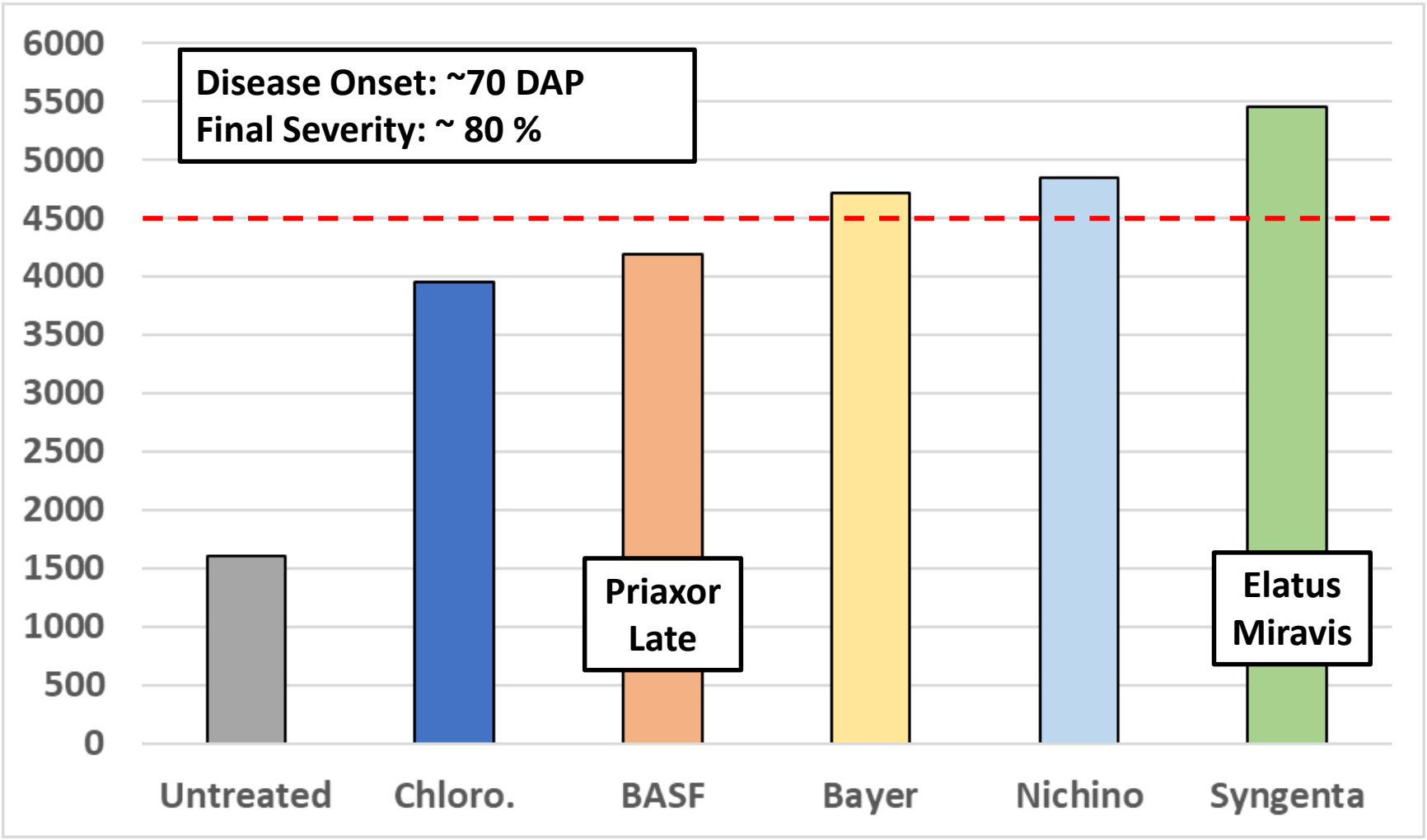
Peanut Rx Program Efficacy 2018 Small Plots (NFREC, Live Oak - ELS)



LSD =540

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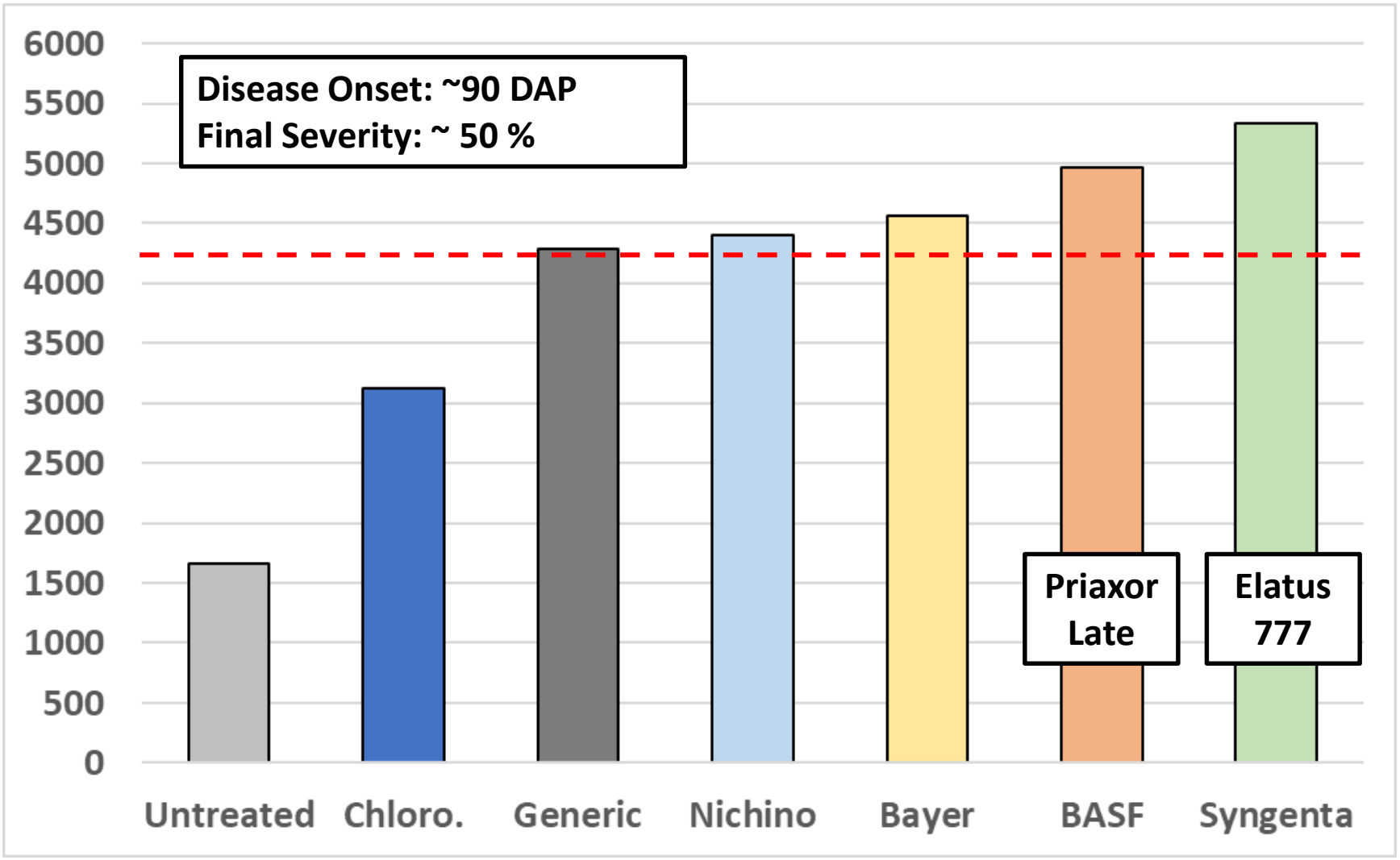
Peanut Rx Program Efficacy 2018 Small Plots (NFREC, Marianna- LLS)



LSD =1200

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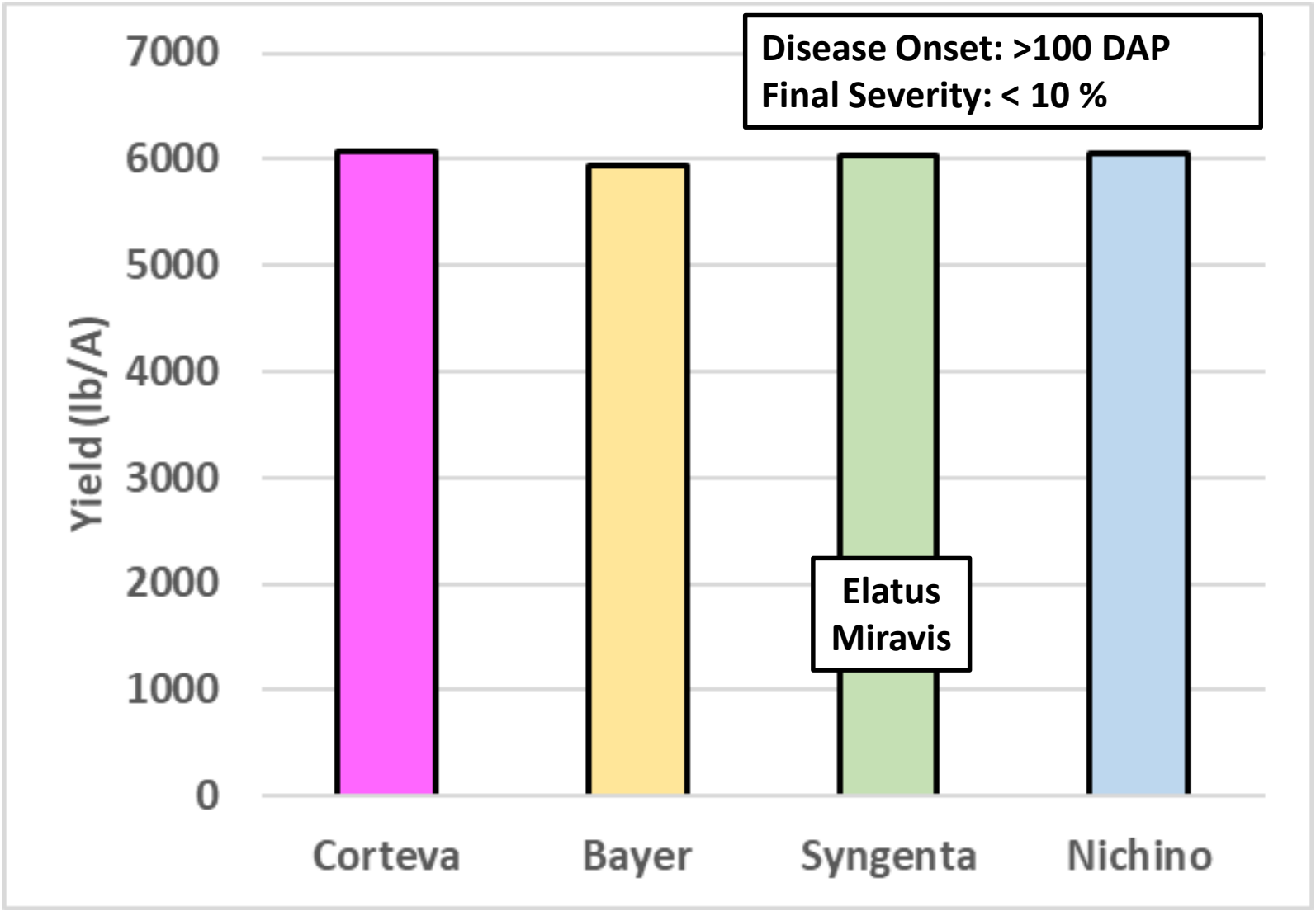
Peanut Rx Program Efficacy 2018 Large Plots (Hamilton Co.)



LSD = NS

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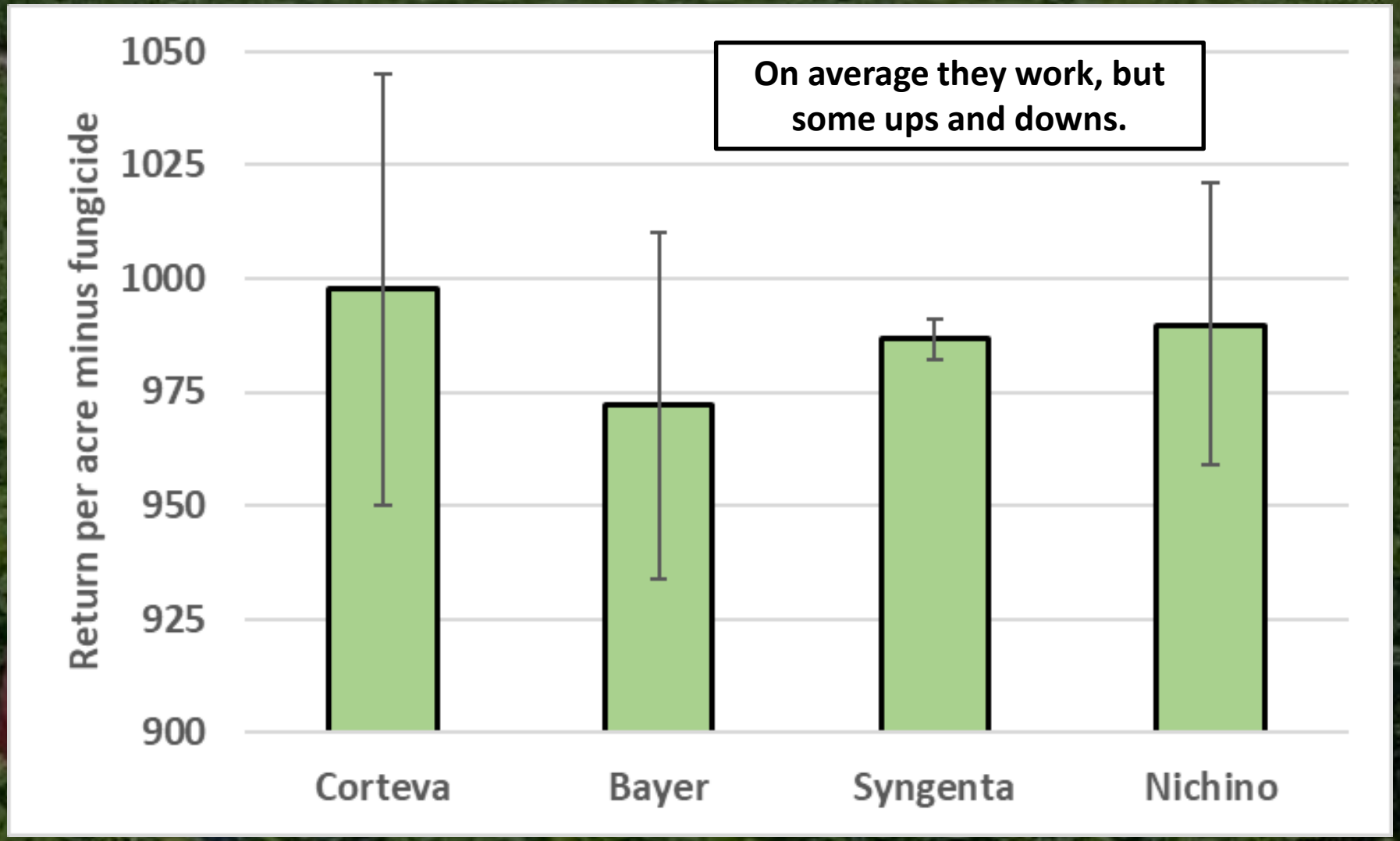
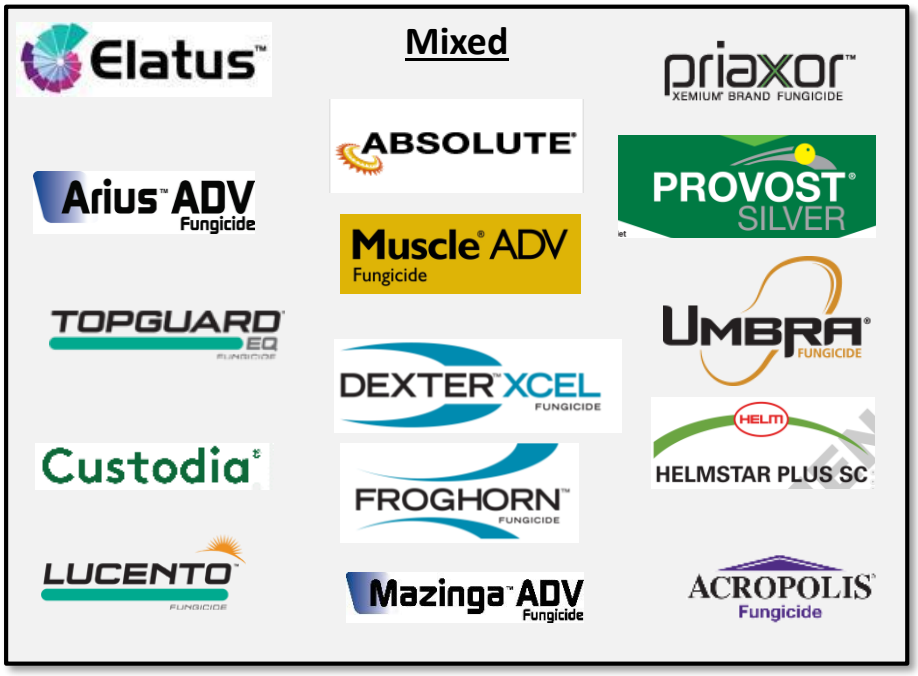

On average they work, but some ups and downs.
Return per acre minus fungicide
1050
1025
1000
975
950
925
900
Corteva
Bayer
Syngenta
Nichino

Can you get by with a “cheaper” program?



Many products available

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For example: Leaf spot management

Chlorothalonil (1-1.5 pts/a)

- 2.5 fl oz/a Domark®
- 5-10 fl oz/a Topsin® M
- 5.5 fl oz/a Alto®
- 7-14 fl oz/a Topguard®

Other products

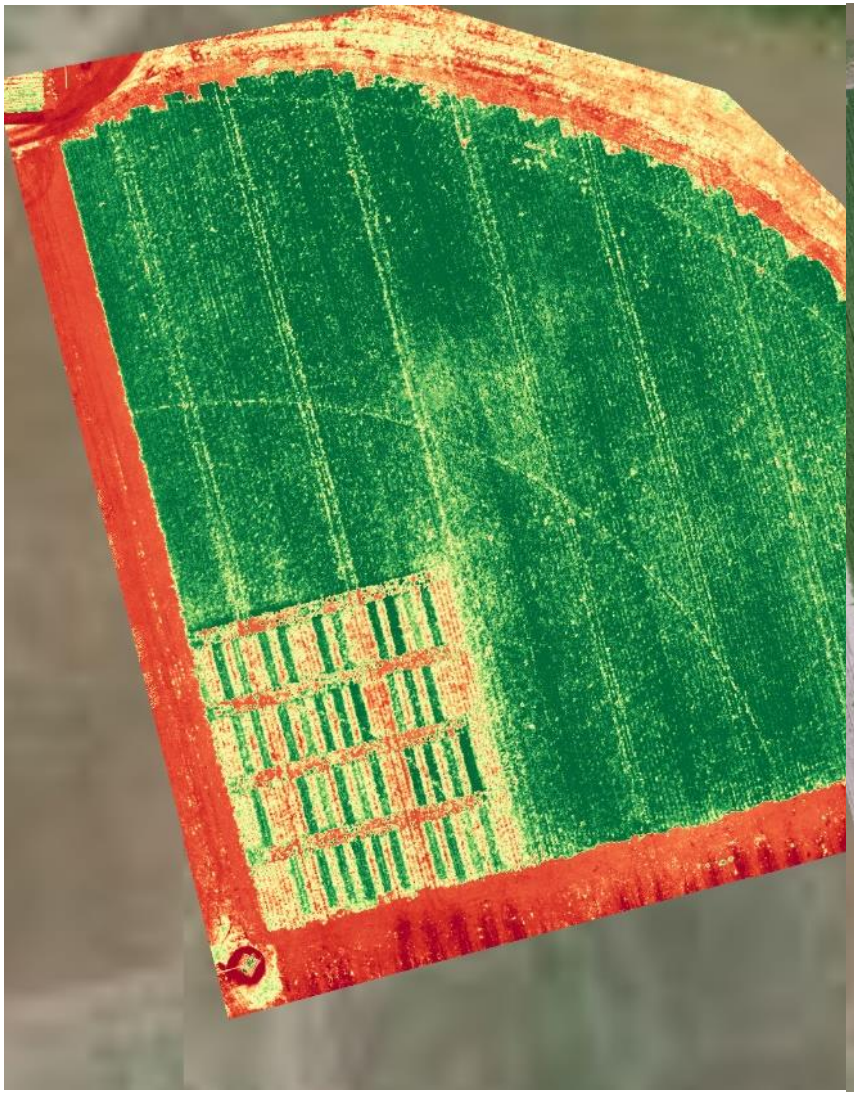
- 2 lb/a Koverall® + 14 fl oz/a Topguard®
- 1.5 pt/a Elast® 400F
- 3.5 fl oz/a Absolute®
- 6 to 8 fl oz/ a Priaxor®

Large plot input comparison trials

NFREC, Live Oak – Large Plot Trial 2018

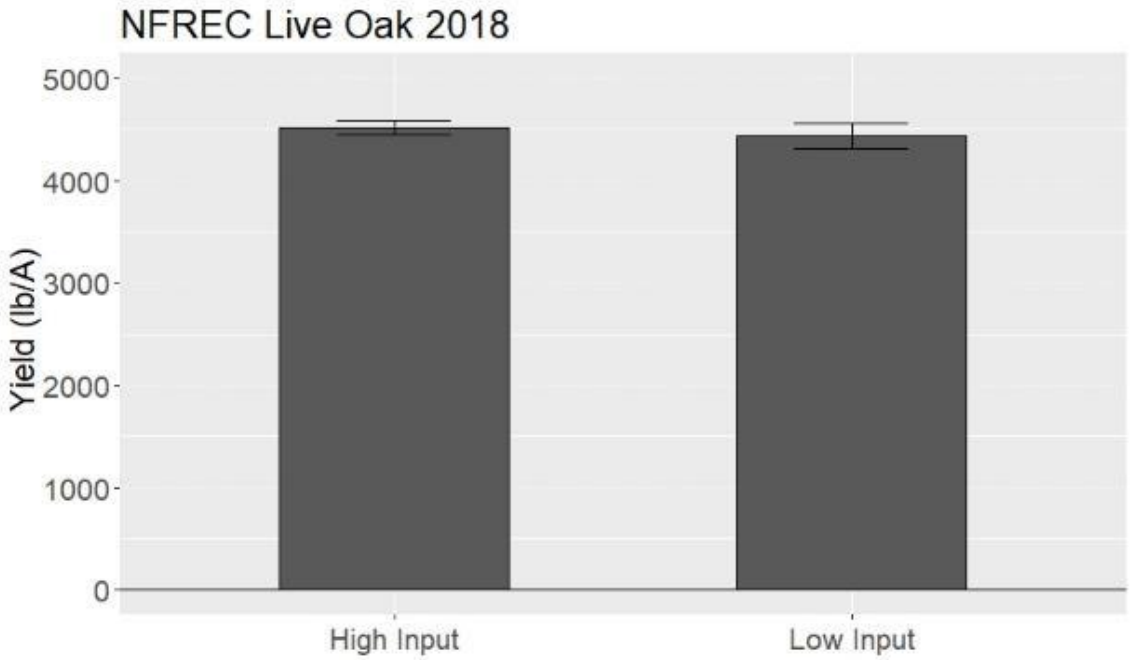
	37 DAP 27-Jun-18	51 DAP 11-Jul-18	64 DAP 24-Jul-18	78 DAP 7-Aug-18	93 DAP 22-Aug-18	108 DAP 6-Sep-18	126 DAP 24-Sep-18	Total Fug. Yearly Cost
High Input	Proline (5.7 oz/A) $21.83/A		Provost Opti (10.7 oz/A) $18.40/A	Abound (18.5 oz/A) $18.87/A Chlorothalonil (24 oz/A) $9.12/A	Provost Opti (10.7 oz/A) $18.40/A	Provost Opti (10.7 oz/A) $18.40/A	Chlorothalonil (24 oz/A) $9.12/A	$114.14 Acre
Low Input	Chlorothalonil (24 oz/A) $9.12/A	Chlorothalonil (24 oz/A) $9.12/A	Chlorothalonil (24 oz/A) $9.12/A Tebuconazole (7.2 oz/A) $2.38/A	Abound (18.5 oz/A) $18.87/A Chlorothalonil (24 oz/A) $9.12/A	Chlorothalonil (24 oz/A) $9.12/A Tebuconazole (7.2 oz/A) $2.38/A	Chlorothalonil (24 oz/A) $9.12/A Tebuconazole (7.2 oz/A) $2.38/A	Chlorothalonil (24 oz/A) $9.12/A	$89.85 Acre

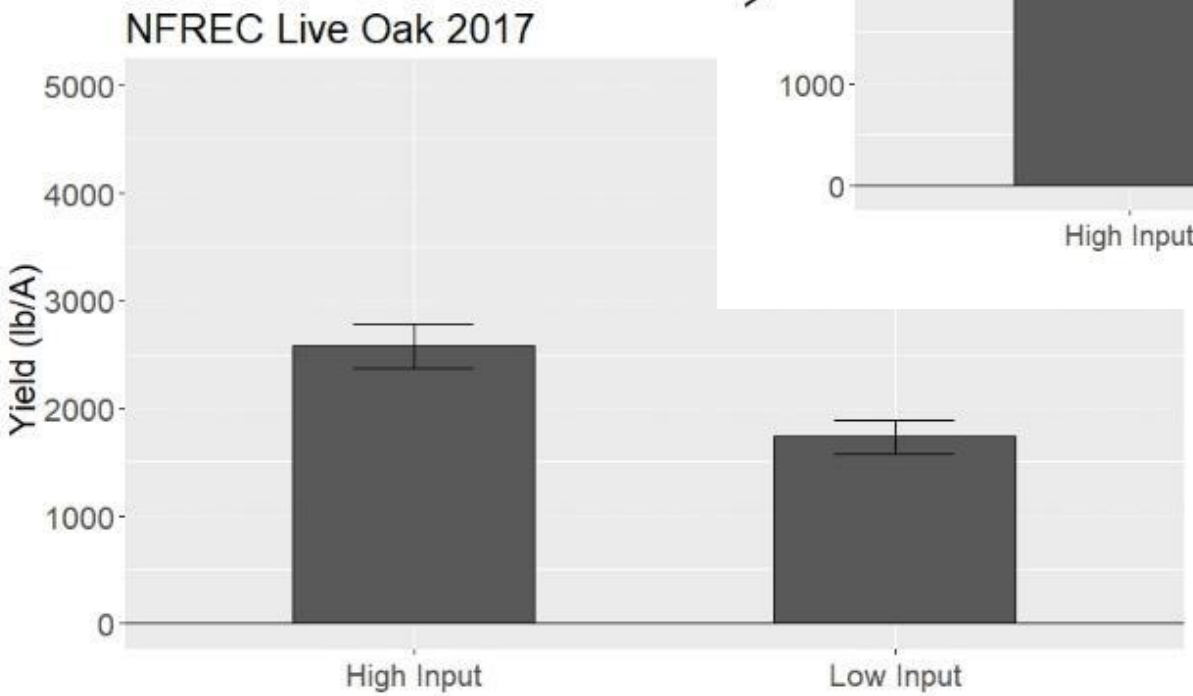
Disease pressure was low in both plots but check strips were completely defoliated by leaf spot



Results depend on year and stress

Only difference is
addition of Proline





Both programs have
3 FRAC groups

UF UNIVERSITY of FLORIDA
IFAS Extension

Variety & disease onset crucial in returns

Less root and crown damage in FloRun™ '331'

UF UNIVERSITY of FLORIDA IFAS Extension

A great application decision requires knowledge & luck

There are also many hidden factors involved:

- Duration of fungicide
- Environment stress
- Infection (when and where)
- Pathogen genetics
- Others?

https://cropprotectionnetwork.org/

So, can you get by with a cheaper program?

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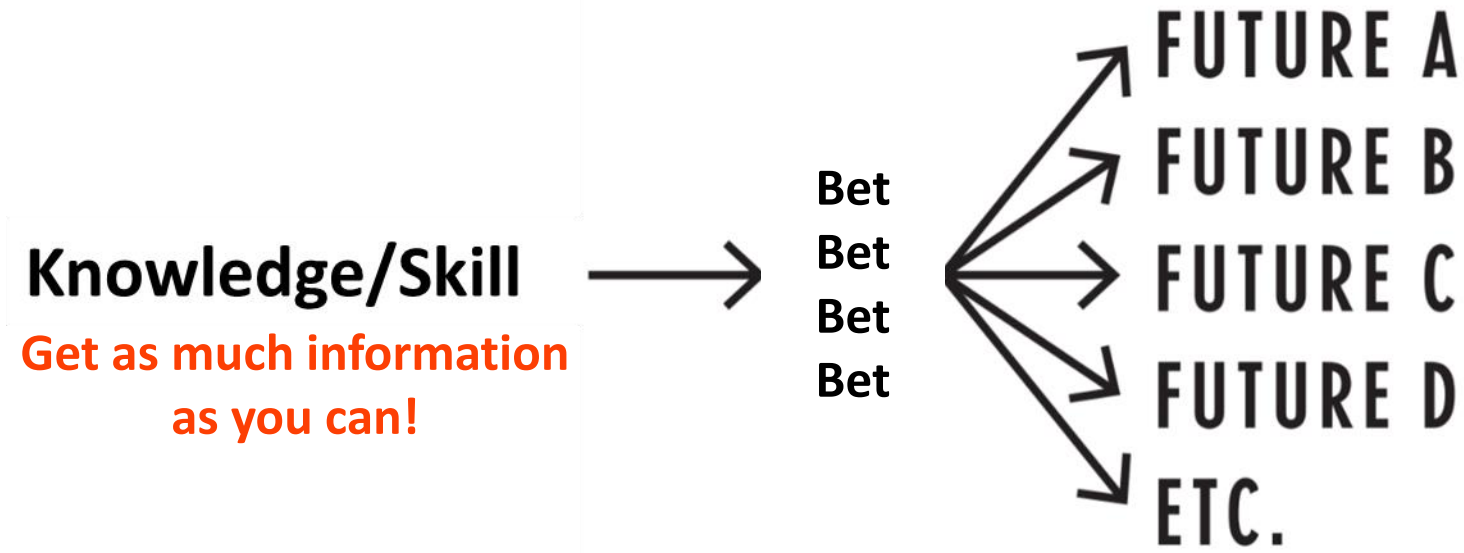
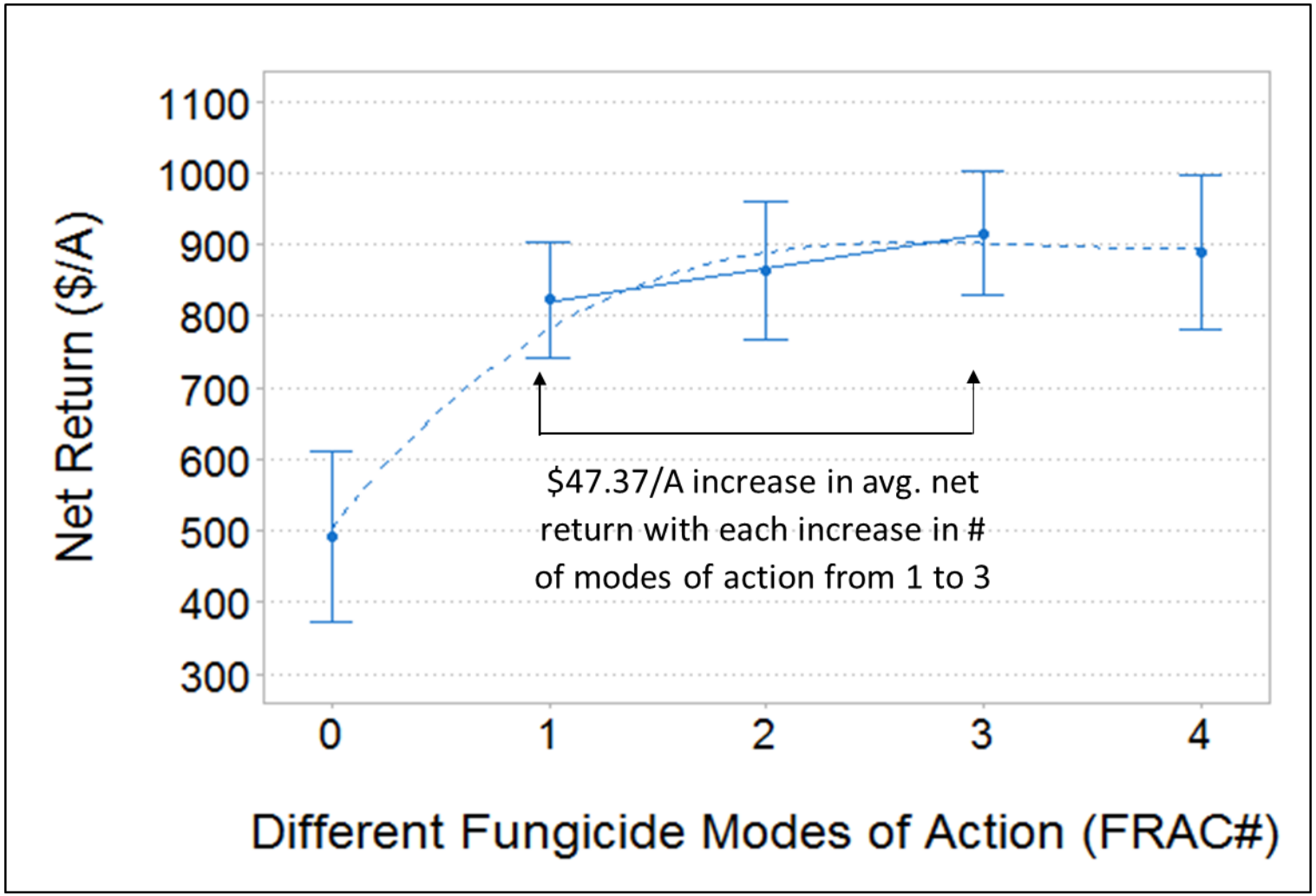
It is possible but “hedge your bets”



Thinking in Bets, 2018, A. Dukes

Variety, planting date & fungicides



Thank you