Soybean Disease Management Using Genetic Resistance, Planting Date, and Fungicides

THE LOUISIANA
Soybean & Grain
RESEARCH & PROMOTION BOARD

Louisiana Agricultural Technical and Management Conference
February 7-9, 2024

LSU AgCenter
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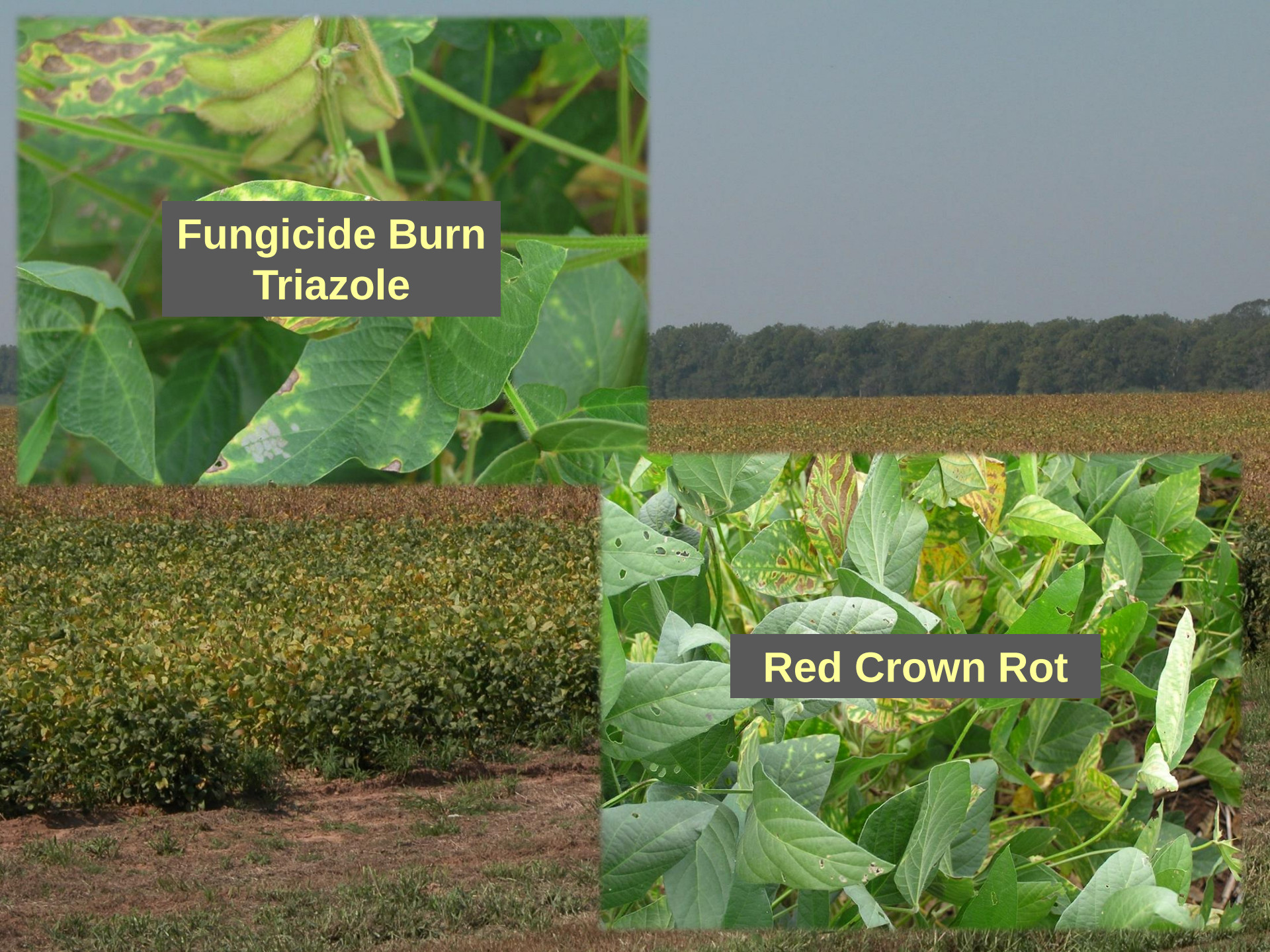
Disease Identification and Management


Fungicide Burn
Triazole
Red Crown Rot

REDUCED VS CONVENTIONAL

Soil Temperature

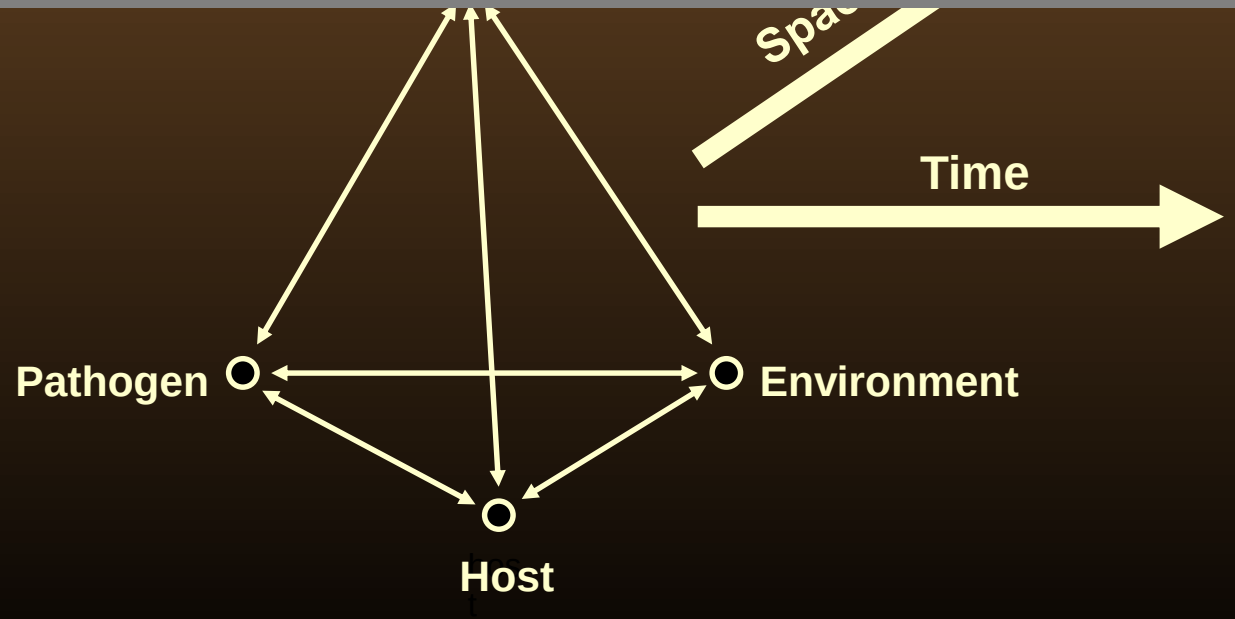
Soil Moisture

Pest Cycle

Plant Debris

Includes both temporal and spatial aspects of disease development and the influence of the environment and humans

VARIES FOR EACH DISEASE



Environmental Factors Drive Epidemics

- ✓ Air / Soil Temperature
- ✓ Leaf Wetness/RH
- ✓ Soil Moisture
- ✓ UV Light
- ✓ How Long Conditions Remain Favorable

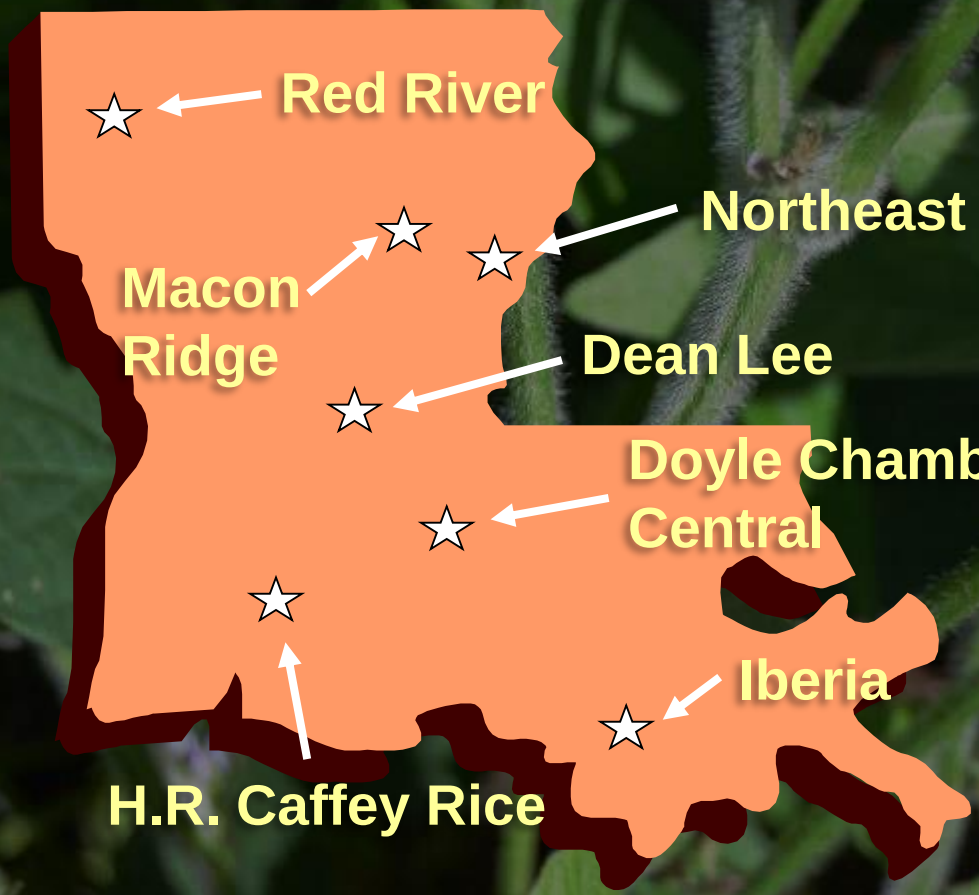
Disease Cycle – Pathogen Dispersal

SOYBEAN DISEASE MANAGEMENT

- ✓ OVT at Dean Lee and Doyle Chambers Central Research Stations (No Fungicide vs Fungicide)
- ✓ Soybean planting date at Dean Lee (selected dates No Fungicide vs Fungicide)
- ✓ Fungicide Screening (on-station, on-farm)


OFFICIAL
VARIETY
TRIALS

Locations


Red River
Northeast
Macon Ridge
Dean Lee
Doyle Chambers
Central
Iberia
H.R. Caffey Rice

Locations

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SOYBEAN OVT

- ✓ OVT – Same OVT Dr. Moseley (Planted side by side in the same field)
- ✓ Varieties in 5 Maturity Groupings (71-152 var)
- ✓ Revytek (8.0 fl oz/A) ¼% v/v NIS applied R3/R4
- ✓ Monitor and quantify disease development (CLB, Frog Eye, Aerial Blight, Target Spot, Rust)
- ✓ Compare disease ratings and yields of treated vs non-treated
- ✓ Improve variety selection based on disease resistance and yield
- ✓ Results published in LSU AgCenter Soybean Variety Publication

2021 Dean Lee Soybean OVT
WITH AND WITHOUT FUNGICIDE

	Yield			FE SCORE		
Brand / Variety	FUNG	NO FUNG	diff	FUNG	NO FUNG	diff
	bu/a			0-9		
AG43XF2	57.0	42.5	14.4	0.0	0.0	0.0
LS4415XF	64.1	51.0	13.2	0.0	0.0	0.0
NK S44-C7X	62.9	50.4	12.5	0.5	1.5	1.0
PROGENY P 4444RXS	57.4	46.6	10.7	0.0	0.0	0.0
ARMOR 44-D49	64.5	53.8	10.6	0.0	0.5	0.5
AG38XF1	48.7	38.3	10.4	0.0	0.0	0.0
NK39-A1XF	46.6	36.8	9.9	0.0	0.0	0.0
AG40XF1	55.9	46.1	9.8	0.0	0.0	0.0
PIONEER 42A96X	56.4	46.9	9.5	0.0	1.3	1.3
DYNA-GRO S43XS70	62.0	53.3	8.7	0.0	0.0	0.0
PROGENY P 4431E3	54.8	47.1	7.7	0.0	0.0	0.0
BASF CZ 4202XF	48.5	42.3	6.2	0.0	1.3	1.3

Charcoal Rot

2021-23 Soybean OVT
WITH AND WITHOUT FUNGICIDE

	DEAN LEE			CENTRAL		
	Yield (bu/A)			Yield (bu/A)		
YEAR MG	FUNG	NO	diff	FUNG	NO	diff
2021 (3.0-4.4)	56.6	46.6	10.0			
2022 (3.0-4.4)	74.4	76.4	-2.0	49.4	43.8	5.6
2023 (3.0-4.4)	43.8	37.9	5.9	60.1	54.4	5.7
2021 (4.5-4.7)	62.3	48.6	13.7			
2022 (4.5-4.7)	77.5	76.7	0.8	48.9	43.2	5.7
2023 (4.5-4.7)	35.5	32.7	2.8	65.6	61.7	3.9
2021 (4.8-4.9)	56.7	43.1	13.6			
2022 (4.8-4.9)	69.6	66.3	3.3	50.0	46.0	4.0
2023 (4.8-4.9)	37.8	34.6	3.2	66.3	60.6	5.7

2021-23 Soybean OVT
WITH AND WITHOUT FUNGICIDE

	DEAN LEE			CENTRAL		
	Yield (bu/A)			Yield (bu/A)		
YEAR MG	FUNG	NO	diff	FUNG	NO	diff
2021 (5.0-5.3)	64.1	47.8	16.3			
2022 (5.0-5.3)	74.9	74.6	0.3	56.3	41.9	14.4
2023 (5.0-5.3)	33.2	35.1	-1.9	67.1	60.8	6.3
2021 (5.4-5.9)	65.7	50.0	15.7			
2022 (5.3-5.9)	77.8	72.5	5.3	63.0	49.7	13.3
2023 (5.4-5.9)	27.0	29.9	-2.9	55.6	52.9	2.7

Variety Yields and Production Practices

2023

SOYBEAN

Varieties (Isuagcenter.com)

2021 / 2022 / 2023
SOYBEAN PLANTING DATE

- ✓ 12 Varieties (MG 4.0-5.3)
- ✓ Planting dates from March to June
- ✓ Fungicide applied at R3/R4
- ✓ Quantify disease and yield
- ✓ Determine if planting date can be used to reduce risk to disease

2021 Planting Date – Dean Lee

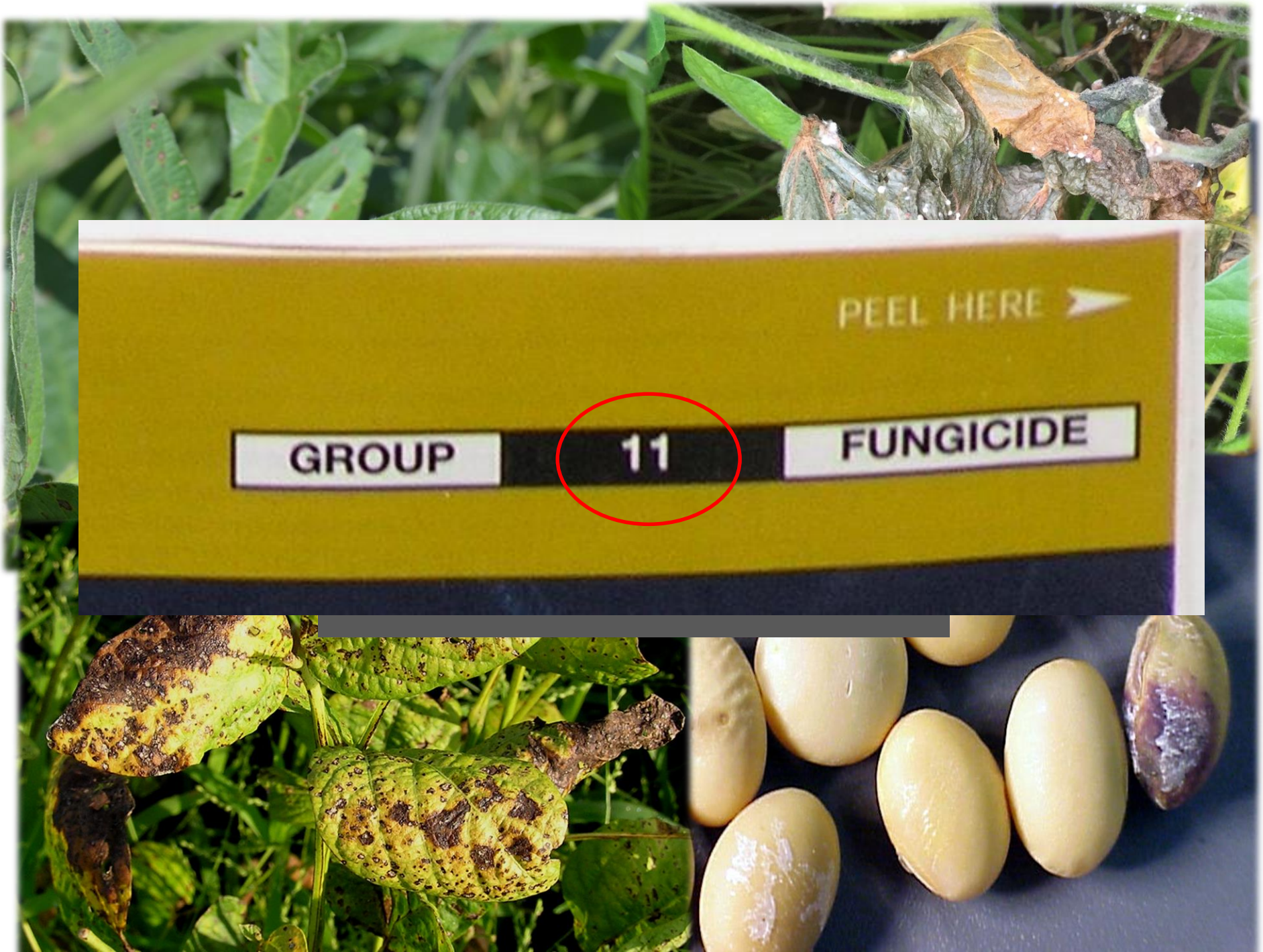
VARIETY (MG)	PD 1 FE (0-9)	PD 2 FE (0-9)	PD3 FE (0-9)	PD 4 FE (0-9)	PD 5 FE (0-9)	PD 6 FE (0-9)
AG40XF1 (4.0)	0	3.8	-	0	0	1.3
S17PR-499RS (4.2)	8.0	8.0	8.0	6.8	7.5	6.3
AG43X0 (4.3)	0.8	0	1.0	0	0.8	0
AG44XF2 (4.4)	0.8	0	0	0	0	1.8
S16-550R (4.6)	0	0	0	0	0.5	0
AG47XF2 (4.7)	0	0	0	0	0	0
CZ4770X (4.7)	0	0	0	0	0	1.0
AG48X9 (4.8)	0	0	1.0	0	0.8	0.8
S16-3747RY (5.0)	0	0	1.5	4.0	4.3	2.5
AG53XF2 (5.3)	0	0	0	0	0	0.8
AG55XF0 (5.5)	0	0	0	0	0	0
AG56X8 (5.6)	0	0	0	1.0	0	0

2021 Planting Date – Dean Lee

VARIETY (MG)	PD 1 AB (0-9)	PD 2 AB (0-9)	PD3 AB (0-9)	PD 4 AB (0-9)	PD 5 AB (0-9)	PD 6 AB (0-9)
AG40XF1 (4.0)	0	0	0	0	0	0.3
S17PR-499RS (4.2)	0	0.5	0.3	0	3.0	3.3
AG43X0 (4.3)	0	0.0	3.3	0	0	1.8
AG44XF2 (4.4)	0	0.3	0.3	0	1.5	0.3
S16-5540R (4.6)	0	0.5	1.5	0	0	4.0
AG47XF2 (4.7)	0.3	0.8	2.5	0	0.3	2.0
CZ4770X (4.7)	0	0.3	0.3	0.8	0.3	3.3
AG48X9 (4.8)	0	0	5.0	0.3	5.5	1.3
S16-3747RY (5.0)	0	0	3.5	0	3.3	2.3
AG53XF2 (5.3)	0	0	5.3	0	6.0	1.0
AG55XF0 (5.5)	0	1.0	3.3	0	4.0	0.8
AG56X8 (5.6)	0	0.3	2.0	0	1.5	0

FUNGICIDE SCREENING

Locations


PEEL HERE
GROUP
11
FUNGICIDE

Mode of action determines risk to resistance

Class	Active Ingredient	Trade Name	Resistance Risk
QoI (strobilurins) Group 11	azoxystrobin	Quadris (Generics)	HIGH
	trifloxystrobin	Gem	
	pyraclostrobin	Headline	
DMI (triazoles) Group 3	flutriafol	Topguard	MEDIUM
	propiconazole	Tilt (Generics)	
	tetraconazole	Domark	
MBC Thiophanates (benzimidazoles) Group 1	thiophanate-methyl	Topsin-M Incognito (Generics)	HIGH
SDHI Carboxamides Group 7	boscalid	Endura	HIGH
	fluopyram	Luna	
	sedaxane	Vibrance	
	fluxapyroxad	Priaxor	

Strategy list

1. Do not use the product exclusively
2. Restrict the number of treatments applied per season and apply only when strictly necessary. Use other fungicides both beforehand and subsequently.
3. Maintain manufacturers' recommended dose
4. Avoid eradicant or curative use.
5. Integrated disease management
6. Chemical diversity

2020 Fungicide – Dean Lee

Treatment (fl oz/a)[1]	Sept 10 Aerial Blight Hits 25 ft row[2]	Sept 19 Rust 0-9	Sept 19 CLB 0-9	Sept 25 % Defol	Oct 20 TW lb/bu	Oct 20 Yld bu/a
Non-treated	9.7	5.5	5.5	71.3	55.2	48.1
Miravis Top (13.7)	5.2	0.3	2.3	11.3	56.2	60.5
Trivapro (13.7)	0.7	0.5	2.8	22.2	55.7	58.0
Revytek (8.0)	2.7	0.0	3.3	7.5	56.1	57.4
Aproach Prima (6.8)	2.3	0.8	3.3	25.0	55.7	51.8
Stratego Yld (4.5)	2.7	0.8	3.3	33.8	55.9	52.8
Topguard EQ (5)	1.0	0.3	3.0	26.3	56.0	57.5
Priaxor (4)	2.2	0.8	2.8	26.3	56.0	57.2
Lucento (5)	1.7	0.3	2.8	20.0	55.6	55.4
LSD P=0.10	4.0	0.7	1.1	14.2	0.9	5.5

[1] Application timing R3.
[2] Hit is up to 1 ft of row with symptoms of aerial blight.

2020 Fungicide – Ben Hur

Treatment (fl oz/a) [1]	Aug 17 Aerial Blight Hits/25 ft	Aug 24 Aerial Blight Hits/25 ft	Aug 31 Aerial Blight Hits/25 ft	Oct 6 Test Weight lb/bu	Oct 6 Yield bu/A
Non-treated	7.0	13.1	13.5	50.2	24.7
Miravis Top (13.7)	4.1	8.7	10.8	49.8	30.9
Trivapro (13.7)	3.0	4.7	7.6	52.1	36.8
Revytek (8.0)	1.8	3.6	5.7	51.7	39.1
Aproach Prima (6.8)	6.0	8.2	13.2	50.9	32.0
Stratego Yld (4.5)	3.6	6.8	9.3	52.3	36.1
Topguard EQ (5)	2.1	5.1	6.7	51.5	45.6
Priaxor (4)	2.5	4.7	5.7	53.0	35.6
Lucento (5)	4.0	6.6	9.1	50.9	38.4
LSD P=0.10	3.1	4.0	3.6	2.5	5.8

[1] Application timing R3.
[2] Hit is up to 1 ft of row with symptoms of aerial blight.

- ✓ Lucento (G
  Blight)
- ✓ All Good o

2021 Fungicide – Dean Lee

Treatment (fl oz/a)[1]	Sept 17 Aerial Blight 0-9	Sept 17 Target Spot 0-9	Oct 20 TW lb/bu	Oct 20 Yld bu/A
Non-treated	5.5	4.5	52.9	50.8
Trivapro (13.7)	0.0	3.5	53.1	54.0
Aproach Prima (6.8)	1.5	4.3	52.5	51.4
Quadris Top SBX (7.0)	0.5	4.0	53.1	55.7
Miravis Top (13.7)	0.5	2.5	52.9	56.3
Brixen (13.0)	0.8	4.3	53.0	54.0
LSD P=0.10	0.9	0.9	0.6	2.4

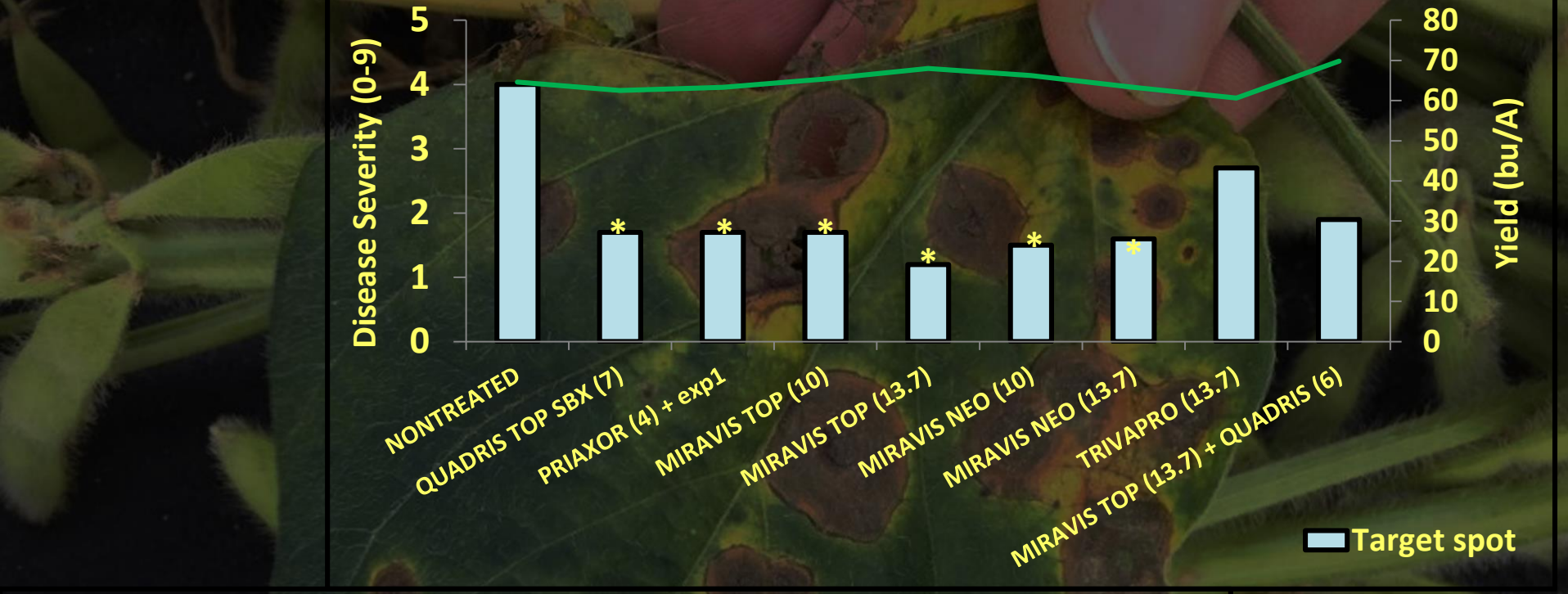
[1] Application timing R3.

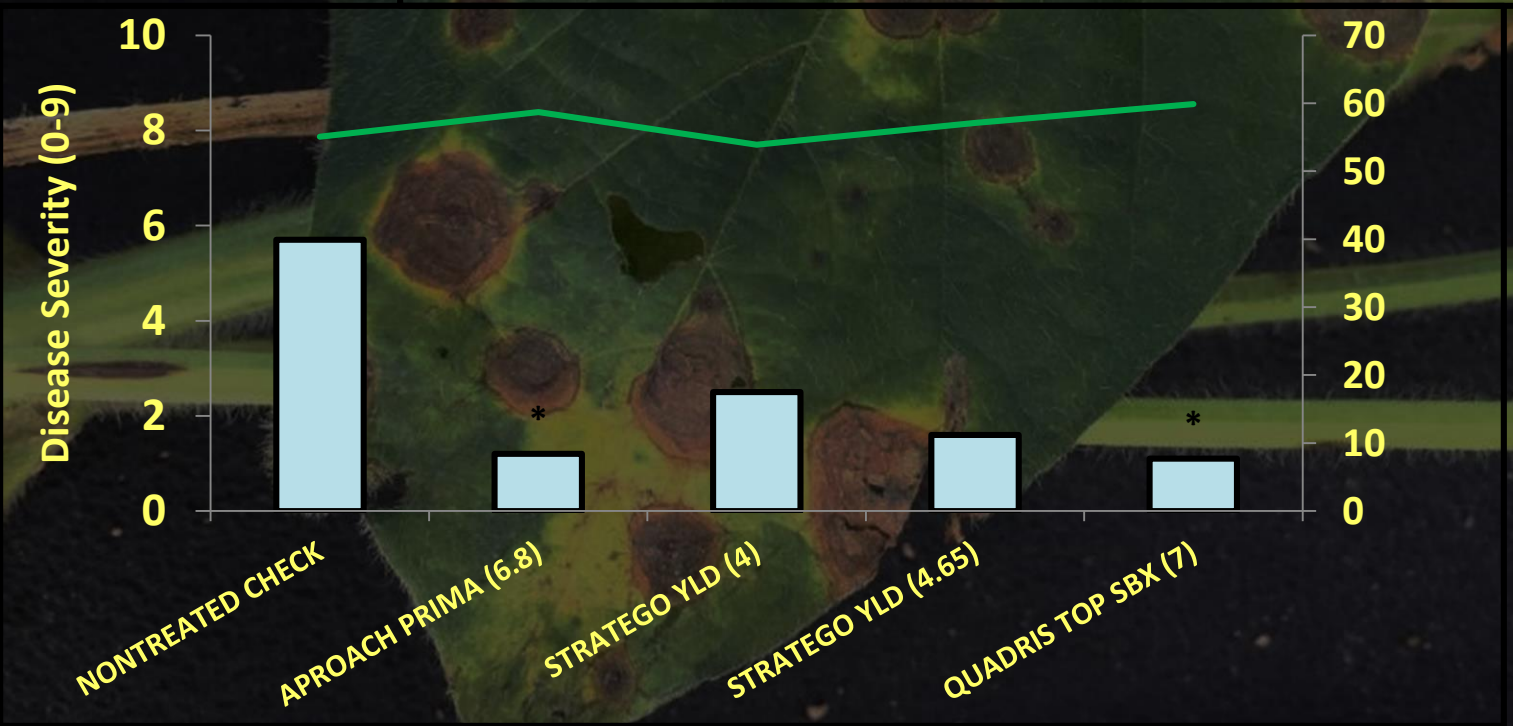
2021 Fungicide – Dean Lee

Treatment (fl oz/a)[10]	Sept 17 Aerial Blight 0-9	Sept 17 Target Spot 0-9	Oct 20 TW lb/bu	Oct 20 Yld bu/A
Non-treated	5.3	4.8	52.7	47.2
Revytek (8.0)	1.8	3.5	53.5	54.2
Lucento (5.0)	0.5	2.3	52.7	54.1
Miravis Top (13.7)	2.5	3.0	53.4	56.7
Delaro Complete (8.0)	2.5	2.8	52.5	56.7
LSD P=0.10	1.0	1.1	1.1	3.4

[1] Application timing R3.

Target spot



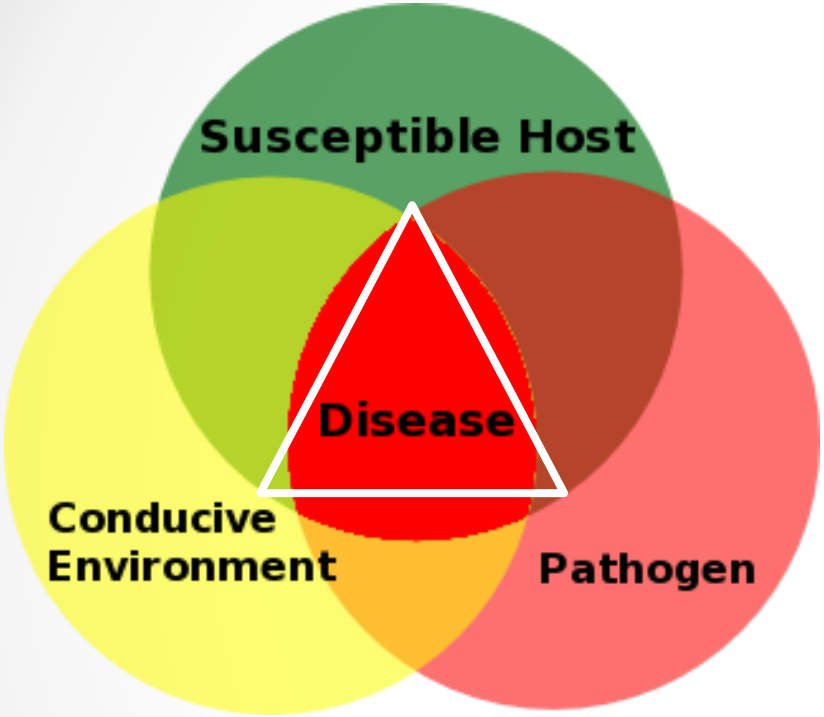


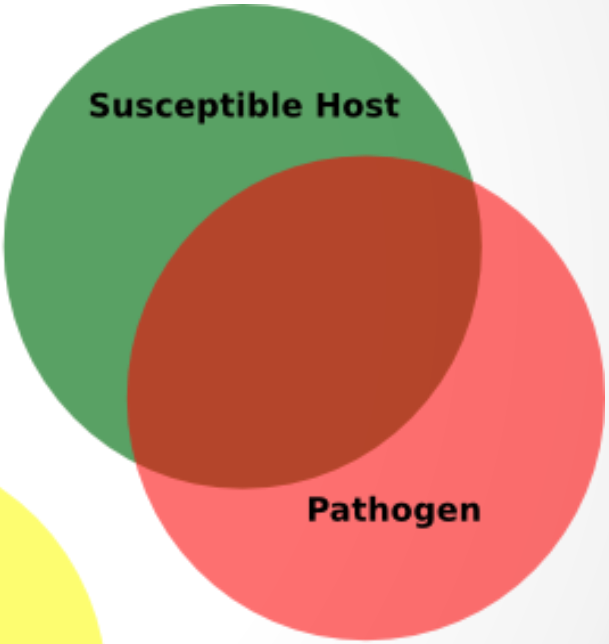
Dr. Trey Price

2023

ALEXANDRIA	
May	0
June	4.57
July	1.66
August	0.01
September	0.73
Total Inches	6.97

How Does Disease Occur?





No Disease

2023 Fungicide Doyle Chambers

Treatment (fl oz/a)[1]	GS @ Appl.	CLB[1] (0-9)	CLB[2] (0-9)	TW (lb/bu)	Yield[3] (bu/A)
Non-Treated	--	5.8	7.3	57.8	69.7
Quadris (6.0)	R3	5.5	7.0	57.5	71.5
Headline (6.0)	R3	5.5	7.5	57.8	69.4
Quadris Top SBX (7.0)	R3	4.6	5.7	57.6	70.4
Topguard EQ (5.0)	R3	4.8	5.2	58.0	72.5
Priaxor (4.0)	R3	5.1	6.2	57.5	72.5
Revytek (8.0)	R3	4.1	5.5	57.5	72.9
Miravis Top (13.7)	R3	4.4	5.9	58.0	71.7
Trivapro (13.7)	R3	4.9	6.6	57.9	71.0
Quilt Xcel (14.0)	R3	4.5	5.7	57.6	75.0
Aproach Prima (6.8)	R3	4.4	6.5	57.6	70.9
Stratego Yld (4.6)	R3	4.4	6.1	58.4	75.2
LSD (0.05)		1.2	1.4	NS	NS

[1] September 11.
[2] September 15.
[3] October 9.

2023 Fungicide Dean Lee

Treatment (fl oz/a)[1]	GS @ Appl.	(Sep 22) % Grn Lvs	TW (lb/bu)	(Oct 12) Yield (bu/A)
Non-Treated	--	7.3	56.9	30.2
Quadris (6.0)	R3	10.6	57.1	31.4
Headline (6.0)	R3	9.2	56.2	28.9
Quadris Top SBX (7.0)	R3	10.6	57.0	28.8
Topguard EQ (5.0)	R3	10.8	56.8	33.1
Priaxor (4.0)	R3	7.3	57.1	29.7
Revytek (8.0)	R3	13.1	56.9	30.3
Miravis Top (13.7)	R3	13.7	56.9	32.9
Trivapro (13.7)	R3	9.2	57.1	32.5
Quilt Xcel (14.0)	R3	9.4	56.7	32.4
Aproach Prima (6.8)	R3	9.2	57.2	34.6
Stratego Yld (4.6)	R3	7.3	57.1	35.6
LSD (0.05)		NS	NS	NS

On-Farm Locations

- Acadia
- Avoyelles
- Beauregard
- Morehouse
- Pointe Coupee
- Rapides
- St. James
- St. Landry
- Tensas

2023 Fungicide Demonstration
Somerset, Tensas Parish

Fungicide Trial

1. Non-treated
2. Stratego Yield (4.65 oz/A)
3. Stratego Yield + Stimulate (4.65 oz + 8 oz/A)
4. Topguard (9 oz/A)
5. Revylok (1.84 + 4.14 oz/A)
6. Non-Treated
7. Trivapro (13.7 oz/A)
8. Miravis Top (13.7 oz/a)
9. Miravis Top + Agrispon (13.7 oz + 8 oz/a)
10. Revytek (8 oz/A)
11. Non-treated

Rogers Leonard / Trey Price

2023 Fungicide Demonstration
Somerset, Tensas Parish

Treatment	TS/CB[1] (0-9)[2] 8/8/2023	TS/CB (0-9) 8/18/2025	TS/CB (0-9) 8/25/2023	YLD (BU/A)
Non-treated	3.9	6.1	6.4	70.9
BASF Mix (Revylok)	1.0	3.0	4.0	71.7
Revytek	1.7	3.6	5.0	74.0
Miravis Top	2.3	3.8	4.6	74.7
Miravis Top + Agrispon	1.0	3.9	4.4	74.6
Trivapro	1.0	3.4	4.0	73.7
Stratego YLD	1.7	5.2	5.7	72.9
Stratego YLD + Stimulate	2.3	3.7	4.6	73.8
Topguard	1.3	3.0	4.8	73.7

[1] Target spot (TS), Cercospora leaf blight (CB).
[2] 0-9 rating: 0=no disease, 9=plants dead due to disease.

Treatments applied at R4.
Cooperators: Rogers Leonard / Trey Price.

ON FARM ADVENTURES WITH TREY PRICE

SLIDES COMPLEMENTS OF TREY

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A RECOVERING ADMINISTRATOR AND A NEW TOY!

Mowata, LA – Acadia Parish

- Frey Farms, Cooperator
- Jeremy Hebert, Agent
- Boyd Padgett, Co-PI
- QoI (Quadris, etc.) resistant location
- Rice/soybean rotation
- Aerial blight started at R5…then quit
- Treatments applied shortly thereafter

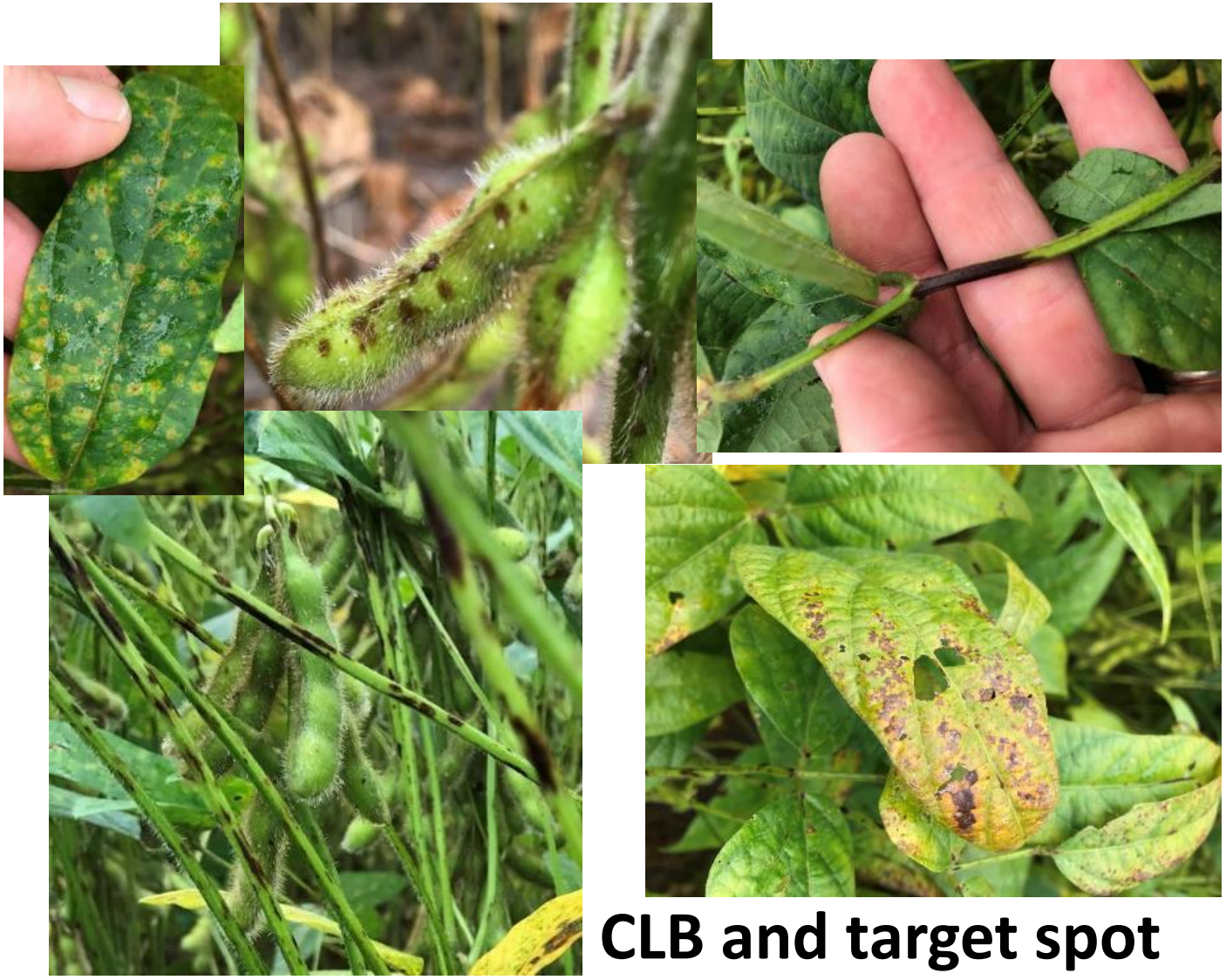
Iowa 1 & 2…FAIL

Stand issues & no disease

Convent, LA – St. James Parish

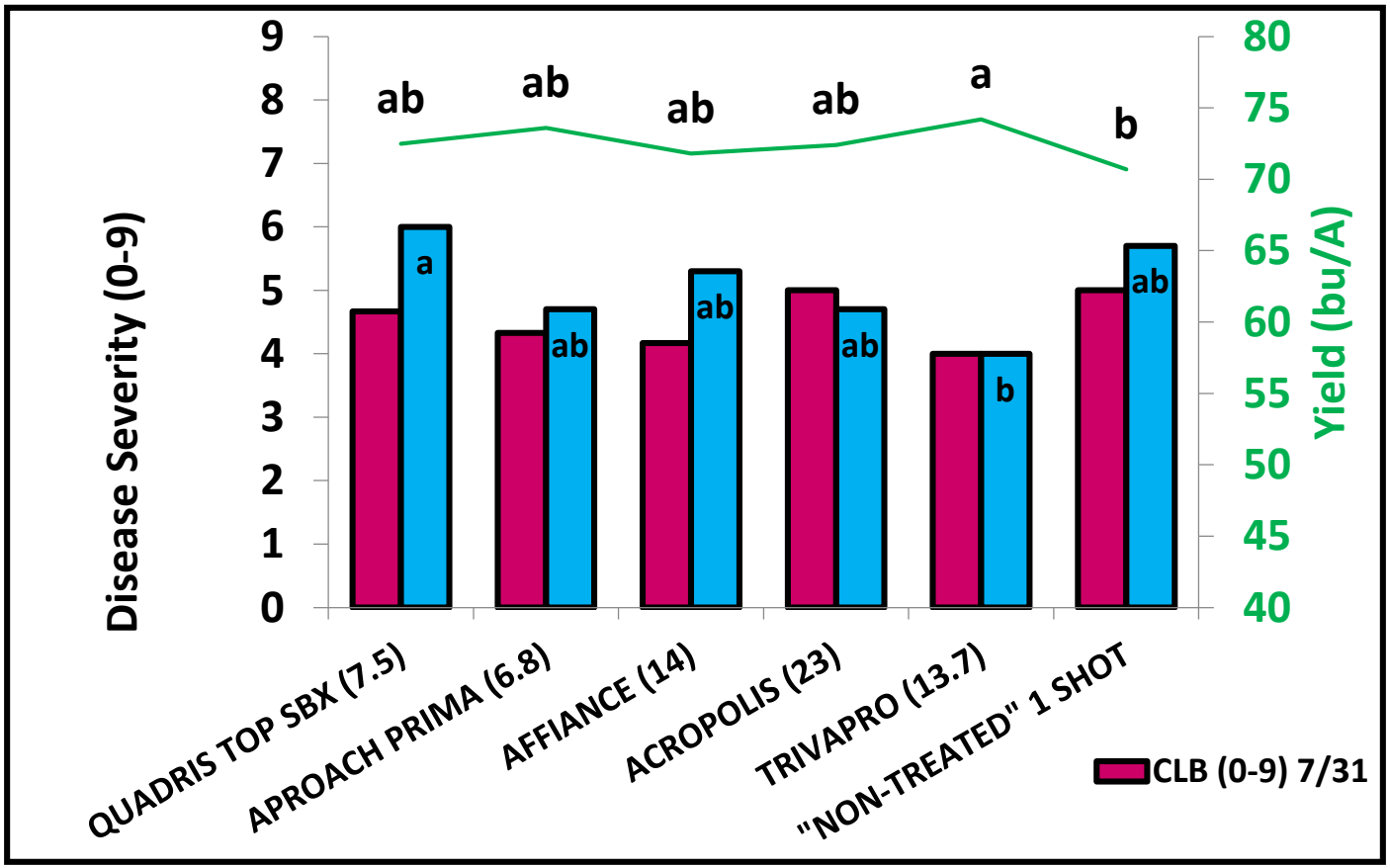
- Gravois Farms, Cooperator
- Matt Foster, Agent
- Boyd Padgett, Co-PI
- Ozane Gravois, Cooperator
- Summer fallow cane field in soybean
- R3/R5 application timings (12 GPA)
- Commercial products
- Moderate disease pressure
- Field was over sprayed

Gravois Farms – Convent, LA



CLB and target spot

Gravois – Fungicide efficacy on CLB and target spot – 2018

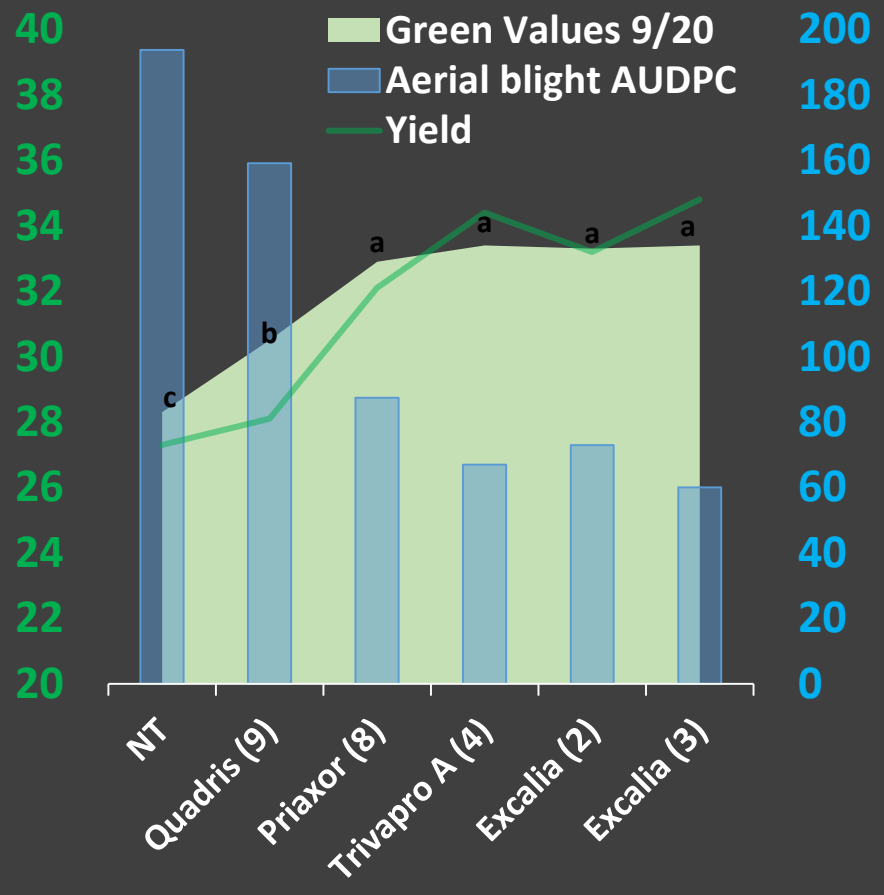


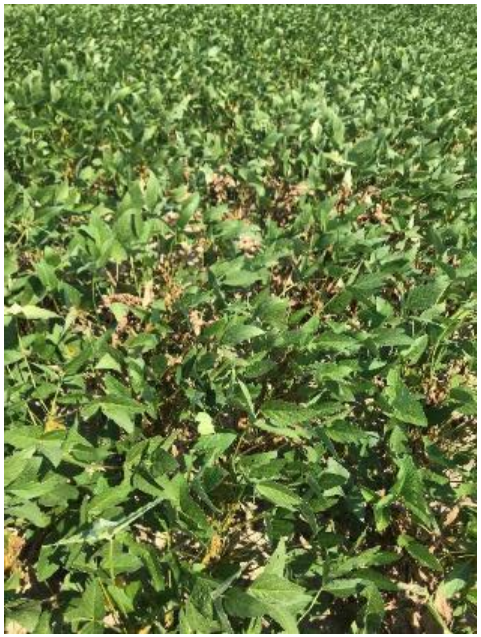
St. James

Morse, LA – Acadia Parish – 2019

- Thibodaux Farms, Cooperator
- Jeremy Hebert, Agent
- Boyd Padgett, Co-PI
- Dustin Harrell & James Leonards, Heroes
- QoI (Quadris, etc.) resistant location
- Rice/soybean rotation
- Applicator missed field (delayed app.)
- Treatments applied at R5 (8/9/2019)
- SDHI materials
- Rated 8/9; 8/16; 9/6; & 9/20

Remote Sensing





Non-Treated Quadris SDHI

9/6/2019

SDHI vs. Non-Treated
9/20/2019


MEE MEE'S
CAFE
MEE MEE'S
Cafe


AngieA's
HOT
EATS
SWEET
TREATS


CLEAN EQUIPMENT BETWEEN FIELDS WITH SOIL DISEASES AND NEMATODES

Cooperators

Parish Agents

Consultants

Producers

Fred Collins

Dustin Ezell

Darrell Franks

Jeremy Hebert

Laura Lee

James Leonards

Tashia Monaghan

Al Orgeron

David Moseley

Myra Purvis

Trey Price

Hunter Pruitt

Chris Roider

Brandi Woolam

University Faculty/Staff

Ag Industry

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Darrell Franks & Crew
Steve Harrison
Donnie Miller
Tashia Monaghan
David Moseley
Randy Price
Trey Price
Myra Purvis
Hunter Pruitt
Warren Ratcliff & Crew
Daniel Stephenson
Scott Washam & Crew
Brandi Woolam

Agents
Consultants
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THE LOUISIANA
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Trey Price
pprice@agcenter.lsu.edu
318-235-9805
@ppp_trey

Boyd Padgett
bpadgett@agcenter.lsu.edu
318-614-4354

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