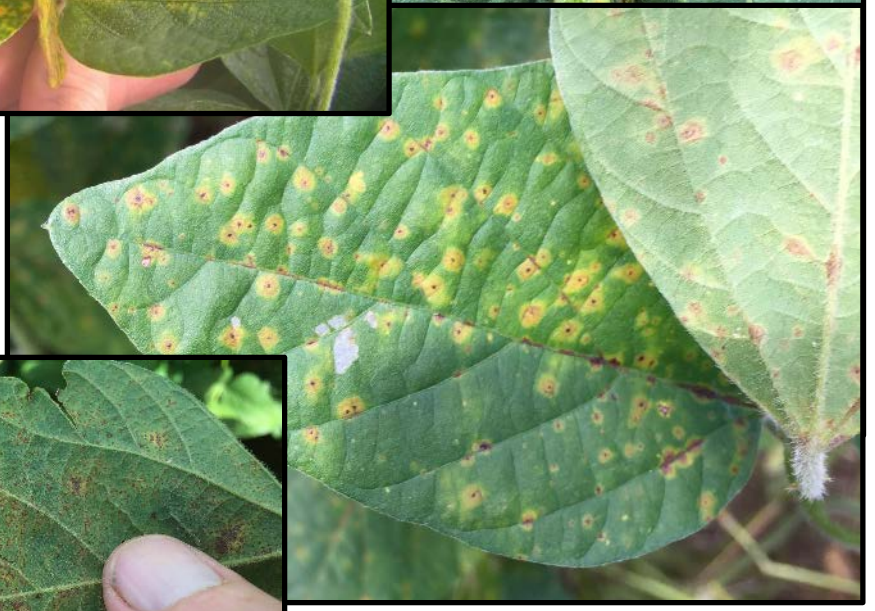
Soybean Disease Management Update – LATMC ‘18



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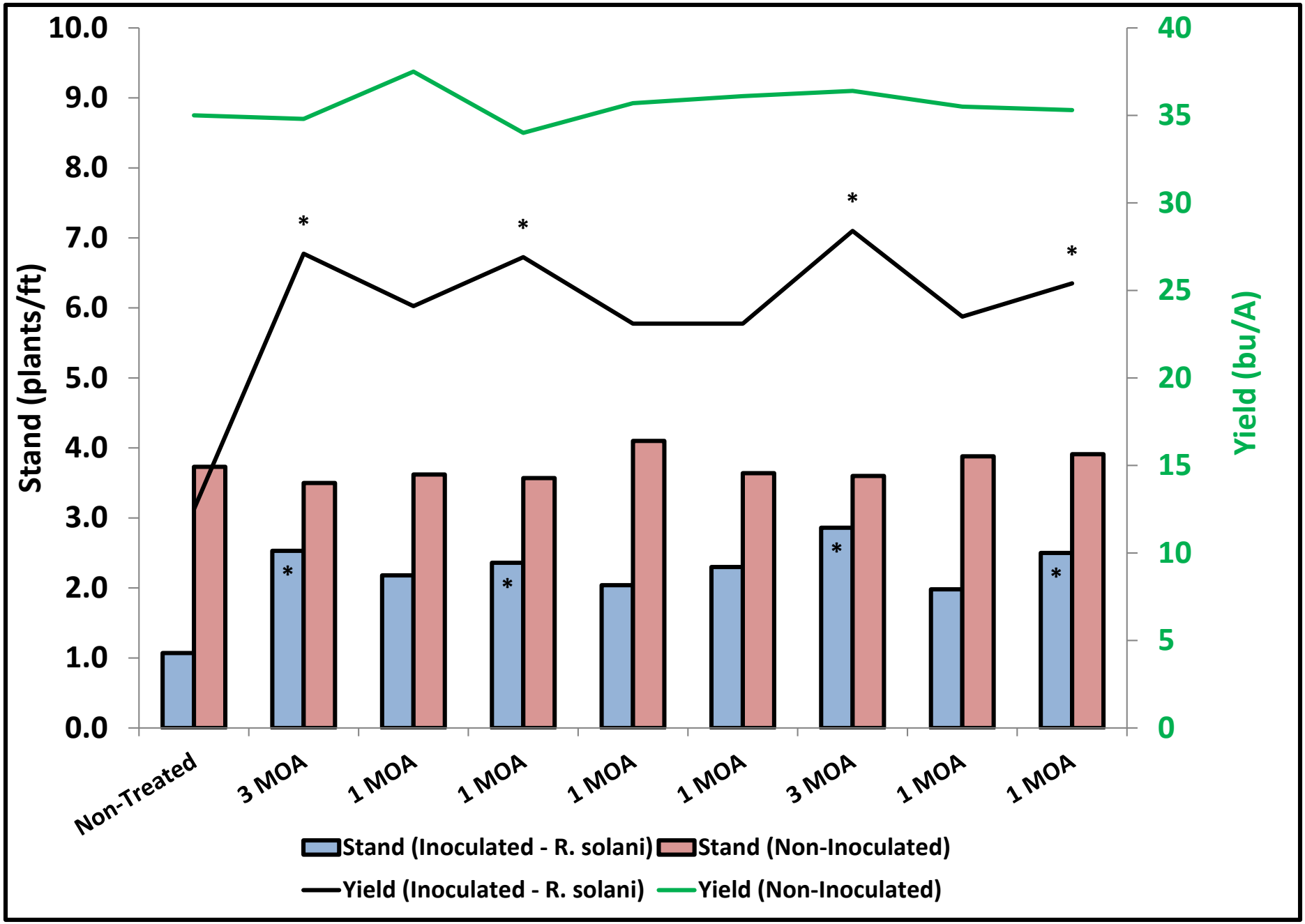
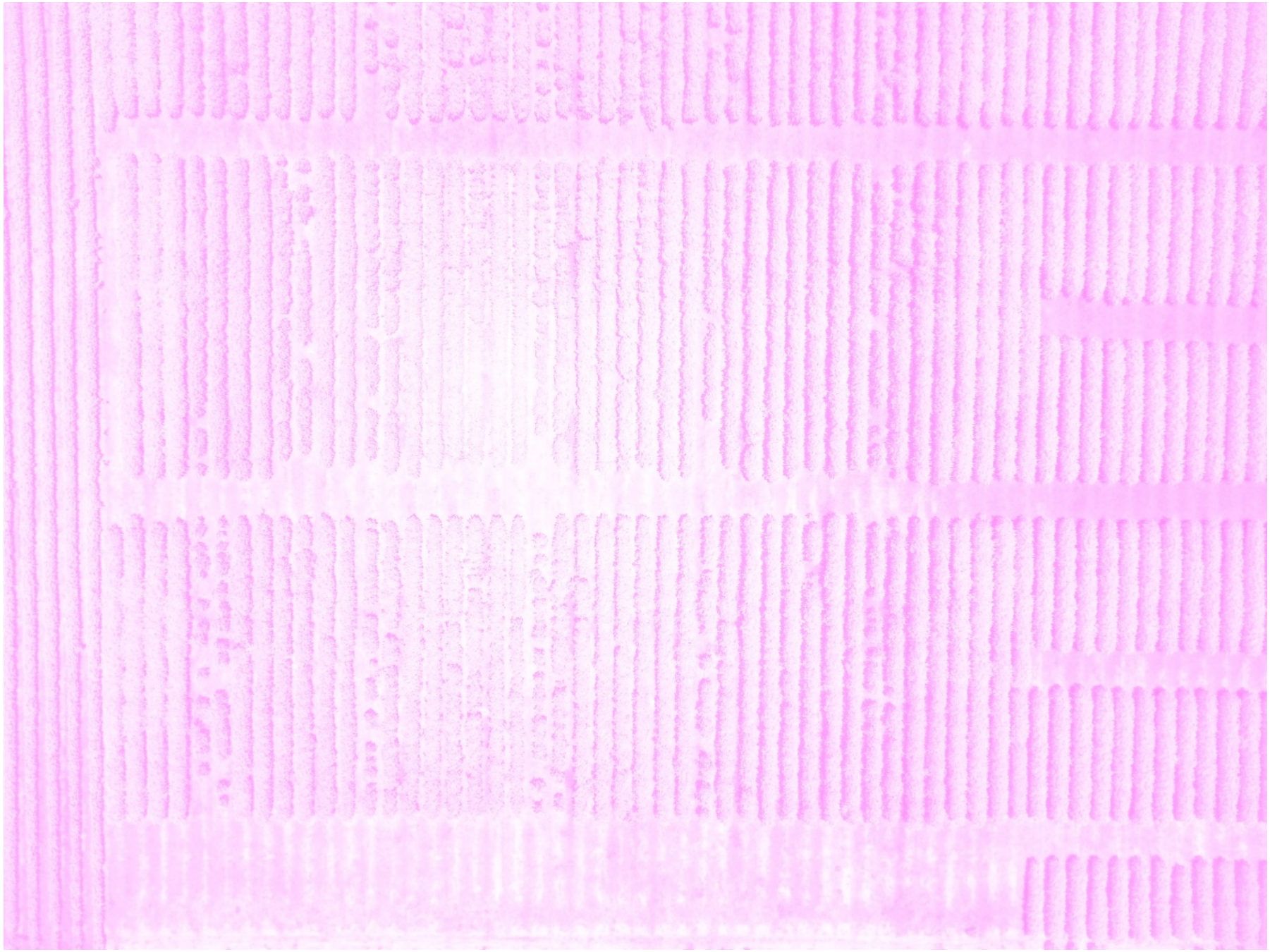
Soybean Seedling Disease Management

- *Rhizoctonia solani*, *Pythium* spp., *Phytophthora* spp., *Fusarium* spp., and others
- Cool, wet conditions soon after planting
- Seed treatments are effective
- Most of the time, seed treatments do not result in significantly preserved yield

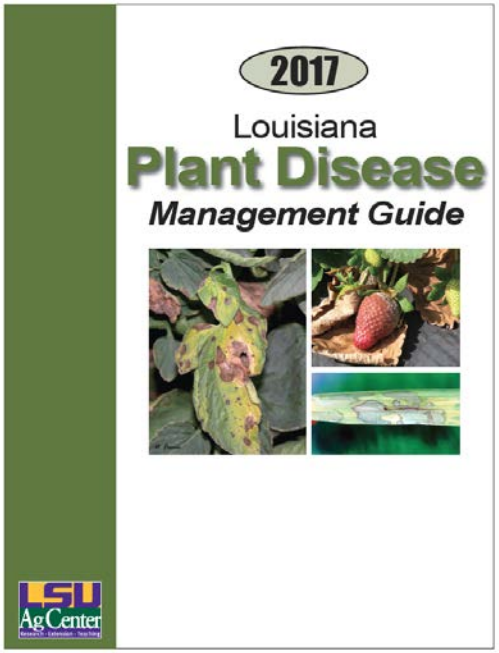

10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Stand (plants/ft)
40
35
30
25
20
15
10
5
0
Yield (bu/A)
*
Non-Treated
3 MOA
1 MOA
1 MOA
1 MOA
1 MOA
3 MOA
1 MOA
1 MOA
Stand (Inoculated - R. solani)
Stand (Non-Inoculated)
Yield (Inoculated - R. solani)
Yield (Non-Inoculated)

MRSB1701



Seed Treatment Fungicides

- CDMS website: www.cdms.net
- Agrian website: www.agrian.com
- ~80 seed treatment or in-furrow fungicides labeled in soybean
- http://www.lsuagcenter.com/portals/communications/publications/management_guides



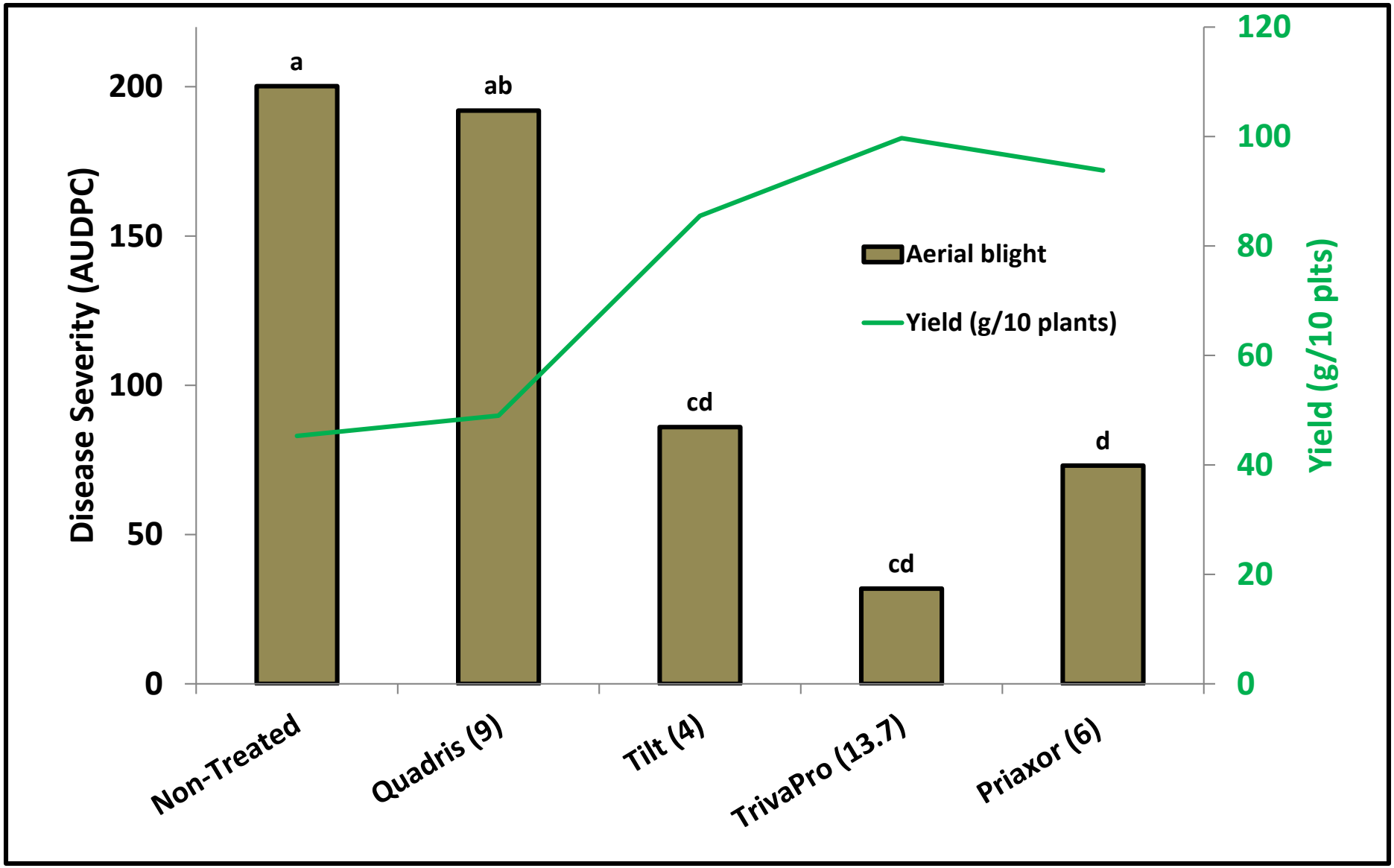
Seed Treatments, In-Furrow Sprays and Granular Fungicide Options
Field Crops

Table 1. Fungicide seed treatments, in-furrow sprays and granular options for field crops.

Product Name[1]	Company	Active Ingredient	FRAC Code[2]	Crop (Rate fl oz/cwt) Unless otherwise noted	Pathogens/Diseases Targeted
ACCELERON DC-309	Monsanto	metalaxyl	4	Corn (0.75)	*Pythium*
ACCELERON DC-509	Monsanto	ipconazole	3	Corn (0.085)	*Rhizoctonia, Fusarium, Phomopsis*
ACCELERON DT-510	Monsanto	myclobutanil	3	Cotton (1.25-4)	*Rhizoctonia solani, Thielaviopsis basicola, Pythium*
ACCELERON DX-109	Monsanto	pyraclostrobin	11	Cotton (1.5-3), Soybean (0.4-1.5)	*Pythium, Fusarium, Phomopsis, Rhizoctonia*
ACCELERON DX-309	Monsanto	metalaxyl	4	Cotton, Soybean, Corn (0.75-1.5)	*Pythium* seed rot, damping-off, *Phytophthora* (soybean) and systemic downy mildew (corn)
ACCELERON DX-509	Monsanto	ipconazole	3	Cotton (0.085-0.34), Corn (0.085)	*Rhizoctonia, Fusarium, Phomopsis*
ACCELERON DX-612	Monsanto	fluxapyroxad	7	Cotton (0.47-0.94), Soybean (0.24-0.47)	*Rhizoctonia solani* and *Fusarium*
ACCELERON DX-709	Monsanto	trifloxystrobin	11	Cotton, Corn (0.32-0.64)	*Alternaria, Aspergillus, Cladosporium, Penicillium, Rhizoctonia solani* and *Fusarium*
ACQUIRE	BASF	metalaxyl	4	Cotton, Soybean, Corn, Peanut, Wheat, Oats, Rice (0.75 minimum), Sorghum (0.375-1.5)	*Pythium, Phytophthora*
ACTINOVATE AG[BC]	Novozymes BioAg	*Streptomyces lydicus* WYEC 108	n/a	Cotton, Corn, Peanut, Soybean, Sorghum, Wheat (2-6)	*Fusarium, Rhizoctonia, Pythium, Phytophthora, Xanthomonas perforans, Verticillium, Botrytis, Sclerotinia, Monilinia, Alternaria, Erwinia*
ACTINOVATE STP[BC]	Novozymes BioAg	*Streptomyces lydicus* WYEC 108	n/a	Cotton (4-8), Corn (1-2), Peanut (0.74-1.5), Soybean (0.31-0.64)	*Fusarium, Rhizoctonia, Pythium, Phytophthora, Xanthomonas perforans, Verticillium, Botrytis, Sclerotinia, Monilinia, Alternaria, Erwinia*
AFRAME	Syngenta	azoxystrobin	11	Corn, Cotton, Grain Sorghum, Peanut, Soybean (0.4-0.8 fl oz/1,000 row ft)	Soilborne/seedling disease control
AFTERSHOCK	Loveland	fluoxastrobin	11	Corn, Peanut, Soybean (0.16-0.24 fl oz/1,000 row ft)	*Rhizoctonia solani, Pythium* spp., *Sclerotinia rolfsii*

Soybean Seed Treatment Advice

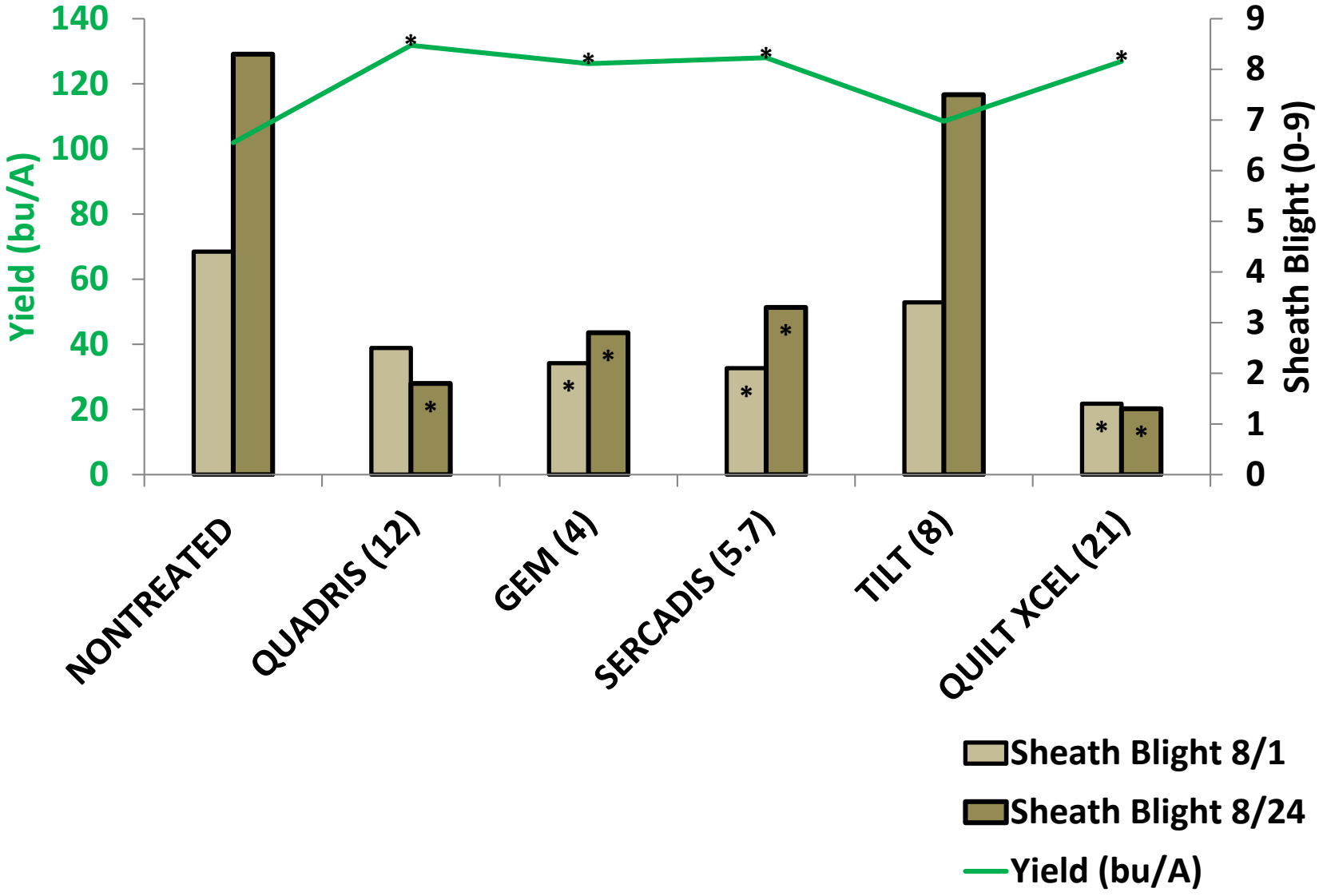
- Do your homework…figure out which fungicides are already on the seed…may vary with company.
- “Base” fungicides usually consist of metalaxyl/mefenoxam+broad spectrum QoI/DMI
- Base treatments are usually adequate in soybean
- It is redundant to over-treat with the same MOA
- Fungicides are not needed with optimum conditions
- Even Cadillac treatments fail under worst case scenarios

Effect of commercial fungicide application on aerial blight and yield – QoI–resistant location, 2016.

MROS1601

Sheath blight in rice – 2017
QoI sensitive location, Franklin Parish



MRR1702

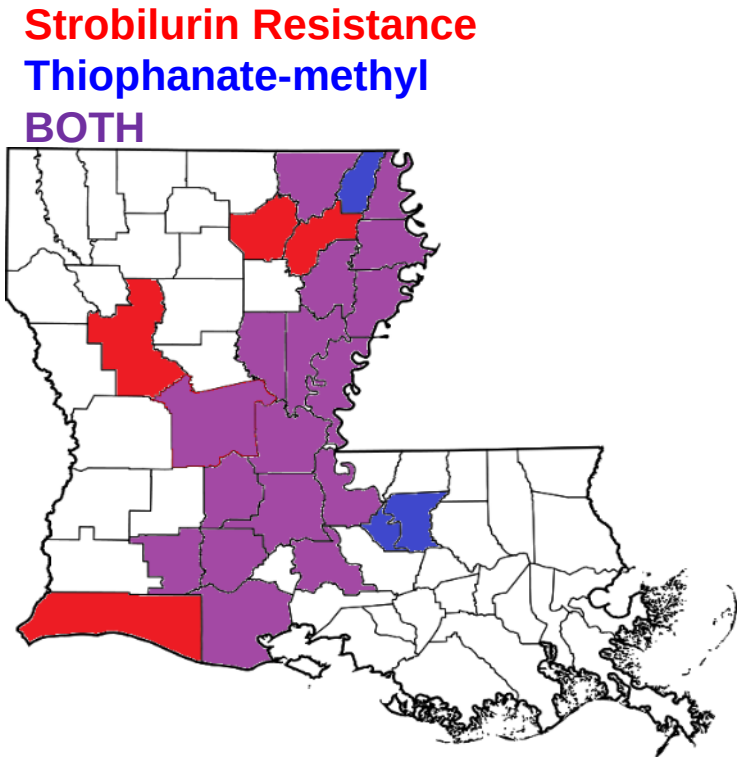
Cercospora spp.

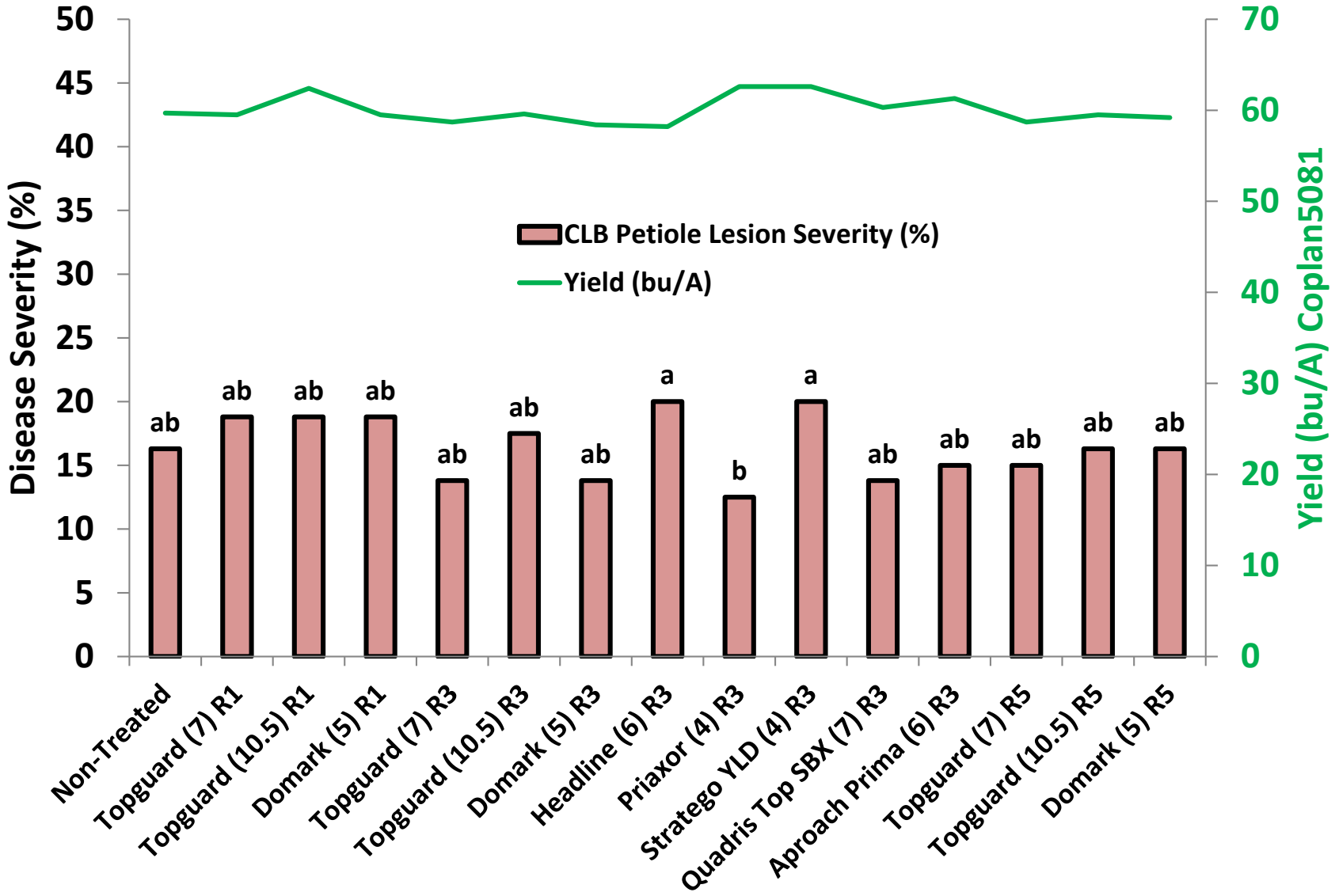
Annual losses vary from 0.5 to 5.0% in LA
Losses of up to 100% have been noted
More often in later-planted/maturing beans

Cercospora Leaf Blight – Fungicide Resistance

~90% resistant to strobilurins

~33% resistant to thiophanate-methyl

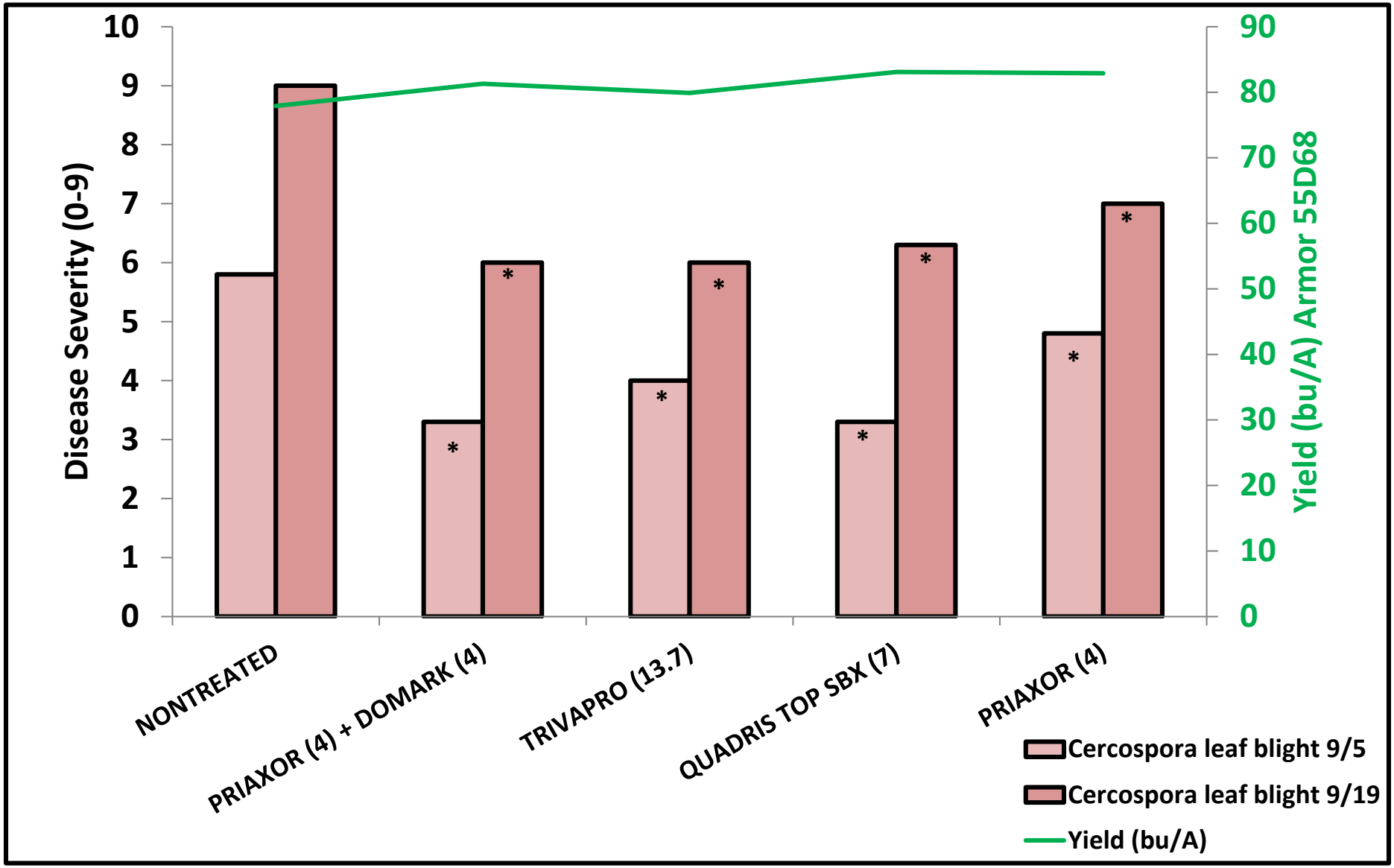




LA Application Timing Trial – St. Joseph 2016. Fungicides had minimal effect on CLB severity.

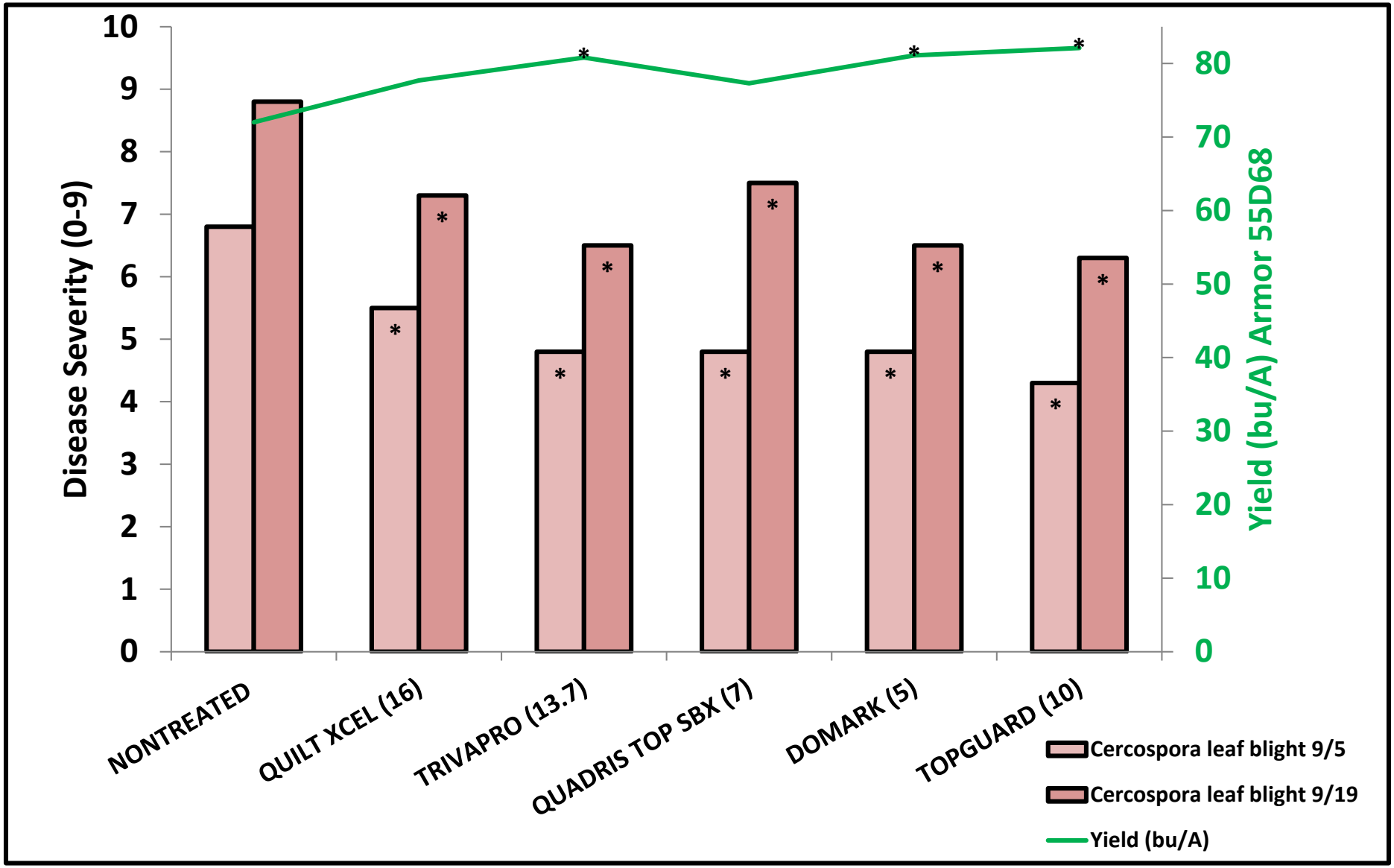
NESB1602

Commercial programs for CLB, MRRS



MRSB1709

Commercial foliar programs for CLB, MRRS



MRSB1715_KB

Products with inconsistent efficacy on CLB (sometimes they work, sometimes not)

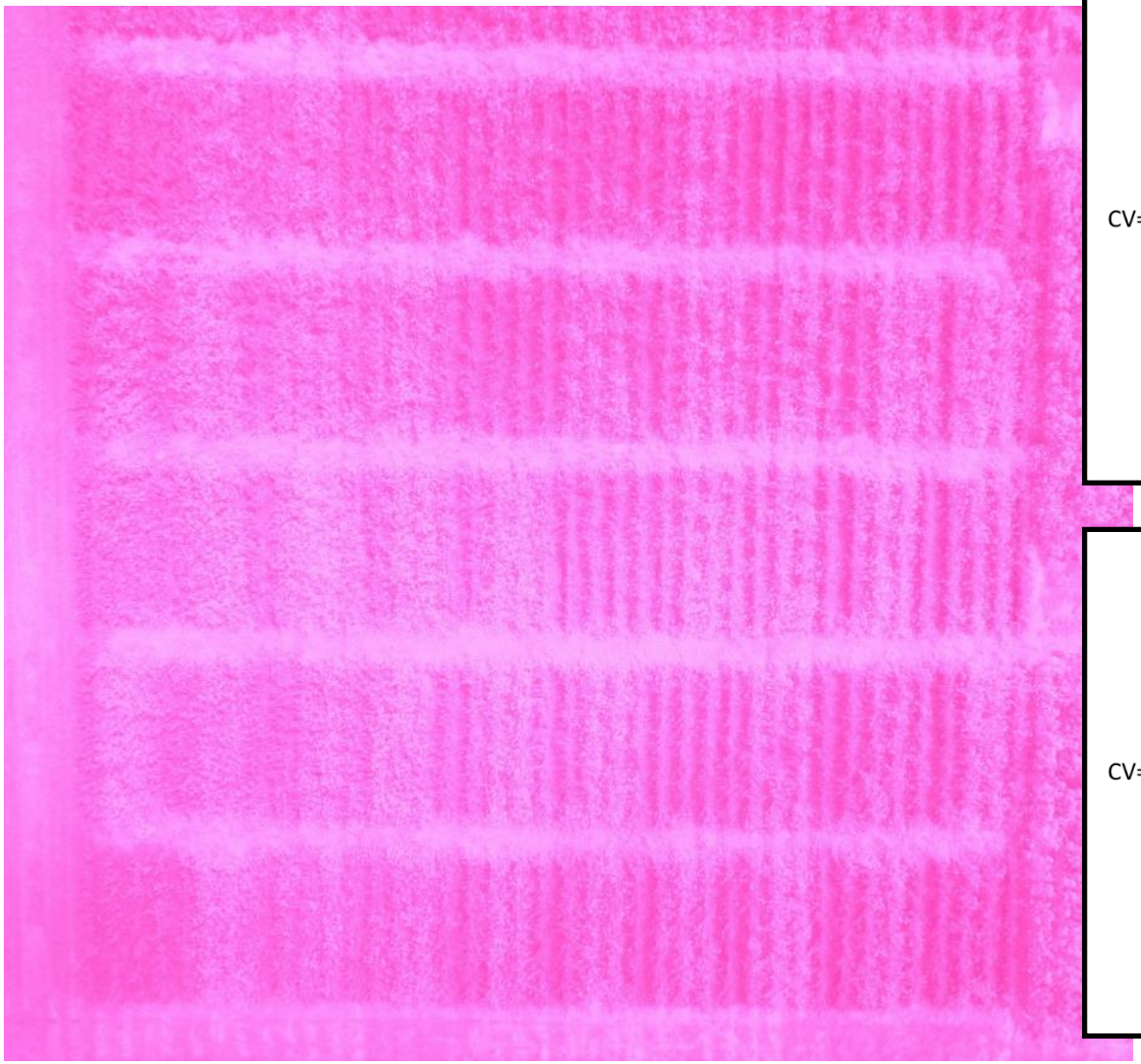
- **In no particular order…**
- Domark
- Topguard
- Priaxor
- Aproach Prima
- TrivaPro
- Quadris Top SBX

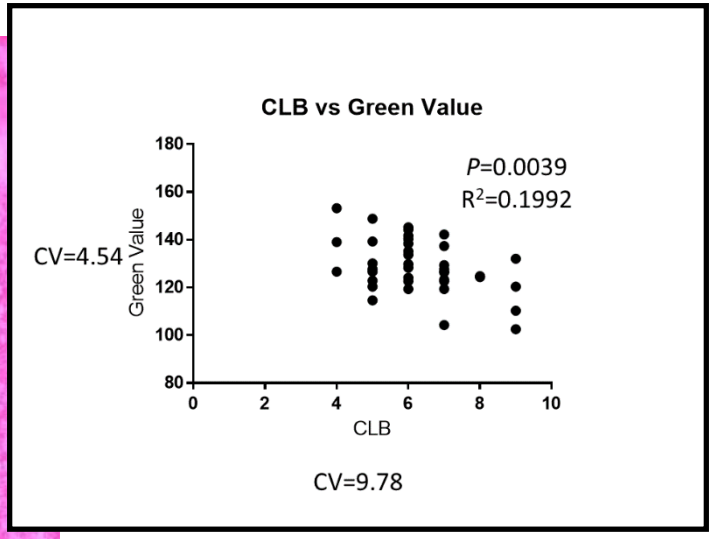
- **Possible reasons…**
- Genetic diversity in pathogens
- Ratio of pathogens in a given area
- Varying degrees of fungicide resistance across areas
- Differences in varietal responses to disease and/or fungicide application
- **Combinations of all of the above**

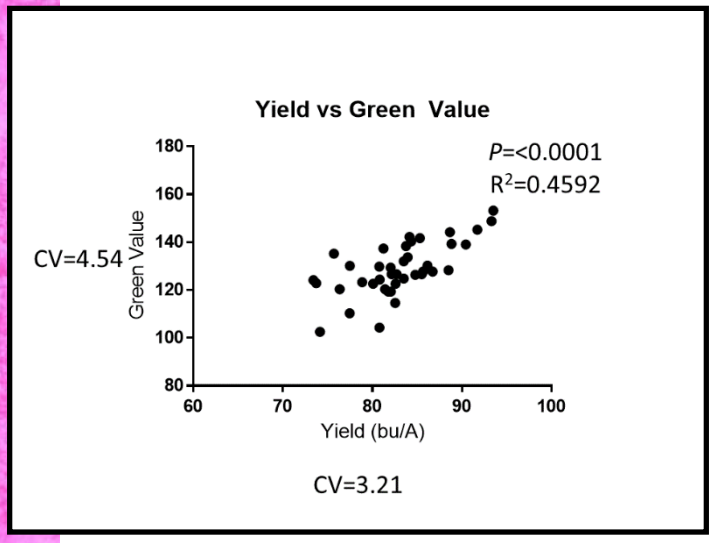
NONTREATED VS TREATED

CLB SYMPTOMS, MRRS 2017

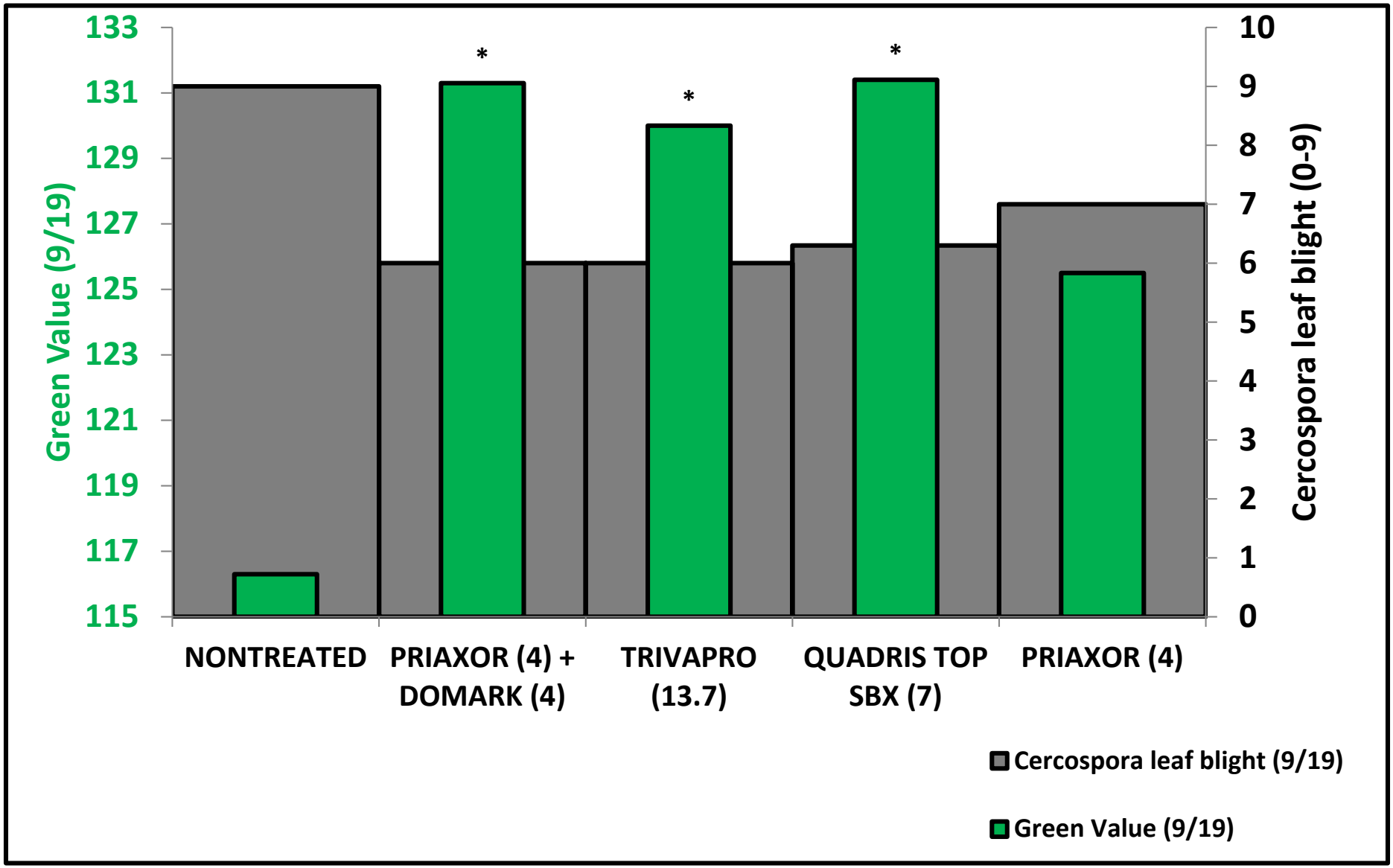
Unmanned Aerial Vehicle Photograph Analysis







Commercial programs for CLB, MRRS



MRSB1709

UAV Photograph Analysis Data

Pros

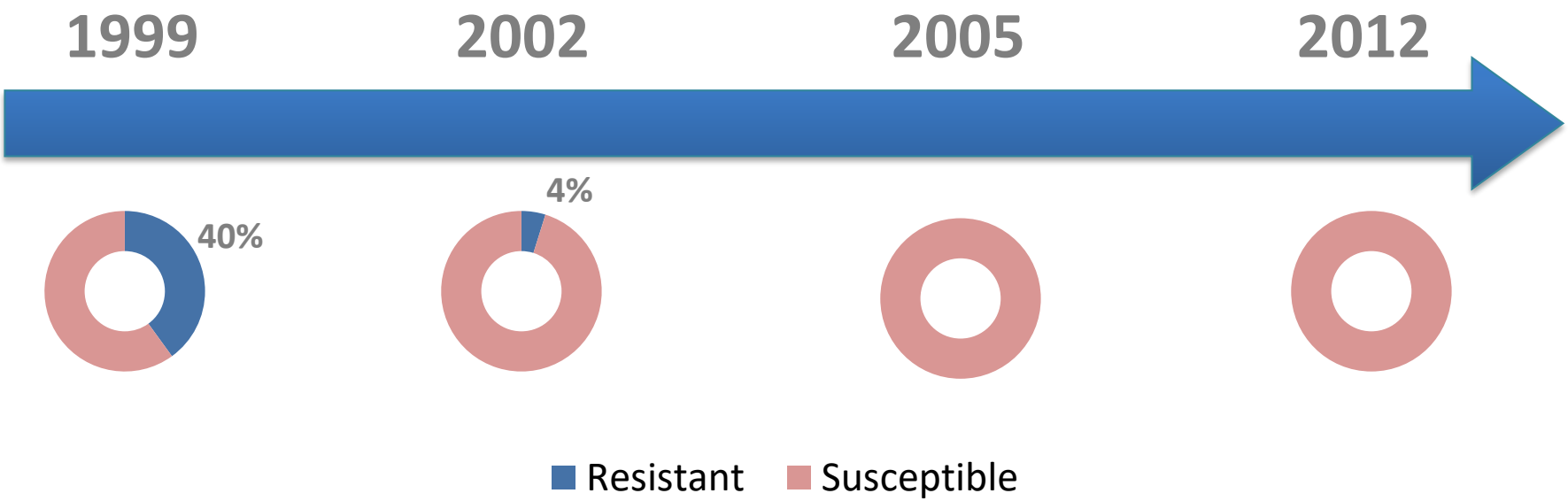
- Non-biased
- Low relative variability
- Relatively inexpensive
- Not difficult to operate
- Enhances/confirms rating data
- Multiple applications
- Lead to thresholds?
- On-farm applicability?

Cons

- Multiple field issues would muddy the waters
- Still need to “ground truth”…know what you are measuring
- Some reluctance to adopt
- Regulations for drones

Soybean Varieties Resistant to CLB

Louisiana



Moore, 2000

Schneider, 2003

Unpublished Data

Levy, 2013

E. Silva

2016/2017 MSSB Project Locations

Cooperator	Location #	Location (s)
Allen	2	Stoneville, MS Verona, MS
Buckley	1	Bossier City, LA
Faske	1	Newport, AR
Hollier	2	Baton Rouge, LA Crowley, LA
Kelly	1	TN
Price	2	Alexandria, LA St. Joseph, LA
Rupe	1	Marianna, AR
Shannon	1	Portageville, MO
Sikora	1	Shorter, AL
Spurlock	1	Rohwer, AR
Zhou	1	Beaumont, TX

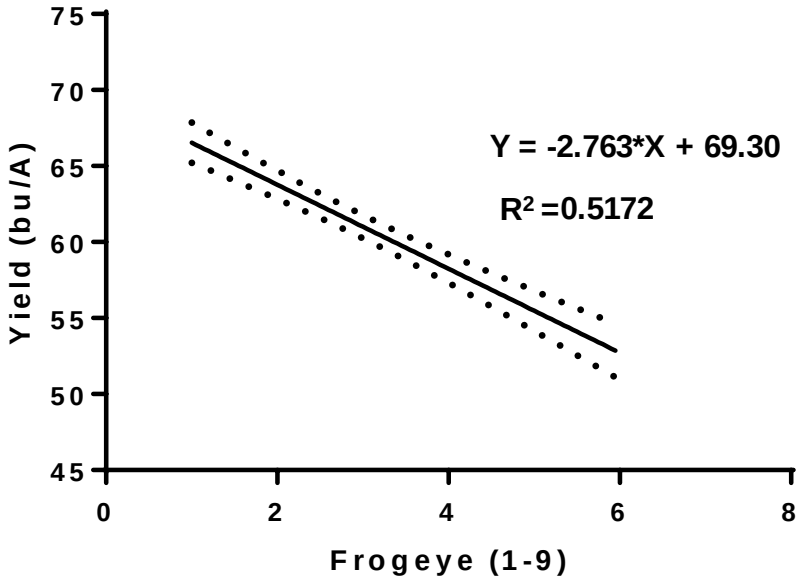
VARIETY DEVELOPMENT

Frogeye Leaf Spot

Variety Trials – NERS 2014

Variety	Frogeye (1-9)	Yield (bu/A)	Rank
C4544R2	1	65.6	19
5N451R2	1	65.4	21
REV 49R94	1	67.8	8
REV 48R44	1	68.7	3
REV 47R34	1	67.2	13
REV 47R53	1	67.7	9
HALO 4:94 LL	1	69.1	2
S47-K5	1	70.5	1
P 4928 LL	1	63.9	40
AG 4632	1	64.4	36

← Top 10 Frogeye Resistant Varieties



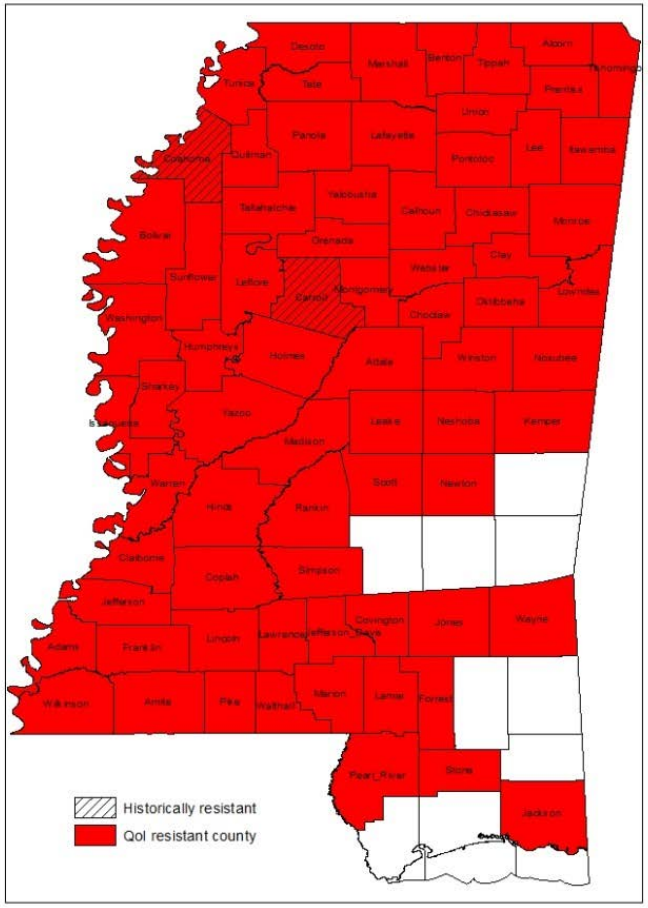
Variety	Frogeye (1-9)	Yield (bu/A)	Rank
AX4470	5	53.8	89
46X04	5	56.5	78
AG 4934	5	54.7	85
AX4490	5.3	49.2	97
AG 4531	5.3	57.5	73
S09-6262	5.3	45.2	100
P 4510 RYS	5.7	54.5	87
DG 4930 RR2	5.7	49.7	98
R08-2797	5.7	46.5	99
48X34	6	50	96

← Bottom 10 Frogeye Susceptible Varieties

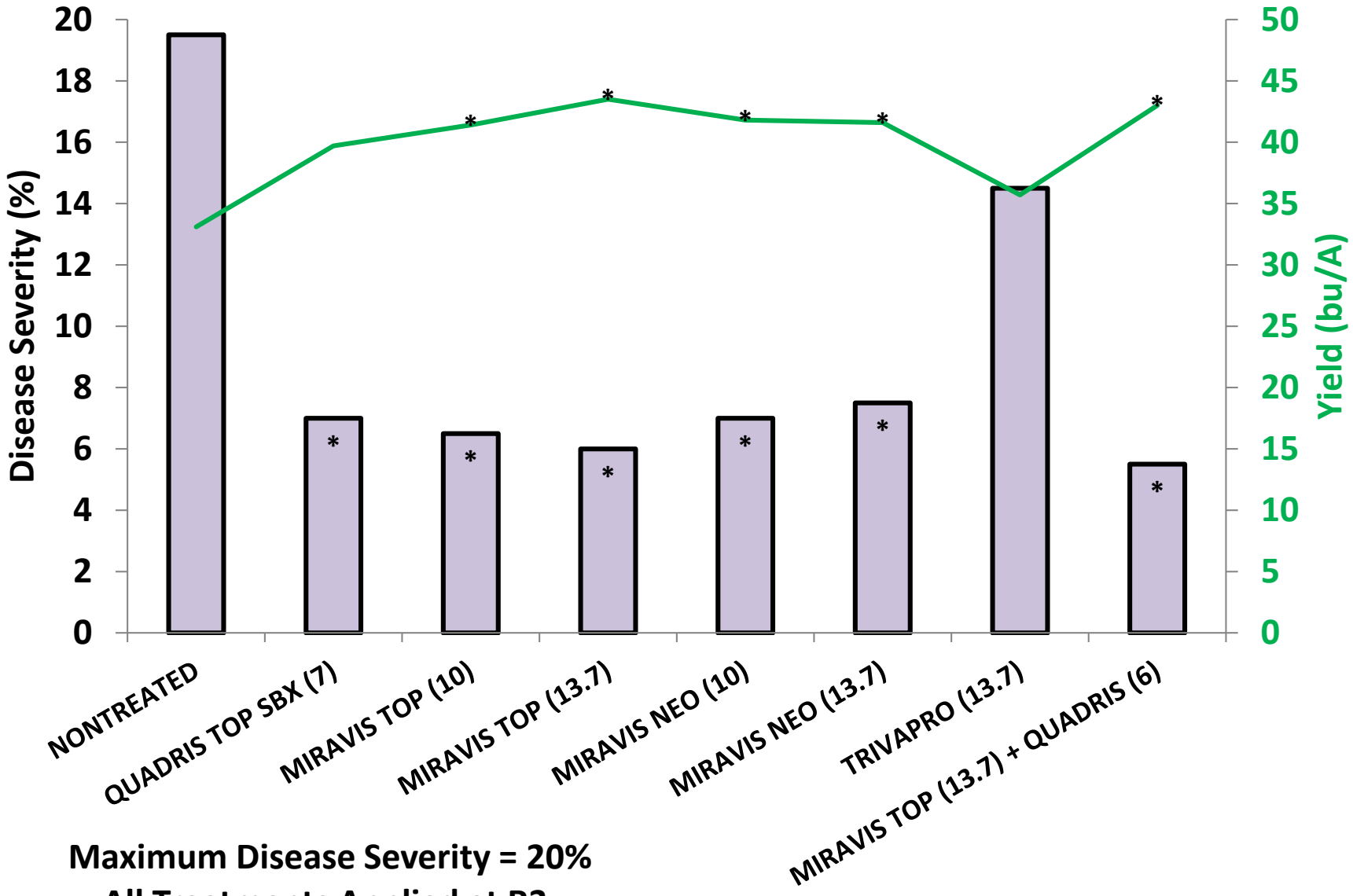
Estimated maximum losses up to 18% in this trial.

Foliar Diseases – Frogeye leaf spot

Strobilurin Resistance



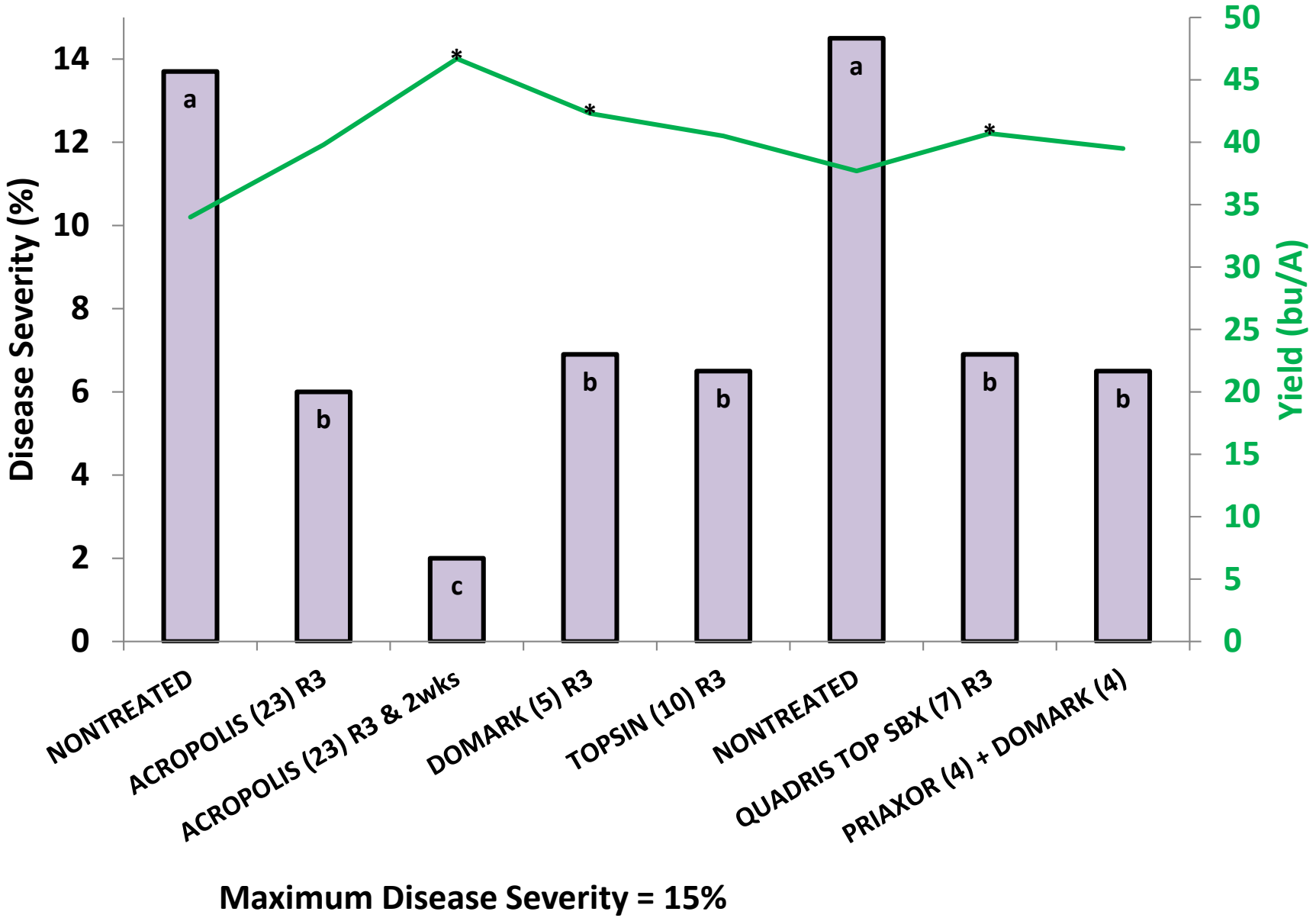
Commercial foliar programs for FLS, Alexandria



Maximum Disease Severity = 20%
All Treatments Applied at R3.

DLSB1704

Commercial foliar programs for FLS, Alexandria



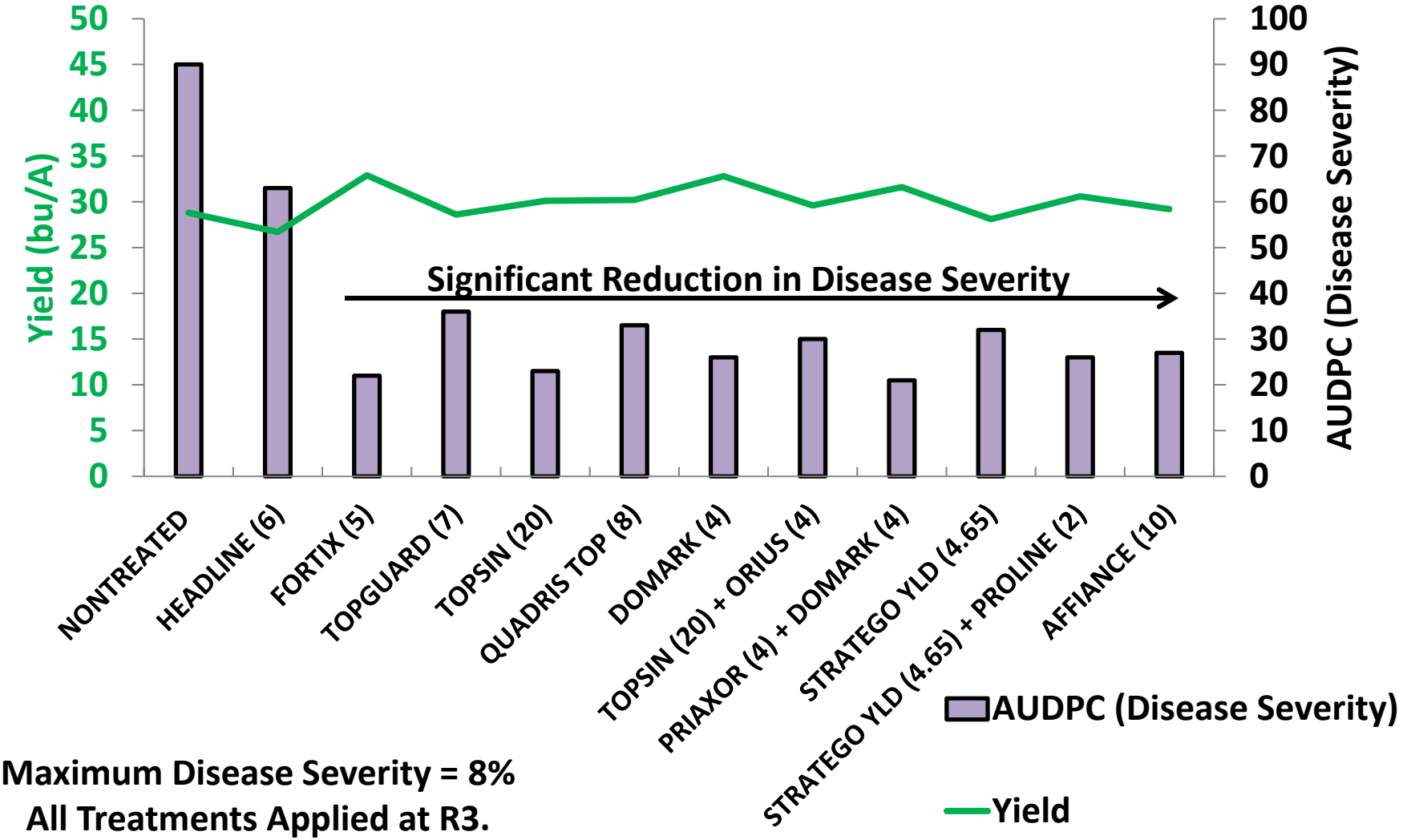
Maximum Disease Severity = 15%

DLSB1706

NONTREATED VS TREATED 9/21/17

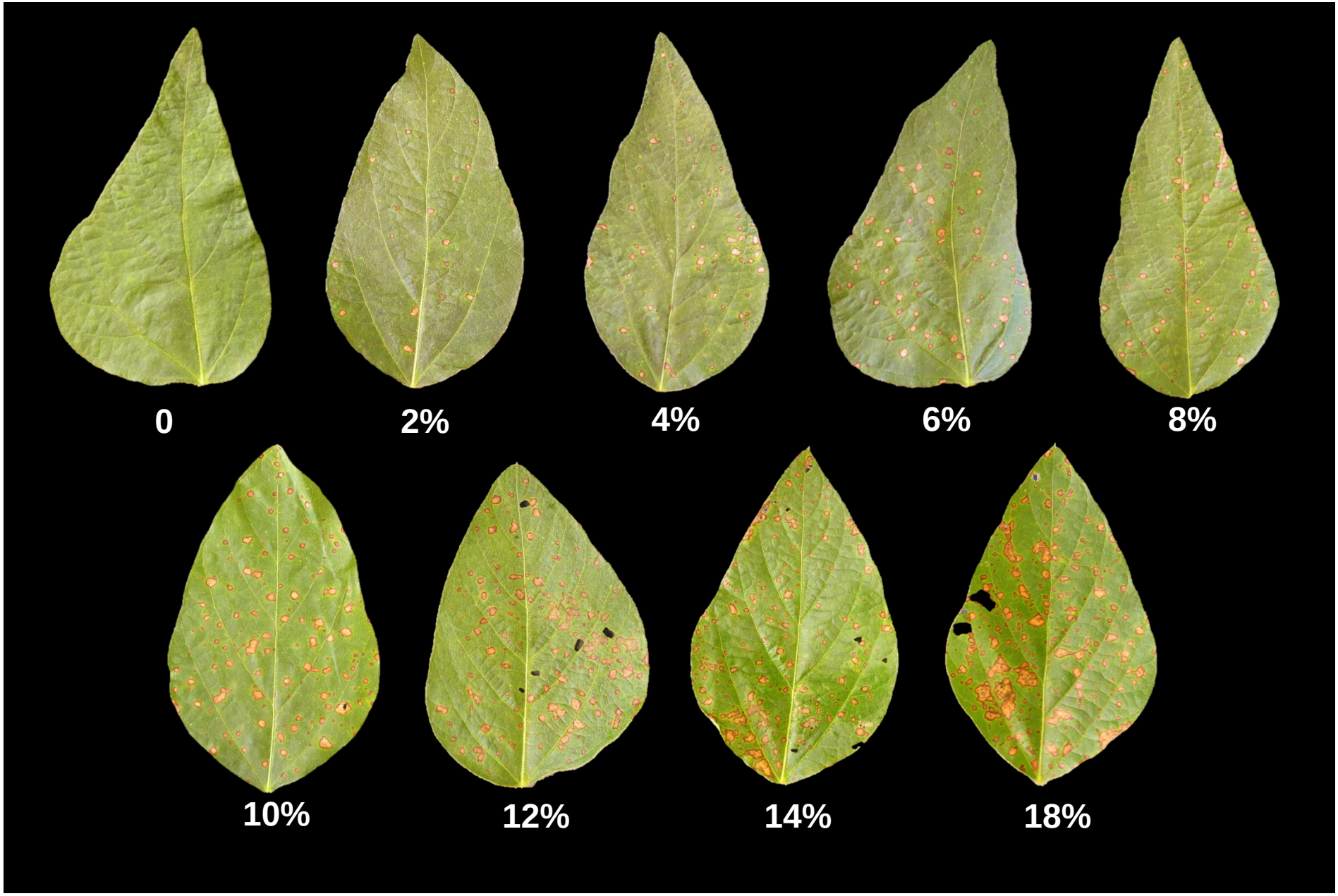
NONTREATED VS TREATED 10/3/17

Comparison of Popular Fungicide Options on Frogeye Leaf Spot - 2015



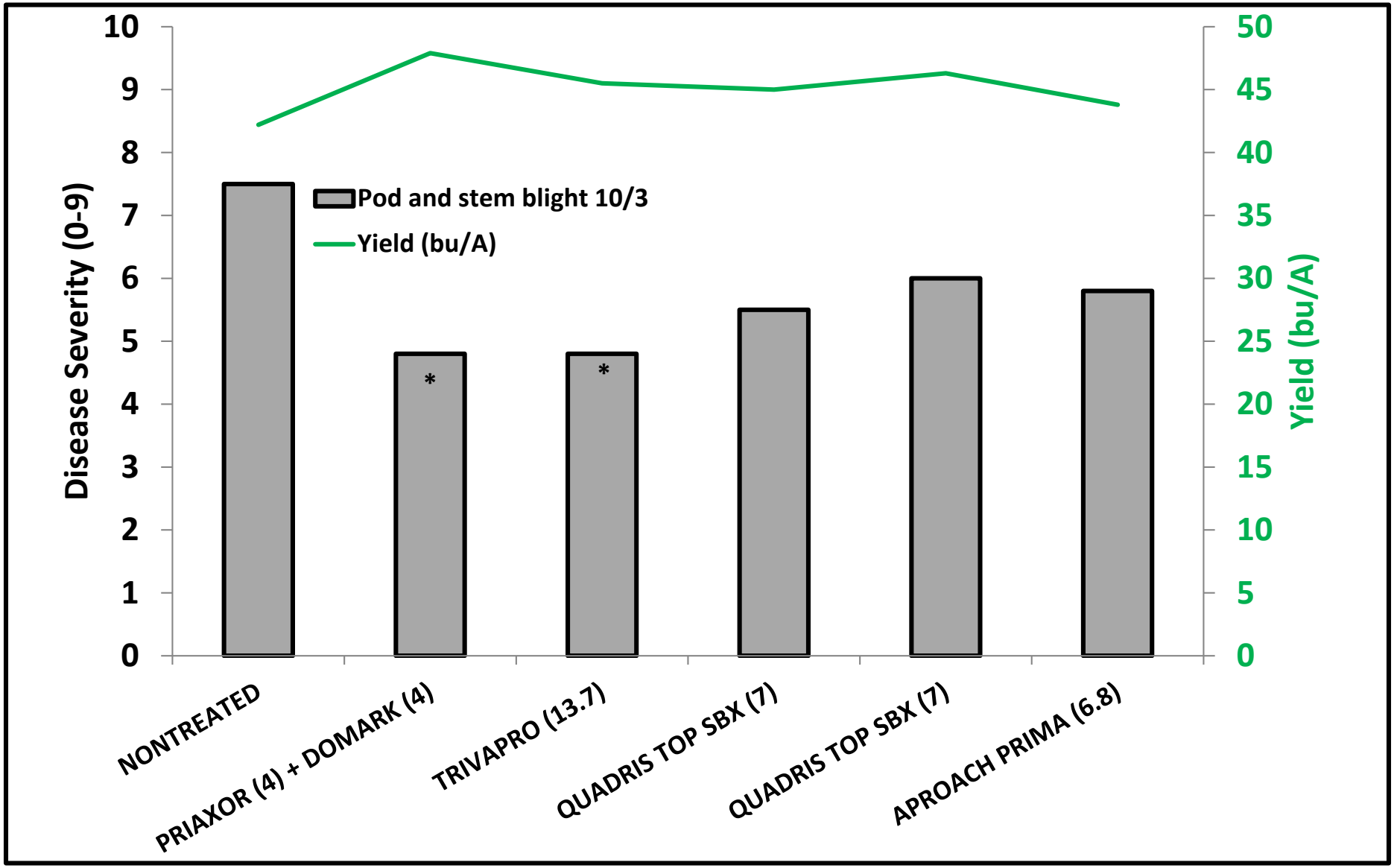
Maximum Disease Severity = 8%
All Treatments Applied at R3.

Armor DK 4744
MRSB1509



Frogeye leaf spot rating scale

Commercial foliar programs for pod and stem blight, DLRS



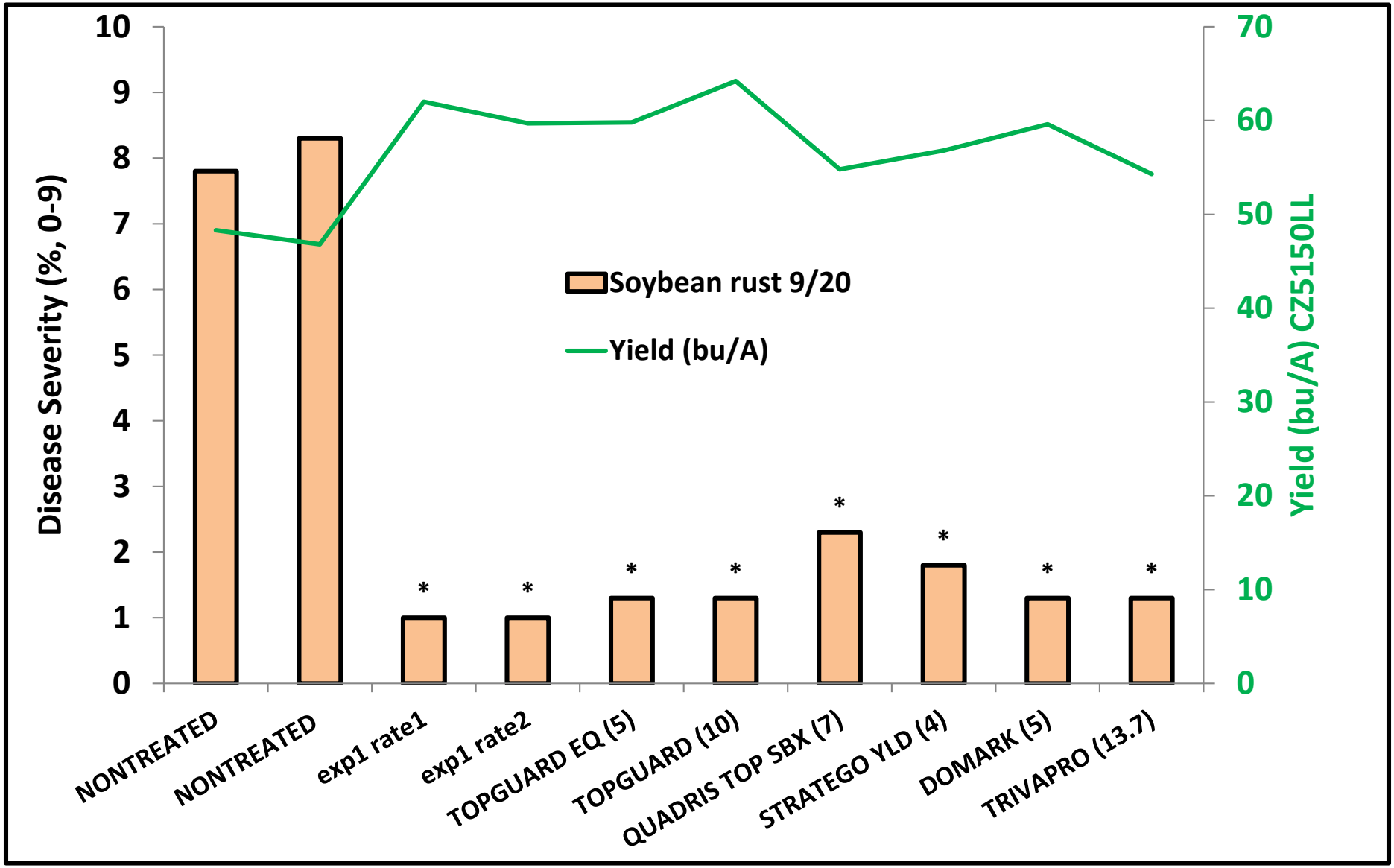
DLSB1711

Soybean Rust

Soybean Rust

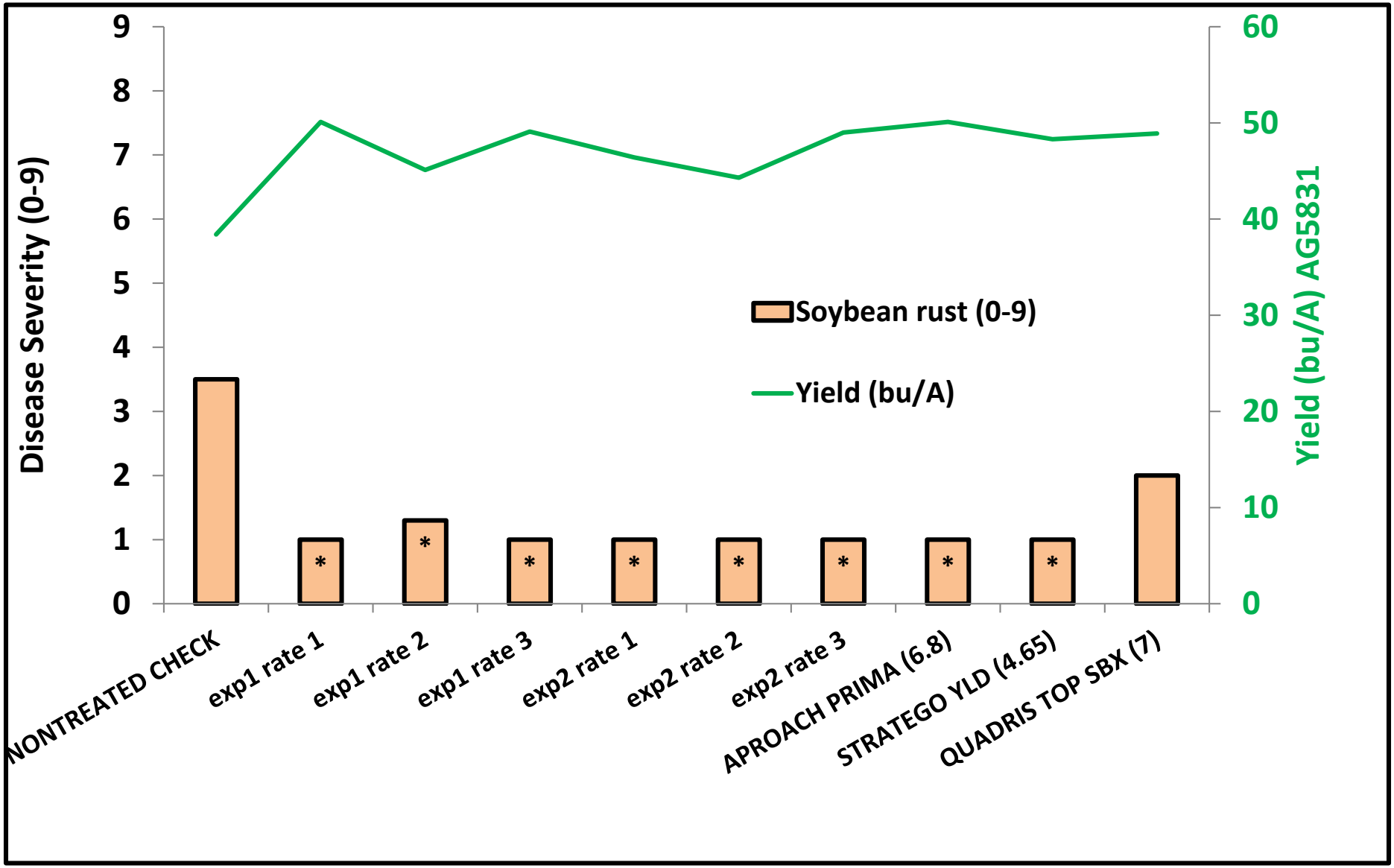
Soybean Rust

Experimental and commercial foliar programs for SBR, NERS



NESB1704

Experimental and commercial foliar programs for SBR, MRRS

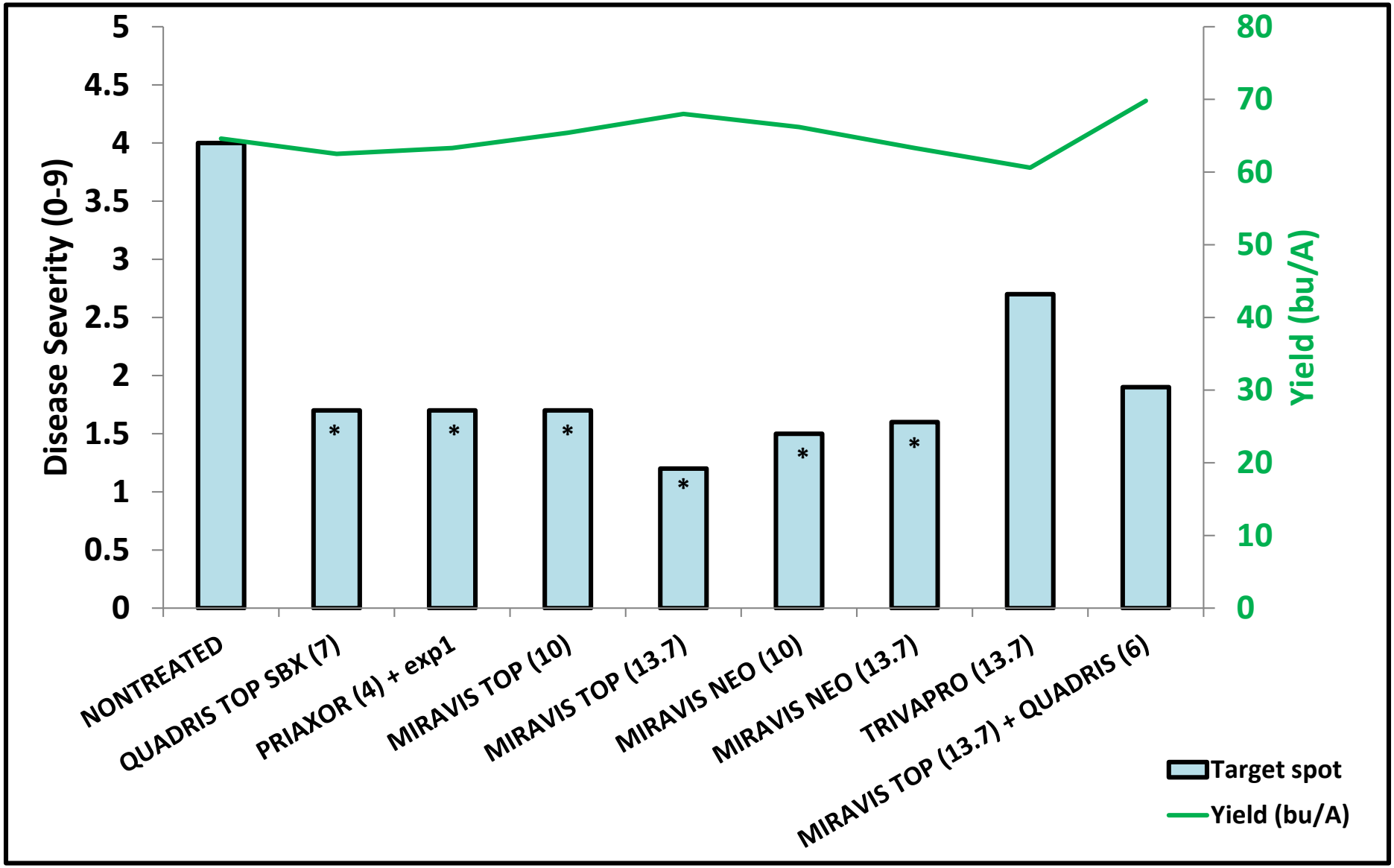


MRSB1719

NONTREATED VS TREATED 9/27/17

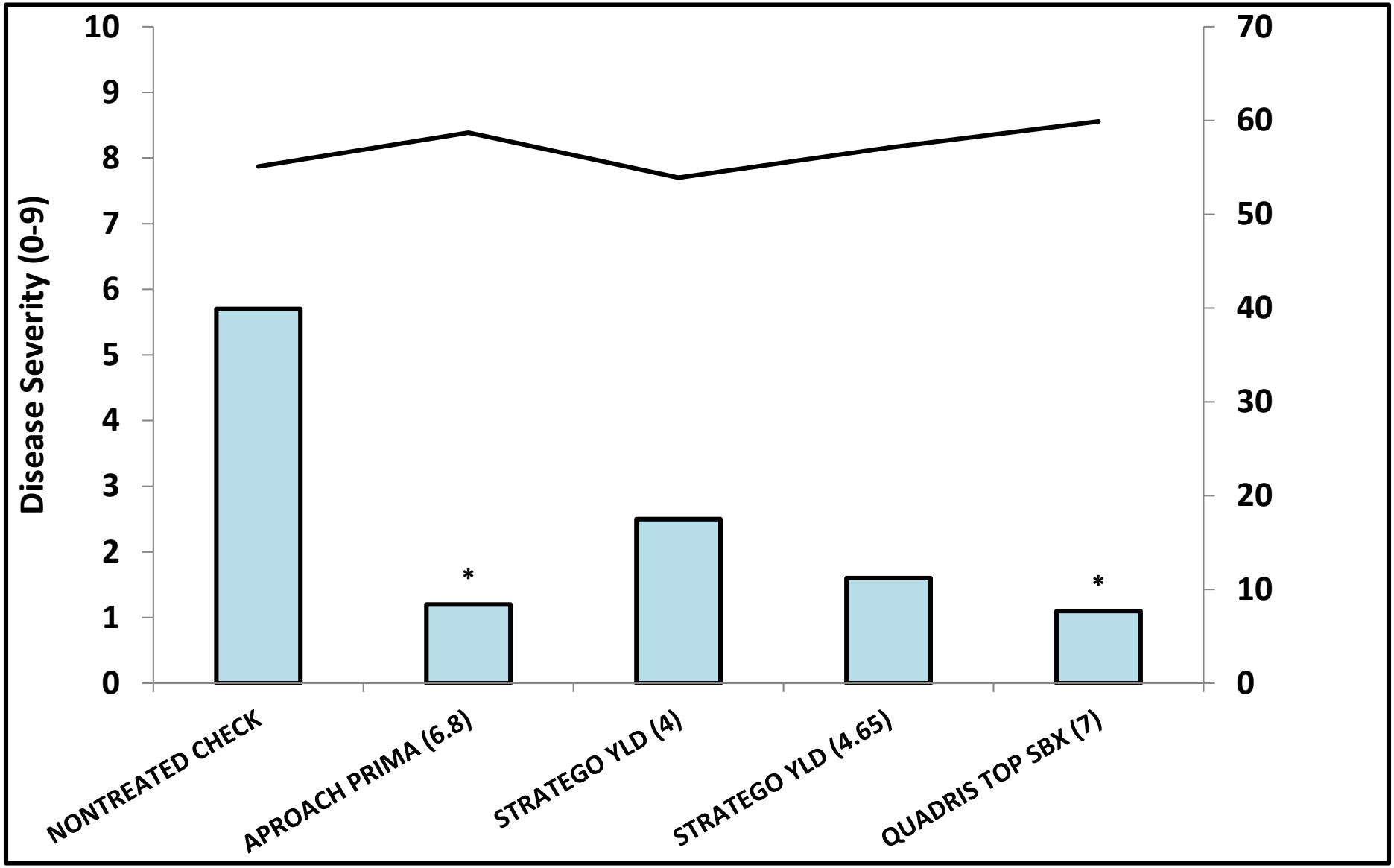
Target spot

Commercial product efficacy on target spot, Winnsboro



MRSB1707

Commercial product efficacy on target spot, Winnsboro



MRSB1713

Fungicide Efficacy Table

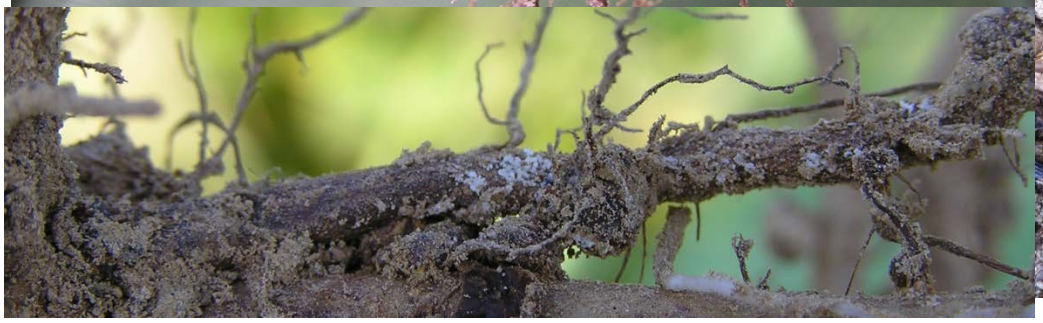
Fungicide(s)										
Class	Active ingredient (%)	Product/Trade name	Rate/A (fl oz)	Aerial web blight[2]	Anthracnose	Brown spot	Cercospora leaf blight[3]	Frogeye leaf spot[4]	Soybean rust	Harvest restriction[5]
QoI Strobilurins Group 11	Azoxystrobin 22.9%	Quadris 2.08 SC Multiple Generics[6]	6.0 - 15.5	VG	VG	G	P	P	G-VG	14 days
	Fluoxastrobin 40.3%	Aftershock 480 SC Evito 480 SC	2.0 – 5.7	VG	G	G	P	P	U	R5 (beginning seed) 30 days
	Picoxystrobin	Aproach 2.08 SC	6.0 -12.0	VG	G	G	P	P	G	14 days
	Pyraclostrobin 23.6%	Headline 2.09 EC/SC	6.0 - 12.0	VG	VG	G	P	P	VG	21 days
DMI Triazoles Group 3	Cyproconazole 8.9%	Alto 100SL	2.75 – 5.5	U	U	VG	F	F	VG	30 days
	Flutriafol 11.8%	Topguard 1.04 SC	7.0 – 14.0	U	VG	VG	P-G	VG	VG-E	21 days
	Propiconazole 41.8%	Tilt 3.6 EC Multiple Generics[6]	4.0 - 6.0	P	VG	G	NL	F	VG	R5 (beginning seed)
	Prothioconazole 41.0%	Proline 480 SC[7]	2.5 - 5.0	NL	NL	NL	NL	G-VG	VG	21 days
	Tetraconazole 20.5%	Domark 230 ME	4.0 – 5.0	NL	VG	VG	P-G	G-VG	VG-E	R5 (beginning seed)
MBC Thiophanates Group 1	Thiophanate-methyl	Topsin-M Multiple Generics	10.0 – 20.0	U	U	U	F	VG	G	21 days

Many products have specific use restrictions about the amount of active ingredient that can be applied within a period of time or the amount of sequential applications that can occur. Please read and follow all specific use restrictions prior to fungicide use. This information is provided only as a guide. It is the responsibility of the pesticide applicator by law to read and follow all current label directions. Reference to products in this publication is not intended to be an endorsement to the exclusion of others that may be similar. Persons using such products assume responsibility for their use in accordance with current directions of the manufacturer. Members or participants in the NCERA-137 group assume no liability resulting from the use of these products.

Fungicide(s)				Aerial web blight[2]	Anthracnose	Brown spot	Cercospora leaf blight[3]	Frogeye leaf spot[4]	Soybean rust	Harvest restriction[5]
Class	Active ingredient (%)	Product/Trade name	Rate/A (fl oz)							
SDHI Carboxamides Group 7	Boscalid 70%	Endura 0.7 DF	3.5 – 11.0	U	NL	VG	U	P	NL	21 days
Mixed mode of action	Azoxystrobin 18.2% Difenoconazole 11.4%	Quadris Top 2.72 SC	8.0 – 14.0	U	U	G-VG	P-G	VG	VG	14 days
	Azoxystrobin 19.8% Difenoconazole 19.8%	Quadris Top SBX 3.76 SC	7.0-7.5	U	U	U	P-G	G-VG	U	14 days
	Azoxystrobin 7.0% Propiconazole 11.7%	Quilt 1.66 SC Multiple Generics[6]	14.0 – 20.5	U	U	G	F	F	VG	21 days
	Azoxystrobin 13.5% Propiconazole 11.7%	Quilt Xcel 2.2 SE	10.5 - 21.0	E	VG	G	F	F	VG	R6
	Bensovindiflupyr 10.27% Azoxystrobin 13.5% Propiconazole 11.7%	Trivapro A 0.83 + Trivapro B 2.2 SE	A = 4.0 B = 10.5	E	U	VG	U	VG	U	14 days R6
	Cyproconazole 7.17% Picoxystrobin 17.94%	Aproach Prima 2.34 SC	5.0-6.8	U	U	VG	P-G	G	U	14 days
	Flutriafol 19.3% Fluoxastrobin 14.84%	Fortix SC Preemptor SC	4.0-6.0	U	U	G	U	G	U	R5
	Pyraclostrobin 28.58% Fluxapyroxad 14.33%	Priaxor 4.17 SC	4.0 – 8.0	E	VG	E	P-G	P-F	VG	21 days
	Pyraclostrobin 28.58% Fluxapyroxad 14.33% Tetraconazole 20.50%	Priaxor D 4.17 SC 1.9 SC	4.0 (each component)	U	U	VG	U	G-VG	U	21 days R5
	Trifloxystrobin 32.3% Prothioconazole 10.8%	Stratego YLD 4.18 SC	4.0 – 4.65	VG	VG	VG	F	F	VG	21 days
	Tetraconazole 7.48% Azoxystrobin 9.35%	Affiance 1.5 SC	10.0-14.0	U	VG	VG	F	G	U	R5 14 days

[1]Multiple fungicides are labeled for soybean rust only, powdery mildew, and Alternaria leaf spot, including tebuconazole (multiple products) and Laredo (myclobutanil). Contact fungicides such as chlorothalonil may also be labeled for use.
[2]Fungicides with a mixed or solo QoI may not be effective in areas where QoI resistance has been detected in the fungal population that causes aerial blight.
[3]Fungicide efficacy has been inconsistent with some products. Fungicides with a solo or mixed QoI or MBC mode of action may not be effective in areas where QoI or MBC resistance has been detected in the fungal population that causes Cercospora leaf blight.
[4] In areas where QoI-fungicide resistant isolates of the frogeye leaf spot pathogen are not present, QoI fungicides may be more effective than indicated in this table.
[5]Harvest restrictions are listed for soybean harvested for grain. Restrictions may vary for other types of soybean (edamame, etc.) and soybean for other uses such as forage or fodder.
[6]Multiple generic products containing this mode of action may also be labeled in some states.

Soilborne Disease Management - Soybean



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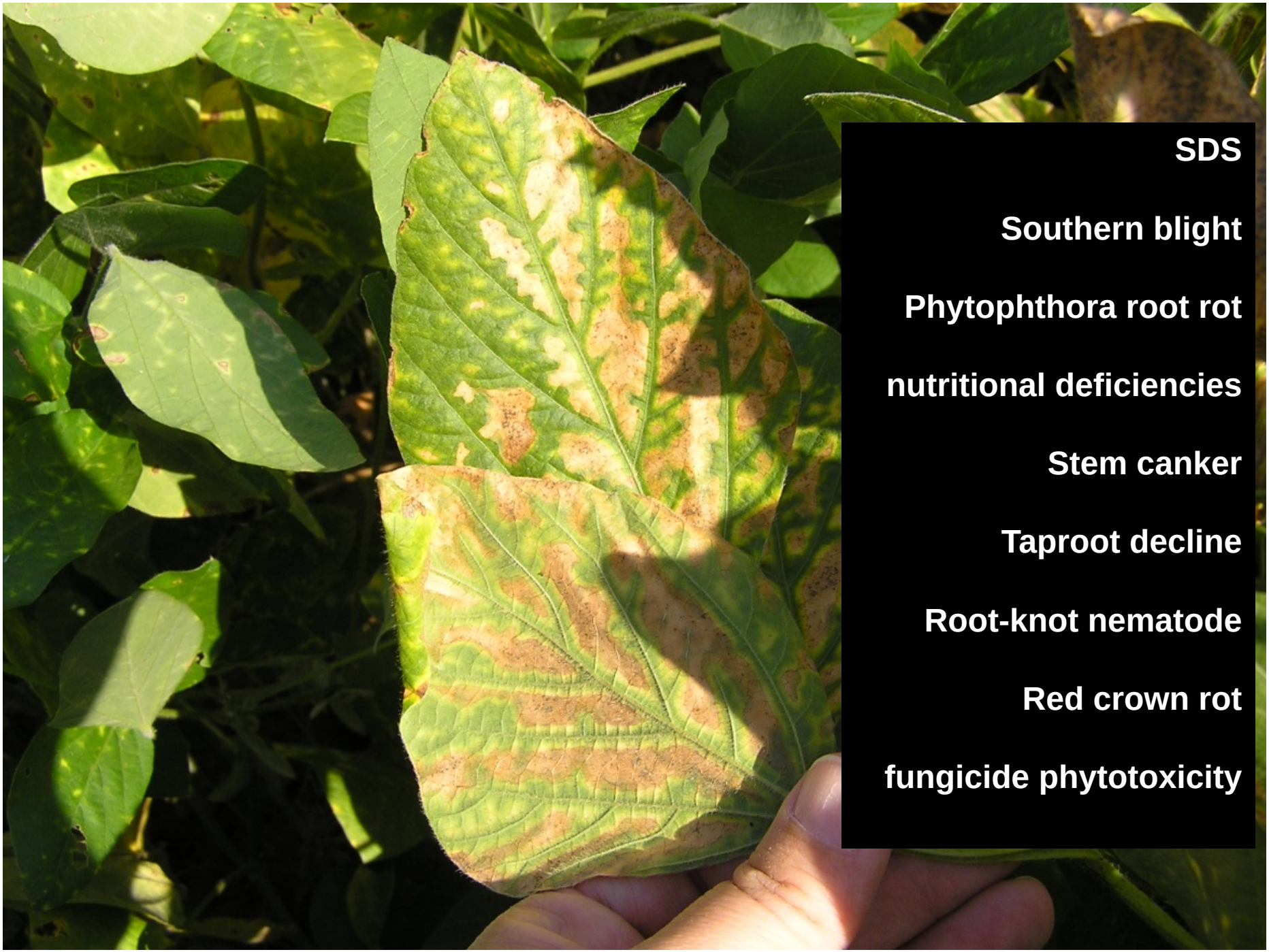
SDS

A rarity in Louisiana…

Confirmed in East Carroll in 2014

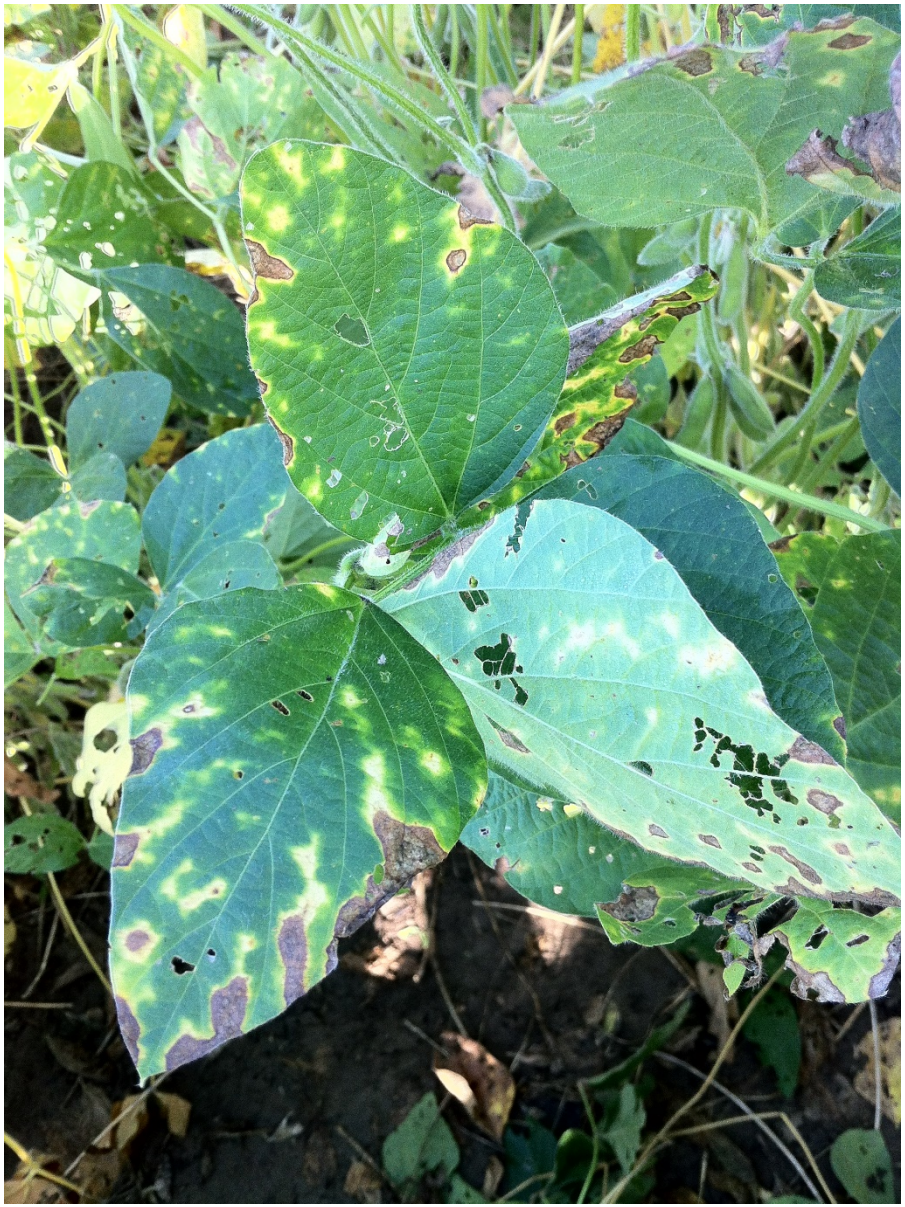
Not a widespread issue, but worth monitoring (major issue up north).


SDS
Southern blight
Phytophthora root rot
nutritional deficiencies
Stem canker
Taproot decline
Root-knot nematode
Red crown rot
fungicide phytotoxicity

Red Crown Rot

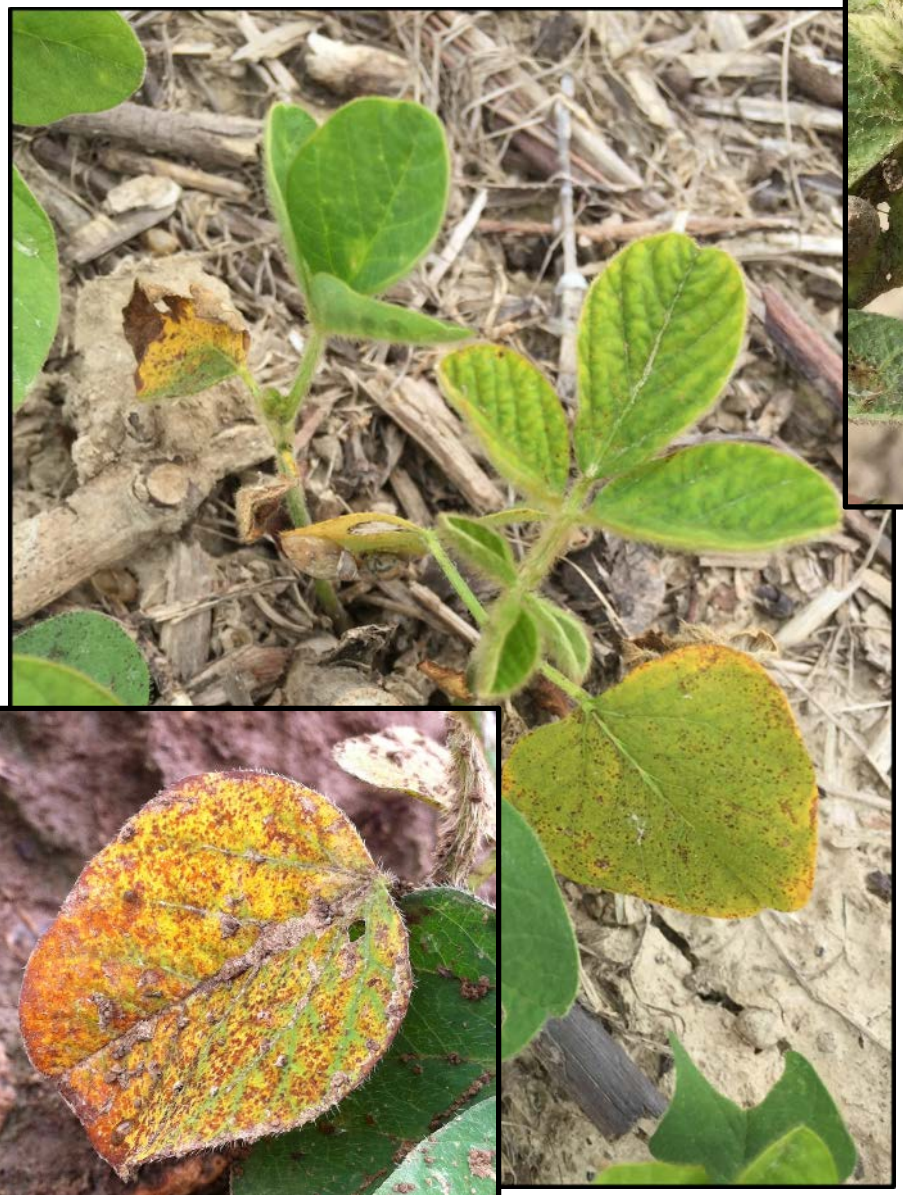
Red Crown Rot

Fungicide Phytotoxicity



Root knot Nematode

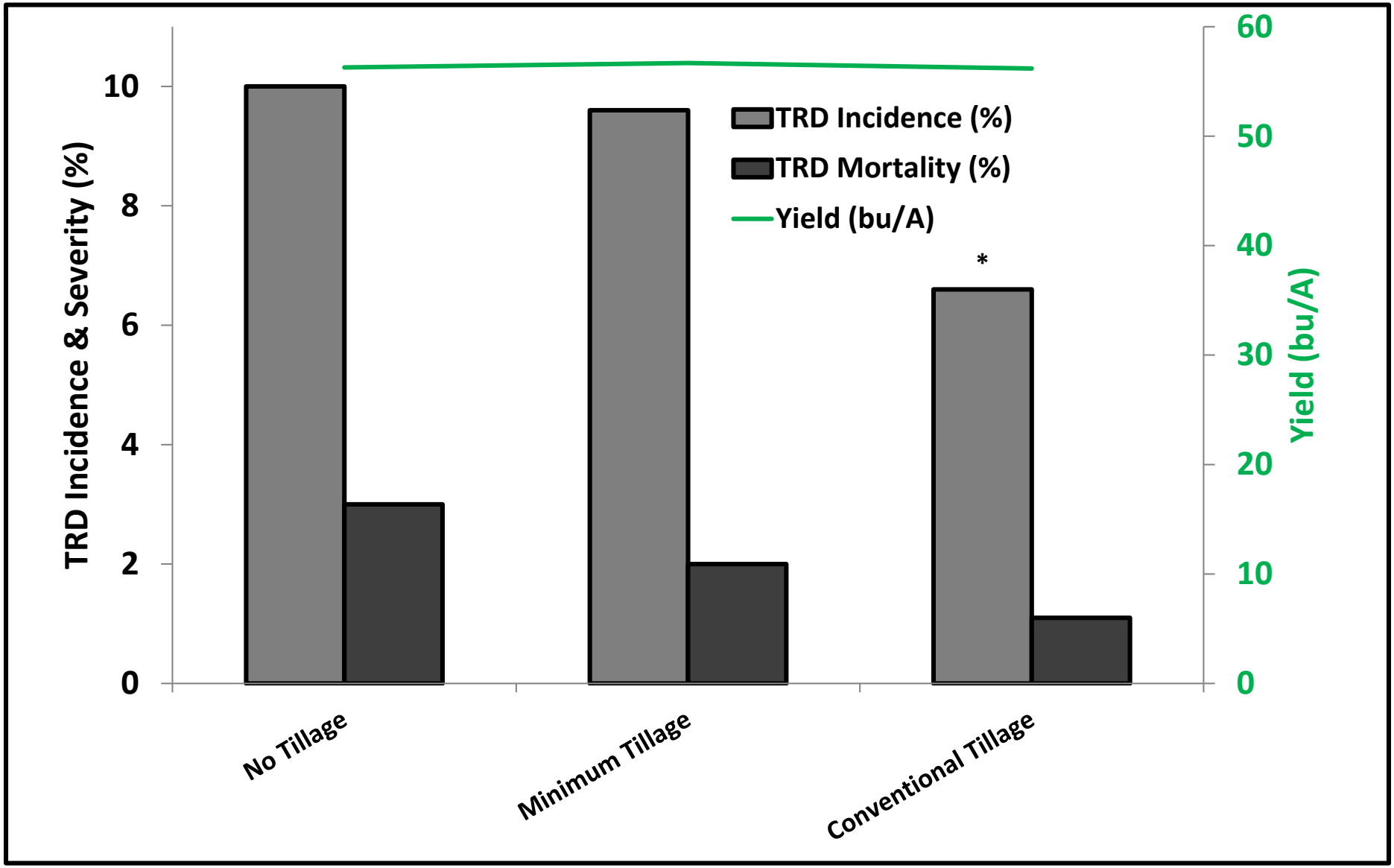
Soybean Taproot Decline (TRD)



Soybean Taproot Decline (TRD)


G.B. Padgett

Effect of tillage on taproot decline – Winnsboro



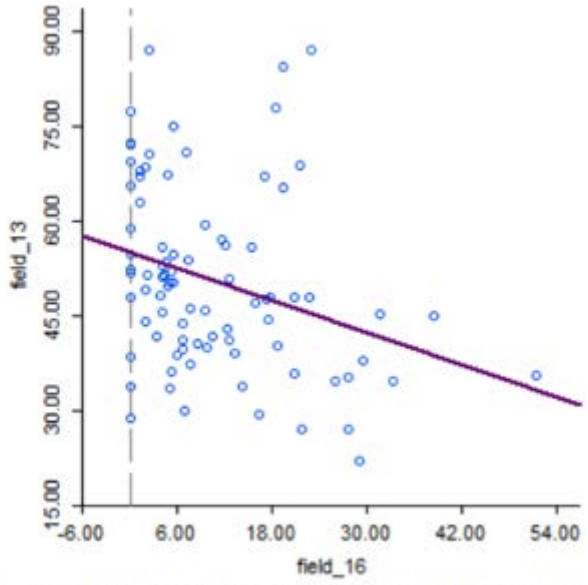
MRSB1701

Taproot decline reports from the southern U.S.

State reporting	Number of counties/parishes	Year first reported
Alabama	11	2015
Arkansas	11	2007
Louisiana	21	2007
Missouri	2	2016
Mississippi	68	2007
Tennessee	2	2017
TOTAL	**115**	

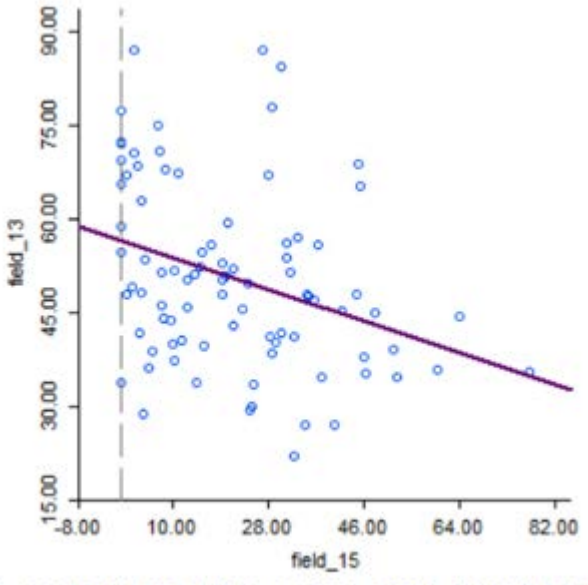
Yield impact 10 locations 2015-2017 (LA)

Mortality 20%=10 bu/A



#obs	R^2	const a	std-err a	t-stat a	p-value a	slope b	std-err b	t-stat b	p-value b
86	0.091	55.047	2.173	25.332	0.000	-0.426	0.147	-2.895	0.005

Incidence 20%=8 bu/A



#obs	R^2	const a	std-err a	t-stat a	p-value a	slope b	std-err b	t-stat b	p-value b
86	0.112	56.537	2.378	23.776	0.000	-0.283	0.087	-3.249	0.002

Taproot Decline – Management

- Avoid soybean monoculture, if possible
- Pathogen survives in soybean debris
- Tillage likely will reduce incidence
- Rotation likely will reduce incidence
- Resistant varieties may be available, have preliminary data (once through the greenhouse)
- Seed treatment and in-furrow fungicide information is limited

Thanks to all Collaborators!

Agents
Producers
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Paul Washam
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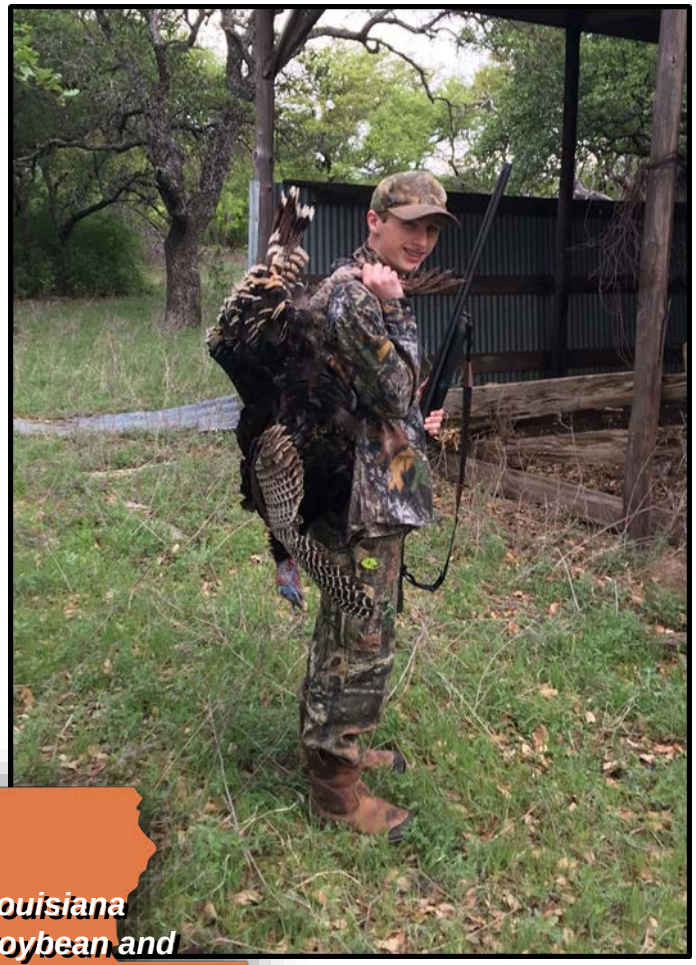
Darrell Franks and Crew
Daniel Stephenson
Donnie Miller
Rick Mascagni
Steve Harrison
Kelly Arceneaux
Vinson Doyle
Teddy Garcia



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