

Sulfur Fertility in Soybean



Shaun N. Casteel, Purdue University
Extension Soybean Specialist

scasteel@purdue.edu

Purdue Crop Chat

SOYBEAN STATION

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à la carte Menu of Soybean + Sulfur

- Sources
- Timing
- Rate
- Responsiveness
- Interactions to Avoid
- Intense Management Synergies



Sulfur Fertilizer Sources



No Sulfur



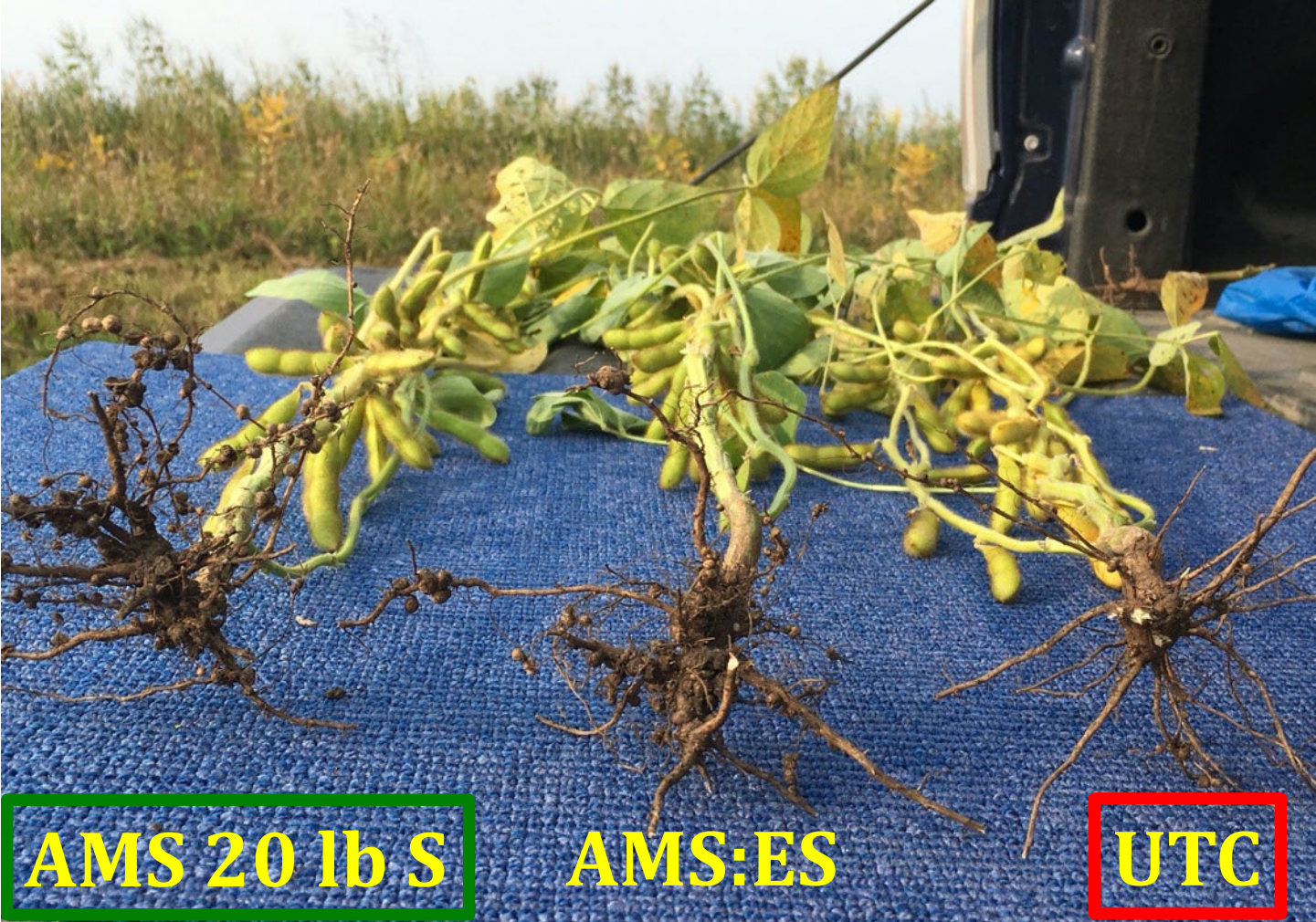
20 lb S/ac

No Sulfur



20 lb S/ac

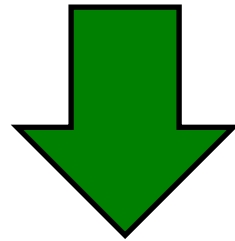
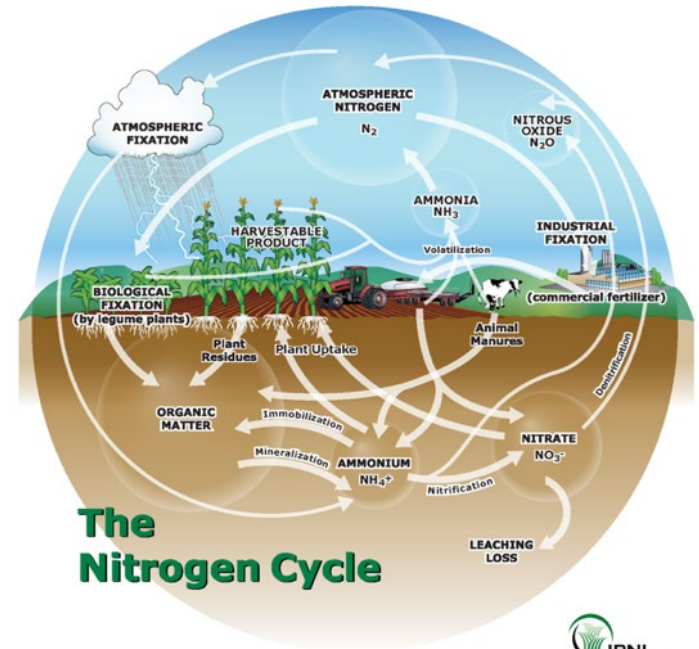
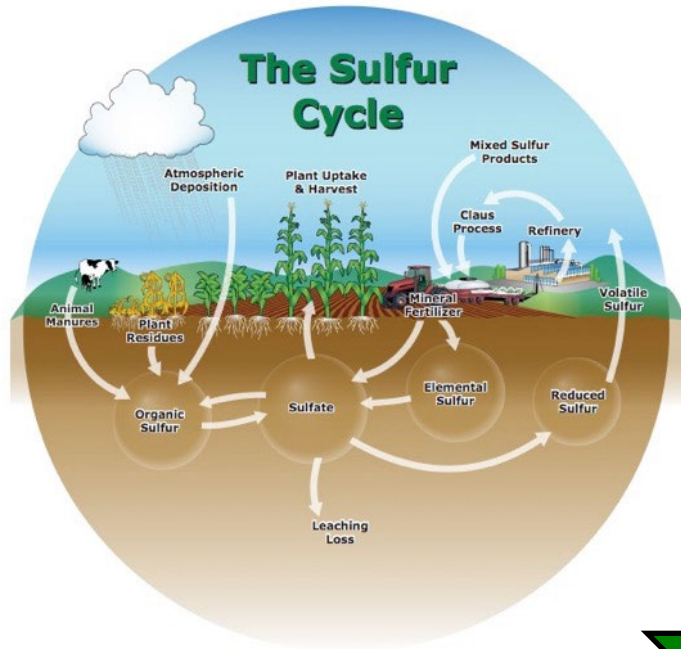




AMS 20 lb S

AMS:ES

UTC



High Yielding Soybeans!



N+S x Planting Date: 2018

EARLY **LATE**

May 11th June 5th



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2018 N+S x Planting Date

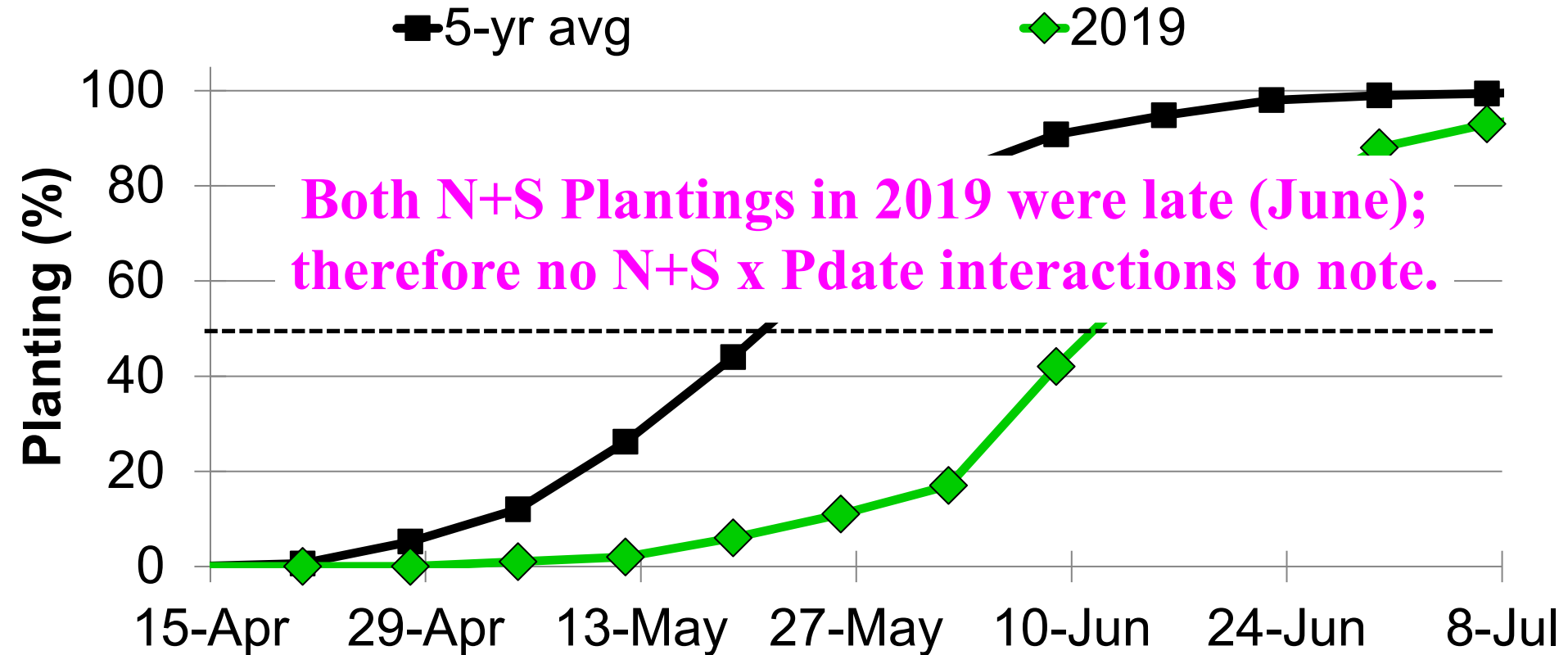
<i>Fertility Treatments</i>			
Treatment	Timing	N	S
		lb N/ac	lb S/ac
UTC	.	.	.
AMS	PRE	17.5	20
ATS	PRE	9.3	20
AMS + UREA	PRE	40	10
AMS + UREA	V4	40	10



2018 N+S x Planting Date

<i>Fertility Treatments</i>				<i>Yield</i>	
Treatment	Timing	N	S	11-May	5-Jun
		lb N/ac	lb S/ac	bu/ac	
UTC	.	.	.	62.4 de	59.2 e
AMS	PRE	17.5	20	69.5 bc	60.7 e
ATS	PRE	9.3	20	71.5 abc	61.9 e
AMS + UREA	PRE	40	10	74.2 ab	62.8 de
AMS + UREA	V4	40	10	75.9 a	58.0 e

Indiana Soybean: Late Plantings



Both N+S Plantings in 2019 were late (June); therefore no N+S x Pdate interactions to note.

2020 N+S x Planting Date

Treatment	Timing	N	S	Yield			
				12-May		8-Jun	
				lb N/ac	lb S/ac	bu/ac	
UTC	.			61.9	de	61.9	de
AMS	PRE	17.5	20	79.8	a	68.6	bcd
ATS	PRE	9.3	20	76.0	ab	66.1	de
AMS + Urea	PRE	40	10	82.6	a	66.5	cde
Gypsum 10	PRE	.	10	76.7	ab	68.5	bcd
Gypsum 20	PRE	.	20	75.2	abc	66.7	cde

2021 S x Planting Date: West Lafayette

Treatment	Timing	N	S	14-May		10-Jun	
		lb N/ac	lb S/ac	bu/ac			
UTC	.	.	.	69.0	cde	54.1	g
AMS	PRE	17.5	20	72.3	abcd	56.0	g
Gyp	PRE	.	20	76.9	a	55.4	g
ATS	PRE	9.3	20
Urea	PRE	40	.	67.3	def	57.3	g
AMS_Urea	PRE	40	20	75.2	ab	56.0	g
AMS	V4	17.5	20	73.4	ab	57.4	g
Gyp	V4	.	20	70.4	bcde	56.8	g
Urea	V4	40	.	65.4	abcd	54.0	g
AMS_Urea	V4	40	20	63.3	f	54.1	g

2021 S x Planting Date: West Lafayette

Treatment	Timing	N	S	Yield*	R3 Nitrogen		R3 Sulfur		R3 N:S	
		lb N/ac	lb S/ac							
UTC	.	.	.	61.6	4.9	cd	0.26	c	18.8	a
AMS	PRE	17.5	20	64.1	5.2	abc	0.31	a	16.8	b
Gyp	PRE	.	20	66.1	5.2	ab	0.30	a	17.3	b
Urea	PRE	40	.	62.3	4.7	d	0.26	c	18.5	a
AMS_Urea	PRE	40	20	65.6	5.4	a	0.31	a	17.2	b
AMS	V4	17.5	20	65.4	5.0	bcd	0.29	ab	17.1	b
Gyp	V4	.	20	63.6	5.0	cd	0.30	a	16.6	b
Urea	V4	40	.	58.7	4.9	cd	0.27	bc	18.8	a
AMS_Urea	V4	40	20	61.4	5.0	bcd	0.30	a	17.1	b

*Pooled over Planting Dates

2022 S x Planting Date: West Lafayette

Treatment	Timing	N	S	12-May		6-Jun	
		lb N/ac	lb S/ac	bu/ac			
UTC	.	.	.	61.8	def	59.0	efg
AMS	PRE	17.5	20	64.0	bcde	61.4	def
Gyp	PRE	.	20	67.1	abcd	64.6	abcde
ATS	PRE	9.3	20	69.3	ab	53.4	g
Urea	PRE	40	.	64.4	bcde	63.9	bcde
Gyp_Urea	PRE	40	20	67.9	abc	65.3	abcd
AMS	V4	17.5	20	69.8	ab	63.9	bcde
Gyp	V4	.	20	70.7	a	62.3	cdef
Urea	V4	40	.	65.4	abcd	56.6	fg
Gyp_Urea	V4	40	20	61.8	cdef	62.0	cdef

N+S x Planting Interactions

- **EARLY** planting still proves to increase yield.
- **N+S Fertility** increased yield in **EARLY** planted soybeans in 2018, 2020 (10+ bu/ac), 2021, 2022
- **N+S Fertility** did not affect the yield of **LATE** planted soybeans in 2018, 2019, 2020, 2021.
- **Cool and/or wet conditions** associated with **EARLY** plantings likely increased the yield response to the **N+S Fertility** due to limited mineralization of soil organic matter and slow soybean growth (roots, nodules).

Sulfur Synergies with Foliar Protection?

- **2 x 4 Factorial** with 5 replications
- **2 Sulfur** → 0, 20 lb S/ac
- **4 Foliar Protection @ R4 (prophylactic)**
 - None
 - Fungicide:
 - Priaxor 4 oz/ac (2019, 2020)
 - Revytek 8 oz/ac (2021, 2022)
 - Insecticide: Fastac 3.2 oz/ac
 - Both: Priaxor + Fastac
- West Lafayette, Wanatah



S x R4 Protect: 19 W. Lafayette

R4 Foliar	No Sulfur		Sulfur	
None	67.0	d	69.2	cd
Fung.	68.4	cd	71.6	abc
Insect.	66.7	d	73.4	ab
Both	66.7	d	74.5	a

- No benefit from R4 protection alone
- 6.7 bu/ac increase with pre-S + R4 Insecticide
- 7.5 bu/ac increase with pre-S + R4 Both
- **Leaf retention and “stay-green” during seed fill?**

S x R4 Protect: 20 W. Lafayette

R4 Foliar	No Sulfur	Sulfur
None	62.2	62.2
Fung.	68.1	66.0
Insect.	64.0	64.1
Both	67.4	67.4

- Sulfur did not improve yield nor did it provide synergies w/ R4 Foliar
- **Late planting (June 3, 2020) coupled with late season dry conditions during seed fill negated responses.**

S x R4 Protect: 21 W. Lafayette

R4 Foliar	No Sulfur	Pre-AMS	V4_AMS
None	74.0	82.3	81.7
Fung.	74.0	83.5	83.3
Insect.	73.8	86.9	82.7
Both	78.4	87.3	82.4

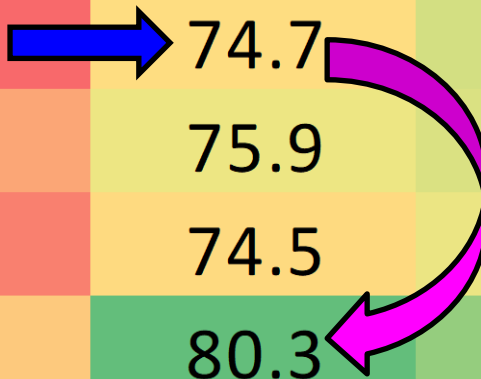
- **AMS PRE to V4 increased yield ~8 bu/ac**
- **Additional 4-6 bu/ac with R4 insect with pre-AMS** but no other improvements with R4 foliar protection.

S x R4 Protect: 21 W. Lafayette

AMS	Protect	N @ R4	S @ R4	N:S @ R4
None	None	4.6	0.25	18.6
	Fung.	4.7	0.25	19.0
	Insect.	4.7	0.25	18.7
	Both	4.8	0.25	19.1
		4.7 b	0.25 b	18.8 a
PRE	None	5.4	0.30	18.0
	Fung.	5.4	0.31	17.5
	Insect.	5.4	0.30	18.2
	Both	5.5	0.31	18.1
		5.4 a	0.30 a	17.9 b
V4	None	5.5	0.30	18.5
	Fung.	5.1	0.30	17.2
	Insect.	5.3	0.31	17.2
	Both	5.4	0.31	17.3
		5.3 a	0.30 a	17.6 c

S x R4 Protect: 22 W. Lafayette

R4 Protect	No Sulfur	Pre-AMS	V4-AMS
None	69.2	74.7	76.7
Fung.	72.1	75.9	76.5
Insect	70.3	74.5	75.9
Both	73.7	80.3	78.7



- AMS PRE to V4 increased yield ~6 bu/ac
- Additional 5.5 bu/ac with R4 both with pre-AMS but no other improvements with R4 foliar protection.

Sulfur Management Considerations

- **Timely planting is foundational** for high yielding soybeans; which seems to be intensified when coupled with PRE applications of N + S.
- **Field conditions** that affect S availability and nodulation + N fixation (soil temp, planting, residue)
- **Synergies** with baseline sulfur and R4 foliar protection seem to have connections to soil conditions (e.g., time of planting) **followed by leaf retention and pod protection for seed fill**




S Fertilizer Blends Broadcasted at Planting of Soybean

Treatment	Sulfur	Nitrogen	Phosphorus	Potassium
	lb S/ac	lb N/ac	lb P₂O₅/ac	lb K₂O/ac
Untreated
N	.	17.5	.	.
P	.	.	40	.
K	.	.	.	60
NPK	.	17.5	40	60

Treatment	Sulfur	Nitrogen	Phosphorus	Potassium
	lb S/ac	lb N/ac	lb P ₂ O ₅ /ac	lb K ₂ O/ac
Untreated
N	.	17.5	.	.
P	.	.	40	.
K	.	.	.	60
NPK	.	17.5	40	60
Sulfur + N	20	17.5	.	.
Sulfur + P	20	17.5	40	.
Sulfur + K	20	17.5	.	60
Sulfur + NPK	20	17.5	40	60

2019 Sulfur x NPK

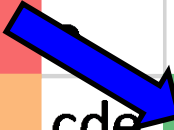
	No AMS		AMS	
UTC	50.0	b		
N	50.0	b	53.4	b
P	53.5	b	57.8	a
K	45.3	c	50.9	b
NPK	50.8	b	50.7	b



- K impeded yield ~ 5 bu/ac
 - Addition of N and P alleviated the yield hit (same as UTC)
 - Addition of N and S alleviated the yield hit (same as UTC)
- ~8 bu/ac improvement with AMS + P

2020 Sulfur x NPK

	No AMS		AMS	
UTC	50.6			
N	54.4	cde	63.3	a
P	56.8	bcd	58.9	abc
K	51.4	e	62.3	a
NPK	53.7	de	60.2	ab



- K did not have negative impact
- 6.2 bu/ac improvement with P
- 12.7 bu/ac improvement with AMS
 - 3.8 bu/ac numeric improvement with N (urea alone)

2021 LaCrosse: Sulfur x NPK

Source	Yield	N		P	K	S		Mn	N:S	
UTC	58.4	4.9	b	0.32	2.17	0.264	cd	35	18.5	abcd
N	57.5	4.8	b	0.32	2.13	0.255	d	33	19.0	ab
P	57.9	5.0	b	0.33	2.14	0.265	cd	42	18.8	abc
K	62.5	5.1	b	0.31	2.16	0.270	bcd	33	18.7	abc
NPK	63.6	4.9	b	0.33	2.24	0.256	d	36	19.2	a
AMS	55.7	4.9	b	0.30	1.96	0.283	bc	41	17.4	e
AMS_P	63.8	5.6	a	0.36	2.10	0.320	a	35	17.5	de
AMS_K	62.8	5.1	b	0.33	2.25	0.286	b	34	18.1	bcde
AMS_PK	62.5	5.1	b	0.33	2.25	0.286	b	39	17.7	cde
Trt	ns	*		ns	ns	***		ns	*	
CV	11.2	6.4		8.0	8.0	6.3		21.4	5.0	

S-NPK

LaCrosse

Aug 4, 2021



UTC

KCI + AMS

AMS

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21 W. Lafayette: S+NPK x Variety

Var ***

Fert***

V x Fert: ns

Cl Incl. → 68.2

Cl Intermed. → 74.6

ACRE 21	Pooled Over Varieties			
Source	No AMS		AMS	
UTC	67.9	c		
N	68.5	c	75.0	b
P	69.1	c	78.5	a
K	67.1	c	74.9	b
NPK	68.3	c	73.4	b

21 W. Lafayette: S+NPK x Variety

ACRE 21	Pooled Over Varieties												
Source	Yield		N		P	K		S		Mn		N:S	
UTC	67.9	c	5.4	bc	0.35	1.92	c	0.29	bc	46.5	ef	18.7	a
N	68.5	c	5.2	d	0.33	1.93	c	0.28	c	45.5	f	18.7	a
P	69.1	c	5.5	b	0.36	2.02	ab	0.29	b	47.9	def	18.9	a
K	67.1	c	5.3	cd	0.35	2.03	a	0.28	c	48.3	de	19.2	a
NPK	68.3	c	5.4	bc	0.35	1.93	bc	0.29	bc	48.9	cde	18.9	a
AMS	75.0	b	6.0	a	0.36	2.02	ab	0.35	a	49.4	bce	17.2	b
AMS+P	78.5	a	6.0	a	0.36	2.05	a	0.35	a	52.2	a	17.1	b
AMS+K	74.9	b	6.1	a	0.36	2.10	a	0.35	a	51.4	abc	17.4	b
AMS+PK	73.4	b	5.9	a	0.35	2.03	a	0.34	a	51.9	ab	17.3	b
Var	***		**		***	ns		***		***		ns	
Fert	***		***		ns	*		***		**		***	
Var*Fert	ns		ns		ns	ns		X		X		ns	
CV (%)	5.6		4.5		7.3	6.0		5.6		7.1		4.8	

21 Wanatah: S+NPK x Variety

Var ***

Fert***

V x Fert: ns

Cl Incl. → 73.5

Cl Intermed. → 69.3

Pinney 21	Pooled Over Varieties			
Source	No AMS		AMS	
UTC	70.0	cd		
N	70.7	bcd	71.7	abc
P	70.9	bcd	72.9	a
K	69.7	d	73.1	a
NPK	71.5	abcd	72.1	ab

21 Wanatah: S+NPK x Variety

Pinney 21	Pooled Over Varieties													
Source	Yield		N		P		K		S		Mn		N:S	
UTC	70.0	cd	5.8	cd	0.43	ab	2.10	ab	0.34	c	35	bc	17.5	bc
N	70.7	bcd	6.0	bc	0.42	bc	2.02	bc	0.33	cd	34	c	18.3	a
P	70.9	bcd	5.9	cd	0.43	ab	2.04	bc	0.33	c	34	c	17.7	ab
K	69.6	d	5.8	d	0.41	c	2.19	a	0.32	d	35	bc	18.2	a
NPK	71.5	bcd	5.9	cd	0.44	ab	2.18	a	0.33	c	38	ab	17.8	ab
AMS	71.7	abc	6.0	ab	0.42	bc	2.00	c	0.37	a	35	bc	16.2	e
AMS+P	72.9	a	6.2	a	0.45	a	2.04	bc	0.38	a	39	a	16.4	de
AMS+K	73.1	a	6.2	a	0.42	c	2.19	a	0.37	bc	40	a	16.9	cd
AMS+PK	72.1	ab	6.2	a	0.43	bc	2.15	a	0.36	b	39	a	17.3	bc
Var	***		**		ns		*		*		**		ns	
Fert	*		***		*		**		***		*		***	
Var*Fert	ns		ns		ns		ns		ns		ns		ns	
CV (%)	3.4		3.4		5.2		5.9		4.3		12.7		4.9	

22 W. Lafayette: S+NPK x Variety

YIELD

Var ns

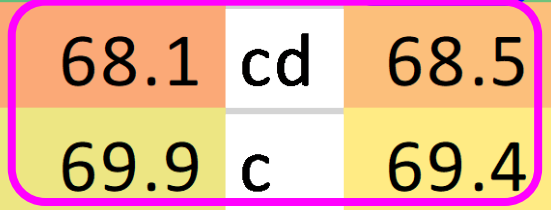
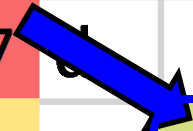
Fert**

V x Fert: ns

Cl Incl. → 69.9

Cl Intermed. → 69.7

W.Laf. 22	Pooled Over Varieties			
Source	No AMS		AMS	
UTC	66.7			
N	69.3	c	70.5	bc
P	73.1	a	72.8	ab
K	68.1	cd	68.5	cd
NPK	69.9	c	69.4	c



22 W. Lafayette: S+NPK x Variety

Seed Weight

Var **

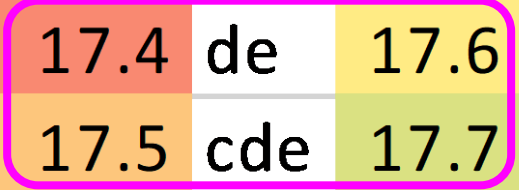
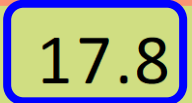
Fert**

V x Fert: ns

Cl Incl. → 17.8

Cl Intermed. → 17.5

W.Laf. 22	Pooled Over Varieties			
Source	No AMS		AMS	
UTC	17.3			
N	17.4	de	18.1	a
P	17.8	bc	18.0	ab
K	17.4	de	17.6	cd
NPK	17.5	cde	17.7	bc



22 LaCrosse: S+NPK

Source	No AMS		AMS	
UTC	50.8	a		
N	48.8	a	52.1	a
P	51.4	a	52.8	a
K	43.2	a	50.9	a
NPK	43.6	b	52.0	a

22 LaCrosse: S+NPK, Seed Weight (g/100 sd)

Source	No AMS		AMS	
UTC	16.2	ab		
N	15.9	b	16.4	ab
P	16.5	a	16.2	ab
K	16.2	ab	16.0	ab
NPK	15.3	c	16.0	ab

Sulfur Management Considerations

- **Soluble S Fertilizer applied PRE to early V stages** of greatest benefit and flexibility
- **Broadcast of 15 to 20 lb S/ac** with soluble source near planting such as AMS, MES10, pelletized Gypsum, or before emergence with ATS.
- **Leaf Nutritional Snapshots then Apply Sulfur**
 - “Close” to **critical S levels (0.25%)**
 - **N:S ~18:1 or higher**
- **Nutrient interactions** can mask yield reductions and limit yield improvements based on **timing of potash**.
- **Phosphorus blending** is promising.

Thanks for the support!



Purdue Crop Chat



Dr. Dan Quinn
Purdue Extension Corn Specialist

Dr. Shaun Casteel
Purdue Extension Soybean Specialist



What biologicals do you want evaluated in soybean?



Simple Survey that will take a few minutes.

Summary tables available within the survey for each category: N Suppliers (non-rhizobial), P Suppliers, Humic/Fulvic Acids, Marine Extracts, and Combinations.

Thank you!

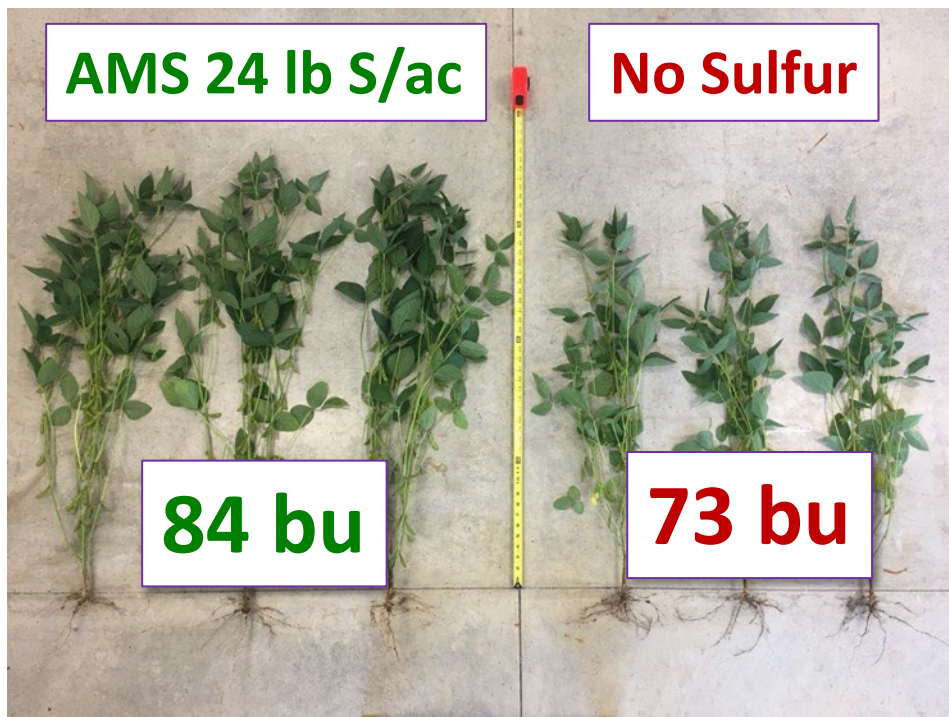
Shaun Casteel

scasteel@purdue.edu



https://purdue.ca1.qualtrics.com/jfe/form/SV_5o7gWCyUynGxCL4

18 INFA Tipton



AMS 24 lb S/ac

No Sulfur

84 bu

73 bu

66 pods/plant

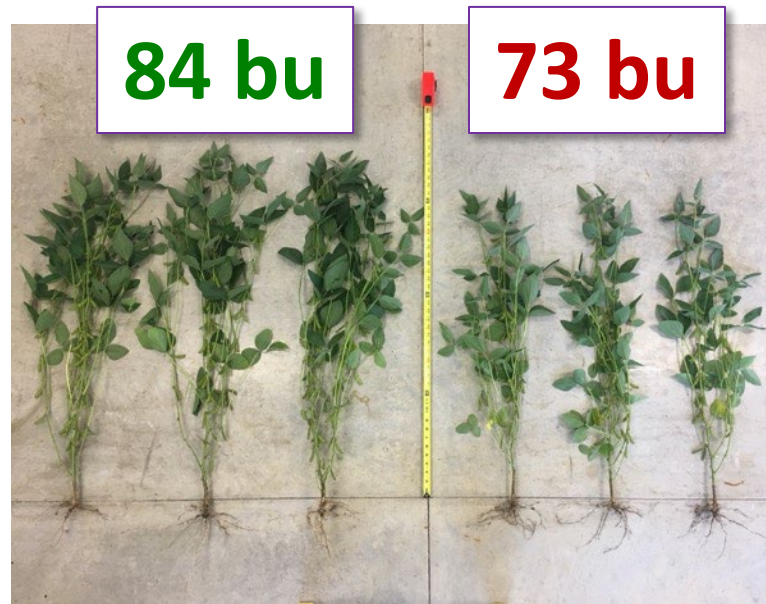
44 pods/plant

18.4 nodes

16.6 nodes

2022-23 Cereal Rye x NS in Soybean

- 2 x 4 Factorial at field-scale
- 2 Cereal Rye → Yes, No
- 4 NS Fertility
 - None
 - Sulfur: 20 lb S/ac (pelletized Gypsum)
 - Nitrogen: 40 lb N/ac (Urea)
 - N+S: 40 lb N, 20 lb S
- **Terminate** ~12-16 inches (April-ish)
- **Indiana:** Columbia City, W. Lafayette, Butlerville
- **Illinois:** Effingham, Urbana



18 INFA Tipton

Nutrient Application After Planting (PRE)

- LaCrosse, IN. Sandy loam to Loamy Sand
 - pH 6.6, 2.5% O.M., 35 M3P, 125 M3K, 3-8 M3S

		2018	2019	2020	2021	2022
Planting Date		May 22	May 20	May 4	May 15	May 12
Nutrients (kg/ha)						
Sulfur	S Sources	20	15	15	15	15
Nitrogen	Urea (46-0-0)	.	20	20	20	20
P₂O₅	TSP (0-45-0)	.	60	60	60	60
K₂O	KCl (0-0-60)	.	60	50	.	.

2018-2022 Sulfur Sources: Leaf N @ R3

Leaf Nitrogen	2018	2019	2020	2021	2022	Trt*YR**
UTC	5.0	5.7	4.6 e	5.2 e	.	5.1
NPK (or NP)	.	5.6	4.9 de	5.5 d	.	5.3
AMS	5.2	5.2	5.5 bc	5.8 bcd	.	5.4
MES_10	5.3	5.3	5.8 ab	5.9 ab	.	5.6
Sulf4R	5.2	5.3	5.7 ab	6.1 a	.	5.6
K_Mag	5.1	5.1	5.8 ab	6.0 ab	.	5.5
Tlger90CR	5.0	5.2	5.2 cd	5.8 bc	.	5.3
AMS_Tiger	5.1	5.4	5.5 bc	5.8 abc	.	5.4
spray_ATS	5.2	5.0	5.6 abc	5.6 cd	.	5.3
MES_15	.	5.6	5.9 a	6.0 ab	.	5.8
Super_Sulfur	.	5.2	5.7 ab	5.8 bc	.	5.5

2018-2022 Sulfur Sources: Leaf S @ R3

Leaf Sulfur	2018		2019		2020		2021		2022		Trt*YR**
UTC	0.28	d	0.30		0.24	c	0.28	d	.		0.28
NPK (or NP)	.	.	0.31		0.24	c	0.29	d	.		0.28
AMS	0.36	a	0.31		0.34	a	0.33	abc	.		0.34
MES_10	0.36	ab	0.32		0.33	a	0.34	a	.		0.34
Sulf4R	0.36	a	0.30		0.34	a	0.33	abc	.		0.33
K_Mag	0.36	a	0.33		0.33	a	0.34	ab	.		0.34
Tlger90CR	0.30	c	0.30		0.29	b	0.32	c	.		0.30
AMS_Tiger	0.35	b	0.32		0.33	a	0.33	abc	.		0.33
spray_ATS	0.36	ab	0.32		0.31	b	0.32	bc	.		0.33
MES_15	.	.	0.30		0.33	a	0.33	abc	.		0.32
Super_Sulfur	.	.	0.32		0.29	b	0.32	bc	.		0.31

2018-2022 Sulfur Sources: Leaf N:S @ R3

Leaf N:S	2018		2019		2020		2021		2022		Trt*YR**
UTC	18.0	a	19.3	a	19.3	b	18.9	a	.	.	18.9
NPK (or NP)	.	.	18.1	ab	20.9	a	18.7	ab	.	.	19.2
AMS	14.4	cd	17.2	bcd	16.0	f	17.4	d	.	.	16.2
MES_10	14.7	c	16.6	cd	17.6	cde	17.4	d	.	.	16.6
Sulf4R	14.2	cd	17.7	abc	16.8	def	18.3	ab	.	.	16.7
K_Mag	13.9	d	15.3	d	17.5	cde	17.8	cd	.	.	16.1
Tlger90CR	16.9	b	17.6	abc	18.1	bcd	18.3	abc	.	.	17.7
AMS_Tiger	14.7	c	16.7	bcd	16.6	ef	17.9	cd	.	.	16.5
spray_ATS	14.4	cd	15.4	d	18.1	bc	17.6	cd	.	.	16.4
MES_15	.	.	18.6	ab	17.8	cde	18.3	abc	.	.	18.2
Super_Sulfur	.	.	16.0	cd	19.3	b	18.1	bcd	.	.	17.8

2018-2022 Sulfur Sources: Yield

Yield (bu/ac)	2018		2019		2020		2021		2022		Avg.	
UTC	61.7	d	54.9		51.6	e	61.8	d	50.8	c	56.1	c
NPK			55.2		55.8	de	63.3	cd	56.5	abc	57.7	c
AMS	72.0	ab	53.6		63.2	ab	70.1	b	59.7	ab	63.7	ab
MES_10	73.4	a	59.3		63.8	ab	68.9	bc	60.8	ab	65.2	a
Sulf4R	72.8	ab	53.8		61.6	bc	72.3	ab	58.2	ab	63.7	ab
K_Mag	67.9	bc	56.2		60.2	bcd	69.1	bc	56.8	ab	62.1	b
Tlger90CR	65.5	cd	57.9		62.8	abc	73.3	ab	55.4	bc	63.0	ab
AMS_Tiger	68.8	abc	60.9		66.3	a	72.7	ab	57.2	ab	65.2	a
spray_ATS	68.6	abc	59.0		63.1	ab	69.2	bc	61.2	ab	64.2	ab
MES_15	.	.	56.5		64.0	ab	76.3	a	61.6	a	64.6	ab
Super_Sulfur	.	.	58.5		63.9	ab	74.5	ab	57.7	ab	63.7	ab

2018-2022 Sulfur Sources

- **Yield Trend:**

- Low S rate (15 lb S / ac) needed a blend of sulfate and elemental S
- Higher rate (20 lb S / ac) seem to displace the differences and more soluble sources
- Cl effects in 2019, 2020 masked some S benefits

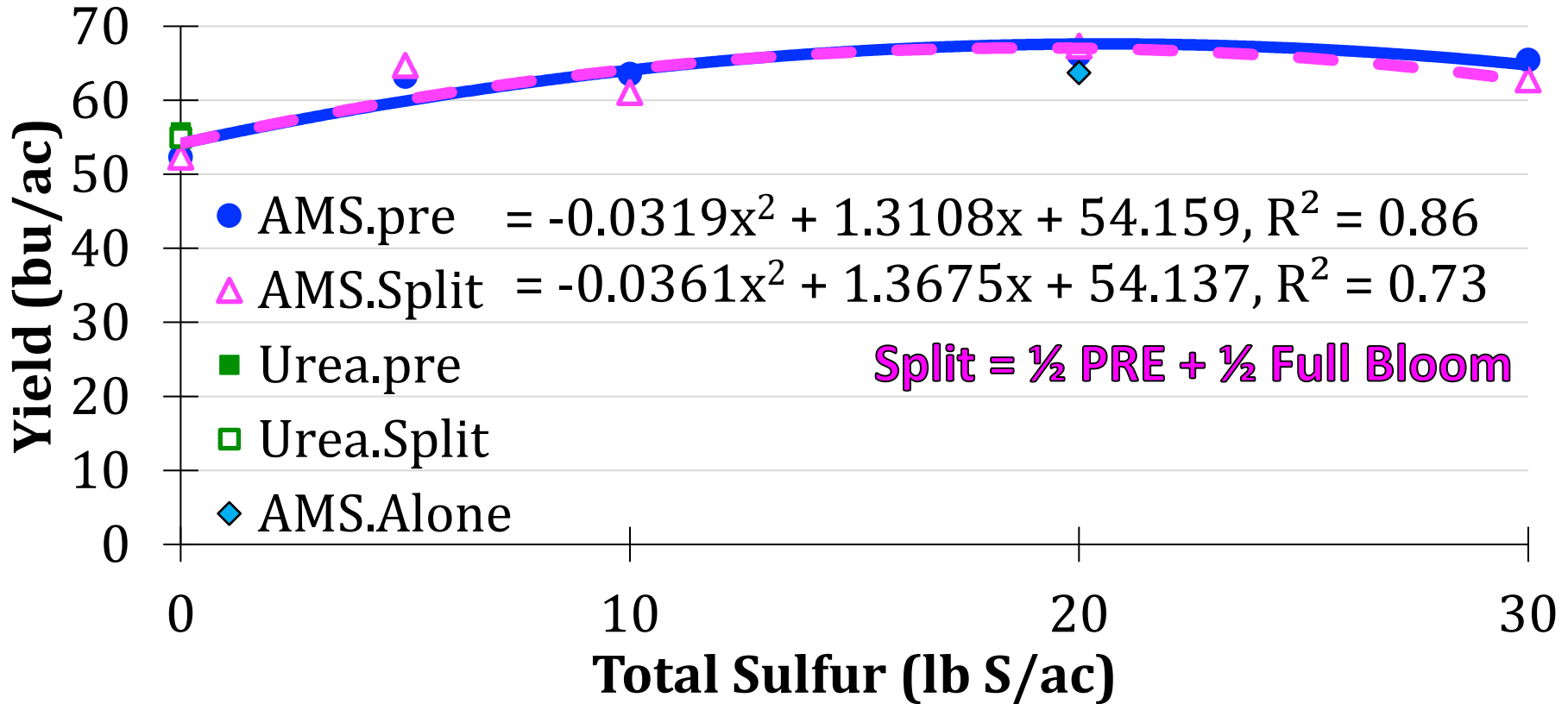
- **Protein Trend:**

- Most S sources improved absolute protein 2 to 4%, K-Mag and Tiger occasionally did not improve protein as much.
- N treatment did not improve protein.

2023 Sulfur Sources

- Let sources stand on their own. No additional or balancing nitrogen and phosphorus. TSP is providing ~1.5% S, so we were adding ~2 lb S/ac with the 15 lb S rate.

18 AMS Rate x Timing: LaCrosse



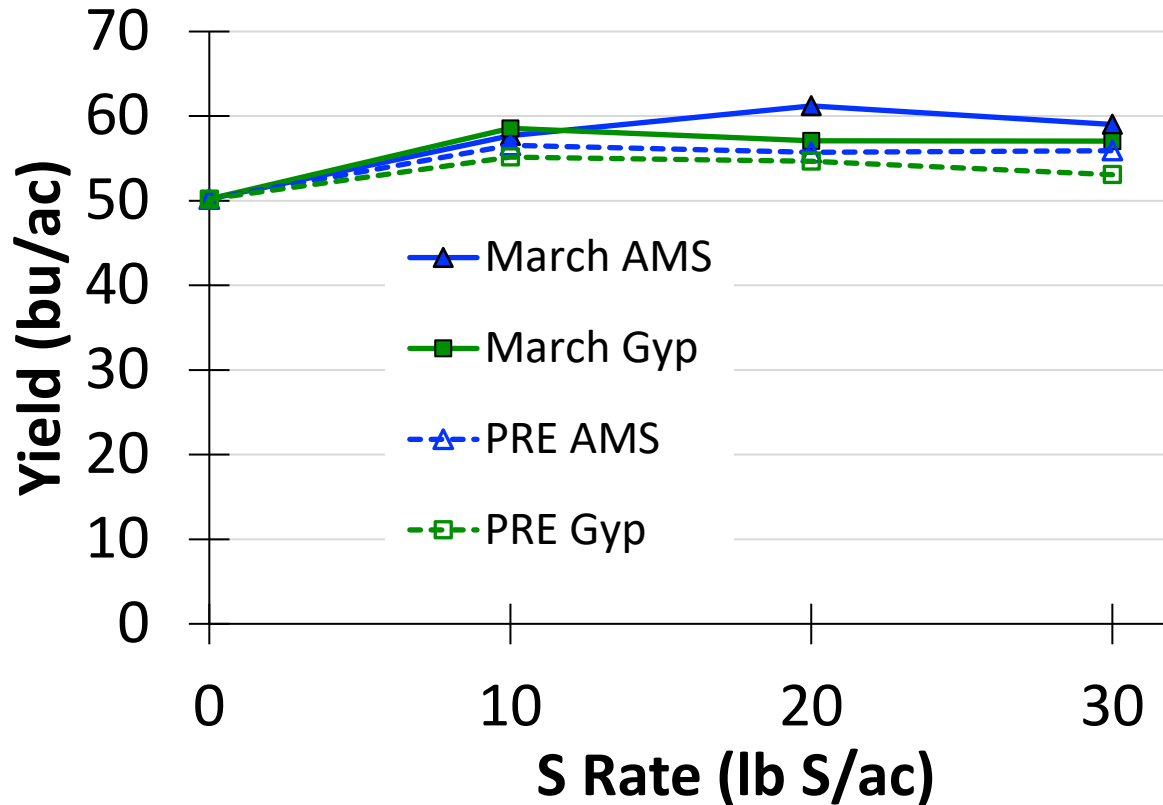
22 Sulfur Timing: March vs. PRE

- LaCrosse
- Timing: March vs. PRE
- Source:
 - **AMS** 21-0-0-24S
 - **PolyS** 0-14-0-19S, 3.6Ca, 12.2Mg
 - **Gypsum** 0-0-0-17S, 22Ca
- Rate: 0, 10, 20, 30 lb S/ac

S Timing: Other Nutrients Applied

S Rate	AMS	PolyS	PolyS	PolyS	Gypsum
lb S/ac	lb N/ac	lb K₂O/ac	lb Mg/ac	lb Ca/ac	lb Ca/ac
0	.	.			.
10	8.8	7.4	6.4	1.9	12.9
20	17.5	14.7	12.8	3.8	25.9
30	26.3	22.1	19.3	5.7	38.8

22 Sulfur Timing: March vs. PRE



Timing

- March 58.0 a
- PRE 55.5 b
- UTC 50.2 c

Rate by Timing

- March → ~20 lb S/ac
- PRE → ~10 lb S/ac