Comparative efficacy of fungicides for management of white mold in soybeans:

Results from field studies conducted in Carrington and Oakes, ND from 2019 to 2023.

Testing was conducted with fungicide spray droplet size calibrated relative to canopy characteristics.

- Testing was conducted in soybeans seeded to 14 or 21" rows.
- **Teejet nozzles:** fine droplets were utilized if average canopy closure was <80%, medium droplets were utilized if average canopy closure was 80-90%, and coarse droplets were utilized if average canopy closure was >90%.
- Wilger nozzles: coarse droplets were utilized if average canopy closure was <90%, and very coarse droplets were utilized if average canopy closure was >90%.
- No testing was conducted in soybeans seeded to wide (28 or 30") rows.
- Note that due to increased plant density within the row in soybeans seeded to wide rows, it may be necessary to calibrate droplet size relative to canopy density within the row when wide rows are used. This will be tested in 2024.

Results from field trials conducted in Carrington indicate that calibrating fungicide droplet size relative to canopy characteristics improves the consistency of fungicide performance against white mold and increases the yield gain conferred by fungicides in soybeans under white mold pressure.

Calibrating droplet size appears to be particularly important for fungicides with intermediate efficacy against white mold. In field trials in which fungicide spray droplet size has been calibrated versus canopy closure, the differences in the relative efficacy of fungicides against white mold in soybeans have narrowed. The most effective fungicides are still the same, but the difference between the most effective fungicides and the fungicides with intermediate efficacy has decreased.

Impact of optimizing fungicide droplet size: efficacy of the fungicide Endura

Each circle: yield gain conferred by a single application of Endura (5.5 oz) in a replicated field study.

Carrington and Oakes, ND (2018-2023); hand-applied and tractor-applied studies. Testing conducted in soybeans seeded to 14" or 21" rows.

CALIBRATION in studies where TeeJet nozzles were used: <u>Fine droplets</u> when average canopy closure < 80%, <u>medium</u> <u>droplets</u> when ave. canopy closure 80-90%, <u>coarse droplets</u> when ave. canopy closure >90%. CALIBRATION, Wilger nozzles: <u>Coarse</u> droplets when canopy closure <90%, <u>very coarse</u> when canopy closure >90%.

In soybeans seeded to wide (28-30") rows, plant spacing within the row is much higher, and fungicide spray droplet size might need to be calibrated versus canopy density within the row, not canopy closure. This will be tested in 2024.

 (A) When Endura was applied with fine droplets irrespective of canopy characteristics,
the yield gain conferred by the fungicide at any given level of disease pressure was highly variable.

(B) When Endura was applied with spray droplet size calibrated relative to canopy characteristics, the yield gain conferred by the fungicide at any given level of disease pressure was much more consistent.

Each circle: the yield gain observed from applying Endura at 5.5 oz/ac in one replicated study.

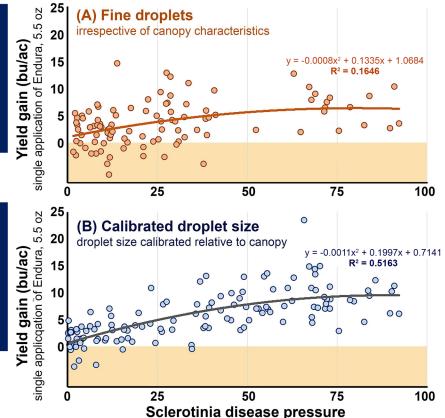
 (C) When Endura was applied with spray droplet size calibrated relative to canopy characteristics, the average yield gain conferred by the fungicide Endura (5.5 oz/ac) at any given level of white mold disease pressure increased.

Bars: average response across all studies conducted at each range of disease pressure.

Circles: yield gain conferred by Endura (applied at 5.5 oz/ac) in one replicated study.



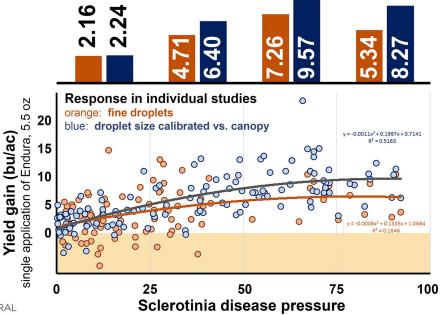
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percent of canopy diseased in non-treated control at end of season

Average response

Yield gain (bu/ac) conferred by single application of Endura, 5.5 oz fine droplets vs. calibrated droplet size



percent of canopy diseased in non-treated control at end of season

Delaro Complete 8 fl oz - single application

	Dela		s n oz - single	аррпсатоп		
prothioconaz	ole (FRAC 3), 1.47 lb	s ai/gal; trifloxystrol	bin (FRAC 11), 1.29 lb	s ai/gal; fluopyram (FRAC 7), 1.07 lbs ai/g	al
year	r 2020	2021	2021	2022	2023	
location	n Carrington	Carrington	Carrington	Carrington	Carrington	
funding	g Bayer	BASF	Gowan	Bayer	Bayer	
variety	/ DSR-0418	DSR-0807	DSR-0807	AG09Xf0	P06T04E	
brand, maturity	/ Dairyland, 0.4	Dairyland, 0.8	Dairyland, 0.8	Asgrow, 0.9	Pioneer, 0.6	
row spacing	g 21 inches	21 inches	21 inches	14 inches	14 inches	
seeding rate	e 165,000 pls/ac	165,000 pls/ac	165,000 pls/ac	165,000 pls/ac	165,000 pls/ac	
previous crop	spring wheat	spring wheat	spring wheat	dry bean	chickpeas	
planting date	e May 18	May 12	May 12	May 27	May 24	
disease assessment date	e Oct. 16	Oct. 4	Oct. 4	Oct. 19	Oct. 12	
rows assessed for disease	e 1	1	1	1	1	
harvest date	e Oct. 19	Oct. 6	Oct. 7	Oct. 21	Oct. 17	
date fungicide was applied	1 July 17	July 26	July 26	July 23	July 22	The first fungicide
growth stage, 1st application	100% R2	R3	R3	100% R2	100% R2	application was delayed until R3 when
canopy closure, 1st application	1 75-90%	1	1	99-100%	95-100%	weather did not favor
nozzles, pressure, 1st application	n AIXR110015, 60 psi	AIXR110015, 50 psi	AIXR110015, 50 psi	AIXR110015, 50 psi	AIXR110015, 50 psi	white mold earlier in
droplet size, 1st application	n medium	coarse	coarse	coarse	coarse	bloom.
adjuvant	t Induce 0.125% v/v	Masterlock 6.4 fl oz	Induce 0.25%	Induce 0.125% v/v	Induce, 0.125% v/v	
fungicide spray volume	e 15 gal/ac	15 gal/ac	15 gal/ac	15 gal/ac	15 gal/ac	
application method	l hand-held boom	hand-held boom	hand-held boom	hand-held boom	hand-held boom	
Sclerotinia incidence (% of plants))					
UNTREATED	38 a	34 a	35 a	74 b	63 b	_
DELARO COMPLETE 8 fl oz/ac	42 a	17 a	20 a	49 a	50 ab	_
PROPULSE 6 fl oz/ac	45 a			53 a	57 ab	_
PROPULSE 8 fl oz/ac	31 a			48 a	51 ab	_
ENDURA 5.5 or 6.0 oz/ac			20 a	60 ab	42 a	_
CV:	: 19.7	35.6	20.3	18.2	22.2	
Sclerotinia disease severity index	(% of canopy)					
UNTREATED	15 a	24 a	23 a	63 b	43 b	
DELARO COMPLETE 8 fl oz/ac	17 a	12 a	12 a	34 a	30 ab	_
PROPULSE 6 fl oz/ac	23 a			36 a	37 ab	
PROPULSE 8 fl oz/ac	8 a			33 a	32 ab	_
ENDURA 5.5 or 6.0 oz/ac			12 a	41 a	24 a	_
CV	: 23.2	19.8	26.9	24.6	31.2	
Yield (bu/ac)						
UNTREATED	49 ab	53 a	56 a	30 b	47 b	_
DELARO COMPLETE 8 fl oz/ac	48 b	62 a	61 a	43 a	54 a	
PROPULSE 6 fl oz/ac	49 ab			39 a	51 ab	
PROPULSE 8 fl oz/ac	53 a			42 a	52 ab	
ENDURA 5.5 or <mark>6.0</mark> oz/ac			62 a	38 a	56 a	_
CV:	: 5.1	8.6	9	8.2	6.5	-
Delaro Complete (8 fl oz/ac) ver	eus ProPulso (6 or	8 fl 07/20)	COMBINED ANAL	VSIS 3 studies		
Delaro Complete (8 il 02/ac) ver				Yield		
UNTREATED	Sclerotinia incideno 58 a	()	nia DSI (%) 0 a	42 a	Cingle for sinis	mulication -t DO
DELARO COMPLETE 8 fl oz/ac	<u>зо</u> а 47а		7a	42 a 48 a	_ 0 0	application at R2 or R3
	52 a		2 a	47 a	_	
PROPULSE 6 fl oz/ac	5∠a 43 a		2a 4a	47 a 49 a		oplication was delayed her did not favor white
PROPULSE 8 fl oz/ac				49 a 6.8		er in bloom.
		26.		0.0		
Delaro Complete (8 fl oz/ac) ver	sus Endura (5.5 or	6.0 oz/ac)	COMBINED ANAL	YSIS, 3 studies		
	Sclerotinia incident		nia DSI (%)	Yield	Single fungicide a	application at R2 or
UNTREATED	57 b		3 b	44 b	F	२३
DELARO COMPLETE 8 fl oz/ac	40 a	2	5 a	52 a	_ The first fungicide a	oplication was delayed
ENDURA 5.5 or 6.0 oz/ac	41 a	2	6a	52 a		her did not favor white
CV:	: 11.1	16.	1	5.1	mold earli	er in bloom.
Delaro Complete (8 fl oz/ac) ver	sus non-treated		COMBINED ANAL	YSIS, 5 studies		
	Sclerotinia incidend	ce (%) Sclerofir	nia DSI (%)	Yield	Qi,	ngle fungicide
UNTREATED	49 a	_ ` '	3 a	47 a		ation at R2 or R3
DELARO COMPLETE 8 fl oz/ac	36 a		1 a 38%	53 a	- 14%	
CV:		reduction 16.		5.1	_ I 4 /0 increase	
00.		10.		0.1		

Delaro Complete 8 fl oz - two sequential applications

		<u> </u>	· · · ·			-1
		ai/gal; trifloxystrob			(FRAC 7), 1.07 lbs ai/g	al
year		Carrington	2022 Carrington	2023	2023	
	Carrington	0	0	Carrington	Carrington	
funding		Gowan	BASF	Corteva	BASF	
	DSR-0807	DSR-0807	AG09Xf0	P06T04E	21Xf07	
brand, maturity		Dairyland, 0.8	Asgrow, 0.9	Pioneer, 0.6	Peterson Farms, 0.7	
row spacing		21 inches	14 inches	14 inches	14 inches	
-	165,000 pls/ac	165,000 pls/ac	165,000 pls/ac	165,000 pls/ac	165,000 pls/ac	
	spring wheat	spring wheat	dry bean	chickpeas	chickpeas	
planting date		May 12	May 27	May 24	May 24	
disease assessment date		Oct. 4	Oct. 19	Oct. 12	Oct. 12	
rows assessed for disease		1	1	1	1	
harvest date		Oct. 7	Oct. 21	Oct. 17	Oct. 17	
dates, applications 1 and 2		July 26, Aug. 6	July 23, Aug. 1	July 22, Aug. 2	July 22, Aug. 2	The first fungicide application was
interval between applications		11 days	9 days	11 days	11 days	delayed until R3 when
growth stage, 1st application		R3	100% R2	100% R2	100% R2	weather did not favor
canopy closure, 1st application		100%	99-100%	95-100%	98-100%	white mold earlier in bloom.
nozzles, pressure, 1st application		AIXR110015, 50 psi	AIXR110015, 50 psi	AIXR110015, 50 psi	AIXR110015, 50 psi	
droplet size, 1st application		coarse	coarse	coarse	coarse	
canopy closure, 2nd application		100%	100%	100%	100%	
nozzles, pressure, 2nd application		AIXR110015, 50 psi	AIXR110015, 50 psi	AIXR110015, 40 psi	AIXR110015, 40 psi	
droplet size, 2nd application		coarse	coarse	coarse	coarse	
	Masterlock 6.4 fl oz/ac				Masterlock, 6.4 fl oz/ad	2
fungicide spray volume	-	15 gal/ac	15 gal/ac	15 gal/ac	15 gal/ac	
application method		hand-held boom	hand-held boom	hand-held boom	hand-held boom	
Sclerotinia incidence (% of plants)						
Non-treated control	42 a	35 a	82 b	50 b	54 b	
ENDURA 6 oz/ac	36 a	20 a	53 a		33 ab	
PROPULSE 6 fl oz/ac			49 a		35 ab	<u>.</u>
DELARO COMPLETE 8 fl oz/ac	21 a	20 a	41 a	25 a	38 ab	
ENDURA 8 oz/ac				17 a	28 a	
CV:		20.3	14.4	17 a 33.7	28 a 35.6	
CV: Sclerotinia disease severity index	(% of canopy)			33.7	35.6	
CV: Sclerotinia disease severity index Non-treated control	(% of canopy) 27 a	23 a	70 b		35.6 31 b	
CV: Sclerotinia disease severity index Non-treated control ENDURA 6 oz/ac	(% of canopy)		70 b 40 a	33.7	35.6 31 b 18 ab	
CV: Sclerotinia disease severity index Non-treated control ENDURA 6 oz/ac PROPULSE 6 fl oz/ac	(% of canopy) 27 a 19 a	23 a 12 a	70 b 40 a 35 a	33.7 31 b	35.6 31 b 18 ab 18 ab	
CV: Sclerotinia disease severity index Non-treated control ENDURA 6 oz/ac PROPULSE 6 fl oz/ac DELARO COMPLETE 8 fl oz/ac	(% of canopy) 27 a	23 a	70 b 40 a	33.7 31 b 14 a	35.6 31 b 18 ab 18 ab 20 ab	
CV: Sclerotinia disease severity index Non-treated control ENDURA 6 oz/ac PROPULSE 6 fl oz/ac DELARO COMPLETE 8 fl oz/ac ENDURA 8 oz/ac	(% of canopy) 27 a 19 a 9 a	23 a 12 a 12 a	70 b 40 a 35 a 31 a	33.7 31 b 14 a 7 a	35.6 31 b 18 ab 18 ab 20 ab 11 a	
CV: Sclerotinia disease severity index Non-treated control ENDURA 6 oz/ac PROPULSE 6 fl oz/ac DELARO COMPLETE 8 fl oz/ac ENDURA 8 oz/ac CV:	(% of canopy) 27 a 19 a 9 a	23 a 12 a	70 b 40 a 35 a	33.7 31 b 14 a	35.6 31 b 18 ab 18 ab 20 ab	
CV: Sclerotinia disease severity index Non-treated control ENDURA 6 oz/ac PROPULSE 6 fl oz/ac DELARO COMPLETE 8 fl oz/ac ENDURA 8 oz/ac CV: Yield (bu/ac)	(% of canopy) 27 a 19 a 9 a 25	23 a 12 a 12 a 26.9	70 b 40 a 35 a 31 a 17.5	33.7 31 b 14 a 7 a 49.2	35.6 31 b 18 ab 18 ab 20 ab 11 a 47.4	
CV: Sclerotinia disease severity index Non-treated control ENDURA 6 oz/ac PROPULSE 6 fl oz/ac DELARO COMPLETE 8 fl oz/ac ENDURA 8 oz/ac CV: Yield (bu/ac) Non-treated control	(% of canopy) 27 a 19 a 9 a 25 51 a	23 a 12 a 12 a 26.9 56 a	70 b 40 a 35 a 31 a 17.5 25 b	33.7 31 b 14 a 7 a	35.6 31 b 18 ab 18 ab 20 ab 11 a 47.4 50 a	
CV: Sclerotinia disease severity index Non-treated control ENDURA 6 oz/ac PROPULSE 6 fl oz/ac DELARO COMPLETE 8 fl oz/ac ENDURA 8 oz/ac CV: Yield (bu/ac) Non-treated control ENDURA 6 oz/ac	(% of canopy) 27 a 19 a 9 a 25	23 a 12 a 12 a 26.9	70 b 40 a 35 a 31 a 17.5 25 b 42 a	33.7 31 b 14 a 7 a 49.2	35.6 31 b 18 ab 18 ab 20 ab 11 a 47.4 50 a 50 a	
CV: Sclerotinia disease severity index Non-treated control ENDURA 6 oz/ac PROPULSE 6 fl oz/ac DELARO COMPLETE 8 fl oz/ac ENDURA 8 oz/ac CV: Yield (bu/ac) Non-treated control ENDURA 6 oz/ac PROPULSE 6 fl oz/ac	(% of canopy) 27 a 19 a 9 a 25 51 a 55 a	23 a 12 a 12 a 26.9 56 a 62 a	70 b 40 a 35 a 31 a 17.5 25 b 42 a 43 a	33.7 31 b 14 a 7 a 49.2 56 b	35.6 31 b 18 ab 18 ab 20 ab 11 a 47.4 50 a 50 a 50 a 56 a	
CV: Sclerotinia disease severity index Non-treated control ENDURA 6 oz/ac PROPULSE 6 fl oz/ac DELARO COMPLETE 8 fl oz/ac ENDURA 8 oz/ac CV: Yield (bu/ac) Non-treated control ENDURA 6 oz/ac PROPULSE 6 fl oz/ac DELARO COMPLETE 8 fl oz/ac	(% of canopy) 27 a 19 a 9 a 25 51 a	23 a 12 a 12 a 26.9 56 a	70 b 40 a 35 a 31 a 17.5 25 b 42 a	33.7 31 b 14 a 7 a 49.2 56 b 59 ab	35.6 31 b 18 ab 18 ab 20 ab 11 a 47.4 50 a 50 a 50 a 50 a 50 a 50 a 50 a	
CV: Sclerotinia disease severity index Non-treated control ENDURA 6 oz/ac PROPULSE 6 fl oz/ac DELARO COMPLETE 8 fl oz/ac ENDURA 8 oz/ac CV: Yield (bu/ac) Non-treated control ENDURA 6 oz/ac PROPULSE 6 fl oz/ac DELARO COMPLETE 8 fl oz/ac ENDURA 8 oz/ac	(% of canopy) 27 a 19 a 9 a 25 51 a 55 a 60 a	23 a 12 a 12 a 26.9 56 a 62 a 61 a	70 b 40 a 35 a 31 a 17.5 25 b 42 a 43 a 47 a	33.7 31 b 14 a 7 a 49.2 56 b 59 ab 63 a	35.6 31 b 18 ab 18 ab 20 ab 11 a 47.4 50 a 50	
CV: Sclerotinia disease severity index Non-treated control ENDURA 6 oz/ac PROPULSE 6 fl oz/ac DELARO COMPLETE 8 fl oz/ac ENDURA 8 oz/ac CV: Yield (bu/ac) Non-treated control ENDURA 6 oz/ac PROPULSE 6 fl oz/ac DELARO COMPLETE 8 fl oz/ac	(% of canopy) 27 a 19 a 9 a 25 51 a 55 a 60 a	23 a 12 a 12 a 26.9 56 a 62 a	70 b 40 a 35 a 31 a 17.5 25 b 42 a 43 a	33.7 31 b 14 a 7 a 49.2 56 b 59 ab	35.6 31 b 18 ab 18 ab 20 ab 11 a 47.4 50 a 50 a 50 a 50 a 50 a 50 a 50 a	
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CV: Sclerotinia disease severity index Non-treated control ENDURA 6 oz/ac PROPULSE 6 fl oz/ac DELARO COMPLETE 8 fl oz/ac ENDURA 8 oz/ac Yield (bu/ac) Non-treated control ENDURA 6 oz/ac PROPULSE 6 fl oz/ac DELARO COMPLETE 8 fl oz/ac ENDURA 8 oz/ac ENDURA 8 oz/ac	(% of canopy) 27 a 19 a 9 a 25 51 a 55 a 60 a 13 sus Endura (6.0 oz/	23 a 12 a 12 a 26.9 56 a 62 a 61 a 9 ac) e (%) Sclerotin	70 b 40 a 35 a 31 a 17.5 25 b 42 a 43 a 47 a 10.7 COMBINED ANAL	33.7 31 b 14 a 7 a 49.2 56 b 59 ab 63 a 6.8 YSIS, 4 studies	35.6 31 b 18 ab 18 ab 20 ab 11 a 47.4 50 a 50 a 50 a 56 a 53 a 62 a 15 Two sequential a	oplications: R2 or days later
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CV: Sclerotinia disease severity index Non-treated control ENDURA 6 oz/ac PROPULSE 6 fl oz/ac DELARO COMPLETE 8 fl oz/ac ENDURA 8 oz/ac CV: Yield (bu/ac) Non-treated control ENDURA 6 oz/ac PROPULSE 6 fl oz/ac DELARO COMPLETE 8 fl oz/ac CV: Delaro Complete (8 fl oz/ac) ver UNTREATED DELARO COMPLETE 8 fl oz/ac ENDURA 6 oz/ac	(% of canopy) 27 a 19 a 9 a 25 51 a 55 a 60 a 13 sus Endura (6.0 oz/ Sclerotinia incidence 53 b 30 a 36 a 19.1 sus Endura (8.0 oz/	23 a 12 a 12 a 12 a 26.9 56 a 62 a 61 a 9 (%) Sclerotin 38 18 22 28.3 (ac)	70 b 40 a 35 a 31 a 17.5 25 b 42 a 43 a 47 a 10.7 COMBINED ANAL a DSI (%) b a a 2 ab	33.7 31 b 14 a 7 a 49.2 56 b 59 ab 63 a 6.8 YSIS, 4 studies Yield 46 a 55 a 52 a 9.0 YSIS, 2 studies	35.6 31 b 18 ab 18 ab 20 ab 11 a 47.4 50 a 50 a 50 a 56 a 53 a 62 a 15 Two sequential and R3 + 9-11 The first fungicide ap until R3 when weath mold earlier	days later plication was delayed er did not favor white er in bloom.
CV: Sclerotinia disease severity index Non-treated control ENDURA 6 oz/ac PROPULSE 6 fl oz/ac DELARO COMPLETE 8 fl oz/ac ENDURA 8 oz/ac CV: Yield (bu/ac) Non-treated control ENDURA 6 oz/ac DELARO COMPLETE 8 fl oz/ac ENDURA 8 oz/ac CV: Delaro Complete (8 fl oz/ac) ver UNTREATED DELARO COMPLETE 8 fl oz/ac ENDURA 6 oz/ac CV: Delaro Complete (8 fl oz/ac) ver CV: Delaro Complete (8 fl oz/ac) ver	(% of canopy) 27 a 19 a 9 a 25 51 a 55 a 60 a 13 sus Endura (6.0 oz/ Sclerotinia incidence 53 b 30 a 36 a 19.1 sus Endura (8.0 oz/ Sclerotinia incidence	23 a 12 a 12 a 12 a 26.9 56 a 62 a 61 a 9 61 a 9 61 a 18 22 28.3 18 22 28.3 18 22 28.3 18 22 28.3 28 28 28 28 28 28 28 28 28 28	70 b 40 a 35 a 31 a 17.5 a 25 b 42 a 43 a 47 a 10.7 COMBINED ANAL' a DSI (%) b a a 2 a a b a b b a combined Anal' a b b b a b b b b a b b b a b b b b b b b b b a b b b cobs a cobs a cobs a cobs b cobs a cobs a cobs a	33.7 31 b 14 a 7 a 49.2 56 b 59 ab 63 a 6.3 Yield 46 a 55 a 52 a 9.0 Yield Yield	35.6 31 b 18 ab 18 ab 20 ab 11 a 47.4 50 a 50 a 50 a 56 a 53 a 62 a 15 Two sequential and R3 + 9-11 The first fungicide apountial and mold earlied Two sequential and Two sequential and T	days later plication was delayed er did not favor white er in bloom. pplications: R2 +
CV: Sclerotinia disease severity index Non-treated control ENDURA 6 oz/ac PROPULSE 6 fl oz/ac DELARO COMPLETE 8 fl oz/ac ENDURA 8 oz/ac CV: Yield (bu/ac) Non-treated control ENDURA 6 oz/ac DELARO COMPLETE 8 fl oz/ac ENDURA 8 oz/ac CV: Delaro Complete (8 fl oz/ac) ver UNTREATED DELARO COMPLETE 8 fl oz/ac ENDURA 6 oz/ac CV: Delaro Complete (8 fl oz/ac) ver UNTREATED DELARO COMPLETE 8 fl oz/ac) ver UNTREATED	(% of canopy) 27 a 19 a 9 a 25 51 a 55 a 60 a 13 sus Endura (6.0 oz/ Sclerotinia incidence 53 b 30 a 36 a 19.1 sus Endura (8.0 oz/ Sclerotinia incidence 52 b	23 a 12 a 12 a 26.9 56 a 62 a 61 a 9 (%) Sclerotin 38 18 22 28.3 (%) Sclerotin 31	70 b 40 a 35 a 31 a 17.5 a 25 b 42 a 43 a 47 a 10.7 COMBINED ANAL' a DSI (%) b a a b a combined Anal a b b b b b b b b b b b b b b b b b b b b combined Anal b b b b b	33.7 31 b 14 a 7 a 49.2 56 b 59 ab 63 a 6.8 YSIS, 4 studies Yield 46 a 55 a 52 a 9.0 YSIS, 2 studies Yield 53 a	35.6 31 b 18 ab 18 ab 20 ab 11 a 47.4 50 a 50 a 50 a 56 a 53 a 62 a 15 Two sequential and R3 + 9-11 The first fungicide apountial and mold earlied Two sequential and Two sequential and T	days later plication was delayed er did not favor white er in bloom.
CV: Sclerotinia disease severity index Non-treated control ENDURA 6 oz/ac PROPULSE 6 fl oz/ac DELARO COMPLETE 8 fl oz/ac ENDURA 8 oz/ac CV: Yield (bu/ac) Non-treated control ENDURA 6 oz/ac PROPULSE 6 fl oz/ac DELARO COMPLETE 8 fl oz/ac ENDURA 8 oz/ac CV: Delaro Complete (8 fl oz/ac) ver UNTREATED DELARO COMPLETE 8 fl oz/ac ENDURA 6 oz/ac CV: Delaro Complete (8 fl oz/ac) ver UNTREATED DELARO COMPLETE 8 fl oz/ac CV: Delaro Complete (8 fl oz/ac) ver UNTREATED DELARO COMPLETE 8 fl oz/ac	(% of canopy) 27 a 19 a 9 a 25 51 a 55 a 60 a 13 sus Endura (6.0 oz/ Sclerotinia incidence 53 b 30 a 36 a 19.1 sus Endura (8.0 oz/ Sclerotinia incidence 52 b 32 a	23 a 12 a 12 a 12 a 26.9 56 a 62 a 61 a 9 (%) Sclerotin 38 18 22 28.3 (%) Sclerotin 31 17	70 b 40 a 35 a 31 a 17.5 a 25 b 42 a 43 a 47 a 10.7 COMBINED ANAL' a DSI (%) b a a 3 combined Anal- b a combined Anal- a b a a DSI (%) b b a a a	33.7 31 b 14 a 7 a 49.2 56 b 59 ab 63 a 6.8 Yield 46 a 55 a 52 a 9.0 YSIS, 2 studies Yield 53 a 53 a 56 a	35.6 31 b 18 ab 18 ab 20 ab 11 a 47.4 50 a 50 a 50 a 56 a 53 a 62 a 15 Two sequential and R3 + 9-11 The first fungicide apountial and mold earlied Two sequential and Two sequential and T	days later plication was delayed er did not favor white er in bloom. pplications: R2 +
CV: Sclerotinia disease severity index Non-treated control ENDURA 6 oz/ac PROPULSE 6 fl oz/ac DELARO COMPLETE 8 fl oz/ac ENDURA 8 oz/ac CV: Yield (bu/ac) Non-treated control ENDURA 6 oz/ac PROPULSE 6 fl oz/ac DELARO COMPLETE 8 fl oz/ac ENDURA 8 oz/ac CV: Delaro Complete (8 fl oz/ac) ver UNTREATED DELARO COMPLETE 8 fl oz/ac ENDURA 6 oz/ac CV: Delaro Complete (8 fl oz/ac) ver UNTREATED DELARO COMPLETE 8 fl oz/ac ENDURA 6 oz/ac CV: Delaro Complete (8 fl oz/ac) ver UNTREATED DELARO COMPLETE 8 fl oz/ac ENDURA 8 oz/ac	(% of canopy) 27 a 19 a 9 a 25 51 a 55 a 60 a 13 sus Endura (6.0 oz/ Sclerotinia incidence 53 b 30 a 36 a 19.1 sus Endura (8.0 oz/ Sclerotinia incidence 52 b 32 a 22 a	23 a 12 a 12 a 26.9 56 a 62 a 61 a 9 (%) Sclerotin 38 18 22 28.3 (ac) e (%) Sclerotin 31 17 9	70 b 40 a 35 a 31 a 17.5 a 25 b 42 a 43 a 47 a 10.7 COMBINED ANAL' ia DSI (%) b 3 a 2 combined Anal.' a a 3 a 47 a 10.7 COMBINED ANAL' ia DSI (%) b a a a a a a	33.7 31 b 14 a 7 a 49.2 56 b 59 ab 63 a 6.8 YSIS, 4 studies Yield 46 a 55 a 52 a 9.0 YSIS, 2 studies Yield 53 a 56 a 62 a	35.6 31 b 18 ab 18 ab 20 ab 11 a 47.4 50 a 50 a 50 a 56 a 53 a 62 a 15 Two sequential and R3 + 9-11 The first fungicide apountial and mold earlied Two sequential and Two sequential and T	days later plication was delayed er did not favor white er in bloom. pplications: R2 +
CV: Sclerotinia disease severity index Non-treated control ENDURA 6 oz/ac PROPULSE 6 fl oz/ac DELARO COMPLETE 8 fl oz/ac ENDURA 8 oz/ac Yield (bu/ac) Non-treated control ENDURA 6 oz/ac PROPULSE 6 fl oz/ac DELARO COMPLETE 8 fl oz/ac ENDURA 8 oz/ac CV: Delaro Complete (8 fl oz/ac) ver UNTREATED DELARO COMPLETE 8 fl oz/ac ENDURA 6 oz/ac CV: Delaro Complete (8 fl oz/ac) ver UNTREATED DELARO COMPLETE 8 fl oz/ac ENDURA 6 oz/ac CV: Delaro Complete (8 fl oz/ac) ver UNTREATED DELARO COMPLETE 8 fl oz/ac ENDURA 8 oz/ac CV: CV: Delaro Complete (8 fl oz/ac) ver UNTREATED DELARO COMPLETE 8 fl oz/ac ENDURA 8 oz/ac CV:	(% of canopy) 27 a 19 a 9 a 25 51 a 55 a 60 a 13 sus Endura (6.0 oz/ Sclerotinia incidence 53 b 30 a 36 a 19.1 sus Endura (8.0 oz/ Sclerotinia incidence 52 b 32 a 22 a 9.0	23 a 12 a 12 a 12 a 26.9 56 a 62 a 61 a 9 (%) Sclerotin 38 18 22 28.3 (%) Sclerotin 31 17	70 b 40 a 35 a 31 a 17.5 a 25 b 42 a 43 a 47 a 10.7 COMBINED ANAL' a DSI (%) b a a a 3 a 47 a 10.7 COMBINED ANAL' a DSI (%) b a a a a a a a b a a a a a b a b a a b a b	33.7 31 b 14 a 7 a 49.2 56 b 59 ab 63 a 6.8 Yield 46 a 55 a 52 a 9.0 YSIS, 2 studies Yield Yield 53 a 62 a 3.4	35.6 31 b 18 ab 18 ab 20 ab 11 a 47.4 50 a 50 a 50 a 56 a 53 a 62 a 15 Two sequential and R3 + 9-11 The first fungicide apountial and mold earlied Two sequential and Two sequential and T	days later plication was delayed er did not favor white er in bloom. pplications: R2 +
CV: Sclerotinia disease severity index Non-treated control ENDURA 6 oz/ac PROPULSE 6 fl oz/ac DELARO COMPLETE 8 fl oz/ac ENDURA 8 oz/ac CV: Yield (bu/ac) Non-treated control ENDURA 6 oz/ac PROPULSE 6 fl oz/ac DELARO COMPLETE 8 fl oz/ac ENDURA 8 oz/ac CV: Delaro Complete (8 fl oz/ac) ver UNTREATED DELARO COMPLETE 8 fl oz/ac ENDURA 6 oz/ac CV: Delaro Complete (8 fl oz/ac) ver UNTREATED DELARO COMPLETE 8 fl oz/ac ENDURA 6 oz/ac CV: Delaro Complete (8 fl oz/ac) ver UNTREATED DELARO COMPLETE 8 fl oz/ac ENDURA 8 oz/ac	(% of canopy) 27 a 19 a 9 a 25 51 a 55 a 60 a 13 sus Endura (6.0 oz/ Sclerotinia incidence 53 b 30 a 36 a 19.1 sus Endura (8.0 oz/ Sclerotinia incidence 52 b 32 a 22 a 9.0 sus non-treated	23 a 12 a 12 a 26.9 56 a 62 a 61 a 9 (%) Sclerotin 38 22 28.3 (%) Sclerotin 31 17 9 12.5	70 b 40 a 35 a 31 a 17.5 a 25 b 42 a 43 a 47 a 10.7 COMBINED ANAL' a DSI (%) b a a 30 COMBINED ANAL' a DSI (%) b a a 3 COMBINED ANAL' a DSI (%) b b a combined Anal a a a b a a a a a a a b a b a a a a a b a a a a a a a b a b a b a a a b	33.7 31 b 14 a 7 a 49.2 56 b 59 ab 63 a 6.8 Yield 46 a 55 a 52 a 9.0 YSIS, 2 studies Yield 53 a 62 a 3.4 YSIS, 5 studies	35.6 31 b 18 ab 18 ab 20 ab 11 a 47.4 50 a 50 a 50 a 56 a 53 a 62 a 15 Two sequential and R3 + 9-11 The first fungicide apountial and mold earlied Two sequential and Two sequential and T	days later plication was delayed er did not favor white er in bloom. pplications: R2 +
CV: Sclerotinia disease severity index Non-treated control ENDURA 6 oz/ac PROPULSE 6 fl oz/ac DELARO COMPLETE 8 fl oz/ac ENDURA 8 oz/ac Vield (bu/ac) Non-treated control ENDURA 6 oz/ac PROPULSE 6 fl oz/ac DELARO COMPLETE 8 fl oz/ac ENDURA 8 oz/ac CV: Delaro Complete (8 fl oz/ac) ver UNTREATED DELARO COMPLETE 8 fl oz/ac ENDURA 6 oz/ac CV: Delaro Complete (8 fl oz/ac) ver UNTREATED DELARO COMPLETE 8 fl oz/ac ENDURA 6 oz/ac CV: Delaro Complete (8 fl oz/ac) ver UNTREATED DELARO COMPLETE 8 fl oz/ac ENDURA 8 oz/ac CV: Delaro Complete (8 fl oz/ac) ver UNTREATED DELARO COMPLETE 8 fl oz/ac ENDURA 8 oz/ac CV: Delaro Complete (8 fl oz/ac) ver	(% of canopy) 27 a 19 a 9 a 25 51 a 55 a 60 a 13 sus Endura (6.0 oz/ Sclerotinia incidence 53 b 30 a 36 a 19.1 sus Endura (8.0 oz/ Sclerotinia incidence 52 b 32 a 22 a 9.0 sus non-treated Sclerotinia incidence	23 a 12 a 12 a 26.9 26.9 56 a 62 a 61 a 9 (%) Sclerotin 38 22 28.3 (%) Sclerotin 17 9 12.5 (%) Sclerotin	70 b 40 a 35 a 31 a 17.5 a 25 b 42 a 43 a 47 a 10.7 COMBINED ANAL' a DSI (%) b a a a 30 COMBINED ANAL' a DSI (%) b a a a combined AnAL' a a a combined AnAL' a a a b a a a a b a combined AnAL' a a a a a b a a b a a a a b a a a b a combined AnAL' a a a b a b a	33.7 31 b 14 a 7 a 49.2 56 b 59 ab 63 a 6.8 Yield 46 a 55 a 52 a 9.0 YSIS, 2 studies Yield 53 a 52 a 9.0 YSIS, 2 studies Yield 53 a 56 a 62 a 3.4 Yield	35.6 31 b 18 ab 18 ab 20 ab 11 a 47.4 50 a 50 a 50 a 50 a 56 a 53 a 62 a 15 Two sequential a R3 + 9-11 The first fungicide ap until R3 when weath mold earlie Two sequential a 11 day	days later plication was delayed er did not favor white er in bloom. pplications: R2 +
CV: Sclerotinia disease severity index Non-treated control ENDURA 6 oz/ac PROPULSE 6 fl oz/ac DELARO COMPLETE 8 fl oz/ac ENDURA 8 oz/ac CV: Yield (bu/ac) Non-treated control ENDURA 6 oz/ac PROPULSE 6 fl oz/ac DELARO COMPLETE 8 fl oz/ac ENDURA 8 oz/ac CV: Delaro Complete (8 fl oz/ac) ver UNTREATED DELARO COMPLETE 8 fl oz/ac ENDURA 6 oz/ac CV: Delaro Complete (8 fl oz/ac) ver UNTREATED DELARO COMPLETE 8 fl oz/ac ENDURA 6 oz/ac CV: Delaro Complete (8 fl oz/ac) ver UNTREATED DELARO COMPLETE 8 fl oz/ac ENDURA 8 oz/ac CV: Delaro Complete (8 fl oz/ac) ver UNTREATED DELARO COMPLETE 8 fl oz/ac ENDURA 8 oz/ac CV: Delaro Complete (8 fl oz/ac) ver UNTREATED	(% of canopy) 27 a 19 a 9 a 25 51 a 55 a 60 a 13 sus Endura (6.0 oz/ Sclerotinia incidence 53 b 30 a 36 a 19.1 sus Endura (8.0 oz/ Sclerotinia incidence 52 b 32 a 22 a 9.0 sus non-treated Sclerotinia incidence 53 b	23 a 12 a 12 a 26.9 56 a 62 a 61 a 9 (%) Sclerotin 38 28.3 (ac) e (%) Sclerotin 31 17 9 12.5 (%) Sclerotin 31 31 37	70 b 40 a 35 a 31 a 17.5 a 25 b 42 a 42 a 43 a 47 a 10.7 COMBINED ANAL' a DSI (%) b 3 a 2 ab 3 a 2 ab 3 a 2 ab 3 a 3 a 2 ab 3 a 3 a 3 a 3 a 3 a 3 a 3 a 4 a 3 a 4 a 5 COMBINED ANAL' a a 5 COMBINED ANAL' a a 5 COMBINED ANAL' a a	33.7 31 b 14 a 7 a 49.2 56 b 59 ab 63 a 6.8 Yield 46 a 55 a 52 a 9.0 YSIS, 2 studies Yield 53 a 62 a 3.4 Yield Yield 48 a	35.6 31 b 18 ab 18 ab 20 ab 11 a 47.4 50 a 50 a 50 a 50 a 53 a 62 a 15 Two sequential a R3 + 9-11 The first fungicide ap until R3 when weath mold earlie Two sequential a 11 day	plication was delayed er did not favor white er in bloom. pplications: R2 + /s later /o sequential ons: R2 or R3 + 9
CV: Sclerotinia disease severity index Non-treated control ENDURA 6 oz/ac PROPULSE 6 fl oz/ac DELARO COMPLETE 8 fl oz/ac ENDURA 8 oz/ac Vield (bu/ac) Non-treated control ENDURA 6 oz/ac PROPULSE 6 fl oz/ac DELARO COMPLETE 8 fl oz/ac ENDURA 8 oz/ac CV: Delaro Complete (8 fl oz/ac) ver UNTREATED DELARO COMPLETE 8 fl oz/ac ENDURA 6 oz/ac CV: Delaro Complete (8 fl oz/ac) ver UNTREATED DELARO COMPLETE 8 fl oz/ac ENDURA 6 oz/ac CV: Delaro Complete (8 fl oz/ac) ver UNTREATED DELARO COMPLETE 8 fl oz/ac ENDURA 8 oz/ac CV: Delaro Complete (8 fl oz/ac) ver UNTREATED DELARO COMPLETE 8 fl oz/ac ENDURA 8 oz/ac CV: Delaro Complete (8 fl oz/ac) ver	(% of canopy) 27 a 19 a 9 a 25 51 a 55 a 60 a 13 sus Endura (6.0 oz/ Sclerotinia incidence 53 b 30 a 36 a 19.1 sus Endura (8.0 oz/ Sclerotinia incidence 52 b 32 a 22 a 9.0 sus non-treated Sclerotinia incidence 53 b 29 a	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	70 b 40 a 35 a 31 a 17.5 a 25 b 42 a 43 a 47 a 10.7 COMBINED ANAL' a DSI (%) b a a 30 COMBINED ANAL' a DSI (%) b b a combined ANAL' a a a combined ANAL' a a a b a a a b a combined ANAL' a a a a a b a a a b a a a b a a a b a a a a a b a a a b	33.7 31 b 14 a 7 a 49.2 56 b 59 ab 63 a 6.8 Yield 46 a 55 a 52 a 9.0 YSIS, 2 studies Yield 53 a 52 a 9.0 YSIS, 2 studies Yield 53 a 56 a 62 a 3.4 Yield	35.6 31 b 18 ab 18 ab 20 ab 11 a 47.4 50 a 50 a 50 a 50 a 53 a 62 a 15 Two sequential al R3 + 9-11 The first fungicide ap until R3 when weath mold earlie Two sequential al 11 day	days later plication was delayed er did not favor white er in bloom. pplications: R2 + /s later

Miravis Neo 13.7 or 20.8 fl oz - single fungicide application

	IVIII AVIS INEO	15.7 01 20.0	s ii oz - single iu	ngiciue appir	Cation		
pydiflume	etofen (FRAC 7), 0.63 lbs	ai/gal; azoxystrob	in (FRAC 11), 0.83 lbs a	i/gal; propiconazol e	e (FRAC 3), 1.	04 lbs ai/g	jal
year	2019	2020	2020	2021	2021		
location	Carrington	Carrington	Carrington	Carrington	Carrington		
funding	Syngenta	Syngenta	BASF	Syngenta	Gowan		
variety	17X04N	DSR-0418	DSR-0418	DSR-0807	DSR-0807		
brand, maturity	Peterson Farms, 0.7	Dairyland, 0.4	Dairyland, 0.4	Dairyland, 0.8	Dairyland, (0.8	
row spacing	21 inches	21 inches	21 inches	21 inches	21 inches		
seeding rate	165,000 pls/ac	165,000 pls/ac	165,000 pls/ac	165,000 pls/ac	165,000 pls		
•	lentils		•				
previous crop		spring wheat	spring wheat	spring wheat	spring whe	al	
planting date	May 9	May 18	May 18	May 12	May 12		
disease assessment date	Oct. 30	Oct. 16	Oct. 15	Oct. 4	Oct. 4		
rows assessed for disease	1	1	1	1	1		
harvest date	Oct. 31, Nov. 2	Oct. 19	Oct. 16	Oct. 6	Oct. 7		
date fungicide was applied	July 28	July 17	July 14	July 22	July 26		The first fungicide
growth stage, 1st applic.	100% R3	100% R2	100% R2	100% R2	R3		application was
canopy closure, 1st applic	90-100% (ave. 97%)	75-90%	65-95%	95-100%	1		delayed until R3 when weather did not favor
nozzles, pressure, 1st applic.	AIXR110015, 50 psi	AIXR110015, 60 ps	si AIXR110015, 60 psi	XR11010, 30 psi	AIXR11001	5, 50 psi	white mold earlier in
droplet size, 1st applic.	coarse	medium	medium	coarse	coarse		bloom.
adjuvant	none	Induce 0.25% v/v	none	NIS 0.25% v/v	Induce 0.25	5%	
fungicide spray volume	15 gal/ac	15 gal/ac	15 gal/ac	15 gal/ac	15 gal/ac		
application method	hand-held boom	hand-held boom	hand-held boom	tractor, 6.5 mph	hand-held t	boom	
		iana nola boom		access, oto mpri	Hand Hold L		
Sclerotinia incidence (% of pl		19.0	26 h	24.0	25	-	_
	78 a	48 a	26 b	24 a	35		-
MIRAVIS NEO 13.7 fl oz/ac	72 a		20 b	0-	23	а	-
MIRAVIS NEO 20.8 fl oz/ac	74 a	52 a		25 a			-
ENDURA 5.5 or 6.0 oz/ac		38 a	3 a	21 a	20	а	-
	CV: 10.9	26.3	30.7	30.5	20.3		
Sclerotinia severity index (%	of canopy)						_
UNTREATED	58 a	21 a	10 b	16 a	23	а	_
MIRAVIS NEO 13.7 fl oz/ac	52 a		8 ab		14	а	
MIRAVIS NEO 20.8 fl oz/ac	48 a	21 a		14 a			_
ENDURA 5.5 or 6.0 oz/ac		13 a	1 a	12 a	12	а	-
	CV: 16.1	34.6	39.5	32.8	26.9		-
Yield							
UNTREATED	25 a	33 a	45 a	55 a	56	а	<u>_</u>
MIRAVIS NEO 13.7 fl oz/ac	31 a		46 a		64		-
MIRAVIS NEO 20.8 fl oz/ac	31 a	34 a		58 a			-
ENDURA 5.5 or 6.0 oz/ac	014	36 a	49 a	58 a	62	2	-
	CV: 19.4	7.2	15.1	4.2	9	a	-
	CV. 10.4	1.2	10.1	7.2	J		
Miravis Neo (13.7 fl oz/ac) v	ersus Endura (6.0 oz/a	c)				Sin	ngle fungicide
COMBINED ANALYSIS, 2 st	tudies Sclerotin	ia incidence (%)	Sclerotinia DSI (%)) Yield			ation at R2 or R3
Non-treated control	3()a	17 a	Į	51 a		ingicide application was
MIRAVIS NEO 13.7 fl oz/ac	2'	1 a	11 a	l	55 a		til R3 when weather did r white mold earlier in
ENDURA 6 oz/ac	1:	2 a	7 a		55 a		bloom.
	CV: 24.		23.5		5.1		
Miravis Neo (13.7 fl oz/ac) v						Sin	igle fungicide
COMBINED ANALYSIS, 3 st		ia incidence (%)	Sclerotinia DSI (%)) Yield			ation at R2 or R3
UNTREATED	46 a		31 a	42 a	_		ingicide application was
MIRAVIS NEO 13.7 fl oz/ac	38 a	17%	24 a 21%	47 a	12%	delayed un	til R3 when weather did
	CV: 5.6	reduction	24 a 2170 9.6 reduction	6.2		not favo	r white mold earlier in bloom.
Miravie Neo (20.8 fl. a-la-)				0.2	increase	-	
Miravis Neo (20.8 fl oz/ac) v	•	-	Colorationia DOL (01)				igle fungicide
COMBINED ANALYSIS, 2 st		ia incidence (%)	Sclerotinia DSI (%)				ation at R2 or R3
Non-treated control		6a	18 a		44 a		Ingicide application was til R3 when weather did
MIRAVIS NEO 20.8 fl oz/ac		8 a	17 a		46 a		r white mold earlier in
ENDURA 5.5 oz/ac		9 a	13 a	4	47 a		bloom.
	CV: 9.	6	13.9	:	2.1		
Miravis Neo (20.8 fl oz/ac) v	ersus non-treated					Sin	gle fungicide
COMBINED ANALYSIS, 3 st	tudies Sclerotin	ia incidence (%)	Sclerotinia DSI (%)) Yield			ation at R2 or R3
UNTREATED	50 a		32 a	37 a			ingicide application was
MIRAVIS NEO 20.8 fl oz/ac	50 a	_0%	28 a 13%	41 a	10%		til R3 when weather did r white mold earlier in
	CV: 5.7		3.4 reduction	4.7	increase	not favo	r white mold earlier in bloom.
	••••						

Miravis Neo 13.7 or 20.8 fl oz - two sequential fungicide applications

			8 11 02 - two 3e				
		-	oxystrobin (FRAC 11),				
year		2020	2020	2021	2021	2022	
	Carrington	Carrington	Carrington	Carrington	Carrington	Carrington	
	Syngenta	Syngenta	ADAMA	Syngenta	Gowan	BASF	
	17X04N	DSR-0418	DSR-0418	DSR-0807	DSR-0807	AG09Xf0	
	Peterson Farms, 0.7	Dairyland, 0.4	Dairyland, 0.4	Dairyland, 0.8	Dairyland, 0.8	0	
row spacing		21 inches	21 inches	21 inches	21 inches	14 inches	
seeding rate	165,000 pls/ac	165,000 pls/ac	165,000 pls/ac	165,000 pls/ac	165,000 pls/a	· ·	
previous crop	lentils	spring wheat	spring wheat	spring wheat	spring wheat	dry bean	
planting date	May 9	May 18	May 18	May 12	May 12	May 27	
disease assessment date	e Oct. 30	Oct. 16	Oct. 15	Oct. 4	Oct. 4	Oct. 19	
rows assessed for disease	: 1	1	1	1	1	1	
harvest date	Oct. 31, Nov. 2	Oct. 19	Oct. 16	Oct. 6	Oct. 7	Oct. 21	
dates, applications 1 and 2	2 July 28, Aug. 8	July 17, 28	July 14, 28	July 22, Aug. 2	July 26, Aug.	6 July 23, Aug. 1	The first fu
interval between applications	11 days	11 days	14 days	11 days	11 days	9 days	applicatio
growth stage, 1st application	100% R3	100% R2	100% R2	100% R2	R3	100% R2	delayed until weather did
canopy closure, 1st application	90-100% (ave. 97%)	75-90%	65-95%	95-100%	100%	99-100%	white mold
nozzles, pressure, 1st application	AIXR110015, 50 psi	AIXR110015, 60 psi	AIXR110015, 60 psi	XR11010, 30 psi	AIXR110015,	50 psi AIXR110015, 50 psi	bloor
droplet size, 1st application	coarse	medium	medium	coarse	coarse	coarse	
canopy closure, 2nd application	100%	100%	100%	100%	100%	100%	
nozzles, pressure, 2nd application		AIXR110015, 40 psi	AIXR110015, 40 psi	XR11010, 30 psi	AIXR110015,	50 psi AIXR110015, 50 psi	
droplet size, 2nd application	coarse	coarse	coarse	coarse	coarse	coarse	
adjuvant		Induce 0.25% v/v	none	Activator 90 NIS 0.2		, some tr Masterlock, 6.4 fl oz/a	с
fungicide spray volume		15 gal/ac	15 gal/ac	15 gal/ac	15 gal/ac	15 gal/ac	
application method	0	hand-held boom	hand-held boom	tractor, 6.5 mph	hand-held bo	-	
clerotinia incidence (% of plants)				adotor, oro mpri			
on-treated control	78 b	48 a	34 a	24 a	35 a	82 b	_
	63 a	40 a	34 d	24 d			-
IIRAVIS NEO 13.7 fl oz/ac	69 ab	38 a	30 a	22 a	20 a	00 80	-
IIRAVIS NEO 20.8 fl oz/ac	09 ab	30 a	30 a	22 a	20	F2 -	_
NDURA 6 oz/ac	10.9	26.3	30.3	30.5	20 a 20.3	53 a 14.4	_
CV:		20.5	50.5	30.5	20.3	14.4	
clerotinia severity index (% of ca		01 -	40 -	40 -	00 -	70 -	_
lon-treated control	58 b	21 a	13 a	16 a	23 a		_
IIRAVIS NEO 13.7 fl oz/ac	43 a	10	10	10	14 a	56 ab	_
IIRAVIS NEO 20.8 fl oz/ac	48 ab	12 a	12 a	13 a	10	40	_
NDURA 6 oz/ac	10.1				12 a		_
CV:	16.1	34.6	39.9	32.8	26.9	17.5	
oybean yield							_
on-treated control	25 a	33 a	42 a	55 b	56 a		-
IIRAVIS NEO 13.7 fl oz/ac	35 a				64 a	34 a	_
IIRAVIS NEO 20.8 fl oz/ac	30 a	34 a	39 a	60 a			_
NDURA 6 oz/ac					62 a		_
CV:	19.4	7.2	11	4.2	9	10.7	
liravis Neo (13.7 fl oz/ac) versu	s Endura (6.0 oz/ac	:)				Two fungicide application	e: R2 or
OMBINED ANALYSIS, 2 studie		ia incidence (%)	Sclerotinia DSI (%)	Yield		R3 + 9-14 days late	
on-treated control		a incluence (76)	47 a		11 a	ļ	
IIRAVIS NEO 13.7 fl oz/ac		5 a	35 a		19 a	The first fungicide application wa until R3 when weather did not fa	
		ра 7а				mold earlier in bloom.	
NDURA 6 oz/ac			26 a		52 a		
CV:		3	19.8	8	3.7	-	-
iravis Neo (13.7 fl oz/ac) versu			0.1			Two fungicide application	
OMBINED ANALYSIS, 3 studie		ia incidence (%)	Sclerotinia DSI (%)		_	R3 + 9-14 days late	er
NTREATED	65 a		51 a	35 a	-	The first fungicide application wa	
IRAVIS NEO 13.7 fl oz/ac	51 a	_21%3	87 a 26%	44 a	26%	until R3 when weather did not fa mold earlier in bloom.	avor white
CV	2	reduction	5 reduction	1.6	increase	molu eanler in bloom.	
iravis Neo (20.8 fl oz/ac) versu	s non-treated					Two fungicide application	s: R2 or
OMBINED ANALYSIS, 4 studie	s Sclerotin	ia incidence (%)	Sclerotinia DSI (%)	Yield		R3 + 9-14 days late	er
NTREATED	46 a	2	27 a	39 a		The first fungicide application wa	as delaved
/IRAVIS NEO 20.8 fl oz/ac	40 a	13% 2	21 a 21%	41 a	5%	until R3 when weather did not fa	
CV:	5.7		.4 reduction	4.7	increase	mold earlier in bloom.	

Fung	cicide efficacy: M	ANAGEMENT OF	WHITE MOLD IN	SOYBEANS					
Fungicide efficacy: MANAGEMENT OF WHITE MOLD IN SOYBEANS ProPulse 6 fl oz - single application									
prothioconazole (FRAC 3), 1.67 lbs ai/gal; fluopyram (FRAC 7), 1.67 lbs ai/gal									
pro yea	· · · · ·	2022	2023	2023					
	n Carrington	Carrington	Carrington	Carrington					
	a Bayer	Bayer	ND Soybean Council	Bayer					
	/ DSR-0418	AG09Xf0	21Xf07	P06T04E					
brand, maturity	/ Dairyland, 0.4	Asgrow, 0.9	Peterson Farms, 0.7	Pioneer, 0.6					
row spacing	g 21 inches	14 inches	14 inches	14 inches					
seeding rate	e 165,000 pls/ac	165,000 pls/ac	165,000 pls/ac	165,000 pls/ac					
previous crop	o spring wheat	dry bean	chickpeas	chickpeas					
planting date	e May 18	May 27	May 24-25	May 24					
disease assessment date	e Oct. 16	Oct. 19	Oct. 12-13	Oct. 12					
rows assessed for disease		1	1	1					
harvest date		Oct. 21	Oct. 17	Oct. 17					
date fungicide was applied		July 23	July 22	July 22					
growth stage, 1st application		100% R2	100% R2	100% R2					
canopy closure, 1st application		99-100%	98-100%	95-100% AIXR110015, 50 psi					
nozzles, pressure, 1st applicatior droplet size, 1st applicatior		AIXR110015, 50 psi coarse	AIXR110015, 50 psi coarse	coarse					
	t Induce 0.125% v/v	Induce 0.125% v/v	none	Induce, 0.125% v/v					
fungicide spray volume		15 gal/ac	15 gal/ac	15 gal/ac					
application method	-	hand-held boom	hand-held boom	hand-held boom					
Sclerotinia incidence (% of plants)									
UNTREATED	38 a	74 b	62 a	63 b	-				
PROPULSE 6 fl oz/ac	45 a	53 a	61 a	57 ab	_				
PROPULSE 8 fl oz/ac	31 a	48 a		51 ab	_				
ENDURA 5.5 oz/ac		60 ab		42 a	_				
CV		18.2	26.4	22.2					
Sclerotinia severity index (% of ca		00 k	40 -	40 h	_				
	15 a	63 b	42 a	43 b	_				
PROPULSE 6 fl oz/ac	23 a 8 a	36 a 33 a	41 a	37 a 32 a	_				
ENDURA 5.5 oz/ac	0 4	 41 a		24 a	-				
CV	: 23.2	24.6	35.9	31.2	-				
Yield									
UNTREATED	49 a	30 b	44 a	47 b	-				
PROPULSE 6 fl oz/ac	49 a	39 a	48 a	51 ab	-				
PROPULSE 8 fl oz/ac	53 a	42 a		52 ab	_				
ENDURA 5.5 oz/ac		38 a		56 a	_				
CV		8.2	12.5	6.5					
ProPulse (6 fl oz/ac) versus Enc	,		COMBINED ANALY						
	Sclerotinia incidenc		ia DSI (%)	Yield	Single fungicide				
	69 a		3 a	38 a	application at				
PROPULSE 6 fl oz/ac	55 a 51 a		5 a 3 a	45 a 47 a	100% R2				
ENDURA 5.5 oz/ac CV		19.8		5.1	-				
		19.0							
ProPulse (6 fl oz/ac) versus Pro			COMBINED ANALY						
	Sclerotinia incidenc 58 a	. ,	ia DSI (%)) a	Yield 42 a	Single fungicide				
	58 a		2 a	42 a 47 a	application at 100% R2				
PROPULSE 6 fl oz/ac PROPULSE 8 fl oz/ac	43 a		2 a 1 a	47 a 49 a	100 /0 KZ				
CV		28.3		6.3	-				
ProPulse (6 fl oz/ac) versus non	I-treated Sclerotinia incidenc		IED ANALYSIS, 4 stu		Single applic. at 100% R2				
UNTREATED	50 scierolinia incidenc	- ` `	ia DSI (%) La	Yield 42 a	100 /0 KZ				
PROPULSE 6 fl oz/ac	53 a		ta 16%	42 a	11%				
CV		reduction 27.9		6.4	_ I I /0 increase				
		_/							

ProPulse 6 fl oz - two sequential applications

•	•		iopyram (FRAC 7), 1.6	7 lbs ai/gal	
	2022	2023	2023		
location	Carrington	Carrington	Carrington		
funding	BASF	ND Soybean Council			
variety	/ AG09Xf0	21Xf07	21Xf07		
brand, maturity	Asgrow, 0.9	Peterson Farms, 0.7	Peterson Farms, 0.7		
row spacing	14 inches	14 inches	14 inches		
seeding rate	e 165,000 pls/ac	165,000 pls/ac	165,000 pls/ac		
previous crop	o dry bean	chickpeas	chickpeas		
planting date	e May 27	May 24-25	May 24		
disease assessment date	e Oct. 19	Oct. 12-13	Oct. 12		
rows assessed for disease	: 1	1	1		
harvest date	e Oct. 21	Oct. 17	Oct. 17		
dates, applications 1 and 2	2 July 23, Aug. 1	July 22, Aug. 2	July 22, Aug. 2		
interval between applications	s 9 days	11 days	11 days		
growth stage, 1st application	100% R2	100% R2	100% R2		
canopy closure, 1st application	99-100%	98-100%	98-100%		
nozzles, pressure, 1st application	AIXR110015, 50 psi	AIXR110015, 50 psi	AIXR110015, 50 psi		
droplet size, 1st application	coarse	coarse	coarse		
canopy closure, 2nd application		100%	100%		
nozzles, pressure, 2nd application		AIXR110015, 40 psi	AIXR110015, 40 psi		
droplet size, 2nd application		coarse	coarse		
	t Masterlock, 6.4 fl oz/a		Masterlock, 6.4 fl oz/ac		
fungicide spray volume		15 gal/ac	15 gal/ac		
application method	0	hand-held boom	hand-held boom		
Sclerotinia incidence (% of plants					
Non-treated control	, 82 b	62 a	54 b		
PROPULSE 6 fl oz/ac	49 a	51 a	35 ab		
ENDURA 6 oz/ac	53 a		33 ab		
ENDURA 8 oz/c			28 a		
CV:	14.4	26.4	35.6		
Sclerotinia severity index (% of c	anopy)				
Non-treated control	70 b	42 a	31 b		
PROPULSE 6 fl oz/ac	35 a	32 a	18 ab		
ENDURA 6 oz/ac	40 a	02 0	18 ab		
ENDURA 8 oz/c	lou		11 a		
CV:	17.5	35.9	47.4		
Soybean yield					
Non-treated control	25 b	44 b	50 a		
PROPULSE 6 fl oz/ac	43 a	53 a	56 a		
ENDURA 6 oz/ac	43 a	00 a	50 a		
ENDURA 8 oz/c	72 a		62 a		
CV:	10.7	12.5	15		
		.2.0			
ProPulse (6 fl oz/ac) versus End	. ,		COMBINED ANALYS	· · · ·	
	Sclerotinia incidenc	()	()	Yield	Two sequential
UNTREATED	68 a		а	38 a	applications: full
PROPULSE 6 fl oz/ac	42 a		'a	50 a	R2 + 9-11 days
ENDURA 6 oz/ac	43 a		а	46 a	later
CV:	9.8	23.2		13.6	
ProPulse (6 fl oz/ac) versus nor	n-treated		COMBINED ANALYS	SIS, 3 studies	
	Sclerotinia incidenc	e (%) Sclerotin		Yield	
UNTREATED	66 a		a	40 a	
PROPULSE 6 fl oz/ac	45 a		a 41%	51 a	27%
CV/		reduction 25		95	increase

CV:

14.2

reduction

25

reduction

9.5

increase

ProPulse 8 fl oz - single application

		Propulse o II o	iz - single appl			
	prothioconaz	ole (FRAC 3), 1.67 lb	s ai/gal; fluopyram (FRAC 7), 1.67 lbs a	i/gal	
year	2020	2022	2023			
location	Carrington	Carrington	Carrington			
funding	Bayer	Bayer	Bayer			
variety	DSR-0418	AG09Xf0	P06T04E			
orand, maturity	Dairyland, 0.4	Asgrow, 0.9	Pioneer, 0.6			
row spacing	21 inches	14 inches	14 inches			
seeding rate	165,000 pls/ac	165,000 pls/ac	165,000 pls/ac			
previous crop	spring wheat	dry bean	chickpeas			
planting date	May 18	May 27	May 24			
disease assessment date	Oct. 16	Oct. 19	Oct. 12			
rows assessed for disease	1	1	1			
narvest date	Oct. 19	Oct. 21	Oct. 17			
date fungicide was applied	July 17	July 23	July 22			
growth stage, 1st applic.	100% R2	100% R2	100% R2			
canopy closure, 1st applic	75-90%	99-100%	95-100%			
nozzles, pressure, 1st applic	AIXR110015, 60 psi	AIXR110015, 50 psi	AIXR110015, 50 psi			
droplet size, 1st applic.	medium	coarse	coarse			
	Induce 0.125% v/v	Induce 0.125% v/v	Induce, 0.125% v/v			
adjuvant						
fungicide spray volume	15 gal/ac	15 gal/ac	15 gal/ac			
application method	hand-held boom	hand-held boom	hand-held boom			
Sclerotinia incidence (% of p	,	74 6	60 k	_		
	38 a	74 b	63 b	_		
PROPULSE 6 fl oz/ac	45 a	53 a	57 ab	_		
PROPULSE 8 fl oz/ac	31 a	48 a	51 ab	_		
ENDURA 5.5 oz/ac	CV: 20	60 ab	42 a	_		
		18	22			
Sclerotinia severity index (%	197			_		
UNTREATED	15 a	63 b	43 b	_		
PROPULSE 6 fl oz/ac	23 a	36 a	37 ab			
PROPULSE 8 fl oz/ac	8 a	33 a	32 ab			
ENDURA 5.5 oz/ac		41 a	24 a	_		
	CV: 23	25	31			
Yield						
UNTREATED	49 a	30 b	47 b			
PROPULSE 6 fl oz/ac	49 a	39 a	51 ab			
PROPULSE 8 fl oz/ac	53 a	42 a	52 ab			
ENDURA 5.5 oz/ac		38 a	56 a			
	CV: 5.1	8.2	6.5	_		
ProPulse (6 and 8 fl oz/ac)	versus Endura (5.5 ozla		COMBINED ANAL	YSIS 2 studies		
	Sclerotinia incidence	•	ia DSI (%)	Yield	Single f	Ingicide application at 100%
UNTREATED	69 a	. ,	3 a	38 a	Single It	R2
PROPULSE 6 fl oz/ac	55 a		6 a	45 a		
PROPULSE 8 fl oz/ac			3 a	45 a		
	49 a 51 a		за За	47 a		
ENDURA 5.5 oz/ac						
	CV: 13.3	19.		6.4		
ProPulse (8 fl oz/ac) versu			COMBINED ANAL	YSIS, 4 studies		
	Sclerotinia incidence	ce (%) Sclerotin	ia DSI (%)	Yield		Single fungicide
UNTREATED	58 a		Da	42 a		application at 100% R2
PROPULSE 8 fl oz/ac	43 a	_ 26% 2	<u>4 a 39%</u>	49 a	17%	
	CV/: 12.7	roduction 00	5 roduction	7.6	increases	

reduction

7.6

increase

reduction

26.5

CV:

13.7

Revytek 8 fl oz - single fungicide application

mefentrifluconazole (FRAC 3), 1.11 lbs ai/gal; pyraclostrobin (I	FRAC 11), 1.48 lbs ai/gal; fluxapyroxad (FRAC 7), 0.74 lbs ai/gal
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year	2020	2021	2021	
location	Carrington	Carrington	Carrington	
funding	BASF	BASF	Gowan	
variety	DSR-0418	DSR-0807	DSR-0807	
brand, maturity	Dairyland, 0.4	Dairyland, 0.8	Dairyland, 0.8	
row spacing	21 inches	21 inches	21 inches	
seeding rate	165,000 pls/ac	165,000 pls/ac	165,000 pls/ac	
previous crop	spring wheat	spring wheat	spring wheat	
planting date	May 18	May 12	May 12	
disease assessment date	Oct. 15	Oct. 4	Oct. 4	
rows assessed for disease	1	1	1	
harvest date	Oct. 16	Oct. 6	Oct. 7	
date fungicide was applied	July 14	July 26	July 26	The first fungicide
growth stage, 1st applic.	100% R2	R3	R3	application was
canopy closure, 1st applic	65-95%	1	1	delayed until R3 when weather did not favor
nozzles, pressure, 1st applic.	AIXR110015, 60 psi	AIXR110015, 50 psi	AIXR110015, 50 psi	white mold earlier in
droplet size, 1st applic.	medium	coarse	coarse	bloom.
adjuvant	none	Masterlock 6.4 fl oz	Induce 0.25%	
fungicide spray volume	15 gal/ac	15 gal/ac	15 gal/ac	
application method	hand-held boom	hand-held boom	hand-held boom	

Sclerotinia incidence (% o	f plants)			
UNTREATED		26 b	34 a	35 a
REVYTEK 8.0 fl oz/ac		30 b	35 a	33 a
ENDURA 6.0 oz/ac		3 a		20 a
	CV:	30.7	35.6	20.3
Sclerotinia severity index	(% of can	эру)		
UNTREATED		10 b	24 a	23 a
REVYTEK 8.0 fl oz/ac		13 b	23 a	21 a
ENDURA 6.0 oz/ac		1 a		12 a
	CV:	39.5	19.8	26.9
Yield				
UNTREATED		45 a	53 a	56 a
REVYTEK 8.0 fl oz/ac		47 a	55 a	57 a
ENDURA 6.0 oz/ac		49 a		62 a
	CV:	15.1	8.6	9

Revytek (8 fl oz/ac) versus	s Endura	a (6.0 oz/ac)		COMBINED ANALY	′SIS, 2 stu	idies		
	S	clerotinia incide	nce (%)	Sclerotinia DSI (%)		Yield	Single fu	Ingicide application at R2 or
UNTREATED		30 a		17 b		51 a	_	R3
REVYTEK 8.0 fl oz/ac		31 a		17 b		52 a	The first	fungicide application was delayed
ENDURA 6.0 oz/ac		12 a		7 a		55 a	until R3	when weather did not favor white
	CV:	21.1		11.3		2.3	_	mold earlier in bloom.
Revytek (8 fl oz/ac) versus	s non-tre	eated		COMBINED ANALY	′SIS, 3 stu	idies		
	S	clerotinia incide	nce (%)	Sclerotinia DSI (%)		Yield		Single fungicide
REVYTEK 8.0 fl oz/ac		32 a		19.3 a	-	51 b		application at R2 or R3
ENDURA 6.0 oz/ac		33 a	0%	18.9 a	2%	53 a	3%	
	CV:	6.3	reduction	8.8	reduction	0.7	increase	

Revytek 8 fl oz - two fungicide applications

			vo rungiciuc u			
mefentriflucona	zole (FRAC 3), 1.11 lb			os ai/gal; fluxapyroxa	d (FRAC 7), 0.74 lbs ai/gal
yea	ar 2021	2021	2022			
locatio	on Carrington	Carrington	Carrington			
fundir	ng BASF	Gowan	BASF			
varie	ty DSR-0807	DSR-0807	AG09Xf0			
brand, maturi	ty Dairyland, 0.8	Dairyland, 0.8	Asgrow, 0.9			
row spacir	ng 21 inches	21 inches	14 inches			
seeding rat	te 165,000 pls/ac	165,000 pls/ac	165,000 pls/ac			
previous cro	op spring wheat	spring wheat	dry bean			
planting da	te May 12	May 12	May 27			
disease assessment da	te Oct. 4	Oct. 4	Oct. 19			
rows assessed for diseas	se 1	1	1			
harvest da	te Oct. 6	Oct. 7	Oct. 21			
dates, applications 1 and	2 July 26, Aug. 6	July 26, Aug. 6	July 23, Aug. 1	The first fungicide		
interval between application	ns 11 days	11 days	9 days	application was		
growth stage, 1st application	on R3	R3	100% R2	delayed until R3 when weather did not favor		
canopy closure, 1st application	on 100%	100%	99-100%	white mold earlier in		
nozzles, pressure, 1st application	on AIXR110015, 50 psi	AIXR110015, 50 psi	AIXR110015, 50 psi	bloom.		
droplet size, 1st application	on coarse	coarse	coarse			
canopy closure, 2nd application	on 100%	100%	100%			
nozzles, pressure, 2nd application	on AIXR110015, 50 psi	AIXR110015, 50 psi	AIXR110015, 50 psi			
droplet size, 2nd application	on coarse	coarse	coarse			
adjuva	nt Masterlock 6.4 fl oz	Induce 0.25%	Masterlock 6.4 fl oz			
fungicide spray volum	ne 15 gal/ac	15 gal/ac	15 gal/ac			
application metho	od hand-held boom	hand-held boom	hand-held boom			
Sclerotinia incidence (% of plant	s)					
Non-treated control	42 a	35 a	82 b	_		
REVYTEK 8 fl oz/ac	43 a	33 a	67 a	_		
ENDURA 6 oz/ac	36 a	20 a	53 a	_		
C\	/: 38.8	20.3	14.4	-		
Sclerotinia severity index (% of	canopy)					
Non-treated control	27 a	23 a	70 b	_		
REVYTEK 8 fl oz/ac	26 a	21 a	51 a	_		
ENDURA 6 oz/ac	19 a	12 a	40 a	_		
C\	/: 25	26.9	17.5	-		
Soybean yield (bushels/acre)						
Non-treated control	51 a	56 a	25 b	-		
REVYTEK 8 fl oz/ac	51 a	57 a	33 b	_		
ENDURA 6 oz/ac	55 a	62 a	42 a	_		
C\		9	10.7	_		
Revytek (8 fl oz/ac) versus End			IED ANALYSIS, 3 stu	ıdies		
	Sclerotinia incidend		ia DSI (%)	Yield	Two se	quential applications: R2 or
Non-treated control	53 a*	. ,) a*	44 a*		R3 + 9-11 days later
REVYTEK 8 fl oz/ac	47 a		3 a	47 a		-
ENDURA 6 oz/ac	37 a		4 a	53 a		fungicide application was delayed when weather did not favor white
C\				7.2		mold earlier in bloom.
Revytek (8 fl oz/ac) versus nor			IED ANALYSIS, 3 stu			
	Sclerotinia incidend		ia DSI (%)	Yield		Two sequential
	53 a) a	44 b	00/	applications: R2 or R3 + 9
REVYTEK 8 fl oz/ac	47 a		<u>3 a 18%</u>	47 a	6%	11 days later
C/	/: 6.3	reduction 8.	8 reduction	0.7	increase	

Topsin/generic 20 fl oz - single fungicide application

thiophanate-methyl (FRAC 1), 4.5 lbs ai/gal										
year	2020	2020	2020	2020	2020	2023				
location	Oakes	Oakes	Carrington	Carrington	Carrington	Carrington				
funding	ND Soybean Council	ND Soybean Council	ND Soybean Council	Gowan	BASF	ND Soybean Council				
variety	GH0543X	14R09N	14R09N	DSR-0418	DSR-0418	21Xf07				
brand, maturity	Golden Harvest, 0.5	Peterson Farms, 0.9	Peterson Farms, 0.9	Dairyland, 0.4	Dairyland, 0.4	Peterson Farms, 0.7				
row spacing	22.5 inches	22.5 inches	21 inches	21 inches	21 inches	14 inches				
seeding rate	165,000 pls/ac	165,000 pls/ac	165,000 pls/ac	165,000 pls/ac	165,000 pls/ac	165,000 pls/ac				
previous crop	sunflowers	sunflowers	dry bean	spring wheat	spring wheat	chickpeas				
planting date	May 12	May 12	May 18	May 18	May 18	May 24-25				
disease assessment date	Aug. 26. 28	Sept. 25	Oct. 12-15	Oct. 16	Oct. 15	Oct. 12-13				
rows assessed for disease	1	1	1	1	1	1				
harvest date	Oct. 8-9	Oct. 8-9	Oct. 15-16	Oct. 19	Oct. 16	Oct. 17				
date fungicide was applied	July 8	July 8	July 10	July 16	July 14	July 22				
growth stage, 1st applic.	65% R2, 35% R3	79% R2, 21% R3	89% R2, 100% bloom	100% R2	100% R2	100% R2				
canopy closure, 1st applic	91% average	87% average	87% average	75-85%	65-95%	98-100%				
nozzles, pressure, 1st applic.	AIXR110015, 60 psi	AIXR110015, 60 psi	AIXR110015, 60 psi	AIXR110015, 60 psi	AIXR110015, 60 psi	AIXR110015, 50 psi				
droplet size, 1st applic.	medium	medium	medium	medium	medium	coarse				
adjuvant	none	none	none	none	none	none				
fungicide spray volume	15 gal/ac	15 gal/ac	15 gal/ac	15 gal/ac	15 gal/ac	15 gal/ac				
application method	n method hand-held boom		hand-held boom	hand-held boom	hand-held boom	hand-held boom				
Sclerotinia incidence (% of plants	s)									
UNTREATED	4 a	2 a	18 ab	25 a	26 b	79 a				
TOPSIN or generic 20 fl oz/ac	4 a	4 a	25 b	26 a	16 ab	69 a				
ENDURA 5.5 or <mark>6.0</mark> oz/ac	2 a	2 a	12 a	31 a	3 a					
CV	/: 55	46	43	53	31	13				
Sclerotinia severity index (% of a	canopy)									
UNTREATED	2 a	1 a	11 ab	8 a	10 b	60 b				
TOPSIN or generic 20 fl oz/ac	2 a	2 a	17 b	8 a	5 ab	48 a				
ENDURA 5.5 or <mark>6.0</mark> oz/ac	1 a	0 a	7 a	10 a	1 a					
CV	/: 46	49	53	68	40	15				
Yield										
UNTREATED	77 a	76 a	53 a	46 a	45 a	32 a				
TOPSIN or generic 20 fl oz/ac	79 a	76 a	50 a	45 a	46 a	38 a				
ENDURA 5.5 or <mark>6.0</mark> oz/ac	77 a	79 a	54 a	42 a	49 a					
CV	1: 3.5	3.8	6.8	8.2	15.1	17				
Topsin/generic (20 fl oz/ac) ver	sus Endura (5.5 or 6	6.0 oz/ac)	COMBINED ANALY	SIS, 5 studies						
	Sclerotinia incidenc		ia DSI (%)	Yield						
UNTREATED	15 a	()	a ()	59 a	- Single fungicide application at early					
TOPSIN or generic 20 fl oz/ac	15 a		'a	59 a						
ENDURA 5.5 or 6.0 oz/ac	10 a		a	60 a	to f	ull R2				
CV: 44.3 52.6 2.9										
Topsin/generic (20 fl oz/ac) ver										
Topsin/generic (20 fl oz/ac) Ver	sus non-treated		COMBINED ANALY	SIS, 6 Studies						

	Sclerotinia DSI (%)	_	Yield				
UNTREATED	26 a		15 a	-	55 a		Single fungicide
TOPSIN or generic 20 fl oz/ac	24 a	7%	13 a	13%	56 a	2%	application at early to full
CV	: 20.2	reduction	31.2	reduction	3.1	increase	R2

Topsin/generic 20 fl oz - two sequential applications

thiophanate-methyl (FRAC 1), 4.5 lbs ai/gal											
year	2020	2020	2020	2023							
location	Oakes	Oakes	Carrington	Carrington							
funding	ND Soybean Council	ND Soybean Council	ND Soybean Council	ND Soybean Council							
variety	GH0543X	14R09N	14R09N	21Xf07							
brand, maturity	Golden Harvest, 0.5	Peterson Farms, 0.9	Peterson Farms, 0.9	Peterson Farms, 0.7							
row spacing	22.5 inches	22.5 inches	21 inches	14 inches							
seeding rate	165,000 pls/ac	165,000 pls/ac	165,000 pls/ac	165,000 pls/ac							
previous crop	sunflowers	sunflowers	dry bean	chickpeas							
planting date	May 12	May 12	May 18	May 24-25							
disease assessment date	Aug. 26. 28	Sept. 25	Oct. 12-15	Oct. 12-13							
rows assessed for disease	1	1	1	1							
harvest date	Oct. 8-9	Oct. 8-9	Oct. 15-16	Oct. 17							
dates, applications 1 and 2	July 8, 15	July 8, 15	July 10, 20	July 22, Aug. 2	The first fungicide						
interval between applications	7 days	7 days	10 days	11 days	application was						
growth stage, 1st application	65% R2, 35% R3	79% R2, 21% R3	89% R2, 100% bloom	100% R2	delayed until late R2 when weather did not						
canopy closure, 1st application	91% average	87% average	87% average	98-100%	favor white mold						
nozzles, pressure, 1st application	AIXR110015, 60 psi	AIXR110015, 60 psi	AIXR110015, 60 psi	AIXR110015, 50 psi	earlier in bloom.						
droplet size, 1st application	medium	medium	medium	coarse							
canopy closure, 2nd application	95% average	94% average	98% average	100%							
nozzles, pressure, 2nd application	AIXR110015, 40 psi	AIXR110015, 40 psi	AIXR110015, 40 psi	AIXR110015, 40 psi							
droplet size, 2nd application	coarse	coarse	coarse	coarse							
adjuvant	none	none	none	none							
fungicide spray volume	15 gal/ac	15 gal/ac	15 gal/ac	15 gal/ac							
application method	hand-held boom	hand-held boom	hand-held boom	hand-held boom							
Sclerotinia incidence (% of plants))										
Non-treated control	4 b	2 b	18 b	79 b	-						
TOPSIN or generic 20 fl oz/ac	3 ab	3 b	11 ab	68 a	_						
ENDURA 5.5 oz/ac	1 a	0 a	6 a								
CV:	55.1	45.6	43.5	12.6							
Sclerotinia severity index (% of ca	anopy)										
Non-treated control	2 b	1 b	11 b	60 b							
TOPSIN or generic 20 fl oz/ac	1 ab	1 b	7 ab	47 a	_						
ENDURA 5.5 oz/ac	0 a	0 a	3 a								
CV:	45.9	48.8	53.0	15.4							
Soybean yield											
Non-treated control	77 a	76 a	53 a	32 a	_						
TOPSIN or generic 20 fl oz/ac	79 a	76 a	55 a	40 a	_						
ENDURA 5.5 oz/ac	77 a	79 a	57 a								
CV:	3.5	3.8	6.8	17							
Topsin/generic (20 fl oz/ac) vers	us Endura (5.5 oz/a	c)	COMBINED ANALY	SIS, 3 studies							
	Sclerotinia incidenc	· · ·	a DSI (%)	Yield	Turner						
UNTREATED	8 b		i b	69 a	Two sequential applications:						
TOPSIN or generic 20 fl oz/ac	6 b		ab	70 a	early to late R2 +						
ENDURA 5.5 oz/ac	2 a		а	71 a	7-11 days later						
CV:		20.7		2.2							
Topsin/generic (20 fl oz/ac) versus non-treatedTwo sequential applications: earlyCOMBINED ANALYSIS, 4 studiesto late R2 + 7-11 days later											
COMBINED ANALYSIS, 4 studie											
	Sclerotinia incidenc		a DSI (%)	Yield							
UNTREATED	26 a		a 34 9/	60 a	E0/						
TOPSIN or generic 20 fl oz/ac	21 a		a 24%	<u>63</u> a	5%						
CV:	8.5	reduction 11.6	reduction	4	increase						

			Fur	gicide efficacy:	MANAGEMEN	T OF WHITE MO	LD (Sclerotinia	stem rot) OF SC	YBEANS				
					sin/generi								
				iop		ethyl (FRAC 1),							
/ear	2021	2021	2021	2021	2021	2021	2022	2022	2022	2022	2022	2022	2022
location	Oakes	Oakes	Oakes	Carrington	Oakes	Oakes	Oakes						
funding	ND Soybean Council	ND Soybean Council	ND Soybean Council	ND Soybean Council	ND Soybean Council	ND Soybean Council	ND Soybean Council	ND Soybean Council	ND Soybean Council	ND Soybean Council	ND Soybean Council	ND Soybean Council	ND Soybean Cound
variety	AG06X8	AG09Xf0	AG11X8	AG009X8	AG06X8	AG09Xf0	AG06X8	XO0602E	XO0731E	AG09Xf0	DSR1120	AG11X8	AG09Xf0
prand, maturity	Asgrow, 0.6	Asgrow, 0.9	Asgrow, 1.1	Asgrow, 0.09	Asgrow, 0.6	Asgrow, 0.9	Asgrow, 0.6	Xitavo, 0.6	Xitavo, 0.7	Asgrow, 0.9	Dairyland, 1.1	Asgrow, 1.1	Asgrow, 0.9
ow spacing	21 inches	21 inches	21 inches	14 inches									
seeding rate	165,000 pls/ac	165,000 pls/ac	165,000 pls/ac	165,000 pls/ac	165,000 pls/ac	165,000 pls/ac	165,000 pls/ac	165,000 pls/ac	165,000 pls/ac	165,000 pls/ac	165,000 pls/ac	165,000 pls/ac	165,000 pls/ac
revious crop	various crops	various crops	various crops	sunflowers	sunflowers	sunflowers	dry bean	dry bean	dry bean	dry bean	various	various	various
planting date	May 4	May 4	May 4	May 17	May 17	May 17	May 27	May 27	May 27	May 27	June 2	June 2	June 2
disease assessment date	Sept. 30	Sept. 30	Sept. 30	Oct. 4-5	Oct. 4-5	Oct. 4-5	Oct. 14-19	Oct. 14-19	Oct. 14-19	Oct. 14-19	Oct. 21	Oct. 21	Oct. 21
rows assessed for disease	1	1	1	1	1	1	1	1	1	1	1	1	1
harvest date	Oct. 7-8	Oct. 7-8	Oct. 7-8	Oct. 15-16	Oct. 15-16	Oct. 15-16	Oct. 20	Oct. 20	Oct. 20	Oct. 20	Oct. 21-22	Oct. 21-22	Oct. 21-22
date fungicide was applied	July 5	July 5	July 5	July 23	July 23	July 23	July 21	July 21	July 21	July 21	July 24	July 24	July 24
growth stage, 1st applic.		m 66% R2 100% bloo		,	100% R2	100% R2	100%R2	100% R2	98% R2 100% bloor		100%R2	100%R2	100%R2
canopy closure, 1st applic	90-100%	95-100%	95-100%	90-95%	95-100%	95-100%	99-100%	0.95	98-100%	97-100%	95-100%	95-100%	95-100%
nozzles, pressure, 1st applic.	AIXR110015 50 psi			AIXR110015 50 psi	AIXR110015 50 psi					AIXR110015 50 psi		AIXR110015 50 psi	
droplet size, 1st applic.	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse	coarse
adjuvant	none	none	none	none	none	none	none	none	none	none	none	none	none
fungicide spray volume	15 gal/ac	15 gal/ac	15 gal/ac	15 gal/ac	15 gal/ac	15 gal/ac	15 gal/ac	15 gal/ac	15 gal/ac	15 gal/ac	15 gal/ac	15 gal/ac	15 gal/ac
application method	hand-held boom	hand-held boom	hand-held boom	hand-held boom	hand-held boom	hand-held boom	hand-held boom	hand-held boom	hand-held boom	hand-held boom	hand-held boom	hand-held boom	hand-held boom
Sclerotinia incidence (% of pla	ants)												
UNTREATED	, 55 a	43 b	51 a	8 b	77 b	62 a	92 a	80 b	91 b	79 b	3 a	12 a	8 a
TOPSIN or generic 40 fl oz/ad	c 61.a	37 ab	52 a	2 a	62 ab	55 a	83 a	65 a	74 a	65 a	2 a	4 a	5 a
ENDURA 5.5 oz/ac	54 a	27 a	44 a	3 a	51 a	42 a	81 a	63 a	79 ab	65 a	2 a	4 a	3 a
	CV: 29.9	38.4	37.4	91.7	27.9	32.0	13.0	13.2	11.3	12.9	105.9	78.5	73.2
Sclerotinia severity index (% o	of canopy)												
UNTREATED	38 a	29 a	34 a	4 b	49 b	37 b	86 a	72 b	84 b	70 b	1 a	5 a	3 a
TOPSIN or generic 40 fl oz/ad	2 42 a	26 a	36 a	1 a	37 ab	31 ab	73 a	55 a	64 a	53 a	1 a	2 a	1 a
ENDURA 5.5 oz/ac	40 a	18 a	30 a	2 ab	30 a	19 a	71 a	53 a	68 a	55 a	1 a	1 a	1 a
	CV: 36.2	52.1	17.1	117.1	39.4	49.0	15.3	16.5	13.0	15.5	133.6	98.2	84.8
Yield													
UNTREATED	60 a	67 a	68 a	58 a	42 b	41 a	25 b	29 b	21 b	25 b	67 a	73 a	71 a
TOPSIN or generic 40 fl oz/ad	58 a	66 a	68 a	60 a	48 ab	43 a	34 a	40 a	32 a	34 a	67 a	75 a	71 a
ENDURA 5.5 oz/ac	64 a	72 a	68 a	59 a	55 a	53 a	37 a	37 a	31 a	40 a	70 a	75 a	72 a
	CV: 14.7	8	11.5	6.1	9.1	9	12.1	10.6	13.3	10.6	4.8	5.8	4.8
Topsin/generic (40 fl o	z/ac) versus Endu	ıra (5.5 oz/ac)		Scleroti	nia incidence	Sclerotinia severi	ty index Yield						
COMBINED ANALYSIS	· · · · · · · · · · · · · · · · · · ·	,,		% of pla		% of canopy	bu/ac						

%

Topsin/generic (40 ii 02/ac) versus Endura (5.5 02/	acj	Scierourna incluence	Scierourna sevenity index	neiu
COMBINED ANALYSIS, 13 studies		% of plants	% of canopy	bu/ac
	UNTREATED	51 b	39 b	50 b
Single fungicide application at early to full R2	SIN or generic 40 fl oz/ac	44 a	32 a	53 a
	ENDURA 5.5 oz/ac	40 a	30 a	56 a
	CV	: 10.4	14.5	6.3
Topsin/generic (40 fl oz/ac) versus non-treated		Sclerotinia incidence	Sclerotinia severity index	Yield

Topsin/generic (40 fl oz/ac) versus non-treat	ed		Sclerotinia incid	lence	Sclerotinia sever	rity index	Yield		
COMBINED ANALYSIS, 13 studies			% of plants		% of canopy		bu/ac		
Single fungicide application at		UNTREATED	51 a		39 a		50	а	
early to full R2	TOPSIN	or generic 40 fl oz/ac	44 a	14%	32 a	18%	53	а	7%
		CV:	8.5	reduction	11.6	reduction	4		increa

Topsin 40 fl oz/ac followed by Endura 5.5 oz/ac versus Endura 5.5 oz/ac applied twice sequentially

			TOPSIN:	thiophanate-m	ethyl (FRAC 1),	4.5 lbs ai/gal	ENDURA: bos	calid (FRAC 7), 7	0% by weight				
year 202	21	2021	2021	2021	2021	2021	2022	2022	2022	2022	2022	2022	2022
location Oal	kes	Oakes	Oakes	Carrington	Oakes	Oakes	Oakes						
funding ND	Soybean Council	ND Soybean Council	ND Soybean Council	ND Soybean Council	ND Soybean Council	ND Soybean Council	ND Soybean Council	ND Soybean Council	ND Soybean Council	ND Soybean Council	ND Soybean Council	ND Soybean Council	ND Soybean Council
variety AG	06X8	AG09Xf0	AG11X8	AG009X8	AG06X8	AG09Xf0	AG06X8	XO0602E	X00731E	AG09Xf0	DSR1120	AG11X8	AG09Xf0
brand, maturity Asg	grow, 0.6	Asgrow, 0.9	Asgrow, 1.1	Asgrow, 0.09	Asgrow, 0.6	Asgrow, 0.9	Asgrow, 0.6	Xitavo, 0.6	Xitavo, 0.7	Asgrow, 0.9	Dairyland, 1.1	Asgrow, 1.1	Asgrow, 0.9
row spacing 21 i	inches	21 inches	21 inches	14 inches									
seeding rate 165	i,000 pls/ac	165,000 pls/ac	165,000 pls/ac	165,000 pls/ac	165,000 pls/ac	165,000 pls/ac	165,000 pls/ac	165,000 pls/ac	165,000 pls/ac	165,000 pls/ac	165,000 pls/ac	165,000 pls/ac	165,000 pls/ac
previous crop vari	ious crops	various crops	various crops	sunflowers	sunflowers	sunflowers	dry bean	dry bean	dry bean	dry bean	various	various	various
planting date May	y 4	May 4	May 4	May 17	May 17	May 17	May 27	May 27	May 27	May 27	June 2	June 2	June 2
disease assessment date Sep	ot. 30	Sept. 30	Sept. 30	Oct. 4-5	Oct. 4-5	Oct. 4-5	Oct. 14-19	Oct. 14-19	Oct. 14-19	Oct. 14-19	Oct. 21	Oct. 21	Oct. 21
rows assessed for disease 1		1	1	1	1	1	1	1	1	1	1	1	1
harvest date Oct		Oct. 7-8	Oct. 7-8	Oct. 15-16	Oct. 15-16	Oct. 15-16	Oct. 21	Oct. 20	Oct. 20	Oct. 20	Oct. 21-22	Oct. 21-22	Oct. 21-22
dates, applications 1 and 2 July		July 5, 12	July 5, 19	July 23, 30	July 23, 30	July 23, 30	July 21, 28	July 21, 28	July 21, 28	July 21, 28	July 24, Aug. 5	July 24, Aug. 5	July 24, Aug. 3
interval between applications 7 da	-	7 days	14 days	7 days	7 days	7 days	7 days	7 days	7 days	7 days	12 days	12 days	10 days
growth stage, 1st application 81%					100% R2	100% R2	100%R2	100% R2	98% R2, 100% in bl		100%R2	100%R2	100%R2
canopy closure, 1st application 90-		95-100%	95-100%	90-95%	95-100%	95-100%	99-100%	95%	98-100%	97-100%	95-100%	95-100%	95-100%
nozzles, pressure, 1st application AIX		AIXR110015 50 psi		AIXR110015 50 psi	AIXR110015 50 psi	AIXR110015 50 psi		AIXR110015 50 psi	AIXR110015 50 psi	AIXR110015 50 psi		AIXR110015 50 psi	
droplet size, 1st application coa		coarse											
canopy closure, 2nd application 100		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
nozzles, pressure, 2nd application AIX droplet size, 2nd application coa		AIXR110015 50 psi coarse											
adjuvant non		none											
fungicide spray volume 15		15 gal/ac											
application method han	-	hand-held boom											
Sclerotinia incidence (% of plants)		hand-field boom	nand-field boom		hand-field booth	nand-field boom			nand-neid boom	nand-neid boom		nand-neid boom	
Non-treated control	55 a	43 b	51 b	8 b	77 bc	62 b	92 b	80 b	91 b	79 b	3 a	12 a	8 a
Endura 5.5 oz applied twice	38 a	12 a	17 a	2 a	34 a	19 a	67 a	55 a	71 a	71 a	2 a	4 a	3 a
Topsin 40 fl oz / Endura 5.5 oz	38 a	24 a	29 a	3 a	62 ab	36 a	65 a	54 a	66 a	59 a	1 a	3 a	2 a
CV:	29.9	38.4	37.4	91.7	27.9	32.0	13.0	13.2	11.3	12.9	105.9	78.5	73.2
Sclerotinia severity index (% of canop	oy)												
Non-treated control	38 a	29 b	34 b	4 b	49 b	37 b	86 b	72 b	84 b	70 b	1 a	5 a	3 a
Endura 5.5 oz applied twice	27 a	8 a	10 a	1 a	17 a	6 a	55 a	44 a	58 a	58 a	1 a	1 a	1 a
Topsin 40 fl oz / Endura 5.5 oz	29 a	16 a	16 a	1 a	37 b	15 a	54 a	44 a	54 a	43 a	0 a	1 a	1 a
CV:	36.2	52.1	17.1	117.1	39.4	49.0	15.3	16.5	13.0	15.5	133.6	98.2	84.8
Soybean yield													
Non-treated control	60 a	67 a	68 b	58 a	42 a	41 a	25 b	29 b	21 b	25 b	67 a	73 a	71 a
Endura 5.5 oz applied twice	67 a	76 a	85 a	58 a	59 b	58 a	47 a	47 a	38 a	38 a	68 a	76 a	70 a
Topsin 40 fl oz / Endura 5.5 oz	65 a	73 a	82 a	58 a	48 a	53 a	43 a	44 a	40 a	42 a	68 a	79 a	69 a
CV:	14.7	8.0	11.5	6.1	9.1	9.0	12.1	10.6	13.3	10.6	4.8	5.8	4.8
Topsin/generic (40 fl oz/ac) fo	-	•	ac)			Sclerotinia incider	nce Sclerotir	nia severity index	Yield				
vs Endura (5.5 oz/ac) app	plied twice	sequentially				% of plants	% of car	пору	bu/ac	_			
COMBINED ANALYSIS, 13 studie	es				UNTREATED	51 b	39	b	50 b				
			TOPSIN	40 flozfh F	NDURA 5.5 oz	34 a	24	a	59 a				
Two fungicide applications: early t full R2 + 7-14 days later	to									-			
1011 172 + 1-14 udys later			END	DURA 5.5 oz/a	c applied twice	30 a	22	а	60 a				
					CV	9.9	9.9	9	8.5				
Topsin/generic (40 fl oz/ac) fo	ollowed by I	Endura (5.5 oz/	ac)			Sclerotinia incider	nce Sclerotir	nia severity index	Yield				
vs non-treated						% of plants	% of car	пору	bu/ac	_			
COMBINED ANALYSIS, 13 studie	es				UNTREATED	51 a	39	a	50 a				
Two fungicide applications: early			TOPON							-			
full R2 + 7-14 days later			TOPSIN	1 40 fl oz f.b. E	NDURA 5.5 oz		33% 24		59 a	_18%			
					CV:	: 9	reduction 6.1	reduction	9.6	increase			