

# Improving management of white mold in dry beans: Comparative fungicide efficacy

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# **Methods:**

**APPLICATION TIMING:** Fungicides were applied at early bloom and 10 to 14 days later

**FUNGICIDE SPRAY DROPLET SIZE:** Nozzles and application pressures were generally not adjusted relative to canopy closure.

- Flat-fan nozzles emitting fine or medium droplets were utilized in most applications
- Initial findings from droplet size research conducted on dry beans (primarily pinto and kidney beans) suggest that calibrating fungicide droplet size relative to canopy closure will improve fungicide efficacy.

#### **APPLICATION METHODS:**

- Hand-held boom
- 15 gal/ac spray volume



# **Methods:**

**DATA WERE GENERATED FROM COMPARATIVE EFFICACY STUDIES** funded by the Northarvest Bean Growers Association and by private companies.

- To assess comparative efficacy across multiple studies differing in overall treatment lists, data were analyzed for just the comparisons of interest (for instance, non-treated control vs. ProPulse @ 10.3 fl oz vs. Endura @ 8 oz) for all studies in which these treatments were evaluated.
- Combined analyses were conducted by treating the results from each study as an experimental replicate.
- Analyses were only conducted for fungicides that were evaluated a minimum of 3 times across different studies.



### Topsin (30 fl oz) vs. Endura (8 fl oz/ac) applied twice

# Endura (8 oz) conferred a numerical increase in yield vs. Topsin (30 fl oz) in four of seven studies (just over half of the time).

Statistical separation of these fungicides (P < 0.05) was not observed for disease or yield.

The combined	location year	Carrington	Langdon 2014	Langdon 2012	Carrington 2012	Carrington 2014	Carrington 2020	Carrington 2014	
	canopy closure, 1 <sup>st</sup> application	2012	2014	2012	2012	2014 85%	2020 95%	2014 90%	
analysis showed a	days between applications	13	12	13	13	12	95% 13	90% 12	
trend towards	nozzles, pressure, 1 <sup>st</sup> applic.		XR8001, 40 psi	Al11002, 40 psi	XR8001, 35 psi	XR8001, 35 psi	AIXR110015, 60 psi	XR8001, 35 psi	
slightly better	nozzles, pressure, 2 <sup>nd</sup> applic.		XR8001, 40 psi	Al11002, 40 psi	XR8001, 35 psi	XR8001, 35 psi	AIXR110015, 50 psi	XR8001, 35 psi	
	droplet size		fine	extra-coarse	fine	fine	medium, coarse	fine	
disease control and	application method		hand boom	hand boom	hand boom	hand boom	hand boom	hand boom	
yield with Endura,		'Maverick' pinto	'Lariat' pinto	'Maverick' pinto	'Othello'	'Lariat' pinto	'Palomino' pinto	'Lariat' pinto	AVERAGE
but statistical	row spacing	30 inches	30 inches	30 inches	14 inches	14 inches	14 inches	14 inches	7 studies
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separation was not	White mold	0			10				
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	ac	944		203					
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	<b>Yield</b>		1 944 844	39.33	22 30	245 924 088	1842 2170 1827	2004 2657 2819	23
	<b>Yield</b>	29 31 31	$\rightarrow$	6 6 4	300	300	7 0 7	500	NNN
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the second s		Non-treated control Topsin 30 fl oz/ac Endura 8.0 oz/ac	ontrol oz/ac oz/ac	control fl oz/ac ) oz/ac	ontrol oz/ac oz/ac	Non-treated control Topsin 30 fl oz/ac Endura 8.0 oz/ac	control fl oz/ac ) oz/ac	on-treated control Topsin 30 fl oz/ac Endura 8.0 oz/ac	ontrol oz/ac oz/ac
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NORTHARVEST		n-treated c Fopsin 30 fl Endura 8.0	d c 0 fl 8.0		n-treated c Fopsin 30 fl Endura 8.0	6 c 8.0		n-treated c Fopsin 30 fl Endura 8.0	n-treated c Fopsin 30 fl Endura 8.0
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NIDOL I NORTH DAK	OTA AGRICULTURAL	° L I	Non-treated control Topsin 30 fl oz/ac Endura 8.0 oz/ac	Non-treated Topsin 30 Endura 8.	Non-treated control Topsin 30 fl oz/ac Endura 8.0 oz/ac	° N	Non-treated Topsin 30 Endura 8.	Non-treated control Topsin 30 fl oz/ac Endura 8.0 oz/ac	Non-treated control Topsin 30 fl oz/ac Endura 8.0 oz/ac
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### Topsin (20, 30 or 40 fl oz) vs. Endura (8 oz) applied twice

Topsin @ 40 vs. 20 fl oz: The higher application rate conferred a numerical increase in yield in 3 of 3 studies. Topsin @ 40 vs. 30 fl oz: The higher application rate conferred a numerical increase in yield in 3 of 3 studies. But statistical separation (P < 0.05) was not observed for application rates for Topsin in any individual study or in the combined analysis.

> canopy days

> > nozzle

nozzles

The results suggest that Topsin exhibits a rate response as the application rate increases from 20 to 40 fl oz/ac, but statistical separation was not observed.

Applied at 40 fl oz, Topsin performed very similarly to Endura at 8 oz/ac.

Note that the Topsin label permits only one application at 40 fl oz per season. If Topsin is applied at 40 fl oz, a different fungicide must be utilized if a second fungicide application is made that season.



NDSU NORTH DAKOTA AGRICULTURAL

	Carrington	Langdon	Carrington	
-	2012	2012	2012	
closure, 1 <sup>st</sup> application				
s between applications		13	13	
es, pressure, 1 <sup>st</sup> applic.		AI11002, 40 psi	XR8001, 35 psi	
es, pressure, 2 <sup>nd</sup> applic.	XR8001, 35 psi	Al11002, 40 psi	XR8001, 35 psi	
droplet size		extra-coarse	fine	
application method		hand boom	hand boom	
	'Maverick' pinto	'Maverick' pinto		AVERAGE
row spacing		30 inches		3 studies
White mold percent of canopy	24 8 5 8 8 5 8 8 8 8 7	аааа 21 25 25 25	46 b 48 b 35 ab 26 ab 10 a	35 29 18 13 a <sup>b</sup> a <sup>b</sup> 13 35 20 13
<b>Yield</b> pounds / acre	906 a 274 a 174 a 154 a 154 a	<b>593</b> a 1040 a 1916 a 1399 a 1115 a	271 a 350 a 602 a 917 a 3009 a	<b>923</b> b 222 ab 231 ab 579 a 579 a
≻ă	Non-treated control Topsin 20 fl oz/ac Topsin 30 fl oz/ac Topsin 40 fl oz/ac Endura 8.0 oz/ac	Non-treated control Topsin 20 fl oz/ac Topsin 30 fl oz/ac Topsin 40 fl oz/ac Endura 8.0 oz/ac	Non-treated control Topsin 20 fl oz/ac Topsin 30 fl oz/ac Topsin 40 fl oz/ac Endura 8.0 oz/ac	Non-treated control Topsin 20 fl oz/ac Topsin 30 fl oz/ac Topsin 40 fl oz/ac Endura 8.0 oz/ac

### Topsin (40 fl oz) rotated with Endura (8 oz)

<u>Applying Topsin 1<sup>st</sup> and Endura 2<sup>nd</sup></u> conferred a numerical increase in yield (vs. two applications of Endura) in 6 of 7 studies, with statistical separation (P < 0.05) observed in two studies.

<u>Applying Endura 1<sup>st</sup> and Topsin 2<sup>nd</sup> conferred a numerical increase in yield (vs. two applications of Endura) in 6 of 7 studies,</u> but statistical separation was not observed in any study.

The results suggest applying Topsin in rotation with Endura may be more effective than applying Endura	location Carrington year 2012 canopy closure, 1 <sup>st</sup> application days between applications 13 nozzles, pressure, 1 <sup>st</sup> applic. XR8001, 35 psi droplet size fine application method hand boom variety Maverick' pinto row space	Langdon 2014 12 XR8001, 40 psi XR8001, 40 psi fine hand boom 'Lariat' pinto 30 inches	Langdon 2012 13 A111002, 40 psi A111002, 40 psi extra-coarse hand boom 'Maverick' pinto 30 inches	Carrington 2013 85% 14 XR8001, 35 psi XR8001, 35 psi fine hand boom 'Lariat' pinto 28 inches	Carrington 2013 100% 14 XR8001, 35 psi XR8001, 35 psi fine hand boom 'Lariat' pinto 14 inches	Carrington 2014 85% 12 XR8001, 35 psi XR8001, 35 psi fine hand boom 'Lariat' pinto 14 inches	Carrington 2014 90% 12 XR8001, 35 psi XR8001, 35 psi fine hand boom 'Lariat' pinto 14 inches	AVERAGE 7 studies
Applying Topsin first and Endura second	White mold percent of canopy 24 b 22 a 23 a	33 b 14 a 12 a	36 a 35 a 31 a 25 a	45 b 31 a 27 a 37 a	54 b 31 a 30 a 28 a	<b>72</b> b 38 a 49 a 48 a	83 b 51 a 51 a 51 a	52 30 26 a 20 a 20 a
and Endura second appeared to perform better than the reverse, but statistical separation was not achieved between these treatments.	<mark>Yield</mark> pounds / acre 3571 a 3283 a 3154 a	1188 b 1925a 1937a 1844 a	3593 a 4072 a 4158 a 4115 a	1949 c 3028 a 2814 ab 2656 b	1984 c 3106 a 3074 ab 2789 b	2245 b 3215 a 2981 a 3088 a	2004 b 3141 a 3031 a 2819 a	2267 b 3151 a 3040 a 2924 a
	Non-treated control Topsin 40 fl oz / Endura 8 oz Endura 8 oz / Topsin 40 fl oz Endura 8.0 oz/ac	Non-treated control Topsin 40 fl oz / Endura 8 oz Endura 8 oz / Topsin 40 fl oz Endura 8.0 oz/ac	Non-treated control Topsin 40 fl oz / Endura 8 oz Endura 8 oz / Topsin 40 fl oz Endura 8.0 oz/ac	Non-treated control Topsin 40 fl oz / Endura 8 oz Endura 8 oz / Topsin 40 fl oz Endura 8.0 oz/ac	Non-treated control Topsin 40 fl oz / Endura 8 oz Endura 8 oz / Topsin 40 fl oz Endura 8.0 oz/ac	Non-treated control Topsin 40 fl oz / Endura 8 oz Endura 8 oz / Topsin 40 fl oz Endura 8.0 oz/ac	Non-treated control Topsin 40 fl oz / Endura 8 oz Endura 8 oz / Topsin 40 fl oz Endura 8.0 oz/ac	Non-treated control Topsin 40 fl oz / Endura 8 oz Endura 8 oz / Topsin 40 fl oz Endura 8.0 oz/ac

### Omega (13.6 fl oz) vs. Endura (8 oz) applied twice

#### Omega (13.6 fl oz) performed well when good fungicide coverage was achieved.

- Omega was associated with a numerical increase in yield versus Endura (but not statistical separation) in five of eight studies.
  - Yields were equivalent in one study.
  - In both studies in which Omega was associated with associated with a numerical decrease in yield versus Endura, fungicide coverage in the interior of the canopy was poor.

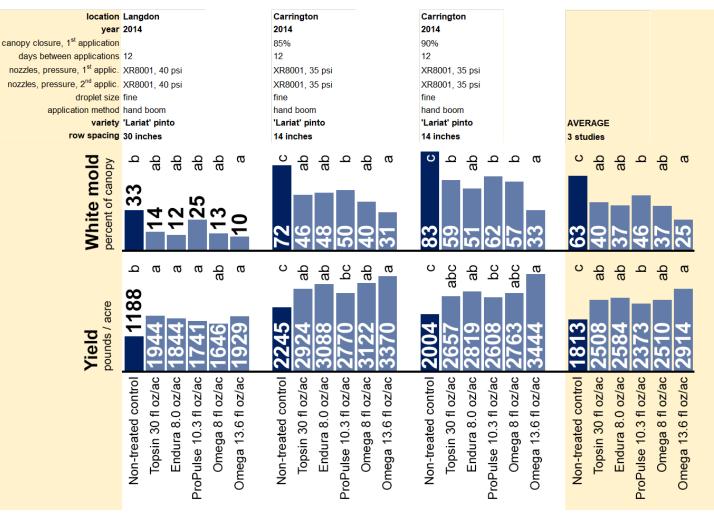
Langdon (2012): fungicides were applied with extra- coarse droplets to pintos with an open canopy. This droplet size was much larger than needed for penetrating the canopy, resulting in poor coverage.	year canopy closure, 1 <sup>st</sup> application days between applications nozzles, pressure, 1 <sup>st</sup> applic. nozzles, pressure, 2 <sup>nd</sup> applic. droplet size application method	13 XR8001, 35 psi XR8001, 35 psi fine hand boom 'Maverick' pinto	Langdon 2014 12 XR8001, 40 psi XR8001, 40 psi fine hand boom 'Lariat' pinto 30 inches	Langdon 2012 13 Al11002, 40 psi Al11002, 40 psi extra-coarse hand boom 'Maverick' pinto 30 inches	Carrington 2013 85% 14 XR8001, 35 psi XR8001, 35 psi fine hand boom 'Lariat' pinto 28 inches	Carrington 2012 13 XR8001, 35 psi XR8001, 35 psi fine hand boom 'Othello' 14 inches	Carrington 2013 100% 14 XR8001, 35 psi XR8001, 35 psi fine hand boom 'Lariat' pinto 14 inches	Carrington 2014 85% 12 XR8001, 35 psi XR8001, 35 psi fine hand boom 'Lariat' pinto 14 inches	Carrington 2014 90% 12 XR8001, 35 psi XR8001, 35 psi fine hand boom 'Lariat' pinto 14 inches	AVERAGE 8 studies
Carrington (2012): fungicides were applied with fine droplets to pintos with a very dense canopy. This droplet size was insufficient for achieving good deposition to the interior of a dense canopy, resulting in poor	White mold percent of canopy	24 2 10 a <sup>b</sup> a <sup>b</sup>	33 b 12 ab 10 a	36 25 21	45 37 23	46 10 30 a b ab	54 28 36	<b>72</b> b 48 a 31 a	a a b	49 27 24
coverage to the interior of the canopy where white mold develops. Omega is a contact fungicide with no systemic movement.	<b>Yield</b> bushels / acre	2906 a <u>3154 a</u> 3685 a	1188 b 1844 a 1929 a	3593 a 4115 a 3632 a	1949 b 2656 a 2701 a	2271 a 3009 a 2310 a	1984 b 2789 a 2783 a	2245 b 3088 a 3370 a	2004 b 2819 a 3444 a	2268 b 2934 a 2982 a
Achieving good fungicide coverage to the target tissues is critical for achieving good white mold control with this fungicide.		Non-treated control Endura 8.0 oz/ac Omega 13.6 fl oz/ac	Non-treated control Endura 8.0 oz/ac Omega 13.6 fl oz/ac	Non-treated control Endura 8.0 oz/ac Omega 13.6 fl oz/ac	Non-treated control Endura 8.0 oz/ac Omega 13.6 fl oz/ac	Non-treated control Endura 8.0 oz/ac Omega 13.6 fl oz/ac	Non-treated control Endura 8.0 oz/ac Omega 13.6 fl oz/ac	Non-treated control Endura 8.0 oz/ac Omega 13.6 fl oz/ac	Non-treated control Endura 8.0 oz/ac Omega 13.6 fl oz/ac	Non-treated control Endura 8.0 oz/ac Omega 13.6 fl oz/ac

### Omega (8 or 13.6 fl oz) vs. competitive standards applied twice

Increasing the application rate of Omega from 8 to 13.6 fl oz/ac resulted in a numerical increase in yield in three of three studies, but statistical separation was not observed.

The results suggest that Omega exhibits a rate response as the application rate increases from 8 to 13.6 fl oz, but statistical separation of these treatments (P < 0.05) was not observed.

Caution - Omega is a contact fungicide with no systemic movement. Achieving good fungicide coverage to the target tissues is critical for achieving good white mold control with this fungicide. See the previous slide for details.



### ProPulse (10.3 fl oz) vs. Endura (8 oz) applied twice

#### Applied twice 10 to 14 days apart to pinto and kidney beans under white mold pressure, **ProPulse** (10.3 fl oz) **and Endura** (8 oz) **performed equivalently.**

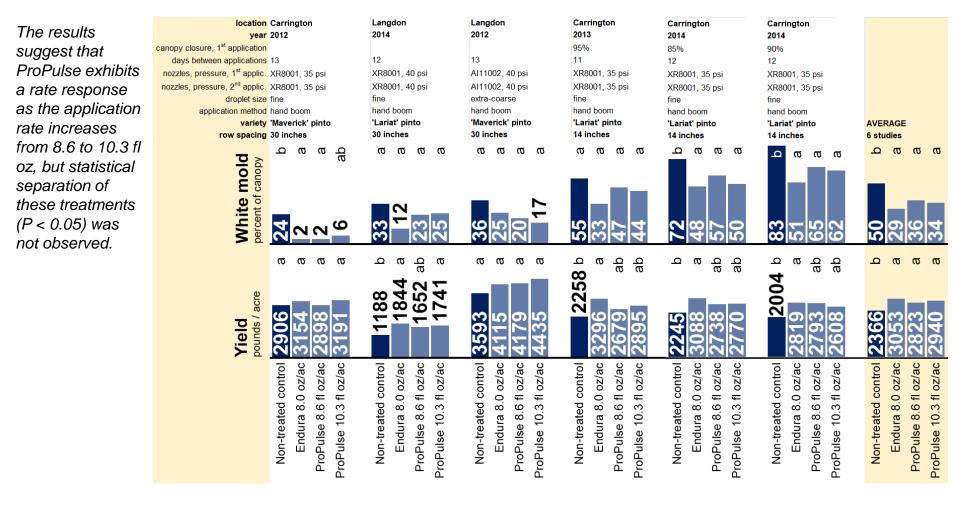
ProPulse (10.3 fl oz) conferred a numerical increase in yield vs. Endura (8 oz) in 6 of 14 studies; Endura conferred a numerical increase in yield vs. ProPulse in 7 of 14 studies; ProPulse and Endura conferred equivalent yields in 1 of 14 studies.

The average disease control and yield response conferred by ProPulse (10.3 fl oz) vs. Endura (8 oz) was virtually identical across 14 studies, and no statistical separation was observed between these fungicides in either the combined analysis or any individual study.

location Carrin	ngton	Carrington	Carrington	Carrington	Carrington	Carrington	Langdon	Langdon	Carrington	Carrington	Carrington	Carrington	Carrington	Carrington	
year 2017		2017	2021	2021	2017	2012	2014	2012			2013	2014	2020	2014	
canopy closure, 1 <sup>st</sup> application 75%				80%	95%				85%		95%	85%		90%	
days between applications 10		10	10	10	10	13	12	13	14	14	11	12	13	12	
nozzles, pressure, 1st applic. DG110		DG110015, 35 psi	DG110015, 30 psi	DG110015, 30 psi			XR8001, 40 psi	Al11002, 40 psi	XR8001, 35 psi	XR8001, 35 psi	XR8001, 35 psi	XR8001, 35 psi	AIXR110015, 60 psi		
nozzles, pressure, 2 <sup>nd</sup> applic. DG110		DG110015, 35 psi	DG110015, 30 psi	DG110015, 30 psi	DG110015, 35 psi	XR8001, 35 psi	XR8001, 40 psi	AI11002, 40 psi	XR8001, 35 psi	XR8001, 35 psi	XR8001, 35 psi	XR8001, 35 psi	AIXR110015, 50 psi		
droplet size mediu				medium	medium	fine	fine	extra-coarse	fine	fine	fine	fine	medium, coarse	fine	
application method hand t					hand boom		hand boom								
variety 'Talon			-			'Maverick' pinto 30 inches	'Lariat' pinto	'Maverick' pinto	'Lariat' pinto	'Lariat' pinto	'Lariat' pinto	'Lariat' pinto		'Lariat' pinto	AVERAGE 14 studies
row spacing 14 inc		28 inches	14 inches	14 inches	_		30 inches	30 inches	28 inches	14 inches					
e mold of canopy	ຫ ຫ	ອ ອ <sup>ອ</sup>	<i>ຫ ຫ</i>	, , , , , , , , , , , , , , , , , , ,	0021 0 0	<b>24</b> b ap	a ge a	a a a	a ge	<b>σσ</b> Ω	<i>ຫ</i> ຫ	<b>σσ</b>	<b>υ υ υ</b>	<b>σ σ</b> Ω	ு க ம
White percent of	5 4	2	3 9 <sub>8</sub>	15 6 6	, <u>, , , , , , , , , , , , , , , , , , </u>	2 9	33 12 25	36 25	45 37 30	54 28 30	<mark>55</mark> 33 44	72 48 50	74 73 68	83 51 62	38 24 25
	ຫ ຫ	ຫ ຫ ຫ	အ ဝ ဝ	ຫ ຫ ຫ	ຫ ຫ ຫ	ຫ ຫ ຫ	~ <b>4</b> <del>2</del> ° ° °		4 <b>9</b> b a a	984 b a a	2 <b>58</b> b a ab	2 <b>45</b> b a ab	42 a 27 a a	0 <b>4</b> b a ab	391b a a
Yield pounds / acre 2469		2887 2916 2812	2600 2768 3068	<u>2562</u> 2778 2782	<mark>2991</mark> 3311 3357	2906 3154 3191	1188 184 174	<u>3593</u> 4115 4435	19 2656 2549	1 2789 2802	<mark>22</mark> 3296 2895	22 3088 2770	18 2369	200 2819 2608	2 2880 2861
Non-treated control	Endura 8.0 oz/ac ProPulse 10.3 fl oz/ac	Non-treated control Endura 8.0 oz/ac ProPulse 10.3 fl oz/ac													

### ProPulse (10.3 fl oz) vs. Endura (8 oz) applied twice

**ProPulse @ 10.3 vs. 8.6 fl oz:** The higher application rate of ProPulse was associated with a numerical increase in yield in 5 of 6 studies, but statistical separation was not observed.



### Topsin (30 fl oz) followed by ProPulse (10.3 fl oz) or Endura (8 oz)

Applying Topsin (30 fl oz) at early bloom followed by **ProPulse** (10.3 fl oz) 10-14 days later was associated with a numerical increase in yield (vs. Topsin / Endura) in 4 of 5 studies, but statistical separation was not observed.

				/	(	- /
	Carrington	Carrington	Carrington	Carrington	Carrington	
year t		2021	2019	2017	2014	
canopy closure, 1 <sup>st</sup> application		75%		95%	95%	
days between applications		10	14	10	12	
nozzles, pressure, 1 <sup>st</sup> applic.		DG110015, 30 psi	AIXR110015, 50 psi	DG80015, 35 psi	XR8001, 35 psi	
nozzles, pressure, 2 <sup>nd</sup> applic.		DG110015, 30 psi	XR11002, 30 psi	DG80015, 35 psi	XR8001, 35 psi	
	medium, medium	medium, medium	medium, fine	medium, medium	fine, fine	
application method	'Palomino' pinto	hand boom 'Palomino' pinto	hand boom 'Palomino' pinto	hand boom 'Palomino' pinto	hand boom <b>'Palomino' pinto</b>	AVERAGE
row spacing		14 inches	14 inches	14 inches	14 inches	5 studies
row opcomy				14 1101100		o otaaloo
t <b>mold</b> f canopy	a ab	<u>,</u> , , ,	ຫ ຫ ຫ	ຫ ຫ ຫ	ס מ	b ab ab
White mold	10 6	33 9 16	38 26 30	7 6 4	78 40 43	33 17 2(
	ຫ ຫ ຫ	a a b	a a b	<i>ຫ</i> ຫ	<i>ത</i> ത <u>വ</u>	a b ab
Yield pounds / acre	2967 3129 2877	3149 3743 3599	<u>1948</u> 2722 2311	1904 2128 2230	<mark>2593</mark> 3495 3247	2512 3043 2853
	Non-treated control Topsin 30 fl oz / ProPulse 10.3 fl oz Topsin 30 fl oz / Endura 8.0 oz/ac	Non-treated control Topsin 30 fl oz / ProPulse 10.3 fl oz Topsin 30 fl oz / Endura 8.0 oz/ac	Non-treated control Topsin 30 fl oz / ProPulse 10.3 fl oz Topsin 30 fl oz / Endura 8.0 oz/ac	Non-treated control Topsin 30 fl oz / ProPulse 10.3 fl oz Topsin 30 fl oz / Endura 8.0 oz/ac	Non-treated control Topsin 30 fl oz / ProPulse 10.3 fl oz Topsin 30 fl oz / Endura 8.0 oz/ac	Non-treated control Topsin 30 fl oz / ProPulse 10.3 fl oz Topsin 30 fl oz / Endura 8.0 oz/ac

### **Topsin** (30 fl oz) rotated with **ProPulse** (10.3 fl oz)

Applying Topsin (30 fl oz) at early bloom followed by **ProPulse** (10.3 fl oz) 10-14 days later was associated with a numerical increase in yield (vs. ProPulse f.b. Topsin) in 4 of 5 studies, but statistical separation was not observed.

,			···· · · ·		- /	
location	Carrington	Carrington	Carrington	Carrington	Carrington	
-	2015	2021	2019	2017	2014	
canopy closure, 1 <sup>st</sup> application		75%		95%	95%	
days between applications		10	14	10	12	
nozzles, pressure, 1 <sup>st</sup> applic.		DG110015, 30 psi	AIXR110015, 50 psi	· · ·	XR8001, 35 psi	
nozzles, pressure, 2 <sup>nd</sup> applic.		DG110015, 30 psi	XR11002, 30 psi	DG80015, 35 psi	XR8001, 35 psi	
	medium, medium	medium, medium	medium, fine	medium, medium	fine, fine	
application method		hand boom	hand boom	hand boom	hand boom	
row spacing	'Palomino' pinto	'Palomino' pinto 14 inches	'Palomino' pinto 14 inches	'Palomino' pinto 14 inches	'Palomino' pinto 14 inches	AVERAGE 5 studies
Tow spacing	14 mones	5 studies				
<b>mold</b> canopy	a a b a	ס ס ב	<i>ຫ</i> ຫ	ຫ ຫ ຫ	ממ ב	b ab
White mold percent of canopy	10 6	33 9 16	30 30 30	6 4	78 40 43	33 17 20
ω	ກ ກ ກ	a a b	a a b	<i>ຫ ຫ ຫ</i>	<i>ຫ</i> ຫ <u>ດ</u>	b ab
<b>Yield</b> pounds / acre	<mark>2967</mark> 3129 2877	3149 3743 3599	1948 2722 2311	1904 2128 2230	<mark>2593</mark> 3495 3247	<mark>2512</mark> 3043 2853
	Non-treated control Topsin 30 fl oz / ProPulse 10.3 fl oz Topsin 30 fl oz / Endura 8.0 oz/ac	Non-treated control Topsin 30 fl oz / ProPulse 10.3 fl oz Topsin 30 fl oz / Endura 8.0 oz/ac	Non-treated control Topsin 30 fl oz / ProPulse 10.3 fl oz Topsin 30 fl oz / Endura 8.0 oz/ac	Non-treated control Topsin 30 fl oz / ProPulse 10.3 fl oz Topsin 30 fl oz / Endura 8.0 oz/ac	Non-treated control Topsin 30 fl oz / ProPulse 10.3 fl oz Topsin 30 fl oz / Endura 8.0 oz/ac	Non-treated control Topsin 30 fl oz / ProPulse 10.3 fl oz Topsin 30 fl oz / Endura 8.0 oz/ac



# Thank You!

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 $NDSU \underset{\text{experiment station}}{\text{NDSU}} \underset{\text{experiment station}}{\text{NDSU}}$ 

