

Improving white mold management in dry beans:

Comparative fungicide efficacy – general methods

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Market class = pinto in most studies; kidney in some studies

Row spacing = 14 inches in most studies; 28 inches in some studies

Seeding rate = 90,000 viable seeds/ac in most studies; sometimes 80,000 viable seeds/ac

Fungicide spray volume = 15 gal/ac.

Fungicides applied with a hand-held boom pressurized by CO₂.

Fungicide spray droplet size: fine or medium in studies conducted from 2010-2021; fine, medium or coarse, calibrated relative to canopy density and lodging, from 2022-2024.

Number of fungicide applications: two

Application timing, first fungicide application: early bloom and initial pin pod-pod

Interval between fungicide applications: 7 to 14 days later, depending on study

Number of experimental replicates = 5 or 6 replicates (most studies)

White mold assessment: Assessed at or near dry bean maturity by evaluating every plant individually in for the percent of the plant impacted by white mold.

Harvest: To ensure that variability in dry bean standability did not bias yields, plants were clipped at base concurrent with disease assessments, wind-rowed to dry, and manually lifted into the combine.

Supplemental irrigation: Supplemental overhead irrigation was applied as needed to establish the white mold disease pressure needed to evaluate fungicide performance.

1. Fungicides and fungicide application rates that can be applied twice in-season

Testing was conducted with two sequential applications of the same fungicide with the goal of rigorously assessing comparative efficacy.

These comparative efficacy results are provided to help facilitate informed decisions for selecting products for application once or twice in-season, either alone or in rotation with another fungicide.

Comparative fungicide efficacy: Management of white mold in dry edible beans

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Endura: active ingredient, boscalid (FRAC 7) Miravis Neo: azoxystrobin (FRAC 11), propiconazole (FRAC 3), pydiflumetofen (FRAC 7)

Miravis Neo (13.7 fl oz) versus Endura (8 oz)

Two sequential applications of the same fungicide (early bloom/pin-pod + 13 or 14 days apart)

location	Carrington	Carrington	Carrington	Carrington	Carrington	COMBINED ANALYSIS 5 studies
year	2019	2022	2022	2023	2024	
canopy closure, 1 st application		95-97%	90-95%	90-95%	85-95%	
days between applications	12	14	14	12	7	
nozzles, pressure, first fungicide application	AIXR110015 50 psi	DG110015 40 psi	DG110015 40 psi	DG110015 30 psi	DG110015 30 psi	
nozzles, pressure, 2 nd fungicide application	XR11002 X 30 psi	AIXR110015 60 psi	AIXR110015 60 psi	AIXR110015 60 psi	AIXR110015 60 psi	
droplet size, applic. #1	medium	fine	fine	medium	medium	
droplet size, applic. #2	fine	medium	medium	medium	medium	
market class	pinto	pinto	LR kidney	pinto	pinto	
variety	'Palomino'	'Lariat'	'Rosie'	'Vibrant'	'Vibrant'	
row spacing	14 inches	14 inches	14 inches	14 inches	14 inches	
WHITE MOLD SEVERITY (% of canopy)						White mold (%)
Non-treated control	25 b	92 b	60 b	56 a	70 a	70 b
Endura 8.0 oz/ac	3 a	83 a	37 a	44 a	66 a	58 a
Miravis Neo 13.7 fl oz/ac	20 b	92 b	64 b	55 a	66 a	69 b
CV:	25.6	4.8	14.2	26.3	10.5	10.3
YIELD (lbs/ac)						Yield (lbs/ac)
Non-treated control	3510 a	1286 b	2267 b	2327 b	1226 a	1776 b
Endura 8.0 oz/ac	3838 a	2147 a	3010 a	3128 a	1578 a	2466 a
Miravis Neo 13.7 fl oz/ac	3317 a	1361 b	2209 b	2555 ab	1478 a	1901 b
CV:	9.7	16.4	7.4	14.8	16.0	7.4

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Endura: boscalid (FRAC 7) ProPulse: prothioconazole (FRAC 3) + fluopyram (FRAC 7)

Miravis Neo: azoxystrobin (FRAC 11), propiconazole (FRAC 3), pydiflumetofen (FRAC 7)

Miravis Neo (13.7 fl oz) versus ProPulse (10.3 fl oz), Endura (8 oz)

Two sequential applications of the same fungicide (early bloom/pin-pod + 13 or 14 days apart)

	location Carrington	Carrington	Carrington	Carrington	COMBINED ANALYSIS 4 studies
year	2022	2022	2023	2024	
canopy closure, 1 st application	95-97%	90-95%	90-95%	85-95%	
days between applications	14	14	12	7	
nozzles, pressure, 1 st applic.	DG110015, 40 psi	DG110015, 40 psi	DG110015, 30 psi	DG110015, 30 psi	
nozzles, pressure, 2 nd applic.	AIXR110015, 60 psi	AIXR110015, 60 psi	AIXR110015, 60 psi	AIXR110015, 60 psi	
droplet size	fine, medium	fine, medium	medium, medium	medium, medium	
variety	'Lariat' pinto	'Rosie' LR Kidney	'Vibrant' pinto	'Vibrant' pinto	
row spacing	14 inches	14 inches	14 inches	14 inches	
WHITE MOLD SEVERITY (% of canopy)					White mold (%)
Non-treated control	92 b	60 b	56 a	70 a	70 b
Endura 8.0 oz/ac	83 a	37 a	44 a	66 a	58 a
ProPulse 10.3 fl oz/ac	88 ab	46 a	30 a	62 a	57 a
Miravis Neo 13.7 fl oz/ac	92 b	64 b	55 a	66 a	69 b
CV:	4.8	14.2	26.3	10.5	10.4
YIELD (lbs/ac)					Yield (lbs/ac)
Non-treated control	1286 b	2267 b	2327 c	1226 a	1776 b
Endura 8.0 oz/ac	2147 a	3010 a	3128 ab	1578 a	2466 a
ProPulse 10.3 fl oz/ac	1745 ab	2702 a	3426 a	1736 a	2402 a
Miravis Neo 13.7 fl oz/ac	1361 b	2209 b	2555 bc	1478 a	1901 b
CV:	16.4	7.4	14.8	16.0	9.3

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Endura: active ingredient, boscalid (FRAC 7) Aproach: picoxystrobin (FRAC 11)

Endura 8 oz versus Aproach 12 fl oz

Two sequential applications of the same fungicide (early bloom/pin-pod + 11, 13, or 14 days apart)

	location	Carrington	Langdon	Carrington	Carrington	Carrington	Carrington	Carrington	Carrington	COMBINED ANALYSIS 7 studies
	year	2012	2012	2013	2013	2010	2012	2013	2019	
	days between applications	13	13	14	14	11	13	14	14	
	nozzles, pressure, first fungicide application	XR8001 35 psi	AI11002 40 psi	XR8001 35 psi	XR8001 35 psi	XR80015 35 psi	XR8001 35 psi	XR8001 35 psi	AIXR110015 50 psi	
	nozzles, pressure, 2 nd fungicide application	XR8001 35 psi	AI11002 40 psi	XR8001 35 psi	XR8001 35 psi	XR80015 35 psi	XR8001 35 psi	XR8001 35 psi	XR11002 30 psi	Approach @ 12 fl oz/ac
	droplet size, applic. #1	fine	extra coarse	fine	fine	fine	fine	fine	medium	
	droplet size, applic. #2	fine	extra coarse	fine	fine	fine	fine	fine	fine	
	market class	pinto	pinto	pinto	pinto	pinto	pinto	pinto	pinto	
	variety	'Maverick'	'Maverick'	'Lariat'	'Lariat'	'Lariat'	'Maverick'	'Lariat'	'Palomino'	
	row spacing	30 inches	30 inches	28 inches	14 inches	15 inches	15 inches	14 inches	14 inches	White mold (%)
WHITE MOLD SEVERITY (% of canopy)										
Non-treated control		24 b	36 a	45 a	54 b	66 b	56 b	54 b	37 b	
Endura 8 oz/ac		2 a	25 a	37 a	28 a	46 a	5 a	36 a	5 a	
Approach 8 fl oz/ac						65 b				
Approach 9 fl oz/ac							57 b			
Approach 10 fl oz/ac									38 b	
Approach 12 fl oz/ac		9 ab	34 a	38 a	37 a	69 b	42 b	59 b		
CV:		78.4	2.24	31.1	32.7		8.2	15.0	36.5	
YIELD (lbs/ac)										
Non-treated control		2906 a	3593 a	1949 b	1984 b	2419 a	2162 b	2459 b	3190 a	
Endura 8 oz/ac		3154 a	4115 a	2656 a	2789 a	3172 a	2750 a	3185 a	3472 a	
Approach 8 fl oz/ac						2237 a				
Approach 9 fl oz/ac							2020 b			
Approach 10 fl oz/ac									3529 a	
Approach 12 fl oz/ac		3198 a	4005 a	1927 b	2168 b	2525 a	2183 b	2492 b		
CV:		12.4	0.72	9.9	9.4		14.8	9.6	10.0	

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Endura: active ingredient, boscalid (FRAC 7) Priaxor: pyraclostrobin (FRAC 11) + fluxapyroxad (FRAC 7)

Endura followed by Endura versus Endura f.b. Priaxor

Two-application fungicide program (early bloom/pin-pod + 7, 12 or 13 days apart)

	location	Carrington	Carrington	Carrington	Carrington	Carrington	COMBINED ANALYSIS 5 studies
	year	2020	2012	2014	2019	2024	
	days between applications	13	13	13	12	7	
nozzles, pressure, first fungicide application		AIXR110015 60 psi	XR8001 35 psi	XR8001 35 psi	AIXR110015 50 psi	DG110015 30 psi	
nozzles, pressure, 2 nd fungicide application		AIXR110015 50 psi	XR8001 35 psi	XR8001 35 psi	XR11002 30 psi	AIXR110015 60 psi	
droplet size, applic. #1	medium	fine	fine	medium	medium		
droplet size, applic. #2	medium	fine	fine	fine	medium		
market class	pinto	pinto	pinto	pinto	pinto		
variety	'Palomino'	'Maverick'	'ND-307'	'Palomino'	'Vibrant'		
row spacing	14 inches	15 inches	14 inches	14 inches	14 inches		
WHITE MOLD SEVERITY (% of canopy)							White mold (%)
Non-treated control	74 a	11 b	74 a	25 b	70 a		51 b
Endura 8.0 oz/ac	55 a	1 a	62.6 a	3 a	66 a		38 a
Endura 8.0 oz/ac / Priaxor 4 fl oz/ac	67 a	1 a	62.5 a	12 b	74 a		43 ab
CV:	16.4	53.6	14.9	25.6	10.5		10.8
YIELD (lbs/ac)							Yield (lbs/ac)
Non-treated control	1842 a	2566 a	1992 a	3510 a	1226 a		2227 a
Endura 8.0 oz/ac	2692 a	2663 a	2151 a	3838 a	1578 a		2584 a
Endura 8.0 oz/ac / Priaxor 4 fl oz/ac	1897 a	2697 a	2261 a	3805 a	1285 a		2389 a
CV:	18.4	12.5	10.8	9.7	16.0		8.3



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