

Improving white mold management in dry beans:

Comparative fungicide efficacy – general methods

Michael Wunsch, Jesse Hafner, Suanne Kallis, Aaron Fauss, Thomas Miorini, Billy Kraft, Michael Schaefer
North Dakota State University Carrington Research Extension Center

Scott Halley and Amanda Arens, NDSU Langdon Research Extension Center

Questions should be directed to Michael Wunsch (michael.wunsch@ndsu.edu, 701-652-2951)

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.

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Endura: active ingredient, boscalid (FRAC 7)

Omega: active ingredient, fluazinam (FRAC 29)

Endura 8 oz versus Omega 13.6 fl oz

Two sequential applications of the same fungicide (early bloom/pin-pod + 12, 13, or 14 days apart)

	location	Carrington	Langdon	Langdon	Carrington	Carrington	Carrington	Carrington	Carrington	Carrington
	year	2012	2014	2012	2013	2012	2013	2014	2014	2023
	days between applications	13	12	13	14	13	14	12	12	13
nozzles, pressure, first fungicide application	XR8001 35 psi	XR8001 40 psi	AI11002 40 psi	XR8001 35 psi	XR8001 35 psi	XR8001 35 psi	XR8001 35 psi	XR8001 35 psi	XR8001 35 psi	DG110015 30 psi
nozzles, pressure, 2 nd fungicide application	XR8001 35 psi	XR8001 40 psi	AI11002 40 psi	XR8001 35 psi	XR8001 35 psi	XR8001 35 psi	XR8001 35 psi	XR8001 35 psi	XR8001 35 psi	AIXR110015 60 psi
droplet size, applic. #1	fine	fine	extra coarse	fine	fine	fine	fine	fine	fine	medium
droplet size, applic. #2	fine	fine	extra coarse	fine	fine	fine	fine	fine	fine	medium
market class	pinto	pinto	pinto	pinto	pinto	pinto	pinto	pinto	pinto	DR Kidney
variety	'Maverick'	'Lariat'	'Maverick'	'Lariat'	'Othello'	'Lariat'	'Lariat'	'Lariat'	'Lariat'	'Red hawk'
row spacing	30 inches	30 inches	30 inches	28 inches	14 inches	14 inches	14 inches	14 inches	14 inches	14 inches

WHITE MOLD SEVERITY (% of canopy)

Non-treated control	24 b	33 b	36 a	45 b	46 b	54 b	72 b	83 b	34 a	65 b
Endura 8 oz/ac	2 a	12 ab	25 a	37 b	10 a	28 a	48 a	51 a	22 a	50 ab
Omega 13.6 fl oz/ac	10 ab	10 a	21 a	23 a	30 ab	36 a	31 a	33 a	13 a	41 a
CV:	78.4	20.5	2.24	31.1	35.3	32.7	9.0	13.9	42.8	4.9

YIELD (lbs/ac)

Non-treated control	2906 a	1188 b	3593 a	1949 b	2271 a	1984 b	2245 b	2004 b	2579 b	1963 b
Endura 8 oz/ac	3154 a	1844 a	4115 a	2656 a	3009 a	2789 a	3088 a	2819 a	2994 ab	2774 ab
Omega 13.6 fl oz/ac	3685 a	1929 a	3632 a	2701 a	2310 a	2783 a	3370 a	3444 a	3182 a	3018 a
CV:	12.4	14.1	0.72	9.9	19.6	9.4			9.5	16.3

	White mold (%)	Yield (lbs/ac)	COMBINED ANALYSIS 10 studies
Non-treated control	49 b	2268 b	
Endura 8 oz/ac	29 a	2924 a	
Omega 13.6 fl oz/ac	25 a	3005 a	
CV:	23.2	9.5	

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Topsin/T-methyl: active ingredient, thiophanate-methyl (FRAC 1) Omega: active ingredient, fluazinam (FRAC 29)

Topsin/generic (30 fl oz) versus Omega (13.6 fl oz)

Two sequential applications of the same fungicide (early bloom/pin-pod + 12 or 13 days apart)

location	Carrington	Langdon	Langdon	Carrington	Carrington	Carrington	COMBINED ANALYSIS 6 studies
year	2012	2014	2012	2012	2014	2014	
days between applications	13	12	13	13	12	12	
nozzles, pressure, first fungicide application	XR8001 35 psi	XR8001 40 psi	AI11002 40 psi	XR8001 35 psi	XR8001 35 psi	XR8001 35 psi	
nozzles, pressure, 2 nd fungicide application	XR8001 35 psi	XR8001 40 psi	AI11002 40 psi	XR8001 35 psi	XR8001 35 psi	XR8001 35 psi	
droplet size, applic. #1	fine	fine	extra-coarse	fine	fine	fine	
droplet size, applic. #2	fine	fine	extra-coarse	fine	fine	fine	
market class	pinto	pinto	pinto	pinto	pinto	pinto	
variety	'Maverick'	'Lariat'	'Maverick'	'Othello'	'Lariat'	'Lariat'	
row spacing	30 inches	30 inches	30 inches	14 inches	14 inches	14 inches	
WHITE MOLD SEVERITY (% of canopy)							White mold (%)
Non-treated control	24 a	33 b	36 a	46 a	72 b	83 c	49 b
Topsin 30 fl oz/ac	5 a	14 ab	21 a	35 a	46 a	59 b	30 a
Omega 13.6 fl oz/ac	10 a	10 a	21 a	30 a	31 a	33 a	23 a
CV:	78.4	20.5	2.24	35.3	9.0	13.9	24.0
YIELD (lbs/ac)							Yield (lbs/ac)
Non-treated control	2906 a	1188 b	3593 a	2271 a	2245 b	2004 b	2368 b
Topsin 30 fl oz/ac	3174 a	1944 a	3916 a	2602 a	2924 a	2657 ab	2870 a
Omega 13.6 fl oz/ac	3685 a	1929 a	3632 a	2310 a	3370 a	3444 a	3062 a
CV:	12.4	14.1		19.6			11.2

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ProPulse: active ingredients, fluopyram (FRAC 7) + prothioconazole (FRAC 3) Omega: active ingredient, fluazinam (FRAC 29)

ProPulse (10.3 fl oz) versus Omega (13.6 fl oz)

Two sequential applications of the same fungicide (early bloom/pin-pod + 12, 13 or 14 days apart)

	location Carrington	Langdon	Langdon	Carrington	Carrington	Carrington	Carrington	COMBINED ANALYSIS 7 studies
year	2012	2014	2012	2013	2013	2014	2014	
days between applications	13	12	13	14	14	12	12	
nozzles, pressure, first fungicide application	XR8001 35 psi	XR8001 40 psi	AI11002 40 psi	XR8001 35 psi	XR8001 35 psi	XR8001 35 psi	XR8001 35 psi	
nozzles, pressure, 2 nd fungicide application	XR8001 35 psi	XR8001 40 psi	AI11002 40 psi	XR8001 35 psi	XR8001 35 psi	XR8001 35 psi	XR8001 35 psi	
droplet size, applic. #1	fine	fine	extra-coarse	fine	fine	fine	fine	
droplet size, applic. #2	fine	fine	extra-coarse	fine	fine	fine	fine	
market class	pinto	pinto	pinto	pinto	pinto	pinto	pinto	
variety	'Maverick'	'Lariat'	'Maverick'	'Lariat'	'Lariat'	'Lariat'	'Lariat'	
row spacing	30 inches	30 inches	30 inches	28 inches	14 inches	14 inches	14 inches	
WHITE MOLD SEVERITY (% of canopy)								White mold (%)
Non-treated control	24 a	33 b	36 a	45 b	54 b	72 c	83 c	50 b
ProPulse 10.3 fl oz/ac	6 a	25 ab	17 a	30 a	30 a	50 b	62 b	31 a
Omega 13.6 fl oz/ac	10 a	10 a	21 a	23 a	36 a	31 a	33 a	24 a
CV:	78.4	20.5	2.24	31.1	32.7	9.0	13.9	23.8
YIELD (lbs/ac)								Yield (lbs/ac)
Non-treated control	2906 a	1188 b	3593 a	1949 b	1984 b	2245 b	2004 b	2267 b
ProPulse 10.3 fl oz/ac	3191 a	1741 a	4435 a	2549 a	2802 a	2770 b	2608 b	2871 a
Omega 13.6 fl oz/ac	3685 a	1929 a	3632 a	2701 a	2783 a	3370 a	3444 a	3078 a
CV:	12.4	14.1		9.9	9.4			10.6

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ProPulse: active ingredients, fluopyram (FRAC 7) + prothioconazole (FRAC 3) Omega: active ingredient, fluazinam (FRAC 29)

ProPulse (8.6 fl oz) versus Omega (13.6 fl oz)

Two sequential applications of the same fungicide (early bloom/pin-pod + 12 or 13 days apart)

	location Carrington	Langdon	Langdon	Carrington	Carrington	Carrington	Carrington	Carrington	COMBINED ANALYSIS 8 studies
year	2012	2014	2012	2012	2014	2014	2023	2023	
days between applications	13	12	13	13	12	12	13	13	
nozzles, pressure, first fungicide application	XR8001 35 psi	XR8001 40 psi	AI11002 40 psi	XR8001 35 psi	XR8001 35 psi	XR8001 35 psi	DG110015 30 psi	DG110015 30 psi	
nozzles, pressure, 2 nd fungicide application	XR8001 35 psi	XR8001 40 psi	AI11002 40 psi	XR8001 35 psi	XR8001 35 psi	XR8001 35 psi	AIXR110015 60 psi	AIXR110015 60 psi	
droplet size, applic. #1	fine	fine	extra-coarse	fine	fine	fine	medium	medium	
droplet size, applic. #2	fine	fine	extra-coarse	fine	fine	fine	coarse	coarse	
market class	pinto	pinto	pinto	pinto	pinto	pinto	DR kidney	pinto	
variety	'Maverick'	'Lariat'	'Maverick'	'Othello'	'Lariat'	'Lariat'	'Red hawk'	'Vibrant'	
row spacing	30 inches	30 inches	30 inches	14 inches	14 inches	14 inches	14 inches	14 inches	
WHITE MOLD SEVERITY (% of canopy)									White mold (%)
Non-treated control	24 b	33 b	36 a	46 a	72 b	83 b	34 a	65 b	49 c
ProPulse 8.6 fl oz/ac	2 a	23 ab	20 a	43 a	57 b	65 b	26 a	56 ab	37 b
Omega 13.6 fl oz/ac	10 ab	10 a	21 a	30 a	31 a	33 a	13 a	41 a	24 a
CV:	78.4	20.5	2.24	35.3	9.0	13.9	42.8	4.9	21.7
YIELD (lbs/ac)									Yield (lbs/ac)
Non-treated control	2906 a	1188 b	3593 a	2271 a	2245 b	2004 b	2579 b	1963 b	2344 b
ProPulse 8.6 fl oz/ac	2898 a	1652 ab	4179 a	2291 a	2738 b	2793 ab	3037 ab	2664 ab	2782 a
Omega 13.6 fl oz/ac	3685 a	1929 a	3632 a	2310 a	3370 a	3444 a	3182 a	3018 a	3071 a
CV:	12.4	14.1		19.6			9.5	16.3	10.8

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Endura: active ingredient, boscalid (FRAC 7) Omega: fluazinam (FRAC 29)

Topsin: thiophanate-methyl (FRAC 1) ProPulse: prothioconazole (FRAC 3) + fluopyram (FRAC 7)

Omega 8 or 13.6 fl oz versus Endura 8 oz, Topsin 30 fl oz, ProPulse 10.3 fl oz

Two sequential applications of the same fungicide (early bloom/pin-pod + 12 days apart)

location	Langdon	Carrington	Carrington	COMBINED ANALYSIS 3 studies
year	2014	2014	2014	
days between applications	12	12	12	
nozzles, pressure, 1 st application	XR8001, 40 psi	XR8001, 35 psi	XR8001, 35 psi	
nozzles, pressure, 2 nd application	XR8001, 40 psi	XR8001, 35 psi	XR8001, 35 psi	
droplet size	fine	fine	fine	
variety	'Lariat' pinto	'Lariat' pinto	'Lariat' pinto	
row spacing	30 inches	14 inches	14 inches	
WHITE MOLD SEVERITY (% of canopy)				White mold (%)
Non-treated control	33 b	72 c	83 c	63 c
ProPulse 10.3 fl oz/ac	25 ab	50 b	62 b	46 b
Topsin 30 fl oz/ac	14 ab	46 ab	59 b	40 ab
Omega 8 fl oz/ac	13 ab	40 ab	57 b	37 ab
Endura 8 oz/ac	12 ab	48 ab	51 ab	37 ab
Omega 13.6 fl oz/ac	10 a	31 a	33 a	25 a
CV:	20.5	9.0	13.9	13.2
YIELD (lbs/ac)				Yield (lbs/ac)
Non-treated control	1188 b	2245 c	2004 c	1813 c
ProPulse 10.3 fl oz/ac	1741 a	2770 bc	2608 bc	2373 b
Topsin 30 fl oz/ac	1944 a	2924 ab	2657 abc	2508 ab
Omega 8 fl oz/ac	1646 ab	3122 ab	2763 abc	2510 ab
Endura 8 oz/ac	1844 a	3088 ab	2819 ab	2584 ab
Omega 13.6 fl oz/ac	1929 a	3370 a	3444 a	2914 a
CV:	14.1			6.5

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Proline: active ingredient, prothioconazole (FRAC 3) Omega: active ingredient, fluazinam (FRAC 29)

Proline (5.7 fl oz) versus Omega (13.6 fl oz)

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

location	Carrington	Langdon	Carrington	Carrington	Carrington	COMBINED ANALYSIS 5 studies
year	2012	2012	2013	2012	2013	
days between applications	13	13	14	13	14	
nozzles, pressure, first fungicide	XR8001	AI11002	XR8001	XR8001	XR8001	
application	35 psi	40 psi	35 psi	35 psi	35 psi	
nozzles, pressure, 2 nd fungicide	XR8001	AI11002	XR8001	XR8001	XR8001	
application	35 psi	40 psi	35 psi	35 psi	35 psi	
droplet size, applic. #1	fine	extra-coarse	fine	fine	fine	
droplet size, applic. #2	fine	extra-coarse	fine	fine	fine	
market class	pinto	pinto	pinto	pinto	pinto	
variety	'Maverick'	'Maverick'	'Lariat'	'Othello'	'Lariat'	
row spacing	30 inches	30 inches	28 inches	14 inches	14 inches	
WHITE MOLD SEVERITY (% of canopy)						White mold (%)
Non-treated control	24 a	36 a	45 b	46 a	54 b	41 b
Proline 5.7 fl oz/ac	14 a	29 a	46 b	53 a	43 ab	37 b
Omega 13.6 fl oz/ac	10 a	21 a	23 a	30 a	36 a	24 a
CV:	78.4	2.24	31.1	35.3	32.7	15.0
YIELD (lbs/ac)						Yield (lbs/ac)
Non-treated control	2906 a	3593 a	1949 c	2271 a	1984 c	2541 b
Proline 5.7 fl oz/ac	3428 a	4012 a	2309 b	1982 a	2379 b	2822 ab
Omega 13.6 fl oz/ac	3685 a	3632 a	2701 a	2310 a	2783 a	3022 a
CV:	12.4	0.72	9.9	19.6	9.4	9.0



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