



WINTER WHEAT VARIETY CHARACTERIZATION CHART

Variety	Test Wgt	Protein	WQL Rating <small>2019 * => 3 year data</small>	Falling # Rank (WSU)	Heading TMC, WSU, OSU	Plant Hgt	Lodging TMC, WSU, OSU	PLS TMC	Spring Vigor TMC	Frost Tolerance 2020 TMC
M-idas	Good	Low		Moderate	Early	MS	Fair	Tolerant	Strong	Fair
M-PRESS	Good	Low	D	Moderate	Medium	MS	Excellent	Mod Tol	Strong	V Good
Nixon	Good	Med Low	MD	Higher	Med Early	MT	Very Good	Sensitive	Med Slow	Excellent
NW Duet	Good	Med Low	D	Higher	Med Late	Tall	Good	Tolerant	Good	V Good
NW Tandem	Very Good	Low	A	Higher	Med Early	SHT	Excellent	Tolerant	Med Slow	Excellent
Devote			D*	Moderate	Late	Med	Good	Sensitive	Good	Good
Jasper	Fair	Medium	MD	Below	Med Late	MT	Good	Tolerant		
Puma	Good	Med High	MD	Good	Med Late	MT	Good	Mod Tol	Slow	V Good
Purl	Good	Medium	A	Moderate	Medium	MT	Fair	Tolerant	Strong	Good
AP Dynamic	Fair	Med High	D*	Moderate	Medium	MT	Good	Mod Sen	Good	Fair
AP Illiad	Fair	Med Low		Good	Med Early	MS	Very Good	Tolerant	Strong	Excellent
SY Assure	Excellent	Med Low	D	Good	Early	Med	Very Good	Mod Tol		
SY Command	Fair	Med Low	D	Good	Medium	MS	Excellent	Mod Sen	Med Slow	Excellent
SY Dayton	Good	Med Low	D	Moderate	Medium	Med	Good	Tolerant	Med Slow	Excellent
SY Ovation	Good	Med Low	D/ poor FN	Below	Medium	Med	Very Good	Tolerant	Med Slow	V Good
SY Raptor	Fair	Med Low	D/ poor FN	Below	Med Early	Med	Good	Tolerant	Good	Excellent
11PN039#20				Good	Early	Med	Excellent		Good	Excellent
11PN042#02				Moderate	Medium	MS	Good	Tolerant	Strong	Fair
LCS Artdeco	Fair	Low	A	Good	Early	MS	Excellent			
LCS Drive	Pour	Low	D	Good	vEarly	SHT	Excellent	Mod Sen		
LCS Ghost	Poor	Low	D*	Below	Med Early	Med	Fair	Sensitive	Strong	Pour
LCS Hulk	Very Good	Medium	D	Higher	Med Late	Med	Very Good	Sensitive	Slow	Fair
LCS Shark	Fair	Med Low	D	Moderate	Med Early	Med	Very Good	Sensitive		
LCS Shine	Very Good	Low	MD*	Good	Med Early	SHT	Fair	Mod Tol	Slow	Good
VI Bulldog			D*	Good	Med Early	SHT	Excellent		Strong	Pour
WB1604	Very Good	Medium	A	Good	Med Early	Med	Very Good			
WB1783	Excellent	Med High	LD	Higher	Med Late	MT	Fair	Mod Sen	Strong	Good
Appleby CL+	Good	Med High	D		Med Early	MT	Good	Sensitive	Good	Excellent
Curiosity CL+	Fair	Med High	A	Below	Late	MT	Poor	Sensitive	Slow	Good
OR2X2 CL+	Good	Med High	A*	Good	Med Late	Med	Good	Sensitive	Slow	Good
Resilience CL+	Very Good	Med High	D	Higher	Med Late	MT	Very Good	Sensitive	Slow	Good
Stingray CL+			D	Higher	Medium	MT	Good	Sensitive	Med Slow	Excellent
UI Magic CL+	Very Good	Med High	D	Moderate	Med Early	MS	Very Good	Tolerant	Strong	V Good
CP7017AX				Not Ranked	vEarly	Med	Fair	Mod Tol	Med Slow	Good
CP7050AX				Not Ranked	vEarly	MS	Very Good	Sensitive	Good	Good
Fusion AX				Not Ranked	vEarly	MT	Poor	Mod Sen	Med Slow	Pour
AP Redeye	Excellent	Medium	A*	Not Ranked	Med Early	SHT	Good	Mod Tol	Good	Fair
Keldin	Excellent	Low	A	Not Ranked	Med Early	Med	Fair	Mod Tol		
LCS Jet	Very Good	Medium	A	Not Ranked	Med Early	Med	Excellent	Mod Tol	Good	Fair
LCS Rocket	Fair	Med Low	D	Not Ranked	Med Early	MS	Very Good	Sensitive	Strong	Pour
LCS Zoom	Fair	Medium	A	Not Ranked	Early	Med	Good	Sensitive	Good	Pour
Scorpio		Medium	A	Not Ranked	Medium	MS	Excellent	Mod Sen	Slow	Good
WB4303	Very Good	Med High	LD	Not Ranked	vEarly	Med	Poor	Sensitive	Strong	Excellent



WINTER WHEAT VARIETY CHARACTERIZATION CHART

Variety	Response to Osprey (Mesosulfuron)	Response to PowerFlex (Pyroxulam)	Strp Rust Score	Strp Rust WSU HTAP	C Stripe WSU OSU	Fusarium Crown Rot OSU TMC	SFR WSU, OSU, TMC	Snow Mold OSU/WSU	SBWMV OSU	Late Septoria OSU	Early Septoria (1-9 score) 20 TMC	Stem Rust (1-9 Score, 20 TMC)	Leaf Rust (1-9 Score, 20 TMC)
M-idas	Average	Average	1.0	High							2.3	4.5	2.5
M-PRESS	Average	Less Responsive	1.0	High	Mod 5	Mod Tol	Mod Sus	Sus	Mod Res	Mod Tol	2.8	4.0	4.0
Nixon	Average	Average	2.0	High	TOL (3/4)	Tol (2/3)	Pch1	Sus		Mod Sus		5.0	4.0
NW Duet	More Responsive	Highly Responsive	1.3	High	TOL (2/3)	Tol (2/3)	Sus	Mod Tol	SUS	Mod Tol	2.8		
NW Tandem	More Responsive	Average	2.0	High	TOL (2/3)	Mod Tol	Mod Tol	Mod Tol	SUS	Mod Tol	1.3	9.0	4.7
Devote	Average	Average	4.0	Moderate		Tol/2	Mod Tol	Mod Tol			4.8		
Jasper			3.0	Moderate	TOL (3)	Tol	Pch1	Mod Tol		Mod Sus			
Puma	More Responsive	More Responsive	5.0	Moderate	Mod Sus (6)		Tol	Sus	Mod Res		2.8		
Purl	Average	More Responsive	4.0	Moderate	Mod 5		Mod Tol		SUS		2.3	3.5	1.8
AP Dynamic	More Responsive	Average	1.3	Moderate	TOL (3/4)	Mod Tol/3	Tol	Sus		Mod Tol	4.8		
AP Illiad	Average	Average	1.3	High	Sus 7	Mod/4			RES	Mod Sus		3.0	1.0
SY Assure			2.0	High	Sus (7)	Sus	Sus	Sus	Mod Res	Mod Sus			
SY Command	More Responsive	More Responsive	2.0	Moderate	Mod 5	Mod Tol	Sus	Sus	Mod Res	Mod Tol	2.8		
SY Dayton	More Responsive	More Responsive	1.7	High	Mod Tol (4)	Tol (2/3)	Mod Sus	Sus	RES	Mod Sus	1.3	7.5	5.0
SY Ovation	Average	Less Responsive	4.0	High	Mod Tol (5)	Mod Sus	Sus	Sus	RES	Mod Sus	2.3	5.0	3.0
SY Raptor	Average	Average	2.5	Moderate	Sus (7)	Mod Sus	Sus	Sus	Mod Res	Mod Sus		3.5	1.7
11PN039#20	Average	Average	1.0	High								2.0	2.3
11PN042#02	Average	More Responsive	1.0	High							2.8	4.5	2.5
LCS Artdeco	Average	More Responsive	4.0	Moderate	Sus (8)	Mod	Tol	Mod Sus	Mod Sus	Mod Tol			
LCS Drive	Average	Average	1.0	High	Mod Sus 6	Mod Sus	Mod Sus	Mod Tol	SUS	Sus			
LCS Ghost	Average	Average	2.0	High	Sus 7	Mod Sus	Sus			Sus	4.5	6.5	4.0
LCS Hulk	Highly Responsive	Highly Responsive	1.0	High	Mod 5	Tol (2/3)	Mod Sus	Sus	SUS	Sus	5.8		
LCS Shark	Average	Highly Responsive	3.0	Low	Mod Sus 6	Mod Tol	Mod Sus	Mod Tol	RES	Mod Sus			
LCS Shine	Less Responsive	Less Responsive	1.0	High	Mod Tol (4)	Sus	Sus			Sus	1.3	1.5	1.3
VI Bulldog	Less Responsive	Less Responsive	1.5	High	Mod Tol (4)	Tol (2/3)	Mod Sus			Sus		2.0	1.0
WB1604			2.0	High	Mod Tol (3/4)	Mod	Tol	Sus	Mod Sus	Sus			
WB1783	Average	Average	3.0	Moderate	TOL (3/4)	Tol (2/3)	Mod Sus	Mod Tol	RES	Sus	3.8	5.0	2.5
Appleby CL+	Less Responsive	Average	1.0	High	Mod Sus (5)	Mod Sus	Mod Sus				1.5		
Curiosity CL+	Less Responsive	Less Responsive	5.7	Moderate	Tol (2)	Sus	Sus	Hi Tol		Mod Tol	5.0		
OR2X2 CL+	Less Responsive	Average	1.3	High	Mod Sus (6/7)	Mod Sus	Pch1/2	Sus	SUS	Mod Sus	1.0	3.0	2.0
Resilience CL+	Average	Less Responsive	2.0	High	Mod Tol (4)	Mod Sus	Tol	Mod Sus		No Data	2.3	5.5	2.5
Stingray CL+	Less Responsive	Less Responsive	2.0	Moderate	Mod Tol (4)	Mod Res	Pch1/2				2.0	2.0	1.0
UI Magic CL+	Less Responsive	Less Responsive	6.0	Low	Mod Sus (6)	Sus	Sus	Mod Sus	SUS	Mod Sus	2.0	3.0	1.5
CP7017AX	More Responsive	More Responsive	5.3								7.0	1.5	1.3
CP7050AX	Highly Responsive	Highly Responsive	1.0								6.8		
Fusion AX	More Responsive	Average	7.5								4.0		
AP Redeye	Average	Average	3.0	High					RES		3.8	2.0	1.5
Keldin	More Responsive	Average	6.0	Low	Sus (7/8)	Sus	Mod Sus	Tol	Mod Res	Tol			
LCS Jet	Average	Average	4.0	Low	Mod Tol (4)	Mod Sus	Tol	Mod Sus	SUS	Mod Tol	3.3	1.0	1.0
LCS Rocket	More Responsive	More Responsive	3.0	Low	Sus (7/8)	Hi Sus	Mod Sus	Sus	SUS	Mod Sus		2.0	1.0
LCS Zoom	Average	Average	1.3	Moderate	Mod Tol (5)		Sus			Sus	6.0		
Scorpio	Less Responsive	Less Responsive	3.0	Low							3.3	1.5	1.0
WB4303	Average	Average	7.0	Low	Mod Tol (5)		Sus	Mod Sus	RES	V Sus	2.5	3.5	1.0



2020 OVERALL WINTER WHEAT PERFORMANCE

VARIETY TRIALS

Source	Class	Variety	Overall		158.4		152.2		152.6		157.4		105.9		109.7		56.1	
			Overall % Mean	(- Herm) % Mean	Steptoe, WA YLD	%	Colfax, WA YLD	%	Athena, OR YLD	%	Pomeroy, WA YLD	%	Hooper, WA YLD	%	Ritzville, WA YLD	%	Hermiston, OR YLD	%
LCS	SWW	LCS Shine	109%	110%	166	105%	174	114%	170	111%			116	110%	122	112%	59	105%
TMC	SWW	M-PRESS	108%	108%	168	106%	165	108%	164	107%	166	105%	118	111%	118	108%	61	109%
WSU	HRW	Scorpio	106%	105%	173	109%	162	107%	159	104%	157	100%	111	105%	114	104%	64	113%
LCS	SWW	LCS Ghost	105%	106%	164	104%	153	101%	150	98%	172	109%	119	112%	125	114%	56	100%
AP	SWW	11PN042#02	105%	105%	165	104%	167	110%	157	103%	154	98%	113	107%	119	109%	59	105%
TMC	SWW	M-idas	105%	107%	164	104%	156	103%	161	105%	168	107%	117	111%	122	111%	52	92%
AP	SWW	11PN039#20	104%	107%	170	107%	168	110%	162	106%	167	106%					50	89%
LCS	HRW	LCS Zoom	103%	104%			156	103%					104	99%	121	110%	57	102%
AP	SWW	SY Dayton	103%	101%	156	98%	147	97%	162	106%	158	100%	111	105%	112	102%	62	110%
LCS	HRW	LCS Rocket	102%	102%	162	102%	154	102%	156	102%	163	103%						
LCS	SWW	VI Bulldog	102%	102%	161	102%	153	101%	156	102%	162	103%						
AP	SWW	SY Command	102%	106%									112	105%	117	107%	52	93%
LCS	HRW	LCS Jet	101%	103%	163	103%	148	97%	159	104%	164	104%	106	100%	117	107%	52	92%
AP	SWW	SY Ovation	101%	103%	164	104%	157	103%	164	108%	157	100%	104	98%	112	102%	52	93%
OSU	SWW	NW Tandem	101%	101%	148	93%	157	103%	153	100%	164	104%	109	102%	109	100%	57	101%
WSU	SWW	Puma	100%	100%									105	100%	110	100%		
OSU	SWW	Nixon	100%	99%	162	102%			147	96%							57	101%
WSU	SWW	Purl	100%	100%	153	96%	155	102%	150	99%	157	100%	107	101%	110	100%	56	99%
OSU	SWW CL+	Appleby CL+	99%	96%									99	93%	109	99%	59	106%
AP	SWW	AP Dynamic	99%	98%			138	91%	152	100%	153	97%	109	103%	110	101%	57	102%
LCS/UI	SWW CL+	UI Magic	99%	98%	153	97%	144	95%	144	94%	154	98%	108	102%	110	101%	58	104%
AP	SWW	AP Illiad	99%	99%	156	99%	159	105%	143	94%	152	97%						
AP	SWW	SY Raptor	98%	98%	155	98%	150	99%										
OSU	SWW	NW Duet	98%	97%			142	93%			151	96%	106	100%	111	101%	56	99%
LCS	SWW	LCS Hulk	98%	98%			152	100%	148	97%	153	97%	106	100%	105	96%	54	97%
WSU	SWW CL+	Stingray CL+	98%	97%	153	97%	147	97%	145	95%	156	99%	101	95%	110	100%	57	101%
WSU	SWW CL+	Resilience	97%	96%	153	96%	153	100%	144	94%	148	94%	99	93%	108	98%	58	103%
WSU	SWW	Devote	96%	96%			142	93%			152	96%	100	95%	109	100%	54	95%
OSU	SWW CL+	OR2X2 CL+	95%	93%	139	88%	139	91%	148	97%	137	87%	104	98%	107	98%	61	109%
AP	HRW	AP Redeye	95%	97%	158	100%	147	97%	149	98%	155	98%	97	91%	108	99%	46	82%
WB	SWW	WB1783	95%	96%	142	89%	147	96%	148	97%	156	99%	103	97%	106	97%	49	87%
WSU	SWW CL+	Curiosity	93%	93%									94	89%	106	97%		
Win	HRW AX	CP7017AX	89%	90%	145	92%	148	97%	131	86%	141	90%	97	91%	93	85%	45	80%
LCS	HRW AX	Fusion AX	87%	85%			136	89%			119	76%	93	87%	98	90%	53	95%
Win	HRW AX	CP7050AX	75%	79%			139	92%			109	69%	83	78%	83	75%	33	60%
WB	HRW	WB4303	77%	78%	Lodged		Lodged		Lodged		Lodged		Lodged		86	78%	42	75%



FROST DAMAGE SCORES

Variety	Winter Hardiness	Frost Tolerance 2020 TMC	Frost Damage			
			Overall	Steptoe 2020	Hooper 2020	Colfax 2020
Nixon	Good	Excellent	1.0	1.0		
WB4303	V Good	Excellent	1.5	2.0	1.0	1.5
Stingray CL+	Excellent	Excellent	1.7	1.5	1.5	2.0
SY Dayton	Good	Excellent	1.8	1.8	1.0	2.5
11PN039#20		Excellent	2.0	2.3		1.8
NW Tandem	Good	Excellent	2.2	1.8	2.3	2.5
SY Command	Good/5	Excellent	2.3		2.3	
SY Raptor	Good	Excellent	2.5	2.5		2.5
Appleby CL+		Excellent	2.5		2.5	
AP Illiad		Excellent	2.6	2.5		2.8
SY Ovation	Good	V Good	2.7	3.5	1.0	3.5
UI Magic	Good	V Good	2.7	3.0	2.3	2.8
M-PRESS	Good	V Good	2.8	2.8	2.0	3.5
NW Duet	V Good	V Good	2.8		2.8	2.9
Puma	Good	V Good	3.0		3.0	
WB1783	Excellent	Good	3.1	4.0	1.5	3.8
Devote	Excellent	Good	3.1		4.0	2.3
LCS Shine		Good	3.2	4.5	1.3	3.8
Purl		Good	3.3	3.8	3.3	3.0
Resilience	Excellent	Good	3.3	2.8	2.8	4.5
OR2X2 CL+	V Good	Good	3.3	3.0	2.3	4.8
Scorpio		Good	3.6	4.5	3.7	2.5
Curiosity	Excellent	Good	4.0		4.0	
CP7017AX		Good	4.0	3.5	3.3	5.3
CP7050AX		Good	4.0		5.5	2.5
AP Redeye		Fair	4.3	4.5	4.8	3.8
M-idas		Fair	4.4	3.8	3.8	5.6
LCS Jet	Fair	Fair	4.4	3.3	5.0	5.0
AP Dynamic	Excellent	Fair	4.5		4.0	5.0
LCS Hulk	V Good	Fair	4.9		6.0	3.8
11PN042#02		Fair	5.0	5.8	3.0	6.3
VI Bulldog		Pour	5.5	4.8		6.3
Fusion AX		Pour	5.8		5.7	6.0
LCS Ghost		Pour	6.0	6.0	5.8	6.3
LCS Rocket	Fair	Pour	6.5	6.0		7.0
LCS Zoom		Pour	7.1		7.0	7.3



SPRING VIGOR SCORES

Variety	Multi Year	2020 Overall	Spring Vigor Score (1-9)					
			2020 Overall Spring Vigor	Ritzville	Walla Walla	Athena	Hooper	Colfax
M-idas	Good	Strong	1.2	1.8	1.0	1.0	1.0	1.4
LCS Ghost	Good	Strong	1.3	1.0	1.3	1.5	1.3	1.3
AP Illiad	Strong	Strong	1.6			1.5		1.8
UI Magic	Strong	Strong	1.7	2.0	1.0	1.8	2.0	1.5
M-PRESS	Strong	Strong	1.8	1.5	2.0	2.0	1.5	1.8
LCS Rocket	Strong	Strong	1.9		1.5	2.3		2.0
11PN042#02		Strong	2.0	1.0	3.0	2.5	1.5	2.0
Purl	Strong	Strong	2.1	1.5	2.3	2.8	2.3	1.5
VI Bulldog		Strong	2.1		2.0	2.0		2.3
Appleby CL+	Good	Good	2.1	2.3			2.0	
11PN039#20		Good	2.2		2.0	2.5		2.0
WB4303	Strong	Strong	2.3	3.5	2.0	2.3	2.3	1.5
CP7050AX		Good	2.4	3.0			2.0	2.3
WB1783	Strong	Strong	2.5	3.8		2.3	2.0	2.0
AP Dynamic	Good	Good	2.5	2.5			2.5	2.5
AP Redeye	Strong	Good	2.6	4.3	2.3	2.3	2.0	2.3
LCS Zoom		Good	2.7	3.5			2.5	2.0
NW Duet	Good	Good	2.9	2.0			2.5	4.3
Devote		Good	3.0	2.0			2.3	4.8
LCS Jet	Strong	Good	3.2	3.0	3.5	3.3	2.5	3.5
SY Raptor	Strong	Good	3.3					3.3
Nixon	Med Slow	Med Slow	3.3			3.3		
SY Dayton	Med Slow	Med Slow	3.3	3.0	3.0	3.0	3.7	3.8
CP7017AX		Med Slow	3.4	4.0	2.8	3.0	3.8	3.5
SY Command	Strong	Med Slow	3.8	4.3			3.3	
Fusion AX		Med Slow	3.8	3.5			4.5	3.3
NW Tandem	Med Slow	Med Slow	3.9	3.8	3.5	3.5	3.8	5.0
Stingray CL+	Good	Med Slow	4.0	3.8	4.5	4.0	3.8	3.8
SY Ovation	Med Slow	Med Slow	4.0	4.0	4.0	4.0	3.8	4.3
Curiosity	Slow	Slow	4.1	4.3			4.0	
Scorpio		Slow	4.8	3.8	4.8	6.5	4.5	4.5
Resilience	Slow	Slow	4.8	4.5		4.8	5.3	4.8
LCS Shine		Slow	5.0	3.5	4.8	5.0	5.8	5.8
OR2X2 CL+	Good	Slow	5.0	4.8		6.0	3.3	6.0
LCS Hulk	Good	Slow	5.4	4.5		4.8	6.5	6.0
Puma	Slow	Slow	5.5	5.0			6.0	



2020 LOCATION TRAIT SCORES

VARIETY TRIALS

	Lodging (% of Stand @ Harvest)		PLS (score)		Rust Score (1-9)		Septoria (1-9 score) Jointing	Stem Rust (1-9 Score, Harvest)	Leaf Rust (1-9 Score, 7-15-20)
	Steptoe, WA	Athena, OR	Hooper, WA	Ritzville, WA	Hooper, WA	Colfax, WA	Ritzville, WA	Steptoe, WA	Steptoe, WA
AP Dynamic		0.0	Mod Sen	Mod Sen	1.0	1.0	4.8		
AP Illiad	2.5	5.0				1.0		3.0	1.0
AP Redeye	70.0	15.0	Mod Tol	Mod Tol	1.0	1.3	3.8	2.5	1.5
Appleby CL+			Sensitive	Sensitive	1.0		1.5		
CP7017AX	20.0	8.0	Mod Tol	Mod Tol	5.5	4.0	7.0	1.5	1.3
CP7050AX			Sensitive	Sensitive	1.0	1.0	6.8		
Curiosity			Sensitive	Sensitive	1.0		5.0		
Devote			Mod Tol	Mod Tol	2.0	1.8	4.8		
Fusion AX			Mod Sen	Mod Tol	7.0	5.8	4.0		
LCS Ghost	10.0	50.0	Sensitive	Sensitive	1.0	1.5	4.5	6.5	4.0
LCS Hulk		0.0	Sensitive	Sensitive	1.0	1.0	5.8		
LCS Jet	0.0	0.0	Tolerant	Mod Tol	3.0	4.3	3.3	1.0	1.0
LCS Rocket	0.0	5.0				2.0		2.0	1.0
LCS Shine	32.5	40.0	Mod Tol	Mod Tol	1.0	1.0	1.3	1.5	1.3
LCS Zoom			Sensitive	Sensitive	1.0	1.0	6.0		
M-idas	10.0	50.0	Tolerant	Tolerant	1.0	1.0	2.3	4.5	2.0
M-PRESS	0.0	0.0	Mod Tol	Mod Tol	1.0	1.0	2.8	4.0	4.0
Nixon	2.5	5.0						5.0	4.0
NW Duet			Mod Tol	Tolerant	1.0	1.0	2.8		
NW Tandem	0.0	0.0	Tolerant	Tolerant	2.0	1.0	1.3	9.0	4.7
OR2X2 CL+	20.0	10.0	Sensitive	Sensitive	1.0	1.0	1.0	3.0	2.0
Puma			Mod Tol	Mod Tol	1.0		2.8		
Purl	80.0	20.0	Mod Tol	Mod Tol	1.0	1.3	2.3	3.5	1.8
Resilience	2.5	5.0	Sensitive	Sensitive	1.0	1.0	2.3	5.5	2.3
Scorpio	0.0	0.0	Mod Sen	Mod Sen	1.0	1.8	3.3	1.5	1.0
Stingray CL+	5.0	10.0	Sensitive	Sensitive	1.0	1.3	2.0	2.0	1.0
SY Command			Mod Tol	Mod Tol	1.0		2.8		
SY Dayton	22.5	10.0	Mod Tol	Mod Tol	1.0	1.0	1.3	7.5	5.0
SY Ovation	0.0	0.0	Tolerant	Tolerant	1.0	1.0	2.3	5.0	3.0
SY Raptor	0.0					1.0		3.5	1.7
UI Magic	0.0	5.0	Tolerant	Tolerant	4.5	7.0	2.0	3.0	1.5
VI Bulldog	5.0	5.0				1.5		2.0	1.0
WB1783	70.0	25.0	Mod Sen	Mod Tol	1.0	1.0	3.8	5.0	2.0
WB4303	100.0	100.0	Mod Tol	Mod Tol	4.5	7.5	2.5	3.5	1.0
11PN039#20	0.0	0.0				1.0		2.0	2.3
11PN042#02	12.5	10.0	Tolerant	Tolerant	1.0	1.0	2.8	4.5	2.0



WSU SOFT WHITE WINTER YIELD DATA

	Overall	Higher Rainfall	Mid Rainfall	Lower Rainfall	79.9 Moses Lake	130.2 Walla Walla	140.1 Pullman	132.8 Colton	130.0 Farrington	124.3 Dayton	123.8 St. John	102.5 Dusty	93.8 Mayview	84.4 Creston	87.8 Lamont	75.5 Almira	67.4 Eureka	61.0 Connell	79.7 Lind	38.5 Horse Heaven	57.0 Harrington	74.2 Anatone
LCS Ghost	108%	109%	110%		109%	103%	115%	107%	104%	105%	113%	109%	112%									
LCS Shine	106%	106%	105%	104%		110%	104%	110%	102%	104%	106%	100%	112%	108%	105%	101%	105%	102%	115%	112%		90%
Devote	106%		104%	105%										104%	101%			105%	104%	117%	105%	92%
LCS Blackjack	106%	105%	107%		100%	109%	103%	108%	98%	107%	108%	102%	110%				108%					
ARS-Crescent	106%	102%	108%	110%		101%	86%	98%	105%	102%	105%	107%	109%		108%	102%	116%	113%	115%	104%	117%	102%
Norwest Duet	106%	104%	106%	108%	96%	106%	104%	105%	102%	101%	103%	109%	110%	92%	108%	109%	111%	110%	102%	96%	119%	108%
LCS Hulk	105%	103%	104%	111%	104%	101%	95%	106%	104%	105%	110%	98%	106%	97%	96%	107%	107%	115%	109%	115%	114%	112%
M-Press	104%	104%	105%	103%	100%	112%	104%	105%	101%	105%	99%	100%	107%	113%	104%	105%	104%	111%	100%	99%	100%	
LCS Sonic	104%		104%	105%										105%	100%	103%		107%	90%	107%	116%	109%
SY Command	104%		105%	104%		106%								110%	100%	99%	113%	102%	95%	104%	105%	106%
Xerpha	104%	99%	103%	111%	94%	88%	98%	99%	98%	103%	96%	106%	103%	91%	100%	99%	114%	116%	113%	112%	117%	105%
SY Dayton	103%	103%	104%		100%	111%	106%	101%	95%	105%	99%	107%	102%				104%					
SY Raptor	103%	104%	106%		113%	103%	99%	100%	96%	109%	103%	112%	103%				105%					
LCS Artdeco	103%	103%	104%		91%	103%	103%	105%	100%	105%	104%	109%	103%				98%					
Jasper	103%	102%	104%	100%	93%	100%	106%	99%	108%	105%	107%	99%	103%	113%	106%	101%	101%	98%	100%	99%	107%	96%
UI Sparrow	103%	102%	100%	106%	105%	102%	103%	103%	104%	97%	99%	101%		94%	104%	98%	111%	98%	113%	101%	116%	105%
11PN042#02	103%	103%	101%	102%	105%	107%	101%	110%	98%	106%	95%	104%	101%	102%	101%		107%	93%		120%	95%	96%
M-idas	103%	102%	105%	99%	103%	105%	98%	97%	102%	107%	104%	100%	97%	115%	104%	109%	98%	115%	93%	96%		80%
Mela CL+	102%		98%	102%										95%	96%	97%		107%	103%	114%	103%	90%
Rosalyn	102%	100%	103%		89%	97%	100%	105%	99%	97%	110%	104%	99%				107%					
Purl	102%	103%	101%	103%	99%	107%	102%	110%	100%	106%	105%	94%	101%	97%	100%		101%	107%	104%	104%	89%	111%
AP Dynamic	102%	100%	105%	103%		97%	92%	99%	91%	107%	104%	109%	103%	102%	107%	98%	101%	113%	99%	101%	105%	106%
SY Banks	101%		101%	105%										94%	101%	94%		113%	104%	117%	86%	113%
Pritchett	101%	99%	103%	101%		101%	94%	90%	105%	105%	100%	97%	101%		108%	107%	105%	102%	102%	101%	95%	97%
Puma	101%	98%	99%	103%	99%	102%	92%	99%	106%	93%	103%	98%	93%	103%	104%	98%	105%	97%	108%	109%	105%	98%
11PN039#20	101%		103%	100%										108%	99%	101%		105%	90%			104%
ARS-Castella	100%	99%	102%	97%		103%	101%	94%	101%	99%	93%	105%		104%	108%	98%	116%	92%	103%	99%	89%	82%
Nixon	100%	100%	100%		95%	99%	101%	100%	99%	101%	100%	99%	103%				96%					
Curiosity CL+	100%		97%	99%										103%	89%	101%		95%	104%	101%	105%	90%
AP Iliad	99%	100%	100%		104%	102%	106%	93%	95%	102%	96%	99%	101%				99%					
Bruehl	99%		99%	97%										96%	100%	97%		105%	99%	101%	95%	85%
OR2x2 CL+	98%	99%	98%		105%		101%	96%	96%	99%	99%	100%	96%									
Dyna-Gro Impact	98%	96%	98%	101%	101%	96%	96%	99%	95%	97%	99%	91%	94%	100%	105%	98%	98%	102%	112%	86%	107%	108%
UI Castle CL+	98%	99%	97%	98%	109%	110%	95%	96%	102%	102%	98%	90%	94%		96%	98%	102%	98%	98%	81%	112%	96%
Norwest Tandem	98%	100%	98%	98%	113%	98%	97%	96%	106%	101%	96%	95%	99%	101%	95%	95%	96%	105%	92%	99%	95%	102%
WB1783	97%	96%	96%	97%	91%	101%	93%	96%	92%	99%	99%	98%	98%	111%	90%	91%	93%	85%	108%	91%	107%	104%
Otto	97%		99%	94%										96%	107%			93%	98%	101%	86%	93%
Stingray CL+	97%	99%	97%	92%	109%		98%	105%	96%	101%	93%	95%	98%	108%	105%	95%		82%	95%	81%	100%	101%
WB1532	96%	96%	94%	97%	100%	103%	96%	92%	100%	92%	96%	94%	94%	90%	95%	89%	99%	97%	109%	109%	86%	90%
VI Bulldog	95%	97%	94%		106%	95%	97%	94%	98%	96%	95%	92%					92%					
VI Frost	95%		96%	100%										86%	96%	106%					91%	104%
Resilience CL+	95%	95%	93%	96%	98%	91%	96%	99%	95%	95%	92%	85%	102%	98%	93%	105%	95%	75%	109%	81%	103%	101%
LCS Shark	93%	93%	93%		93%		100%	96%	82%	94%	90%	90%	102%				91%					
LCS Drive	93%	95%	93%		104%	85%	93%	96%	99%	95%	90%	99%	93%				89%					
Appleby CL+	92%	92%	94%	95%	100%	88%	91%	90%	92%	93%	86%	97%	90%	100%	90%	99%	92%	97%	85%	99%	91%	102%
UI Magic CL+	92%	94%	92%	92%	104%	99%	93%	100%	92%	91%	87%	81%	96%	96%	91%	101%	92%	93%	85%	78%	100%	93%
WB1529	91%	93%	93%	87%	100%	94%	83%	95%	88%	93%	92%	93%	98%	98%	92%		93%	87%	88%	86%		82%
WB1604	89%	92%	88%	83%	95%	90%	95%	96%	95%	88%	86%	91%	89%	89%	92%		89%	80%		70%		92%



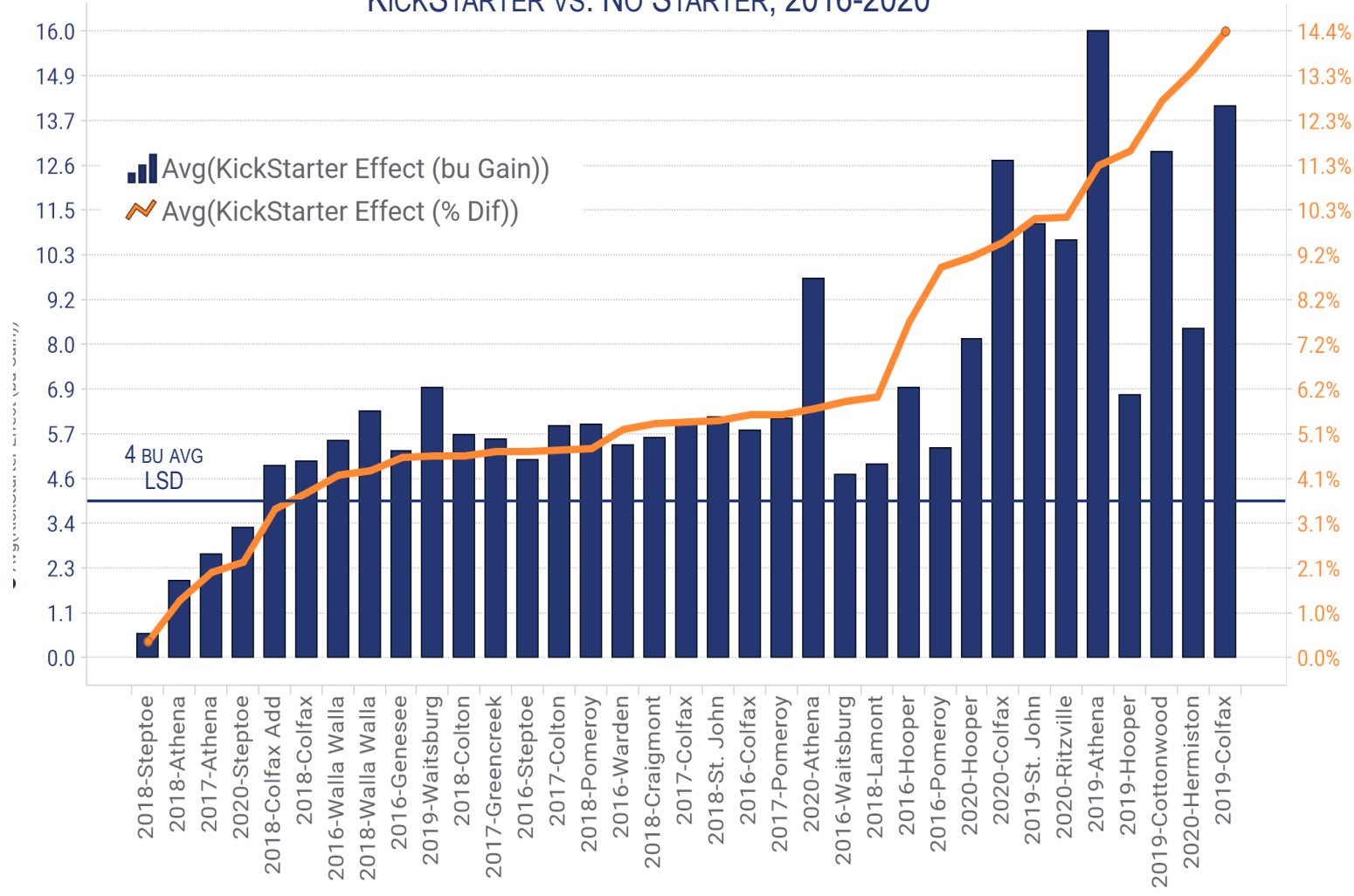
IMPORTANCE OF KICKSTARTER, OVER YEARS AND LOCATIONS

Seed-placed P is vital for fall root and shoot development, setting tiller counts, and reducing winter kill susceptibility (heads per acre). The worse the early season emergence and fall/early spring conditions are, the better starter fertilizers perform. In many ways, using starter fertilizers is like insurance. In perfect early stand development scenarios, you pay for the applications. In less than ideal situations, the yield gains are larger and larger.

Year	# of Locs	KickStarter Effect (bu Gain)	KickStarter Effect (% Dif)
2016	9	5.5	5.8%
2017	7	5.5	4.7%
2018	10	4.7	3.9%
2019	6	11.3	10.8%
2020	6	9.9	9.6%

Year	Loc Avg	Location	KickStarter Effect (Bu Gain)	KickStarter Effect (% Dif)	KickStarter Yld Bu/c	No Starter Yld Bu/c
2020	138	Colfax, WA	12.7	9.5%	140	127
2020	107	Ritzville, WA	10.7	10.1%	111	100
2020	173	Athena, OR	9.7	5.7%	175	166
2020	67	Hermiston, OR	8.4	13.5%	67	58
2020	92	Hooper, WA	8.2	9.2%	93	85
2020	156	Step toe, WA	3.3	2.2%	153	149
Across Loc Avg			8.8	8.4%		
Effect in Bu/ac *					10.2	

KICKSTARTER VS. NO STARTER, 2016-2020



KICKSTARTER

COMPLETE LIQUID STARTER FERTILIZER

POWERED BY M-STRUCT

**More tillers
now equals
more grain
later**

- Access to highly available seed-placed KickStarter increases fall tiller counts and reduces winter damage leading to more uniform spring stands.
- Developed in the PNW specifically for performance in cold soils and low pH
- Formulated with the power of M-Struct for improved phosphorus use efficiency
- Improved green-up with benefits observed from emergence to harvest
- Seed safe on cereal grains for use in furrow; can be applied directly on the seed



A visible difference can be seen where KickStarter was turned off through the middle of this field.

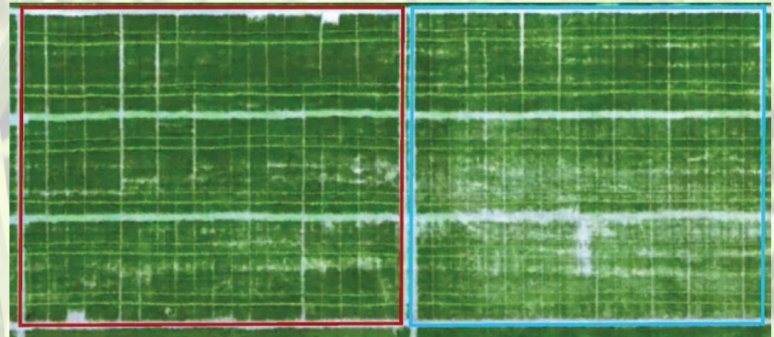
5.8+ bu/ac

AVERAGE YIELD INCREASE

Data collected across 25+ locations comparing treatments with KickStarter vs. various grower standards applied in furrow.

KickStarter

No KickStarter



Drone imagery shows a visibly greener crop with noticeable stand establishment differences.

KICK IT ^{UP} A NOTCH

Premium Plant Nutrition



www.mcgregor.com

OVER-YEARS EVALUATION OF TMC SEEDSTART ZINC ON WINTER WHEAT

Year	Locations	SeedStart Zinc Effect (Bu Gain)	+ 4 oz. SeedStart Zinc	
			Yield (Bu/a)	SY CMVCB 0.66 (base) Yield (Bu/a)
		3.9	118.6	114.8
2020	Conrad, MT	↑ 4.2	61	57
2020	Hermiston, OR	↑ 4.0	58	54
2020	Pomeroy, WA	↑ 3.3	170	167
2020	Fort Benton, MT	↑ 3.2	77	74
2020	Ritzville, WA	↑ 3.1	116	113
2020	Walla Walla, WA	→ 1.7	169	168
2020	Hooper, WA	→ 0.8	96	95
2020	Overall	2.9	106.8	103.9
2019	Colfax	↑ 5.4	113	108
2019	Pomeroy	↑ 3.7	82	78
2019	Athena	↑ 3.6	142	139
2019	Hooper	↑ 3.2	63	60
2019	Waitsburg	↑ 3.1	150	147
2019	Cottonwood	↑ 3.1	98	95
2019	St John	→ -1.2	99	100
2019	Overall	3.0	106.7	103.8
2018	Craigmont, ID	↑ 8.3	113	105
2018	Steptoe, WA	↑ 7.1	166	159
2018	Hooper, WA	↑ 6.5	111	104
2018	Colfax, WA	↑ 6.4	148	141
2018	St John, WA	↑ 4.9	117	112
2018	Pomeroy, WA	↑ 4.6	133	129
2018	Athena, OR	↑ 4.4	154	149
2018	Overall	6.0	134.5	128.4
2017	Colfax, WA	↑ 5.5	122	117
2017	Pomeroy, WA	↑ 5.4	114	109
2017	Hooper, WA	↑ 3.9	120	116
2017	GreenCreek, ID	↑ 3.4	119	115
2017	Athena, OR	↑ 3.3	133	130
2017	Colton, WA	→ 2.8	159	157
2017	Tammany, ID	→ 2.5	132	130
2017	Hooper, WA	→ 1.5	105	103
2017	Overall	3.5	125.5	122.0



OVER-YEARS EVALUATION OF SYNGENTA'S 'HI-RES' BLENDS

Vibrance (Sedaxane) is a broad-spectrum Group 7 (SDHI) seed treatment fungicide. The activity spectrum covers seed-borne fungi such as Ustilago (Loose Smut), Tilletia caries (Common bunt), and Monographella nivalis (causal agent of snow mold), as well as the soil-borne fungi Rhizoctonia cerealis (sharp eyespot) and high activity on Rhizoctonia solani.

The PNW has used one of 2 rates of Vibrance on cereals.

CruiserMaxx Vibrance Custom Blend (CMVCB 0.66) contains a 0.08 oz / CWT rate.

CruiserMaxx Vibrance Custom Blend 'Hi-Residue' (CMVCB 0.66 Hi-Res) contains a 0.16 oz / CWT rate.

Crop	Year	Locations	Vibrance Effect (Bu Gain)	Yield (Bu/a)	
				Hi Res CMVCB .66	CMVCB .66
SWW	2020	Pendleton OR	11.4	94	82
DNS	2017	Warden WA	10.0	123	113
SWW	2020	Hermiston OR	8.9	63	54
SWW	2020	Twin Falls ID	8.6	151	143
SWW	2017	Hooper WA	6.9	112	105
SWW	2020	Colfax WA	5.7	153	147
HRW	2020	Fort Benton MT	5.3	80	74
SWW	2018	Craigmont ID	4.9	109	104
SWW	2020	Colfax WA	4.9	123	119
DNS	2016	Warden WA	4.8	110	105
SWW	2020	Hooper WA	4.5	104	99
SWW	2019	Buhl ID	4.5	181	176
SWW	2018	St John WA	3.9	115	111
SWW	2019	Hooper WA	3.4	56	52
SWW	2018	Steptoe WA	3.0	161	158
SWW	2019	Idaho Falls ID	3.0	93	90
SWW	2016	Fairfield WA	2.8	114	111
SWW	2016	Hooper WA	2.8	89	86
SWW	2018	Pomeroy WA	2.8	130	127
SWW	2018	Athena OR	2.6	151	148
SWW	2016	Fairfield WA	2.1	112	110
SWW	2019	Jerome ID	1.5	166	164
Overall			4.9		