



UNIVERSITY OF WISCONSIN AGRONOMY, SOYBEAN RESEARCH, UNIVERSITY OF WISCONSIN-EXTENSION

Intensive Winter Wheat Management - 2018

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A research trial was initiated at the Arlington Agricultural Research Station to assess the impact of various management levels (Table 1) on the yield, grain quality, and disease incidence on 14 soft red winter wheat varieties. Management levels were stair-stepped with increasing intensity of inputs. Each management step increased yield, however growers should verify individual farm gate input prices to see if yield increases had a positive ROI.

Table 1. Management treatments at three levels.

	Management Treatments		
	Current	MidLevel	HighLevel
Base seed treatment	Same variety/treatment at all levels. See Table 2.		
Base herbicide (16-May)	Huskie 15 fl oz/a	Huskie 15 fl oz/a	Huskie 15 fl oz/a
Seeding rate (million seeds/a)	1.50	1.75	2.00
Nitrogen (lbs N/a) (25-Apr + 14-May)	55	55+30 split	110+30 split
Growth regulator @ F6 (16-May)			Palisade 12 fl oz/a
Micronutrients @ F9 (25-May)			TakeOff Phite MZ (3-20-7+Mn+Zn) 32 fl oz/a EB Mix (N,S,B,Mn, Fe,Zn) 64 fl oz/a
Fungicide @ F9 (25-May)			Trivapro 13.7 fl oz/a
Micronutrients @ F10.5.1 (4-June)			TakeOff Phite 32 fl oz/a
Fungicide @ F10.5.1 (4-June)		Miravis Ace 13.7 fl oz/a	Miravis Ace 13.7 fl oz/a

Table 2. Fungicidal, insecticidal, and biological seed treatments used in this study.

Brand	Variety	Seed treatment
Croplan	SRW9606	Nitro Shield IV, Warden Cereals II
FS Seed	FS624	CruiserMaxx, Vibrance
Kratz Farms	Kratz 15241	Cruiser 5FS, Vibrance Extreme
PIp	PIp 735	Charter, imidacloprid
PIp	PIp 776	Charter, imidacloprid
Pro Seed Genetics	Pro 260	CeresUS
Pro Seed Genetics	Pro 320A	Vibrance Extreme
Pro Seed Genetics	Pro 380	CeresUS
Pro Seed Genetics	Pro 410	CeresUS
Syngenta	SY 547	CruiserMaxx, Vibrance
Public	Harpoon	Warden Cereals II
Public	Red Devil	Warden Cereals II
Public	Sunburst	Cereus Trio, Cruiser 5FS, Release LC
Public	Whale	CeresUS

Table 3. Materials and methods.

Year:	2017-2018
Expt. No.	18085
Title:	Intensive Wheat Management
Personnel:	Shawn Conley, John Gaska, Adam Roth, Spyridon Mourtzinis, Brian Mueller, and Damon Smith
Organization:	University of Wisconsin-Madison, Depts. of Agronomy and Plant Pathology
Supported by:	Wisconsin Crop Improvement Association
Location:	Arlington Agricultural Research Station, Arlington, WI
FIELD INFORMATION	
Field:	248C
Previous Crop:	Soybean
Tillage:	No-tillage
EXPERIMENTAL PROCEDURE	
Exp. Design:	RCB Split plot
Replicates:	4
Variables:	3 management levels 14 varieties
Plot Size:	Planted: 8' x 25' Harvested: 5' x 21'
Row Spacing:	7.5"
Cultivars:	14 varieties
Planting:	Date: 25-Sep-17 Equipment: No till plot planter Rate: variable with treatment Depth: 1"
Harvesting:	Date: 18-Jul-18 Equipment: 1999 Almaco SPC-40 plot combine

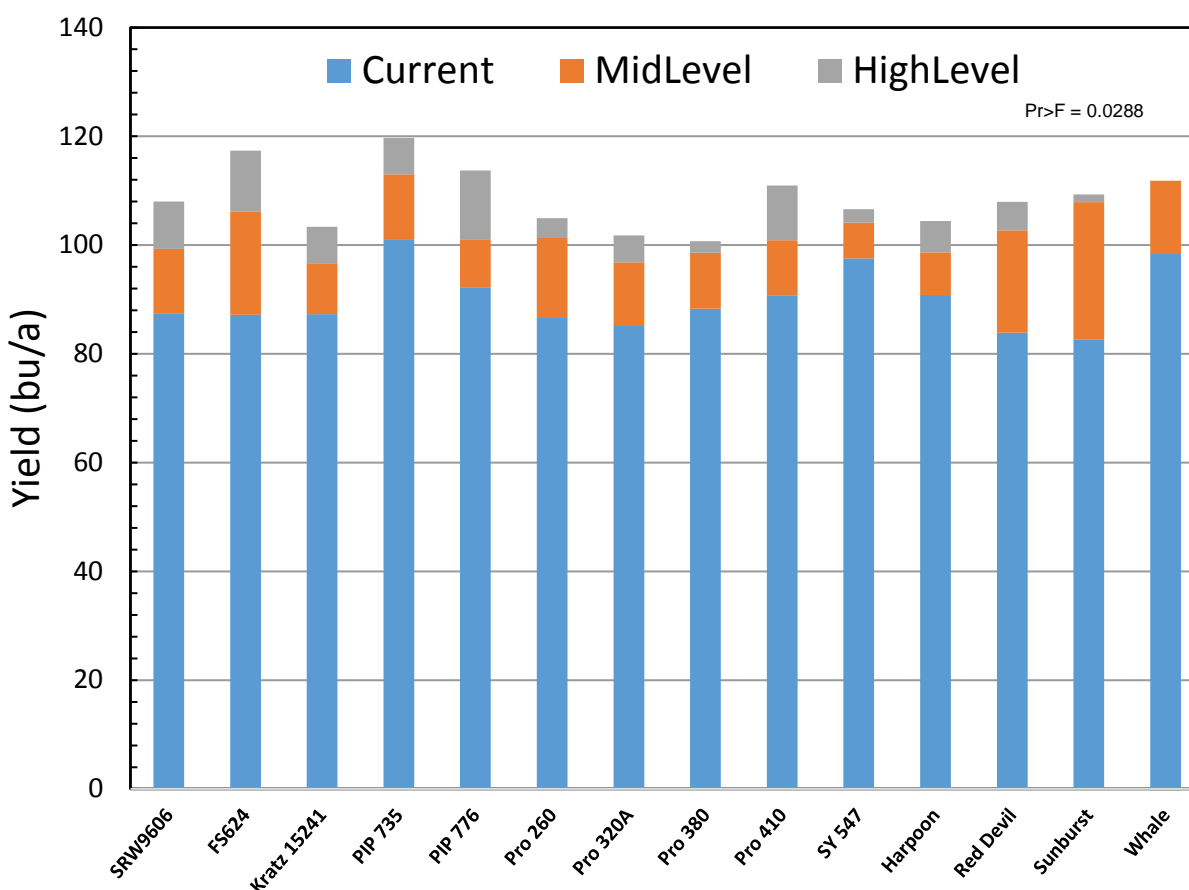


Figure 1. Winter wheat yield among 14 varieties and three management levels. Means separation shown in Table 4.

Table 4. Selected main effects and interactions of management level and variety on yield, plant characteristics, and disease.

			Grain	Test	Straw	Fusarium head scab		DON ²	Means separation									
Management	Brand	Variety	yield bu/a	weight lbs/bu	yield tons DM/a	Incidence %	Severity %	ppm	for yield ¹									
	Croplan	SRW9606		55.0				1.31										
	FS Seed	FS624		58.4				0.80										
	Kratz Farms	Kratz 15241		57.8				0.21										
	PiP	PIP 735		57.2				0.47										
	PiP	PIP 776		57.4				0.79										
	Pro Seed Genetics	Pro 260		54.8				1.51										
	Pro Seed Genetics	Pro 320A		56.7				0.58										
	Pro Seed Genetics	Pro 380		58.9				0.26										
	Pro Seed Genetics	Pro 410		57.1				0.92										
	Syngenta	SY 547		57.9				0.90										
	Public	Harpoon		55.3				0.40										
	Public	Red Devil		59.2				1.08										
	Public	Sunburst		59.7				1.36										
	Public	Whale		57.4				1.67										
Current				55.6	0.78	2.2	8.6	1.26										
MidLevel				57.8	1.03	1.1	2.6	.527										
HighLevel				58.6	1.10	1.0	2.5	.655										
Current	Croplan	SRW9606	87.3									G	H	I	J	K		
Current	FS Seed	FS624	87.2									G	H	I	J	K		
Current	Kratz Farms	Kratz 15241	87.3									G	H	I	J	K		
Current	PiP	PIP 735	101.0						B	C	D	F	G	H	I	J		
Current	PiP	PIP 776	92.3								D	F	G	H	I	J	K	
Current	Pro Seed Genetics	Pro 260	86.6											H	I	J	K	
Current	Pro Seed Genetics	Pro 320A	85.1												I	J	K	
Current	Pro Seed Genetics	Pro 380	88.3									F	G	H	I	J	K	
Current	Pro Seed Genetics	Pro 410	90.8									F	G	H	I	J	K	
Current	Syngenta	SY 547	97.6								C	D	F	G	H	I	J	K
Current	Public	Harpoon	90.8										F	G	H	I	J	K
Current	Public	Red Devil	83.9													J	K	
Current	Public	Sunburst	82.6														K	
Current	Public	Whale	98.4								C	D	F	G	H	I	J	K

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Table 4 continued.

Management	Brand	Variety	Grain yield bu/a	Test weight lbs/bu	Straw yield tons DM/a	Fusarium head scab		DON ppm	Means separation										
						Incidence %	Severity %		for yield ¹										
MidLevel	Croplan	SRW9606	99.3									C	D	F	G	H	I	J	K
MidLevel	FS Seed	FS624	106.1						A	B	C	D							
MidLevel	Kratz Farms	Kratz 15241	96.6									C	D	F	G	H	I	J	K
MidLevel	PiP	PIP 735	113.0						A	B	C								
MidLevel	PiP	PIP 776	101.1							B	C	D	F	G	H	I	J		
MidLevel	Pro Seed Genetics	Pro 260	101.3							B	C	D	F	G	H	I			
MidLevel	Pro Seed Genetics	Pro 320A	96.8								C	D	F	G	H	I	J	K	
MidLevel	Pro Seed Genetics	Pro 380	98.6								C	D	F	G	H	I	J	K	
MidLevel	Pro Seed Genetics	Pro 410	100.9							B	C	D	F	G	H	I	J		
MidLevel	Syngenta	SY 547	104.2						A	B	C	D	F	G					
MidLevel	Public	Harpoon	98.6									C	D	F	G	H	I	J	K
MidLevel	Public	Red Devil	102.7						A	B	C	D	F	G	H				
MidLevel	Public	Sunburst	107.9						A	B	C	D							
MidLevel	Public	Whale	111.8						A	B	C								
HighLevel	Croplan	SRW9606	108.0						A	B	C	D							
HighLevel	FS Seed	FS624	117.4						A	B									
HighLevel	Kratz Farms	Kratz 15241	103.4						A	B	C	D	F	G	H				
HighLevel	PiP	PIP 735	119.7						A										
HighLevel	PiP	PIP 776	113.7						A	B	C								
HighLevel	Pro Seed Genetics	Pro 260	105.0						A	B	C	D	F						
HighLevel	Pro Seed Genetics	Pro 320A	101.8							B	C	D	F	G	H	I			
HighLevel	Pro Seed Genetics	Pro 380	100.7								C	D	F	G	H	I	J		
HighLevel	Pro Seed Genetics	Pro 410	111.0						A	B	C								
HighLevel	Syngenta	SY 547	106.6						A	B	C	D							
HighLevel	Public	Harpoon	104.4						A	B	C	D	F	G					
HighLevel	Public	Red Devil	108.0						A	B	C	D							
HighLevel	Public	Sunburst	109.3						A	B	C	D							
HighLevel	Public	Whale	111.4						A	B	C								
Means			100.4	57.3	0.97	1.4	4.5												
Probability (Pr>F)																			
Management			0.0004	<.0001	0.0004	<.0001	0.0006	0.0003											
Variety			<.0001	<.0001		0.1777	0.0008	<.0001											
Mgt x Variety			0.0288	0.4633		0.8732	0.4559	0.2397											

¹ Main effects and interactions followed by the same letters are statistically the same.

²Deoxnivalenol (DON), sometimes referred to as vomitoxin, is a mycotoxin that may be produced in wheat and barley grain infected by the Fusarium head blight (FHB or scab) fungus. Grain samples were collected from this study at harvest and submitted to the University of MN DON testing lab. Both the main effects of variety and management were significant for DON.(Table 4). DON concentration in the grain ranged from 0.21 to 1.67 ppm across varieties and the application of Miravis Ace decreased DON significantly. Overall, DON levels in our study in 2018 were relatively low and would probably not result in any discount at the elevator.

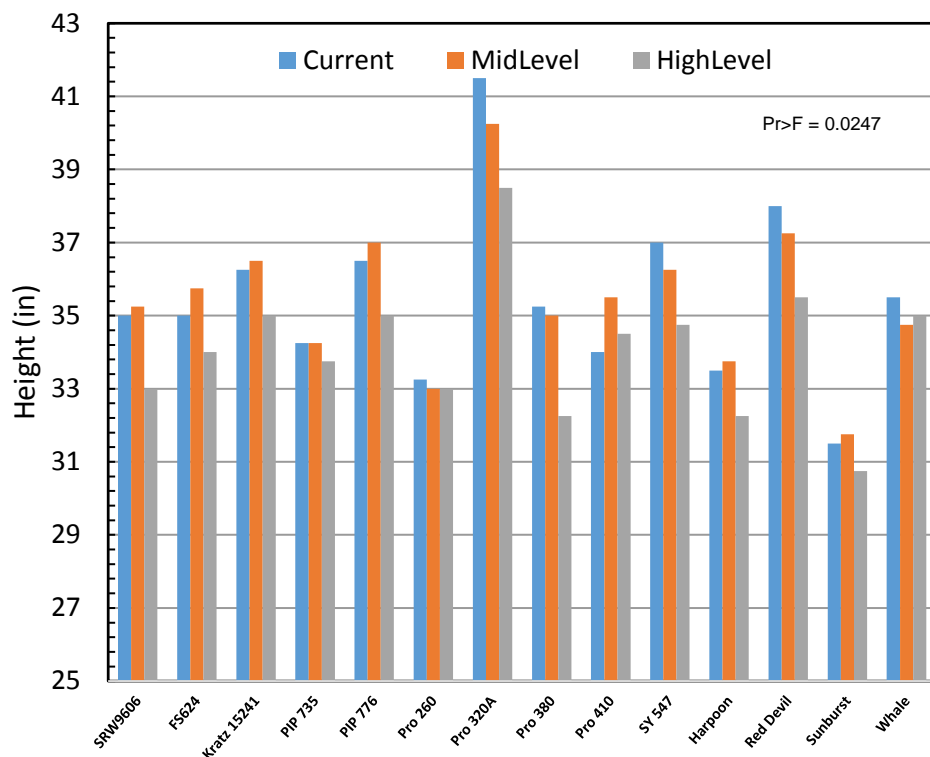


Figure 2. Winter wheat plant height among 14 varieties and three management levels.

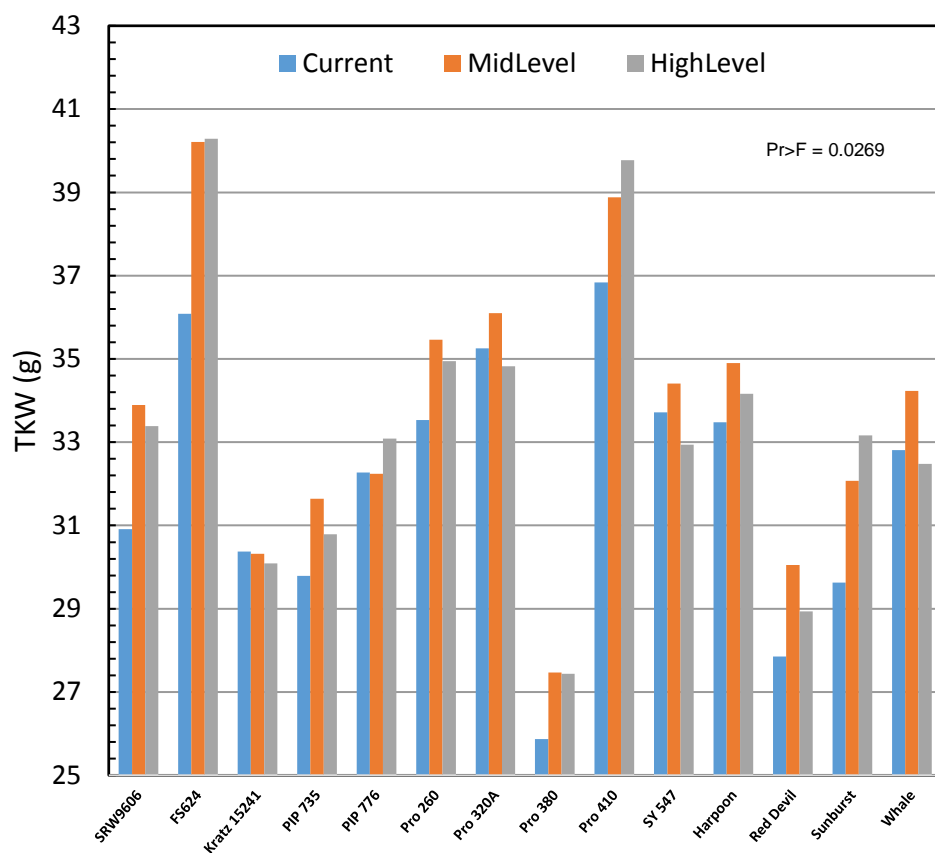


Figure 3. Winter wheat thousand kernel weight (TKW) among 14 varieties and three management levels.