Cool Bean Advisor
UNIVERSITY OF WISCONSIN AGRONOMY, SOYBEAN RESEARCH, UNIVERSITY OF WISCONSIN-EXTENSION

Does the Application of a Plant Growth Regulator and Fungicide Increase Oat Yield - 2017

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In an Oat Shock:

- The addition of Palisade PGR and Trivapro fungicide increased oat yield and reduced lodging
- Increased N rate above those recommended in A2809 did not increase oat yield
- Growers should explore expected ROI and apply BMP's prior to adding any additional inputs

A research trial was initiated in the spring of 2017 at the Arlington Agricultural Research Station, Arlington, WI to assess the impact of a plant growth regulator (PGR) (Palisade, trinexapac-ethyl, Syngenta) and a foliar fungicide (Trivapro, benzovindiflupyr+azoxystrobin+propiconazole, Syngenta) in oats. Three high yielding varieties were selected for this trial: 1) BetaGene is a mid-late maturity variety with good yield potential and high beta-glucan levels released at the University of Wisconsin in 2015. BetaGene has good test weights, very good crown rust resistance and BYDV tolerance and medium lodging potential. 2) Ron is a mid-late season variety released by the UW in 2014. Ron has a good test weight, very good crown rust resistance and BYDV tolerance and medium lodging potential. 3) Antigo is a new, high yielding, early maturing oat with excellent test weight, medium lodging, and moderate resistance to crown rust. Palisade PGR was chosen because of its potential to mitigate lodging. It acts by shortening the internodes and strengthening the stem through inhibition of cell elongation. It was applied at 10 fl oz/a at the Feekes 4 stage. Trivapro was chosen as a broad-spectrum, preventative fungicide against many leaf diseases including rusts. It was applied at 13.7 fl oz/a at the Feekes 9 stage. Three nitrogen rates of 45, 90, and 135 lbs N/a were chosen to increase lodging potential. UWEX recommendations (A2809) for oats grown in this situation are 40 lbs N/a. Nitrogen treatments were applied as urea (46-0-0) in a broadcast surface application immediately following planting. UWEX recommended corrective fertilization practices were used.

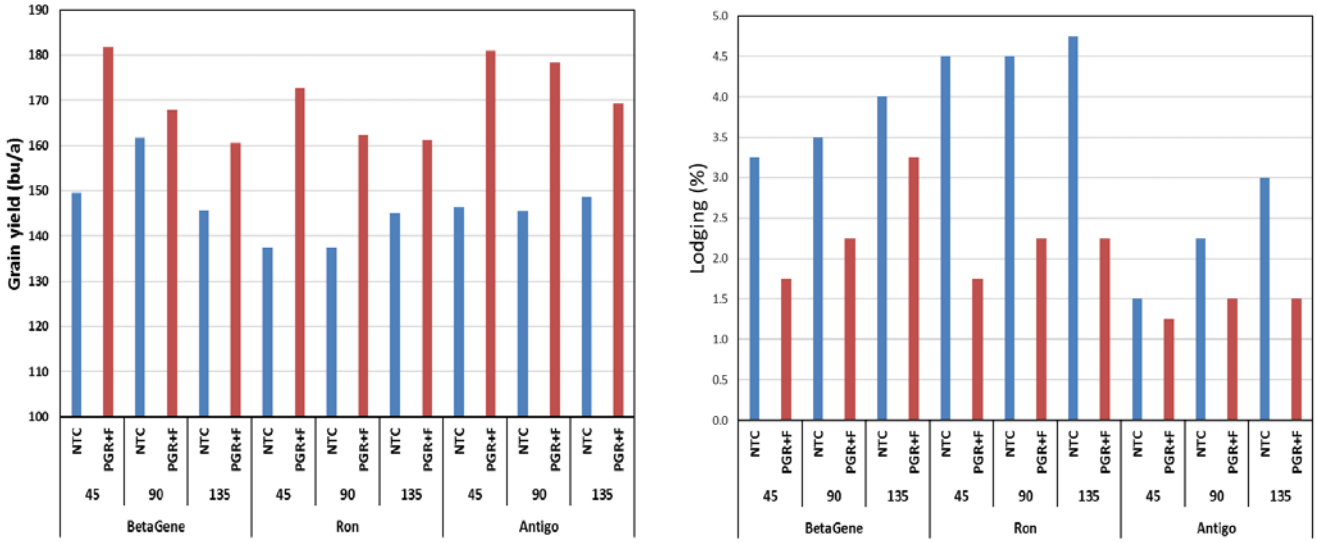

Figure 1. Yield and lodging of three oat varieties, at three nitrogen fertilization levels, with and without a PGR+fungicide combination.

Table 1. Materials, methods, and location information.

Year:	**2017**		
Expt. No.	**17092**		
Title:	**Response of Three Oat Varieties to Nitrogen and a Plant Growth Regulator fb Foliar Fungicide Combination**		
Personnel:	**Dr. Shawn Conley, John Gaska, and Adam Roth**		
Organization:	**University of Wisconsin-Madison, Dept. of Agronomy**		
Supported by:	**Wisconsin Crop Improvement Association**		
Location:	**Arlington Agricultural Research Station, Arlington, WI**		
FIELD INFORMATION			
Field:	248W		
Previous Crop:	Soybean		
Soil fertility:	pH: 6.9 O.M.: 3.7 % P: 42 ppm K: 112 ppm		
Tillage:	No-tillage		
EXPERIMENTAL PROCEDURE			
Exp. Design:	RCB		
Replicates:	4		
Variables:	3 oat varieties		
	3 nitrogen rates		
	2 foliar fungicide/PGR products		
Plot Size:	Planted:	8' x 18'	
	Harvested:	5' x 14'	
Row Spacing:	7.5"		
Planting:	Date:	18-Apr-17	
	Equipment:	No till plot planter	
	Rate:	1.4 million seeds/acre	
	Depth:	1"	
Harvesting:	Date:	1-Aug-17	
	Equipment:	2010 Almaco SPC-40 plot combine	
	Material	Rate	Use
Pesticides:	MCPA	24 fl oz/a	Herbicide

Results

The main effects of variety and foliar treatment were significant for yield. Overall, the application of nitrogen fertilizer above the recommended rate in A2809 did not increase oat yield. The combination of Palisade and Trivapro significantly decreased plant height and lodging and increased yields over the untreated control. Applying high rates of nitrogen fertilizer in conjunction with a PGR and fungicide application did not result in higher yields than the lower rate of nitrogen. This study will be repeated in 2018.

Table 2. Grain yield, lodging, plant height, and test weight of oat variety, nitrogen fertilization, and PGR fb fungicide treatments.

Variety	Nitrogen	Foliar treatment	Grain yield	Height	Lodg	Test weight
	lbs N/a		bu/ac	inches	1-5	lbs/bu
BetaGene			161.2	38.1	3.0	29.2
Ron			152.7	39.2	3.3	28.9
Antigo			161.6	37.3	1.8	35.4
	45		161.5	37.9	2.3	31.5
	90		158.9	38.3	2.7	30.7
	135		155.1	38.4	3.1	31.3
BetaGene	45		165.7	37.5	2.5	29.0
BetaGene	90		164.7	37.8	2.9	28.4
BetaGene	135		153.2	39.0	3.6	30.1
Ron	45		155.1	39.1	3.1	29.5
Ron	90		149.9	39.0	3.4	28.5
Ron	135		153.2	39.4	3.5	28.8
Antigo	45		163.7	37.1	1.4	35.9
Antigo	90		162.0	38.0	1.9	35.4
Antigo	135		158.9	36.9	2.3	34.9
		NTC	146.4	39.3	3.5	30.8
		Palisade fb Trivapro	170.6	37.1	2.0	31.5
BetaGene		NTC	152.3	39.0	3.6	28.5
BetaGene		Palisade fb Trivapro	170.1	37.2	2.4	29.8
Ron		NTC	140.1	40.3	4.6	28.5
Ron		Palisade fb Trivapro	165.4	38.0	2.1	29.4
Antigo		NTC	146.9	38.7	2.3	35.3
Antigo		Palisade fb Trivapro	176.2	36.0	1.4	35.4
	45	NTC	144.5	39.3	3.1	31.0
	45	Palisade fb Trivapro	178.5	36.6	1.6	31.9
	90	NTC	148.3	39.4	3.4	30.7
	90	Palisade fb Trivapro	169.6	37.1	2.0	30.8
	135	NTC	146.5	39.3	3.9	30.7
	135	Palisade fb Trivapro	163.7	37.5	2.3	31.9
BetaGene	45	NTC	149.6	38.8	3.3	28.5
BetaGene	45	Palisade fb Trivapro	181.8	36.3	1.8	29.5
BetaGene	90	NTC	161.7	39.0	3.5	28.2
BetaGene	90	Palisade fb Trivapro	167.8	36.5	2.3	28.6
BetaGene	135	NTC	145.7	39.3	4.0	28.9
BetaGene	135	Palisade fb Trivapro	160.7	38.8	3.3	31.3
Ron	45	NTC	137.6	40.0	4.5	28.8
Ron	45	Palisade fb Trivapro	172.6	38.3	1.8	30.3
Ron	90	NTC	137.5	40.3	4.5	28.1
Ron	90	Palisade fb Trivapro	162.4	37.8	2.3	28.9
Ron	135	NTC	145.0	40.8	4.8	28.5
Ron	135	Palisade fb Trivapro	161.3	38.0	2.3	29.1
Antigo	45	NTC	146.4	39.0	1.5	35.8
Antigo	45	Palisade fb Trivapro	181.0	35.3	1.3	36.0
Antigo	90	NTC	145.6	39.0	2.3	35.7
Antigo	90	Palisade fb Trivapro	178.5	37.0	1.5	35.1
Antigo	135	NTC	148.6	38.0	3.0	34.6
Antigo	135	Palisade fb Trivapro	169.3	35.8	1.5	35.2
Means			158.5	38.2	2.7	31.2
Probability Pr>F						
Variety			0.0716	<.0001	<.0001	<.0001
Nitrogen			0.3257	0.3879	0.0017	0.0294
VarietyxNitrogen			0.6954	0.0976	0.6170	0.0053
Foliar Treatment			<.0001	<.0001	<.0001	0.0011
VarietyxFoliar treatment			0.3903	0.5239	0.0005	0.0742
NitrogenxFoliar treatment			0.1321	0.5239	0.9231	0.1381
VarietyxNitrogenxFoliar treatment			0.7769	0.3125	0.3562	0.3994