

Response of winter malting barley to elevated fertilizer nitrogen, fungicides, and growth regulator, 2017



A field trial was established to measure the effects of two rates of fertilizer nitrogen, foliar fungicides (Stratego Yld and Prosaro), and a growth regulator (Palisade) on performance of three winter barley varieties.

On September 25, 2016, Puffin, KWS Scala, and Wintmalt varieties were drilled into a tile-drained, commercial field. The entire trial area received 84 lbs/ac fertilizer nitrogen (UAN) during green-up. The varieties, as the main plot, were split with half the block receiving an additional 51 lbs/ac of nitrogen at the full-tillering stage. Within each split block, along with an untreated control, there was an additional input with each succeeding treatment:

- Prosaro (7 oz/ac) applied May 31, early flowering;
- Prosaro preceded by Stratego Yld (2.3 oz/ac; applied April 29 at second joint stage);
- Prosaro preceded by Stratego and Palisade (12 oz/ac applied at second joint stage)

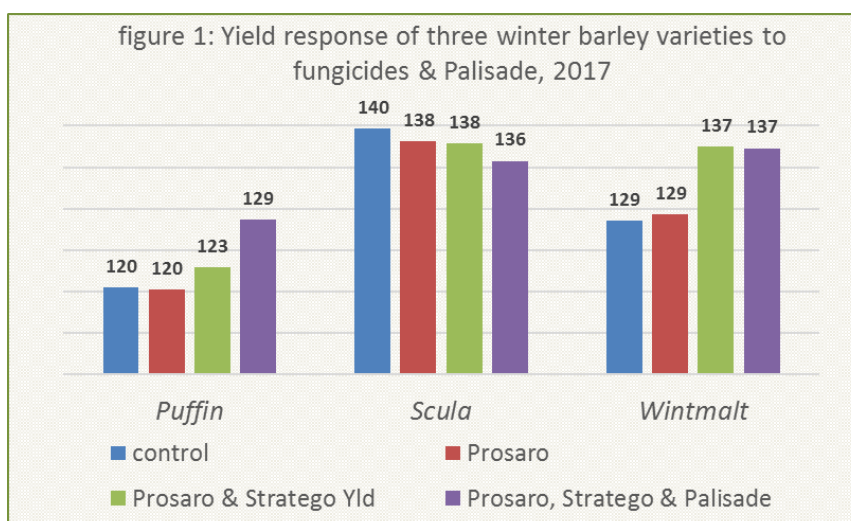
There were three replications.

Overall, the barley survived the winter relatively well, although there were a few individual plots damaged. Foliar disease levels remained very low throughout the season. There was no evidence of Fusarium head scab. Plant lodging was severe during grain-fill so all plots were rated. Plant heights were determined within select treatments for evidence of Palisade activity.

The trial was harvested on July 16 using an International 2144 combine equipped with a 15-foot wide head and a Juniper HarvestMaster system that provided grain weight, test weight, and moisture. Grain samples were collected and submitted to the MSU Barley Quality Lab. for analysis.

Overall, the barley achieved high yields and very good grain quality.

<u>BACKGROUND</u>	
Location	Applegate, MI
Soil Type	Guelph silt loam
Previous crop:	edible dry beans
Planting date:	Sept 24, 2016
Seeding rate:	2.8 bu/ac
Harvest date:	July 16, 2017
<u>PLOT DESIGN</u>	
Design:	Split block
Replications:	three
Plot area:	14 x 60 ft
<u>VARIABLES</u>	
Varieties:	Puffin, Sculla, & Wintmalt
Fertilizer N rates:	84 & 135 lbs/ac
Stratego Yld:	2.3 oz/ac, 2nd joint
Prosaro:	7 oz/ac, early flower
Palisade:	12 oz/ac, 2nd joint



However, it was largely unresponsive to the management inputs employed (results are provided in table 1 and 2). This lack of definitive response, particularly relative to fungicide use, is not consistent Michigan’s limited experience with malting barley to date. There was no significant response to elevating the nitrogen rates (this may have been due to an above normal level of available nitrogen from the previous season). Further, there was not a consistent response to using a single or double fungicide treatment. The lack of foliar disease and Fusarium head blight contributed to this outcome. While Puffin seemed to respond to the use of Palisade plant growth regulator, the product largely failed to significantly reduce plant height or curb lodging when the data is averaged across all varieties.

Figure 1 illustrates barley’s yield response to fungicides and Palisade when averaged across both nitrogen rates. Although Puffin and Wintmalt appeared to respond to inputs to a limited extent, the data was too inconsistent to be very convincing.

Table 1: Response of three winter barley varieties to fertilizer nitrogen, fungicides and plant growth regulator
Deckerville, MI 2017

treatment product *	N rate lbs/ac	<i>Puffin</i>					<i>Sculla</i>					<i>Wintmalt</i>				
		yield bu/ac	test wt	harv. moist.	plant height	plant lodge	yield bu/ac	test wt	harv. moist.	plant height	plant lodge	yield bu/ac	test wt	harv. moist.	plant height	plant lodge
		14 % M	lbs	%	inches.	%	14 % M	lbs	%	inches.	%	14 % M	lbs	%	inches.	%
1. untreated	84	118	48	15.9	--	65	139	48	12.1	--	63	125	49	12.4	--	18
2. Prosaro	84	121	48	15.9	--	39	134	49	12.3	--	60	127	48	13.0	--	24
3. Prosaro, Stratego Yld	84	123	48	15.4	34.2	53	140	48	12.6	30.2	54	131	49	12.7	32.7	53
4. Prosaro, StrategoYld, Palisade	84	130	48	15.5	34.0	40	133	48	12.9	29.6	44	136	49	12.5	32.5	27
5. untreated	135	123	48	15.7	--	74	140	49	12.9	--	81	133	49	12.0	--	13
6. Prosaro	135	120	48	15.5	--	64	142	49	12.1	--	88	131	48	12.9	--	37
7. Prosaro, StrategoYld	135	123	48	16.0	34.2	59	135	49	11.8	30.5	57	144	49	12.3	30.5	33
8. Prosaro, StrategoYld, Palisade	135	127	48	15.6	32.9	42	138	49	12.4	30.6	72	139	49	12.5	31.7	26

* Stratego Yld (2.3oz/ac) and Palisade (12 oz/ac) applied at g.s.7 on April 29; Prosaro (7oz/ac) applied at g.s 10.5 on May31

Table 2: Effects of fertilizer nitrogen, fungicides, and growth regulator on the quality of three winter barley
Deckerville, MI 2017

treatment	N rate lbs/ac	<i>Puffin</i>					<i>Sculla</i>					<i>Wintmalt</i>				
		protein dry,%	plump > 6/64	thin ≤ 5/64	RVA	DON ppm	protein dry,%	plump > 6/64	thin ≤ 5/64	RVA	DON ppm	protein dry,%	plump > 6/64	thin ≤ 5/64	RVA	DON ppm
1. untreated	84	13.0	92	0.9	150	< 0.3	12.9	95	0.9	150	< 0.3	12.6	93	0.8	142	< 0.3
2. Prosaro	84	12.8	93	0.8	150	< 0.3	13.2	94	0.7	140	< 0.3	12.5	92	0.8	139	< 0.3
3. Prosaro, Stratego Yld	84	12.9	91	0.9	142	< 0.3	12.6	96	0.8	148	< 0.3	12.4	92	1.1	144	< 0.3
4. Prosaro, StrategoYld, Palisade	84	12.8	91	0.9	148	< 0.3	12.7	95	0.9	147	< 0.3	12.6	90	1.1	138	< 0.3
5. untreated	135	13.2	89	1.3	144	< 0.3	13.6	94	1.1	150	< 0.3	12.9	90	1.4	136	< 0.3
6. Prosaro	135	13.4	89	1.2	149	< 0.3	12.7	92	1.1	155	< 0.3	13.2	88	1.4	135	< 0.3
7. Prosaro, StrategoYld	135	13.4	90	1.5	151	< 0.3	13.3	95	0.8	143	< 0.3	14.4	92	1.0	137	< 0.3
8. Prosaro, StrategoYld, Palisade	135	12.8	92	1.2	146	< 0.3	13.3	94	0.9	157	< 0.3	12.5	93	0.9	142	< 0.3

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