

Spring Malting Barley Trial

Applegate MI, 2015

A malting barley trial was conducted in Michigan’s Thumb region to observe the effect of an elevated rate of fertilizer nitrogen (N), and applications of a fungicide and plant growth regulator on the agronomic performance of four spring malting barley varieties.



Procedure

Two 2 row varieties (Colon and Pinnacle) and two 6 row varieties (Lacy and Rasmusson) were planted on April 29, 2015 on a moderately well- drained Guelph silt loam soil.

The agronomic variables included: 1) control treatment with 45 lbs/ac of fertilizer N; 2) 45 lbs N and Prosaro fungicide; 3) 90 lbs N and Prosaro; and 4) 90 lbs N, Prosaro and Palisade plant growth regulator. The N was applied as 28%UAN through streamer bars at tillering. Prosaro was applied at a rate of 6.5 oz/ac with 0.125 percent NIS on June 19 at late boot /early heading. Palisade was applied at 11 oz/ac on May 29 at tillering. The varieties were the main plots and management practices the sub-plots. There were four replications of each treatment. Individual plots measured 15 by 55 feet. In-field measurements included plant height and lodging, and an estimate of leaf disease on the flag leaf. The trial was harvested on August 7 using an International 2144 combine equipped with a Juniper HarvestMaster system that provided grain yield, test weight, and moisture. Grain samples were collected to submit a limited number of composite samples for quality testing.

Results

In general, weather conditions were favorable for barley growth, except that a rain event during tillering was excessive leading to severe crop loss in portions of the trial area and loss of multiple replications. Conlon developed considerably earlier than the other varieties which may have placed it at a disadvantage as all treatments were applied to all varieties the same day. It may have also subjected it to greater deer damage.

All four replications of Pinnacle were useable and, therefore, its data are provided in table 1. Prosaro significantly increased grain yield and harvest moisture, and decreased the amount of leafspot. The use of Palisade significantly increased grain yield and harvest moisture. The additional 45 lbs of N had no effect. When the varieties are viewed individually (table 2), the data suggests that the yield of the 6 row varieties may have benefited from the extra N, but it also encouraged lodging. Palisade seemed to effectively reduce this lodging and, consequently, grain yield was improved, although no statistical validation is offered. Looking at the average yields across all varieties (table 3), the use of Prosaro contributed the most to yield improvement by consistently reducing leaf disease.

Table 1: Effect of nitrogen, fungicide and plant growth regulator on the performance Pinnacle spring barley, Applegate, MI, 2015

treatment	Pinnacle ¹					
	yield ² 12%M bu/ac	test weight lbs.	harv. moist. %	plant height in.	plant lodging %	leaf ³ spot %
45#N (control)	103	49.9	11.4	36.3	5	16
45# N + Prosaro	116	49.6	12.6	36.8	6	6
90# N + Prosaro	115	49.7	12.2	36.8	7	7
90# N + Prosaro+ Palisade	116	49.6	12.7	34.5	2	8
CV (%)	8.3	na	6.1	3.5	na	40.5
LSD 0.05	12.1	NS	1.0	1.6	NS	8.3

¹ data represents the average of four replications of Pinnacle.

² grain yield per acre adjusted to 12 percent moisture.

³ leafspot (Net blotch) as percent on flagleaf.

Two composite grain samples were mailed to the Cereal Grain Quality Laboratory, University of Vermont for quality analysis. The results indicate that all measurements were acceptable with the possible exception of seed germination (table 4). This deficiency appeared to be due to naturally occurring seed dormancy, which eventually corrected itself based on samples tested several weeks after harvest.

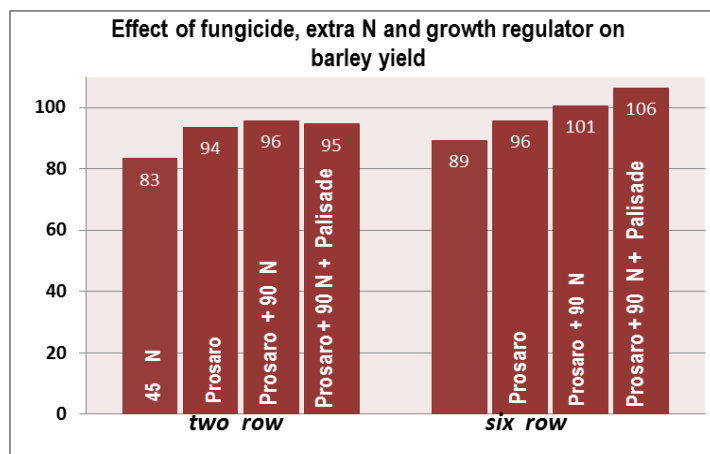


Table 2: Effect of nitrogen, fungicide and plant growth regulator on the grain yield and test weight; plant height and lodging; and leafspot on four malting spring barley varieties, Applegate, MI, 2015

treatment	Conlon (3 reps) ¹					Pinnacle (4 reps) ¹					Lacy (2 reps) ¹					Rasmusson (2 reps) ¹				
	yield ² bu/ac	tw lbs	hght in.	lodg %	lfsp ³ %	yield ² bu/ac	tw lbs	hght in.	lodg %	lfsp ³ %	yield ² bu/ac	tw lbs	hght in.	lodg %	lfsp ³ %	yield ² bu/ac	tw lbs	hght in.	lodg %	lfsp ³ %
45# N (control)	64	49	34	6	10	103	50	36	5	16	85	48	37	28	9	94	48	36	43	10
45# N + Prosaro	72	50	32	5	4	116	50	37	6	6	90	48	38	13	4	101	49	35	35	3
90# N + Prosaro	74	50	34	43	4	115	50	37	7	7	97	48	39	40	2	105	49	37	48	3
90# N + Prosaro+ Palisade	74	50	34	8	4	116	50	35	2	8	105	49	37	20	3	108	49	35	40	4
average	71	50	33	16	6	112	50	36	5	9	94	48	37	25	5	102	49	36	41	5

¹ the number of useable replications for Conlon, Pinnacle, Lacy, and Rasmusson are 3,4,2,and 2, respectively.

² grain yield per acre adjusted to 12 percent moisture.

³ leafspot (Net blotch) as percent on flagleaf.

Commentary

This was our first attempt to conduct agronomic field trials on spring barley. This crop, as a whole, produced higher than expected grain yields especially considering that the four acre trial was on non-tiled, undulating ground. The high yields were largely due to weather that was unusually favorable to small cereal grain crops. In the future, I would expect yields at this site to average 10 to 25 percent less than reported here. The weather pattern during grain-fill was favorable. In particular, low stress levels allowed protein to remain relative low and the absence of extensive wet weather during grain-fill mitigated any risk of sprouting and Fusarium head scab.

Based on very limited experience, I would suggest growers in the Thumb region consider:

- 1) Limiting the use of fertilizer N to 45 to 65 lbs/ac to avoid elevated protein levels and plant lodging.
- 2) Applying Prosaro (or Caramba) at early heading to reduce the risk of quality losses from Fusarium head scab and grain yield losses due to leaf diseases.
- 3) Foregoing the use of Palisade in most cases as N rates need to remain below the levels that could lead to lodging. The risk of lodging can be further reduced by selecting varieties with good lodging resistance.

Table 3: Average effect of nitrogen, fungicide and plant growth regulator on the performance of spring barley Applegate, MI, 2015

treatment	averages ¹					
	yield ² 12% M bu/ac	test weight lbs	harv. moist. %	plant height in.	plant lodging %	leaf ³ spot %
45#N (control)	86	49	13	36	20	11
45# N + Prosaro	95	49	13	35	15	4
90# N + Prosaro	97	49	13	37	34	4
90# N + Prosaro+ Palisade	101	49	13	35	20	5
average	95	49	13	36	22	6

¹ average data across all four varieties; useable replications for Conlon, Pinnacle, Lacy, and Rasmusson are 3,4,2,and 2, respectively.

² grain yield per acre adjusted to 12 percent moisture.

³ leafspot (Net blotch) as percent on flagleaf.

Table 4: Quality test results for two composite samples of barley, Applegate, MI, 2016

Grain Moist	Test Wt	As-Is Prot	DM Prot	Falling No.	DON	Seed Germ
%	lbs	%	%	sec	ppm	%
16.1	49.8	7.2	8	336	1	67.5
16.4	50.2	7.45	8.3	334	0.9	70.5

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