

Evaluation of Organic Barley Varieties in Southeast Iowa

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Kathleen Delate, professor
Henry Franzen, research assistant
Departments of Horticulture and Agronomy
Myron Rees, farm co-manager
Cody Schneider, farm co-manager

Introduction

According to the USDA National Organic Program, certified organic farmers must source organic seed (seed from organically raised crops). The organic seed industry is growing in Iowa and the Midwest, and with this growth, organic growers are looking for university-based recommendations on organic varieties to use in Iowa. The Organic Agriculture Program at Iowa State University has been using organic seed at the Southeast Research Farm (SERF), Crawfordsville, Iowa, for 17 years with excellent results.

Materials and Methods

The organic barley trial followed soybean in the long-term crop rotation at SERF. There were four varieties selected for the 2020 organic barley variety trial. These included the following Albert Lea Seed House (Albert Lea, MN) barley varieties: Hayes, Haxby, Quest, and ND Genesis.

Plots measuring 20 x 380 ft were placed in a randomized complete block design with four replications of each variety. The plots had a harvest area of 15 x 290 ft. Barley was planted at 96.5 lb/acre at a depth of 1 in. on April 1. Red clover was planted as an underseeding to improve soil health at 12 lb/acre. Barley was harvested July 26. Due to COVID restrictions, fewer data collections occurred in 2020.

Results and Discussion

Despite the challenging weather in 2020 (Table 1), organic barley performance was very good in southeast Iowa. Overall precipitation totals varied over 2019 and 2020, but 2019 had the highest total precipitation at 39.11 in., with May having the most at 9.59 in. In 2020, total precipitation was only 29.77 in., with September having the highest precipitation for the season at 6.20 in. The 30-yr average total precipitation was 34.32 in., so 2020 rains were 4.45 in. below normal. Average temperatures in 2020 were warmer than 2019, with the month of July having the highest temperature for both years, 79.29°F (2019) and 77.15°F (2020). The 2020 seasonal average of 54.39°F exceeded the 30-yr seasonal average at 53.96°F.

Barley yields were good, considering the weather, and averaged 34.03 bushels/acre across all varieties (Table 2). The Haxby variety yield, at 47 bushels/acre, was significantly greater than Quest (35 bu/ac), ND Genesis (32 bu/ac), and Hayes (32 bu/ac). These results mirrored previous organic barley production results at this site in 2017, when the four varieties averaged 34 bushels/acre.

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Table 1. Monthly growing season precipitation totals and mean temperature, Southeast Research Farm, Crawfordsville, IA, 2019-2020.

Month	Monthly precipitation (in.)			Average air temperature (°F)		
	2019	2020	30-yr avg.	2019	2020	30-yr avg.
January	1.51	1.73	0.98	19.02	27.34	22.51
February	2.69	0.25	1.26	20.13	29.36	26.64
March	2.01	4.00	2.30	34.55	43.85	39.05
April	4.55	1.68	3.67	51.10	49.98	51.06
May	9.59	4.99	4.72	59.34	59.34	62.08
June	3.38	5.27	5.30	71.15	72.80	71.98
July	1.04	2.86	4.02	79.29	77.15	75.19
August	4.71	0.47	4.01	73.21	73.45	73.19
September	7.49	6.20	3.22	71.30	62.68	65.12
October	2.14	2.32	2.88	49.44	47.95	52.73
Total seasonal precipitation and seasonal avg. air temperature	39.11	29.77	32.36	52.85	54.39	53.96

Table 2. Organic barley yields, Southeast Research Farm, Crawfordsville, IA, 2020.¹

Variety	Weight (lb)	Moisture (%)	Avg. yield (bu/ac)
Haxby	202.85a	18.83b	46.98a
Hayes	130.88d	19.2c	31.98c
ND Genesis	153.13c	18.93b	31.91d
Quest	166.53b	17.33a	34.70b
P value = 0.05	0.0027	0.0340	0.0027

¹Means followed by the same letter in a column are not significantly different at $P \leq 0.05$.