

Performance of Hop Cultivars in Iowa

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Introduction

Iowa currently has more than 90 craft breweries and ranks 17th in economic impact per capita in U.S. craft breweries. As a result, brewers' demand for hops is predicted to increase by 33 percent by 2020. Although there is interest from brewers to buy locally grown hops, cone quality and profitability will be important deciding factors. In order to move hop production forward, it is necessary to test and analyze which cultivars do best in our environment. Cultivars for this trial were selected based on historical uses and anecdotal evidence that these would do well in Iowa.

Most of the cultivars selected for this trial are commonly grown in the Pacific Northwest region of the United States, which is considered semi-arid with a Mediterranean precipitation pattern, whereas our region lies within a humid continental zone. Winters are milder in the Pacific Northwest compared with the cold, harsh winters of Iowa. This hop cultivar trial focuses on the challenges of producing a high-quality specialty food crop grown under the environmental conditions in Iowa.

Materials and Methods

Currently, seven cultivars are being evaluated: Fuggle, Mount Hood, Newport, Northern Brewer, Nugget, Triple Pearle, and Zeus. Plants were established May 2016 at a spacing of 3.5 ft within row x 10 ft between row at the ISU Horticulture Research Station, Ames, Iowa. Prior to planting, the field was amended

with 80 lb N/acre, 70 lb P₂O₅/acre, and 150 lb K₂O/acre based on soil test recommendations. In subsequent years, plants were supplied with 150 lb N/acre. Leaf greenness was measured using a handheld 502 SPAD chlorophyll meter throughout the season. Plant growth (height) and cone yield was recorded at the end of the season.

Results and Discussion

Growth of cultivars was significantly different (Table 1). Nugget was at least 31.6 percent taller than Fuggle, Mount Hood, Newport, and Northern Brewer. Similarly, Nugget produced significantly more cones and had a higher estimated yield than Mount Hood and Northern Brewer. Overall, Nugget, Triple Pearle, Zeus, and Newport were the top performers based on height (> 10 ft) and estimated yields (> 180 lb/acre) compared with Mount Hood, Fuggle, and Northern Brewer.

While there was a difference in growth, none of the cultivars reached the height of the trellis (18 ft), most likely due to the unseasonable spring weather, which delayed emergence. Temperatures in April were 4.9°F below the average high (56.1°F) and 6.9°F below the average low (30.5°F); whereas, temperatures in May were 11.2°F above the average high (72°F) and 8.1°F above the average low (49°F). Consequently, yields also were lower than expected for second-year hops, most likely due to delayed spring emergence.

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Table 1. Performance of seven hop cultivars in Iowa.

Cultivar	Average height (ft)^x	Yield/plant (lb)^z	Estimated yield/acre (lb)^y
Fuggle	8.1de	0.51abc	150.8ab
Mt. Hood	9.5cde	0.19bc	45.0b
Newport	11.2bcd	0.57abc	182.8ab
Northern Brewer	6.4e	0.02c	4.3b
Nugget	15.4a	0.91a	288.4a
Triple Pearle	14.7ab	0.67abc	199.5ab
Zeus	13.2abc	0.78ab	222.9ab

^xYield/plant: dried cones divided by the number of plants/cultivar.

^yYield/acre: estimated yield per acre at 1,000 plants/acre.

^zMeans (within a column) with the same letters are not statistically different according to Tukey's HSD ($\alpha=0.05$).