

## In-Line Trellis Hop Production to Enhance Economic Opportunities for Ohio Farmers and Brewers 2017

Brad Bergfurd, Extension Educator, Scioto County and Piketon Research & Extension Center, Ohio State University

Thomas Harker, Horticulture Research Assistant, South Centers

Craig Everett, Horticulture Program Assistant, Wood County Extension

Zach Zientek, Crop Production and Research Specialist, Hirzel Farms

### Objective

To screen hop cultivars for suitability, production performance and quality attributes under Ohio growing conditions.

### Background

This study was conducted at the Agricultural Incubator Foundation Bowling Green, Ohio (lat. 41.46° N, long. 83.66° W), elevation 660 feet. Research and Demonstration plot is a collaborated effort between The Ohio State University, Hirzel Farms, and Center for Innovation of Food and Technology. The experimental soil is designated as a HoA—Hoytville Clay loam, with 0–1% slopes. Soil was formed from wave planed- till. It is a very deep, nearly level and a very poorly drained soil. Permeability consists of moderately slow in the upper part of the solum, slow in the lower part of the solum, and slow or very slow in the substratum. The A horizon soil surface is predominantly clay loam or sandy clay loam; while the subsoil is clay, silty clay, clay loam, or silty clay loam.

### Methods

Four replications of each treatment was established. Rhizomes were hand planted into 10 inch tall raised beds covered with black landscape fabric for weed and soil erosion control. Plants are spaced 5 feet apart in row and beds are spaced 15 foot on center. Drip irrigation is installed on high tinsel wire above the landscape fabric. 159 pounds of P2O5, 140 pounds of K2O and 2477 pounds of CaCO3 per acre was applied according to soil test results and incorporated before forming beds and applying landscape fabric. A high trellis training system (20 ft. tall) was installed and assembled after formation of the raised beds.

**Insect control:** Collected leaf samples were inspected weekly for the presence of two-spotted spider mite, hop aphid and the potato leaf hopper. Chemical control was used when the thresholds had been reached for each insect type.

**Disease control:** Plant samples were analyzed by the Plant Pathology lab, OARDC to evaluate for disease as needed throughout the growing season.

Fungicide applications were made on a 7-10 day schedule depending on weather conditions and disease pressure.

**Irrigation:** Drip irrigation was applied weekly throughout the growing season.

**Fertilization:** 305lb/acre of Nitrogen fertilizer applications were made via fertigation through the drip irrigation system, over a ten week period 5/10/17-7/17/17. Nitrogen source used was 28% and 6-6-17 (fish emulsion).



## Yield data

Hop cones were mechanically harvested as they reached physiological maturity according to chemical analysis results and fresh weight data was collected. Hop cones were then dried to 8% moisture using a hop drying Oast (dryer), weighed, and pelletized.

Table 1: In-Line Trellis Hop Yields Bowling Green, Ohio 2017

Cultivar	Wet lbs. per Plant	Dry lbs. per Plant	Wet lbs. per Acre	Dry lbs. per Acre
Columbus	2.44	0.98	1416	831
Chinook	2.00	0.80	1161	680
Nugget	1.84	0.74	1067	626
Cascade	1.24	0.49	720	420
Galena	0.86	0.26	498	219
Mt. Hood	0.52	0.21	301	177
Willamette	0.48	0.19	279	164
Sterling	0.43	0.11	246	94
Centennial	0.18	0.05	105	46
Golding	0.09	0.02	54	20

\* All results based on 580 plants per acre

Table 2: Hop chemical analysis sample date 08/28/17.

Variety	Moisture	Alpha Acids	Beta Acids	Alpha Acids at 8%	Beta Acids at 8%
Cascade	63.46	2.43	2.53	5.98	6.22
Centennial	70.00	2.41	0.86	7.23	2.58
Chinook	61.21	2.90	0.80	6.72	1.85
Columbus	61.04	3.60	1.40	8.31	3.23
Galena	67.30	2.50	1.56	6.88	4.29
Golding	75.49	0.70	0.80	2.57	2.05
Mt. Hood	61.49	2.28	0.93	5.32	2.16
Nugget	60.56	2.85	0.88	6.50	2.00
Sterling	74.78	0.95	0.95	3.38	3.38
Willamette	58.11	4.29	1.16	9.21	2.48

## Summary

Overall plant and hop cone quality was good. Wet pounds per acre ranged from a high of 1,416 (Cv. Columbus) to a low of 54 (Cv. Golding). Wet pounds per plant ranged from a high of 2.44 pounds (Cv. Columbus) to a low of .09 pound (Cv. Golding). Wet hop market prices average \$25 per pound with gross return potential from Ohio hops in excess of \$70,000 per acre. Acreage estimates indicate 80 mature Ohio hop acres harvested in 2015.

([http://www.usahops.org/userfiles/image/1452960660\\_2015%20Stat%20Pack.pdf](http://www.usahops.org/userfiles/image/1452960660_2015%20Stat%20Pack.pdf))





THE OHIO STATE UNIVERSITY

For more information, contact:  
Brad Bergefurd  
OSU South Centers  
1864 Shyville Road  
Piketon, Ohio 45661  
[bergefurd.1@osu.edu](mailto:bergefurd.1@osu.edu)



THE OHIO STATE UNIVERSITY

COLLEGE OF FOOD, AGRICULTURAL,  
AND ENVIRONMENTAL SCIENCES

[southcenters.osu.edu](http://southcenters.osu.edu)

CFAES provides research and related educational programs to clientele on a nondiscriminatory basis. For more information: [go.osu.edu/cfaesdiversity](http://go.osu.edu/cfaesdiversity).