

# Hop Production to Enhance Economic Opportunities for Ohio Farmers and Brewers

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

## Background

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Crop Year: 2015

Location: Ohio Agricultural Research and Development Center (OARDC) Horticulture Research Unit 2. (lat.40° 47' N; long. 81° 55' W, Elevation 1020 ft.).

County/Town: Wayne/Wooster

Soil Type: Doles Wooster Silt-Loam

Drainage: field tile, sub-surface and 10 inch raised beds

Previous Crop: Perennial Hops

Tillage: Permanent raised beds

Soil Test: pH 5.6

P 30 ppm(60 lb/ac)

K314 ppm(628 lb/ac)

Planting Date: May 8, 2013

Nitrogen: 125 lb./ ac

Seeding Rate: 1,210 plants per acre

Harvest Date(s): 7/27, 7/28, 7/31, 8/3, 8/5, 8/6, 8/8, 8/9, 8/10, 8/11, 8/12, 8/18, 8/19, 8/20, 8/21, 8/25, 8/26 and 8/27

## Methods

Experimental design is Randomized Complete Block (RCB) with 4 replications of each treatment Rhizomes were hand planted into 10 inch tall raised beds covered with black landscape fabric for weed and soil erosion control. Plants are spaced 3 feet apart in row and beds are spaced 12 foot on center. Drip irrigation is installed on top the landscape fabric. A high trellis training system (17 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. Carla virus and Apple Mosaic virus was detected in Willamette Cv. samples.

Fungicide applications were made on a 10 day schedule.

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

**Fertilization:** 5000 lb/acre CaCO<sub>3</sub> was applied according to soil test results and incorporated before forming beds and applying landscape fabric. 125 lb/acre of Nitrogen fertilizer applications were made via fertigation through the drip irrigation system, over a six week period 4/15/15-6/10/15. Water soluble Nitrogen sources used were 12-48-8, 8-24-0 and 21-0-0.



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**Yield data:** Hop cones were hand harvested as they reached physiological maturity according to chemical analysis results and fresh weight data collected. Hop cones were then dried to 8% moisture using a hop drying Oast (dryer), weighed, and air tight packaged with a vacuum sealer and immediately placed into a freezer at 10 degrees F.

## Results

Table 1: Hop Yields, Ohio Agricultural Research & Development Center, Wooster, Ohio 2015

Cultivar	Wet lbs. per Acre	Wet lbs. per Plant	Dry lbs. per Acre	Dry lbs. per Plant
Columbus	3505.8 A	2.8973 A	2081.4 A	1.72016 A
Nugget	2560.3 B	2.1159 B	1520 B	1.25623 B
Cascade	2346.7 B	1.9394 B	1393.2 B	1.15143 B
Sterling	1620 C	1.3389 C	961.8 C	0.7949 C
Centennial	985.7 D	0.8146 D	585.2 D	0.48366 D
Willamette	828 D	0.6843 D	491.6 D	0.40629 D
<b>LSD</b>	<b>420.16</b>	<b>0.3472</b>	<b>249.45</b>	<b>0.2062</b>

- *Treatments with the same letter are not significantly different.*

## Summary

Overall plant and hop cone quality was good. Wet pounds per acre ranged from a high of 3,505 (Cv. Columbus) to a low of 985 (Cv. Centennial). Wet pounds per plant ranged from a high of 2.89 pounds (Cv. Columbus) to a low of .81 pound (Cv. Centennial). 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))

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