

Hop Production to Enhance Economic Opportunities for Ohio Farmers 2021

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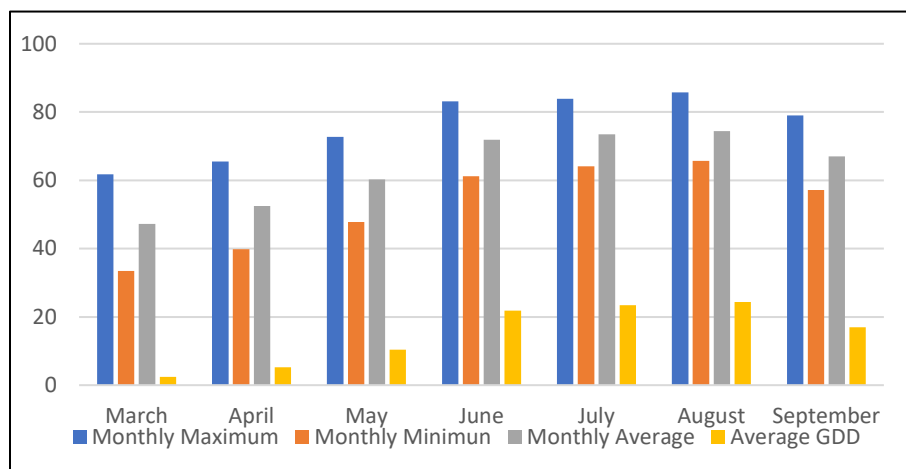
Objective:

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

Materials and Methods:

Description of study area

This study was conducted at the Ohio State University (OSU) South Centers/Piketon Research & Extension Center at Piketon, Ohio (lat. 39.07° N, long. 83.01° W), elevation 578



feet. The experimental soil is designated as a DoA—Doles silt loam, with 0–3% slopes. It is a deep, nearly level and somewhat poorly drained soil. Typically, the soil surface is a brown, friable silt loam about 20 cm deep and beneath this the subsoil is about 18.5 m.

Fig.1. Average minimum and maximum temperature, and growing degree days 2021.

Experiment and cultural practices

Experimental design is Randomized Complete Block (RCB) with 4 replications of each treatment. Plants 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 14 feet on center. Drip irrigation is installed on high tinsel wire above the landscape fabric. Prior to embellishment of raised beds nutrients were 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.

Leaf samples were collected and 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. 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. Herbicides were applied in late February while the hop yard was still dormant.

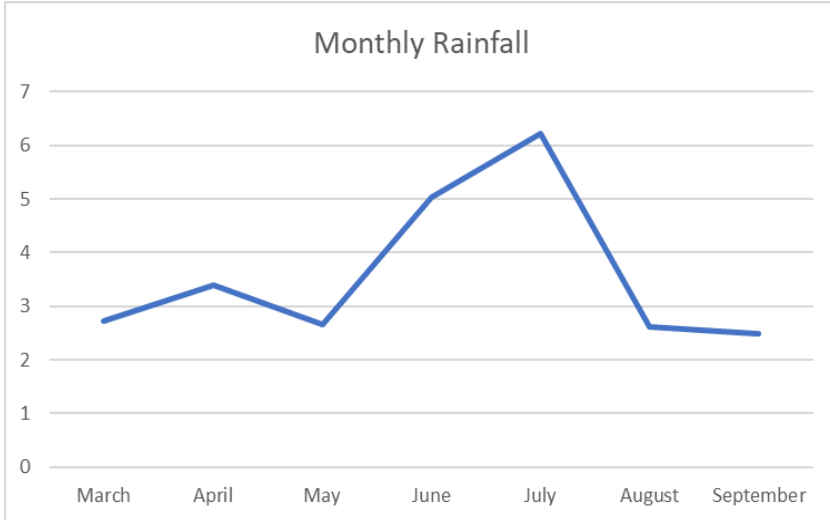


Fig. 2. Monthly rainfall distribution (inches) during the 2021 hop growing season.

Drip irrigation was applied weekly throughout the growing season. Three hundred actual pounds of Nitrogen fertilizer per acre was applied via fertigation through the drip irrigation system, over a seven week period. Primary nitrogen source used was 28%.

Results and Discussion

Yield and Quality of Hops

Overall plant and hop cone quality was good over the entire growing season. 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 stored until they could be pelletized. Wet pounds per acre ranged from a high of 3945 (Cv. Nugget) to a low of 1074(Cv. Galena). Wet pounds per plant ranged from a high of 3.08 pounds (Cv. Nugget) to a low of 1.03 pound (Cv. Galena) Dry pounds per acre ranged from a high of 2264 (Cv. Nugget) to a low of 677(Cv. Galena). Hop analysis was ran at harvest results are seen in table 2. After the cones have been pelletized we will run the analysis again.

Table 1: Hop Yields Piketon, Ohio 2021

Cultivar	Wet lbs./plant	Dry lbs./plant	Wet lbs./acre	Dry lbs./acre
Nugget	3.80 A	2.18 A	3942 A	2264 A
Yakima Gold	2.84 A	1.61 B	2947 A	1671 B
Crystal	2.83 A	1.30 BC	2936 A	1351 BC
Chinook	1.39 B	0.84 CD	1446 B	877 CD
Columbus	1.37 B	1.00 CD	1421 B	1047.3 CD
Cascade	1.13 B	0.75 D	1178 B	779 D
Magnum	1.09 B	0.70 D	1132 B	732 D
Galena	1.03 B	0.65 D	1074 B	677 D
LSD	1.11	0.47	1155	488

* Any means with the same letter in the above chart are not significantly different.

Table 2: Hop Quality Analysis 2021

Cultivar	Alpha Acids, %	Beta Acids, %
Cascade	7.8	5.0
Chinook	10.6	3.2
Columbus	12.2	4.8
Crystal	5.3	1.5
Galena	13.3	3.8
Magnum	10.9	3.7
Nugget	14.2	3.7
Yakima Gold	9.8	2.2

