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Agricenter International

The Story of Hops at Agricenter International

Hops Summit

Agricenter International

- Established in 1979
- 1000 A Research Farm
- Non-profit 501 3(c)
- Expo, Showplace Arena, Farmers Market, RV Park
- Conduct research for 80+ companies
- Agronomic crops, sweet potatoes, peanuts, cereals, sorghums, fruit and vegetables, hemp, and turf

Mission Statement

- To advance knowledge and understanding of agriculture

- Evaluation of new crops and production practices – hops, winter malting barley, oilseeds

Background at Agricenter

- 2016 evaluating new crops for TN producers
- 2017 – initialize demo site hop varieties
  - Cascade
  - Nugget
  - Southern Brewer
  - Multihead neomexicana
  - Alpharoma
- 2018 – 3 A hopyard, organic ORC, agronomic evaluations
- 2022 – New study with illumination

Experiment Design – Initial Test

- 5 plants of each variety
- 1 m spacing
- Temporary poles 16’ tall with heavy cable
- Concentrated on root growth, pruning
- Some bines on each variety
- Used baling twine instead of true coir
- Yield about 1 lb per plant (certain varieties)
  - Cascade and Nugget

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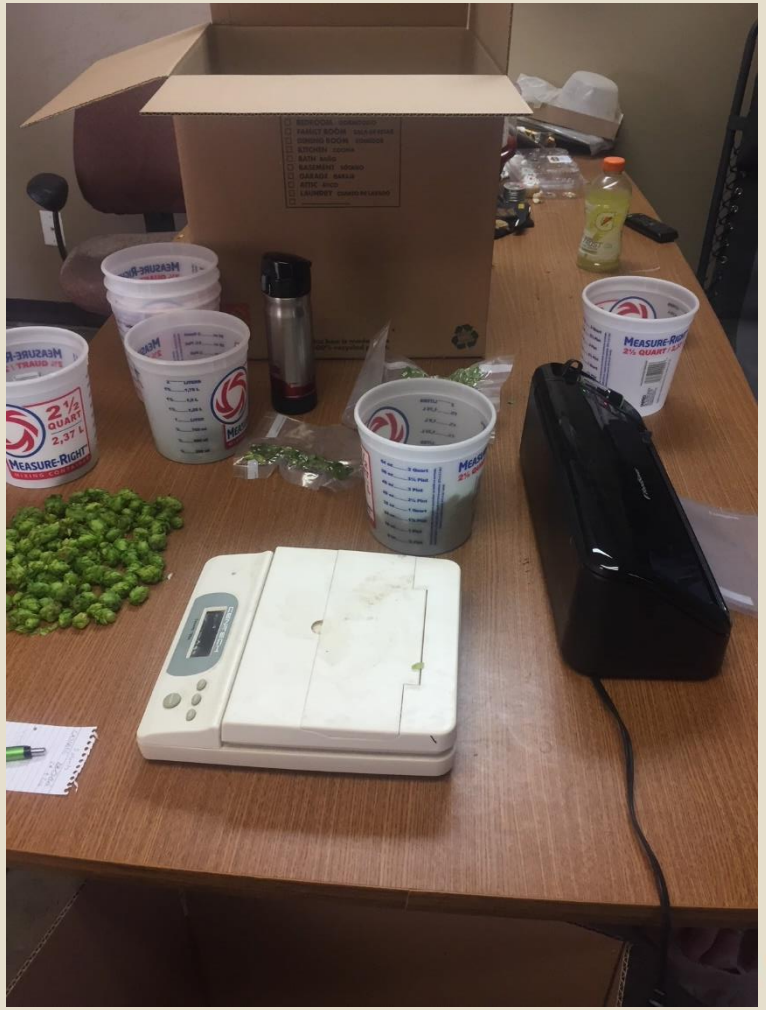
2nd Year

- Cascade and Nugget survived our “Normal” winter in 2018. Southern Brewer 50% kill
- Replaced others with Cascade and Nugget
- Yield about 2 lb per hill/plant

Processing



Hops Grown in Organic Systems

- Tennessee Department of Agriculture
- Awarded November 2018
- 3-acre research and demonstration area
- Project completed in August 2021 but will continue to compile multi-year data

Objective

- To evaluate performance of hops grown organically in the Midsouth
- Fertility requirements
- Increasing daylenght

3 A Hopyard Research Area

Item Description	Per-Unit Cost	Funds Requested
Poles	$32	$4,196.00
Turn buckles/anchors	$28.73	$2,298
Clamps	$1.31	$394
Plants - hops	$6.95	$13,900
Miscellaneous		$3,485.66
		$24,273.66

Design

- 800 plants per acre
- 3 total acres
  - 1 A for variety testing
  - 1 A for pest evaluation
  - 1 A for agronomic evaluation
- Drip irrigation (soluble fertilizer, etc.)

Varieties

- Columbia – early to mid
- Crystal – mid to late
- Alpharoma - late
- Southern Cross - mid
- Zeus – mid to late
- Comet – mid to late
- Multihead neomexicana – early to mid
- Cascade - mid

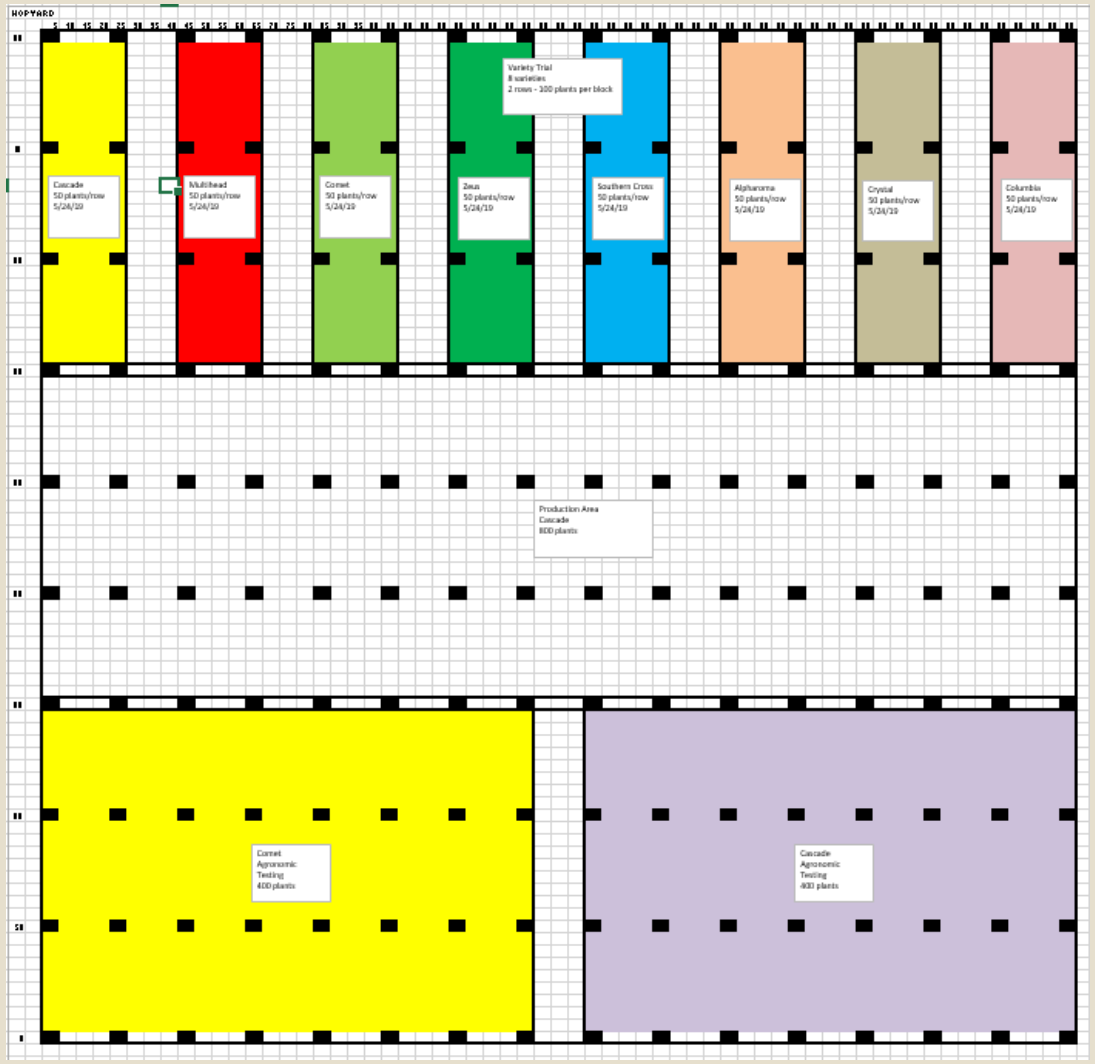
Pest Evaluation

- Insect control
- Disease control
- Organic products
- Mulches
- Middle crops

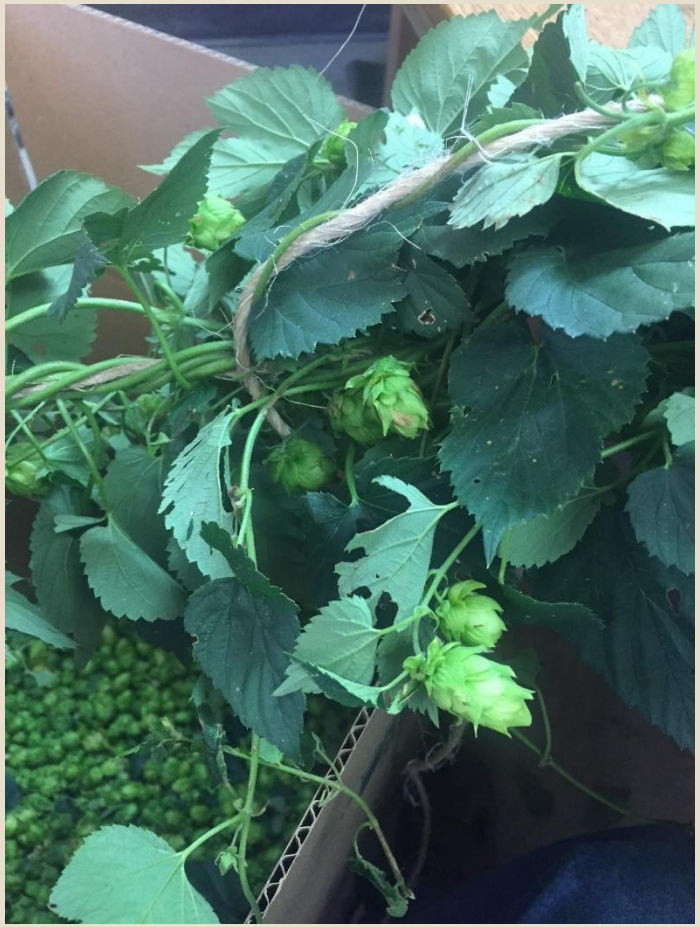
Agronomic Evaluation

- Cover crops – N_2
- Fertility trials
- Lights
- Row covers
- Number of bines to train
- Bare bine height

Field Map


HOPYARD
Variety Trial
8 varieties
2 rows - 100 plants per block
Cascade
50 plants/row
5/24/19
Multihead
50 plants/row
5/24/19
Comet
50 plants/row
5/24/19
Zeus
50 plants/row
5/24/19
Southern Cross
50 plants/row
5/24/19
Alpharoma
50 plants/row
5/24/19
Crystal
50 plants/row
5/24/19
Columbia
50 plants/row
5/24/19
Production Area
Cascade
800 plants
Comet
Agronomic
Testing
400 plants
Cascade
Agronomic
Testing
400 plants

Hops



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Example Cover Between Rows

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Planting

Struggles

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Hopyard

Hopyard

- PVC caps with eyebolt to run main line
- Main line in this design is 5/8” poly rope

Irrigation

Hops Fertilizer Experiment

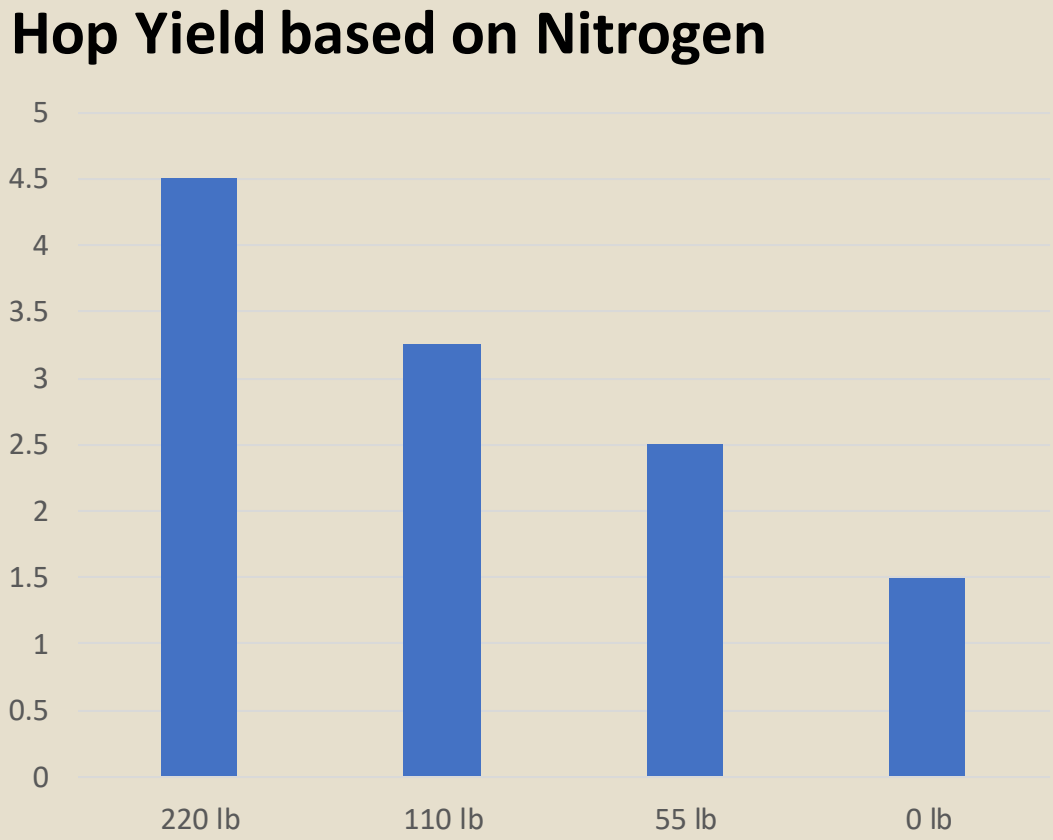
- Based initially on Michigan State University recommendations
- NUE for hops was based at 50%
- Hops need ~110 lbs/A/yr
  - Cones - 45 lb
  - Crop residue – 65 lb

Materials and Methods

- RCB
- Chilean nitrate at 220, 110, 55 and 0 lb/A
  - Applied in spring
  - Organic
- 4 replications
- Yield data

Yield (lb/plant)

	220 lb	110 lb	55 lb	0 lb
Cascade	4.5	3.25	2.5	1.5



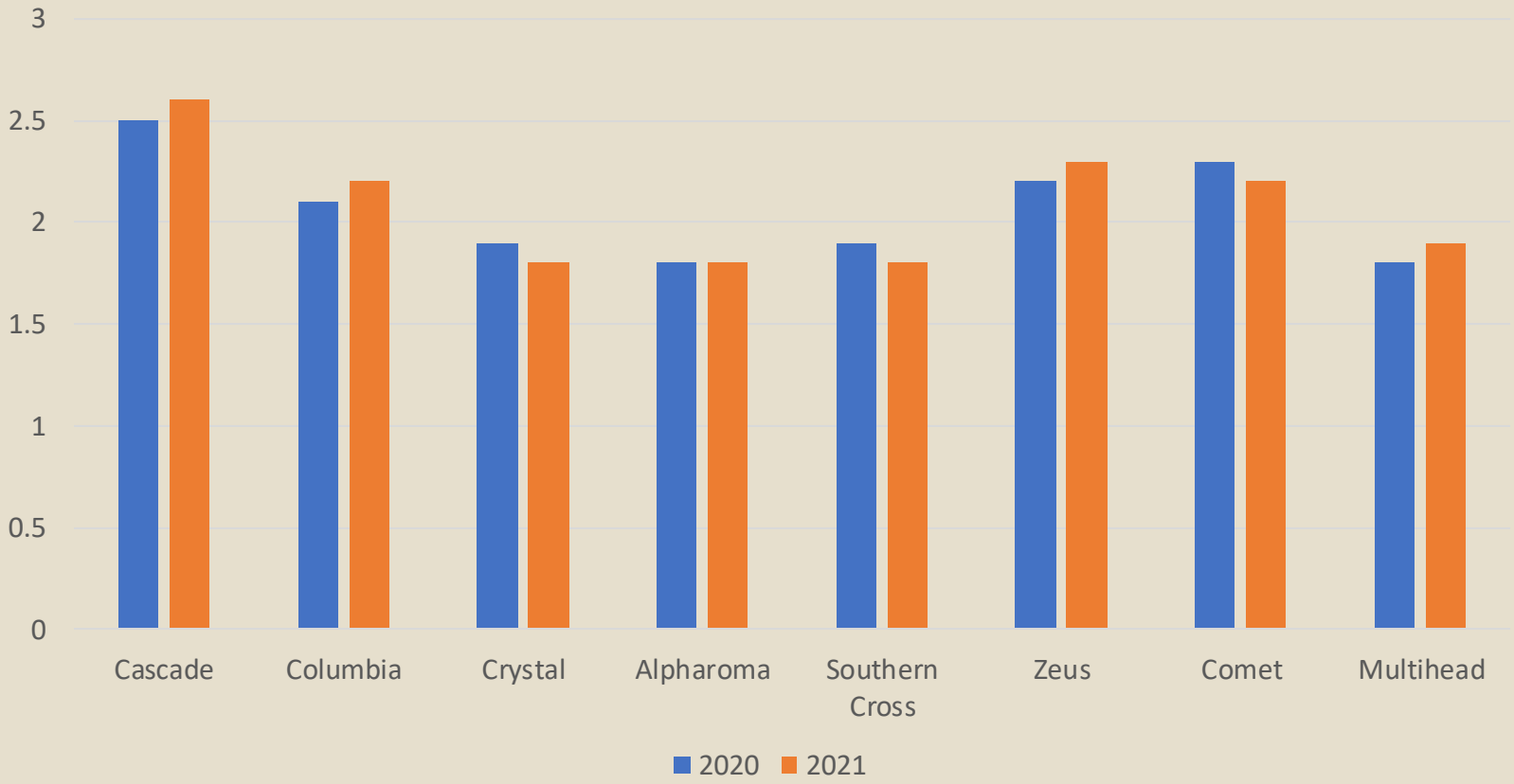
2021 Agricenter

Results

- Predictable
- Will have good base for future trials
- Split applications
- Drip vs broadcast

New Growth

Hop Yield 2020-2021 (lbs/plant)



Increasing Daylength to Maximize Hop Production

- Grant awarded October 2021
- Existing hopyard

- Objective: to increase daylength by 1, 2 or 4 hours per day until summer solstice
- Hypothesis – more vegetative growth will promote more flower production

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EcoDelta Generator

- 1300 watts
- 30 lbs
- Charge
  - AC
  - Solar
  - Car
- Lithium ion 18650

Light Setup

200 watt solar panel
10 watt Phillips Greenpower LED flowering bulb DR/W

Philips GreenPower LED Flowering Lamps

- Inhibits flowering of short-day plants
- 13 W power consumption
- Light output 25 µmol/s
- Efficiency 1.9 µmol/J

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Solar Hook Up

Lights at Night

Questions

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