



CROSBY®
HOP FARM, LLC.

Hops 101 by Blake Crosby

UVM HOP CONFERENCE 2019

Certified



Corporation

8648 Crosby Road NE | Woodburn, OR 97071

CROSBYHOPS.COM



WHAT WE WILL COVER TODAY

- BASIC HOP FERTILITY, PRODUCTION
- HARVESTING, QUALITY, PROCESSING
 - Harvest Timing
 - Common Cultural Practices
 - Pelleting / Packaging Operations
- HOW IS IT OPTIMIZED?
 - Best Practices for Growers / Processors



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OUR HOP HISTORY



1855 – Charles Crosby treks across Oregon Trail (CA gold)



1900 - Albert Crosby purchases land and plants first hops



1924 - Edgar Crosby Sr. further expands operations



1944 – Edgar Crosby Jr. takes over installs first picking machine



**1987
Kevin Crosby takes over and doubles operations**



**2008
Blake Crosby begins craft exclusive focus at CHF**



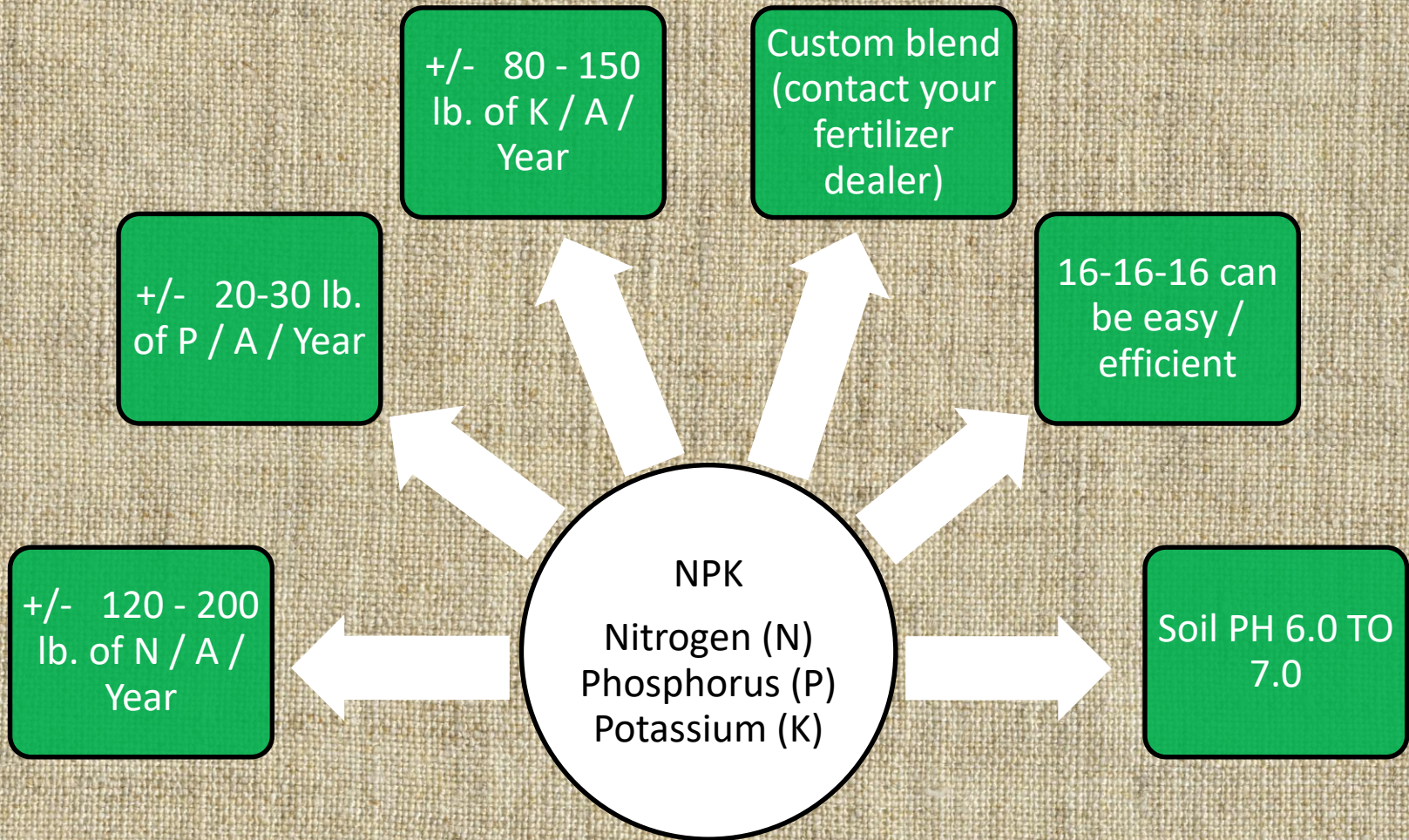
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OREGON NUGGET



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BASIC HOP FERTILITY - KEY NUTRIENTS



NITROGEN APPLICATIONS / TIMING

Nitrogen:
Key to plant
growth but
also can have
diminishing
returns

- +/- 120 to 200 units N / acre / season common in PNW
- Timing is critical and somewhat region dependent
- Too much = excessive foliage, shading, potentially reduced yield
- Application methods vary



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HOP FERTILITY - MICRONUTRIENTS

Boron: +/- 1 lb./acre/season
(Toxic when accumulated
beyond plant need)

Manganese: Also toxic
when accumulated beyond
plant need

**Other Important
Micronutrients for
Hops:**

Zinc: Generally not needed
in Oregon, if so, +/- 5
lb./acre range

Magnesium: Apply +/- 1 ton
dolomite / acre





Mid Spring (left) Nitrogen requirements are increasingly important

Late Summer (pre-harvest) plant is returning carbohydrates to the crown – harvest timing is key to not starving plant of key carbs for subsequent Spring



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WHAT ARE WE HARVESTING ANYWAY?

- **ALPHA ACID**

Still important for many brewers and a force in the market

- **ANTIOXIDANT PROPERTIES**

Xanthumol - Health / Wellness Trends

- **HOP THIOLS - SULFUR COMPOUNDS**

- **HOP ESSENTIAL OILS**

Geraniol
Linalool
Farnesene
Beta Pinene - list goes on...



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https://www.researchgate.net/publication/327704717_Understanding_the_dry_hop_aroma_of_American_hop_varieties

HOP FLAVOR AND AROMA IS WHAT CRAFT CARES ABOUT MOST



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GENERAL HARVEST TIMING IMPACT ON AROMA



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COMMON CULTURAL PRACTICES (Old School)

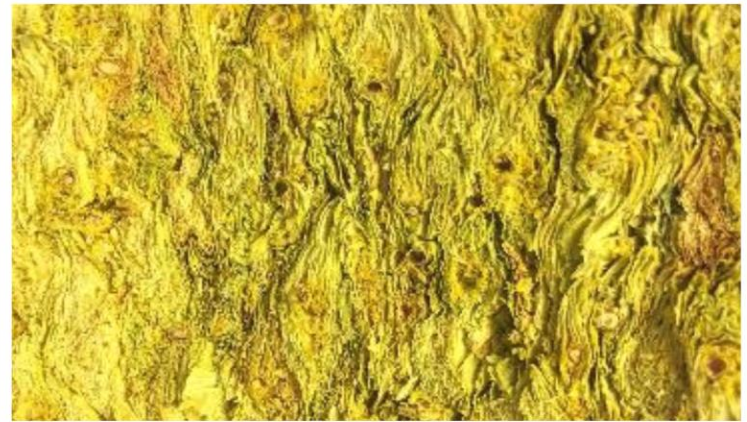
- The Calendar (sometimes surprisingly accurate)
- Dry Matter Testing
- Risk Management Harvest Timing
- Farmer Sensory



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HARVEST TIMING BEST PRACTICES

- Total Oil
- Brewing Values (esp. HSI)
- Trained Sensory Panel
- Advanced Tools: GCMS, Determining Oil Compounds as Markers for Maturity
- Tracking Customer Preferences / Selection Data to Drive Picking Decisions



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DRYING QUALITY HOPS - KILN

Bed Depth, Airspeed, Temperature, Cooling Time



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COOLING AND RESTING HOPS

Adequate Equilibrium Period



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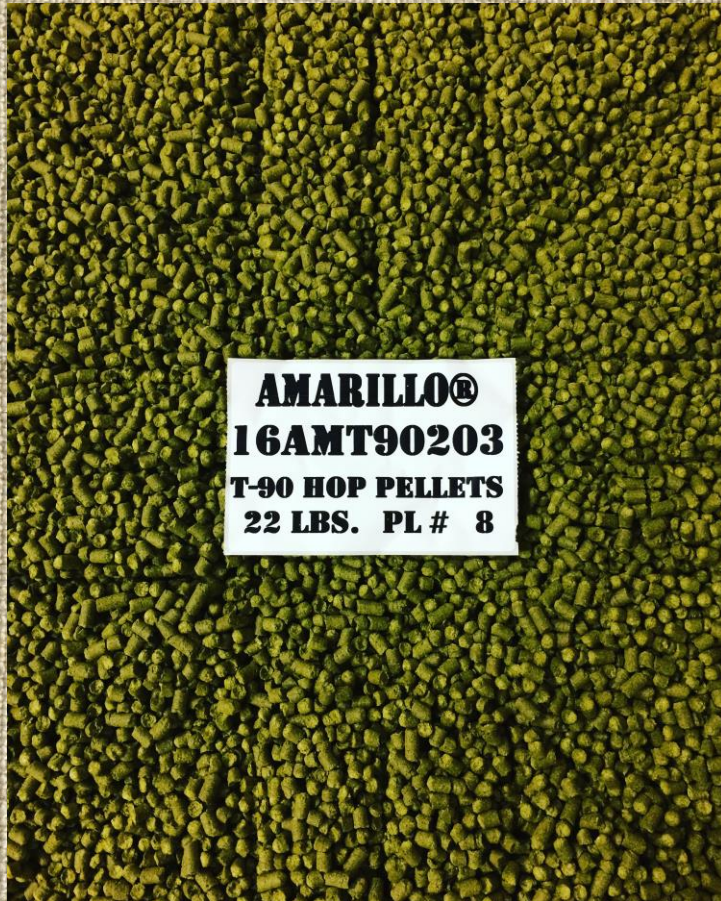
HANDLING BALED HOPS

- Bale Moisture 8-10% (9-10% is optimum)
- Bale Temperature 70F or ambient
- Chilled bales will manipulate moisture probe
- Grower number / lot code critical for traceability
- Pesticide records and data collection



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PELLETING BEST PRACTICES



- Blending Capability
- Cool and managed operating temperature throughout process
- Understanding of die compression ratios
- QC/QA - Homogeneity
- ASBC method lab analysis



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PELLET QUALITY

- Food safety / lot coding / traceable to the source process, HACCP
- Foreign material separation / detection (magnets, rock traps)
- Particle size
- Pellet density, operating temps
- Cold storage (immediately in / out)



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PACKAGING QUALITY



N₂-purged &
vacuum-sealed
in 5 mil foil
barrier bags

Less than
2.5% residual
oxygen

We offer 5KG,
10KG, and 20KG
foils for Crosby®
Type 90 Hop
Pellets



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ENSURING QUALITY - LABORATORY

- Alpha Acids
- Beta Acids
- Hop Storage Index (HSI)
- Total Oil by Steam Distillation
- Flavor Chemistry (GC / GCMS)



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Questions?

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