



Decoding Your CofA

Spencer Tielkemeier
VP of Sales- North America

slido

Please download and install the Slido app on all computers you use



Myrcene is a...

① Start presenting to display the poll results on this slide.

slido

Please download and install the Slido app on all computers you use



What does H.S.I. stand for>

① Start presenting to display the poll results on this slide.



The Evolution of Hop CofAs

Pre-2010



YAKIMA CHIEF, Inc.



555 WEST SOUTH HILL ROAD . POST OFFICE BOX 209 . SUNNYSIDE, WA 98944 . (509) 839-9022 . FAX (509) 839-5570

CERTIFICATE OF ANALYSIS

PRODUCT NAME: YC-Hop Pellets

MANUFACTURER: Yakima Chief, Inc.
555 West South Hill Road
Sunnyside, WA 98944
Tel.: +1-509-839.90.22
Fax: +1-509-839.55.70

LOT NUMBER: P9-HLCL273

VARIETY: Cluster

PRODUCT CODE: YC-P90-20

| | <u>TYPICAL ANALYSIS</u> | <u>ACTUAL ANALYSIS</u> |
|---------------------------|---|------------------------|
| ALPHA ACIDS ASSAY: | 4.5 - 7.0% (w/w) UV SPECTRO. by ASBC HOPS-6A | 7.1% |
| BETA ACIDS ASSAY: | 4.5 - 7.0% (w/w) UV SPECTRO. by ASBC HOPS-6A | 5.2% |

| | | |
|-----------------|-----------|-------------|
| LEAD: | < 1.0 ppm | passes test |
| ARSENIC: | < 0.3 ppm | passes test |
| CADMIUM: | < 0.03ppm | passes test |

2010-2024



P92-HUTAL2079

2022 Talus® Brand, HBC 692, Type 90 Hop Pellets

Best Use Before: October 2025



10.8

UV Alpha %

8.6

UV Beta %

1.7

Total Oil mL/100g

| ACIDS | OILS | OTHER | METHODS | FARM |
|------------------------------|-----------------------------|---|--|-------------------------------------|
| UV Alpha: 10.8% | Total Oil: 1.7% | HSI: 0.222 | UV Alpha by ASBC HOPS UV Spectro - 6A | Perrault Farms, Inc |
| HPLC Alpha: 8.5% | B-Pinene: 0.6% | HPLC Cohumulone: 34.6% | HPLC Alpha by EBC Analytica V 7.7 | |
| Mebak Alpha 7.5: 9.6% | Myrcene: 36.3% | HPLC Colupulone: 63% | Mebak Alpha 7.5 by EBC Analytica LCV V 7.5 | |
| HPLC Beta: 8.5% | Linalool: 0.5% | Moisture: 6.4% | HPLC Beta by EBC Analytica V 7.7 | |
| UV Beta: 8.6% | Caryophyllene: 11.1% | Spray Record Notes: Etoxazole was applied | UV Beta by ASBC HOPS Spectro - 6A | |
| | Farnesene: 0.1% | | Total Oils by ASBC Hops - 13 (%v/w) | |
| | Humulene: 27% | | Oil Profile by ASBC Hops - 17 | |
| | Geraniol: 2.5% | | Hop Storage Index by ASBC Hops - 12 | |
| | | | HPLC by EBC Analytica V 7.7 | |

2022 Talus® Brand, HBC 692, Type 90 Hop Pellets



Best Use Before: [October 2025](#)

10.8

UV Alpha %

8.6

UV Beta %

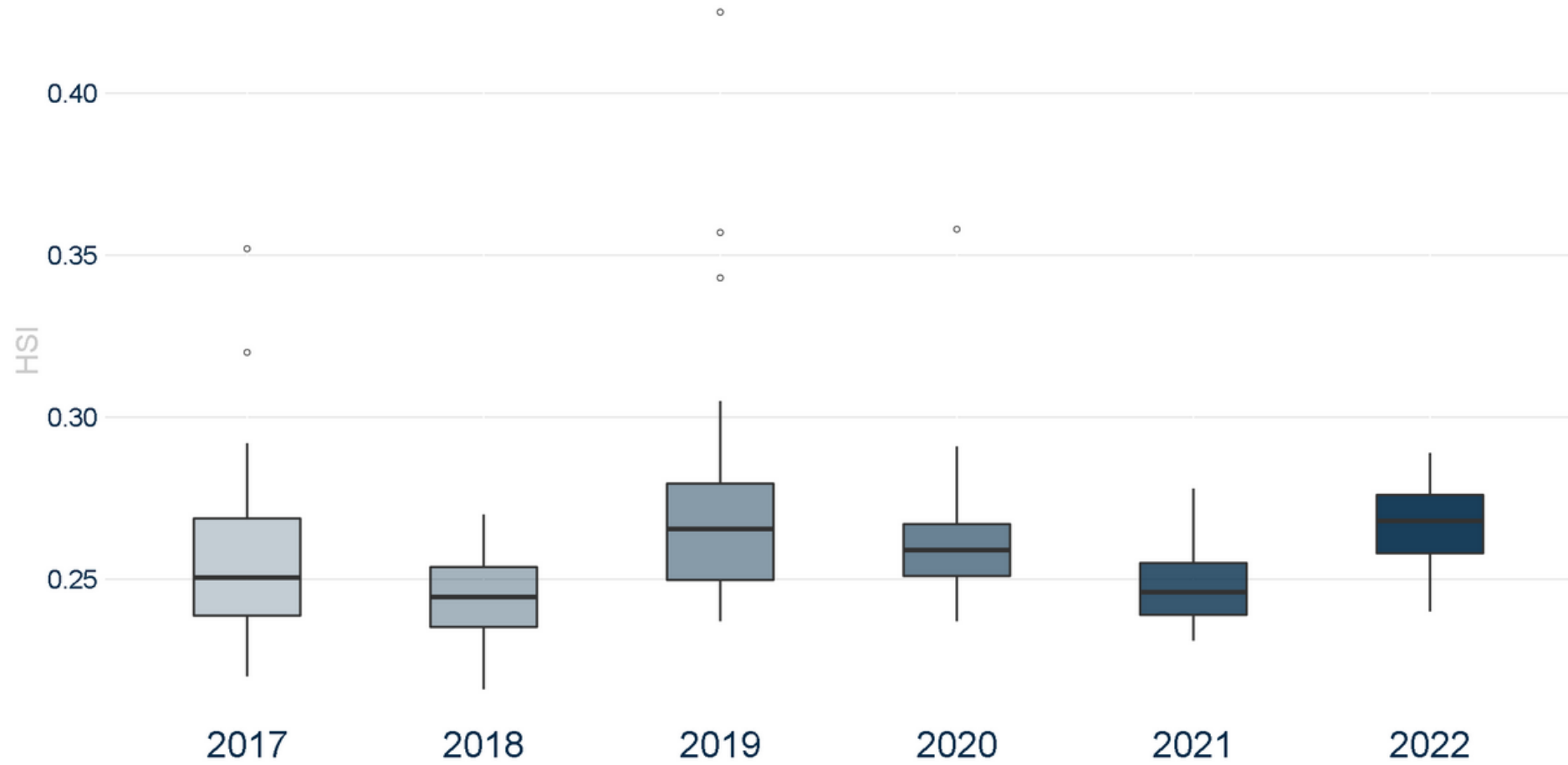
1.7

Total Oil mL/100g

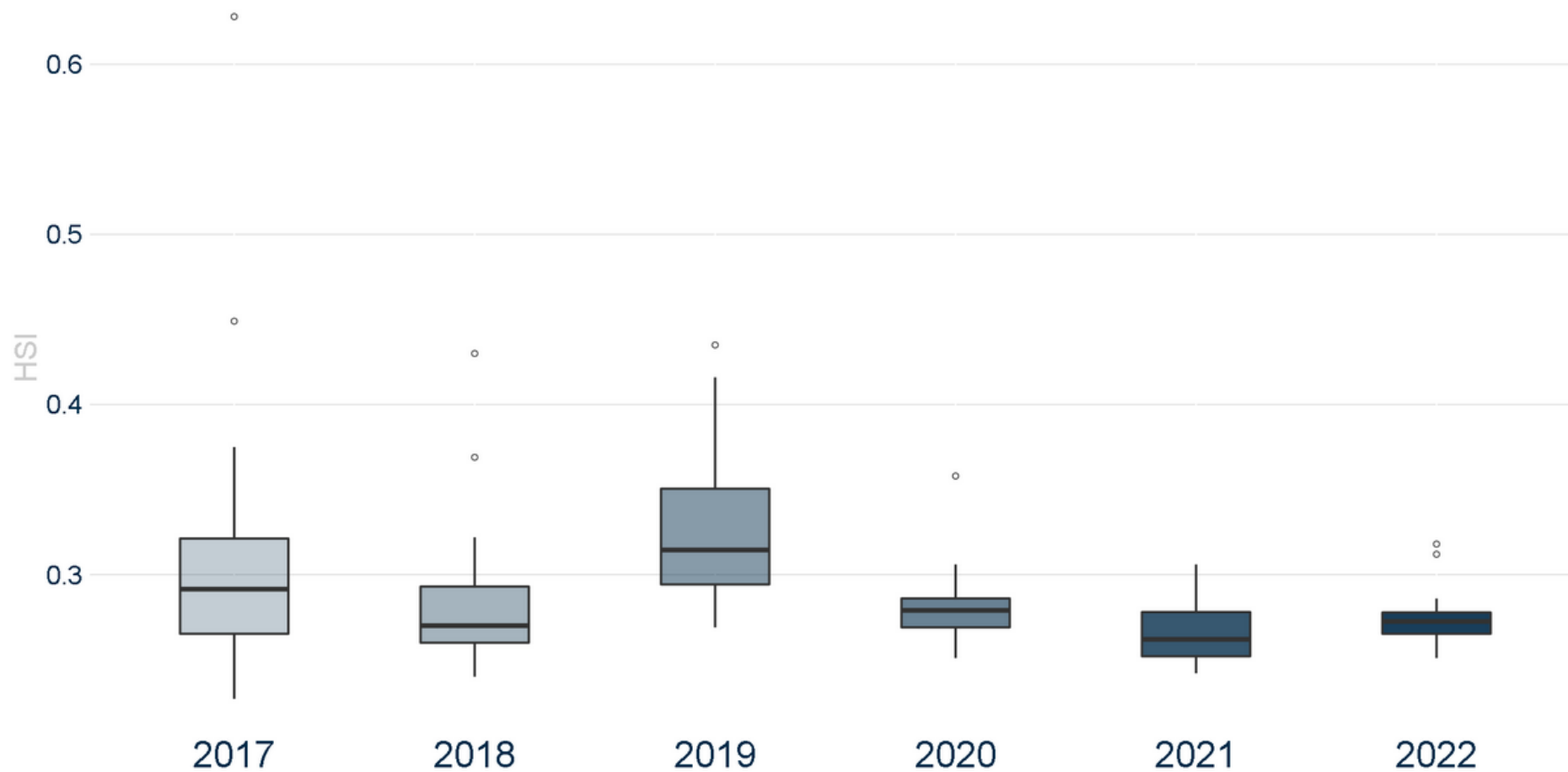
| ACIDS | OILS | OTHER | METHODS | FARM |
|------------------------------|-----------------------------|--|--|-------------------------------------|
| UV Alpha: 10.8% | Total Oil: 1.7% | HSI: 0.222 | UV Alpha by ASBC HOPS UV Spectro - 6A | Perrault Farms, Inc |
| HPLC Alpha: 8.5% | B-Pinene: 0.6% | HPLC Cohumulone: 34.6% | HPLC Alpha by EBC Analytica V 7.7 | |
| Mebak Alpha 7.5: 9.6% | Myrcene: 36.3% | HPLC Colupulone: 63% | Mebak Alpha 7.5 by EBC Analytica LCV V 7.5 | |
| HPLC Beta: 8.5% | Linalool: 0.5% | Moisture: 6.4% | HPLC Beta by EBC Analytica V 7.7 | |
| UV Beta: 8.6% | Caryophyllene: 11.1% | Spray Record Notes: Etoazole was applied | UV Beta by ASBC HOPS Spectro - 6A | |
| | Farnesene: 0.1% | | Total Oils by ASBC Hops - 13 (%v/w) | |
| | Humulene: 27% | | Oil Profile by ASBC Hops - 17 | |
| | Geraniol: 2.5% | | Hop Storage Index by ASBC Hops - 12 | |
| | | | HPLC by EBC Analytica V 7.7 | |

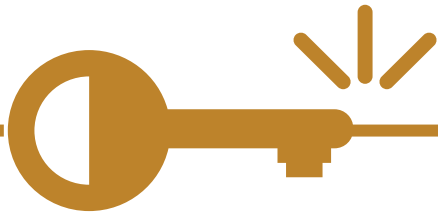


HSI Distribution by Year- Centennial Harvest Lot



HSI Distribution by Year- Centennial T90

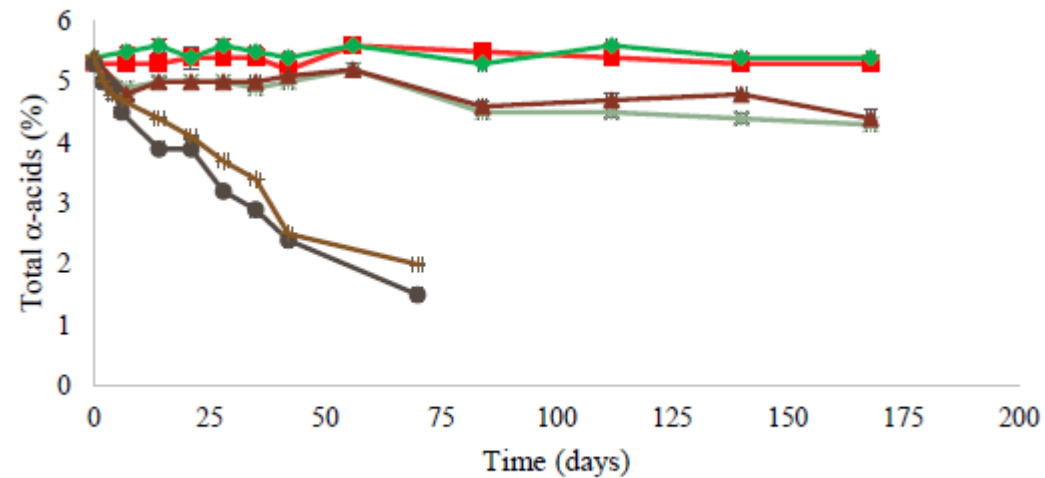




TAKEAWAY:

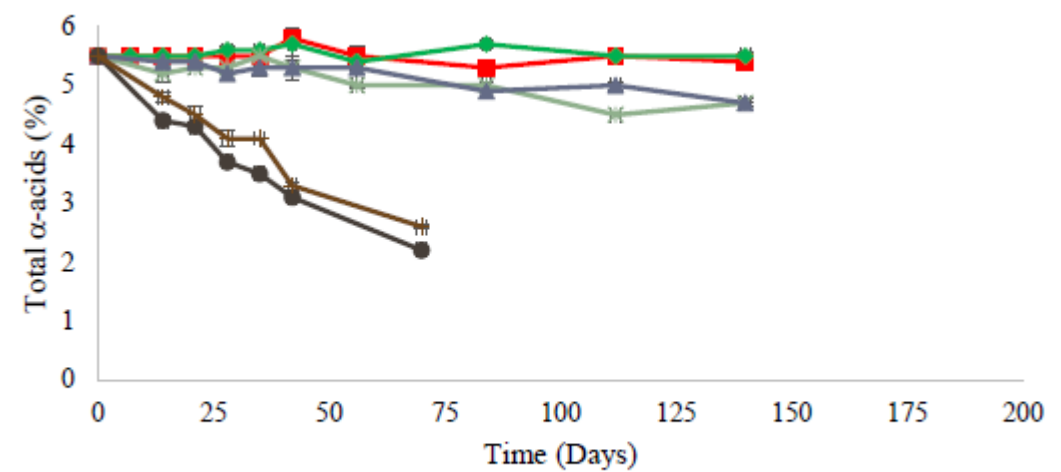
Temperature is king

a) Spectrophotometric method



■ 4C AIR ● 4C N * 25C AIR ▲ 25C N ● 35C AIR + 35C N

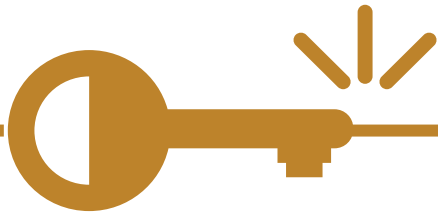
b) HPLC-DAD



■ 4C AIR ● 4C N * 25C AIR ▲ 25C N ● 35C AIR + 35C N

Timbo, G. M. (2020). Effects of Storage Conditions on α -Acid Degredation on Indiana Grown Hops (*humulus lupulus*) . *Purdue University* .

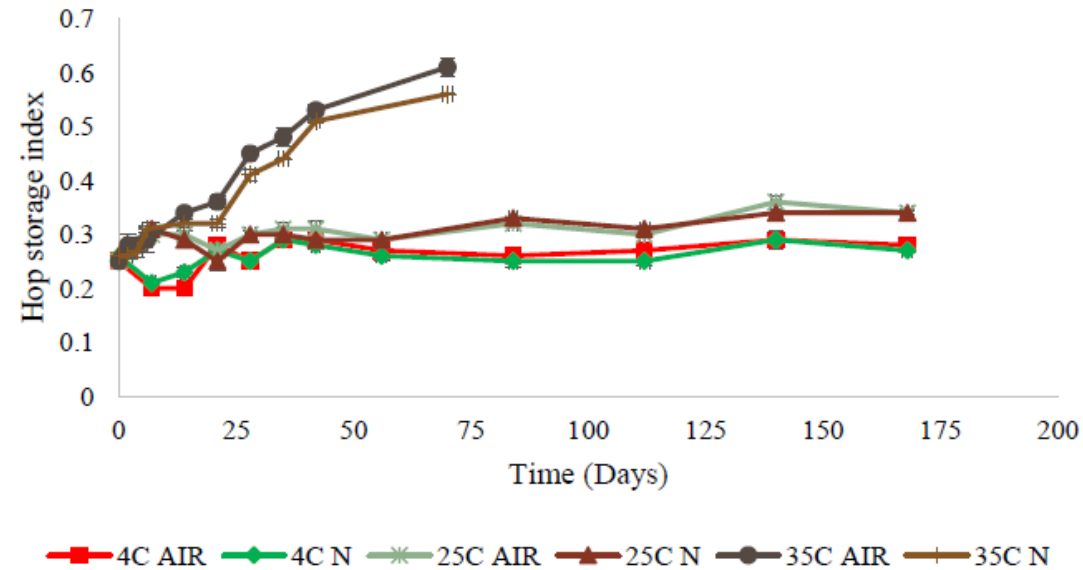




TAKEAWAY:

HSI > Crop Year

a) Cascade



Timbo, G. M. (2020). Effects of Storage Conditions on α -Acid Degredation on Indiana Grown Hops (*humulus lupulus*) . *Purdue University* .



The Future...



The Future!

🔍 P91-GUAHT6358



2021 Ahtanum® Brand • YCR 1 • T90 Hop Pellets

📅 Best Use Before: December 2024 📍 Farm(s): Perrault Farms, LLC, Carpenter Ranches, LLC

🔗 Add to Compare ⌵ Filters 📄 Download 🖨️ Print

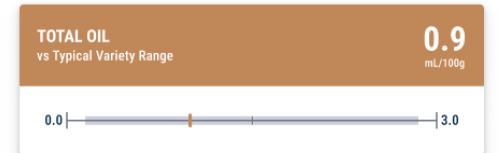
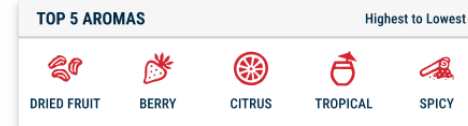
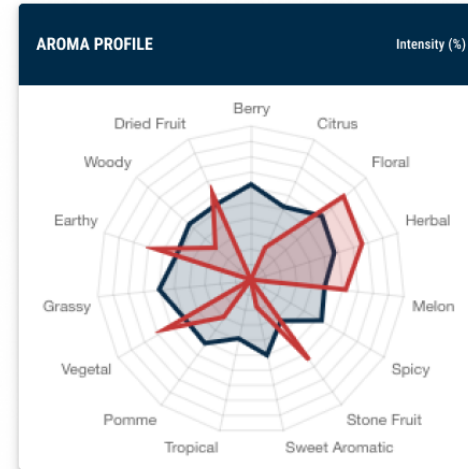


BREWING VALUES Percentage (%)

| | |
|-------------|-------|
| UV ALPHA | 5.3% |
| UV BETA | 1.0% |
| HPLC ALPHA | 60.0% |
| HPLC BETA | 10.0% |
| MEBAK ALPHA | 0.2% |

SURVIVABLE COMPOUNDS Parts per Million (ppm)

| | |
|----------------------------|------|
| ISOBUTYL ISOBUTYRATE | LOQ |
| ISOAMYL ISOBUTYRATE | 10.1 |
| 2 METHYL BUTYL ISOBUTYR... | 25.3 |
| LINALOOL | 37.7 |
| GERANIOL | 12.6 |
| 2 NONANONE | 16.4 |
| METHYL GERANATE | 71.7 |
| 3 MERCAPTOHEXANOL | LOQ |



OIL COMPONENTS Percentage (%)

| | |
|---------------|-------|
| B-PINENE | 0.7% |
| MYRCENE | 60.0% |
| LINALOOL | 0.2% |
| CARYOPHYLLENE | 10.0% |
| FARNESENE | 1.0% |
| HUMULENE | 20.0% |
| GERANIOL | 0.6% |
| OTHER | 29.9% |

OTHER

| | |
|--------------------|----------------------------|
| HSI | 0.233 |
| HPLC COHUMULONE | 22.5% |
| HPLC COLUPULONE | 38.2% |
| MOISTURE | 9.6% |
| SPRAY RECORD NOTES | Bifenazate was not applied |

Analysis Methods:

UV Alpha by ASBC HOPS UV Spectro - 6A, HPLC Alpha by EBC Analytica V 7.7, Mebak Alpha 7.5 by EBC Analytica LCV V 7.5, HPLC Beta by EBC Analytica V 7.7, UV Beta by ASBC HOPS Spectro - 6A, Total Oils by ASBC Hops - 13 (%w/w), Oil Profile by ASBC Hops - 17, Hop Storage Index by ASBC Hops - 12, HPLC by EBC Analytica V 7.7, ASBC HOPS - 4C

Terms of Use:

- The YCH R&D and Quality laboratories possess the capability to analyze hop oil via GCMS-SCD technology and quantify a vast array of aromatic components. This technology allows us to explore the aroma potential of novel hop compounds—specifically beer-soluble compounds that survive the brewing process. For more information, view our [Survivable Compounds Handbook](#).
- Sensory characteristics are determined by averaging the percentage of assessors who reported the presence of each aroma category on a "Check-All-That-Apply" (CATA) ballot. It should be noted that the aroma profile of a hop does not necessarily translate to the flavor of a beer. For questions about YCH's Sensory Program, please contact your Regional Sales Manager or email sensory@yakimachief.com.

🔍 P91-GUAHT6358



2021 Ahtanum® Brand • YCR 1 • T90 Hop Pellets

📅 Best Use Before: December 2024 📍 Farm(s): [Perrault Farms, LLC](#), [Carpenter Ranches, LLC](#)

➦ [Add to Compare](#)

⏴ [Filters](#)

📄 [Download](#)

🖨️ [Print](#)

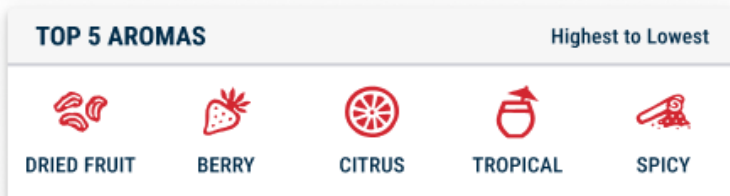
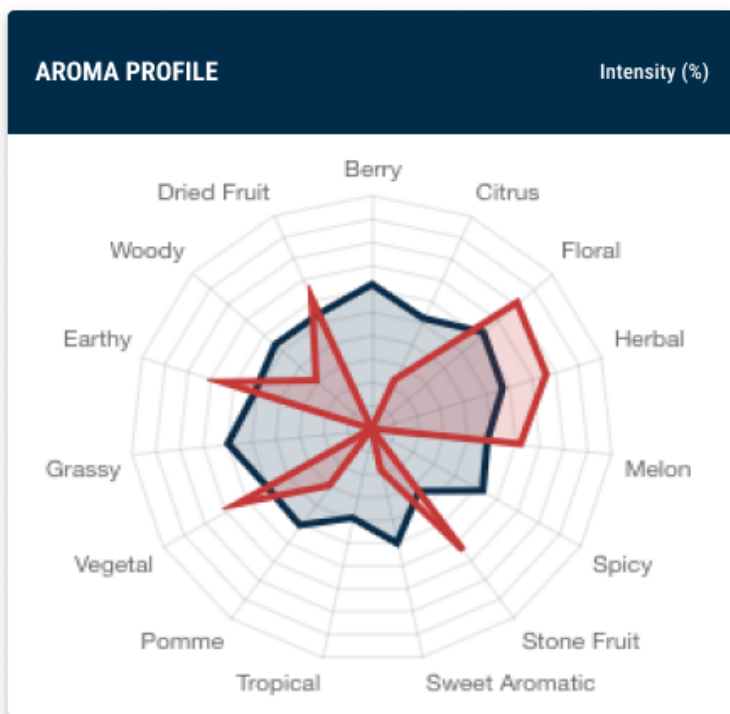


BREWING VALUES Percentage (%)

| | | |
|------------------------|-------|----------------------------------|
| UV ALPHA | 5.3% | <div style="width: 10%;"></div> |
| UV BETA | 1.0% | <div style="width: 2%;"></div> |
| HPLC ALPHA | 60.0% | <div style="width: 60%;"></div> |
| HPLC BETA [Ⓞ] | 10.0% | <div style="width: 10%;"></div> |
| MEBAK ALPHA | 0.2% | <div style="width: 0.2%;"></div> |

SURVIVABLE COMPOUNDS[Ⓞ] Parts per Million (ppm) 📈

| | | |
|---------------------------|------------------|---------------------------------|
| ISOBUTYL ISOBUTYRATE | LOQ [Ⓞ] | |
| ISOAMYL ISOBUTYRATE | 10.1 | <div style="width: 10%;"></div> |
| 2 METHYLBUTYL ISOBUTYR... | 25.3 | <div style="width: 25%;"></div> |
| LINALOOL | 37.7 | <div style="width: 38%;"></div> |
| GERANIOL | 12.6 | <div style="width: 13%;"></div> |
| 2 NONANONE | 16.4 | <div style="width: 16%;"></div> |
| METHYL GERANATE | 71.7 | <div style="width: 72%;"></div> |
| 3 MERCAPTOHEXANOL | LOQ [Ⓞ] | |



OIL COMPONENTS Percentage (%)

| | | |
|---------------|-------|----------------------------------|
| B-PINENE | 0.7% | <div style="width: 0.7%;"></div> |
| MYRCENE | 60.0% | <div style="width: 60%;"></div> |
| LINALOOL | 0.2% | <div style="width: 0.2%;"></div> |
| CARYOPHYLLENE | 10.0% | <div style="width: 10%;"></div> |
| FARNESENE | 1.0% | <div style="width: 1%;"></div> |
| HUMULENE | 20.0% | <div style="width: 20%;"></div> |
| GERANIOL | 0.6% | <div style="width: 0.6%;"></div> |
| OTHER | 29.9% | <div style="width: 30%;"></div> |

OTHER

| | |
|--------------------|----------------------------|
| HSI | 0.233 |
| HPLC COHUMULONE | 22.5% |
| HPLC COLUPULONE | 38.2% |
| MOISTURE | 9.6% |
| SPRAY RECORD NOTES | Bifenazate was not applied |

Survivables



- Beer-soluble compounds
- Monoterpene alcohols, esters, and thiols
- Describe quantity, not quality

| SURVIVABLE COMPOUNDS [®] | | Parts per Million (ppm) | |
|-----------------------------------|------------------|-------------------------|--|
| ISOBUTYL ISOBUTYRATE | LOQ [®] | | |
| ISOAMYL ISOBUTYRATE | 10.1 | | |
| 2 METHYLBUTYL ISOBUTYR... | 25.3 | | |
| LINALOOL | 37.7 | | |
| GERANIOL | 12.6 | | |
| 2 NONANONE | 16.4 | | |
| METHYL GERANATE | 71.7 | | |
| 3 MERCAPTOHEXANOL | LOQ [®] | | |

Survivables

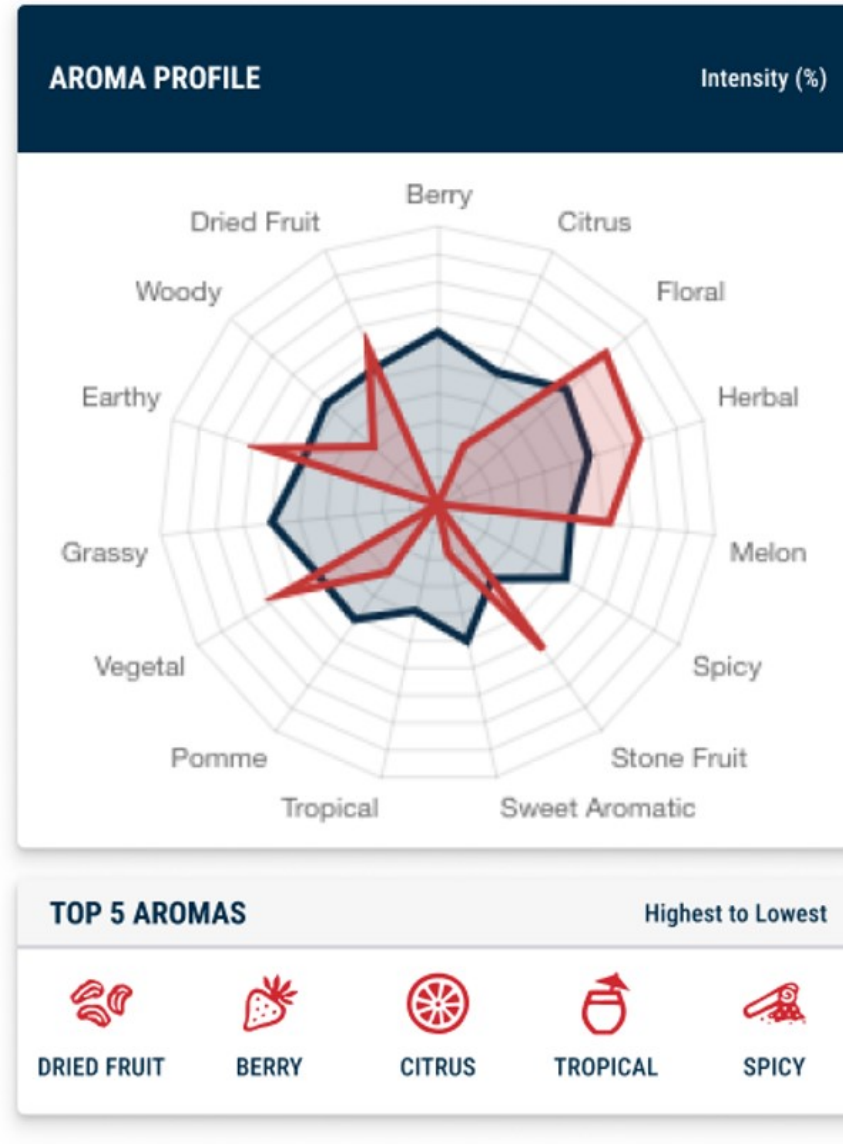


For a comprehensive treatment of “Survivables,” visit:

<https://hopandbrewschool.com/>

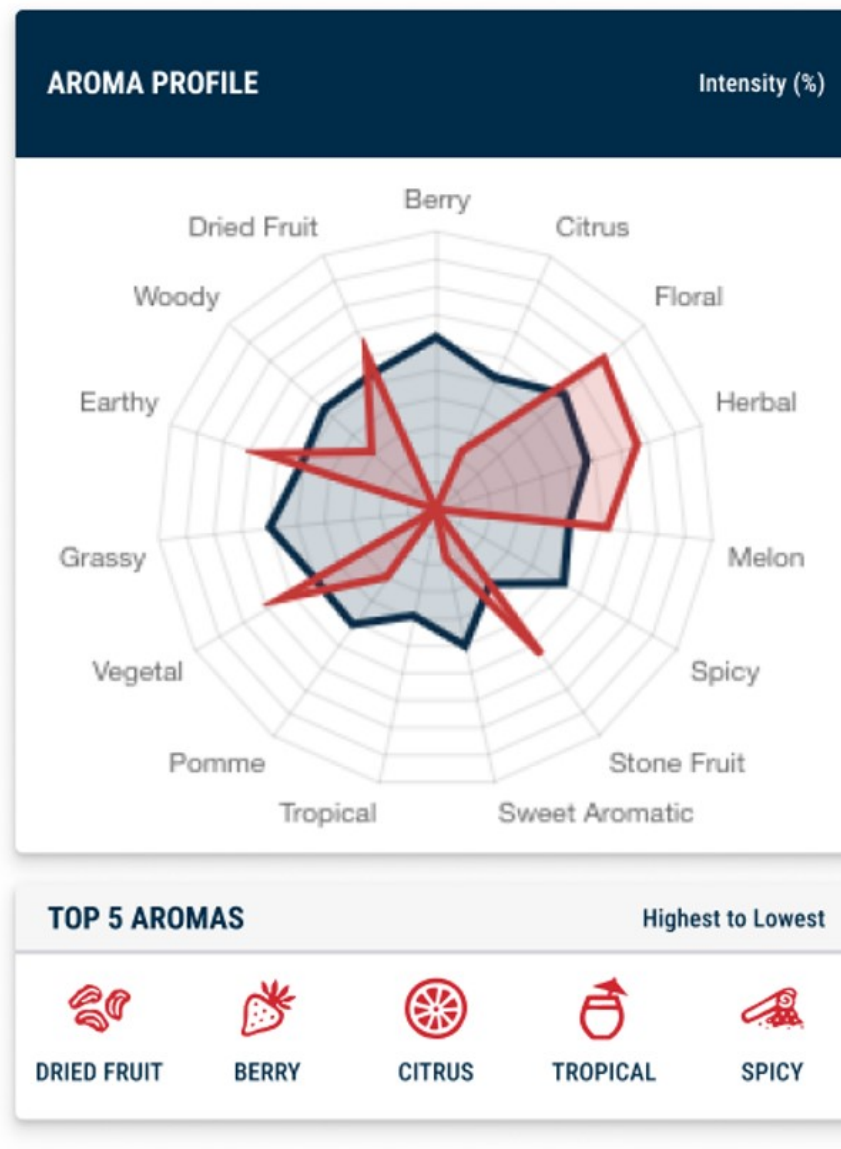
Sensory

- Professional assessment of raw hop aromas
- Describes qualit(ies) of aroma in raw hop, not ideal for describing quantity in beer
- Useful in comparing multiple lots



Sensory

- One of several useful ways of evaluating hop quality



slido

Please download and install the Slido app on all computers you use



**What gets you most excited
about the future of hop CofAs?**

① Start presenting to display the poll results on this slide.



Questions?