



**HOP &  
BREW  
SCHOOL**

**WELCOME TO  
HOP & BREW SCHOOL**





**HOP &  
BREW  
SCHOOL**

# **2021 HOP HARVEST & TECHNICAL DISCUSSION: CHINA**



## OUR MISSION

Our Mission is to connect family hop farms with the world's finest brewers, providing the highest quality hop products and uncompromising service for the ultimate benefit of our customers, employees and growers.

## OUR VISION

Our Vision is to be the global hop supplier of choice. We want our passion for preserving the planet, treating people with respect and dignity, and our commitment to healthy communities to be reflected in every beer brewed with our hops.

## OUR VALUES

- **Passion:** For people, product, planet and process
- **Respect:** Teamwork and collective responsibility
- **Integrity:** Transparency and accountability in all we do
- **Dedication:** Safety, quality and sustainability
- **Excellence:** An emphasis on innovation and continuous improvement

# GROWERS

We are the only 100% grower owned hop company. Our grower families have been harvesting hops in the Northwest since the 1800s and have acquired a wealth of knowledge and expertise throughout the decades to create the highest quality hops.

## These grower-owners include:

- 3D Farm/BC Hop Farm
- Brulotte Farms
- B.T. Loftus Ranches
- C&C Hop Farms
- Carpenter Ranches
- Gasseling Ranches
- Perrault Farms
- Sauve & Son Farms
- Sodbuster Farms
- Van Horn Farms



**CHARLIE  
DAVIDSON**

**3D & BC HOP FARMS**  
4th Generation  
Woodburn, OR



**ED  
ST. MARY**

**BLACK STAR RANCHES**  
5th Generation  
Moxee, WA



**REGGIE  
BRULOTTE**

**BRULOTTE FARMS**  
6th Generation  
Toppenish, WA



**MIKE  
SMITH**

**B.T. LOFTUS RANCHES**  
3rd Generation  
Yakima, WA



**KEITH  
HOUSER**

**C & C HOP FARMS**  
3rd Generation  
Moxee, WA



**CRAIG  
CARPENTER**

**CARPENTER RANCHES**  
5th Generation  
Granger, WA



**JOHN  
COLEMAN**

**COLEMAN AGRICULTURE**  
6th Generation  
St.Paul, OR



**KEVIN  
RIEL**

**DOUBLE R HOP RANCHES**  
5th Generation  
Harrah, WA



**PATRICK  
GASSELING**

**GASSELING RANCHES**  
4th Generation  
Wapato, WA



**BRENTON  
ROY**

**OASIS FARMS**  
4th Generation  
Prosser, WA



**STEVE  
PERRAULT**

**PERRAULT FARMS**  
3rd Generation  
Toppenish, WA



**RICK  
SAUVE**

**SAUVE & SON FARMS**  
3rd Generation  
Mabton, WA



**DOUG  
WEATHERS**

**SODBUSTER FARMS**  
3rd Generation  
Salem, OR



**RICH  
VAN HORN**

**VAN HORN FARMS**  
2nd Generation  
Moxee, WA

We receive hops, not just from our Grower Owners but from over 50 family farms throughout the Pacific Northwest.

# GROWING REGION

## Overview of the Region

- **Washington**
  - **Over 75% of Hops grown in the US**
  - **Moxee, Lower Valley and, Yakama Nation**
  - **~43,000 acres**
- **Oregon**
  - **Willamette Valley**
  - **7,571 acres**
- **Idaho**
  - **Nampa**
  - **2<sup>nd</sup> Largest Growing region in Pacific North West**
  - **9,784 acres**



# VARIETIES – BY ACREAGE

**TABLE 1: TOP 10 U.S. HOP VARIETIES BY ACREAGE**

RANK	2016	2017	2018	2019	2020
1	Cascade	Cascade	Citra®, HBC 394	Citra®, HBC 394	Citra®, HBC 394
2	Centennial	Centennial	CTZ	CTZ	CTZ
3	CTZ	Citra®, HBC 394	Cascade	Cascade	Mosaic®, HBC 369
4	Citra®, HBC 394	CTZ	Centennial	Simcoe®, YCR 14	Simcoe®, YCR 14
5	Simcoe®, YCR 14	Simcoe®, YCR 14	Simcoe®, YCR 14	Mosaic®, HBC 369	Cascade
6	Mosaic®, HBC 369	Mosaic®, HBC 369	Chinook	Centennial	Centennial
7	Chinook	Chinook	Mosaic®, HBC 369	Amarillo®, VGXP01	Pahto®, HBC 682
8	Summit	Willamette	Amarillo®, VGXP01	Chinook	Amarillo®, VGXP01
9	Willamette	Summit	Pahto®, HBC 682	Pahto®, HBC 682	Chinook
10	Apollo™	Apollo™	Summit	Summit	El Dorado®

Photo courtesy of Coleman Agriculture

Source: Hop Growers of America



# 2021 HARVEST – SO FAR

- **Harvest has started strong!**
- **Heat early in June – but not a concern**
- **Smoke has not been a concern**
- **Quality looking great across the board!**
- **Hop Acreage trends Cascade, Centennial, Chinook**



# 2021 HARVEST – VARIETY OVERVIEW

- **Currently Picking Citra and Mosaic**
  - **Citra almost done**
  - **Mosaic ~3/4 harvest**
  - **Simcoe, Cascade, Centennial, Sabro, Idaho Gem are complete**
- **Amarillo, Azacca, Chinook, Cashmere over 1/2**
- **Idaho 7, Comet, CTZ, Pahto, Palisade, El Dorado**
  
- **Oregon getting done this week**
- **Washington about ~3/4 done**
- **Idaho about ~3/4 complete**



# WHAT TO EXPECT

- **Full contract fulfilment - Hops are in very sold position**
- **Less spot volumes throughout this year**
- **Plan to continue growth into future years where contract needs project 2022 and forward**





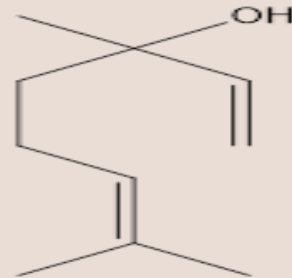
# BIOTRANSFORMATION

## BREWER'S DEFINITION

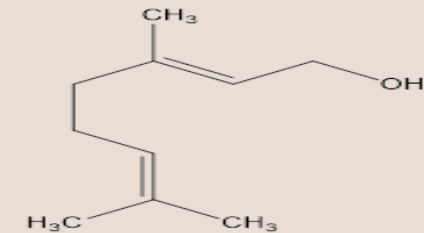
- “...the interaction of a hop compound and a *Saccharomyces* spp., which leads to a new aromatic compound through an enzymatic reaction (hydrolysis)”<sub>3</sub>

## GOALS

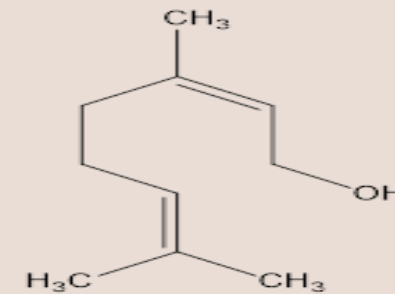
- CONVERSION OF CERTAIN COMPOUNDS**
  - 3MH, GERANIOL, ETC.
- ENHANCEMENT OF SYNERGIES**
  - EX. LEMON/LIME FLAVOR OF LINALOOL+  $\beta$ -CITRONELLOL+ GERANIOL



LINALOOL



GERANIOL



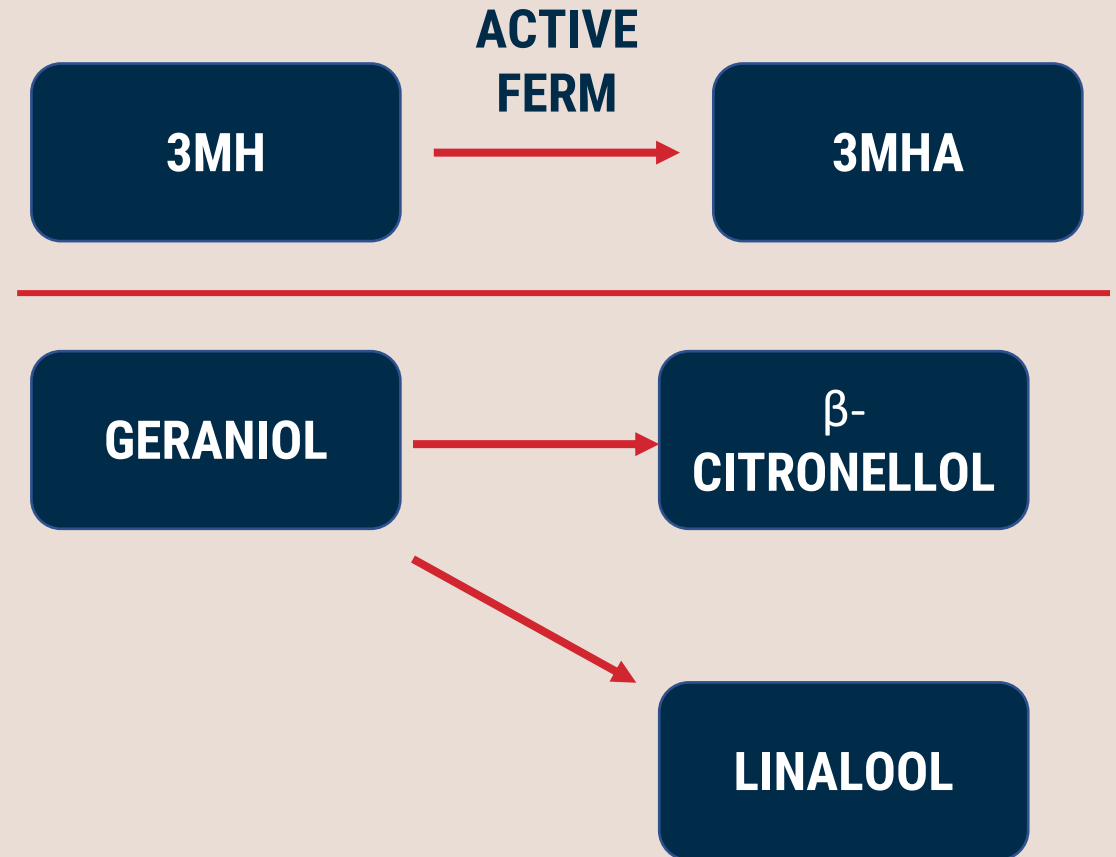
NEROL



# BIOTRANSFORMATION

## CONSIDERATIONS

- “DIFFERENT,” NOT ALWAYS “BETTER THAN”
- VARIETAL SELECTION
  - HIGH LEVELS OF MONOTERPENE ALCOHOLS, THIOLS, ESTERS
- YEAST HANDLING
  - CAN CREATE CHALLENGES
- SAFETY
  - BEWARE OF DH GUSHERS



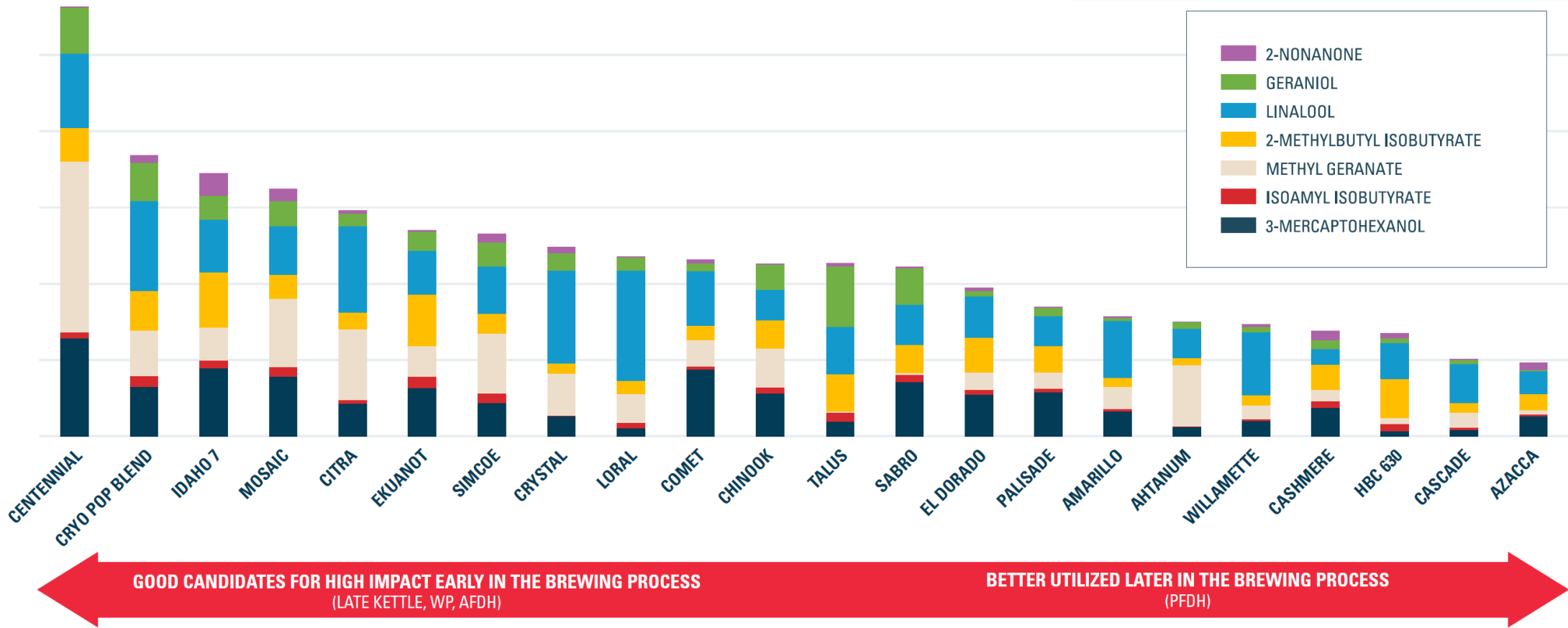


# SURVIVABLE COMPOUNDS

## THE SURVIVABLES GRAPH

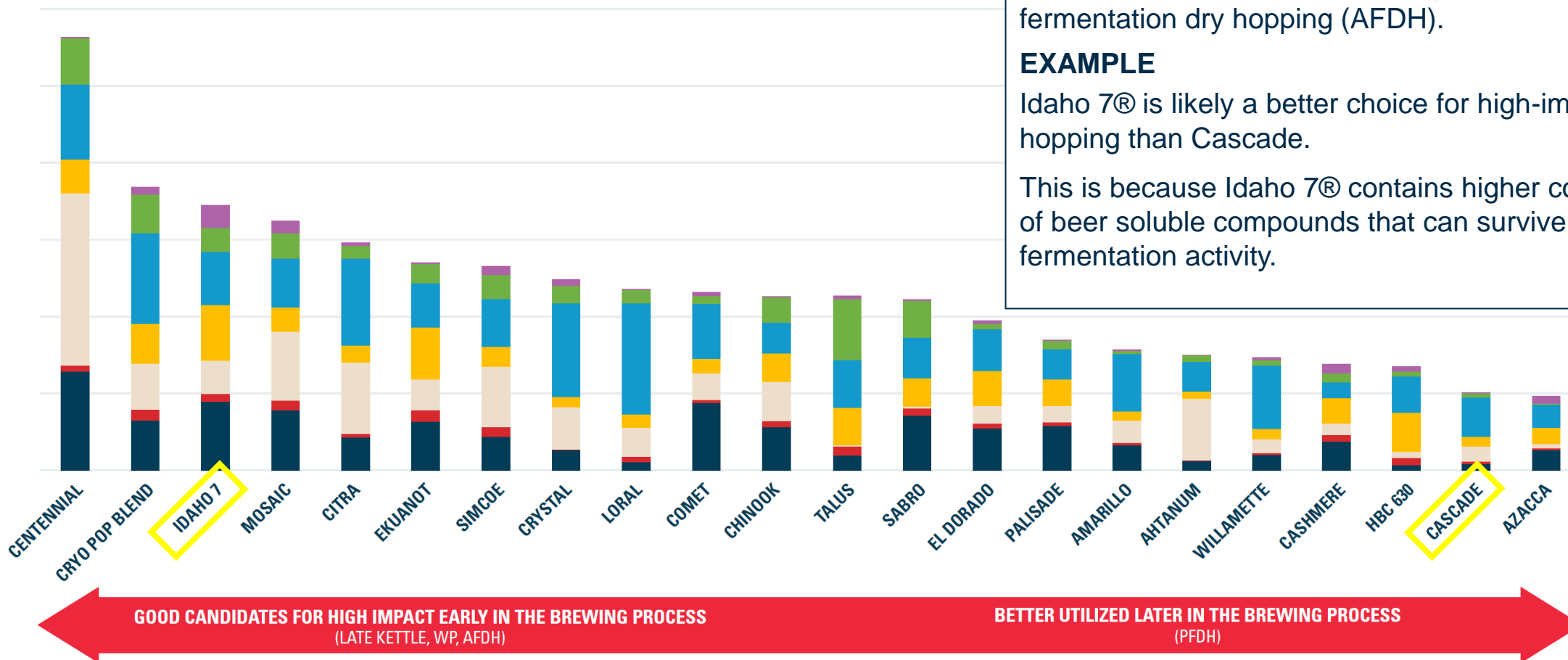
### ANSWERS SUCH QUESTIONS AS:

- What variety should I use?
- Where in the process should I use it?
- Which hops work together in combination?
- How can I use a variety to its maximum effect?



# SURVIVABLE COMPOUNDS

## THE SURVIVABLES GRAPH



### 1. USE HIGH SURVIVABLES HOPS EARLY (OR LATE)

Hops with higher concentrations of survivable compounds have a better likelihood of being successful when used earlier in the brewing process than hops with low concentrations of these same compounds. Early additions include late kettle, whirlpool, and active fermentation dry hopping (AFDH).

#### EXAMPLE

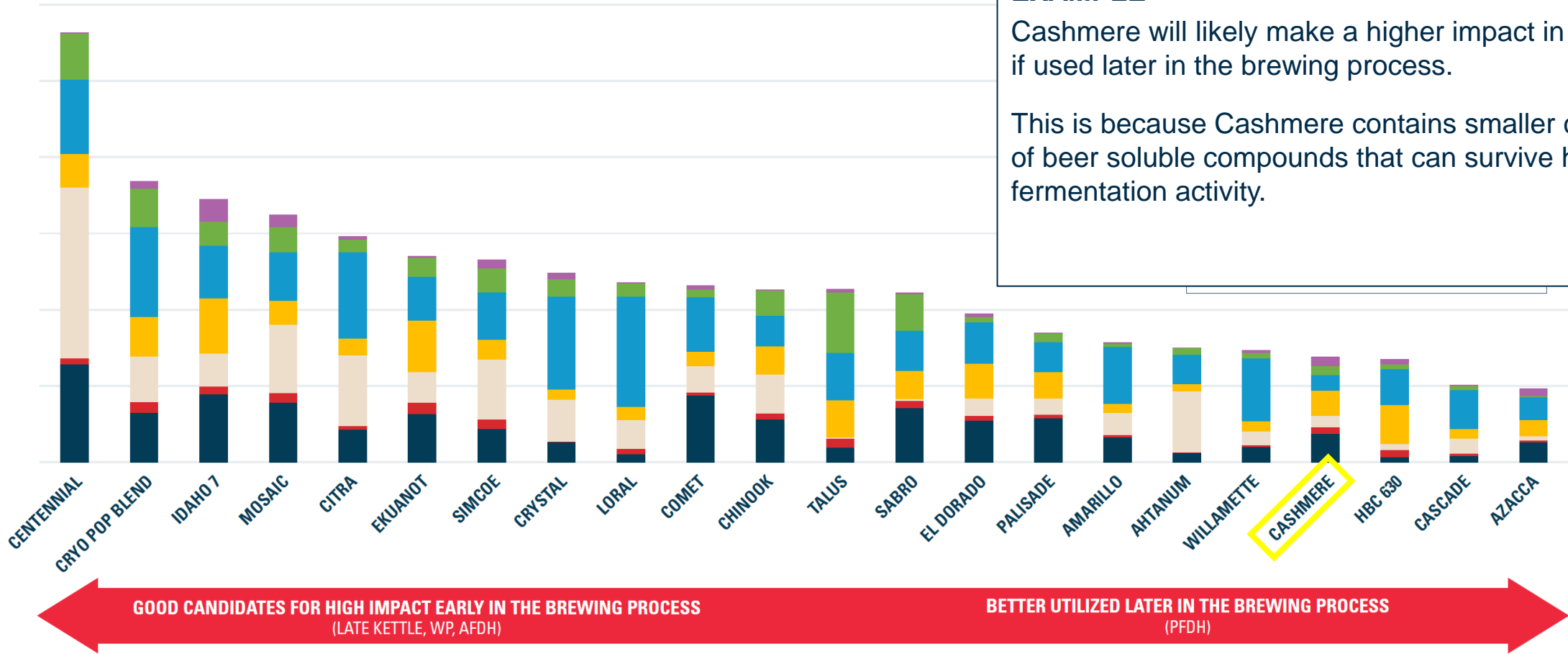
Idaho 7® is likely a better choice for high-impact whirlpool hopping than Cascade.

This is because Idaho 7® contains higher concentrations of beer soluble compounds that can survive heat and fermentation activity.



# SURVIVABLE COMPOUNDS

## THE SURVIVABLES GRAPH



## 2. USE LOW SURVIVABLES HOPS LATE

Similarly, we can say that hops with lower concentrations are likely to find better success and a more positive impact in beer when used later in the process, such as post fermentation dry hopping (PFDH).

### EXAMPLE

Cashmere will likely make a higher impact in finished beer if used later in the brewing process.

This is because Cashmere contains smaller concentrations of beer soluble compounds that can survive heat and fermentation activity.

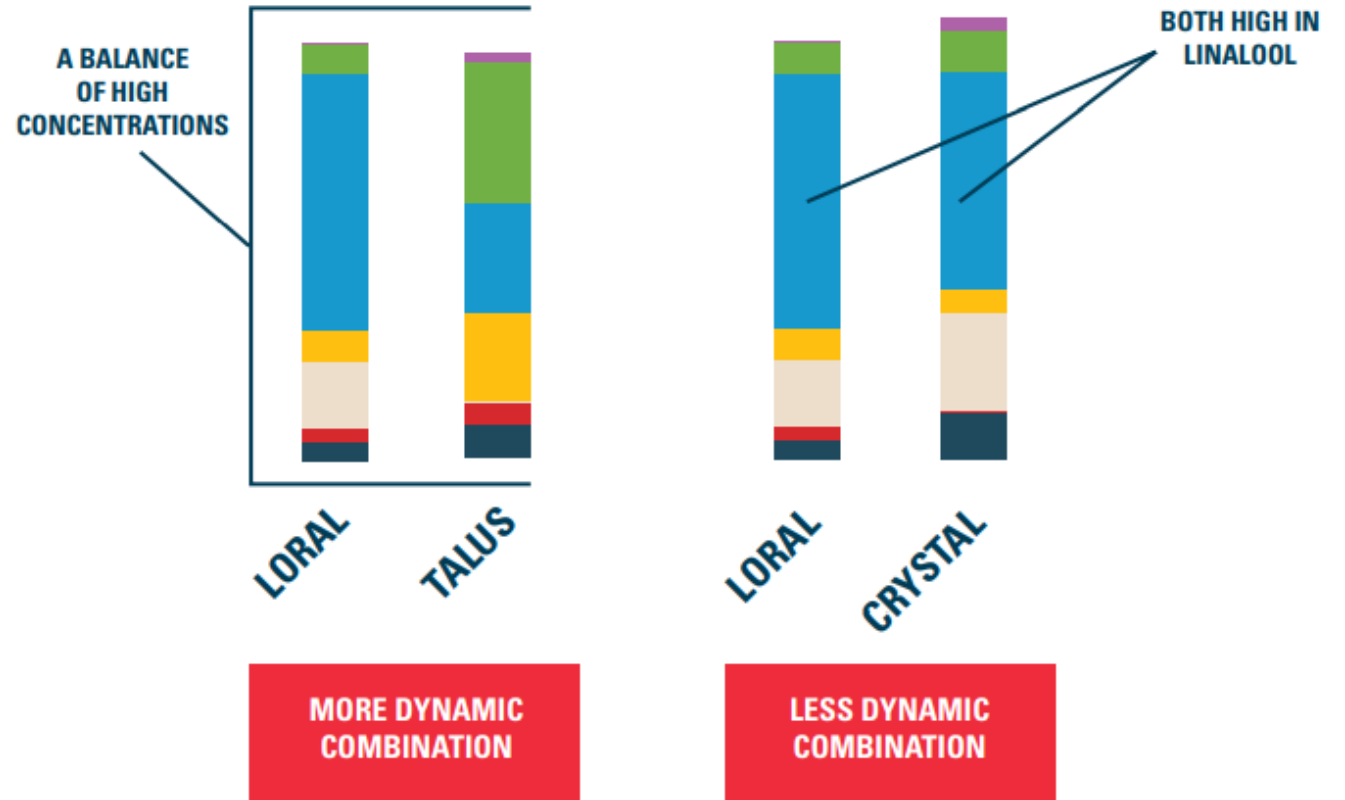
# SURVIVABLE COMPOUNDS

## 3. BLEND HOPS TO MAXIMIZE BENEFICIAL CONCENTRATIONS

Focus on balancing high concentrations when creating blends.

### EXAMPLE

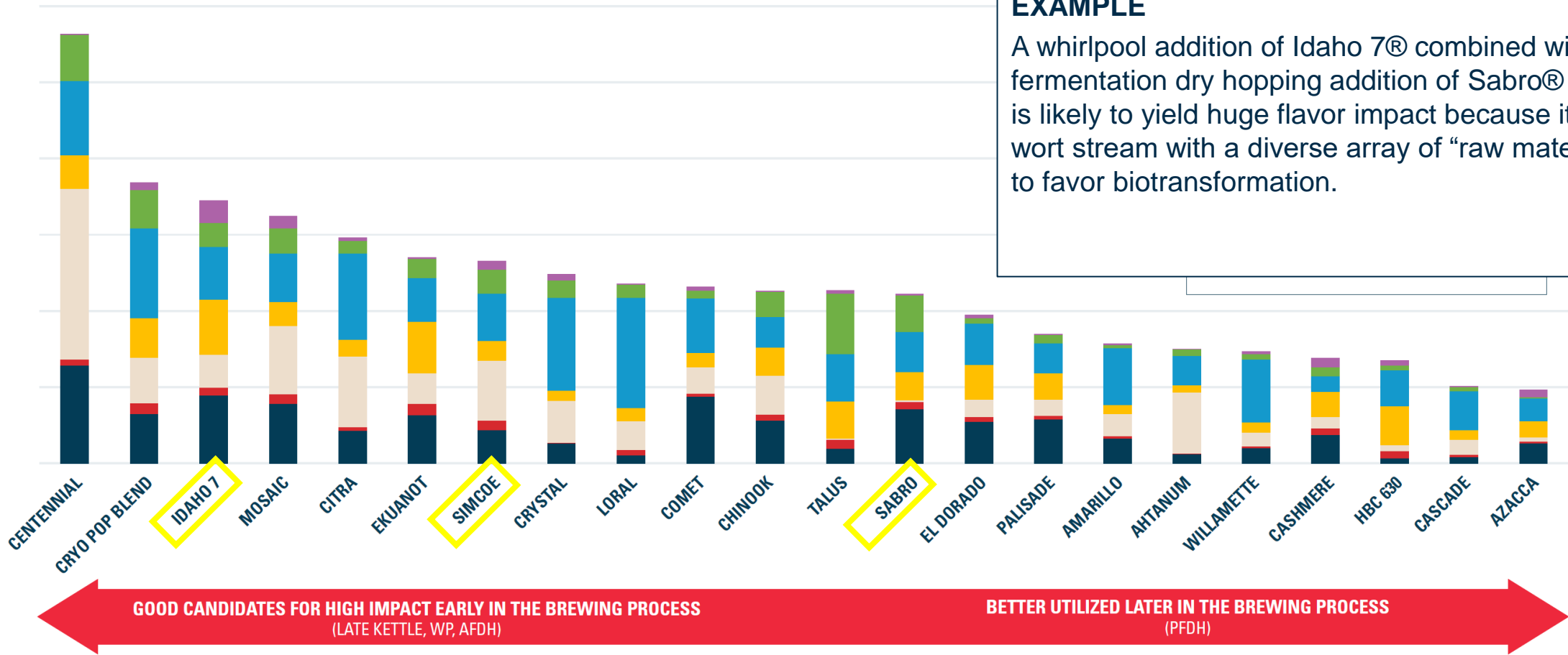
Because Loral® is high in linalool and Talus™ is high in geraniol, the two of them are likely to work well in concert. Loral® and Crystal are both high in linalool and would therefore likely create a less dynamic and more one-dimensional blend.





# SURVIVABLE COMPOUNDS

## THE SURVIVABLES GRAPH



### 4. LOAD WORT STREAMS WITH SURVIVABLES EARLY

High concentrations of survivables in whirlpool and active fermentation dry hopping can create conditions necessary for beneficial biotransformation.

#### EXAMPLE

A whirlpool addition of Idaho 7® combined with an active fermentation dry hopping addition of Sabro® and Simcoe® is likely to yield huge flavor impact because it loads the wort stream with a diverse array of “raw materials” needed to favor biotransformation.

# CRYO POP™ ORIGINAL BLEND

## BORN OF BEER SOLUBLE HOP COMPOUND RESEARCH

Supercharged pellet that provides brewers with a dynamic solution for juicy, fruit-forward, highly aromatic applications, showing massive **tropical, stone fruit, and citrus aromas**

Maximizing concentrations of the most impactful and complementary hop compounds, we offer an incredibly powerful hop pellet that creates a true 'pop' of aromas in beers

The graphic features a blue background with a repeating pattern of various fruit and hop-related icons, including lemons, strawberries, raspberries, and hops. The text "CRYO POP™" is prominently displayed in the center in a large, white, outlined font. Below it, the words "ORIGINAL BLEND" are written in a bold, black, sans-serif font on a yellow rectangular background. At the bottom of the graphic, the text "A SUPERCHARGED BLEND OF BEER SOLUBLE HOP COMPOUNDS" is written in a bold, black, sans-serif font on a yellow background.

**CRYO POP™**

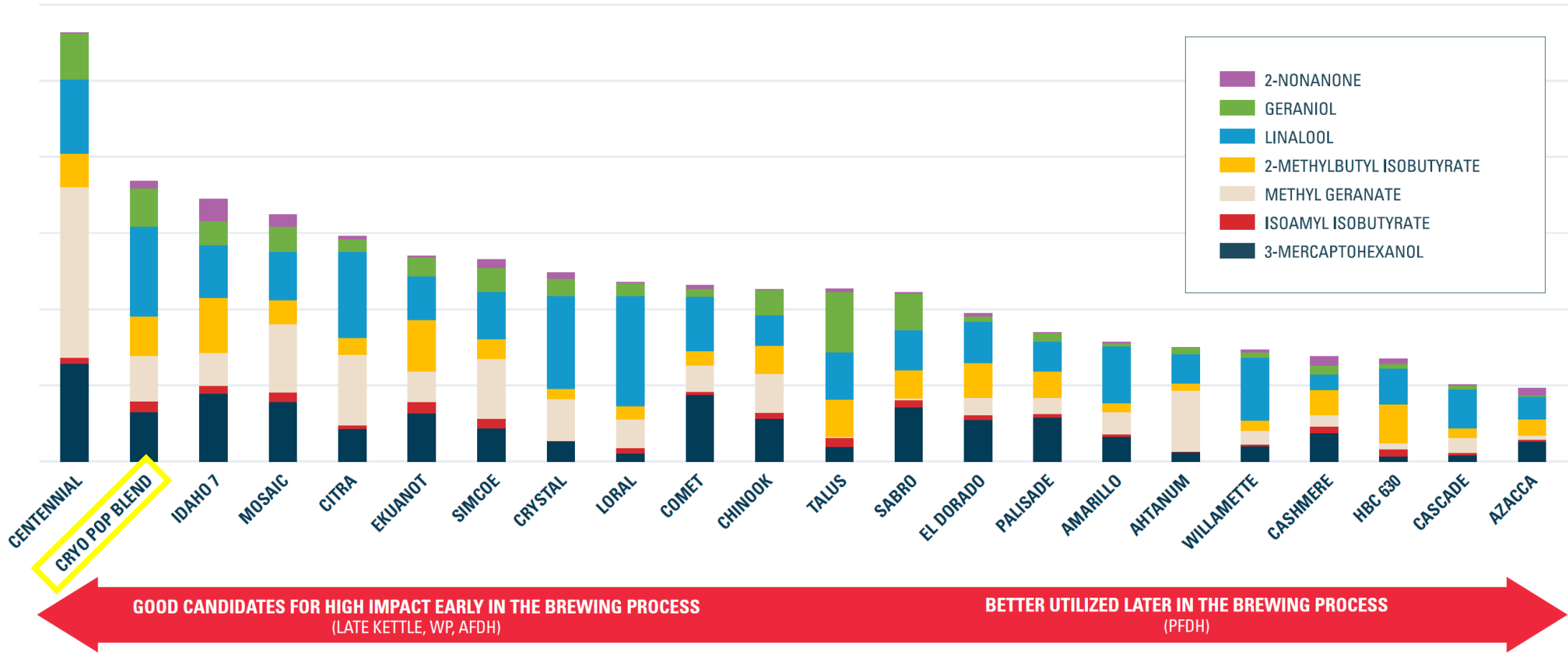
**ORIGINAL BLEND**

**A SUPERCHARGED BLEND OF  
BEER SOLUBLE HOP COMPOUNDS**



# CRYO POP™ ORIGINAL BLEND

## THE SURVIVABLES GRAPH



# CRYO POP™ ORIGINAL BLEND

## CONVENTIONAL USAGE

- Brewer looking for a “go-to” solution for all juicy, hazy, fruit-forward beers
- Brewer needing a user-friendly solution to help them make market-relevant beer

## STRATEGIC USAGE

- Brewer focused on maximizing contributions from individual hop compounds
- Brewer desiring to bridge the gap between raw hop and finished beer aromas







# THANKS FOR JOINING US!



**HOP & BREW SCHOOL**

Have questions about this session or others?

Email us at [brewschool@yakimachief.com](mailto:brewschool@yakimachief.com) or [brewinghelp@yakimachief.com](mailto:brewinghelp@yakimachief.com)

For more sessions visit: [hopandbrewschool.com](http://hopandbrewschool.com)