Yeast Manipulation for Increased Thiol Efficacy in NYS Hops

Presenter and Partners

Presenting

NYHG
NEW YORK HOP GUILD

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Partners

HopTechnic®

OMEGA YEAST

INDUSTRIAL ARTS BREWING COMPANY

Overview of Experiment

- Over the last year the New York Hop Guild and Hop Growers of New York have worked to find ways to help the New York Hop Industry become more sustainable.
- Along with pushing for a state-run public breeding program at Cornell University, the Hop Growers of New York asked growers what varieties grew the best for them.
- Their answer? Cascade was the best performing hop on over 90% of the farms that are currently growing in the state.
- This experiment was put forth to help showcase the multiple uses for New York's highest performing variety.
- In 2021 Omega Yeast released their new thiolized yeast called Cosmic Punch™, along with data suggesting that Cascade hops would work well in the mash because of their abundance of bound precursor thiols.
- New York Hop Guild partnered with Industrial Arts Brewing and Omega Yeast to show the differences between a thiol manipulating yeast such as their Cosmic Punch™ and a Standard Hazy yeast with their British Ale V. Which is the base yeast for their new Cosmic Punch™.
- Industrial Arts Brewing agreed to brew two identical beers side by side with 100% New York Grown Cascade hops.
- Both beers would be brewed with the same malt and hop formulation, with the only difference being the yeast they were fermented with.
- The Cascade hops that were used were formulated by HopTechnic® utilizing their TRUE PELLET™ Technology that ustilizes a thiol footprint based off NYHG's preferred New York terroir flavor characteristics.

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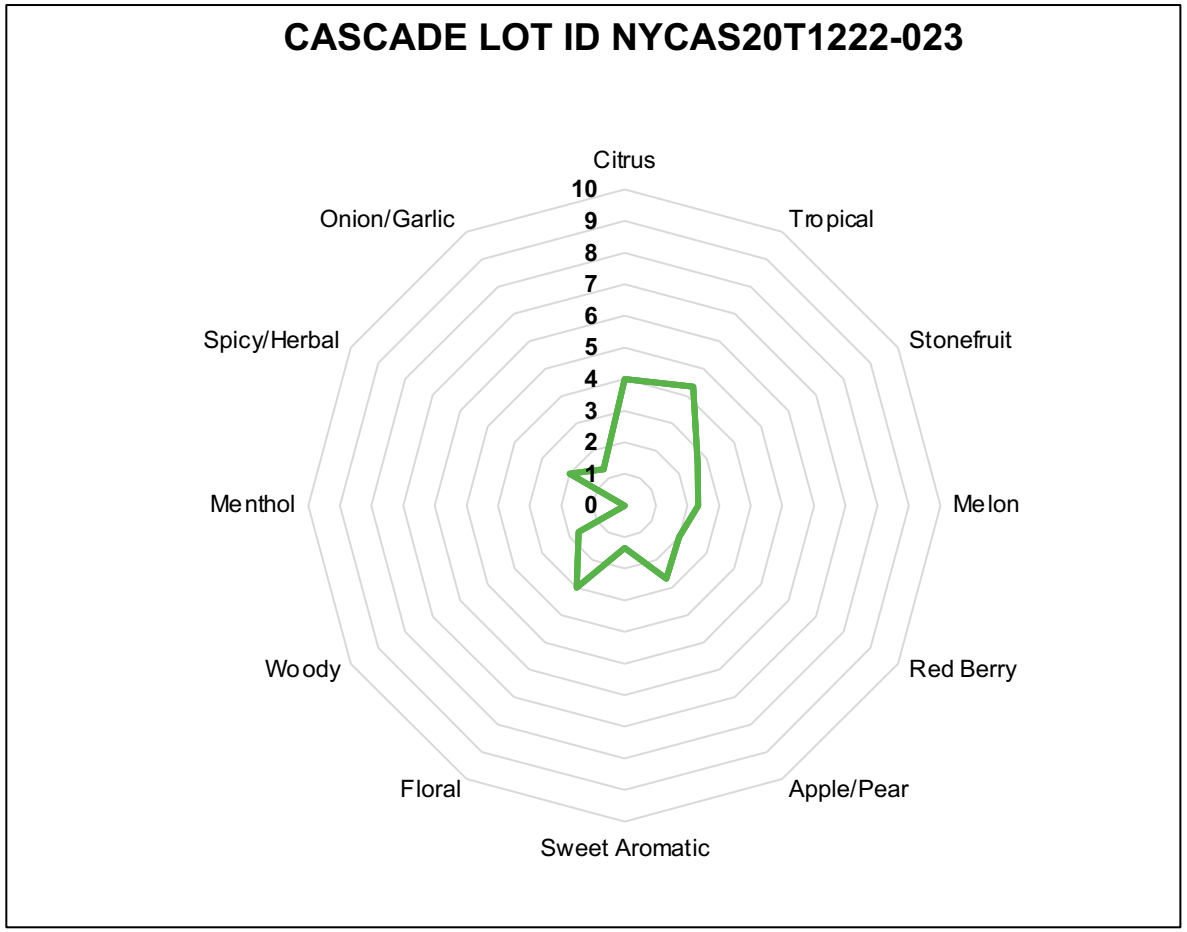
Goals of Experiment

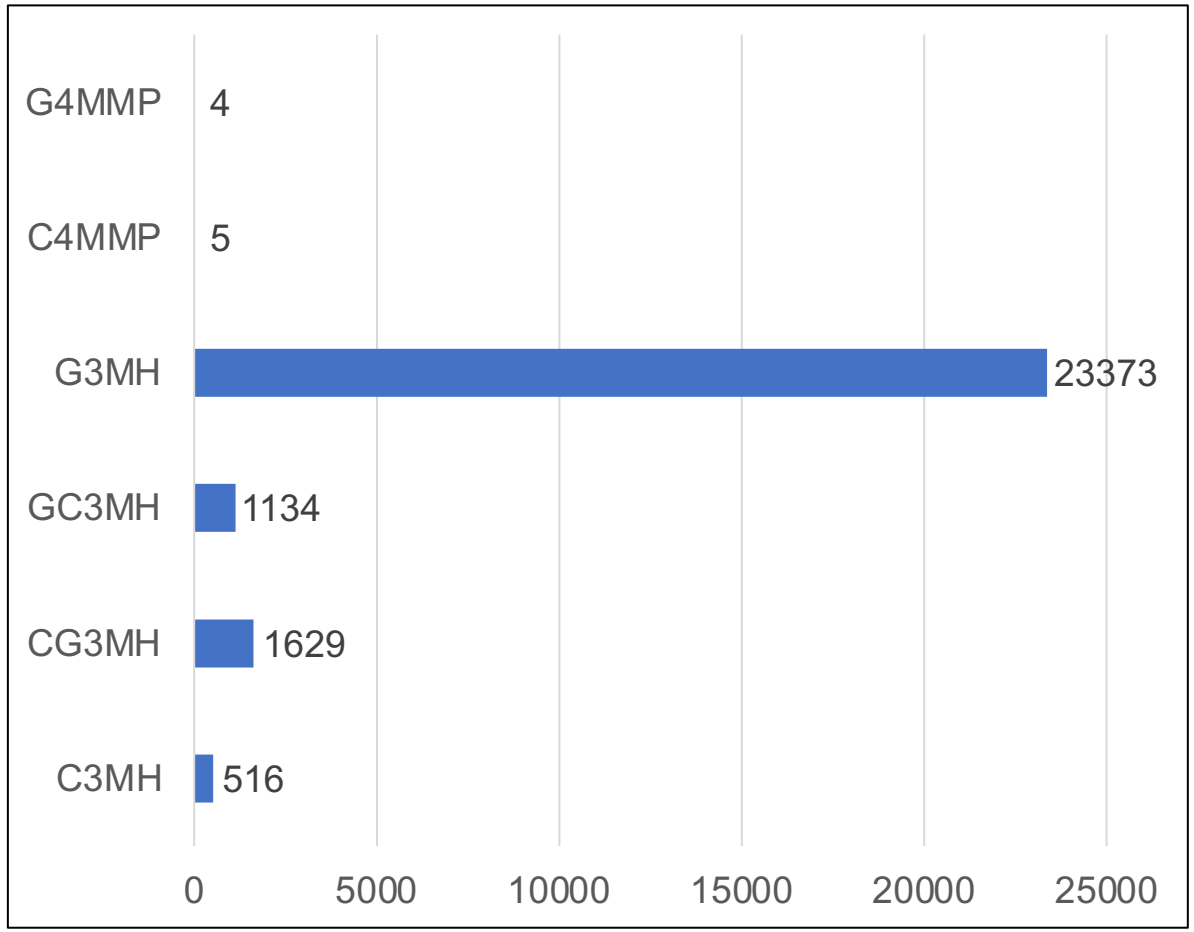
- Help showcase New York's current, most ergonomically sustainable variety to help farmers grow to a more sustainable size.
- Show new and innovative ways to utilize Cascade and hop products that growers and merchants currently have in New York.
- Showcase new and innovative yeasts like Omega's new Cosmic Punch™ or Star Party™. This is to allow brewers to use more of a ergonomically sustainable hop like New York Grown Cascade and utilize the bound / precursor thiols with a thiolized yeast strain.
- Showcase these new and innovative techniques side by side with this new thiolized yeast alongside its cohort British Ale V, and to see the results of both with the same recipe.
- Educate brewers how to use new COA's with thiol graphs and how they can be used during the brewing process.

NY Cascade Hops Used

The batch used for this experiment went through the HopTechnic® TRUE Pellet™ Process for thiol fingerprinting for enhanced Aroma



Thiol Precursor amounts from New York Cascade NYCAS20T1222-023 Lot (73% more G3MH than other Growing Regions)



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Brew Schedule

Malt Bill

Malt Bill	% of Grist
Pils	54.6%
Munich	3.9%
Pale Wheat	23.4%
Unmalted Wheat	3.9%
Flaked Oats	14.2%
Totals	100.0%

Hop Bill

Hop Bill	mass (kg)	Time addition	IBU's
NY Cascade	5	Lauter Tun	24.5
NY Cascade	15	Whirlpool	22.0
NY Cascade WC	4.5	Hop Back	5.0
NY Cascade	15	1st DH	0.0
NY Cascade	25	2nd DH	0.0
			51.5

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Brew Schedule

Totals (kg's)

Totals	Metric
Total Hops (KG's)	64.5
KG's BH Hops/hL	0.9
KG's Dry Hops/hL	1.6
Total KG's Hops/hL	2.3

Total (lbs)

Totals	Standard
Total Hops (lbs)	142.2
LB's BH Hops/bbl	2.2
LB's Dry Hops/bbl	4.1
Total lbs Hops/bbl	5.8

Yeast's Used

Omega Yeast British Ale V

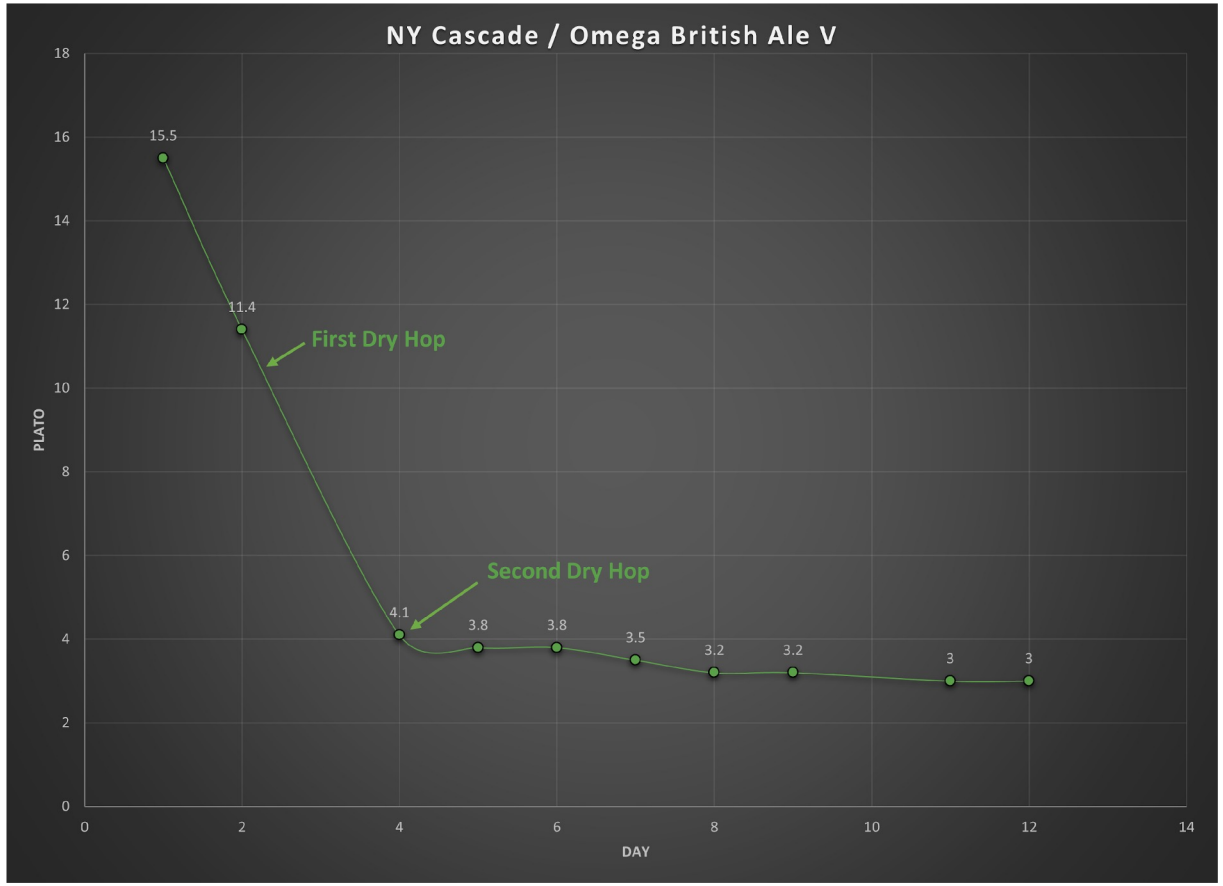
British Ale V is undeniably a gold standard for brewing NEIPAs. Along with it's huge fruity boost to juicy hop character comes a stable haze and residual sweetness that is a signature of this strain and a hallmark of a hazy IPA.

Omega Yeast Cosmic Punch™ Ale

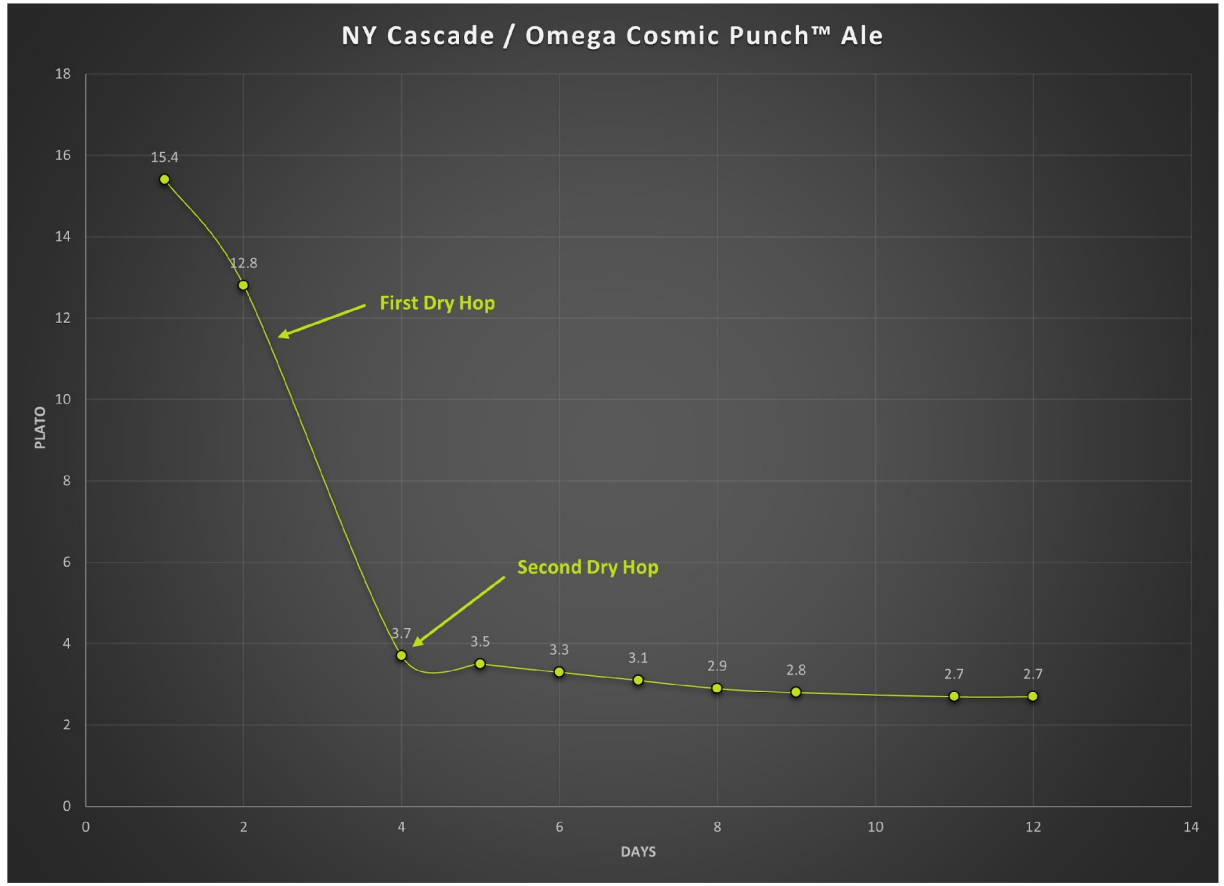
A Thiolized version of our popular hazy strain, British Ale V (OYL-11), Cosmic Punch™ Ale generates thiols through biotransformation, releasing tropical aromas experienced in southern hemisphere hops and New Zealand Sauvignon Blanc. This punchy strain unleashes vibrant grapefruit, passion fruit and guava notes. Expect the same performance and haze you get from British V, but with additional thiol aromas. Experiment with mash hopping or wine grape-derived products to push even more thiols.

Beer Fermentation

Omega Yeast British Ale V



Omega Yeast Cosmic Punch™ Ale



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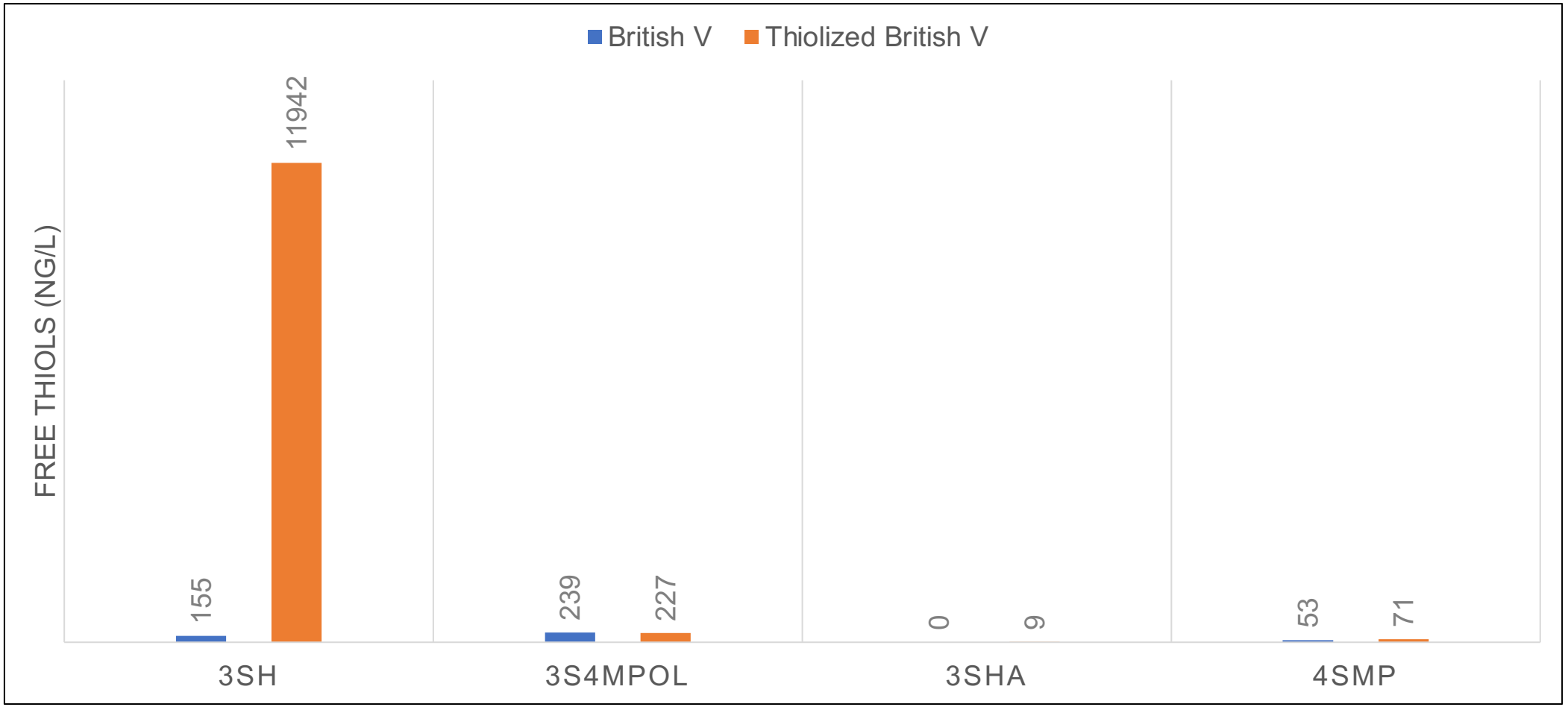
Beer Thiol Results

Thiols Enhanced Dramatically with Thiolized Yeast and NY Cascade 023 Hops



Yeast Manipulation for Increased Thiol Efficacy in NYS Hops

Polyfunctional Thiols

- Tropical and Citrus Aromas
  - Found in many tropical fruits
- Very potent aroma compounds
  - Threshold in the nanomolar concentrations (parts per trillion!)
- Characteristic Flavor
  - Sauvignon Blanc wines (tropical fruit, citrus)
  - Nelson Sauvin, Hallertau Blanc (exotic fruit-like, white wine-like)

Polyfunctional Thiol	Sensory	Threshold (ng/L)
4MSP (4MMP)	Box Tree, Black Current	1.5
3SH (3MH)	Grapefruit, Passion Fruit	60
3SHA (3MHA)	Passion Fruit	4
3S4MPol	Grapefruit, Rhubarb	40
3S4MPA	Grapefruit, Rhubarb	120

Aroma and Sensory!

NY Cascade Hazy IPA Sensory Evaluation

- **Visual:** Soft golden orange in color, moderate soft haze, white foam with some lacing.
- **Aroma:** Heavy to moderate citrus, grapefruit and orange, slight to moderate melon and pineapple, slight creamsicle.
- **Taste:** Slight citrus sweetness quickly followed by a pithy firm but slight bitterness.
- **Mouthfeel/Body:** Spritzy with a medium body and creamy mouthfeel that is washed from the pallet with a slight bitterness that does not linger.

NY Cascade Cosmic Punch Hazy IPA Sensory Evaluation

- **Visual:** Golden in color with moderate haze, moderate white foam with some sticky lacing.
- **Aroma:** Moderate overripe fruit, Diesel, Dank Weed, Mango, fresh cut grass, slight rubber/vinyl, dried citrus peel, lemongrass/herbal.
- **Taste:** Slight sweetness quickly followed by a bitterness that lingers for a short bit.
- **Mouthfeel/Body:** Light to medium body with a prickly mouthfeel and slight bitter linger.