



# Hop Harvest Timing

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**Does the timing of the hop harvest  
have a noticeable effect on beer  
flavor?**

# Hop Harvest Timing

Typical hop harvest time: mid-August through mid-September.

## Early Harvest:

disrupts the various flavor constituents.

## Late Harvest:

reduces brewing quality and aroma and increases the chance of oxidation during storage.





# The Hops

- Cascade Hops
- Grown in the UVM hop yard

Commercial Cascade = 5.6%-8.8% Alpha Acid

Table. Cascade Harvest Dates (HD)

<b>Hop Name</b>	<b>Harvest Date</b>	<b>Alpha Acid %</b>	<b>HSI</b>
<b>HD1</b>	3-Sep	5.84	0.252
<b>HD2</b>	10-Sept	5.82	0.224
<b>HD3</b>	17-Sep	5.72	0.215

# Ingredients

Malts: Pale, Pilsner, Crystal  
13-17, Acid Malt

Bittering Hops: Simcoe

Gypsum

Soft Water

Switchback Ale Yeast

Cascade Hops



Desired IBUs: 50

We used the same IPA recipe for all  
three hop harvests.

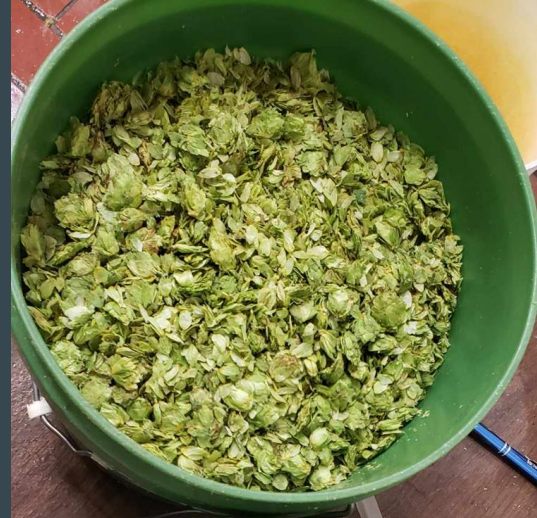


# Initial Impressions of the hops

- Browning increased across all samples
- All were fairly “vegetative”
- More cheesy notes in HD3

Dry fragrance and wet aroma will not determine end flavor!

HD1



HD3





# Hop Additions

1. The Boil  
Bittering hops
2. Whirlpool  
Flavor and aroma hops
3. Dry Hop  
Secondary fermentation

# Sensory Analysis

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# Sensory Scales

Hedonic Scale (Overall Liking)



1

2

3

4

5

6

7

8

9

# Sensory Scales

## Profile Attribute Analysis (PAA)

Ranked based on intensity  
rather than what you felt  
was “good” or “bad”

ATTRIBUTES	SCALE						
	1	2	3	4	5	6	7
Balance	Unblended						Blended
Fullness	Thin						Full
Overall Hop Intensity	None						Strong
Hop Complexity	Simple						Complex
Citrus	None						Strong
Floral	None						Strong
Vegetable Sulfide	None						Strong
Herbal, Spicy	None						Strong
Cheesy	None						Strong
Other Hop Character	None						Strong
Grain Intensity	None						Strong
Fermentation notes	None						Strong
Sour	None						Strong
Bitter	None						Strong
Mouthfeel	None						Strong
Others	None						Strong
Aftertaste	None						Strong

# Data Collected

Overall Liking results from the Switchback Team

Hops	Overall Liking
HD1	4.8
HD2	5.0
HD3	3.6

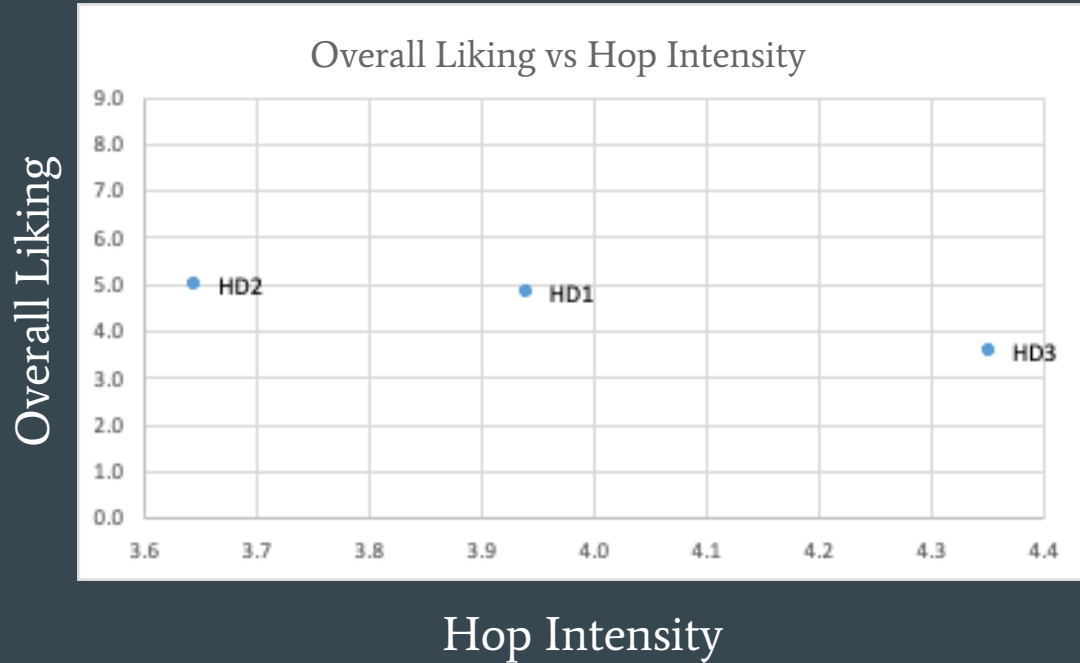
*Note: A 0.5 difference on overall liking is considered meaningful.*



**Why did Overall Liking drop?**

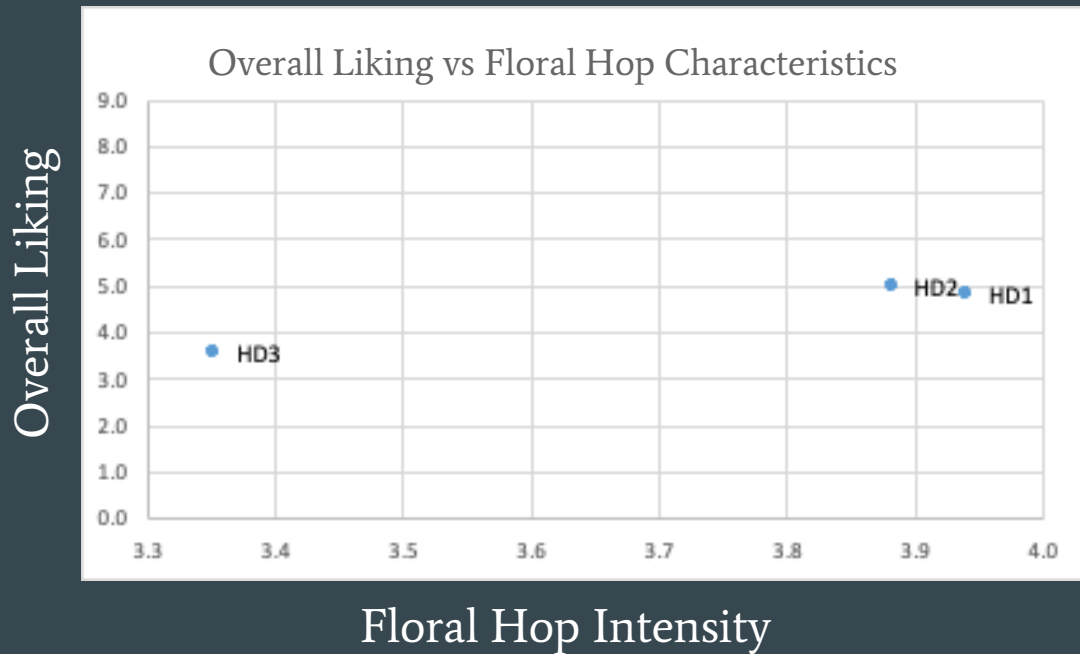


# Hop Intensity



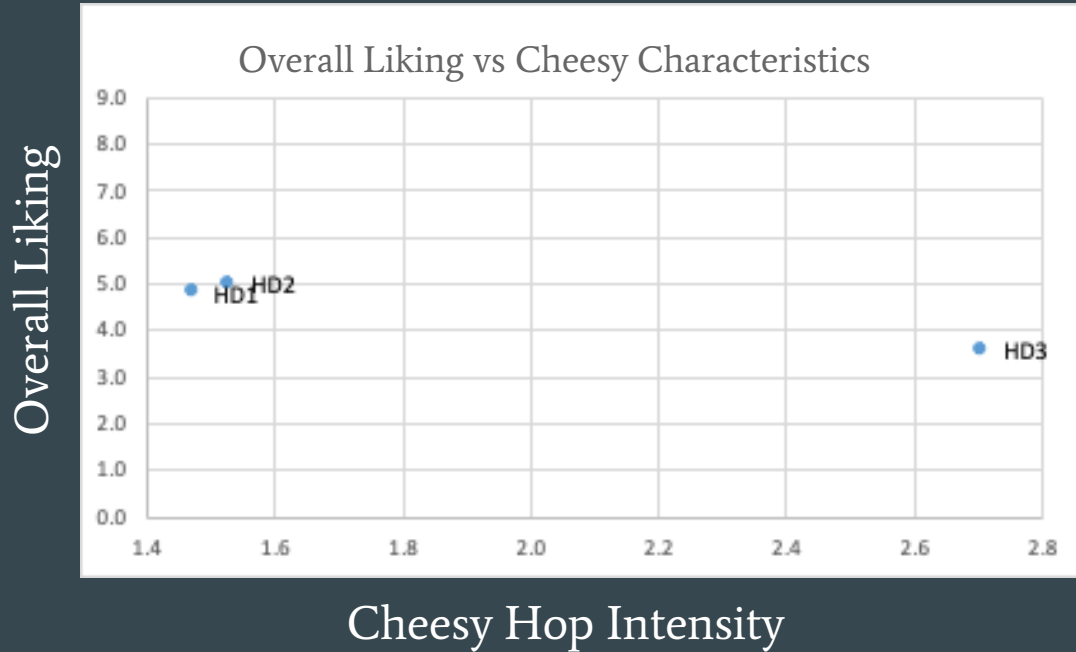
The overall hop intensity in the beer brewed using the HD3 hops was stronger than in the beers brewed with the HD1 and HD2 hops.

# Floral Hop Characteristics



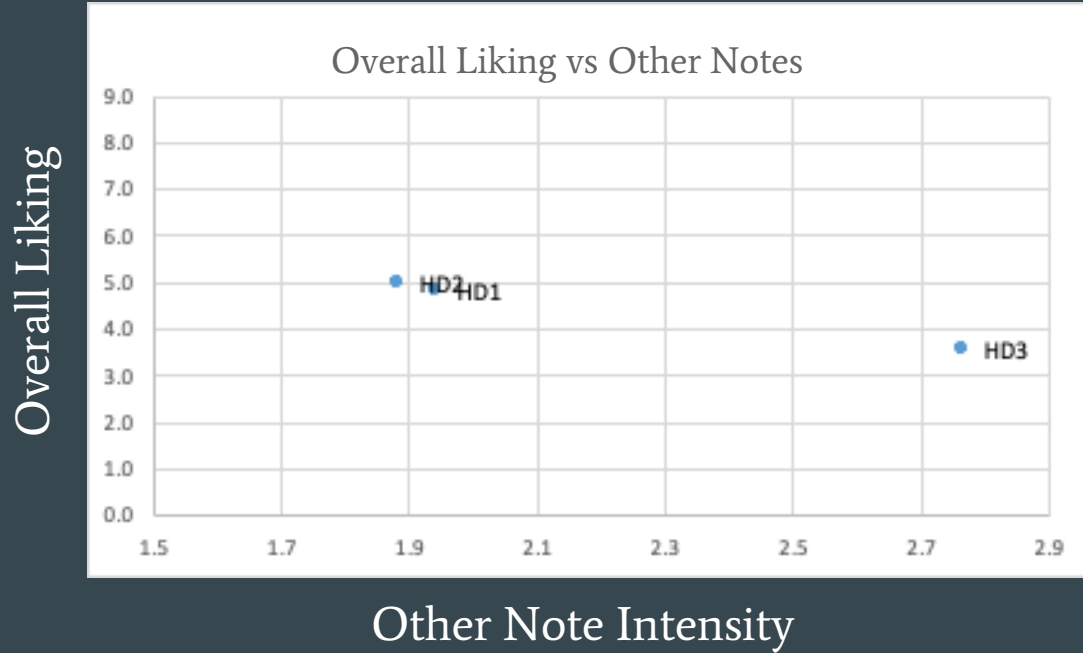
The floral hop characteristics in the beer brewed with the HD3 hops were less intense than in the beers brewed with the HD1 and HD2 hops.

# Cheesy Hop Characteristics



The cheesy hop characteristics in the beer made with the HD3 hops were more intense than in the beers brewed with the HD1 and HD2 hops.

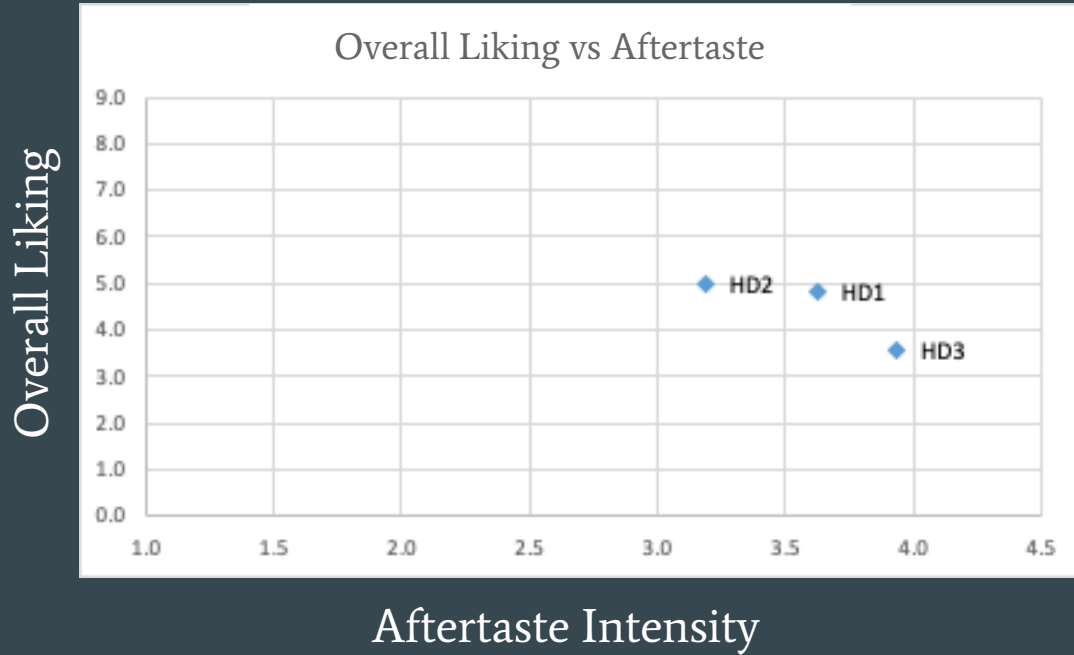
# Other Notes



Other notes, such as resinous and musty, were higher in the beer brewed using the HD3 hops than in the beers brewed with the HD1 and HD2 hops.



# Aftertaste



The beer brewed using the HD3 hops had a more intense aftertaste than the other two.



## Conclusion: Overall Liking

The beer brewed with the HD3 hops was less liked by the Switchback Team than the beers brewed with the HD1 and HD2 hops.

The beer brewed with the HD3 hops had:

- More intense hop flavor
- Less floral and more cheesy hop character
- A more intense aftertaste and more other flavors

# Results

- Range of time
- Effects of late harvesting

**Future:** more research is needed to understand harvest timing effects on:

- Beer flavor (using various hops and additional harvest times)
- Different styles of beer



**That's our conclusion.**

**We will see in a moment what you thought!**

**For a more detailed analysis of your results,  
please check out our blog: [bit.ly/UVMhopspt1](https://bit.ly/UVMhopspt1)**

