



Brewing with Wild Vermont Hops

Ellen Dillenbeck,
Lejla Mahmuljin

Vermont Hops

- ❖ Kingdom: 15.1% alpha acid
- ❖ Northfield: 3.6% alpha acid
- ❖ Wolcott: 3.8% alpha acid
- ❖ Control hop - Cascade: 7.7% alpha acid



Questions:

1. What kind of flavor will a beer brewed with this hop have?
2. What kind of aroma will a beer brewed with this hop have?
3. How much bitterness will this hop add to the beer?
4. Will a beer brewed with this hop be drinkable?
5. Does this hop have any unique, desirable characteristics?

Recipe

We used the same IPA recipe for the Kingdom, Wolcott, and Cascade brews

Desired IBUs: 75

We used a Pale Ale recipe for the Northfield brew due to a shortage of hops

Desired IBUs: 45

Smash Brew:



Single

Malt

And

Single

Hop

Ingredients

- ❖ Best Maltz Pilsner Malt
- ❖ Gypsum
- ❖ Wild whole cone hops
- ❖ Switchback House Ale Yeast



Low Mash Temperature

There are two enzymes that break down starch chains to produce fermentable sugars.

Keeping the mash at a low temperature for a long time period allows the enzymes to more efficiently break down starch chains into fermentable sugars.

High Water to Grist Ratio

We used a ratio of 1L of water to every 2Kg of grist.

This ratio produces a thin mash.

We wanted to make a light-bodied beer that would allow tasters to focus on the beer's hop character.

Hop Additions

Bitterness: 75 minutes before the end of the boil

Flavoring: 20 minutes before the end of the boil

Aroma: End of boil

Dry Hopping: During primary fermentation



Sensory Analysis - Questions

- ❖ Would you enjoy drinking a beer brewed with this hop?
- ❖ On a scale from 1-10, 1 being the least bitter and 10 being the most bitter, how bitter do you think this beer is?
- ❖ Describe the flavor and aroma characteristics imparted by this hop

Would you enjoy drinking a beer brewed with this hop?

Kingdom:

44% of respondents said yes

56% of respondents said no

Northfield:

32% of respondents said yes

65% of respondents said no

Wolcott:

67% of respondents said yes

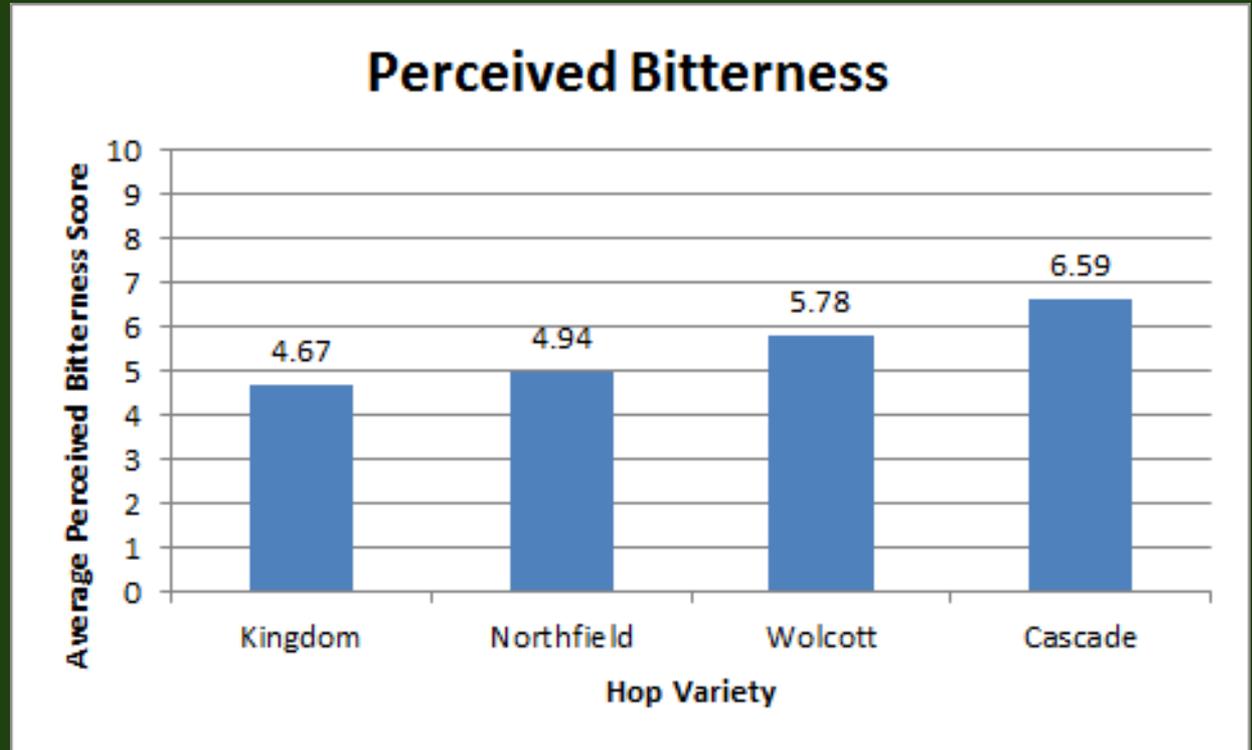
33% of respondents said no

Cascade:

32% of respondents said yes

65% of respondents said no

On a scale
from 1-10,
how bitter
do you think
this beer is?



Hop Characteristics

Citrusy

Floral

Fruity

Herbal

Onion/Garlic



Piney

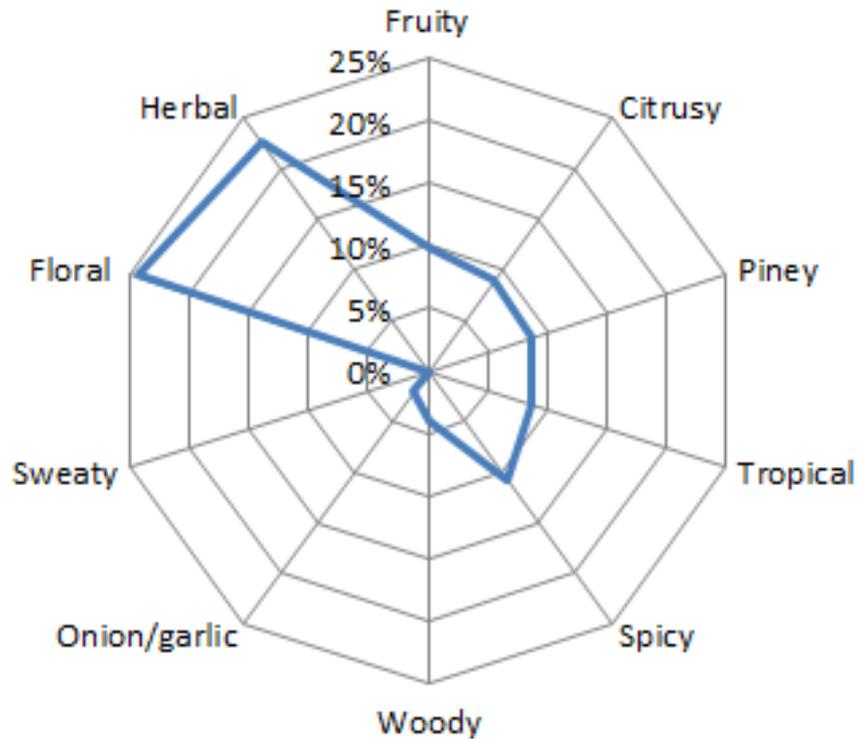
Tropical

Spicy

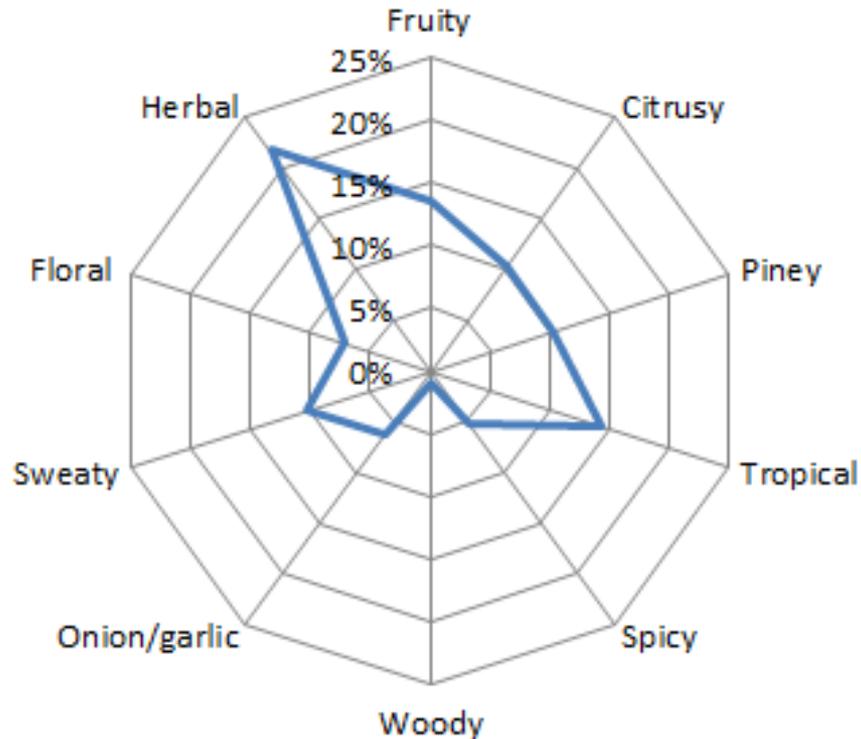
Sweaty

Woody

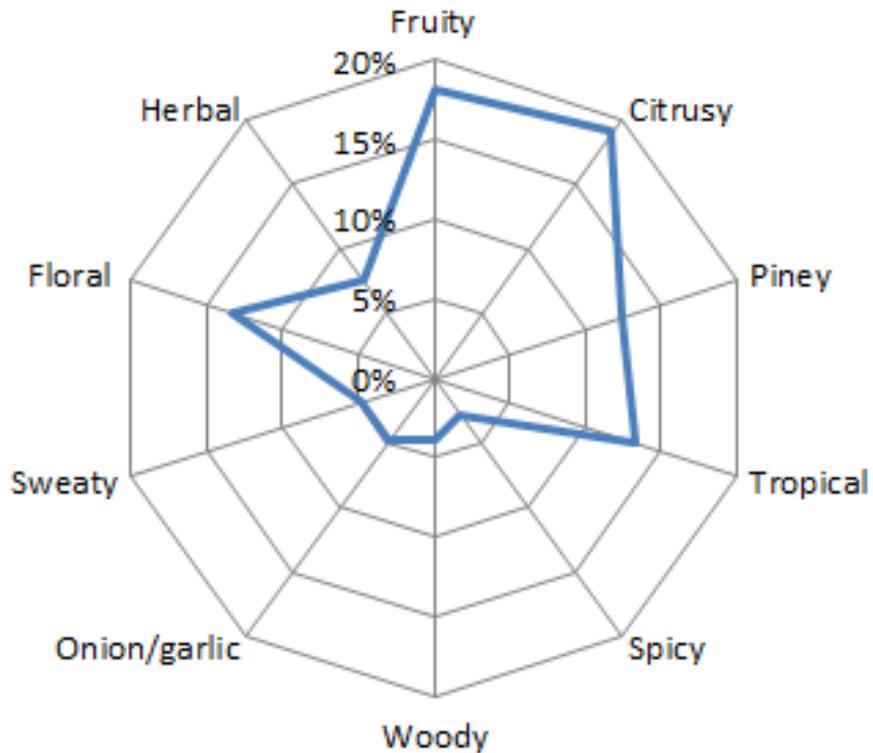
Kingdom Hopped Beer



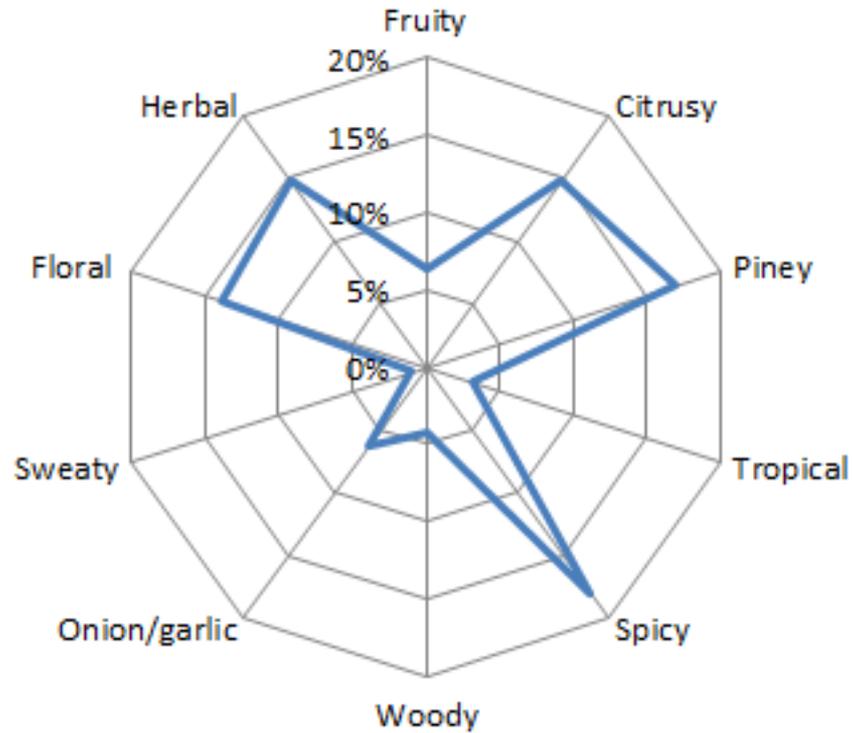
Northfield Hopped Beer



Wolcott Hopped Beer



Cascade Hopped Brew

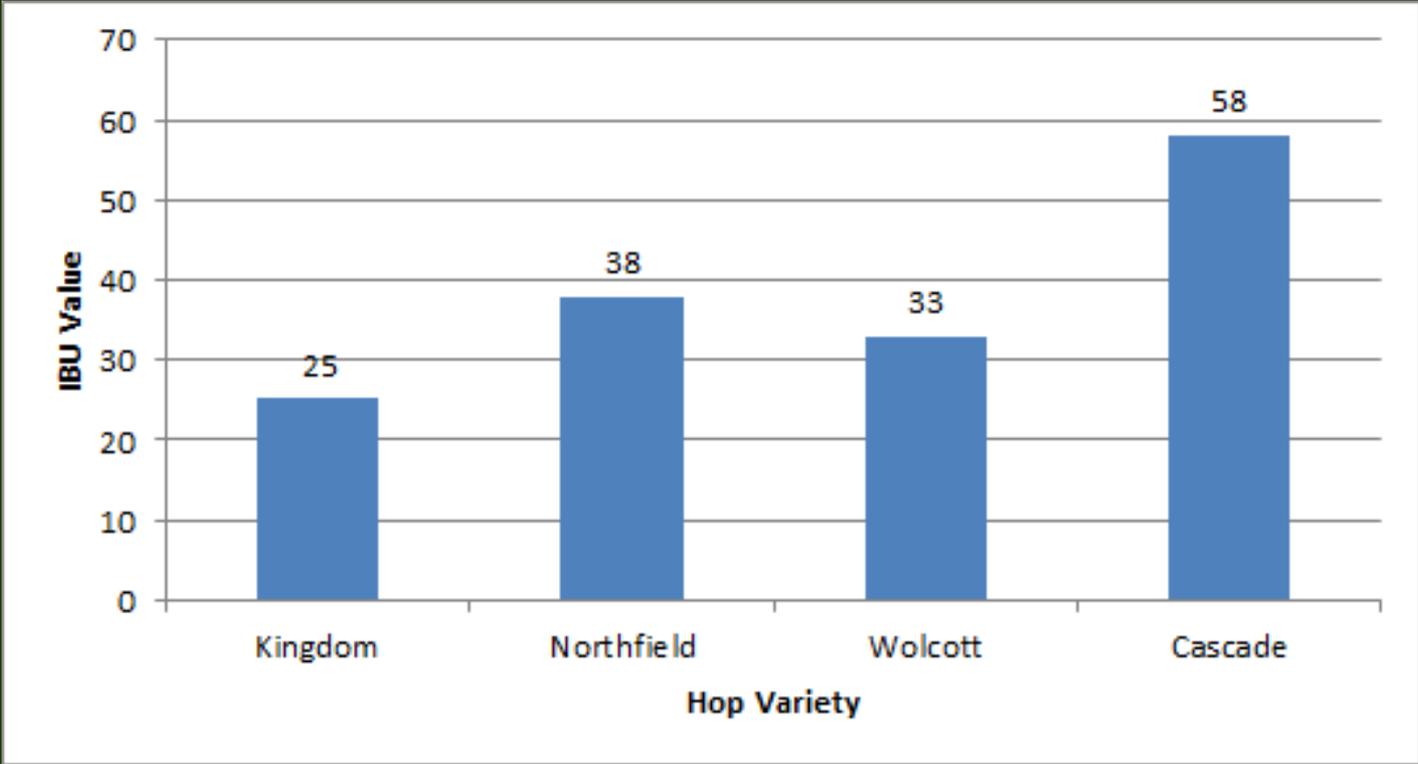


IBU Testing

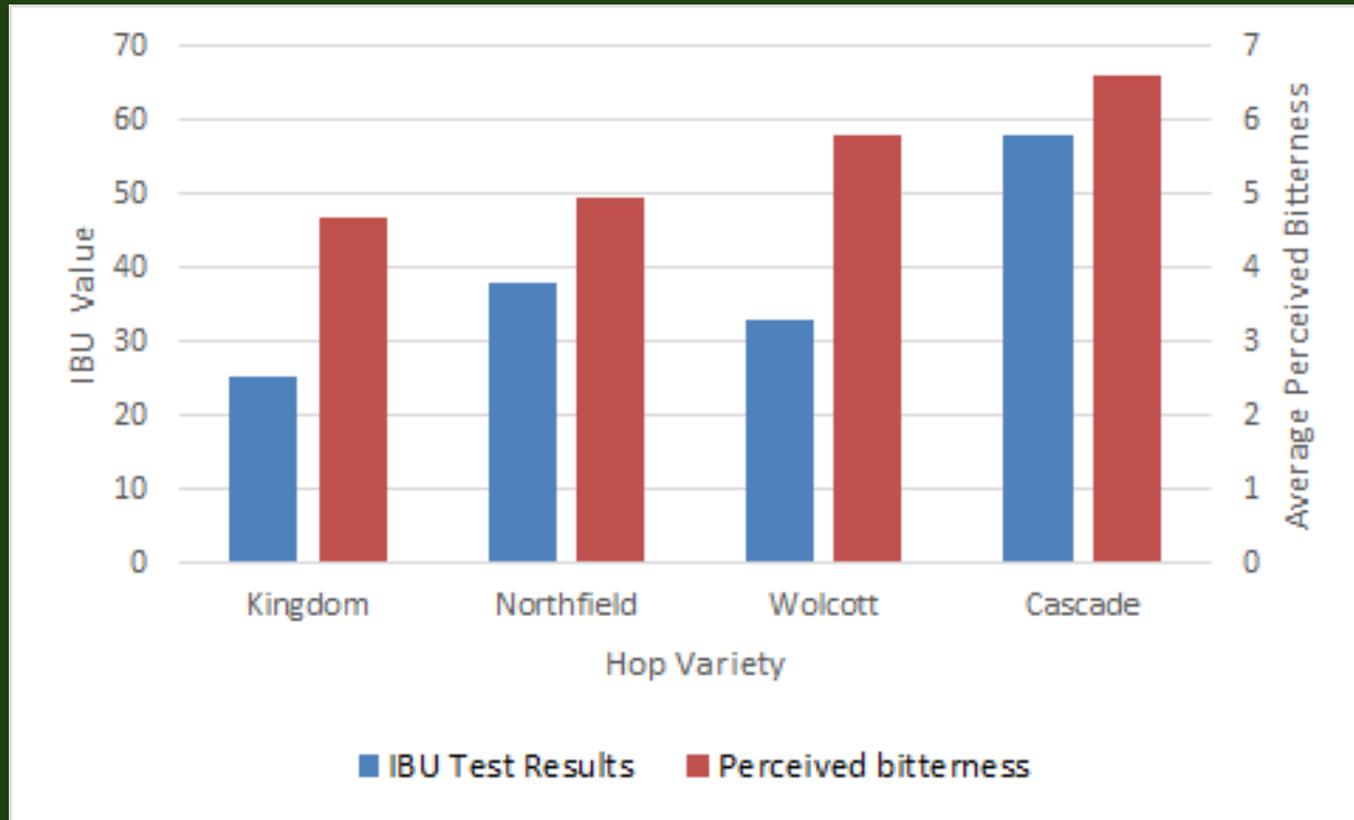
- International Bitterness Units (IBUs)
- IBUs are a measurement of specific chemicals, including isomerized alpha acids, that are known to make beer taste bitter
- Most beers contain between 5 and 120 IBUs



International Bitterness Units (IBU) Results



Perceived vs Calculated Bitterness



Conclusion

Possible Sources of Error

- Possible lab errors in alpha acid calculations
- Switchback house bias

Future Research

- Each batch of beer had different flavors and aromas
- More research and selective breeding will help determine whether these hops have commercial value

And now for the results...

Sample 1 - Kingdom

Sample 2 - Northfield

Sample 3 - Wolcott

Sample 4 - Cascade

Please check out our website for
the questionnaire results:

<https://www.switchbackvt.com/news>



Cheers!