

A brief history of hop and its uses

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Before you start...



- Do you have suitable land for growing?
- Irrigation/water
- Which cultivars will you plant?
- Where will you get plants or rhizomes?
- How will you get them picked and processed?
- Who will you sell your hops to?

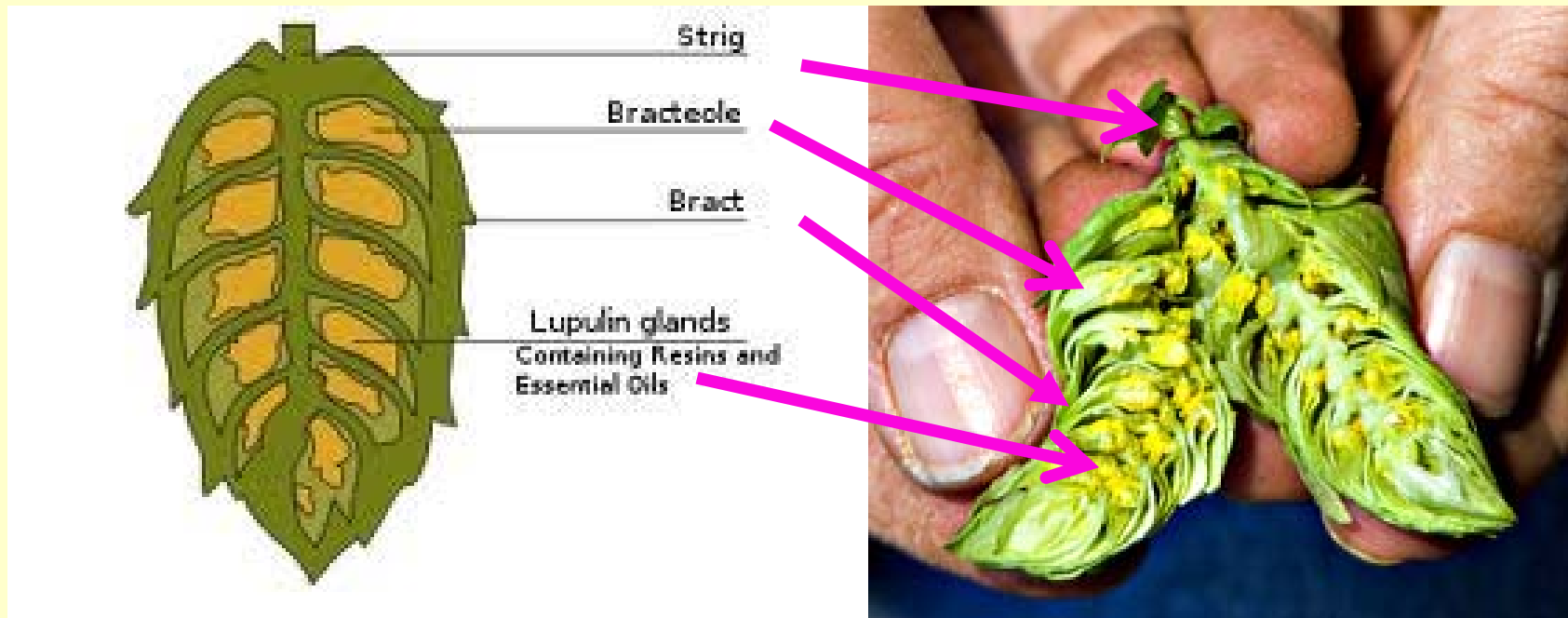


Hop *Humulus lupulus*

- Hop is a perennial that regrows each spring from the rhizomes of an underground rootstock
- Hops produce annual stems called bines from a perennial rootstock-twine clockwise- grow 18-25'
- Hop is native to North America and Europe
- Hops grow only at certain latitudes (38° to 51° latitude)
- There are male and female plants



Anatomy of a hop cone



Important chemical components of hops

- Alpha acids-contribute to the bitter flavor of beer, help prevent unwanted growth of bacteria, and enhance the ability of yeast to grow and ferment the wort to beer.
- Beta acids- contribute very little to bittering, but have strong antimicrobial properties
- Essential oils- contribute aromas and flavors to beers and ales

Hop characteristics

- Levels of alpha acids and essential oils vary among varieties giving them different characteristics that make them suitable for specific styles of beer and ale.
- High Alpha Acid (Bittering) Types: (Alpha acids--%-- contribute to the bitter flavor of beer.
- Aroma hops impart other flavor characteristics to beer including smell and taste. (Often both types are used.)
- Hopunion and usahops.org websites have more information

Aroma descriptors for hop cultivars

| Hop cultivar | aroma |
|---------------|--|
| Brewer's Gold | Black currant, fruity, spicy |
| Cascade | Flowery, citrus, grapefruit |
| Chinook | Spicy, piney, grapefruit |
| Willamette | Mild, slightly spicy, black currant/herbal |
| Fuggle | Delicate, minty, grassy, slightly floral |
| Hallertau | Mild and pleasant |



Source: Grape vs. Grain, p. 97 Bamforth, 2008

Some common hop varieties

- Willamette- most widely grown aroma hop in U.S.
- Tettnanger -most widely grown of German hops; second most popular aroma hop in U.S.
- Cascade -probably the most popular – dual purpose hop
- Centennial-dual purpose higher alpha acids than Cascade

A hop with unusual characteristics

- ‘Teamaker’ hop-released in 2008 ARS by scientists in the ARS Forage, Seed and Cereal Research Unit (FSCRU) in Corvallis, Ore.
- lowest alpha acid concentration of any commercially available hop (0.6 to 1.8 %)
- beta acid levels (5.4 to 13.2 %) significantly higher than most varieties.
- High aroma- spicy, floral

Hop: traditional & current usage

BREWERY: 98%
Natural preservative
Bitter taste
Hoppy flavor
Stable foam head



MEDICINAL

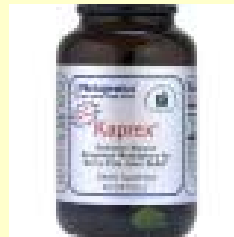
Sedative



Estrogenic



Anti-inflammatory



Cosmetics



Additional uses for hops for the small scale producer

- Hop pillows-sleep aid
- Herbal teas
- Shoots harvested for salads
- Garlands, floral arrangements



current/future pharmaceutical uses for hops

- Anti-oxidants
- Phytoestrogenic
- Anti-carcinogenic
- Anti-viral
- Anti-inflammatory
- Treatment of diabetes symptoms

current/future uses for hops-food processing

- Hop compounds used as an antibiotic for beet sugar processing
- Antibiotic for animal feed
- Hop compounds can replace antibiotics in the production of ethanol
- Used to control bacteria in the production of several foods-processed meats, corn starch, baker's yeast

Why did hops come to be used in beer and ale?

- Hops acted as a preservative to prevent spoilage
- Helped to clarify the wort
- Gave the finished beer a good head
- Allowed for better storage and shipping
- Added flavor



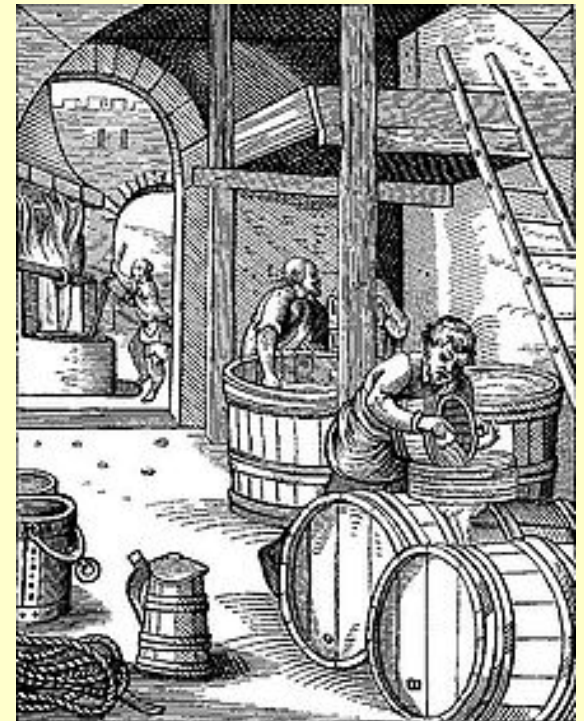
Before there was hopped beer

- -There was “gruit” beer- an herb mixture to provide flavor and bitterness
- Archbishop of Cologne, Germany held monopolistic rights to gruit-
- The hop flourished despite roadblocks
- It’s preservative quality enabled brewing, storing and eventual shipping of German lager style beer possible



Hop history in Europe

- The exclusive use of gruit was gradually phased out in favor of the use of hops alone in a slow sweep across Europe between the 11th century the late 16th century (Great Britain)
- Parliament banned the use of bitter hop alternatives such as broom and wormwood in 1710 to ensure brewers did not try to avoid the new hop tax of a penny a pound.



Acreage of hops in the UK

- Peak acreage in the UK was 77,000 A
- 1909 32,000 A
- Current acreage=
- 2,427



Hops in the American colonies (1629)

- The hop cones were used for beer brewing
- The young shoots in the spring were eaten as a special treat in salads
- A wax from the tendrils provided a reddish-brown vegetable dye
- The fibers were used in textiles as a substitute for flax
- The stalks were used for basket and wicker-work
- Leaves and spent hops provided food for sheep.

Source: Sanborn Brown, *Wines and Beers of Old New England*

Oast house or hop kiln

- Building designed for drying hops as part of the brewing process
- Hops were spread on a slatted floor
- The kiln furnace was lit to dry hops
- After drying, hops were pressed into sacks and sold to breweries



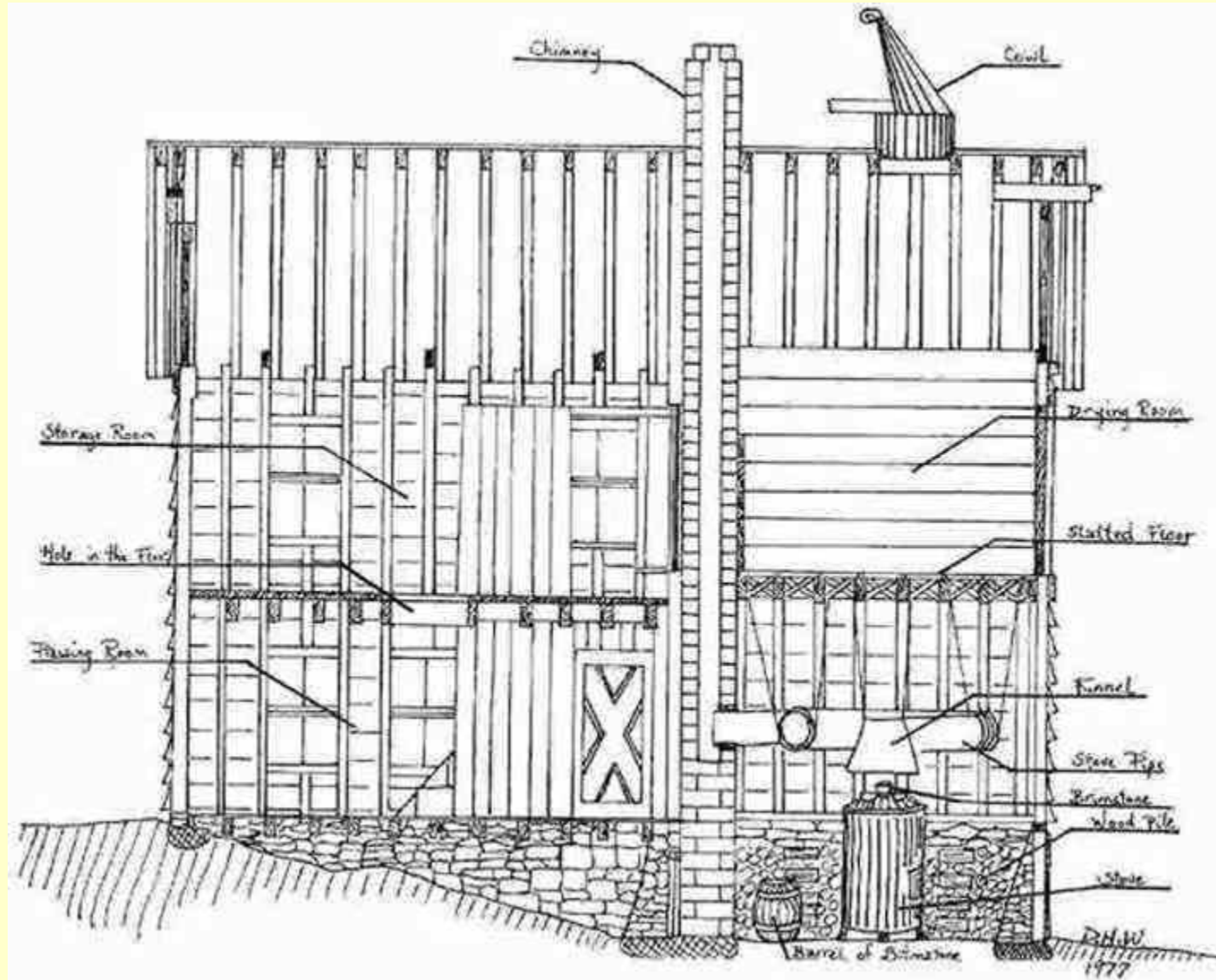
Oast House at Great Dixter, Sussex, UK built in 1890

Hop kiln in New York state



Madison County, NY ca. 1870

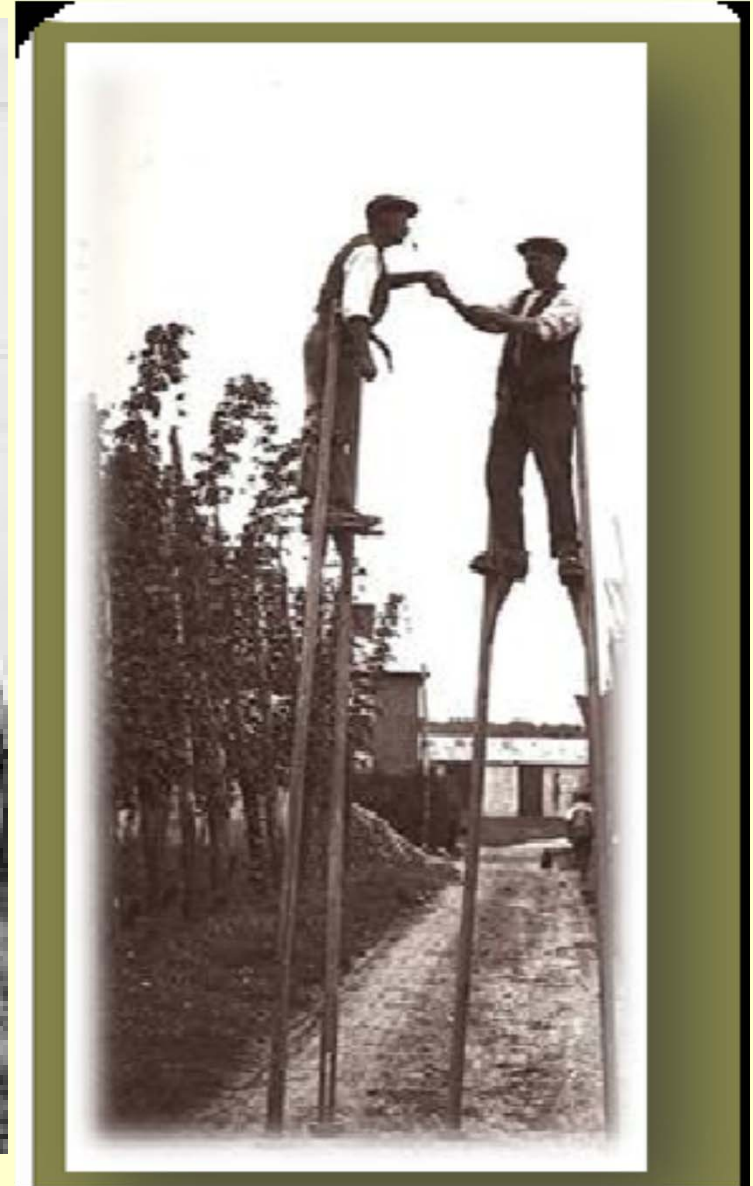
Interior of a hop kiln



Hop stringing on stilts



Hulton-Deutsch Collection/CORB



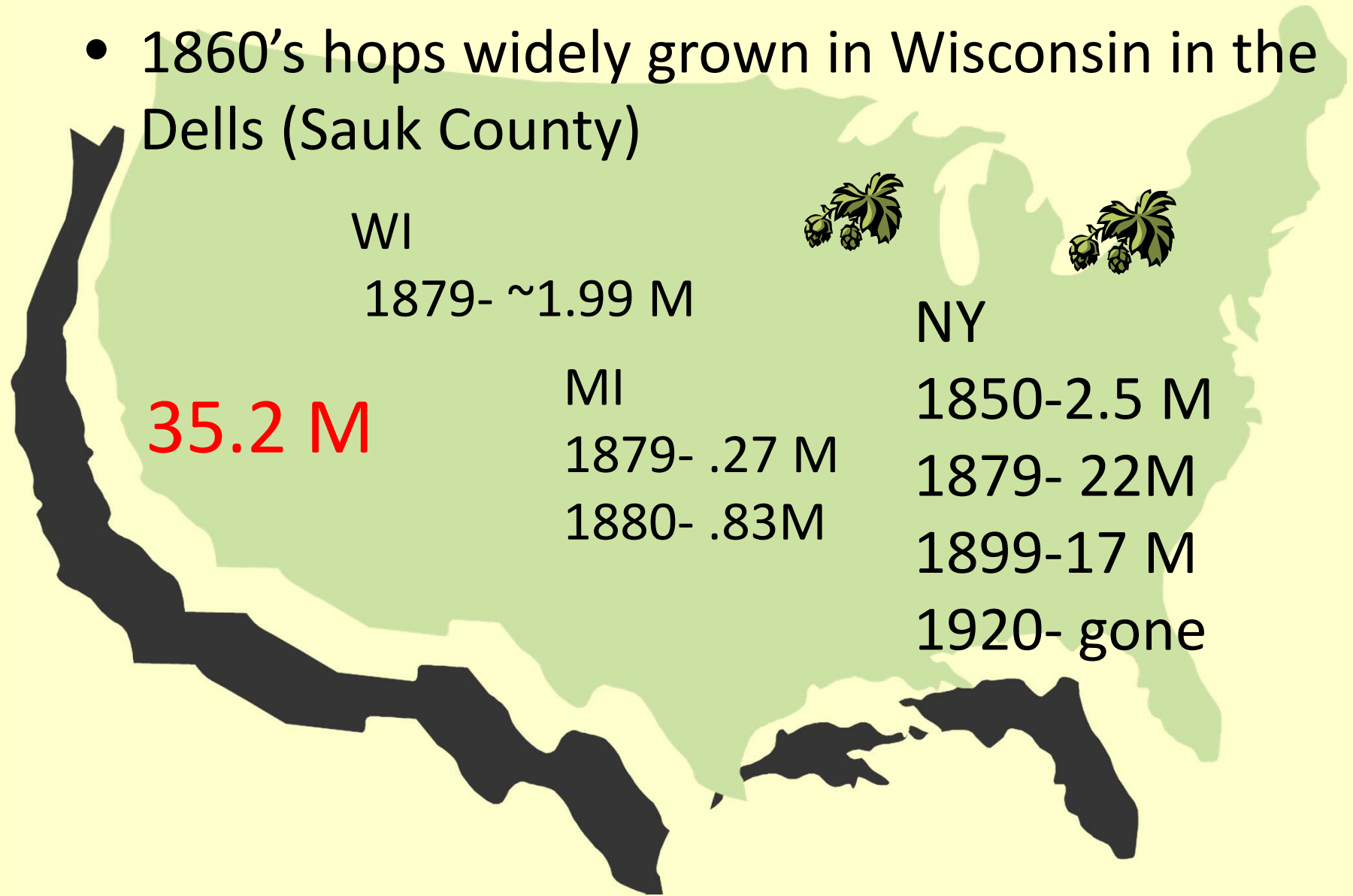
Hops in the United States

- First commercial hops harvested in Massachusetts in 1791
- New York State-first hops planted in Madison County in 1808.
- The first harvests sold for just 12 cents a pound.
- English crop failures increased the demand after 1822
- Erie Canal opened up transportation to the east and west in 1825.
- By 1859, seven-eighths of the nation's hops were harvested in New York State.



Hop production moves westward

- 1860's hops widely grown in Wisconsin in the Dells (Sauk County)



The rise and fall of Wisconsin hops

- In 1860, Wisconsin produced 135,000 lbs of hops.
- 1867's crop -11 million pounds with 4 million of those pounds in Sauk County.

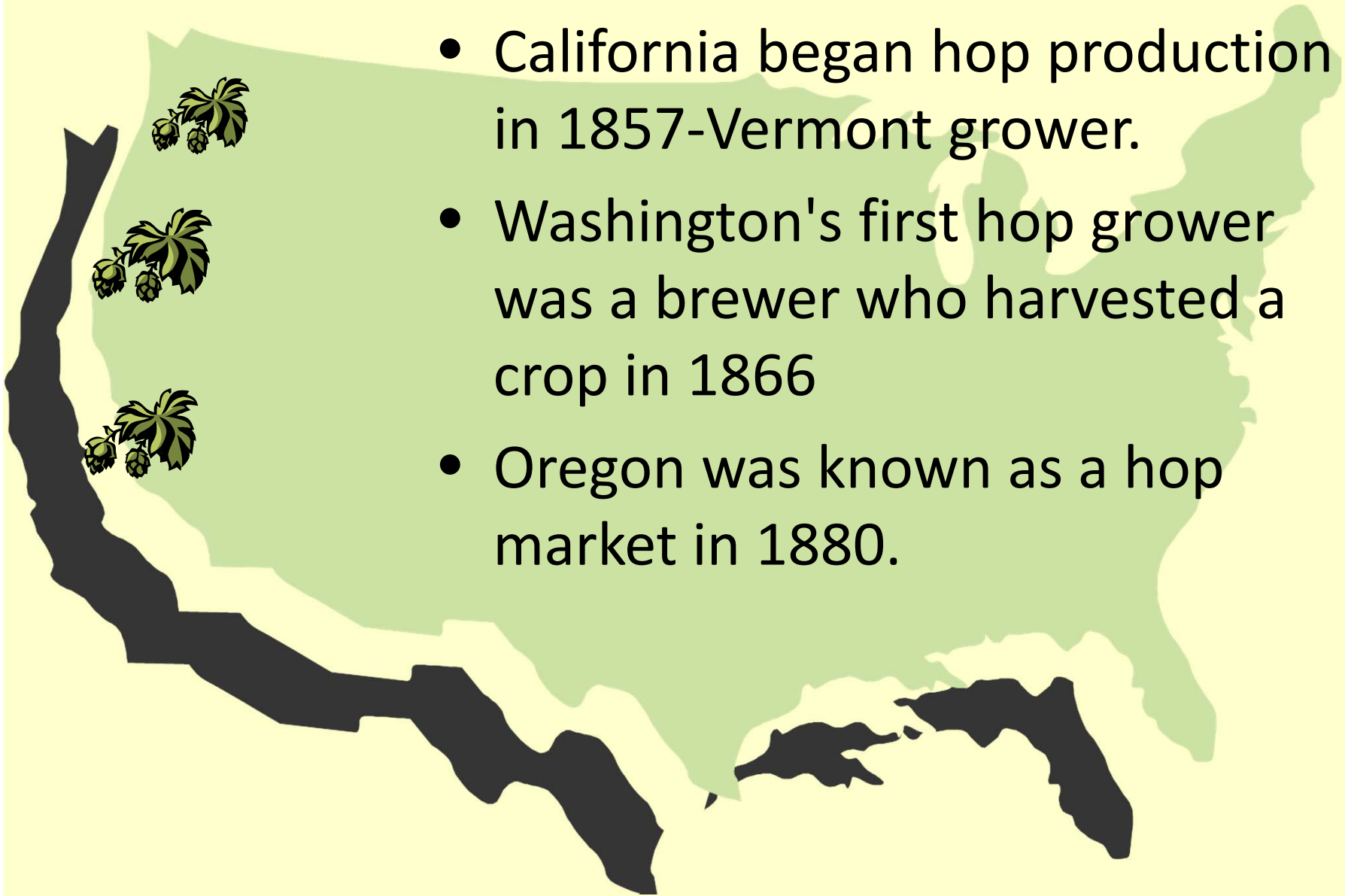


The rise and fall of Wisconsin hops

- New York had solved their problems and brought their production back on-line. This combined with the increased production from Wisconsin caused a major drop in prices. By 1880, Wisconsin's crop had dropped to under 2 million pounds and nearly disappeared by the turn of the century.

Hop production moves westward

- California began hop production in 1857-Vermont grower.
- Washington's first hop grower was a brewer who harvested a crop in 1866
- Oregon was known as a hop market in 1880.



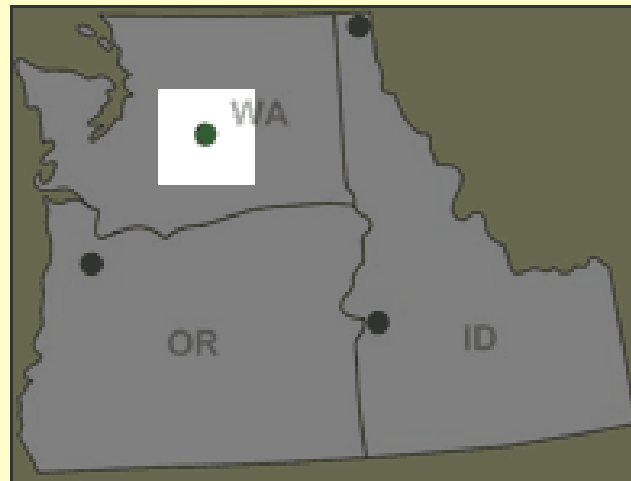
Hop picking in Oregon 1930-1960

- Hop picking in Josephine County, Oregon

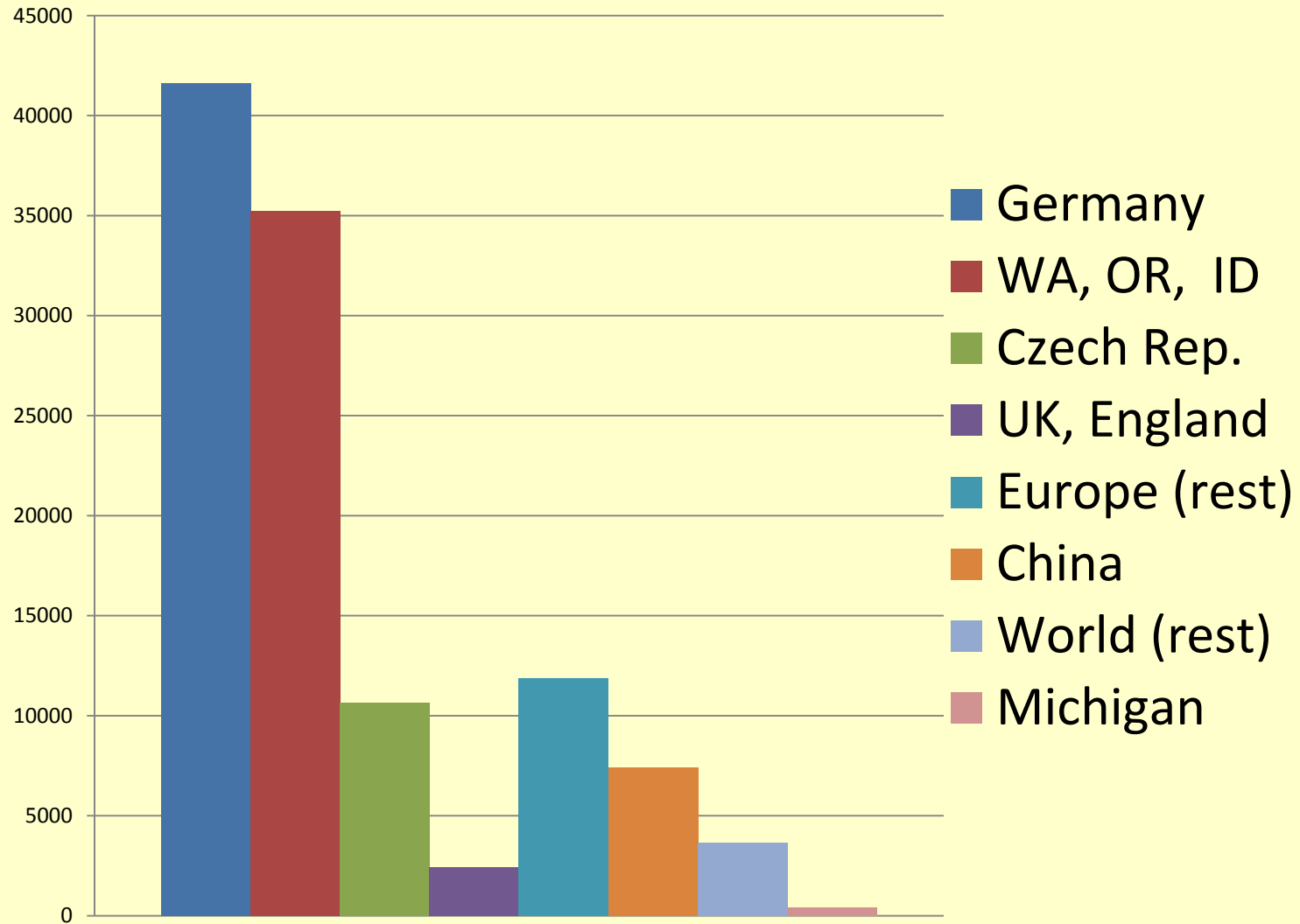


Current major hop production areas

- Washington, (Yakima Valley)
 - average farm size of 450 acres
- Oregon
- Idaho



2013 acres of hop production



Questions?

