

1. Overview
 - 1.1. Why
 - 1.1.1. They're the most expensive brewing ingredient
 - 1.1.2. They grow like weeds
 - 1.1.3. Free hops!!!!
 - 1.2. Hop facts
 - 1.2.1. Perennial, can live for over 30 years
 - 1.2.2. Takes about 3 years to fully establish itself
 - 1.2.3. Female plants and male plants, female plants make hop cones, male plants pollinate the hop cones and fill them with seeds. So, male plants are useless (don't tell my wife)
2. Definitions
 - 2.1. Lupulin: A yellow powder that contains all the oils and resins we want
 - 2.2. Bracteoles: Petals of the hop, hide the lupulin glands
 - 2.3. Burr: A flower, precursor of the hop cone.
 - 2.4. Rhizome: An underground stem, self-replicating
 - 2.5. Crown: The entire root + rhizome structure
 - 2.6. Bine: A clockwise twining vine
3. Getting rhizomes
 - 3.1. Get rhizomes from established plants
 - 3.2. Order rhizomes online (order now!): Northern brewer,
 - 3.3. Classic varieties are available: Cascade, Chinook, Fuggles, Magnum, etc
 - 3.4. Modern varieties are patent protected: Citra, Mosaic
 - 3.5. Keep moist and cold
 - 3.5.1. Ziplock bag wrapped in damp paper towel in fridge/freezer
4. Planting
 - 4.1. Where
 - 4.1.1. Southern exposure
 - 4.1.2. 6-8 hours of sun per day
 - 4.1.3. Good air circulation, but protected from strong wind
 - 4.1.4. Grows up to 30ft vertically
 - 4.1.5. Good drainage, with lots of water
 - 4.1.6. Some sort of trellis structure
 - 4.1.7. Great in 2ft diameter containers or 2ftx2ft boxes
 - 4.1.8. They can grow aggressively, so be careful of where you plant them
 - 4.2. When
 - 4.2.1. Plant new rhizomes as soon as ground isn't frozen
 - 4.3. Procedure
 - 4.3.1. Want 3ft between rhizomes
 - 4.3.2. One Rhizome per hill
 - 4.3.3. Dig 6 to 12 inch deep hole
 - 4.3.4. Add a few inches of manure
 - 4.3.5. Fill with potting soil
 - 4.3.6. Place rhizome on top, horizontally roots down

- 4.3.7. Add more potting soil on top to form 2 inch hill
 - 4.3.8. Cover with mulch
 - 4.3.9. Mark what you plant where!
- 5. Care
 - 5.1. Food and Water
 - 5.1.1. Want to water frequently, but don't let them sit in water
 - 5.1.2. A drip system is ideal
 - 5.1.3. Once shoots start appearing, fertilize with a good nitrogen based fertilizer
 - 5.1.4. Stop fertilizing once burrs appear.
 - 5.2. Trimming
 - 5.2.1. Goal is to have 1 to 3 strong bines, 1 to 3ft long in early to mid may
 - 5.2.2. Cut shoots early and often
 - 5.2.3. Shoots are like asparagus and can be eaten
 - 5.2.4. When ready, train the bines clockwise onto the twine.
 - 5.3. Critters
 - 5.3.1. Deer, rabbits, etc
 - 5.3.2. Bugs, and fungus
 - 5.3.2.1. Caterpillars, beetles, aphids, mites
 - 5.3.2.2. Powdery and downy mildew
 - 5.4. Trellis
 - 5.4.1. Goal is to have a vertical twine string that's 12-18 feet tall. That can support the 20 pound bine.
 - 5.4.2. Want a rough twine the bines can grab onto
 - 5.4.3. They'll grow on anything, but for maximum harvest grow vertically
 - 5.4.3.1. Chain link fence
 - 5.4.3.2. Tie to eave of two story house
 - 5.4.3.3. Custom built from Lamp posts
- 6. Harvest
 - 6.1. When are they ready
 - 6.1.1. Around 90 day growing period (late May to early/mid September)
 - 6.1.2. Generally ready in late summer
 - 6.1.3. Shorter days tell plants to reproduce and generate cones
 - 6.1.4. Hops are ready when:
 - 6.1.4.1. Springy, but dry
 - 6.1.4.2. Have a strong aroma
 - 6.1.4.3. Lots of yellow powder (lupulin, the good stuff)
 - 6.1.5. Check every day or two
 - 6.1.6. Usually takes 3 years for a plant to get to full yield
 - 6.1.7. Expect ½ to 2 pounds per vine.
 - 6.2. Picking
 - 6.2.1. Picking will take an hour or so per bine
 - 6.2.2. Two choices
 - 6.2.2.1. Pick one by one
 - 6.2.2.1.1. Need a ladder
 - 6.2.2.1.2. Biggest yield since you can harvest as hops mature

- 6.2.2.2. Cut the bine and twine and harvest on the ground
- 6.3. Drying
 - 6.3.1. Keep away from sunlight
 - 6.3.2. Store in warm dry room with good air circulation, ideally on screens or racks
 - 6.3.3. Food dehydrator
 - 6.3.4. Vacuum seal, ideally mylar bags
 - 6.3.5. Freeze
- 6.4. Prep for next season
 - 6.4.1. Just cut back shoots
 - 6.4.2. Optionally pull and trim the crown (give away the rhizomes!)
- 6.5. Using homegrown hops:
 - 6.5.1. Unknown bitterness level, so use late in boil for aroma and flavor
 - 6.5.2. Or make a small test beer and compare to a known IBU beer
 - 6.5.3. Or make a hop tea and compare to a known AA hop