



A hand holding a hop vine against a clear blue sky. The vine has green leaves and a long, thin, reddish-brown stem that curves downwards. The hand is positioned in the upper left, with the vine extending towards the bottom right.

GIVE YOUR HOMEBREW TERROIR: GROW YOUR OWN HOPS

Recent hop shortages are debasing your homebrews and putting a dent in your wallet, so why not grow your own? Hops are easy to grow, and their requirements are simple, including plenty of sunshine, well-draining soil, and yearly additions of compost. You don't need a green thumb to give your homebrew its own terroir with homegrown hops.

HISTORY AND GEOGRAPHY OF HOPS

Early European settlers brewed the first American beers with hops growing wild in New England. In 1628, rhizomes were brought over from Europe. Interbreeding soon conceived the "wild tasting" American Cluster variety. After the Civil War, hop production concentrated in fertile upstate New York. As settlers ventured westward, they brought their rhizomes along. Wisconsin and Michigan saw a brief period of prolific hop production, but the extraordinarily high yields in California, Oregon and Washington soon dominated the marketplace.

Today, Washington's Yakima Valley leads the way in hop production, followed by Oregon and Idaho. However, homebrewers grow hops in every state with great success. With careful planning and diligence, you could supply your entire homebrew hop bill for the year.

BY ALI HAMM

PERFORMING A SIMPLE INTERNET SEARCH ON HOP VARIETIES WILL PROVIDE ADEQUATE BACKGROUND INFORMATION TO HELP YOU CHOOSE VARIETIES APPROPRIATE FOR YOUR LOCATION.

THE ROOT OF IT ALL

With more than 80 varieties of hops available, how will you choose which to plant? Ask yourself three important questions: What varieties do I like to brew with? What varieties will perform best in my location? And where do I get these rhizomes?

First, pick the varieties that you'd like to brew with. Consider your objective for growing hops; to supply your entire year's demand, or to supply a few special brews? I recommend planting as many varieties as possible, both aroma and bittering, to cover all your bases.

Next, research your location. Hops grow between the 35th and 55th parallels; locales outside these latitudes will not provide sufficient day lengths for vegetative growth and flowering. Try to pick varieties that typically grow closest to your latitude. For example, the Zatec region of the Czech Republic is located at 50° N; therefore Saaz grown at 35° N may produce few flowers, if any.

The difference between producing a few cones and a few pounds is climate. Hops are obstinate, but they survive if exposed to extreme conditions such as high winds, hail or intolerable heat. Compare your climate to traditional hop growing regions. As a general rule of thumb, aroma varieties perform poorly in hot and dry climates, unless afternoon shade is provided.

HOP VARIETY RESOURCES

HopUnion

www.hopunion.com (direct link: www.hopunion.com/hopunion-variety-databook.pdf)

Yakima Chief

www.yakimachief.com (direct link: www.yakimachief.com/hopvarieties/hopvar.html)

Do a background check on each variety's resistance to disease and pests. In general, newer varieties are fairly tolerant of common hop pests and diseases, while traditional European varieties hardly stand a chance. Most U.S.-bred varieties such as Chinook, Nugget, Willamette and particularly Cascade perform well everywhere. Hop growers living in non-traditional growing areas with a low risk of disease, such as the Rocky Mountain region, have more flexibility in choosing varieties. Performing a simple Internet search on hop varieties (see the sidebar for suggested resources) will provide adequate background information to help you choose varieties appropriate for your location.

With your list of varieties you'd like to grow, it's time to shop for rhizomes. Explore local sources first, including your local homebrew shop. Befriend nearby backyard or commercial hop growers and offer to dig up rhizomes early spring. This way, the plant's history on performance, pest and disease incidences is known. If a local source is not available, search "hop rhizomes" online to find several retailers. Keep in mind that fungal spores and viruses can be carried with rhizomes, so watch for early signs of disease.

BUILDING THE PERFECT HOME

Since hops live 25-50 years, site planning is critical. Keep in mind that they need 6



to 30 feet of climbing space in a sunny location with well-draining soil. To prevent scorching in areas of intense sunlight, choose a location that provides afternoon shade, especially if planting European aroma varieties.

Planting months are flexible depending on climate (e.g. February in California, but April-May in Colorado).

Trellising

Hops are a climbing bine, different from a vine that has tendrils. Hop bines climb clockwise up a narrow support by the aid of tiny hairs. While mature plants will coil around diameters the size of tree trunks (which were used before modern wire trellising), a narrow string will better coax the young shoots upwards. Commercial hop yards use coconut-husk twine. Any type of string will suffice, especially coarse material such as hemp. Garden lattices, chain-link fences, and netting will also work. Many backyard growers simply run string down

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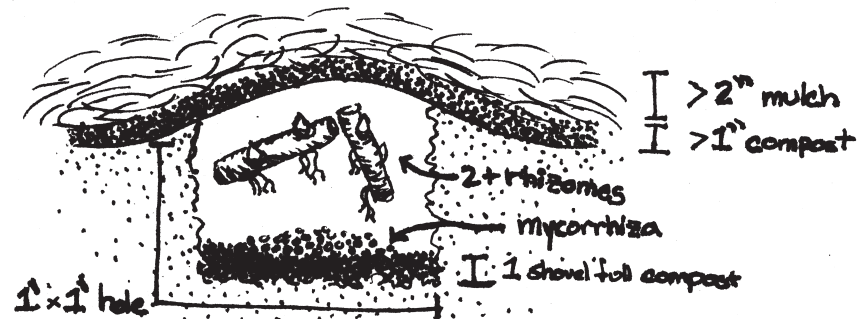


from the roof of their house, create a hedgerow along a fence, or erect a home-made trellis. In the wild, hops are found climbing amongst willows, hence their Latin name *Humulus lupulus*, meaning “like a wolf between sheep.” With that said, be careful to control wandering hop vines ready to smother nearby plants or structures.

Soil Preparation

Hops thrive in loamy, well-draining soil with a pH of 5.5–8.0. To plant your rhizomes, dig a hole 1-foot deep and add a shovelful of compost. To boost healthy root growth, sprinkle in mycorrhizal inoculum. Mycorrhizae, available at local nurseries, is a symbiosis of fungi and plant roots that aids in nutrient uptake of the plant, especially water and phosphorus. If you have poor-draining soil, add some potting mix and form a hill. Plant one to six rhizomes 2 inches below the soil surface, either vertically or horizontally so that the shoots (or “eyes”) point upward. Planting more than two rhizomes per hill will jumpstart your first-year crop. Be sure to space different varieties 3-5 feet apart to avoid mixing. Top-dress the area with more compost, and cover with mulch such as grass clippings, newspaper, straw, etc. Mulch will suppress weeds, protect young plants from a late frost, and add organic matter to your soil.

Top-dress your hops with a shovelful of compost every spring and late fall. Compost degrades slowly and promotes healthy soil ecology, preventing the need for quick-fix liquid fertilizers. It will also slowly raise the pH of acidic soils and lower the pH of basic soils. You can easily make your own compost, using your spent brewing grains and hops, grass clippings, and kitchen scraps. Otherwise, your local nursery



A diagram of how to plant rhizomes.



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Research in New Zealand hop yards has shown that a predatory mite *Phytoseiulus persimilis* is more effective in controlling spider mites than insecticides. Likewise, the most effective control for aphids is ladybugs.



should have several types of compost to choose from.

FROM ROOT TO FLOWER

Pruning and Training

Mature plants over three years old require root pruning in early spring. Without annual pruning, rhizomes will spread throughout the yard, hoarding nutrients and water from the crown needed by the shoots. The first

spring shoots could also be pruned, encouraging more robust secondary shoot growth.

Once these shoots are 1-2 feet tall, pick two to three bines of equal size to train clockwise from the top. Most sources will instruct training no more than four to six bines per plant. However, the older the plant and shorter the height, the more bines a single rootstock can support.

Watering

Hops require a lot of water, especially in their first year. Mature plants grow roots 12 feet deep and require less frequent watering. In areas where irrigation is necessary, never apply overhead water such as sprinklers. Wet hop foliage and pooling at the base is an open invitation to fungal diseases. A drip irrigation system is the most water-efficient way to go.

On brew days, irrigate with excess water from your chiller. If you have basic soils with a pH of 7 or higher, use the slightly acidic mash water leftover after lautering. Never use water that is too hot or acidic. Also, never water with your sanitizing or cleaning solution, as this will kill beneficial soil microorganisms.

Pests and Disease

The most common hop pests are aphids and two-spotted spider mites. Both multiply rapidly, turning a minor infestation into a nightmare overnight. Research in New Zealand hop yards has shown that a predatory mite *Phytoseiulus persimilis* is more effective in controlling spider mites than insecticides. Likewise, the most effective control for aphids is ladybugs. Predators can be purchased at a local nursery, or attracted to your yard by colorful flowers. If you do choose to spray, insecticidal soaps are effective and have a low incidence of evolved resistance. Always spray in the morning to prevent sunburn, and remember not to apply chemicals to maturing cones.

The most serious threats to hops, especial-

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ly in cool and damp climates, are the fungal diseases powdery mildew, downy mildew, and verticillium wilt. Powdery mildew appears as white patches on leaves. Downy mildew forms "basal spikes," or stunted shoots and laterals with silvery curled leaves black on the undersides. Verticillium wilt appears later in the season, having symptoms of streaked yellow and wilted leaves. It is critical to catch fungal growth early by removing and burning infected tissues. Also, sulfur-based fungicides are effective in halting early fungal growth.

Preventative measures and constant monitoring will prevent devastating outbreaks of pests and diseases. The idea is to create an environment inhospitable by pests and diseases, through encouraging predators and promoting good air circulation. Stripping the lower 3 feet of the bines in June is the most important preventative approach. In the event of an outbreak that cannot be controlled by methods mentioned above, consult your local nursery.

CASHING IN THE GOLD

You've planned, pruned and prayed all summer long, and finally, the lupulin arrives! But be patient: a common mistake neophyte hop growers make is harvesting prematurely. Depending on your location, harvest occurs mid-August through September, with aroma varieties maturing first. As resins and oils are synthesized, the cone will send water and nutrients from the bracts into the lupulin glands, leaving the cone slightly dull and papery. When the cones are dry to touch and the aroma has a euphoric pungency, it's time to harvest. You have overshot your window if the lupulin turns orange and smells rancid. If possible, leave the bines intact while picking, so the foliage can lend its nutrients back to the roots for the winter.

Freshly harvested hops can either go directly into the kettle or onto a drying screen. Another common (and devastating) mistake is to improperly dry and store your harvest. Keep in mind three important factors: time, heat, and moisture content. To prevent oxidation, drying should never last more than three days. Speed up drying by blowing hot air over hops spread out on a screen. Heat should never exceed 140° F

to prevent rancidity. Dried hops need a moisture content 8-10 percent by weight to prevent molding. When the central strig (inner stem of the cone) is almost brittle enough to snap in half, drying is done. Over-drying will shatter the bracts and shake out precious lupulin.

TUCKING INTO BED FOR THE WINTER

For all your hard work, you can finally sit back and relax with a fresh, wet-hopped homebrew to admire your art. Throughout the fall months, the bines will send nutrients back down to the roots as cache for next year's growth. Your only job now is to cut back the dead bines, cover with compost and mulch, and start planning for next year's yard expansion.

Ali Hamm is a graduate student at Colorado State University studying organic hops. She is also "brewmaster" of CSU for the undergraduate brewing science and technology course. Ali is joining with the Rocky Mountain Hops business group to promote a local hop industry.

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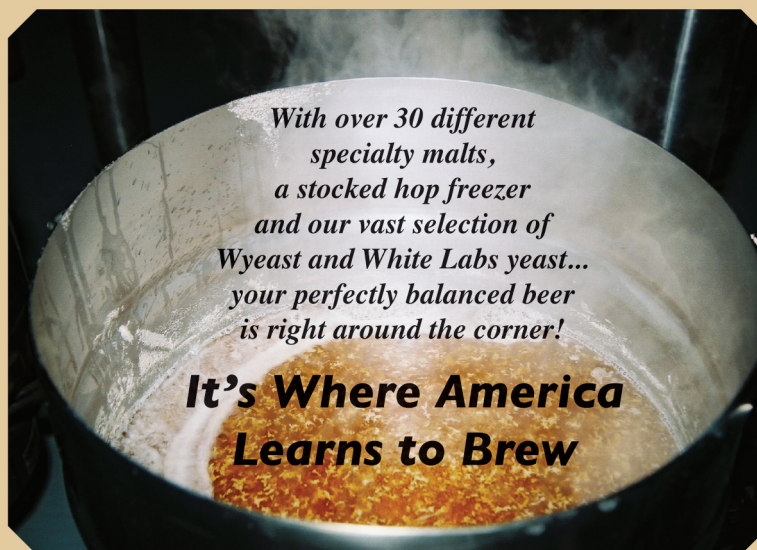


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