

GROWING HOPS AT HOME

by Bruce L. Brode

Background:

Botanical name: *Humulus lupulus* (rough translation: “the wolf of the soil,” due to the tendency of the roots [“rhizomes”] to spread or range laterally).

Plant family: Cannabinaceae; just a few species exist in the genus *Humulus*, of which *H. lupulus* is the only one of value to brewing.

History: Native to Europe and Asia. Hundreds of cultivated varieties (“cultivars”) of *Humulus lupulus*. ‘Land race’ varieties in Central Europe, such as Saaz (Zatec) were selected for cultivation before reliable written records and are considered native to the region. Hops in England were not common before the 1600s, when their importation caused a furious debate about whether ale should have hops in it or not.

Cultivation:

Hops are a deciduous ‘vining’ perennial plant that is grown for its aromatic flowers. Growing shoots emerge from the ground in February, March and April and will then elongate, seeking structure on which to climb. The stems are covered with sticky hairs that readily cling to structure, such as trellis twine, and the stems grow more on one side than the other, causing them to spiral around that structure in an effort to grow higher and seek the sunshine. In this regard, as the hop plant has no tendrils to use in attaching to structure, it is technically a *bine* rather than a true vine such as grapes are.

Hop plants are *dioecious*, meaning that male and female flowers occur on separate plants, and the female flowers are those that produce the aromatic oils and resins. In Germany, the tradition is to grow only female plants for best production; by contrast, in England the tradition has been to grow mainly female plants with some male plants present, in the belief that female flowers that have set seed are more productive than unpollinated ones.

As a bine, hops are adapted to habitats where the roots remain cool, moist and shaded while the growing tops reach sunshine where the leaves can photosynthesize. They rely on other woody plants or structures for support and are insufficiently woody to support themselves. In commercial cultivation, hop bines will easily reach 18 feet in height, and so are trellised for support.

Due to the large amount of green leafy matter they produce, hops are heavy nitrogen feeders. They also have requirements for phosphorus to help get the roots established and encourage flower production. However, of the three main nutrients (N, P & K) they have the heaviest requirements of potassium (“K”), which is theorized to help make the other nutrients more available to the plant. They like good drainage but also a consistent source of moisture.

Growing recommendations:

1. Prepare the growing beds before you plant the rhizomes. “Double digging” is recommended for best health and production of the vines.
 - A. Remove the top 12 inches of soil, placing it nearby.
 - B. Loosen the next 12 inches of soil, for good drainage.
 - C. Place the top 12 inches of soil back into the planting bed, gently interspersed with organic compost and fertilizer.
 - D. Well-rotted compost helps to establish a rich, well-draining soil that will allow roots to grow easily. A mulch of extra compost over the roots can help to keep them cool in warmer weather or sunnier sites. Compost is the closest thing there is to a “silver bullet” in improving soil for growing.
 - E. Good sites for hops:
 - 1) Narrow yards where the roots can stay shaded but the tops can reach the sun.
 - 2) Hop bines can provide a natural source of seasonal shade for a porch or patio in the summer when they are in full leaf; when the bines die back in winter, the sun can shine through for warmth when it is needed.

2. Fertilize the soil.
 - A. Blood meal is a good organic source of nitrogen that can be used to prepare the bed initially and then used each year as a 'top dressing' to promote green leafy growth.
 - B. Steamed bone meal is a good organic source of phosphorus for root and flower production. It can be layered in the soil in a zone where the roots can grow down into it, and it will last for a few years since it does not tend to leach out of the soil as quickly as some nutrient sources.
 - C. An organic source of potassium, such as greensand, can help complete the plants' nutritional needs. An additional advantage of greensand is that it acts as a soil conditioner, whereby it helps the soil retain moisture available to the plant.
3. Plant the rhizomes.
 - A. February and March are ideal planting months in Southern California, which can have an early season compared to commercial growing regions in the Pacific Northwest.
 - B. Sources of rhizomes:
 - 1) The Home Wine, Beer and Cheesemaking Shop usually carries some well-known varieties in March and April.
 - 2) Rhizomes can be obtained by mail order. One good source is Freshops in Philomath, Oregon, which generally has many varieties available by late March and is a good source of information about how varieties are developed by breeding.
 - 3) Local home growers may be willing to harvest rhizome sections in exchange for good beer.
 - 4) Rhizomes should be kept refrigerated and moist until planting – a bit of lightly dampened paper towel around them can help. The small white shoots on them are very fragile, so handle them gently!
 - C. Plant the rhizomes horizontally, with any white shoots pointing upward. A rather small rhizome of a vigorous variety may surprise you at its ability to multiply during the growing season, so avoid planting rhizomes closer together than 18 to 24 inches, to allow room for root growth laterally.
 - D. Do not work the soil or plant the rhizomes when the soil is wet, as this can compact the soil. Wait a couple of days for it to drain or dry to the point of moistness instead, to maintain best soil structure.
 - E. Avoid planting different varieties too close together if you wish to keep the harvest of their flowers separate.
 - F. Commercial plantings are done in hills a couple of feet high, out of which 3 growing shoots are allowed to emerge and climb trellis strings. All other growing shoots emerging from the hill are nipped off, to avoid taxing the roots too much and allow for vigorous and healthy growth of the 3 shoots allowed.
4. Trellis the hops.
 - A. Hops will grow to 18 feet high, or more, if you provide for that. A sufficiently strong and braced trellis to handle the weight of the bines and resist winds will be needed.
 - B. Consider constructing the trellis with a pulley system to allow you to lower the tops of the bines to a level where the flowers can be picked when they are ripe. The bines can then be elevated again to the top where they can finish out the season and help the plants store energy in their roots for the next season.
 - C. Use a natural, organic source of twine (such as sisal, hemp or jute) as trellis strings. The strings can then be composted with the remains of the bines at season's end.
5. The growing seasons.
 - A. Early growth (March through May) is focused on shoots climbing the trellis strings.
 - B. Midseason growth (May through July) will show the production of lateral shoots in most varieties, filling out the leaf canopy and making available spurs for flower production.
 - C. Late season growth (July through September) allows maturation of the flowers, which should be aromatic and have paled a bit in color when they are ready for harvest.
 - D. The bines will have dried out by late November and can then be cut from the ground and the bines and strings composted.

6. Harvesting the hops.
 - A. The female flowers, which look like small green pinecones, turn slightly more pale in color and become a bit papery-dry when they have matured. Pulling a cone open and inspecting the base of the scales (bracts) where they attach will reveal yellow powdery resin deposits, and the cones should be quite aromatic.
 - B. Freshly harvested cones are best dried for a few days in a dark dry area before packaging them for storage. Some brewers will want to work with them in a fresh state and undried state for beers such as “fresh hop” ales, in which case they should be used quickly as they will not keep long in an undried state.
 - C. For best viability, package the dried cones in vacuum-sealed oxygen-barrier heat-sealed freezer bags, label the bags as to variety and year of harvest, and keep in the freezer until use.
 - D. Your hands will be very sticky after picking the flowers. That’s a good sign!
7. Diseases and pests.
 - A. Downey Mildew or Powdery Mildew are the biggest potential threats to an established bine.
 - 1) Avoid getting water on the leaves, particularly in late afternoon or evening.
 - 2) Avoid splashing when watering. Root watering is best and it is fairly simple to set up a drip irrigation system for efficient watering of established plantings.
 - 3) Sulfur powder applied directly to the affected area of the plant can provide some organic remedy to mildew problems.
 - 4) Remove and destroy any leaves and stems affected by mildew – do not compost them or the problem is likely to persist.
 - 5) Good air circulation may help to keep leaves on the dry side and less susceptible to mildew.
 - B. Fungal soil diseases, such as verticillium wilt, are endemic to many areas of Southern California. Choose hop varieties that are listed as resistant to this disease in order to avoid it.
 - C. Insect pests have not been a significant problem in my garden. Consider physical removal by a well-placed strong jet of water, or application of soap solution, as organic pest management methods. Spraying the bines in mid-day with a tea made from steeping compost in water may help to provide resistance to diseases and pests and may provide a bit of foliar (leaf-based) feeding for the plants.