

GROWING YOUR OWN HOPS

What are hops? Hops are perennial plants that send up fast-growing annual vines. These vines (or bines as they're called) have tiny rough tooth-like tendrils that allow it to climb in a clock-wise fashion up to 25 feet within a few months. They spread their rhizomes (small surface to slightly underground branches that spread from the main root system) out away from the main crown part of the plant. Hops are either male or female. Female hops are favored by brewers because they produce the aromatic flowers known as hop cones. These cones contain lupulin. Lupulin is a yellow pollen-like substance that contains pungent oils and a bitter acid (alpha acid) that give beer a bitterness meant to balance the sugary sweetness of barley malt. In the springtime, after the hops are planted, the bines (hop vines) of a new hop plant begin to grow. Hop vines are capable of growing up to 12 inches a day under ideal conditions. However, most grow approximately 2 feet per week. The bines grow vertically winding around their support system in a clockwise direction following the sun. In June as the plant reaches its maximum height it will begin to grow sidearms. The sidearms will then bear the hop cones. In order for flowering to occur, the weather must be frost free for about 120 days, the plant must have ample moisture, and there must be plenty of warm sunny weather. Hops can be grown for ornamental purposes as well. Their fast growth and large size make for a quick screen or shade. Since our summers are usually fairly hot and dry, hops do very well here – in fact, Oregon is one of the largest producers of hops in the nation.

Getting Started: When planning your hop garden, it is important to consider the size and special care your plants will need. Create an area that is free of weeds and close to a support system, such as a trellis, fence or a tall pole. Well-drained soil is a must so use a generous amount of rich compost and starter fertilizer (this will stimulate good root development) mixed with the existing soil. Dig a hole about 1 foot deep and about 3 feet across creating a raised hill or mound. Plant the rhizomes vertical or horizontal with the buds pointing upwards. The buds should be slightly exposed or just under the soil surface. If you're planting a potted hop plant you should only plant it at the same depth as it is in the pot. If you are planting several plants, you can space them 3 feet apart on all sides if they are the same variety, 5-7 feet apart if they are different varieties. Make sure to keep some kind of marking, like variety pegs, on which cultivar is which. Keep the new plants watered frequently, but don't over water. Over watering is one of the biggest and most common problems when growing new hops. Too much water can cause the roots to rot. So, water deeply (preferably with a drip system) so the water soaks in, 2 to 3 times a week, depending on weather. Even though hops are pretty resilient, keep the bottom 2 feet of bines free of foliage to create better airflow and reduce the risk of disease.

For 2nd year plants the first bines that begin to sprout in the early spring can be cut back until mid to late April. Commercial farmers do this to help create a more uniform harvesting time. The new ones that come up later will be used instead and are considered hardier. Don't be afraid to cut the first bines that come up. When your plant reaches about 1 foot tall, you will need to begin training the vines on some kind of trellis or cord like sisal. Begin with training 2-3 bines per string with no more than a few strings (5-7 bines total) for first year plants. This is to help the plant to establish a better root system. By allowing the plant to grow too many bines the first year could weaken the plant. With older more mature plants a lot more bines can be allowed to grow. The bines will grow upward and clockwise around whatever is available. If left to themselves hop bines will sprawl all over and become a tangled mess. Remember hop plants grow quickly, so be prepared. As the season progresses all new shoots should be pruned down to ground level to help with disease prevention. The plants should be fed every 4-6 weeks with a slow release organic fertilizer. You can also supplement with a liquid type fertilizer 1-2 times a month if your plants are struggling. Beware that too much high-nitrogen fertilizer can encourage aphids.

Hops can be grown in containers successfully, but it will limit the size of the plant (and yield) to some degree. For container planting, plant rhizomes directly into a #1 nursery pot then transplant into a lot larger pot (at least 18 inches wide and 18 inches deep for the first year's growth) within a month or so. Second year plants can either be put into very large pots (2-3 ft wide and tall) or put directly into

the ground. Hops develop a large root system very quickly and a small pot will impede development. Remember that planting in a pot leaves the roots more exposed and in need of water and nutrients more frequently.

Mid-Season: As your hop plant grows to its ultimate height, typically at the end of June, the beginning decrease in sunlight will induce flowering. The plant will stop its vegetative stage (vertical growth stage) and begin to grow side-arms. From this lateral growth the plant will produce a burr-like flower that slowly develops into the papery bracts we call hop cones. Make sure to keep the sidearms from tangling up during this time and clear away foliage, weeds, and branches from the bottom 2-3 feet of the plant. Weeds promote moisture, a cover for insects, and fungal disease, so by removing this, chance of disease is reduced and also will improve air circulation for the plant.

As the hop cones grow bigger, keep a close eye on their color and texture. They should be a yellowish green to light green and should feel light and dry when ready to be picked. You can also compress some of the hop cones in your hands. If they stay compressed, they are still not ready. The lupulin, which is the yellow powder in the center of the cone, should make your hands feel sticky, and if your hops are ready, your hands will take up the aroma from the lupulin. If the hops are not yet ready to be harvested, the cones will appear too green and will feel damp in your hand. But keep watch, because harvesting too early or too late will affect the quality of your hops. Low alpha hops, or aroma hops, will typically be ready to harvest sooner than bittering hops (but not always). I harvest my Centennial hops almost a month before the others. However, if you are using the plant for decorative purposes, cut it down a little earlier while the cones contain more moisture.

Harvest Time! When you decide to harvest your crop of hops, which will typically be in late August or September, you can cut the training string at the top and let the bines lay down on the ground. As it dries, the sap from the bines will go back down into the rootstock for winter storage. You can then pick off the hop cones and prepare to dry them. My preferred method is to pick the hops in batches depending on their ripeness. This takes more time but a higher quality hop is the result. It also breaks up the harvest so that you're not overwhelmed. Leave the bottom growth that occurs afterwards to help with rejuvenating the plant for next year. Keep in mind that the first year the plant may not produce many cones, but the 2nd year there will be a lot more. By the third year your plant will be mature enough to produce a bounty.

Drying: You can dry your hops by using a food dehydrator, laying them out on some newspaper or placing on a screen. The hops will need to dry for several hours (dehydrator method) or several days (screen or newspaper method). Check on the hops to see if they are dry every so often. You can tell if they are dry by opening a cone up. Remember, they may feel dry on the outside, but it can take a while for them to dry thoroughly in the center. Also, bittering hops take a little longer to dry than aroma hops. To determine if they are dry enough, pull the cone open. If the petals break off easily from the stem, the hops are dry enough to be put to use. Hops that are not going to be used immediately should be put in food saver bags, the air sucked out, and sealed from the outside air. Then the hops should be stored in the freezer until needed. This is important because hops can degrade quickly if exposed to the air. If the petals are still sticking to the stem, and the stem seems somewhat lithe and moist, leave the hops to dry longer. Try not to over-dry the hops, however, to the point where the petals and stem shatter in your hand when you open up the cone. The hop oils may begin to degrade as a result of over-drying, so check them regularly.

If you don't have access to a food dehydrator, you could dry them in an oven slowly on a very low temperature but be careful not to over-dry them. Air circulation and drying them slowly are very essential when drying hops. They should feel papery when dry, but don't dry them so long they turn brown. Also, it's important that only dry cones go into plastic bags for storage. Wet cones will turn to mush if stored in a plastic bag. If you are using your cones to brew, you will have to use your best guess as to what the alpha (or bitterness level may be). Your hops will be so fresh it is wise to use them more for flavor and aroma than bitterness. For a home brewer there's nothing more satisfying than making a batch of pale ale or IPA with super aromatic hops from your own garden. You can get your hops analyzed to get a specific alpha acid, but it can be expensive.

Alpha Acid Data: Below is an approximate alpha acid based on commercial growing:

Cascade - 4.5-7.0% alpha. Classic PNW aroma/flavor with lots of flowery-citrus-like attributes. Great for pale ales and IPAs. Easy to grow.

Centennial - 8.5-11.5% alpha. Supercharged Cascade type of aroma/flavor. Great for IPAs and pale ales.
Magnum - 11.0-15.0% alpha. Bred for its high alpha acid content, good yield, vigor, and a mild aroma. Easy to grow!
Crystal - 2.5-4.5% alpha. Hybridized from Hallertauer German hop. Nice flowery and spicy aroma/flavor qualities. Great for flavor and aroma in lots of styles.
Goldings - 4.0-5.0% alpha. Classic English variety with a mild flowery and somewhat herbal character. Great for making all English styles of beer.
Mt. Hood - 5.0-8.0% alpha. Hallertauer hybrid with European noble hop character, but a lot more productive and vigorous. A good lager or light ale type hop.
Willamette – 4-6% alpha. Bred from Fuggles an old English variety with a mild aroma. Great for all English style ales.
Nugget - 12.0-14.0% alpha. Easy to grow variety that has a high alpha content and an herbal aroma/flavor.
Sterling - 5.5-7.0% alpha. Saaz hybrid with similar herbal spicy character. Easy to grow with a good yield.
Chinook – 11-13% alpha. Assertive American hop with pine and citrus character. Vigorous and high yielding.
Zeus – 13-17% alpha. Also known as ‘Columbus’. This is a very vigorous and high yielding variety that has an exceptional flavor and aroma

Typical Problems: Hops are pretty resilient but can sometimes be affected by a variety of diseases or insect problems. Sometimes it may be difficult to determine what it is. A fairly common problem is **downy mildew**. This is a fungus that causes new growth spikes to fail to grow in the springtime, and can occur when the weather is warm, about 70 degrees, moist and wet. This disease leaves infected spikes stunted and brittle, unable to grow. It is best to cut off infected parts with sterile pruners and throw away (do not compost). The leaves of a hop plant infected with downy mildew will look malformed or curled, and will have a grayish black fungus appear on the underside of the leaves. Hop cones can also become infected if flowering occurs during warm, wet weather. The cones will turn brown, quit growing or develop improperly. A fungicide containing copper can be used to control downy mildew or a product like **Fungonil** can also provide some control. Another common disease is **powdery mildew**. This disease likes moist climates. In recent times, hops have been subjected to this fungus. It looks like a white powder all over the plant. **Fungonil or other sulfur-based fungicides are also effective against this disease. A spray we carry called Bonide Orchard Spray is an all natural control for disease and insect problems.**

Aside from disease, problems with your hop plant could be a result of insects. Aphid and spider mites are very common. **Aphids** are little green pests. They usually are present during periods of rapid growth and mildly cool weather. They suck juices from a plant's tender new growth weakening them; during flowering they will enter the young hop cones, causing the cones to mold. **Lady Bugs** are an effective control against aphid infestations but may need to be released at one- to two-week intervals. I typically release 3-4 batches of lady bugs for the 10 hop plants I grow. **Insecticidal soap is another non-toxic control. Spider mites** are very small, have eight legs, and are a reddish color. Take a leaf and hold a hand lens up to it in order to see them and their webs, if you suspect Spider Mites. Shaking the leaf slightly will get the mite to move across the leaf. They feed off the leaves and/or hop cones by puncturing them and sucking out the plant sap. Punctures will leave a small colored spot, eventually causing the leaf to shrivel and die, and will cause hop cones to turn brown. In severe situations, the hop plant will appear red due to this. Spider Mite can be a problem during long periods of hot, dry weather. Mites can be difficult to control due to the protective webbing they create around themselves. You can help prevent this problem by hosing off the leaves of the plant during extreme hot weather periods and using **Mite X, Captain Jack's Dead Bug Brew, or Predator Mites.**

Overall, hops are fun to grow and, it's fairly easy to get a bountiful harvest of beautiful aromatic cones for that next special brew or just to have around the house. Just remember that they can become quite large in a short period of time. If you have any questions regarding hops or the care, they require you can call us at any time.

Happy Hopping!