



## Crowning and Training: Early Season Hop Yard Maintenance in the Northeast

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### Introduction

Early season hop yard maintenance includes several critical tasks including crowning and training. These are essential agronomic practices that influence hop plant growth and, therefore, hop yield and quality.

### Crowning

Crowning is the act of removing the top portion of the hop crown prior to or just following shoot emergence. This is primarily done through mechanical means (Figure 1), but crowning can also be accomplished with heat and/or chemicals. Crowning is used in hop production for two purposes—first and foremost, as a hop downy mildew management tool, as well as a harvest timing tool.

The first shoots have an irregular growth rate and are not the most desirable for producing hop cones later in the season. However, the minute the plant is cut back, the growth clock starts. Therefore, farmers can better regulate when plants start growing with crowning so that they reach the top of the trellis, start to flower, and mature all precisely at the right time.

As a general rule of thumb, first year hop plantings should not be crowned to allow for root establishment. Second year hop yards should be crowned if downy mildew was a problem the previous season; and third year and older hop yards should be crowned.

The crowning, or “cut back” date, varies substantially by variety, and Northeast research is continuing to determine “how late” crowning can occur before the practice actually hinders yield instead of helping.



**Figure 1. DR trimmer fitted with a modified metal blade for hop crowning.**

## Training

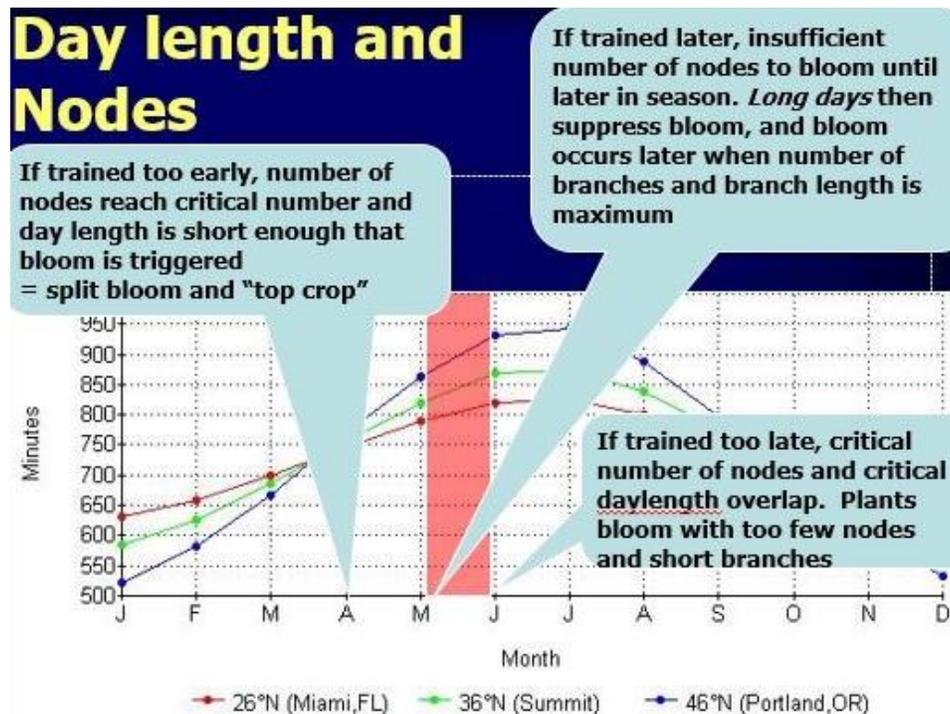
Training hop bines is another critical early season agronomic practice in the hop yard (Figure 2). The bines—3 or 4 shoots per hill—should be wound clockwise around training strings. As the plants grow towards the sun over the course of each day, they will wind themselves up the string. Most standard hop trellises are designed to allow plants to grow to heights reaching at least 18 to 20 feet, allowing the hop plants to develop the side arms from which the burrs/cones are produced at heights from 5 to 18 feet. Proper trellis height is important to assure the highest yield and quality possible. Any higher, the plants would have too much vegetation, not producing enough cones. Any lower, the plants would have too little vegetation, not producing enough or high quality cones (Figure 3).



**Figure 2. Training hops at Borderview Research Farm.**

Hop plants grow quickly, putting on a large amount of biomass in a short period of time. In general, the vegetative part of the season occurs before the summer solstice (June 21) and the reproductive growth phase occurs from June 21 until harvest. The hop reproduction phase primarily includes the development of burrs which slowly grow into the flowers/cones. Hop plants are triggered to produce burrs based on a combination of day length, the number of nodes (17), temperature, and the environment. Each variety differs in its sensitivity to day length (photoperiod).

At our research hop yard at Borderview Research Farm in Alburgh, Vermont, three to four bines per hill were trained the week of May 20, 2015. This gave plants 33 days of vegetative growth to reach the top of the trellis and hypothetically giving enough time to develop ample side arms for cone development. Assuming the plants grew 6 inches per day, they were able to grow to the top of the 192-inch trellis by



June 21. Unfortunately, 33 days were not enough for many of the varieties to reach the top of the wire by the June 21st date. Very cool weather during the months of April and June led to late emergence of hop shoots, late crowning, and slow growth during a critical development period. More research is needed to help farmers make critical decisions such as last possible crowning dates and earliest training dates to minimize disease and maximize yields.

**Figure 3. The effect of training early, just right, and late. Illustration courtesy of David Gent.**

## Crowning and Training Tips

Crowning and training developed by hop growers in the Pacific Northwest do not work well for our short growing season in the Northeast. Farms in our areas should find the best dates to crown and train the varieties grown here. Therefore, it is important that growers closely observe and document crowning and training dates for each variety, flowering dates for each variety, as well as harvest dates.

Since Cascade has such a late burr (flowering) date, it is recommended that it be trained first and as early as possible (Figure 4). In fact, one western grower suggested that Cascade not be crowned in the Northeast, just trained because of its later burr development. After Cascade, it is suggested that Nugget and then Willamette be trained next. Fit in other varieties based on the date that they produce burrs on your farm in relation to these varieties. When in doubt, train as early as possible!



**Figure 4. Early trained Cascade plants.**

Be sure to visit the What's Hoppening blog, research reports, and other resources posted on the UVM Extension Northwest Crops and Soils Program website at <http://www.uvm.edu/extension/cropsoil/> for additional information on hop production.

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