

## AN INTRODUCTION TO GRAPE GROWING IN NOVA SCOTIA

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### Site suitability

Nova Scotia has long since been considered the climatic limit for grape production, however recent expansion of the grape industry across the province with careful variety selection has proven that successful grape production is possible. Careful attention must be taken to identify sites that have acceptable heat unit accumulation (greater than 900 degree days above 10°C), a long frost free period (greater than 150 days), and winter minima where temperatures rarely (if ever) are below -26 °C. A south facing slope and proximity to a large body of water (that does not freeze during winter) are also highly desirable.

Soils at climatically suitable sites must have good internal drainage and potential rooting depth of 80 cm or more.

### Varieties and planting stock

Nova Scotia's wine industry has traditionally been based on the production of short season, hardy French Hybrid varieties including the varieties L'Acadie, Maréchal Foch, New York Muscat, Seyval, Léon Millot, Lucy Kuhlman, Baco Noir, and Vidal. With appropriate sites and management, these varieties are proven performers in Nova Scotia. The production of *vinifera* varieties like Chardonnay, Riesling, Pinot Noir, and Sauvignon Blanc can be difficult in Nova Scotia's challenging climate, but are proving successful in some areas of the province and need to be managed for the climate and protected from extreme cold during the winter months.

### Sourcing vines for planting

There are a number of local suppliers with variable quantities of grapevines and varieties available and a number of larger vine suppliers across Canada that will ship to Nova Scotia. Ensure that any vines you purchase are disease and insect free from your supplier.

If sourcing cuttings from an existing vineyard for propagation it is advised that you visit the vineyard during the growing season to visually inspect the health of the vines and even more important to have the rootstock tested to ensure you are planting virus free stock.

### Soil preparation and planting

Nova Scotia soils tend to have low pH and low levels of the essential macronutrients phosphorous (P) and potassium (K). As it is very difficult to effectively alter pH and levels of these nutrients after planting, it is important to assess this requirement before planting and make appropriate amendments at this time. Ideally, the assessment should be made by soil testing one year prior to planting. Altering pH with limestone is a chemical process that takes time and should be completed the fall prior to planting at the latest. There are several fertilizer options for increasing P and K and these are generally applied at the same time as limestone. All of these products have low solubility and soil mobility so it is important that they be thoroughly incorporated by plowing, discing, harrowing or a combination of these. Soil test kits can be obtained from the nearest Nova Scotia Department of Agriculture office.

If drainage is imperfect, tile drainage will also need to be installed well in advance of planting and if there are restrictive soil layers, ripping or subsoiling will also be beneficial prior to planting.

Planting is best done in May prior to budbreak. Locally produced own-rooted vines are generally dormant, bare-root stock field grown the previous season and kept in cold storage over winter. They should be kept cool and moist up to planting time. Rows are oriented north to south to ensure the best sun exposure and are generally about three meters apart depending on equipment width. Adequate headland should be provided to allow equipment turning. In-row vine spacing is less clear, depending on the cultivar and soil fertility level. In general, the more vigorous the cultivar and the more fertile a soil, the greater the space should be between vines. With this in mind, most vines in Nova Scotia are planted between 90 and 120 cm apart. There is a lot of interest in new higher density plantings and this can be variety and site specific. It is best to talk with a viticulture specialist to determine the proper density for your site and variety.

Rows should be marked before planting and a planting furrow is often made by plow or ripper to accommodate hand planting. In large plantings, mechanical planters are available. Planting depth is not overly critical with own-rooted vines but they should be planted to sufficient depth to be well anchored. After a few weeks of growth, one or two strong shoots are selected for training and the others are removed. These shoots are generally tied to a steel or bamboo training stake.

### **Trellising**

Posts and trellis wires should be in place before the spring of the second growing season. Spacing, height of wires, number of wires and wire gauge are all dependent on the training system to be employed, the overall vigor of the cultivars grown and the site. Traditionally in Nova Scotia, relatively low to medium height trellis' are employed with vertical shoot positioning (VSP) training systems. This generally involves a single heavy gauge (9-12 gauge), high tensile galvanized steel bottom wire that is placed between 30 and 60 cm above ground level and lighter (12-16 gauge) catch wires attached in pairs at 30 cm intervals above this. Two to three pairs of these catch wires are typically employed. End posts need to be anchored and wires can be secured in a variety of ways.

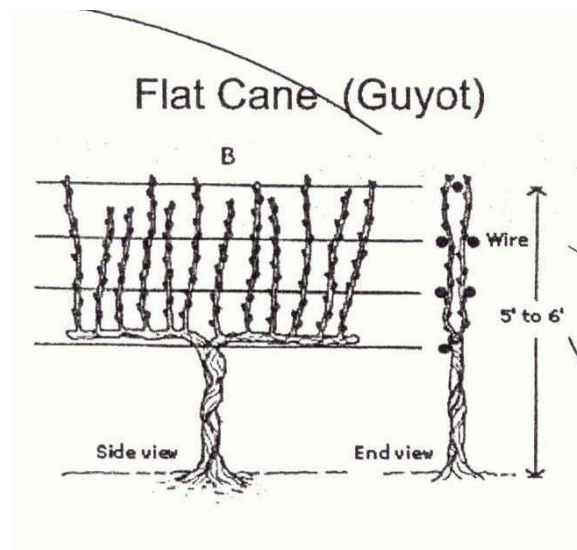
### **Management in the first three years**

Year one focus should be to install the trellis, provide adequate weed control, and control diseases that may infect the young vines. As stated above, the goal should be to produce one to two strong, healthy shoots and a well-developed root system.

In the spring of year two, weak vines are pruned back to one to two buds and treated again as if they were first year vines. If a vine is moderately strong, one trunk (for hybrid varieties) is retained and this is pruned back to the height of the bottom wire, leaving 2-3 buds at the top and removing all buds below. If there are especially vigorous vines, the top 15 to 30 cm can be bent along the bottom wire. As the vine breaks dormancy and grows, all shoots (suckers) should be removed from the lower part of the trunk up to about 10 cm below the renewal zone. As well, good weed and disease management will need to be employed to foster the still immature vines throughout the growing season.

In the spring of the third year, most vines should be treated as if they were mature, as far as pruning and management is concerned. Two healthy canes initiating from close to the trunk are selected and all other canes are removed. The two healthy canes are cut to length and then bent one rotation around the bottom wire of the trellis before being tied near the tip to secure. As buds break dormancy and begin to grow, the shoots that develop are 'vertically positioned' by tucking them between the upper paired wires to form a

narrow curtain that allows improved air and light penetration. Moreover, because the fruit clusters tend to emerge early in the season they form a band located near the bottom wire which makes harvest and other management activities much more efficient.



### **Hedging**

In the VSP system described above, shoots will eventually become too tall for the trellis and potentially overflow. It is important to know that 12-15 leaves are considered necessary to ripen the fruit on a given shoot. A properly designed trellis and a vineyard with balanced vigor and production will provide this level of growth by the time the shoots reach the upper wires. Growth beyond this is not necessary and can be detrimental, leading to shading, and disease. As such, growers should hedge their rows when the majority of shoots extend above the uppermost wire in the vineyard.

### **Other canopy management options**

Cluster thinning is a practice used to increase sugar levels in the grapes at harvest. It can be done prior to flowering or after fruit set. When done prior to flowering there is very good yield compensation but it is costly and may not be necessary if the season turns out to be long and warm. As such, growers generally wait to see how the season progresses and if it is cooler and later than normal they may decide to cluster thin certain varieties and at varying levels of crop removal. This 'post-bloom' cluster thinning has very little yield compensation and the later it is delayed the less the benefit to Brix levels at harvest.

Non-fruiting shoots and secondary shoots emerging from leaf axils of primary shoots are generally removed to improve disease control and sun exposure. Along a similar line, leaves are often removed at veraison from the fruit zone to improve sun exposure and improve Brix levels and ripening components.

### **Nutrient management**

It is recommended that soil testing be conducted every two to three years and that tissue analysis be conducted annually to fine tune vineyard nutrient management. Macronutrients such as nitrogen, phosphorous and potassium are generally applied at budbreak in spring by broadcast application in a three foot wide band underneath each row of vines. The alleyways between rows are generally not fertilized.

## **Diseases and pests**

Downy and powdery mildew are the two most serious diseases to contend with in Nova Scotia vineyards, although *Botrytis* bunch rot can also be problematic. An array of chemical controls are available but generally require a special license to purchase and apply. Some organic controls are available but these are more limited and may not be sufficient with the more susceptible cultivars. Therefore, variety selection is very important for organic production.

Weeds also need to be controlled each year. There are a number of effective herbicides but again special licenses are required to purchase and apply these. Organic control is usually through the use of mulches and/or mechanical devices such as the grape hoe or hand hoe. Mowing can also be used as a method of control but generally is limited to the edge of the row and it usually does not kill the weeds. This can be desirable if some competition is desired for vigor control but mowing should be regular enough so as to prevent seed formation.

Fortunately, insect pests in Nova Scotia are minor but with climate change and an increase in acreage we expect that insect pests will become more prevalent. Wildlife such as birds, raccoons, and deer can be very problematic. A combination of bird scare devices, netting, and/or fences may be required to keep these larger pests out of the vineyard.

## **Harvesting**

Harvesting is generally undertaken when the grapes are deemed to be 'ripe'. This may sound easy enough but is in fact fairly complicated, involving the assessment by the grower of sugar levels (measured in Brix) in the fruit, acidity, and other less quantitative elements including aromatics and taste. For the novice grower, Brix level is perhaps the most useful measure and since Brix levels generally translate into about half the numeric alcohol level after fermentation, growers should be targeting a minimum of 18 Brix before harvest (to make a 9% alcohol wine) and ideally 20-22 Brix. For late season varieties, as long as the leaves are green and the sun is shining the vine will continue to make sugar and deposit it in the fruit. However, if frost hits the vineyard and all leaves are lost there will be nothing gained by leaving the fruit on the vine any longer and it should be harvested immediately.

## **Other References**

The factsheet *Wine Grape Cost of Production* and a *Grape Enterprise Budget Tool* are available on the Nova Scotia Department of Agriculture's website and are essential background reading for anyone considering grape production in the province. <https://novascotia.ca/agri/programs-and-services/research-and-statistics/economic-reports/>