

WINE GRAPE PRODUCTION OUTSIDE TRADITIONAL AREAS IN ONTARIO

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INTRODUCTION

Viticulture in Ontario is well established in Niagara and parts of southwestern Ontario. The success of this industry is tempting many in other areas to try grape growing as well. Niagara and SW Ontario are blessed with mild winters and hot summers. This allows growers and winemakers to grow the best French hybrid and traditional European varieties and produce world recognized high quality wines.

To be successful, an industry requires not only consistent annual production, but also continued excellence. The present Ontario wine industry has developed its own, self imposed quality standards through the Vintners' Quality Alliance. Its stringent application has brought recognition and praise in the highly competitive international world of wine marketing.

Outside Niagara and southwestern Ontario, many climatic risks have to be taken into account when growing grapes. Because winters will be more rigorous, compromises have to be made with variety selection, but good quality wines can be made with other than pure vinifera (European) varieties. The key to success will be consistent wine quality drawing repeat customers. Good tourist traffic in the summer will pay some of the winter bills, but good local support with recurrent business will ultimately solidify the enterprise.

FOUR POINT PLAN

There are always many components to investigate for your business plan prior to entering any new enterprise or to planting any new crop. All four of the following are critical to success:

- **Marketing** – Selling your crop is never guaranteed, but it is better to plant what is in demand rather than what **you** want to plant. Discussion with a buyer and even securing contracts before planting should be part of your plan.
- **Human Resources** – Who is going to do the work in the vineyard? Will you be able to find skilled help? Can you predict your workload within the season and over the first few years and match this with the labour that is available? There is a lot of hand work in the vineyard in the initial 2 to 3 years. These are only a few questions that you will need to address prior to planting.
- **Financing** – You will need to secure financing not only for the year of planting but the following years while waiting for the vine to bear full crops. OMAFRA's Grape Economic Report is a good resource for beginning growers to project their cash flow needs and labour requirements.
- **Production** – Grape production involves several components after the vineyard is established; training, trellises, pruning, tying, canopy and crop management, pest management and other cultural practices.

SITE SELECTION AND CLIMATE FACTORS

There are many potential sites for wine grapes but these sites must be chosen very carefully. A minor difference in geography may represent a major difference in the local climate and will affect the ultimate viability of the vineyard.

Climate:

- Look at the regional climate as well as local climate
- Avoid extreme winter temperatures colder than -24°C
- The frost free period should be 165 days minimum
- Sunshine exceeding 1250 hours
- Avoid frost pockets and low areas
- Orient your rows N/S unless steep slopes require a different orientation

Avoid:

- High frequency of extreme winter cold and/or killing frosts in spring and fall
- High rainfall during bloom or harvest period
- Poor water drainage, both surface and within the soil
- Poor air drainage to escape frosts and reduce disease incidence
- Full southern exposure to prevent early spring bud break and southwest injury

Look for:

- Good soil texture to ensure good soil water drainage
- Good soil quality with organic matter and good nutrient availability
- Good surface air and water drainage (3% slope desirable)

Plan:

- Proper field preparation
- Good perennial weed control before planting
- Proper installation of subsurface or tile drainage
- Proper match of rootstock with soil/climate/vigour potential of vineyard
- Proper vine spacing and trellis design for variety and vigour potential of the vineyard
- Proper variety for average growing season and cold risk of the site

Critical period for vines:

Time	Vine stage	Critical range	Notes
Jan/Feb	dormant	below -20°C	avoid extreme cold or there will be damage to vines and/or buds
March/April	starting to grow	+10°C to -10°C	wide swings in temperature that could prompt early growth and reduce hardiness
May/June	growing and approaching bloom	-1°C to -5°C	fluctuating temperatures could result in spring frost damage to shoots and/or bloom
Nov/Dec	preparing for winter acclimation	+5°C to -10°C	early winter freezes before full dormancy could result in severe bud/wood injury

LAND PREPARATION AND SOILS

Steps in Preparation

- Land leveling, underdrainage
 - take soil test, nematode test
 - know herbicide history, control perennial weeds
 - grow cover crops and add organic matter
- Add lime, fertilizer if necessary

Drainage and Irrigation

Drainage Tile

- Critical during heavy rainfalls in spring and fall
- Every row for heavy soils
- Every other row for loam soils
- Cross tiling across a vineyard – not common, but possible

Irrigation/Rainfall

- Critical for vineyard establishment
- Critical for seed development in early July, and building of the hard green berry structure (same time as the next seasons bud development)
- Critical for veraison in early August (sugar accumulation, colour change and rapid berry enlargement)
- Beware – if irrigating, stop early enough for good fruit ripening for good wine quality and wood ripening for winter survival
- About 2/3 of the annual rainfall occurs during the growing season (860mm) in most areas of Southern Ontario

Soil Fertility

- Soil fertility is not as critical as soil structure
- Can be addressed through soil and petiole analysis interpretation and proper fertilizer application
- Excess nitrogen causes excess vigour, disturbing the delicate balance between yield, berry maturity and ultimately wine quality
- The great balancing act – climate, soil, vigour, cultivar, drainage, labour, etc. must all be balanced for good wine quality

Soils

Ideal: Coarse textured soils, moderate slope, well aerated, no restrictive soil layers

- Allows development of a large root system (150-300 cm) to fully explore for water
- Allows greater regularity in the water supply to the plant
- Allows heavy rains to percolate quickly
- Grape vines will tolerate a wide range of soils (but avoid shallow, poorly drained heavy clay soils)

VARIETY SELECTION

(Source: *Mori Vines Inc and Gemmrich Nurseries*)

- 311 GM* (white) H Riesling type flavour, ripens mid September
- 322 GM* (white) H Gewurztraminer flavour, ripens end of September
- Baco noir (red) H An extremely vigorous variety, does very well in heavy soil. On fertile soils should be grafted on rootstock to reduce vigour. The fruit usually has high acidity but produces wines of good quality and good colour
Ripens mid September.
- Foch (red) H Variety with small clusters, small berries which are particularly attractive to birds. Vines are vigorous, hardy and productive, makes excellent wine. Ripens mid September.
- Gamay (red) V A traditional cultivar of Beaujolais. Vines are vigorous. Vines should be thinned to control crop level and to ensure good colour and maturity.
Ripens mid September.
- Léon Millot (red) H One of the best French Hybrids. Very vigorous should be grafted to contain vigour, high yielding. Ripens early September. Cold hardy.
- Vidal (white) H A white French Hybrid, very good wine record. Vines are vigorous and productive, will suffer winter injury if too vigorous or overcropped.
Ripens early October, suitable for late harvest or icewine production.
- Zweigelt (red) V Variety makes an excellent wine. Will grow at mediocre site without problem. Ripens mid September.
- Others: Cayuga white, St. Croix, St. Pepin, Frontenac, Seyval Blanc

* = *GM (Geisenheim) varieties*

WINTER FREEZE DAMAGE AND SPRING FROST RATINGS FOR GRAPES AT VINELAND STATION, ONTARIO

Variety	Winter Freeze Damage (rating 1-10*)	Spring Frost (rating 1-5**)
Baco Noir	8	1
Cabernet Franc	5	5
Cabernet Sauvignon	3	5
Chambourcin	7	5
Chardonnay	5	3
Concord	10	2
De Chaunac	9	3
Fredonia (fresh table grape)	10	2
Gamay Noir	5	5
Gewürztraminer	3	5
Geisenheim 318	8	5
Léon Millot	10	1
Maréchal Foch	10	1
Merlot	2	4
Niagara	8	2
Petit Sirah	1	?
Pinot Gris	3	5
Pinot Noir	3	5
Riesling	5	5
Sauvignon Blanc	1	5
Sevval Blanc	8	4
Sovereign Coronation (fresh table grape)	9	3
Vidal	8	5
Zinfandel	1	?

* Ranked 1 to 10: 1 is most susceptible and 10 is most tolerant

** Ranked 1 to 5: 1 is most susceptible and 5 is most tolerant

The ratings are based on best management practices with growers and research experience and are subject to fluctuations.

TRAINING THE YOUNG VINE

- Do not plant too soon or too late – new vines need warm, moist soils – not cool and wet (may need to irrigate at planting if too dry)
- Allow several shoots to break
- Reduce the number of shoots to 2 or 3 strong ones
- Establish the trellis system and add the lowest wire
- Bury a steel or bamboo vertical stake into the ground and fasten the top stake to the lowest wire and secure the developing shoots to the stake during the growing season
- Continue to tie the developing shoots to the main stake until you reach the lowest wire, remove the secondary shoots as they break
- Add a second and third wire to continue the shoot training until it reaches the top
- Continue to remove any secondary shoots from the ground up to 6 inches below the lowest wire
- **Maintain good mechanical and/or hand weed control throughout the season**

PRUNING AND TRAINING SYSTEMS

Grape pruning seems drastic to the uninitiated. The bulk of the previous season's growth is removed, leaving only four to six canes. These are reduced in length according to the vigour of the vines. Pruning is basically simple, but requires experience and judgement in the selection of the few canes that are to remain.

The canes selected should originate from the trunk or as close to it as possible. They should be of normal vigour and about pencil size, avoiding weak growth or very heavy bull canes.

In the Niagara district several systems of training are followed, such as Pendelbogen, Umbrella Kniffen, four- and six-cane Kniffen. Kniffen and Pendelbogen are the most common. The main advantage of following a particular system is that the work, particularly pruning and tying, is simplified and standardized.

The six cane Kniffen is trained to a central trunk with six arms (three left and three right). These arms produce canes each year of which one quality cane is selected, usually with 8 to 10 buds. The canes are tied each spring to support trellis wires at three heights from the ground, the lowest at 90 cm, the middle at 130 cm and the top at 170 cm. This results in six parallel canes, two canes at each level. The four cane kniffen has one wire support and therefore have only four canes. The canes are tied each spring to support trellis wires at two heights from the ground, the lowest at 80-100 cm, and the top at 140-160 cm (Figure 1).

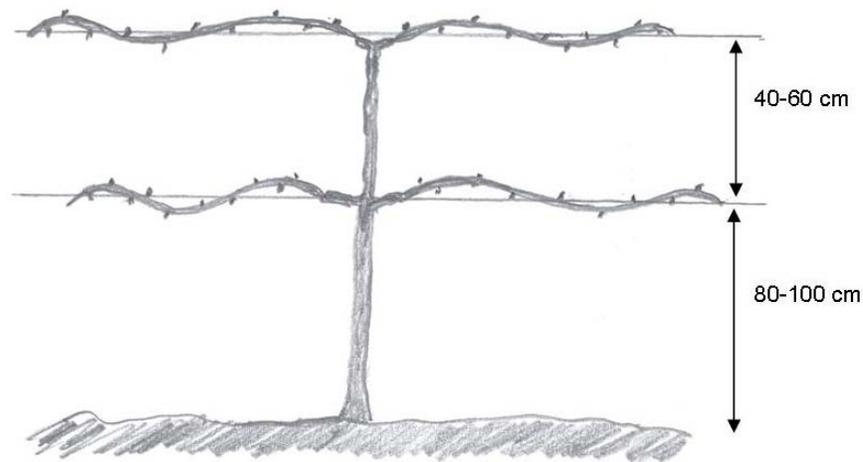
The six-cane Kniffen system is preferred by most growers because selection of fruiting canes and tying are generally easier.

Pendelbogen is simpler than the six cane kniffen, with only two canes coming from a shorter trunk at 80-90 cm above the ground. The two high quality canes with 8 to 10 buds per cane are wrapped above the second wire 25 to 35 cm above the lower wire then tied to the lower wire. In addition, two spurs with two buds on each originating at the top of the trunk and also left for cane replacements for the following year (Figure 2).

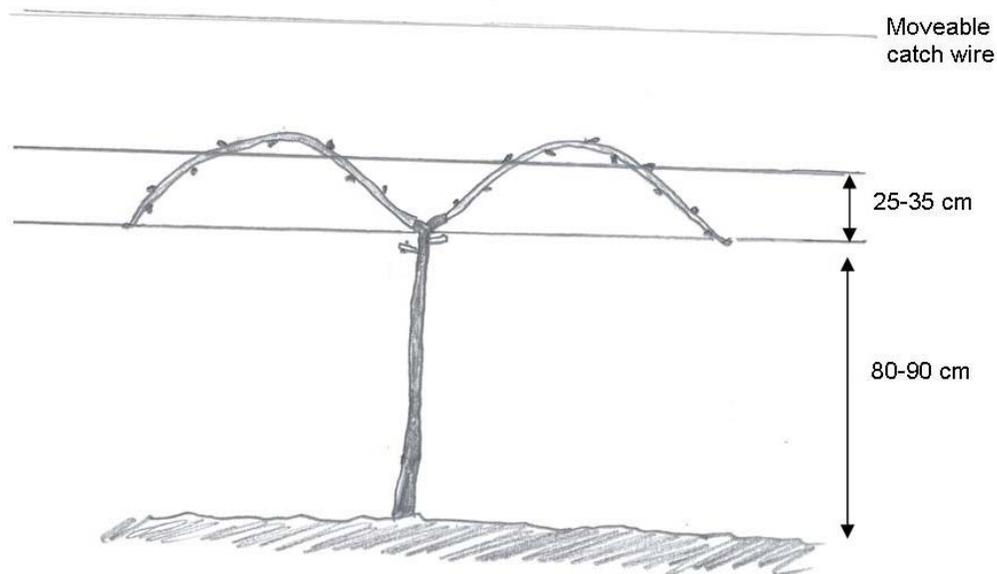
Time of Pruning

Pruning can begin any time after the first hard frost (-5°C or below) and should be finished before the vines start to “bleed” in the spring. The important consideration is that the vines be thoroughly dormant. Pruning should not be done on very cold days when canes are very brittle and those left may be injured when pulling out the brush. Prune labrusca types (Concord, Niagara) first starting as early as mid December and after the first cold temperatures, then prune the French hybrid vines in mid winter and the vinifera vines last in late winter or early spring as they are more likely to suffer winter injury.

TRAINING SYSTEMS



Four-cane Kniffen (labrusca, hybrids)



Pendelbogen (vinifera)

COLD CLIMATE MAINTENANCE PRACTICES

“The Spare Parts Approach”

- Multiple trunks of different ages
- Retain 2-3 times the normal buds, remove appropriate number in spring

“Other Practices”

- Hill vines to protect roots and graft union over winter
- Use the hardiest cultivars
- Use appropriate vineyard floor management for enhancing fall acclimation
- Use canopy management techniques to accentuate good sunlight exposure for wood and fruit ripening

PROPAGATION

Some growers prefer to raise their own plants however there are some drawbacks.

- It is difficult to get consistent plants with hardwood cuttings
- Softwood cuttings and bench graphs require specialized equipment
- Top grafting is not successful in our climate

SOURCES OF NURSERY VINES

Bert Dunn
Box 352 Schomberg, On L0G 1T0
905-880-4453
<http://www.littlefatwino.com/bertslist.html>

Gemmrich Vineyard & Nursery
R.R. #6, 1136 Line 4
Niagara-on-the-Lake, ON L0S 1J0
Phone: 905-468-4324
Fax: 905-468-8594
- selection of grafted or own rooted vines
<http://www.gwnvines.com/index.html>

Mori-Vin Inc.
R.R. #2
Niagara-on-the-Lake, ON L0S 1J0
Phone: 905-468-0822
Fax: 905-468-7271

Phil Ryan
Villa Nova Estate Farm and Vineyard
1449 Concession 13, R.R. #4
Simcoe On N3Y 4K3
519-443-8787
<http://www.villanovaestatewinery.ca/>

RESOURCES

- OMAFRA Publication 360, “Fruit Production Recommendations” for commercial growers in Ontario
<http://www.omafra.gov.on.ca/english/crops/pub360/p360toc.htm>
- OMAFRA 2009 Grape Economic Information
<http://www.grapegrowersofontario.com/thegrowers/documents/2009GrapeCostofProduction000.pdf>
- Ontario Grape Growers’ Marketing Board Annual Report (905-688-0990)
<http://www.grapegrowersofontario.com/thegrowers/home.html>
- Preparing Business Plans, Order No. 08-051
<http://www.omafra.gov.on.ca/english/busdev/facts/08-051.htm>
- OMAFRA Agricultural Business Management website <http://www.ontario.ca/agbusiness>
- Ontario Pesticide Education Program – all growers must have a “Grower Pesticide Certification” in order to purchase commercial pesticides
<http://www.opep.ca/index.cfm>