

Vineyards of the Niagara Peninsula

THE NIAGARA PENINSULA is the strip of land, approximately 80 km long and 40 km wide, between Lake Erie and Lake Ontario. Niagara Falls lies at its eastern extremity where the water of the Great Lakes system drops 100 metres in spectacular fashion on its way to the Atlantic. Southern Ontario is Canada's largest wine-producing region and most of those grapes are grown on the Niagara Peninsula, on the south shore of Lake Ontario. The Niagara fruit belt, located between Hamilton and Niagara Falls, has approximately 12,500 ha of fruit crops including 7,000 ha of vineyards. Until the middle of the 20th century, the Canadian wine industry was based entirely on American varieties, and some French hybrids. Since that time, *vinifera* varieties have been grown with success for winemaking. Nevertheless the more winter-hardy American varieties and hybrids are still the mainstay of the grape industry.

Lake Ontario, and Lake Erie to a lesser extent, have a major influence on the climate of the Niagara Peninsula: they moderate winter temperatures and, in summer, they provide the source of cool onshore breezes. The other major influence on climate is the Niagara Escarpment: this is a 60



Typical *vinifera* vine with two existing trunks plus two watershoots arising from the base which will be trained as new trunks.



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to 100 metre high ridge that runs 5 to 20 km to the south of the lakeshore. It extends along the entire Niagara Peninsula, encouraging onshore winds which dissipate fog and reduce frost risk. Severe cold injury and spring frost are the major factors limiting viticulture in this part of Ontario. The risk of winter damage in the Niagara region is decreased because of the combined effects of the lake and the escarpment.

There are six distinct viticultural zones in the Niagara Peninsula. The "lake shore" (Zone A) is a narrow zone extending inland for just 1.5 to 3 km. This zone experiences cool onshore breezes, particularly in spring and early summer. Therefore, growing season temperatures are lower than further inland. Although this can have the effect of retarding vine growth in spring, it means that there is less risk of late spring frosts. Here winter temperatures are higher and therefore there is the least risk of winter freeze. These are good sites for Traminer and Riesling, but less favourable for late-maturing red varieties. The level plain between the escarpment and Lake Ontario (Zone B) varies in width from being non-existent west of Beamsville to 8 km wide at Niagara-on-the-Lake. Because the land here is relatively flat, cold air can accumulate on calm, clear nights and thus the risk of winter freeze and spring frost is high. The south-east portion is generally the warmest during the growing season, but because development is advanced, early-bursting varieties are prone to late spring frost. Nevertheless, it is a good area for late-maturing reds.

The base of escarpment plus the steep slope east of St Catharines (Zone C) has a gentle slope. Good cold air drainage reduces the risk of cold injury. Some parts of the



Concord vineyard located in zone D.

north-facing escarpment slopes (Zone D) are too steep, but those with 4-10% slope are good for cold sensitive varieties due to airflow patterns: on cold calm nights there is rapid air drainage plus warmer air is drawn from higher on the slope. This is one of most favoured areas, particularly that portion 3 to 6 km from the lake: not only is air drainage good but also there are higher summer temperatures than zone A. Therefore a wider range of varieties can be grown here. *Vitifera* varieties do best in zones A,C,D and in parts of B. Much of the “benchland” in D has been planted recently to high value *vitifera*, replacing the more traditional American varieties. South of the main escarpment, the risk of cold injury is very high and it is too risky to grow *vitifera* varieties.

The region is characterised by a short growing season. Budburst is typically in late May and harvest starts in late August/early September and extends through to early October (not including the ice wine harvest). MJT at the Vineland weather station in Zone B (latitude 43°11'N) is 21.6°C. CTL¹ is 16.9, growing season rainfall² is 498 mm and annual rainfall is 860 mm. The escarpment also influences the soil types: since it was, at one time, the shoreline of an ancient lake, the deposited soil is composed of many different types (clay, clay-loam, loam, sand). Due to the high rainfall and the high proportion of poorly-drained clay soils, most vineyards have installed tile drains in every first or second row depending on the soil type.

In 2001, 57% of the tonnage sold to wineries comprised *vitifera* varieties³. The tonnage of grapes purchased for all end uses (wine, juice, jam) in 2001 comprised 28% white French hybrids (mainly Vidal Blanc and Seyval Blanc), 24% white *vitifera* (mainly Chardonnay, Riesling, Traminer, Pinot Gris and Sauvignon Blanc), 20% American varieties (mainly Concord and Niagara), 19% red *vitifera* (mainly Cabernet Franc, Cabernet Sauvignon, Merlot, Pinot Noir

and Gamay) and 9% red French hybrids (mainly Baco Noir, Foch, Chambourcin and De Chaunac). Concord is still the variety with the largest planted area (10% of the total) but it is likely that it will be surpassed by each of Cabernet Franc, Cabernet Sauvignon and Riesling in the near future. Vidal Blanc is mainly used for ice wine: Canada is now the world's major producer of this wine type.

Vitifera varieties typically have several short trunks and most new plantings will have a VSP trellis with cane-pruning. Canes are usually arched. On the other hand, French hybrid and American varieties, and some older *vitifera* plantings, are trained to a cane pruned “kniffin” system with four to six canes, e.g. 6 × 10 node canes with fruiting wires at 80, 110 and 130 cm. American varieties have a very sprawling growth habit and require renewal zones to be high and well-exposed. Cordon training is not common for any variety because of the risk of winter injury. Also cordons provide more sites for base buds and the French hybrids in particular are prone to excessive watershoot development. The row × vine spacing is typically 2.4 to 2.7 m × 1.2 to 1.5 m. Shoot density ranges from 12 to 17 shoots per metre of row. *Vitifera* are usually shoot trimmed three times between fruitset and veraison. Some vineyards also use leaf removal in the fruit zone (mostly done mechanically) shortly after fruitset to decrease the high risk of bunch rot. Hilling-up of soil in winter to protect the graft-union from cold injury is a common practice.

Typical yield of Pinot Noir in Zone B is 5 to 7 t/ha for red wine and 13 t/ha for sparkling wine. Yield of hybrids is higher at 15 to 20 t/ha. The weighted average of Brix for Riesling in the late 1990s was 19.3. Most vineyards use day-time mechanical harvesting. The main rootstocks are 3309 and SO4, with much less Riparia Gloire and 101-14.

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¹Continentality or mean annual range

²April to October inclusively

³54th Annual Report of the Ontario Grape Growers' Marketing Board