



Ontario



I am grateful to colleagues who invite me to speak in their wine regions so I can go and snoop around. It had been a few years since I was on the Niagara Peninsula in Ontario, which readers know is one of my favorite wine regions. Ontario is impressive. The level of investment and quality of vineyards, and innovative and architecturally imaginative wineries compares favorably with other great wine regions. Many wineries have fine restaurants attached to them, which allows wine tourists and locals alike

to enjoy a winery's wine with excellent food. It's the whole package here. The Grape Growers of Ontario is a \$3.8M organization that represents the needs and interests of the grape growers, and it has amazing clout - the provincial government just awarded the wine industry \$11M to fund a replanting program (read the GGO annual report online, it's a remarkable document - <http://www.grapegrowersofontario.com/>). Acres of wine grapes now stands at 14,000 and it continues to rise, which is amazing because save for a few bottles of Inniskillin ice wine, no Canadian wine is to be found in the U.S. That's a shame because from the Wine Islands in British Columbia to the Gaspereau Valley in Nova Scotia there are lovely wines being produced north of the border. No one I asked seems to quite know where all this wine is going, although Kevin Ker told me that Ontario has 44% of the provincial wine market, and fully expects to capture more of it. On this visit I was particularly impressed by their Chardonnays. Ontario knows they have something good going with this internationally over-exposed and over-planted variety, having gone to the trouble to get no less than Jancis Robinson over here to generate some ink for these gorgeous wines. Well, it sort of worked, suffice to say the wines I tasted from Le Clos Jordanne, Jackson-Triggs, Stratus, and Southbrook on this visit, are of such class and distinction as to render the ABC (anything but chardonnay) movement irrelevant. These are true cool climate wines in the Burgundian tradition of elegance and charm but great depth and subtle power.

I was in Niagara Fall to speak at the annual Ontario Fruit and Vegetable Convention and I was lucky enough to arrive at the meeting room early and corner Ryan Brewster, Kevin Ker's assistant

at KCMS for 11 years, and pepper the poor guy with questions. There is so much of viticultural interest in this small area of distinctive terroirs, from the lake to the plain to the bench and escarpment. It's all very complicated but they are making a real effort to make sense of it. My first encounter with the clay was at Chateau des Charmes and, well, as someone who is familiar with mud season while growing up in New England, theirs is some really intensely sticky, gooey stuff! Quite honestly, I just can't figure out how these clay soils manage to produce wines of such aromatic and textural quality. They cope with the clay by tiling every row on 8' centers. I've seen the aerial photos of tile vs. no tile fields next to each other after a rain and the effects are visibly dramatic. According to Ryan and Kevin the heavier texture clays have a tendency to hold water in the early part of the season and then become very dry during the summer months. These two factors can restrict root development of the vines (especially nutrient feeder roots), which help to reduce vigor the vines. Matching rootstocks and clones to soil types and good cultural practices enable growers to develop balanced vines. Soil pits and a penetrometer is a key measurement tool when evaluating a site for planting. Tractor tire paths are ripped to 10" on every other row every other year to prevent compaction. They have to manage a wide range of soils, from high pH limestone near the escarpment to lighter, warmer soils near the lakeshore.

As I drove around it was easy to see a lot of diversity of viticulture in the region. Dr. Stefano Poni told us that there are 43 different trellis systems in use in the vineyard region around Piacenza and there could be that many here – from the traditional 4-arm kniffen to the four-cane VSP that I saw in the Finger Lakes recently, and Scott Henry. Vine density is mostly moderate but there are vineyards that are pushing the vines closer together, I assume in the name of wine quality. The vines in the Four Mile Creek area were mostly in balance on single or divide canopies. Kevin told me that yields for wine grapes are in the 3-4 t/a range, a comfortable place for good wine quality. Row directions are every which way but north-south seems to be the best choice in a cool region.

Winter injury and frost are, of course, constant threats here, and they have mastered the use of wind machines for frost and freeze protection. I get the impression that vineyards on the peninsula focus mainly on the production of sound quality mid-range wines. Vincor, the largest winery, is owned by Constellation and operates high profile names like Jackson-Triggs, Inniskillin and Le Clos Jordanne, altogether the Vincor wineries consume about 40% of the grapes grown on the peninsula. The grape pricing system rewards vineyards that are not in the upper echelon of quality – prices are set by the provincial



government, and by U.S. standards, may be considered low. The system tends to favor those in the low to mid-market range of grape quality, encouraging higher yields to improve profits. No one can blame a grower for pushing yields under this system but I wonder how this might affect the premium and ultra-premium wine sectors. As I suggested during recent visits to Long Island and the Finger Lakes, the presence and quality of wine professionals in production, administration and marketing must have a gigantic impact on the quality of wine and success of these wine industries. LI and FLX are hampered by a lack of funding that can drive growth – that is the benefit of a strong industry association and powerful marketing order.

We all know of the work that Bryan Hed has done on trace bloom leaf removal in Erie – it affects fruit set and loosens clusters, thereby reducing the amount of fruit rot. A fellow speaker at the grape session was Dr. Stefano Poni, perhaps the contemporary proponent of this practice. It was extremely helpful for Bryan and me to quiz Dr. Poni about his research and we were able to glean some very interesting additional facts. According to Dr. Poni, leaf removal must be done even before trace bloom, which coincides with what I witnessed in vineyards in Piedmont, where growers were stripping more than half of the leaves from 12-16” shoots. He also said that it is important to remove more than the four leaves in Bryan’s research: that 6-7 leaves are necessary to really get a measurable impact on fruit set. It looks very drastic but that’s what needs to be done. He said the effect on fruit set is variable according to variety and some do not respond in the first year due to a buffering effect that vines display, but it can take some additional years for the desired results to occur. The reason that wine growers are doing this practice in Italy is not so much to reduce rot, although it does, but to reduce crop, so the even more expensive process of green harvest is not necessary. His data shows a myriad of complex physiological outcomes from early leaf removal, but the notable net result is improved fruit chemistry, including higher skin to juice ratio that offers more color and concentration to wines, especially red wines. Perhaps the best news of all is that this practice can be mechanized, using a Collard (<http://www.collardaustralia.com/leafremovers.php>), Pellenc or Avidor leaf remover – the air pulsing type, that shreds the leaves but does not affect the cluster inflorescence. This brings the cost of this practice into the realm of reality for larger vineyards. I think this is one cultural practice that can yield a multitude of potential benefits, especially in wine regions with fertile soils and varieties that are susceptible to fruit rots. You can read much more about his work in the American Journal for Enology and Viticulture (57:4. 2006) *The Effects of Early Defoliation on Shoot Photosynthesis, Yield Components and Grape Composition* (I’ll post it on the PWGN website). Hint: do not just skip to the conclusion paragraph, read the entire discussion section!

In all of my talks I always emphasize the need for growers to strive for ripe and clean grapes. The clean part in a year like 2011 is not easily achieved. I have a feeling that the single greatest impact on wine quality could be if the wine industry improved its spray technology and practices by upgrading antiquated machines and using proper sprayer calibration and practices. Spraying is at the center of all disease and pest management programs and is a complicated mix of technology, experience and intuition. It also involves diseases, insects and the weather, all unpredictable elements of nature. Andrew Landers, the professor at Cornell and master of spray technologies and practices can help growers to bring some order to this chaos. I can listen to Andrew’s talks over and over again and always learn something new. I think all growers know intuitively that spray drift means loss of material and less effective disease control, yet the big spray plume is one of the most common images in the vineyard. Air is the carrier of spray droplets to the vine and its speed and direction must be optimal to get maximum treatment performance. Other components of spraying such as tractor speed, pressure and spray volume are just as important. All of these my variables must be properly tuned and calibrated if a spray management program is to have any chance of success. Spray conditions, such as wind and temperature are also important. And, of course, the grower must use the right material at the most efficacious rate to have the best results. There are a lot of decisions that go into executing a successful spray application.

If a spray droplet gets shot up in the air, it drops down either on the ground or top of the canopy and not on the target. Drift will hit the neighboring row(s), ground or blow away with the wind,

and potentially only 40 to 50 percent of the spray material reaches its intended target. This is not only wasteful, but compromises pesticide efficacy. Canopy leaf surface area is important to spray efficiency. For example, leaf surface area of a 100 node Concord vine can increase from 84,458 cm to 187,455 cm in 30 days. Growers deal with vastly varying amounts of canopy throughout the growing season and spray programs should be tailored to fit the size of the canopy. The amount of air created by a sprayer to deliver droplets to the target is a key to good spray deposition. In general, far too much wind is created and most of the material is pushed past the target zone. Smaller canopies require much less air volume and speed than larger ones and Andrew has come up with a number of suggestions to regulate these delivery components:

- Many sprayers have gear boxes with multiple speed selections, use the lowest speed.
- Sprayers may have, or can be retrofitted with a hydraulic or electric variable speed pump that has infinite settings that can be used to control fan speed.
- Reduce tractor PTO RPMs from 540 to 410. On flat fields this is easily done. On hills it may be more complicated.
- Use the Cornell-Landers donut – plywood circles with various size holes in the center that restrict the intake airflow. Early season = small hole. Late season = big hole.
- Adjustable louvers that fit on the nozzle openings that can be opened or closed according to the desired volume of air.

Be aware that alterations or additions to spray equipment may affect a manufacturer's warranty.

The axial fan airblast sprayer is still the standard of the wine industry but it is technology dating to early 1960's that was developed for the tree fruit industry. The fact is, most air blast sprayers are too powerful for even the biggest vines and canopies in wine vineyards, some generating upwards of 190 mph of wind. On an axial fan sprayer the right side of the fan de

If the volume and speed of air adjusted properly then the next step is to deliver the spray material directly to the vine or part of the vine where it is needed. Spray towers commonly used in orchards can have a similar benefit in vineyards. Towers allow nozzles to be directed on a horizontal plane which reduces the amount of upward drift. Andrew mentioned a machine shop in Ontario called Rittenhouse that makes after-market towers for sprayers. Octopus sprayers have arms that deliver spray materials directly to the canopy. Cima sprayers, which are in wide use in the area, have a tower option with nozzles that spray down towards the top of the canopy. Andrew has developed a variety of airflow deflectors that guide the airstream towards the canopy and reducing drift. These can be very inexpensive to retrofit and greatly increase the amount of spray into the canopy. Sprayers that blow air into a canopy from either side of the vine have 30-40 percent better deposition because of the turbulence created by the colliding air streams. Any kind of louvers or deflectors, and nozzles on a sprayer should be properly adjusted for maximum coverage along with the correct number and type of nozzles. His adjustable louver system reduced drift rates by 71% in early applications and improved deposition by 82%.

Eastern wine growers spend a lot of time spraying, especially in wet years. This costs a lot, increases wear on equipment and its operators, and compacts the soil. Fruit zone sprays are very important to reduce fruit rots and it makes no sense to spray the foliage. In cooperation with Hazlitt 1852, Andrew developed a sprayer that can simultaneously spray the canopy with one

material and the fruit zone with another. A smaller front-mounted secondary tank and spray system delivers the fruit zone material. It's a fantastic idea! Talk about multi-tasking, why not hook up a sprayer and hedger (before the sprayer) too? He noted that while most growers know that too little spray material can yield poor results, but too much can also reduce spray efficacy by actually washing off the spray material from leaves and clusters. Only Andrew would hang a cluster in a wind tunnel to determine the air dynamics of wind blowing around and past a cluster. At too high a speed, the materials simply blow past the target. At the right speed, turbulence past the cluster allows the material to reach the back of the cluster, another good argument for reducing fan and wind speed. Serious commercial wine growers should read Andrew's book, *Effective Spraying* - <http://www.effectivespraying.com/> to understand everything there is know about spraying, and improve the quality of your spray applications.

Dr. Rufus Isaacs is an entomologist at Michigan State University who is well known for his work on grape berry moth. Along with Dr. Michael Saunders at Penn State, they are developing innovative management strategies for this important insect pest in vineyards. He began by showing a survey of GBM damage in a Concord vineyard where varying degrees of infestation reduced a crop from 7 t/a, at the 100% level of affected clusters, to 5 t/a. Heat accumulation during the growing season, timing of overwintering, management program combine to determine the level of damage at harvest. Traps can help locate GBM activity and may capture the first early, large flight but later flights, which are smaller and more spread out, are more difficult to pin point. It is these later flights that are responsible for egg laying during harvest. As with most everything else in the vineyard temperature is in control of the overall population, timing of flights and number of generations in a season. He and Dr. Saunders have developed a growing degree day (GDD) based system to identify GBM flights using 47°F as the base temperature and the bloom of wild *Vitis riparia* as the trigger for counting 810 GDD to the first flight, and 1620 for the second. He had two highly different weather years in 2009 and 2010 to match flights to dates and it's no surprise that in the warmer 2010 the flights were earlier and more abundant. Being able to warn growers of a potential fourth flight could significantly reduce losses due to GBM.

Dr. Isaacs showed us a new product with the acronym SPLAT, an insect pheromone that is mixed into a gooey substance that is dripped from overhead onto vines, instead of the labor intensive ties that are applied by hand. This is still in experimental use.

He said that spraying into the woods to cover wild vines is not very effective because they grow so high and spray materials can't reach the clusters. His work also does not support the benefit of culling wild vines along wooded vineyard borders.

I always try to connect what I see in the vineyard to the wines being produced. While veraison is the best time to observe a vineyard in action, the dormant season is also a good time because you see the skeletal canopy. What is missing is the fruit, which tells a big part of the vintage story. I only had time to visit vineyards in the Four Mile Creek appellation including Southbrook, Stratus, Hillenbrand and Inniskillin, and taste the wines from Le Clos Jordanne in the Twenty Mile Bench appellation. Most of the wines were from the 2008, 2009 and 2010 vintages. The 2010 reds exhibited the concentration and warmth of a ripe vintage, but even the '09 and '08 reds were elegant and complete. Despite my skepticism about growing Bordeaux red varieties in Ontario, these wines taste impressive to me. The white wines, including Chardonnay, Riesling,

Gewurztraminer, Pinot Gris and imaginative blends, are undoubtedly world-class in quality. It would be worth a visit here to judge for yourself. Winter is probably not the best time to see the vineyards but you get the most personal attention in the tasting rooms (see Laura and wines from Le Clos Jordanne and Jackson-Triggs below) and from our wine making colleagues. You can learn a lot about the wines and terroir of Ontario at the Ontario VQA website: <http://www.vqaontario.ca/Home>. I also encourage wine growers to visit the Ontario Ministry of Agriculture, Food and Rural Affairs website at <http://www.omafra.gov.on.ca/english/crops/hort/grape.html>. It is chock full of terrific grape growing information, in particular the new grape IPM website recently launched by Dr. Wendy McFadden-Smith. It has a super easy to use scouting and disease and pest identification tool – <http://www.omafra.gov.on.ca/IPM/english/grapes/index.html>.



Laura and 17 wines at Jackson-Triggs



The wines at Stratus



Southbrook white wines

There is quite a stark contrast between the wine industry in Ontario and our own in the Eastern U.S. At the top end of wine consumers, critics, retail and restaurants, the quality in Ontario (wineries, vineyards, wines, villages, restaurants, etc) is what is expected. If we aspire to be this kind of wine industry, we need to look north much more seriously and frequently for some valuable lessons.

I would like to thank Dr. Wendy McFadden-Smith from the Ontario Ministry of Agriculture, Food and Rural Affairs for the invitation to come to Ontario. I am also grateful to Dr. Kevin Ker and his wife, Jina for their hospitality. I encountered some outstanding servers and educators in tasting rooms and extend my sincere gratitude for their hospitality.

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