



Organic Winemaking

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INTRODUCTION

We are asked frequently, “*Why bother growing organically, aren’t all wines basically organic?*”

A partial response comes from our friend Bill Jones, of Magnetic North Cuisine, in the November/December 1995 issue of FarmFolk/CityFolk’s newsletter:

“Organic, as it is applied to our local food sources, is generally assumed to be a products produced in a sustainable and agrotoxin-free environment. When most consumers buy local organic products, they are usually doing so for personal health and environmental preservation sentiments. These are great reasons that stand on their own merits, but the influence you are exerting for positive social change may be the most compelling reason to support organics.

In other words, we made several choices when we decided to seek organic certification of our Vine Yard (and winemaking). We wanted to live on a piece of land where harmful chemicals were not used or accumulating. We wanted to minimize the environmental footprint of our agricultural and business activity. We wanted to make good wines that were as pure as possible, without elaborate chemical or mechanical intervention.

Are we creating positive social change? Perhaps. Do we think our wines are better than anyone else’s just because they are organically produced? No. We, like every other winery on the planet, have made wines we are not completely happy with. We believe, however, that our presence in the marketplace provides an alternative for wine consumers who share our values and concerns. We also realize that not all of our customers are particularly looking for organic wines; they may be choosing our wine just because they like it. The real benefit is that we know who our customers are, and they know us. It’s a value-added symbiosis, far removed from mass marketing,

high volume production and maximization of economic return. If that can be called social change, so be it. We feel comfortable here; not all wineries, nor businesspeople, for that matter, necessarily would.

Our own 18-acre Vine Yard in Peachland has been organic since 1992. Elisabeth Harbeck's Vine Yard in Okanagan Falls, contracted to us for Pinot Blanc and Pinot Noir fruit, will be fully certified organic this year (1997), after completion of the required 3 year transition period. To the best of our knowledge, there are only 5 certified organic wine Vine Yards in the province.

From the 1995 vintage, the following wines, for the first time in British Columbia, bear the COABC decal, identifying both the grapes and winemaking as certified organic: Traminer, Riesling, Bibendum White, Bibendum Rosé, Icewine.

Why would a grower prefer conventional to organic methods?

There is no doubt that yields in organically managed Vine Yards are lower, and labours costs, particularly for soil improvement and weed control, are higher. Some growers have found that the reduced yields mean better plant health and better fruit quality, bringing higher per ton returns that help to offset the increased labour costs. For other growers, this equation may not work. Each grower makes his or her own decision. Each Vine Yard and each grower has a distinct personality.

DISEASE CONTROL

Scene: the Vine Yard. Bill Nye the Science Guy and Agent Scully, both of whom are clad in white lab coats complete with pocket protectors stuffed with fine writing instruments and Red Twizzlers, are crouched down, closely examining a grape cluster. Bill: "Wow! Is that stuff ever icky! What is it?"

Scully: "I don't know, Bill. I've never seen anything like it. Could be powdery mildew. Might be a postcard from Botrytis Cinerea. Whatever it is, it has to be stopped. Hand me a Twizzler."

In this section we will describe the various disease organisms most commonly encountered in our Vine Yard, and the organic practices employed to deal with them.

The Okanagan's dry climate is a natural control for many of the fungal problems occurring in the world's more humid growing environments. Downy mildew, for example, is rarely seen here, but is endemic in Ontario Vine Yards, which are exposed to high humidity during the growing season. In our area, the most frequently encountered disease problems are powdery mildew (odium) and Botrytis (Botrytis Cinerea). Botrytis comes in two forms: the occasionally beneficial Noble Rot, and its evil twin, Grey or Sour Rot. The odd virus appears from time to time as well.

Powdery mildew is, to use Agent Bill's words, icky; fruit, vines and pickers are covered with sticky, gritty, greyish-black spore material. The disease starts with a web like structure which spreads around the spot in which the organism penetrates the plant material. The spores develop, are spread by the wind, and new infections occur. The fungus can attack both the vine and the fruit. If bunches are affected early in the season, fruit set and yield will be reduced. If fully developed bunches are attacked, they will fail to ripen properly, and the fungus will inevitably end up in the wine, where it creates off flavours.

This mildew is one of the few fungal diseases that thrive in hot, dry climates like ours. Organic controls include some common sense gardening. Bright sunlight and good air circulation prevent the spores from spreading, so canopy management is important. If the vine vigour is too high, and there is too much foliage, air stops moving, and shade pockets provide a favourable environment for the fungus. If vigour is controlled (by monitoring of nutrition

and irrigation), and if any dense areas are thinned, then powdery mildew is less likely to become a problem. This, combined with our spray regime of sulphur and water in the early part of the season, and sodium silicate (silica gel) and water later in the season, provides adequate control in our Vine Yard. We apply spray 5 or 6 times during the growing season, commencing with the first in early June, when the vines are at the first “5 leaf” stage, and ending with a last application in mid-August before the developed bunches begin ripening. Most conventional growers use either sulphur or a synthetic equivalent to deal with powdery mildew.

Botrytis is sometimes called bunch rot because it usually affects grapes rather than vines. Whether you have Noble Rot or Sour Rot in your Vine Yard will depend on the maturity of the fruit and the weather conditions at the time it strikes. Sour Rot will occur when the organism affects unripe or damaged fruit, or when wet conditions close to harvest help it thrive. The fungus will enter through an already existing break in the berry’s skin, or it will perforate the skin to make its own entry. Thin skinned varieties with tightly compact bunches like Sémillon, Sauvignon Blanc, Optima and Chenin Blanc are particularly susceptible. Unripe fruit, thus infected, never ripens properly and is left physically damaged, sour and spoiled. Close to harvest, when the fruit is ripe, bird predation or a spell of rainy weather may split the fruit, again creating ideal conditions for the fungus. If the weather remains wet, the rot will spread quickly through the whole bunch. If the weather clears and turns dry, the affected bunches will gradually desiccate. Desiccation, like freezing, is a natural way of concentrating the sweetness already inside the ripe fruit, and it is this drying process (known as Botrytization) which turns Sour Rot into Noble Rot. Botrytis Affected wines are among the world’s most famous dessert wines, known for their intensity of colour, aroma, sweetness and value: Sauterne and Trockenbeerenauslese are among them.

We have to disappoint you now, though; this whole discussion is an academic one when it comes to our Vine Yard, because we seem to have neither the varieties nor the conditions attractive to Botrytis Cinerea. If we did have to deal with it though, the approach would be similar to the strategies used to control mildew: canopy management, improved air flow and leaf pulling to expose ripe or near-ripe bunches to sunlight. A conventional

grower (and it should be noted that not only grape growers have to deal with bunch rot; it’s also a huge problem for strawberry growers) would, as a second line of defence, use a fungicide specifically targeted at Botrytis, which is becoming more and more resistant to chemical controls. Maybe they should try Red Twizzlers.

We wanted to end this section with a bit of information about plant viruses. A plant virus, like a human one, does not respond to external remedies; it remains as part of the organism itself and can only be eradicated by the removal of the plant and the fumigation of the soil. Left uncontrolled, viruses may weaken the vines, alter their growing habits and reduce fruit yield, but rarely do they kill the plant itself. For this reason, virus problems have not been a top priority on the viticultural list of things to do, especially if you are dealing with more drastic stuff like bears, rain and all of those Red Twizzlers which keep appearing between Rows 12 and 13. However, regulatory agencies in Canada and elsewhere have had a fine time dancing between extreme positions on virus control. At first, plant material imported into Canada wasn’t checked at all for viruses. Then, after a few bugs were detected, the Twizzlers hit the fan and all imported vines were detained, strip searched and quarantined at the border indefinitely. This is more than a minor inconvenience when you’ve got 20 acres of expensive land waiting to be planted with several thousand cuttings of your favourite Pinot Noir clone from France. We are happy to report that the official position has relaxed somewhat and that imported plant material is now tested only for diseases not already present in Canadian Vine Yards. Do we have a few plants in our Vine Yard affected by viruses of one kind or another? Yes. Are we about to rip out the whole Vine Yard and fumigate and start again? No. We prefer to deal with it on a plant by plant basis.

INSECTS

There is a perception out there that any sort of organic agriculture is an extravagantly expensive endeavour that leads to politically correct, but inferior product; this conclusion may seem logical given the prices asked for bruised and mushy organic produce in many stores. However, in the case of grapes, organic growers can expect to incur the same costs per acre (and slightly higher per ton costs) as with conventional grape growing, with the added benefits of higher quality yields (bringing more dollars per ton), healthier plants which are less susceptible to disease and winter damage, and the peace of mind afforded by the removal of toxic chemicals from one's working and living environment.

A walk through our Vine Yard might provide a snapshot of how some of these natural systems work. The first thing you will notice are what we call, "volunteer" plants in the Vine Yard. Some grape growers call these weeds, and they will spray herbicides like Roundup or Gramoxone or 2,4-D to eradicate them, and they will create, in the process, a picture-perfect tourism brochure Vine Yard with bare soil containing nothing but vines. Neat, tidy and probably toxic; we'll admit that the volunteers occasionally compete with vines, particularly young ones, for space and nutrients, and we'll also acknowledge that Roundup, in particular, breaks down very quickly, but in their defence, those persistent, energetic volunteers provide cover which prevents moisture loss, host space for beneficial insects and, when cultivated, organic material to condition our very poor soil. The volunteer growth is controlled by a combination of mowing and cultivation about 3 or 4 times during the growing season.

We have to point out too that most of the volunteers were here first, and they constitute the natural flora of the Okanagan (knapweed, an introduced plant, is a noxious exception). We highly value the fact that only 18 acres of our 30-acre parcel is cultivated; the rest is left in its natural Interior Dryland state, full of wildflowers, Ponderosa Pine and native shrubs and grasses. You can take a walk through the Vine Yard and find a rich compendium of native plants, all possessing their own special beauty. It is sad to see the encroachment of abnormally green subdivision lawns, black asphalt and deep brown, wet cedar bark mulch into this fragile and disappearing ecosystem, full of unique, subtle dusty grays, greens and browns. We see

ourselves as stewards of this natural heritage, and have tried to step lightly upon it. The landscape includes the Vine Yard; the Vine Yard does not exclude the landscape. The "wild" area provides a large buffer zone between our organic environment and the conventional agricultural and residential areas outside it. We hope that it will not become a living museum of what was here before the Europeans arrived.

You will see many tiny, light-green hopping insects on your tour; in fact, if you get close to a vine, some of them may get into your eyes and nose. They seem to be everywhere; they are. They are the bane of Okanagan grape growing--the Virginia Creeper Leafhopper (Latin nomenclature *Erythroneura zigzag* Walsh, which sounds like the name of a Celtic performance artist, but then we did not really have a say in it anyway). They have a complicated life cycle that would take several pages to describe. Adults and nymphs hop around from leaf to leaf (grapes are not their exclusive food; we also have them in abundance on our Virginia Creeper vines, and our gooseberry, raspberry and currant bushes) feeding on the nutrient-rich juices in the leaves. Their damage won't kill a plant, but the white-spotted leaves have a reduced photosynthetic capacity, and overall, the plant is weakened. In a conventional Vine Yard, leafhoppers would be killed by sprays of Sevin, Guthion or Endosulfan. In our Vine Yard, our first line of defence is the predatory Parasitic Wasp, which resides and lunches on hoppers in the wild rosebushes in the perimeter of the Vine Yard. Our last resort is insecticide soap, sprayed at a particular time during larval development (the window of effectiveness is very brief, and you'd better pray it's not raining), on the underside of affected leaves. You can guess which of the options is preferred. You can also guess why we have a large population of leafhoppers almost every year. Will we eradicate them? No. Do we want to? No. We would like to keep the population in control though, and we hope that, with more vigilant application of soap, we will do so. In the meantime, I take a grim pleasure in washing them off the gooseberry bush with a high-pressure spray of water. And then I do it again the next morning. And the next.

IRRIGATION

Our Vine Yard tour continues with a look at irrigation practices.

We occupy what is, in essence, the northern tip of the great Sonoran desert system, a rain shadow in the lee of western coastal mountain ranges extending the length of North America. Our mean annual precipitation is 300 mm (as compared to Vancouver's 1200 mm). Irrigation is essential for any large-scale agricultural endeavour in the Okanagan, and the history of European settlement in the valley reads like a tracer line following the old, wooden irrigation flumes coming down from the hills to the valley below. (For example, Coldham Road, which bisects our property, is named for one of 3 pioneering Peachland farm families who built the area's first irrigation system.) Water is a valuable and political commodity, and many British Columbia growers have followed with interest and no small degree of irony the various Canada/U.S. treaties that always seem to result in our precious water being poured, at heavily subsidized rates, onto American crops which are then dumped back into our marketplace. Irony aside, we still think it makes more sense to use water for crops which feed people (directly or indirectly) than for nonfunctional, greedy lawns.

Our irrigation water comes from two sources; mountain reservoirs at Silver and Lacombe Lakes feeding into Trepanier Creek, and Okanagan Lake. The creek system is used until midsummer, when levels are depleted; we must then switch to water pumped from the lake. As organic growers, we are always conscious of the quality of the water all around us, as it will have a direct bearing on the integrity of our organic system. Anything which affects the quality of lake or creek water will affect the quality of our irrigation water; it's inescapable, and political, once again, as population density and recreational use of the lake increases.

Our organic growing guidelines, established by SOOPA and adopted by COABC, stipulate that water quality must be tested every 5 years in order to monitor compliance with minimum guidelines.

It takes a lot of water to irrigate a Vine Yard, but it takes a lot more to keep a golf course green. Farmers continue to be among the valley's most responsible water users,

because they have always had to pay for irrigation water directly. Most households in the valley still pay for their water through taxes rather than through metering--it is no surprise that Canadians rank among the world's most prolific consumers/wasters of water.

We use a combination of two different watering systems. In the lower Vine Yard, planted with Riesling and Traminer, we use drip irrigation (a long pipe with inserted micro jets, running along the trellis line), and in the upper Vine Yards, we use overhead sprinklers. Drip irrigation is more efficient, as less water is lost to evaporation and more water is applied to the area directly around each plant. However, a drip system is about 5 times more expensive than an overhead system to install and maintain.

Irrigation commences in late May, as the vines begin their first spurt of new growth. We have experimented with various irrigation regimens, and have concluded that deep, long soakings benefit the plants more than shallow frequent applications. (We should point out, however, that irrigation practice continues to be a hot topic for research; new findings are being published every year. Grape specialists from the Agri-Food Canada Summerland Research Station just down the road from us have been leaders in this research.) The system, controlled by an automatic timer, is left on for 10 hours per block, and each block will be irrigated every 10 to 20 days, depending on the weather and the time of year.

The Vine Yard's moisture requirements vary throughout the growing season, with demand being heaviest in June and July and lowest in September as harvest approaches (although new research seems to cast some doubt on this). There is also some variance by variety. Monitoring is done through a combination of past experience, weather patterns, and techniques as prosaic as feeling the leaves; if they're hot, or if they feel limp, it's time to water. We do not use automatic sensors, although we are aware of other growers who have installed them.

What would happen if we decided to stop irrigating completely? Grapevines benefit from some water stress during the growing season, as it forces the plant into ripening its fruit instead of putting its energy into producing more foliage. However, with our light, sandy soil, our lack of appreciable precipitation or humidity for most

of the summer and the high evaporation rate, the vines would quickly lapse into severe water stress without some irrigation, and would reach their permanent wilting point beyond which they cannot be revived. Leaves would begin to die and drop, and the plant's reduced photosynthetic ability would decrease its ability to produce ripe fruit. Berry size would decrease, as would juice volume. The quality of the juice would be unbalanced and unsuitable for good wine. Any bunches which were approaching ripeness may, with the lack of leaves, burn in the sun and be damaged, and would certainly be exposed to increased predation by birds. Vines with shallow root systems in poor soil, or vines which are otherwise compromised by disease or pests, may perish altogether.

What happens if we irrigate too much? Vine Yards which are fed lots of water, particularly those planted in heavier soils which retain water, appear to be very impressive, with bushy vigour, deep green leaf colour and huge clusters of berries. Unfortunately, while the fruit volume may be large, the quality is poor. The grapes take a lot longer to ripen, and in our growing season, they may not ripen at all before the plants shed their leaves. The juice will be high in acid, low in sugar and lacking in varietal intensity, and a winemaker will have to work technological miracles to make something palatable out of it. In a quality-driven international wine market, any grape grower who maximizes tonnage by over watering and over fertilizing the vines, thereby sacrificing fruit quality, is not going to be in business for long.

It's all a matter of balance and control. Too little or too much water are equally damaging to the plants, to the fruit and ultimately, to the wine. Our very sandy soil drains quickly, and in our climate, we run more risk of too little water than too much. In addition to careful monitoring of the irrigation system, we are constantly working to improve the soil's water retention by increasing its organic content. (This is accomplished through cultivation of ground cover and by the direct addition of compost.) Keep in mind that our observations are strictly based on our particular location; growers in other parts of the valley or the province, with different soils and micro climates, have their own stories to tell.

SOIL AND PLANT NUTRITION

Our organic standards are the same as set by COABC (Certified Organic Associations of British Columbia). We managing our Vine Yards very specific to organic soil amendments, fertilizers and growth promoters. The standards contain long lists of allowed, regulated and prohibited practices and substances, too detailed to be helpful in the context of our general discussion. It's more important, we think, to provide the rationale behind the restrictions, than to delve into the minutiae of what's allowed and what's not.

Conventional agriculture, following the lead of ever-advancing technology, treats soil as merely the anchor for the plants and the medium through which the plants were fed. Many nutrients are still externally sourced and applied, and often very little attention is paid to the long-term health and viability of the soil itself.

Soil is, however, a living part of our ecosystem, and organic viticultural practices are designed to protect and enhance a natural and healthy interaction between the soil, what's in it, and what's around it. Soil already contains complex organic matter, minerals and communities of micro flora and fauna--whenever we add something to it, including plants, we run the risk of disturbing the natural balance.

This does not mean that organic growers naively adopt a completely noninterventionist attitude--to do so would be irresponsible and financially suicidal. What it does mean, however, is that everything added to the soil in the organic Vine Yard is selected to supply nutrients that are more likely to be compatible with what's already there. Instead of forcing the soil to become a monoculture predetermined by us, we're supporting its existing, complex polyculture and helping out our vines at the same time.

Grapevines, fortunately, will produce very good fruit even in relatively infertile soil. We have found that we can maintain plant vigour and condition our gravelly/sandy soil at the same time with annual applications of composted manure from Valley Brand Fertilizer in Kelowna. The manure has been analyzed for its macro- and micro-nutritional composition and is itself Certified Organic, thus allaying any concerns that it contains unknown or harmful material. This manure is more expensive than conventional synthetic fertilizer; it also requires more labour to apply.

But it's such lovely stuff; it has the texture of a fine bark mulch and it smells a lot like pipe tobacco.

Crop yields in our Vine Yard are certainly lower than in many conventional Vine Yards; our average yield is approximately 2 to 2.5 tons per acre. However, our plants are healthy, our soil is gradually being built up with organic matter (assisting with moisture retention, thereby reducing irrigation demand and leaching), and we know that we are not contributing to Okanagan Lake's significant phosphate pollution problem, created by fertilizer-saturated runoff from lawns, golf courses and agricultural acreage.

Some, including the venerable Jancis Robinson, suggest that organic grape growing is opportunistic pandering to a chemophobic world. We are accustomed to dealing with cynics who are fond of telling us that there is no such thing as inorganic agriculture. However, we keep coming back to the point that our goal is to minimize our footprint. We want to feel part of nature, not engaged in a constant battle against it. This is an ideological statement, but it's also the way in which we make our living. We're not warriors, armed against our landscape; we're farmers who are negotiating an exchange which should, in the end, benefit both us and our environment. It's as simple and as complicated as that.

WEED CONTROL

Controlling weeds begins with a determination of what is a weed and what is not. "Weed" is such an ugly word, and in common parlance, has come to be applied to any plant that appears as an unwanted volunteer. It doesn't seem to matter, in this definition, that the volunteer is a native plant and part of a balanced system that existed before, and continues to exist despite drastic human intervention. Human agricultural crops, be they wheat or grapevines, can upset the balance, particularly if we strive to make them a monoculture to the exclusion of everything that was there before. Are weeds the bane of existence, requiring in their eradication extraordinary time, expense and technology, or are they part of a thriving, healthy ecosystem from which we hope to derive a farming income?

We should provide a caveat here; the weeds in our Vine Yard are not as controlled as we'd like them to be. Our problem plant is quack grass, which spreads by means of rhizomes. The root masses are nearly impenetrable, even with a cultivator. In the spring, after pruning (the prunings are scattered between the rows), we mow and mulch both prunings and plant growth between the rows. During the growing season the space between rows will be cultivated 2 or 3 times to disrupt the grass growth and till organic material into the soil. Grass growth between the vines in the row is another matter; despite experimentation with all manner of exotic plows, we still haven't found a practical, affordable method of removing the grass that won't damage the vine roots. We could burn it, or we could boil it with a blast of high-pressure hot water. Both of these alternatives, however, strike us as physically dangerous and extremely inefficient ways of consuming labour and carbon fuels.

But what if we ever did manage to achieve that picture postcard perfect Vine Yard with vines twining out of bare soil? We'd potentially face erosion, pests, poor nutrition and soil conditioning, and moisture loss. The use of cover crops is now accepted, even in the most conventional of Vine Yards, as a way of dealing with many of these problems. Our reaction: why seed a cover crop when nature creates one for us, every year? Is all of that stuff between the rows a cover crop, or weeds, and what's the difference anyway?

Whatever the answer to that question, cover crops in the Vine Yard do need to be managed, because they can rob the

vines of needed moisture and nutrition. We can take some comfort that in a mature Vine Yard like ours, the vines are less likely to suffer serious harm from their competitors. Eventually, we'll be seeding a nitrogen-fixing, legume crop in every second or third row. Crown vetch, anyone?

In the end, we come back to one of the tenets of organic agriculture; we work with nature, not against it. The aim is to minimize the human footprint and if possible, to provide a net benefit for current and future inhabitants. Inhabitants on our property include a wonderful diversity of flora and fauna, everything from the rare and beautiful Mariposa Lily to the unwelcome leafhopper, and it also just happens to include us and a bunch of grapevines, too. Heck, we'll even leave a bit of space for the quack grass! The cats love to snack on it as a digestive after those heavy mole meals.

FROM VINEYARD TO CELLS

A organic Vine Yard is the first step in making organic wine; the second step is the use of organic practices in the cellar. We now move out of the Vine Yard and into the cool, enclosed space that lies below the tasting room, tucked into the hillside.

We are frequently asked, "Why bother with organic certification? Aren't all wines basically 'organic?'" For us, organic encompasses a wish to minimize the environmental footprint of our agricultural and business activity and the desire to make good wines without elaborate chemical or mechanical intervention. Organic production imparts integrity to these intentions, both in production and marketing. Instead of merely touting our products as "natural", we can prove it.

Do we think our wines are better than anyone else's just because they're organically produced? No, and we have deliberately refrained from making claims to this effect. Wine appreciation is highly subjective. We also realize that not all of our customers are particularly looking for organic wines; they may be choosing our wine just because they like it, and they could care less about the methodology. That's OK, too. Given the increasing frequency of reports linking environmental contamination to disease, however, organic practices seem to make more and more sense.

Why aren't all of our wines organic? We cannot grow enough grapes in our Vine Yard to meet all of our needs, and must purchase about 35-40% of our annual tonnage from other growers. We would prefer to purchase grapes from only certified organic growers, and are always making new contacts, but with the small number of certified Vine Yards in the province, there simply isn't enough organic fruit available. In order for our winery to remain economically viable, we must produce at least 10,000 gallons of wine a year. It's a dose of realism we have to swallow every year, and therefore, you will likely continue to find a mix of certified and non-certified grapes in our portfolio; all wines are made according to organic processing standards, but only those bearing the organic decal on the bottle or label are made from certified organic grapes.

FROM BERRIES TO JUICE

We are often questioned, sometimes quite cynically, about our organic grape growing and winemaking practices. At a recent tasting, one of the proprietors of a prestigious Napa Valley winery, after asking for more details about the meaning of the word “organic,” commented rather pointedly that they weren’t doing anything differently than we were. To that, we say congratulations and good on ya!

The whole point is that our approach is never intended to be critical of anyone else’s; organic does not mean that we’re doing it right and everyone else is doing it wrong. It simply means that there is a verifiable set of standards, we’ve agreed to follow them and we’re willing to have someone audit the process. We keep saying (and we’re about to say it again) that organic production in the Vine Yard and in the cellar is only part of how we’re trying to minimize our environmental footprint; our approach extends to recycling, composting and a host of other decision-making processes in the course of doing business--everything from using washable cloth towels instead of disposable paper in the public washrooms to getting our computer printer cartridges refilled instead of replaced. Some of it just makes good business sense, and some of it just makes us feel a little bit better about what we do. And who’s going to scoff at a chance to do that?

The winemaking process, organic or not, always starts with good quality grapes. Quality is determined by a number of factors, including the winemaker’s preferred balance of sweetness, acidity, pH and flavour. It also generally means fruit unaffected by mildew, rot or surface moisture, brought to the winery as soon as possible after manual picking. (Mechanical harvesting, used in only the largest of Vine Yards and not in ours, usually breaks the skins of the fruit, making the transfer from the Vine Yard to the winery a process involving juice and fruit together.) The low humidity of our climate helps the picked fruit keep a little longer than would be the case in a damper region, but soft-skinned varieties such as Pinot Blanc still need to be dealt with quickly.

Organic standards stipulate that organic grapes must be stored and processed in a manner completely separate from non-organic fruit. Cellar practices need to be adjusted to allow for a complete clean up of equipment and working areas (using phosphate free, permitted solutions) before

switching from one type of fruit to the other. Cellar records include an audible record of incoming fruit and its origins, processing stages and locations, and transfers. (These records are found in any well-organized processing operation, not just the organic ones.) We also need to ensure that the fruit does not come into contact with anything else which may contaminate it; all containers, hoses, tanks and fittings are made of non-reactive food grade plastic or stainless steel. Most modern equipment used by many wineries meets these criteria.

It is on the mechanical side that the first unique qualities of organic winemaking begin to appear. One of the hallmarks of organic winemaking is minimal processing; winemakers are expected to refrain from elaborate mechanical or chemical intervention. We call it “low tech” winemaking, with the help of gravity, a few pieces of vintage used equipment from Germany, the talents of winemakers Tilman Hainle and Jason Parks, and a lot of time.

The fruit goes through a crusher/destemmer, which gently breaks open the berries and remove them from the stems. After crushing, white wine grapes are gravity fed directly into the press, and red wine grapes (either all crushed, or part crushed and part whole berry) are fed into a holding tank or a red wine fermenter in which the juice will ferment with the skins for extraction of colour, flavour and tannins. (What does “gravity fed” mean? It’s a fancy way of saying that instead of pumping the material around mechanically, which consumes energy and treats the fruit and juice roughly, the material simply falls from the crusher--sitting above the cellar’s working area--into a container below.) White wines are pressed immediately after crushing, but red wines may remain in the holding tanks for anywhere from 24 hours (for Rosé wines) to 3 weeks (for full reds) before pressing.

Our press is a Willmes brand pneumatic bladder press which holds approximately 2 tons of material. A rubber bladder inside the press is slowly inflated in cycles with compressed air, and as it expands it presses the grapes against perforated plates, in much the same way you would press any fruit through a sieve. The juice runs into a tray below. Bladder presses are the choice of many winemakers, because their gentle action removes the juice efficiently without crushing the seeds or skins, both of which can lend bitterness to the wine. The bladder can exert pressure as

high as 80 pounds per square inch: we don't use more than 30 pounds, except for Icewine.

We are sometimes asked about "second run" wines or "free run" wines. We don't extract absolutely 100% of the juice from the skins, because the last portions of juice will always be of poorer quality than the first. We will not force more juice from the skins by pressing harder or longer, or by adding water (with or without sugar) to the process.

Gentle handling and pressing and no pumping has other benefits down the line; fewer particles in the juice means lower turbidity (cloudiness) in the wine and less need for heavy fining or filtration. After the juice is pressed, it is pumped into a stainless steel tank and inoculated with yeast. And that's it, so far! Nothing but grapes and juice.

So, you're asking, in this part of the process, what's different about organic winemaking? You will encounter gravity-fed, clean, organized, gentle winemaking in many wineries, not just ours. Occasionally, winemakers will add sulfites to the grapes just before or after crushing to prevent any oxidation of the juice, and sometimes added enzymes are used to break down the skins as an aid to extraction and pressing. And there's your answer; there isn't much difference. So, now you're asking, how come there are only a few organic wineries in Canada? We simply don't know.

MALOLACTIC FERMENTATION

Malolactic fermentation (MLF) may sound mysterious, but it's a technique every winemaker should master. It is quite different from "regular" fermentation, in which yeast convert sugar into alcohol. MLF involves bacteria instead of yeast, and it usually begins when primary fermentation is complete, around 0° Brix.

Malolactic fermentation is conducted by *Leuconostoc* bacteria cultures. These bacteria convert malic acid, which is naturally present in fruits like grapes and apples, to lactic acid. This reduces the acidity of the must and improves the flavour of your wine. After MLF, the wine's flavour profile is more smooth, round and complex. Malolactic fermentation can occur spontaneously, but it's best to conduct it yourself.

MLF is generally used for dry red wines but can also enhance some dry white wines, such as Chardonnay, Sauvignon Blanc and Pinot Gris. MLF is not recommended for sweeter wines, like Riesling, Gewürztraminer and Muscat.

Malolactic bacteria are finicky about their conditions. They aren't tolerant of high alcohol, high sulphur dioxide, low temperatures and low pH. High-acid grapes make it difficult to cultivate Malolactic bacteria; in general, it will work in red wines with a pH of 3.3 or higher and in whites with a pH of 3.1 or above.

The most-accepted rule of thumb is to wait until the end of primary fermentation before adding the culture. Malolactic activity can be detected by the presence of tiny carbon-dioxide bubbles. When the bubbles stop, MLF is complete. This should take one to three months.

SECONDARY FERMENTATION

In our cellar, fermentation ends when all of the natural sugar has been consumed by the yeast, leaving a dry wine with very little or no residual sweetness. (Other wineries may stop fermentation earlier in order to retain sweetness.) At this point, many of the yeast cells are dead and the rest are only marginally active. Along with any other solids left in the juice, they fall to the bottom of the fermentation tank and form a dense, sludgy mass called lees which usually represents 2 to 4% of the tank's contents. The wine by now is quite clear, and will be left in the same tank, in contact with the lees for a period of 6 to 9 months, a process called aging "sur lie."

Aging sur lie makes a lot of sense in an organic wine cellar for a couple of reasons. Firstly, enzymes within the yeast cells are still active enough to continue removing any oxygen dissolved in the wine, and by doing so, they provide a sulfite-free form of protection against oxidation. (Sulfites are added to our wines only at the very end of the winemaking process, and we're not quite there yet.) Secondly, as the yeast cells gradually break down, they release a unique toasty flavour to the wine, a very desirable characteristic particularly in less aromatic white wines like Chardonnay or Pinot Blanc. (In our wines, this "sur lie" character is often mistakenly attributed to oak aging.) The flavour of wine lees is so desirable, in fact, that it's added to bread.

Some wineries will stir the lees during this aging process. This is usually done to accelerate the rate at which lees character is imparted to the wine, and we haven't found it necessary in our cellar.

When the wine is deemed ready, it will be carefully "racked" or drained off the lees sediment, and then someone gets the really fun job of going into the tank and cleaning the lees out. This is something like having a sauna while standing in a knee deep vat of khaki colored sourdough starter. It's a very special part of every cellar worker's initiation. The lees is then composted and returned to the Vine Yard.

All of us have probably encountered a red or white wine which, when opened, released a fine spritz of carbon dioxide. (This is not always unpleasant, by the way.) This spritziness, perhaps accompanied by a bit of turbidity or

sediment, is a sign that the wine has probably gone through a secondary fermentation in the bottle. This secondary fermentation is carried out, not by yeast cells, but by Malolactic bacteria which consume malic acid (naturally present in juice or finished wine—think of it as the Granny Smith apple of wine acids) and produce as by-products lactic acid and carbon dioxide. This process can be a problem in a finished wine (a bit of spritziness is one thing; explosions and cloudy wine are another) and that's why many winemakers will wait for their wines to complete Malolactic fermentation (or prevent it altogether) before bottling.

Malolactic fermentation is deemed desirable for 3 main reasons. It softens acidity (often necessary in a cool climate region such as ours), it makes the wine more stable, and it adds a layer of complexity to the wine's aromas and flavours (the lactic acid can lend a buttery note). The bacteria are fickle creatures, however, and are active only within a fairly narrow set of conditions. Waiting for them to work can often add to the length of time it takes for the wine to be "market ready." The organism can be introduced into the winemaking process by means of inoculation but we have a resident population in our cellar, and when conditions are right (which seems to be the case for most of our wines), they will set to work. When Malolactic fermentation is complete (and this can be during or after the primary fermentation), the bacteria will fall to the bottom of the tank with any other residues.

Sur lie aging and Malolactic fermentation are not unique to organic winemaking (in fact, with the exception of trendy "blips" in production methods, these practices have generally been in use worldwide) but the benefits of both processes are part of what makes organic winemaking possible. Without Malolactic fermentation, for example, de-acidification would involve the use of additives which are tightly controlled by our organic standards. Without sur lie aging, we would have to add sulfite earlier in the winemaking process, with the risk that levels at bottling would exceed organic standards. All this, and added complexity, too, thanks to a natural, low-tech process of leaving well enough alone.

FERMENTATION PRIMER

Alchemy, the transformation of one substance into another, is indeed what yeast does, because these organisms consume the natural sugars present in grape juice and produce in their place alcohol and carbon dioxide. In still wines, the carbon dioxide produced during fermentation is released; in sparkling wines, it is retained to provide the bubbles we all know and love.

Yeast is naturally present as an airborne organism just about everywhere on earth. (Some winemaking regions like Spain's Jerez region depend on the indigenous "wild" yeasts to lend a unique character to their sherry.) In the right conditions, any fruit, including wine grapes, will spontaneously ferment without added yeast. However, because these wild yeast organisms are unpredictable, not very vigorous and often accompanied by less desirable bacterial companions which may overpower them and spoil the product, most winemakers rely on a cultured yeast.

Cultured yeast is, in a sense, a wild yeast which has been selected for admission to and graduation from a good school with hordes of equally educated and clean-behind-the-ears colleagues. It's not essentially different from its wild cousin; in fact the "science" of yeast cultivation is relatively new and there has been very little development of truly new strains. The key is that a particular strain, with identifiable and desirable characteristics, has been identified, isolated, cleaned up and produced in mass quantities. Think of it as the Ivy League of single-celled organisms. Some are best for beer, some for wine and some for high-level management in acidic, high-alcohol or sweet and sticky environments.

Winemakers have 3 basic options when it comes to fermentation:

- Eliminate all of the wild yeast and other organisms in the juice by adding sulfite or by pasteurization, and then add in a selected yeast strain (there are also "killer" yeast strains available which will, in their tiny bond-raider way, terminate their competitors);
- Let nature take its course and hope for the best. Pray that your wild yeast will be vigorous enough to commence fermentation immediately so that sufficient alcohol (anything between 1% and 5%) will accumulate to

deal with potentially harmful bacteria and mold. If fermentation doesn't start quickly, the entire batch of juice can spoil in a day. This will be a nervous, insomniac, fingernail-chewing winemaker;

- Take the middle ground. We don't eliminate the wild organisms, but we make sure that the conditions are right for fermentation to start quickly and vigorously. We let the juice warm up, and expose it to air so that it is well oxygenated (no sulfite is added to protect the juice from oxidation—we even let it brown slightly). Then we inoculate the juice with 2 different strains of cultured yeast. We know that the cultured yeast will control the fermentation process, but there will still be some participation from the wild organisms, which we hope will add a bit of local colour and personality. (This is the winemaking equivalent of including a performance artist in a Board of Directors stacked with MBAs. It won't hurt, but it may help.)

Our cultured yeast comes from Lallemand Inc. of Montreal, a world leader in their field. The 2 strains we've selected are Wädenswil *saccharomyces cerevisiae* HK-4, and good old EC1118, *saccharomyces bayanus*. Both are highly vigorous strains, capable of rapid, complete fermentation, even in high-acid, high-alcohol environments (these yeasts have enabled our Icewines, for example, to reach 17% alcohol) and we are pleased with the character they impart to the wine during and after fermentation. Although different strains of yeast may not yield obvious differences in the wine, the role of yeast in creating a wine's character should not be ignored; the juice from wine grapes bears very little resemblance to the finished product. Some tasters divide aroma into three distinct components: the primary aroma (from the grape), the secondary bouquet (from the wine) and tertiary character (from aging). All of these aspects benefit from the character of the yeast during and after fermentation.

Once the juice has been inoculated with yeast and fermentation begins, the winemaker has another decision to make about temperature. A controlled, extended, cool fermentation will generally result in a fruity wine in which the primary varietal aromas dominate. A warm fermentation (in white wines, something in the range of 20-22°C and in reds ranging between 20-30°C) is generally complete and rapid and results in wines in which the secondary or vinous

character predominates. A warmer fermentation (which is our usual practice) can also provide better colour extraction and stability, and is more suited to a full-bodied wine style.

Our organic standards allow the use of cultured yeast, but prohibit the use of genetically modified yeast strains, enzymes or synthetic yeast nutrients.