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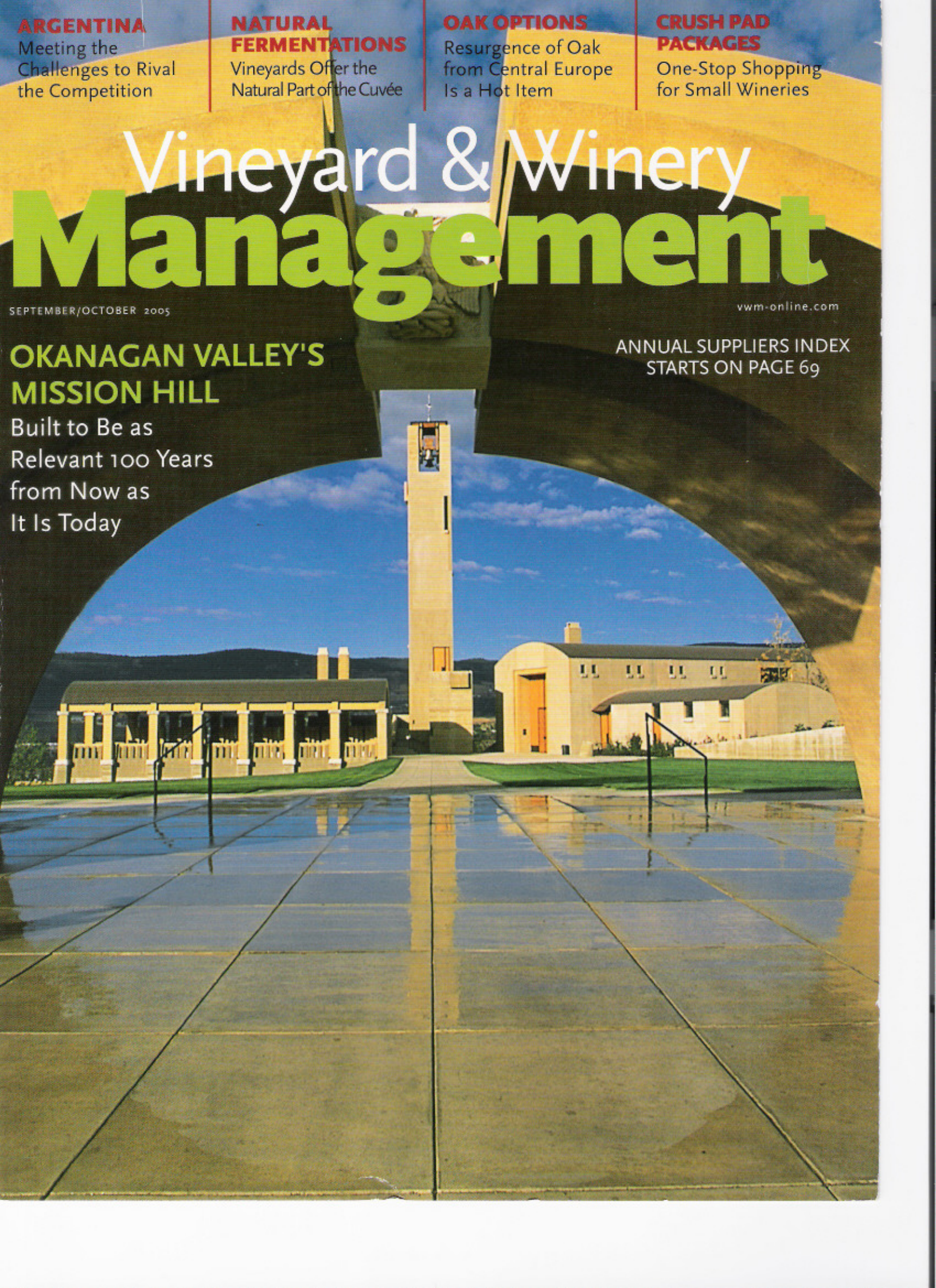
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SEPTEMBER/OCTOBER 2005

OKANAGAN VALLEY'S MISSION HILL

Built to Be as Relevant 100 Years from Now as It Is Today

ANNUAL SUPPLIERS INDEX STARTS ON PAGE 69





ON THE COVER Mission Hill Family Estate in British Columbia's Okanagan Valley. (Cover photo by Brian Sprout.) **Story on Page 60**

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Argentina is meeting the challenge of international competition and making gains. *page 36*



TREND REPORT

Ferments Go “Au Naturel”

Yeast is a natural part of the cuvée—
it should come from the vineyard.

Story by Christy A. Canterbury

Experimentation with wild yeasts surfaces more and more often these days. The trend may prove the follow-on to the “unfiltered, unfinned” buzz. Soon, consumers will throw around terms like “non-inoc” for wines not inoculated with cultured yeast and speculate that wine’s broad mouthfeel may show the imprint of yeast strain ICV-GRE. On the cutting edge, winemaker Stephen Barnard at Rappahannock Cellars in Huntly, VA, proudly labeled his first three naturally fermented chardonnays “Wild Ferment Virginia Chardonnay.”

But before the full-fledged launch of trendy new wine terms, aspiring producers need to master further their own “natural” ferments techniques. That’s a tough task considering native yeasts are “wild” and by their very nature somewhat unpredictable.

The divide between cultured vs. natural yeast use is basically New World vs. Old World. France is the frontrunner in “natural” fermentations. Ambient yeast in her vineyards and wineries step up and do most of the work.

In younger wine-producing countries, producers almost always inoculate. Nonetheless, many New World producers today

Natural fermentations require a delicate balance of philosophy, skill, and technology to create a specific style.

are taking a serious look at native yeast fermentations and feel strongly that the efforts merit the risk.

CASES STUDIES: TERROIR PURISTS

Toni Bodenstern of Weingut Prager in Austria’s Wachau leads the pack of devotees (though Austria rests at the very heart of Europe, its wine industry enjoys the title “The New World of the Old World”). Fiercely proud of his superb terroirs and markedly determined to preserve their characters, Bodenstern pre-harvests from 15-16 vineyards and prepares vineyard-specific yeasts for his cuvées. A laborious task, he begins four to five days prior to the main harvest, collecting 80 kilograms of grapes from each vineyard. After a gentle pressing, the must is transferred into small glass balloons to commence fermentation.

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A Word About HOW YEASTS DIFFER

WINEMAKERS WHO INOCULATE USE the *Saccharomyces* genus. *Saccharomyces* is only found in the vineyard when pomace and yeast lees are deposited there as fertilizer. Wild yeasts come from the *Kloeckera*, *Hansenula*, *Candida* and *Hanseniaspora* genera. In cooler climates such as Burgundy, *Kloeckera apiculata* dominates while *Hanseniaspora* rules in warmer regions.

Yeast strains differ in their tolerance to temperature, pH, alcohol, and sulphur dioxide (SO₂) among other factors. Each produces different by-products, flavors, and aromas. The manner in which they complete their job also varies—some foam more, some flocculate less. Specific selection considerations include:

Production of Flavor Characteristics:

- Clarity of varietal characteristics
- Glycerol
- Volatile acidity (VA)
- Sulfide and thiol ("off" flavors and aromas)

Fermentation Properties:

- Rate of fermentation
- Ethanol tolerance
- Low and high temperature tolerance
- Osmotic tolerance in high sugar musts

Technical Properties:

- Easy flocculation post second fermentation in sparkling wines
- Low foaming in whites
- Low biogenic amines production in reds
- Sensitivity to killer yeast

WINEMAKING

pinot noir vineyard in the Jois on the northwestern edge of Lake Neusiedl. Umatham, who is working on his DEMETER biodynamic certification, also believes vineyard-selected yeasts are a purer selection both of his terroir and of nature.

DETRACTORS SPEAK UP

Detractors of wild yeast provide ready debate. Dominique Delteil, most recently scientific manager of Montpelier's Institut Coopératif du Vin (ICV), offers an easy solution to the complexity argument. He simply recommends inoculating different tanks of the same juice with different commercial yeasts to achieve similar results. Delteil dismisses the standardization argument entirely, insisting that only 30-40 of the 100-150 commercially available yeast strains are standardizing. Strain variety has dramatically increased since the early 1990s.

Emmerich Knoll from Austria's Wachau agrees that native yeasts are not necessarily best. "I don't like

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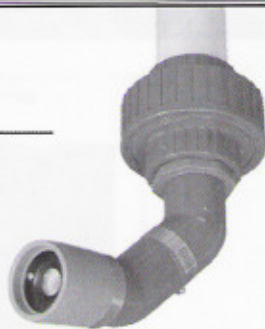
This lead-time allows these selections to achieve a large enough population to be ready to inoculate the main harvest. By injecting with his natural yeasts, Bodenstein reduces the unfavorable lag-time associated with natural fermentations. According to *Principles and Practices of Winemaking* by Roger B. Boulton et al., the addition of two to five percent inoculum from a fermenting juice at 12-15° Brix is common.

"Yeast is a natural part of the cuvée. It should come from the vineyard," Bodenstein states. This soil- and microclimate-conscious winemaker all but apologizes for making yeasts for only one-half of his 35-36 vineyards. "There is a lot we don't yet understand with regard to yeast," he adds, so to try to be as exact to terroir as possible, Bodenstein creates a yeast mixture for each important variety per vineyard. Plots without their own yeasts are inoculated with the most appropriate of Bodenstein's annual cultivations.

Josef Umatham in Burgenland, Austria, also cultivates his own yeast and currently uses two: one from the saint laurent variety that comes from the vom Stein vineyard in the village of Frauenkirchen, and another from a

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Positives and Negatives of Native Yeast Fermentations

Pros:

- Preserve terroir and variety authenticity.
 - Amplify complexity with multiple natural strains versus one inoculated strain, which usually kills off others.
 - Prevent excess acetic acid, the sherry-like qualities of acetaldehyde and the tutti-frutti flavors of mass-market wines.
 - Increase glycerol levels, especially in reds.
 - Use less SO₂ on white wines.
- According to Yair Margalit, Ph.D. and author of *Concepts in Wine Chemistry*, an addition of 100ppm SO₂ shows no effect on cultured yeast growth whereas an addition of 50-100ppm SO₂ to wild yeast fermentations delays yeast population growth by several days. (Red wines, due to

their anthocyanins interacting with and reducing SO₂'s inhibiting effect, are inherently less sensitive.)

Cons:

- Increase lag prior to fermentation start, unless inoculating as above.
- Reduce control of and lengthen fermentation.
- Lessen ability to develop a specific style, such as moderate alcohol production.
- Increase hydrogen sulfide production.
- Raise odds of stuck fermentations due to high alcohol.
- Expect difficulties conducting lower temperature fermentations for white wines and lose moderation of red wine temperatures.
- Lower tolerance to SO₂.
- Increase must's nutritional

WINEMAKING

behavior and manage tank space. When grapes are ripe for harvest, tanks must be ready.

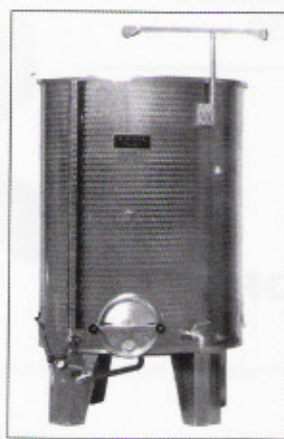
ACHIEVING POSITIVE RESULTS—FIRST-HAND ADVICE

Alan Kinne, winemaker for Justin Vineyards, consulted in Virginia from 1992-1998 and conducted many native yeast fermentations during that period. Asked to evaluate priorities before applying this technique, he said, "First, if you like your wines, is it really a necessity? Or, is this just an experiment? If it could really help the profile of a wine, to create added complexity, okay. Just make sure to start on a scale that, if the indigenous population isn't right and you don't catch it in time, it's not too costly." Basically, be careful with your money. Be excessively careful with other people's money.

Kinne suggests starting trials with white varieties. "Since whites typically come in first, you know your yeasts

strict ideas of only natural yeast," he states. The impracticalities of native yeast fermentations can overrule

philosophy. For example, through use of cultured yeasts, winemakers can better predict fermentation



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"Within a few days of fermentation's start, or a week at most, you'd better know how it's going to turn out. If you can't make that kind of judgment call, you're probably not yet ready to experiment with native yeast."

are from the vineyard, not from neighboring tanks shooting off spores from their fermenting frenzy." He also emphasized the importance of continually tasting the fermentation's progress. "Within a few days of fermentation's start, or a week at most, you'd better know how it's going to turn out. If you can't make that kind of judgment call, you're probably not yet ready to experiment with native yeast."

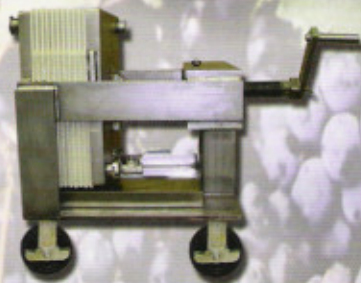
A hemisphere away, Mike Allen of Huia Winery in Marlborough, New Zealand, firmly prefers vinifying his pinot noir with native yeasts. Of particular interest is the increased glycerol production in the early stage of fermentation. Allen finds the resulting mouthfeel highly attractive and believes his clients do as well. Corey Hall of Matua Valley, also in Marlborough, concurs. Hall ferments all his single-vineyard and red wines with natural yeast. The broader palate and increased complexity readily attract consumers raised on lush, New World styles. Hall and Allen also agree native fermentations require more observation. Hall checks the growth of native yeast twice a day, rather than once for his inoculated tanks, counting yeast spores under a microscope and calculating their growth rate delta.

Hall also "feeds" his native ferments with yeast hulls. (Nutrition for

clarified white juices is particularly important. Reds typically need less enrichment because they remain in contact with their grape skins during fermentation.) Yeast hulls, or yeast ghosts, are inactive and insoluble and are composed of yeast cell wall membranes. Their addition supplements survival factors, such as sterols, increases the surface area of clarified

juice and absorbs toxic compounds. Yeast hulls can also prevent sluggish and stuck fermentations. Matua's single-vineyard chardonnay requires one dose of yeast hulls per day for 10 of its 14 days of fermentation. Additions begin around 18° Brix, at 50 parts per million (ppm). Once in barrel, Hall adds 15ppm every few days. He also adds B vitamins at 10ppm. As Brix hit

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In the end, a combination of book learning, hands-on experience, and time aid each winemaker in finding the right recipe for his or her cuvées.

5°, the wine is briefly left to its own devices. Then, Hall adds "a big dose of yeast hulls, approximately 2 g/L, to clean-up" any accumulated C8 or C10 fatty acids (octanoic and decanoic carbon acids), as well as "anything else around that size that might be toxic to yeast, and to help finish the ferment."

At Huia, Allen nourishes his tanks every day, depending on the fermentation speed and the pre-fermentation yeast assimilable nitrogen (YAN). Allen says cuvées receive nutrient doses once their ferments "are well under way, on the assumption the vineyard yeasts used up a bit during the initiation phase and the wine yeasts will develop a stronger popu-

lation with the gradual additions." Allen prefers 50 mg per day of Superfood, a mixture of 30% diammonium phosphate (DAP) with yeast hulls and extracts, B vitamins such as thiamin (B1), and minerals. He, however, finishes additions before 12° Brix as he finds higher alcohol levels interfere with nutrient uptake.

Stephen Barnard of Rappahannock Cellars in Virginia emphasizes the importance of checking YAN prior to fermentation. His soils are nitrogen poor, and his YANs initially measure in the high 80 mg/L area. Accordingly, he adjusts up to 150-200 mg/L with DAP and Superfood. As fermentation commences, he adds in tandem Superfood

and Fermaid K. Barnard favors finishing with Fermaid K, a complex blend of DAP, alpha amino nitrogen, sterols, unsaturated fatty acids, magnesium sulfate, thiamin, folic acid, niacin, biotin, calcium pantothenate, and inactive yeast, because it seems to keep VA low. His positive experience with the product includes his work in Virginia as well as in South Africa at Klein Constantia and Flagstone.

Barnard cautions that natural fermentations are not for the impatient. Though a bit unusual, his non-inoculated chardonnay hadn't even begun to ferment when his inoculated barrels finished 10 days later. The native ferments lasted four to six weeks, each barrel finishing at a different pace. While he ended up with a vivid and complex palate of flavors to blend, all of his alcohol levels turned out in the 13.4-13.5% range.

Rene Pöckl of Burgenland, points out the advantages of natural yeast extend beyond the primary fermentation. His experiments with malolactic fermentation (MLF) inoculation resulted in nearby tanks automatically commencing MLF, regardless his intention. Uncomfortable with that lack of control, Pöckl states, "I like to work traditionally during fermentation to produce honest wines."

In the end, a combination of book learning, hands-on experience, and time aid each winemaker in finding the right recipe for his or her cuvées. Natural fermentations require a delicate balance of philosophy, skill, and technology to create a specific style. Practicalities play an important consideration. Tank space, time spent monitoring cuvées and the cost of potential mistakes must be weighted.

Jean Reilly, a Master of Wine candidate who worked the 2005 harvest at Sileni Estates in Hawkes Bay, New Zealand, offered a final, compelling argument for one convenience of native yeast fermentations. "Yeast inoculation sounded like an easy job," she confessed. "How much could yeast weigh? But, to inoculate a 20,000 liter temperature-controlled tank involves acclimatizing the yeast in wine samples and then carrying four 20 kg (44 lb) buckets up a steep and slippery catwalk." As can be gathered from the collective commentary above, experience shapes perspective.

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