



BARRELWISE

Case Study Barrel Work Efficiency

Sandhill Winery (Andrew Peller Ltd.)

Executive Summary

Sandhill Winery, located in Kelowna BC, is a major Canadian wine producer and part of the Andrew Peller Group. On average, it manages between 1,500 and 2,000 oak barrels of ageing wine. The barrels must be accessed every 4 weeks to carry out three main tasks: collection of samples for chemical analysis, addition of sulfites for quality protection, and topping up the wine level to counteract evaporation. These tasks, carried out using traditional methods, are very labor intensive, and create numerous opportunities for degradation of wine quality. The winemaking team at Sandhill was evaluating ways to address these challenges by improving the operational efficiency, precision, and control over routine barrel work.

The BarrelWise barrel management system (BMS) simplifies the way winemakers and cellar-crew care for ageing wine barrels. Following an initial small-scale trial during 2019 harvest, where the BMS showed potential to significantly reduce barrel work times, the Sandhill team decided to adopt the system at scale. When applied to two rows totaling 212 barrels from August 2020, the BMS saved 53% of the time previously spent on topping, sulfite additions and sampling tasks. The cellar crew also praised the simplicity of the system, which minimized wine spillage, improved sanitation, and relieved some of the risks and physical strain of accessing the barrels for the workers.

After evaluating the costs and benefits of the BarrelWise system, Sandhill made the decision to adopt BarrelWise as the **primary barrel work system for the winery's entire barrel program.**

"The BarrelWise system demonstrated **significant time saving**, making barrel work simpler and easier for the crews, and **increasing the consistency for quality.**"

Sandy Leier, Head Winemaker

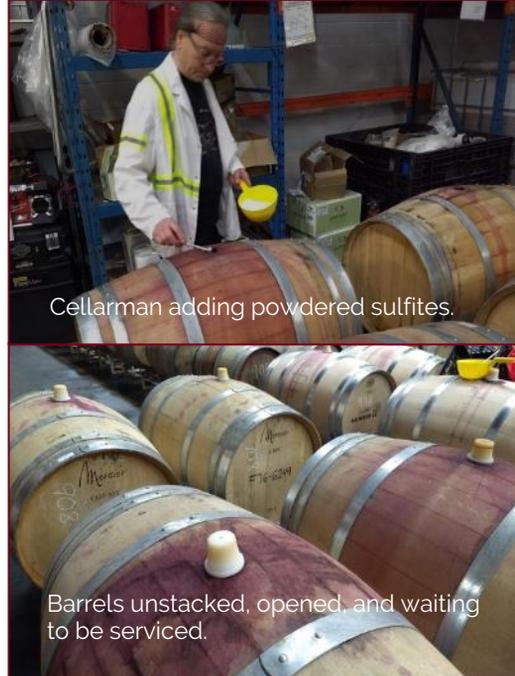


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Baseline Case: Traditional Methods

Traditionally, the cellar crew use a forklift to unstack barrels, lay them out on the floor, and proceed to:

- Open the barrels by removing the bungs
- Take samples from a small subset of barrels for analysis in their laboratory
- Add potassium metabisulfite (KMS) in powdered form
- Stir the wine with a baton to mix the sulfites into the wine
- Use a pressurized wand to add topping wine to the barrel
- Seal the barrels with freshly sanitized bungs



Cellarman adding powdered sulfites.

Barrels unstacked, opened, and waiting to be serviced.



Current Challenges

Observing the traditional process at Sandhill Winery revealed several challenges, with labor requirement being key. The time required to service each barrel is significant - cellar hands spend on average **2 minutes and 32 seconds on servicing each barrel** during a typical shift.



Consistency

In the busy, dynamic winery cellar environment, the crews may occasionally miss an operation on one of the barrels, such as forgetting to top or add sulfites. Losing track of the process usually happens due to a distraction, or when the crews take a scheduled break.



Safety

Unstacking the barrels requires forklifts, which were noted to cause several issues. Significant time was spent waiting for other workers to pass, moving hoses and equipment to access barrels, or waiting for forklift time, as it often became a shared resource for multiple users. Forklifts also present a significant safety hazard in the winery environment. They account for nearly 100,000 workplace injuries and 85 deaths per year (OSHA) in the US alone, suggesting that minimizing forklift use would improve workplace safety.



Wine Quality

After the barrels were opened for topping, it often took some time to complete the work and reseal them. This prolonged exposure to air, as well as the challenge of sanitizing equipment that was transferred from barrel to barrel (topping wand, stirring rod, sampling hose) exposes wine to risk of spoilage and microbial cross-contamination.

The BarrelWise Barrel Management System

The BarrelWise barrel management system (BMS) was used to sample the barrels, then add sulfites and top to full 212 barrels in two rows. BMS consisted of BarrelWise bungs placed on all barrels, as well as the cart, which interfaced with the bungs via the head unit, controlled through a hand-held digital control panel. Upon connecting to the bung, the cart pulled out a wine sample of lab analysis, then topped the barrels, while simultaneously adding sulfites in aqueous forms, and mixing them into the wine. The head unit was automatically sanitized with ethanol between barrels to prevent transfer of wine from barrel to barrel. One Sandhill cellar hand executed all barrel work, including refilling and emptying the kegs on the cart.

The duration of barrel work tasks completed with the BarrelWise system was compared to the baseline case using traditional equipment. **Significant time saving was observed, resulting largely from the ability to complete all barrel work tasks in one barrel touch.** Additional saving came from not having to unstack barrels with a forklift, then restack into rows at the end.

A major bottle neck in the BarrelWise process was the regular re-filling of the 60L topping wine keg. This can be mitigated with a larger topping wine container, or by pre-filling multiple kegs with appropriate topping material for faster swapping.



BarrelWise bungs are installed on wine barrels.



The BMS head-unit is connected to a bung, maintaining an air-tight, sanitary seal.



The cart distributes the topping wine, operated via a digital hand-held control panel.

Results: time to service 212 barrels in two rows

Total Service Time

8h 56min

Traditional Method

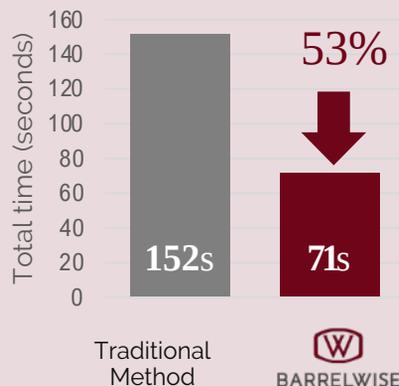


4h 12min


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| <ul style="list-style-type: none"> • Barrels unstacked and restacked with forklift • Barrels opened for topping • Equipment transferred from barrel to barrel | <ul style="list-style-type: none"> • Barrels serviced in place, on a rolling ladder • Barrels remained sealed • No wine transfer from barrel to barrel |
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Average Per-Barrel Service Time



Testimonial

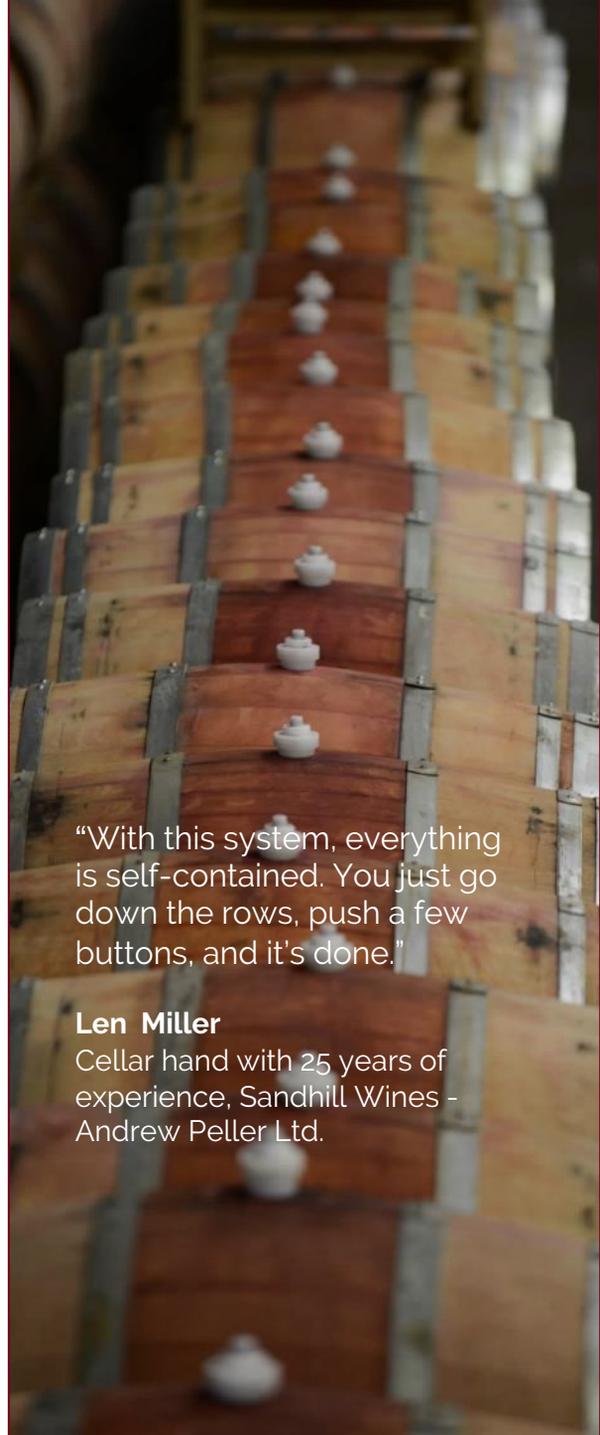
"Sandhill Winery has been working with BarrelWise to develop their new barrel management system for winery cellars. After a promising small-scale pilot, we made the decision to adopt the system at scale to see how it affected our processes.

The BarrelWise system demonstrated significant time saving, making barrel work simpler and easier for the crews, and increasing the consistency for quality. It gives me a greater confidence that our cellar crews will always perform barrel work tasks to the highest standards.

We at Sandhill are always looking for ways to improve our processes and are excited to continue partnering with BarrelWise to improve cellar operations."

Sandy Leier
Head Winemaker

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"With this system, everything is self-contained. You just go down the rows, push a few buttons, and it's done."

Len Miller

Cellar hand with 25 years of experience, Sandhill Wines - Andrew Peller Ltd.



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