

## Technical Spotlight Rack & Riddle

Robotics ramp up sparkling wine production at Healdsburg custom crush

Stacy Briscoe

**Stacy Briscoe** is the assistant editor of *Wine Business Monthly*. She has been writing about wine professionally since 2015, freelancing for multiple publications including *The San Francisco Chronicle*, *Edible Communities* and *Napa Sonoma Magazine*, among others. She also maintains her own website, *BriscoeBites.com*, dedicated to wine reviews and tasting notes. Outside of wine writing, she also contributes as a freelance editor for the independent publisher She Writes Press. Stacy has a Bachelor of Arts degree in English-language literature from the University of California, Santa Cruz.

**SINCE OPENING ITS DOORS** in 2007, **Rack & Riddle**, founded by **Bruce Lundquist** and **Rebecca Faust**, has garnered a well-deserved reputation in premium custom crush services—in no small part due to its focus on producing and bottling custom sparkling wine in the traditional Champagne method.

Within the last 12 years, the business has gone through many transformations, and Rack & Riddle continues to evolve. Within the last year, the team has been able to incorporate some of the latest and greatest in artificial intelligence and robotics in their two newly acquired and custom-designed warehouse spaces in Healdsburg, California, just steps away from the town's main plaza.

Rack & Riddle still owns their 50,000-square-foot facility in Alexander Valley, purchased in January 2014. This is where the first stages of all winemaking operations take place; where grapes are hauled after harvest, crushed and barreled; and where red wines will stay to ferment and age. But all sparkling wine production—and all bottling—takes place in Healdsburg, where Rack & Riddle now owns two 6,700-square-foot warehouse facilities. The properties were previously owned by **Clos du Bois**, which sold off the spaces when they decided to “pare down their barrel program,” according to Rack & Riddle general manager, **Mark Garaventa**.

Rack & Riddle bought the northern-most warehouse in 2014. Originally, everything from tirage to disgorging, final bottling and shipping all took place in the one building. “In terms of spacing, we just couldn't be under one roof anymore,” Bruce Lundquist said. “The footprint for the automation is so huge, we wouldn't be able to operate.”

So in 2018, when the southern-most building became available, “We jumped on it,” Lundquist said. “Now, we have tirage bottling and transfer in the southern building, and riddling, disgorging and bottling in the northern building.”





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## Key Points

- Rack & Riddle expands to secondary warehouse in Healdsburg, Calif.
  - Investment in robotic winemaking equipment increases winemaking efficiency and addresses labor issues
  - Experimentation with faster riddling time may boost annual case production even further
  - Cloud-based system allows winemakers to track their wines through the custom crush process
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Garaventa described the two buildings as “just shells” when Rack & Riddle took over ownership, so they built the entire infrastructure from the inside out, including offices, the CO<sub>2</sub> exhaust system and the cellar. He estimates the cellar, located in a second wing of the northern-most building, holds about 85 tanks of various sizes, produced by both **Santa Rosa Stainless Steel** and **Quality Stainless**. That cellar space also includes an **Oenodia** cold stabilizer that works with electro dialysis. “We can do 800 gallons per hour of stability whereas if you cold-stabilized in tanks, it could take you a couple of weeks,” Garaventa said.

Outside the cellar, Rack & Riddle installed what staff jokingly refer to as their “baby tanks”—12 25,000-gallon tanks and six 50,000-gallon tanks. (They had to lay down 24-inch thick concrete flooring to support the weight.) Garaventa said these tanks are generally filled with white wine for large sparkling wine programs but sometimes hold large batches of red wine blends.

“Outside the tanks we have jackets—they cost just as much as the tanks themselves,” Garaventa said, pointing to the **PolarClad** tank insulation wrapped around the huge tanks and stressing the importance of temperature control on externally located tanks. “These chill the tanks down to 30° F. And once it turns off, they [the tanks] will stay between 30° F to 35° F.”

But the bells and whistles really come with how Rack & Riddle handles secondary fermentation, tirage and dosage—all the processes that mean they are truly producing sparkling wine in the *methode traditionnelle*. Though the method may be traditional, the tools they use are 100 percent modern.



Stacking the riddling boxes had always been the hardest job to staff, and with the cost of labor constantly increasing, Rack & Riddle automated the process.

### Installing Automation

“We moved forward with automation because of labor and the challenges we’re having teaching and keeping people on the line,” said Garaventa, who noted that stacking the riddling boxes had always been the hardest job to staff. “And labor costs, not just hourly wages but benefits, are constantly increasing,” he added.

Garaventa said it was during a trip to Europe that he saw just how far automation could go in a sparkling wine-focused facility and realized how much Rack & Riddle needed to implement this technology to continue to turn out the volume of high-quality wines they’ve built their reputation on.

### Tirage Bottling and Bin-Aging

Wine from the fermentation tanks in the northern-most building is pumped through a pipe bridge into tanks in the southern-most building to begin the tirage bottling process. The tirage line, which is comprised of a **Bertolaso** filler and **Arol** biduler/crowner, moves filled and capped bottles down a conveyor belt to be nestled into bins for aging. **MasPack** produced both the conveyor system and the robotics for bottle transfer.

Lundquist estimates that previous to installing the new robotic system, his team was able to bottle about 3,000 cases of sparkling wine a day; now they’re able to get up to 6,000 cases.

The robotic system efficiently packs the filled bottles into the aging bins. According to Lundquist, Rack & Riddle uses three different-sized aging bins; the robots are pre-programmed to understand the size and shapes of each of those bins. “We punch in a different program every time we run a different bin size; then we run that size all day long. The robot knows what to do based on that program,” he said.

Rack & Riddle has two of these robots running at all times, increasing efficiency and decreasing manual labor significantly. But, Lundquist said, when it comes to the efficiency of the robots, “the integrity of the bin is everything. If the bin starts to bow a bit or becomes misshapen, the robot will lose its position in terms of where the bottle is nestled,” he said. Though Lundquist estimates the wooden bins last anywhere between eight and 10 years, if a bin starts to show any kind of wear, it will be thrown out.

Once bottled and binned, wine is then stored inside the Rack & Riddle southern building (which is kept at a cool 50° F to 55° F) for as long as the client winery requires.

“We have some clients who will age wine as long as five years,” said business development manager **Cynthia Faust**, adding that Rack & Riddle charges for storage space. “Some clients choose to age wines in their own winery and bring it back here for the final stages.”

Once the wines have been aged per the client’s specifications and are ready to

move on to riddling, another MasPack robot grabs the bottles out of the aging bins and passes them to a second robot via a conveyor belt. This second robot then grabs those bottles and lays them into the riddling cages, which are then transferred via forklift to the northern building.

This, too, all used to be completed by hand. Lundquist estimated one employee “on a really good day” can transfer about one bin per hour. “But you get tired,” said Lundquist from experience. “This thing, because it keeps running, we can do double that number now. And honestly, we kind of have to because production has gotten to the point that doing it by hand is virtually impossible.”

### Ready to Riddle

Once transferred to the northern building, riddling cages are then placed onto one of the riddling machines. Currently, the building is home to two different types of riddling machines: four that can riddle eight cages at a time and are appropriately named VMLs for “Very Large Machines.” (The U.S.-based producer is no longer in business, according to Garaventa.) The rest are produced by **Oenoconcept**; these riddle four cages at a time. In total, with the current systems in place, Rack & Riddle can riddle 90 cages at a time, which is about 400,000 cases per year. The team plans to invest in another 36 Oenoconcept riddling machines, increasing production to 650,000 cases per year.

“With sparkling wine, what determines your capacity is riddling,” Garaventa said, adding that the process can take anywhere between three-and-a-half to seven days. “If it’s a seven-day cycle, divide that by 365 and that’s how many turns I can get out of one riddler. Multiply that by the number of riddlers and that’s your capacity for the year,” he said.

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Garaventa pointed out that riddlers can't "pull a double shift," as they run 24/7. "And you don't want a warehouse full of riddlers," he said. So to increase production, he and the Rack & Riddle team are looking into programs that reduce the riddling cycle to as short as three days.

"We ran our first trial with a Rosè, which typically takes at least a day and a half longer than other wine types...it came out awesome," Garaventa said. He said they'll run the trial again, and do so with several different varieties. "We're at an advantage in that we have a lot of products we can test," he said.

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Once the riddling process is complete, sparkling wine then moves on to the ice bath to freeze all the sediment settled into the neck of the bottle. Bottles are then placed on a conveyor belt and go down the line for disgorgement and dosage (machine by **Perrier**), corking (machine by Bertolaso), wiring (machine by **Robino & Galandrino**) and final mixing (no custom supplier).

Before foiling and labeling, the bottles continue along the conveyor belt through an **FTSystem** control and inspection unit that utilizes a light sensor to look for correct fill height, glass imperfections and proper cork and wire fit. If any imperfections are detected, the machine rejects the bottle, pushing it toward an exit conveyor. Those that make the cut go on through the foil applicator and crimper (machine by Robino & Galandrino) and labeling. “The foil pleat design is programmed to line up with the label,” Lundquist said.

Currently, Rack & Riddle is able to bottle about 1,400 cases of sparkling wine in a day. However, in November, the facility will receive a new **Champagel** neck freezer that, according to Lundquist, will be able to grab bottles from the riddler one whole layer at a time (as opposed to the current **Sabat** machine that can only grab one row at a time). This, he said, will increase production by about 1,000 cases.

“With sparkling, freezing and chilling of that neck are the linchpins—everything else on the line depends on how fast you can do that because it is a really slow process,” Garaventa explained, adding that the upgrade was a \$850,000 investment. Lundquist also noted that because the current neck freezer is so slow, all the other machines—the disgorger/doser, corker, wirer, shaker, even the inspector and labeler—aren’t on “full blast.” He added, “The guy running the neck freezer can’t get the glass in there fast enough. The new robot will be much faster, so we can pump up the speed of the rest of the line.”

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## Packaging Process

Labeled bottles gather at the end of the conveyor belt where a MasPack automatic case packer packs two 12-pack cases of wine at a time. A separate extension of the machine actually prepares the packing, builds the boxes, inserts the dividers and pushes completed cases toward the end of the line.

The cases move toward the automatic palletizer, but before being stacked, the conveyor belt provides one more weight check to ensure each case is complete and rejects any underweight packages. Boxes are tagged with ID labels, then palletized based on a pre-programmed pallet configuration, stacked and wrapped, utilizing an automatic wrapping machine—which Garaventa estimated saves 75 percent more shrink wrap simply because of how tightly the machine can wrap the pallets.

## Catering to Clientele

It makes sense that the company would want to invest in a sparkling-specific location and boost the level of efficient technology. According to Faust, when the custom crush facility first opened, they catered to more still-wine clients than sparkling. Today, with an annual case production reaching 1,700,000, nearly 70 percent of Rack & Riddle's business is in sparkling wine, estimated Faust.

Though she can't pinpoint an exact number, Faust said the custom crush facility maintains a couple hundred regular clients. And the client base is an eclectic mix, with a few wineries hailing as far east as New York, and petite producers creating just 100 cases of wine annually. "We love that, though, because we know a lot of times they'll grow into a 'bigger fish,'" Faust said. "And Rack & Riddle was really born from small producers."

In addition to assisting winemakers establish or maintain an existing sparkling wine program, Rack & Riddle provides what they call a "Private Label Program." "We lay down between 50,000 and 70,000 cases of sparkling wine made from vineyards we contract with, and clients can come in and personalize an already-made sparkling wine," Faust said, calling it an ideal solution for those interested in introducing bubbles into their winery's portfolio. The pre-made wines span the spectrum: bruts, blanc de blancs and Rosès, made with grapes from as broad a range as California designate to as specific as Napa or Sonoma County sub-AVAs.

"We'll do dose trials to come up with different levels of residual sugar to cater to customers' profiles. If they have a still wine they want to use for the dosage, our winemaking team can incorporate that, making the sparkling wine more personalized," Faust explained.

Rack & Riddle maintains an open door philosophy when it comes to winemaking involvement. Though there are those that take a hands-off approach, Faust said most are winemakers who want to be a part of, and learn about, the production process. For those who want to stay in the loop, Rack & Riddle utilizes **VinTrace**, a cloud-based system that allows clients to track their wines through the various stages of production. **WBM**

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# Rack & Riddle

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Owners/Principals	<b>Bruce Lundquist</b> , managing member <b>Rebecca Faust</b> , managing member <b>Mark Garaventa</b> , general manager <b>Penelope Gadd-Coster</b> , executive director of winemaking
Winemakers	Seven winemakers on staff
Year bonded	2007
Case production	1,700,000
Custom crush facility	Occupy two leased buildings in Healdsburg, both approximately 67,000 square feet each

## EQUIPMENT

Tanks	Santa Rosa Stainless Steel, <a href="http://www.srss.com">www.srss.com</a> Quality Stainless Tanks, <a href="http://www.qualitystainless.com">www.qualitystainless.com</a>
Cold stabilizer	Oenodia North America, <a href="http://www.oenodia.us">www.oenodia.us</a>
Glycol, tank heating/chilling	PolarClad Tank Insulation, <a href="http://www.polarcladinsulation.com">www.polarcladinsulation.com</a>
Punch-down devices	Pneumatic
Pump-over devices	Waukesha pumps and cap sprinkler
Pumps	Waukesha centrifugal
Presses	Diemme Enologia, <a href="http://www.diemme-enologia.com">www.diemme-enologia.com</a> Bucher Vaslin North America, <a href="http://www.bvnorthamerica.com">www.bvnorthamerica.com</a>
Barrels	Client determined

## TIRAGE LINE

Filler	Bertolaso, <a href="http://www.bertolaso.com">www.bertolaso.com</a>
Biduler/crowner	AROL North America, Inc., <a href="http://www.arol.com">www.arol.com</a>
Conveyer belt	MasPack Packaging USA, <a href="http://www.maspackusa.com">www.maspackusa.com</a>
Robotic bottle transfer	MasPack Packaging USA, <a href="http://www.maspackusa.com">www.maspackusa.com</a>
Riddling machines	Oeno Concept, <a href="http://www.oenoconcept.com">www.oenoconcept.com</a>
Neck freezer	Champagel—Duguit Technologies, <a href="http://www.duguit-technologies.fr">www.duguit-technologies.fr</a>
Dosage	Perrier, <a href="http://www.perrier.fr">www.perrier.fr</a>
Corker	Bertolaso, <a href="http://www.bertolaso.com">www.bertolaso.com</a>
Wirer	Robino & Galandrino, <a href="http://www.robinoegalandrino.it">www.robinoegalandrino.it</a>
Foil applicator and crimper	Robino & Galandrino, <a href="http://www.robinoegalandrino.it">www.robinoegalandrino.it</a>
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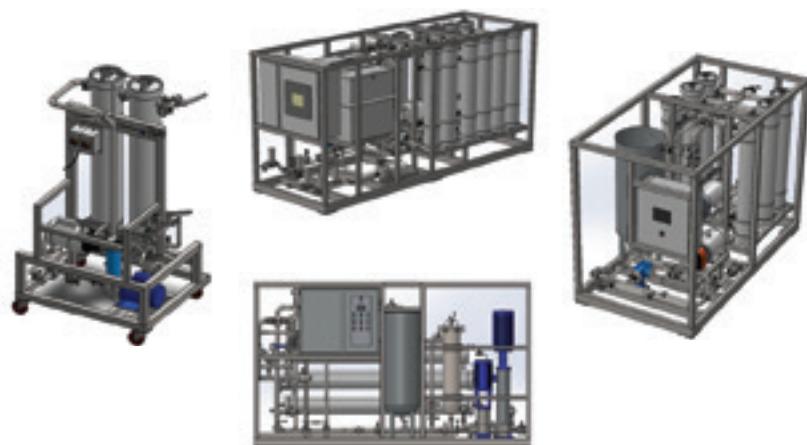
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