DataLase Solutions
for Laser Marking in the Wine Industry

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a SATO company

Introduction to the Problem

Served at family dinner tables, elite functions, and everything in between, wine is one of the most consumed beverages in the world.

Wine production has always been famous for its horticultural challenges: suitable grapes can only be obtained through careful monitoring of soil conditions, temperature, humidity, sunlight, watering, etc. As wine has evolved from a household good into a competitive forprofit industry, however, growers have increasingly faced another challenge: pressure to continuously cut costs to become ever leaner.

That pressure is most acute in the United States market. The US is estimated to be the largest national consumer of wine in the world (source: Forbes) and the market is still growing. From 2000 to 2015, US wine consumption has grown by 25.3% annually to a total size of 56 billion US dollars (source: Statista). Producers of wine have taken notice. Many wineries are continuously developing or acquiring new products to take advantage of growing demand.

New vintages introduce key resource management problems. Demand for wine often fluctuates and is especially difficult to forecast for recently-released varieties.

As a result, predicting sales for a particular wine can be extremely difficult—but is nonetheless critical to the winery. Sales forecasts are used to predict the number of labels needed for the following year, leverage those figures to gain economies of scale, and negotiate volume discounts to reduce the cost per label.

Sales forecasting is far from an exact science in the wine industry, which has led to high levels of inefficiency. Producers usually develop either a deficit or surplus of labels as any given year progresses. Deficits, which occur when demand outpaces forecasts, can increase costs to wine producers because resupplies entail rush label orders and purchasing at a low-volume cost point. Unwanted surpluses of labels, which occur when demand lags behind forecasts, leave wine producers with excess labels and preprinted vintage dates that must be scrapped and written off as losses.

The typical wine bottle carries two labels and these labels, on average, cost 6 US cents per label. Scaled to a full case, wine labels cost 1.44 US dollars for each case. If a wine producer produces 70 million cases per year, the winery would spend 100.8 million US dollars on labels alone. Due to uncertainties in forecasting, it is not uncommon for a winery to run an annual surplus of labels worth 2% of total sales volume for that year – equivalent to 2 million US dollars in value for this example.

Surplus labels cannot be reused later because they have been pre-printed with the vintage date—and would need to be thrown away.

In the inverse situation, where the winery is running a deficit of labels, the cost of additional labels can increase sharply beyond 6 US cents per label for short print runs. This cost can add up quickly depending on the shortfall amount.

Wine producers are also faced with SKU proliferation. In extreme cases, a winery can produce as many as 400 SKUs. The growth in the number of SKUs can be tied to multiple variables, most notably:

- The requirement to print labels in multiple languages, as per export regulations
- The requirement to print alcohol content percentage for each wine, as stipulated by the US Alcohol & Tobacco Tax and Trade Bureau (source: ttb.gov)
- The fact that alcohol content of wine can change over time naturally due to the fermenting process (as highlighted in Table A.)

The wine industry is seeking technology to improve flexibility and reduce the number of SKUs. Tightening SKUs, in turn, can lead to savings from improved production efficiencies (longer print runs), reduction in inventory, and scaling back of effort required to manage inventory against sales forecasts.

Table A:

Alcohol Content in Popular Wine Varieties		
Type	Alcohol content (g/100ml)	% Alcohol by volume
Sparkling Grape Juice	Trace	<0.1%
Wine Coolers	Varies over time	4-7%
Table Wine General	Varies over time	8-14%
Claret	Varies over time	6-10%
Shiraz	Varies over time	10-14%
Rose	8.6	10.5%
White Medium	8.7	10.7%
White Dry	9	11%
Red Medium	9.4	11.5%
White Sparkling	9.8	12%
White Sweet	10.1	12.4%
Barley Wine	10.2	10-15%
Cabernet/Pinot Noir	Varies over time	11-14%
Dessert Wine	Varies over time	14-20%
Zinfandel	Varies over time	17-22%
Vermouth	Varies over time	17-22%
Syrah	Varies over time	17-23%
Port Wine	Varies over time	20%

Source: alcoholcontents.com/wine

Excess inventory example with one SKU

Cabernet Sauvignon (SKU)

2018 Forecast of
12M bottles (1,000,000 cases)

24M labels ordered (2018 Vintage)
@ $.06/label x2 (front/back)
= $.12/bottle, $1.44/case,
$1,440,000 total in labels

Actual 2018 Vintage Cabernet
Sales of 11,760,000 bottles
(~23.5M labels) **surplas**
of 240,000 labels

240,000 unused labels
for 2018 Vintage Cabernet
SKU. @ $.12/bottle
= $28,800 loss

The Solution

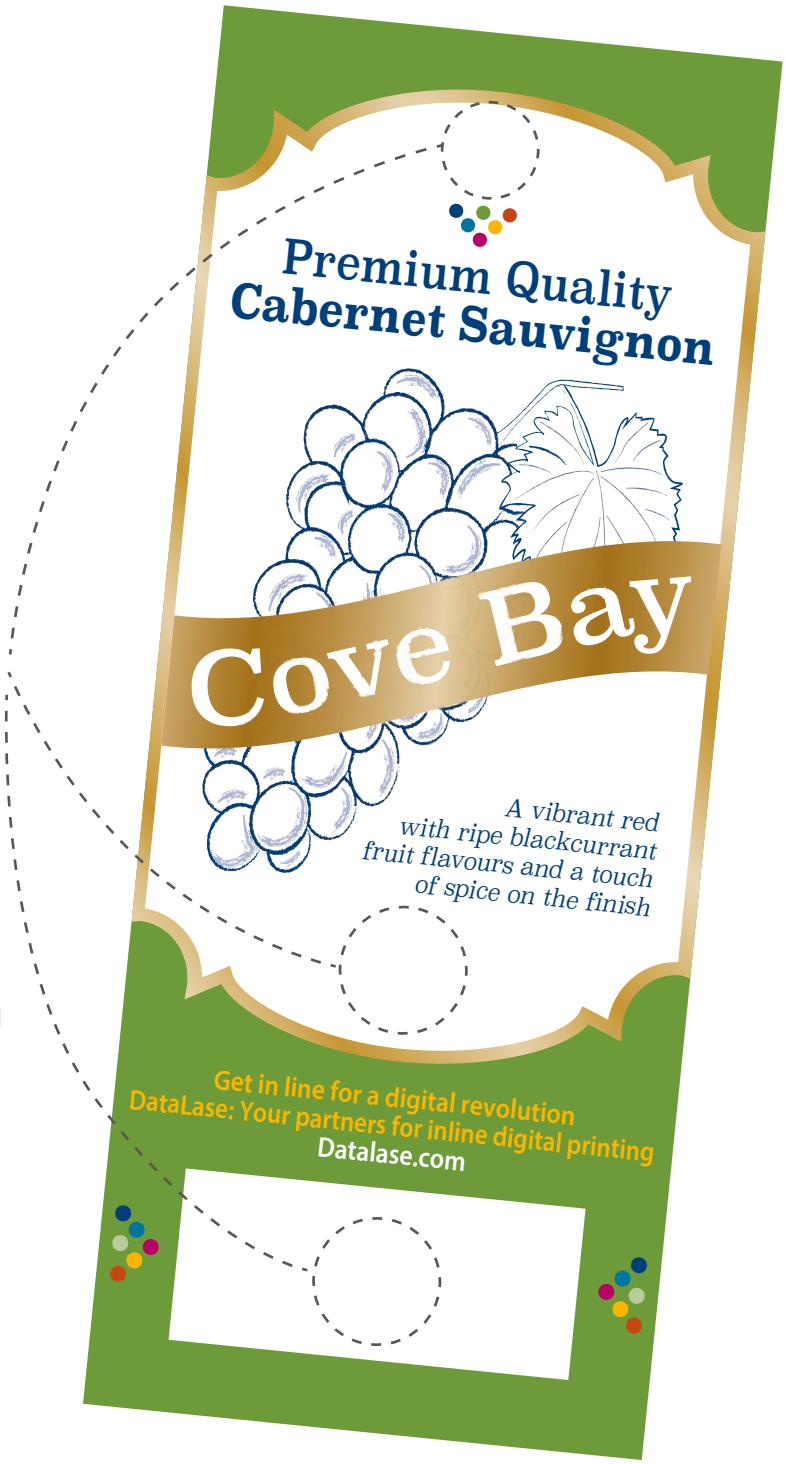
Today, wineries purchase labels pre-printed with the vintage dates, alcohol content, and graphics.

The print method used is conventional, typically lithographic offset or UV flexographic printing. The advantages of pre-printing are well known: quality is excellent and per-label cost is very low. However, pre-printing fundamentally cannot address challenges presented by the growth in SKUs, variability in alcohol content, and discrepancies between forecast and reality in a given year. When conditions change and preprinted labels lose their usefulness, operational efficiencies suffer.

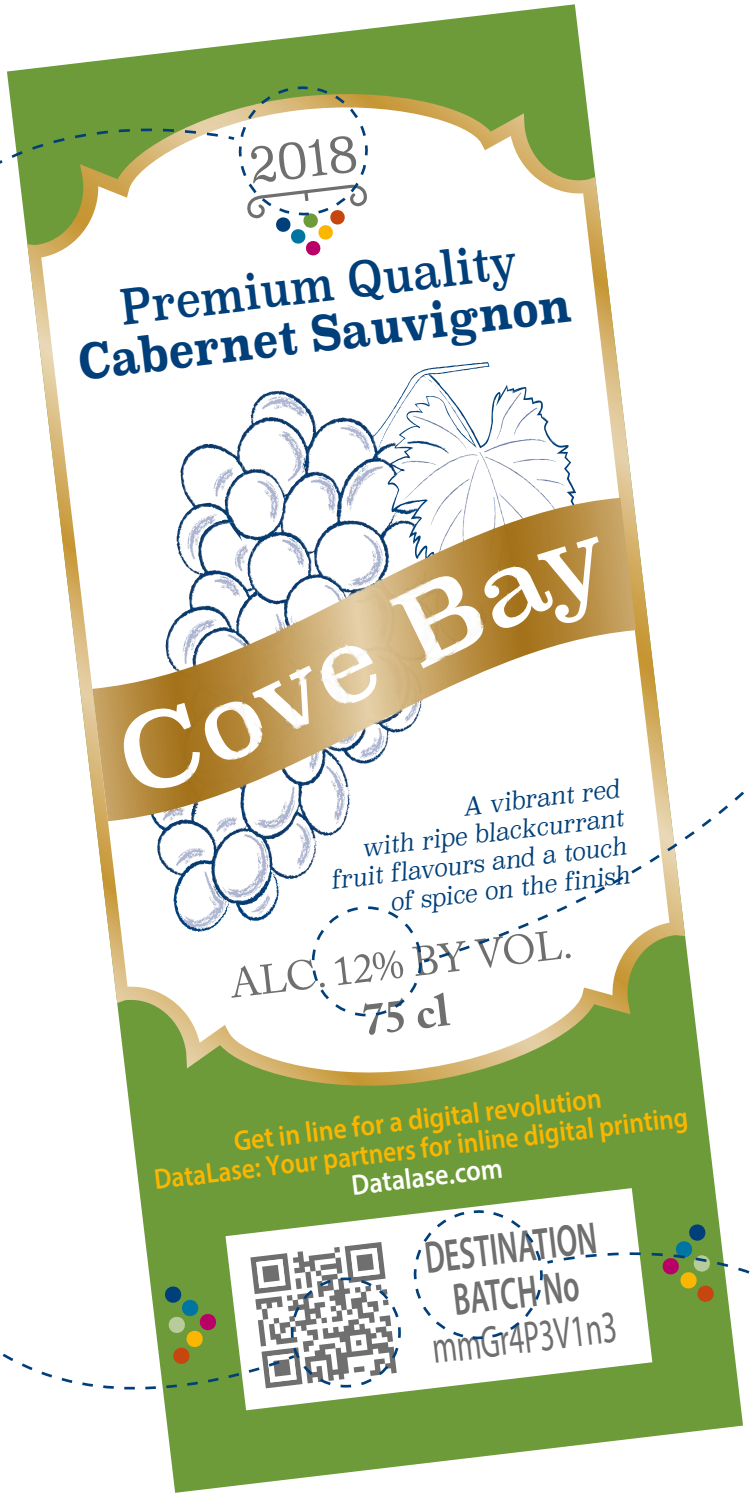
Laser in-line digital printing does address these challenges by combining the efficiencies of laser imaging technology with laser-activated coatings. Laser digital printing is a hybrid approach: a conventional method still prints graphics and artwork, but the variable information – vintage date and alcohol content, for example – is no longer inscribed on the printing plate. Instead, the conventional print method applies a patch (usually a rectangle or square) of laser-activated coating when the label is on press.

These patches appear as "blank" areas when the labels exit the press—the winery will add content to these areas later.

To add variable printing capability, the winery installs a DataLase laser array, either inside a bottle filling machine or on a labeling line. When the label passes through this equipment, the laser-activated coating on the label reacts to output from the laser array, forming areas of monochrome color. The laser array can digitally print vintage date, alcohol content, and other information on the label at high speed. When used in concert with laser-reactive coatings, the laser array is able to print variable information on 120-200 bottles per minute.



Wine label with laser in-line digital print



In-line printing of **vintage date** to reduce SKUs

In-line printing of **alcohol content** to meet government regulations and reduce SKUs

QR code for wine recipes, joint marketing with business partners, and other direct consumer interaction

In-line printing of language of destination to reduce SKUs

Lasers have already become the print method of choice for variable data in many sectors because of uptime (98.8% on average) quality (300dpi for typical applications) and speed (up to 5m/s line speed) (source: equipment manufacturers).

In the wine industry, laser adoption remains limited and the opportunities to grow leaner through the use of laser are considerable. The hybrid conventional-laser printing approach gives wineries maximum flexibility to add SKUs, modify stated alcohol content, and forecast label consumption with pinpoint accuracy. These features translate into cost-saving benefits, such as reduced inventory; shorter set-up times; simplified procurement; and reductions in label waste, purchase price, or both. Laser also offers wineries the ability to engage their consumers with more interactive and personalised messaging.

For more about in-line digital print solutions, please visit Datalase at www.datalase.com

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