

Clones of Classic Varieties:

The Pinot Noir Portfolio

“It’s a hard grape to grow – it’s thin-skinned, temperamental, ripens early. Pinot needs constant care and attention. It can only grow in these really specific, little, tucked-away corners of the world. And only somebody who really takes the time to understand Pinot’s potential can coax it into its fullest expression.”

The quote, of course, comes from the movie *Sideways*, when a quixotic character named Miles Raymond muses on why Pinot Noir is his ultimate wine. His conclusion: “Its flavours are just the most haunting and brilliant and thrilling and subtle and... ancient on the planet.”

That pretty much sums up Pinot’s enduring appeal, and New Zealand just happens to be one of the “tucked-away corners of the world” that can create magic with this idiosyncratic variety.

Burgundy is the natural home for clonal selection of Pinot Noir and, in contrast to selections for other varieties, the process has engaged viticulturists and winemakers for a very long time indeed.

Genetically unstable, a Pinot Noir parent vine may produce offspring that bear fruit that is nothing like the parent’s in the size and shape of the berry or cluster and will frequently even have different aromas, flavours, and levels of productivity. There are currently 43 clones of Pinot Noir listed in the Catalogue of Grapevine Varieties and Clones published by ENTAV-INRA® (the official French government agency responsible for selection work), but grapevine specialists have speculated that anywhere from 200 to 1,000 genetic variants may exist. By comparison, Cabernet Sauvignon has only 20 identifiable clones.

Clonal selection

While there are some very good examples of Pinot Noir wine made from a single clone, they tend to be the exception. Typically, winemakers will blend three to five clones to produce more complex wines. In some respects, this variety provides the most graphic demonstration of how bunch architecture and flavours have evolved over 40 years of clonal selection. When we embarked on our importation programme, three key factors played a role in our choice of accessions:



Pinot Noir ENTAV-INRA® Clone 943 at Riversun source block

- New clones of Pinot Noir had been registered by ENTAV-INRA® that were not yet available in New Zealand.
- New Zealand germplasm for this variety had suffered genetic degradation over time.
- Existing New Zealand source blocks did not allow traceability back to original mother vines.

Early clones

New Zealand’s importations of Pinot Noir clones began in the early 1960s, when government viticulturist Frank Berrysmith put Clone AM10/5 through quarantine. Selected by the Wädenswil Research Station in Switzerland, “Ten Bar Five” is responsible for most of the initial plantings of Pinot Noir in Otago, Martinborough and Canterbury. It has also been the source of some confusion due to the two distinctly different strains found in this country’s vineyards. Growers face some tough challenges, and that has prompted many in the industry to revisit the varietal and clonal mix in their vineyards.

In Martinborough, 10/5 is known as a vigorous and extremely upright clone with a narrow angle between the bunch and the stem – making the bunches relatively upright as well. In Central Otago, 10/5 is known as a moderately vigorous vine with a semi-prostrate habit and a much less upright bunch. In Canterbury, where the imported material was first planted, both forms are known.

It is uncertain which strain of 10/5 is the impostor, although Georg Fromm informed us that the Swiss clone held in Wädenswil is not upright and has a wide angle where the bunch joins the cane. Jean-Michel Boursiquot, ampelographer and former director of ENTAV-INRA® in France, observes that “the more upright clones are considered to produce inferior wines.”

Both versions are medium to high vigour, with medium to large bunches. Yields can be irregular. The upright clone is easy to manage: it requires only two sets of foliage wires and fewer wire lifts than the semi-prostrate strain or other clones of Pinot Noir.

The next wave

The 1970s witnessed a series of importations, largely from the University of California, Davis (UCD). The early UCD series, comprising Clones 5, 6, 13 and 22, provided winemakers with a new favourite – and UCD Clone 5 has gone on to become one of the mainstays of Pinot Noir winemaking in many regions of the world.

Like so many selections for this variety, Clone 5 has had a somewhat chequered history. An early addition to the Foundation Plant Services collection at UCD, the clone originated in France, where it was collected from the Château de Pommard in Burgundy by Dr Harold Olmo at UCD's Department of Viticulture & Enology.

His original selection, Clone 4, tested positive for Rupestris Stem Pitting associated Virus (RSPaV). Although the virus is not particularly damaging or economically significant, Clone 4 was nonetheless put through thermotherapy to remove the virus, and subsequently became Clone 5 and Clone 6. Ironically, those clones were also removed from the register, after once again testing positive for RSPaV – but not before they had begun making their way around the winemaking world. While not widely planted in California, Clone 5 was embraced by the fledgling Oregon Pinot Noir industry, and somewhat later was imported to New Zealand by Bill Irwin in 1976.

Clone 5 plus Clone 6 and, to a lesser extent, Clone 13, were widely used in the next wave of Pinot Noir plantings in New Zealand, which occurred in the late 1980s. While there are still some plantings of Clone 6 (more so in Otago than other regions), Clone 5 proved a real winner, and it has become a favourite part of the mix in most vineyards today.

Clone 5 is described as having a “prostrate” growing habit (as are most Pinot Noir clones). This makes the canopy a little more difficult to manage, and many growers now use three sets of foliage wires for control. Yields are typically on the medium to high end of the scale and they're regular – Clone 5 normally sets fruit well. The bunches are medium to large, and often tight, which makes Clone 5 a bit more susceptible to Botrytis than either 10/5 or the Dijon clones. Fruit thinning is normally required to achieve top tier wines.

New Zealand's own

Another 1970s accession, the Abel selection comes complete with a colourful and uniquely New Zealand pedigree. Back in the 1970s, a Kiwi traveller returning from France (rumoured to be a Rugby player) tried to bring in cuttings illegally – legend has it that the material was tucked into his gumboot. The cuttings – reportedly taken from the fabled vineyards of Domaine de la

Romanée-Conti in Burgundy – were confiscated by a New Zealand customs officer named Malcolm Abel, a winemaker in his own right. Understanding the significance of the smuggled plant material, Abel paid for it to be put through quarantine at Te Kauwhata (accession number TK01022). Vines were first planted out in Abel's vineyard in Kumeu, but a young winemaker named Clive Paton worked a vintage with Abel, and some of the vines found their way to Paton's Ata Rangī vineyard in Martinborough.

Clive Paton and the Ata Rangī team have always rated the Abel selection highly, and many of their original award-winning wines were made solely with Abel grapes. Care needs to be taken when sourcing Abel material because the original vines at Ata Rangī were not marked, and, over time, some of the vines became infected with Grapevine Leafroll-associated Virus 3 (GLRaV-3), which is an economically significant disease.

Abel is a fertile and productive selection, so cropping levels need to be regulated, especially in the establishment phase. Vines can easily be overcropped, but to produce good wine yields must be controlled. The Abel selection has more vigour than the Dijon group of ENTAV-INRA® clones, and tends to mature later. Bunches are relatively large and cluster weights are on the heavier side for this variety.

The Dijon clones

The selection process for this family of clones was overseen by Professor Raymond Bernard, who was affiliated with the Dijon ONIVINS research station and the experimental vineyard in the Côte 'Or in the early 1980s. Now registered as ENTAV-INRA® clones, this group comprises clones 113, 114, 115, 667 and 777 – often these clones carry a “B” prefix (as in B777), but we're not sure whether that refers to Bernard or Burgundy.

B115 was the first of these imported by the New Zealand Grapevine improvement Group in 1988. “Triple Seven” and clone B113 were imported to New Zealand by Martinborough Vineyard, and clones B114 and B667 were imported at the same time by the Wairarapa Grapevine Improvement Group. The plant materials came directly from Professor Bernard (they were released from quarantine in 1992). Today, such accessions flow through ENTAV-INRA® and then on to their licensees (Riversun currently holds the sole New Zealand license for ENTAV importations).

In the case of Clone B777, Martinborough Vineyard contracted a nursery for propagation and grafting, and the scion was grafted onto two different rootstocks, one of which was later found to be infected with Grapevine Leafroll-associated Virus Type 2 (GLRaV-2), known to be associated with graft incompatibilities, bunch structure and fruit set.

From the initial plantings at Martinborough, budwood for B777 formed the basis for all source blocks throughout

New Zealand, with distribution through the Wairarapa Grapevine Improvement Group. In 2003, Dr Roderick Bonfiglioli and Linnaeus Laboratory discovered that some of this source material tested positive for GLRaV-2. By that point, however, Clone B777 had probably suffered further genetic degradation, since the GLRaV-2-infected scion wood had in the meantime been grafted onto other rootstocks, some of which may have carried minor viruses such as RSPaV and Grapevine Fleck Virus. There is also clear evidence of clonal mix-ups from the early release phase: in the mid 1990s, there were no scion wood blocks or nursery certification systems in place to ensure traceability was accurately maintained throughout the propagation process.

The viral history of B777 may have a bearing on the clone's somewhat inconsistent performance throughout New Zealand. It was certainly one of the reasons Riversun Nursery decided to re-import ENTAV-INRA® Clone 777 and other clones in the Dijon group. We wanted to re-establish trueness to type to the clonal level by way of absolute traceability to the original mother vines in France.

The Riversun portfolio

A visitor walking the rows of Pinot Noir planted side by side at our source block is quite literally walking through the history of clonal selection for this variety. Bunch architecture remains fairly consistent until one reaches the later selections for the Dijon group: ENTAV-INRA® Clones 667 and 777. At this point, bunches start to get smaller and reach a dramatic conclusion with ENTAV-INRA® Clone 943, which has a high percentage of small berries (not hen and chicken, just smaller berries), smaller bunch weights and slightly more open clusters. Flavours seem more intense and sugar levels are higher, too: ENTAV-INRA® lists sugar levels as highest in clones 777, 828 and 943, followed by clones 114, 115 and 667. Some of the imports, notably ENTAV-INRA® clones 667 and 777, seem to achieve ripeness slightly earlier than previous imports of these same clones.

Several visitors to our source block earlier this year commented that they have assessed single-clone wines made from ENTAV-INRA® clone 828, describing the wines as by far the most complete clonal wine in terms of flavour. They stated that ENTAV-INRA® clone 943 shows even greater potential, based on its performance at the source block.

Also of note is the Australian Clone MV6, which is used extensively in the Mornington Peninsula. MV6 originates from selection work conducted at the Griffith Viticultural Research Station. It is considered as the Australian "workhorse" for Pinot Noir wines, and is often credited for the consistency of wines produced in Mornington. It is reported to be slightly later to harvest, and has comparatively low crops.

All of the clones mentioned in this article are planted in adjacent rows at our Gisborne source block, and comparisons are based on the data we have collected at the block since vines began bearing fruit in 2007.

Each winegrowing region that produces Pinot Noir tends to have its own preferred clones, although they generally include a percentage of the Dijon clones, UCD Clone 5 and Abel. Riversun's newer clones have recently been planted in commercial vineyards, and we look forward to seeing their impact on the future of New Zealand Pinot Noir.

ENTAV-INRA® Clone 114

- Origin: Côte d'Or, Burgundy
- Medium fertility and bunch weight, fruit set can be irregular
- High sugar potential
- Yields slightly lower than the average, and potential degree of alcohol is slightly higher
- Tighter bunches than 667 and 777
- Classic Pinot Noir flavour profile of black cherry, lovely spice, good skin structure and tannins



ENTAV-INRA® Clone 115

- Origin: Côte d'Or, Burgundy
- Medium fertility, regular fruit set, medium vigour
- High sugar potential, low production
- Tighter bunches than 667 and 777, slightly more acid
- Very juicy raspberry essence, good crunchy skins
- Highly valued clone for balance and aromatic richness



ENTAV-INRA® Clone 667

- Origin: Côte d'Or, Burgundy
- Medium fertility, regular production of small bunches, about the same size as 777
- Slightly shorter cycle, with earlier maturity than some clones
- High sugar production
- Black glaze cherries, rich, spicy, bark, and sensuous flavours with sweet tannins



ENTAV-INRA®

Clone 777

- Origin: Côte d'Or, Burgundy
- Slightly bigger bunches than 828 with some variation in berry size
- Regular production, with earlier maturity than some clones
- High sugar production
- Slightly less flavour than 828, although still offering lovely ripe juicy black fruit



ENTAV-INRA®

Clone 943

- Origin: Côte d'Or, Burgundy
- Smaller berries, nice small bunches, slightly more open
- Lowest production potential, with medium fertility, and significantly higher sugar content
- Great flavour intensity, with red berry fruit



ENTAV-INRA®

Clone 828

- Origin: Côte d'Or, Burgundy
- Has GLRaV-2 (Red Globe Variant), which can cause graft incompatibilities
- Grafting trials on 12 main NZ rootstocks almost complete, release imminent
- Slightly better set than Clone 943, with medium fertility, small bunches and small to medium berries
- High sugar production, with earlier maturity than some clones
- Generous and full-flavoured with blackberry, plum and good acidity; high polyphenol content



Australian Clone MV6

- Origin: Selection made at Griffith Viticultural Research Station
- Compact, small bunches (smaller than UCD 5), somewhat variable, but not tight
- Less productive than Abel and UCD 5
- Small berries, skins quite tough, with good acidity
- Good supple flavours and making good wine in Australia



By Nick Hoskins and Geoff Thorpe

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