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Equipment evolution: Sorting

Simon Nordestgaard

The Australian Wine Research Institute, PO Box 197, Glen Osmond (Adelaide) SA 5064, Australia

Corresponding author's email: simon.nordestgaard@awri.com.au



Sulfiting reduced the need to sort out slightly rotten grapes

Sulfiting before ferment was only introduced in the early 1900s. Ventre (1929) reports that with modern sulfiting and yeasting practices, sorting is not as important as it once was.



Sorting out damaged grapes is critical in Champagne if colourless juice is to be pressed from dark-skinned varieties

Sorting to remove unripe or diseased grapes has likely been practised by high-end wine producers for as long as wine has been produced. The most well-known historical example is the story of the Benedictine monk Dom Pérignon in Champagne and his insistence on the removal of damaged grapes.



Renewed interest in sorting

The prevalence of sorting increased considerably in the 1990s. The damp vintage of 1992 resulted in particularly widespread adoption of sorting in Bordeaux. Labour for manual sorting is costly, manual selection can be poor and product wastage high. This motivated the development of automated sorting solutions.



Belt and vibrating tables

These devices facilitate hand sorting by spreading material and presenting it to workers. Sorting may be performed before and/or after destemming. This contrasts with the automated technologies shown, which are only used after destemming.



Two-stage vibrating

Juice is drained in a first stage and grapes fall between large slots/prongs in the second stage. Stems/petioles bounce off the end. First patent in 1988.



Two-stage vibrating + air-jet

An air-jet blows away some further materials (leaves, smashed grape skins, etc.) after they fall through the second stage prongs of the vibrating table. Vaucher-Beguet c. 2004.



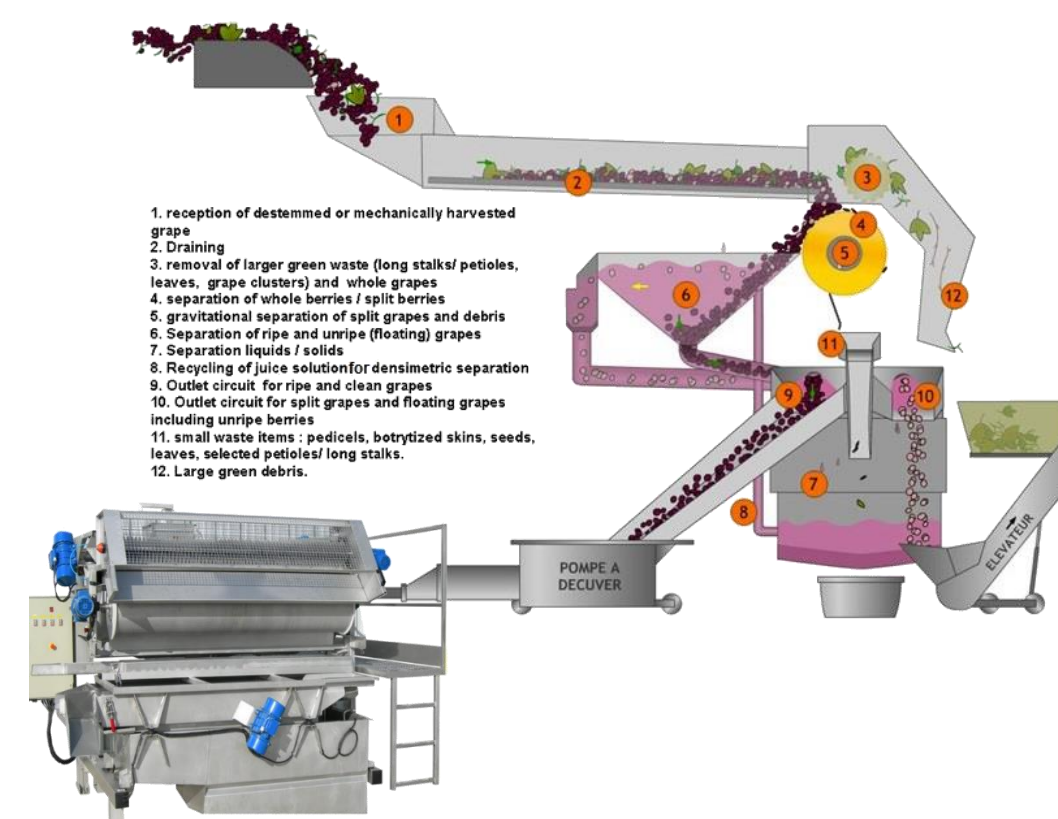
Fast-belt fed air-jet

To achieve higher throughputs, pre-drained materials are accelerated and spread using a fast-belt. Material is subjected to the air-jet as it leaves the belt. The waste is blown to a different trajectory. Bucher-Vaslin c. 2013.



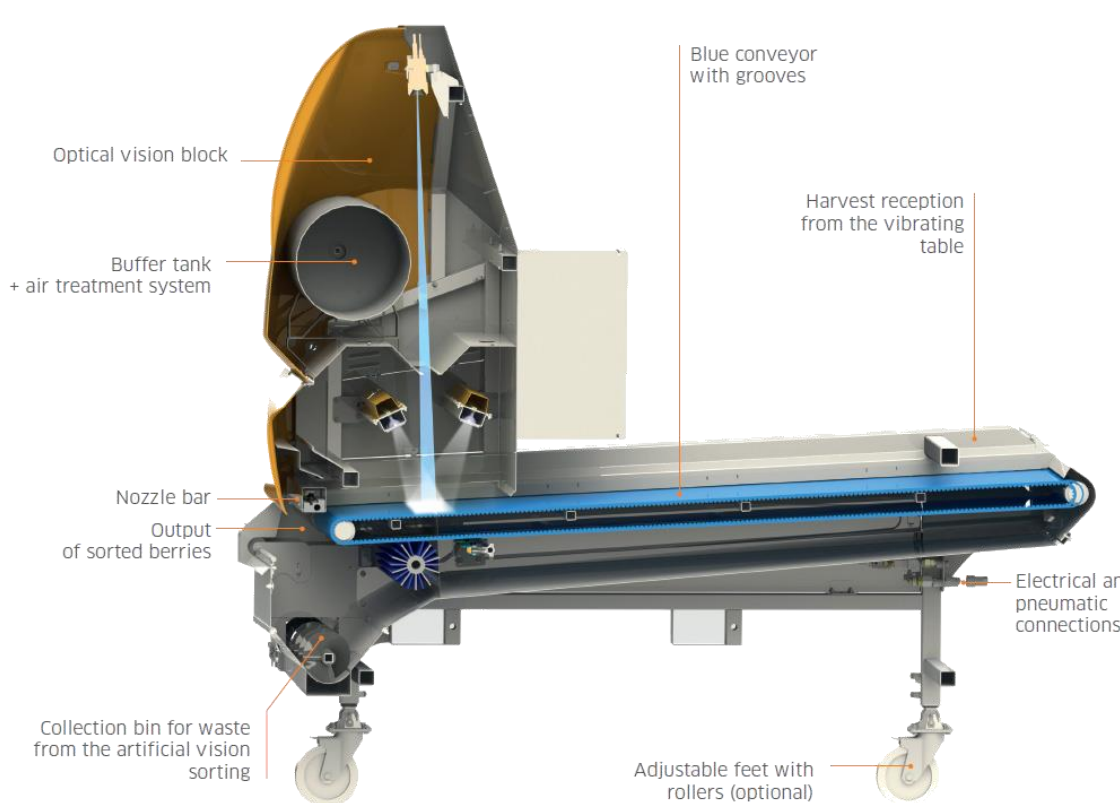
Roller sorting

Grapes fall between rollers, while petioles and stem fragments travel across and fall off the last roller as waste. Initial tight-rollers on some models help to align petioles so that they do not fall through with grapes, and also allow the removal of free seeds and small waste. Introduced by Pellenc c. 2008 as part of their new shaking destemmer but many standalone models are now available.



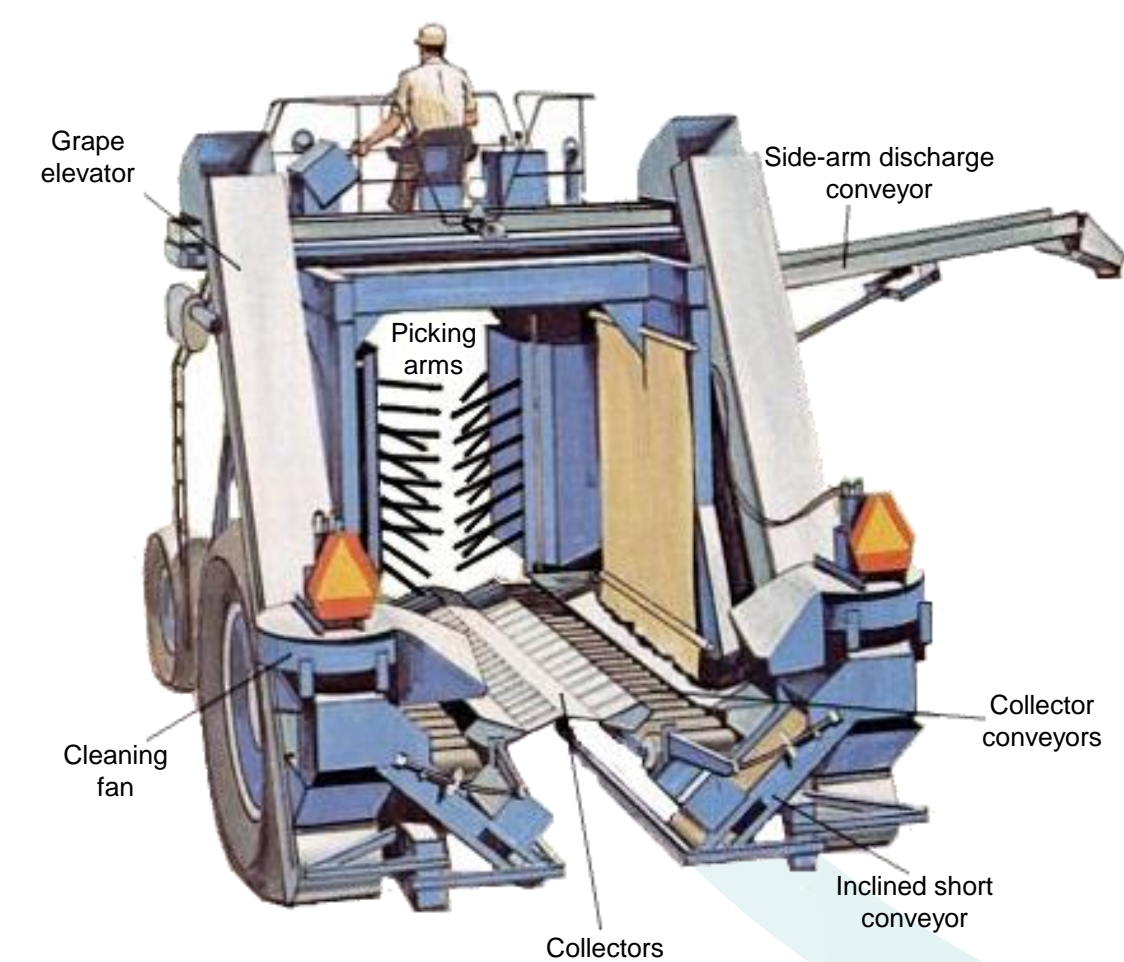
Density bath

Following several initial mechanical separation steps, ripe grapes sink while unripe grapes float in a recirculating sugar or juice solution of set density. Amos Industrie c. 2005.



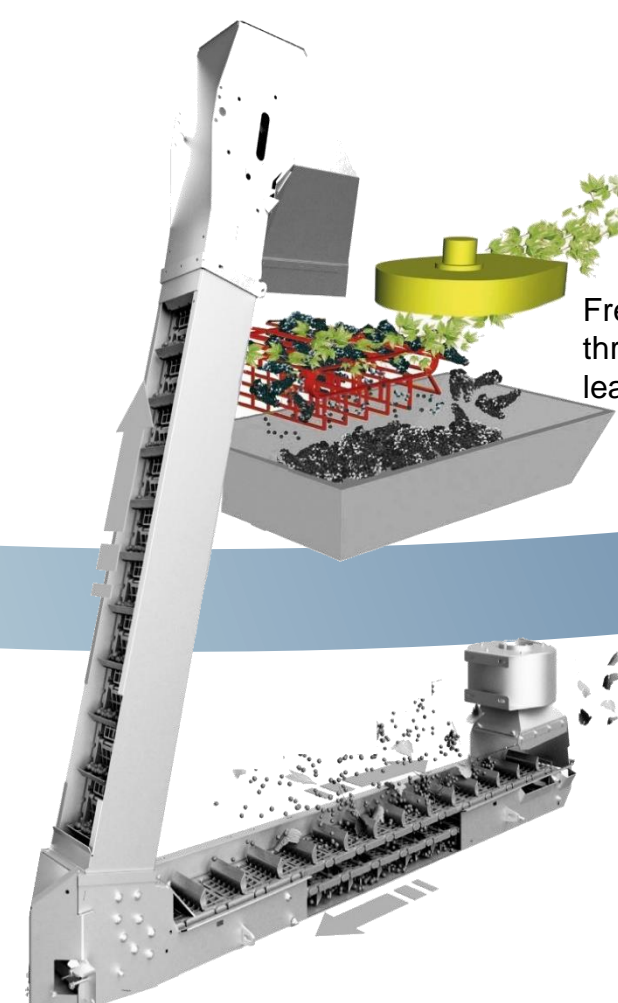
Optical

After pre-draining, material is spread and imaged and defects are ejected by air nozzles spaced across the device. Optical sorting offers more flexibility than other devices because it is software-based. Commercially available in the wine sector from c. 2008 but used in other industries much earlier.



Harvesters prevent and perform some sorting

Mechanical harvesters remove the ability for a person to perform hand sorting while picking. However, they feature some sorting in the form of cleaning fans to remove leaves. Commercially adopted from the early 1970s.



Grid conveyor fan sorter

From c. 1999 Pellenc has offered a grid sorter at the top of the conveyor to facilitate better leaf removal (and to a much lesser extent removal of detached stems and petioles) without juice removal. This has now been adapted to the whole conveyor loop (as shown above) such that it applies to the lower fans as well.



Focused sorting after destemming

With the advent of on-harvest destemming, sorting technologies able to remove contaminants other than just leaves were adopted. This included roller sorters from c. 2008 on Pellenc harvesters and air-jet sorting from c. 2013 on Braud harvesters.



- Sorting grapes for red wine production in Australia is likely to become more prevalent as producers seek to premiumise (more sorting is performed overseas).
- Shaking winery destemmers with in-built roller sorting will be adopted more widely for hand-picked grapes. Optical sorters will increase in prevalence as their price reduces and performance increases.
- Machine harvesters with on-board destemming and sorting will also be more widely adopted as a cost-effective means of sorting machine-harvested red grapes while they are in their most intact condition.

Reference: Ventre, J. 1929. *Traité de vinification. Pratique et rationnelle. Volume 1.* Montpellier: Librairie Coulet.

Other sources include: de Castella (1911), Robinson (2006), www.matevi-france.com, and many equipment suppliers.

Disclaimer: Simplified summary only. There are variations with country, region, scale, wine style and between equipment brands. Equipment often co-exists and independent data on relative performance is often limited. Information should not be considered as an endorsement or dis-endorsement of any product or brand by the AWRI.

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