Equipment evolution: Destemming

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“One question has long divided farmers: To destem or not to destem?”

Jean-Antoine Chaptal et al. (1801)

Destemming

- Ferments are easier with stems
- Stems make pressing easier

Destemming

- Stems occupy press/fermenter space
- Stems can add astringency/greenness

Batch

Grapes are detached from stems by a beater. Stems need to be periodically removed from the drum. Mid 1800s.

Continuous

Bead elements modified to continuously convey stems from the drum. Destemmer is typically integrated underneath a roller crusher. Late 1800s.

Rotary

Must pumps instead of gravity wineries

The introduction of the must pump in the early 1900s meant wineries no longer needed expensive buildings across multiple levels. However, if grapes were not destemmed some pump designs could block.

This practical consideration was likely a major driver in the wider uptake of destemming.

Vibrating

Destemming partially by vibration of beater shaft. This allows slower beater rotation speed and less berry/stem breakage. Armbruster c. 2006.

Shaking

Grapes are detached gently from stems by shaking. This is typically followed by roller sorting. First introduced by Pellenc c. 2008.

Finger wheel

Finger wheels spinning in same direction as a grid conveyor detach grapes from stems. The action is more gentle than a typical rotary destemmer. Socma c. 1999.

Table screen

Bunches are raked across the screen and the grapes fall through.

Harvester as a partial destemmer

Mechanical harvesters leave many stems on the vine. The vegetal matter content is reduced from around 7% with hand-picking to around 1-2%. Commercially adopted from the early 1970s.

- Winery shaking destemmers with in-built roller sorting will likely become increasingly adopted for hand-picked red grapes.
- Harvester-mounted destemmers (& sorters) will increasingly be used for red but not white grapes (because of potential skin maceration).
- As harvester-mounted destemmers (& sorters) improve they may start to also be applicable to higher yielding vineyards.
- Total destemming will continue to be the most common practice but there will always be some debate on the topic.

Harvester-mounted destemmer

Full destemmed added to machine harvesters. Initially rotary destemmers, then linear destemmers that fit neatly above dual on-board bins such as the Socoma finger wheel. Braud c. 2002.

Side-arm compatibility

Most harvester-mounted destemmers were originally only compatible with on-board bins. On-board bins are inefficient in long row vineyards because half-way along a row the bin might be full, and the operator then needs to go to the end of the row to empty it. More models compatible with side-arm discharge conveyors are now being released.

References: Chaptal J.A. et al. 1801. Traité théorique et pratique sur la culture de la vigne, avec l’art de faire le vin, les eaux-de-vie, esprit-de-vin, vinagres simples et composés. Paris: Delulian fils.

Other sources include: Darimelhaq (1855), Müller (1930), Payne et al., (1943), Peyraud (1951, 1988), Rosè (1990), Thudichum and Dupré (1872) and many equipment suppliers.