# Improved Filtration for Hybrid Varieties

**Michael Sobe, Erbslöh Geisenheim GmbH**

There is a long tradition in the wine industry of using enzymes to degrade grape pectin.

A large part of the pectin molecule can be split by specific enzymes - pectinases - which include polygalacturonases, pectin methyl esterases and pectin lyases. These enzyme activities primarily affect certain sections of pectin, however, known as the smooth regions, that predominantly consist of polygalacturonic acid chains that are partially esterified with methanol. The pectin macromolecule's structure is much more complex, though, also containing the strongly branched, or hairy, regions, that are characterised by side chains consisting of a variety of other sugars, primarily arabinose and galactose.

An increased presence of those side chains makes the processing of hybrid varieties particularly difficult.

Arabinogalactan II (AGII) here represents the pectin fraction which can be degraded only to a very limited extent with conventional wine pectinases and is therefore responsible for clarification and filtration problems.

In Trenolin® FastFlow DF, Erbslöh offers a highly concentrated wine enzyme that has been developed specifically for this use. It can be added at crush, but also later in the wine stage to improve filterability and clarification. Trenolin® FastFlow DF is a combination of various classic pectinase activities, such as polygalacturonase and pectin lyase, with a novel enzyme activity: arabinogalactan II-hydrolase (AGIIH). AGIIH can split the hairy regions and allows significant improvements in colloid degradation, and therefore in the processing properties of juice and wine.

The influence of the individual enzyme activities in Trenolin® FastFlow DF on grape pectin degradation was investigated in a laboratory test on Concord grapes. This grape variety is especially difficult to process from a technical viewpoint as it has a tough skin and contains a lot of hairy pectin. The batch was analysed using gel chromatography. Degradation of a large part of the pectin into small cleavage products was clear to see (Fig. 1). A proportion of the macromolecular fraction proved to be pectinase resistant, however. Sugar analysis of the hydrolysed fraction predominantly resulted in galacturonic acid, proof of the strong effect on smooth pectin, polygalacturonan. The unsplit pectin fraction consisted exclusively of arabinose and galactose-containing pectin, arabinogalactan II. The second enzymation stage was to investigate subsequently the effect of AGIIH. For this, the pectinase-resistant pectin fraction was isolated and reset to the natural concentration. After treatment with AGIIH a gel filtration analysis was carried out again (Fig. 2). The complete remaining polymer fraction was split enzymatically into the monosugars arabinose and galactose. Enzymation with classic pectinase and AGIIH led to complete degradation of the total grape pectin.For the winemaker this means, increased filtration rates and better clarification properties in wines from pectin-rich grape varieties.

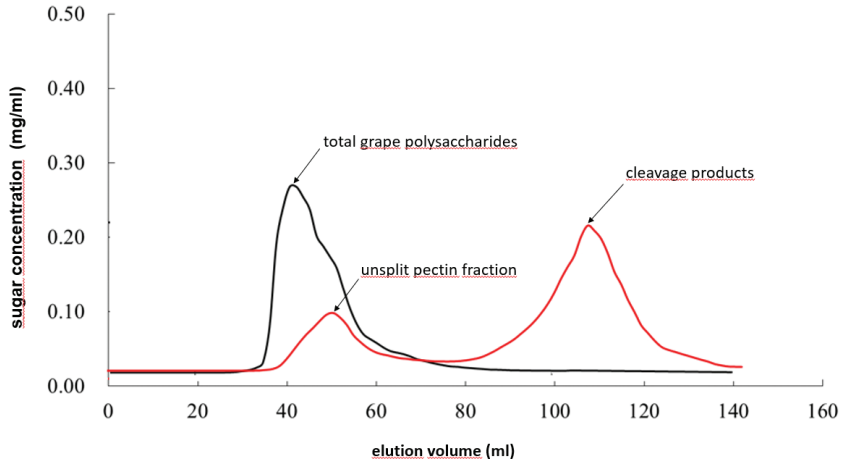


Figure 1: Enzyme effect of a classic wine pectinase on grape total pectin. The black graph shows the sample before enzymation, the red graph the sample after enzyme treatment.

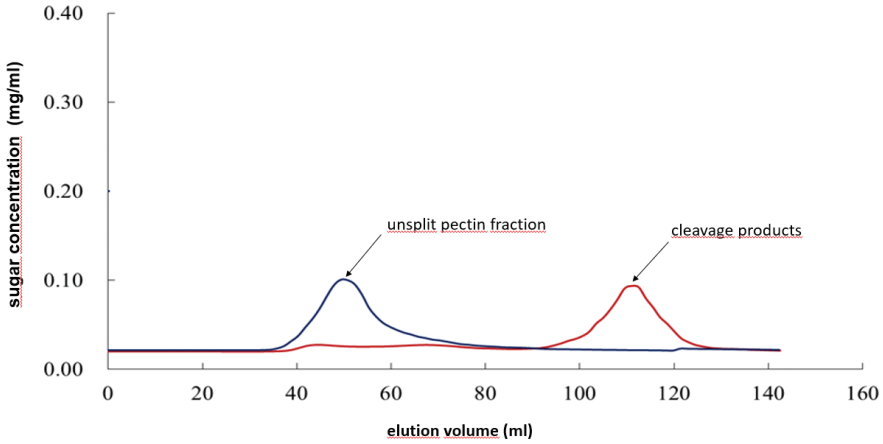


Figure 2: Enzyme effect of AG II hydrolase on the pectinase-resistant fraction of grape pectin. The black graph shows the sample before enzymation, the red graph the sample after AG II hydrolase treatment, which led to a complete degradation of the pectinase-resistant fraction.

ERBSLÖH
Progress is our future