

EXTENDED ABSTRACT

Optimizing vine pruning of Pinot noir and Müller-Thurgau after extreme hail damage

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ABSTRACT

Context and purpose of the study. Climate change is contributing to an increased frequency and intensity of hail events, leading to significant economic losses in viticulture. Hail damage adversely affects both yield and grape quality, while also injuring latent buds, thereby complicating winter pruning works—particularly in pruning systems with long canes, such as the Guyot system. Damage to buds and wood can have carry-over effects, negatively impacting vine productivity in the subsequent growing season. While mitigation strategies such as insurance and anti-hail netting are available, their high cost often limits widespread adoption. Within this context, winter pruning emerges as an helpful adaptive practice, enabling the regulation of bud load and the optimization of yield potential, thus enhancing vineyard resilience to climatic variability.

Material and methods. Following two hail events in June and July 2021, a study was implemented during the winter pruning season of 2022 at the Agroscope station in Wädenswil (Kanton Zürich, Switzerland) on the Pinot noir and Müller-Thurgau grape varieties. The objective of the trial was to assess the impact of different pruning methods on the yields, duration of vineyard works, and must quality.

Four pruning techniques were tested: two cordon methods (short with three buds and long with four buds per spur), a simple Guyot, and a double Guyot. The experimental design included five randomized blocks with four repetitions for each grape variety. Measured variables included yield, the duration of various vineyard works (pruning, cane tying, de-budding, and harvesting), the percentage of bud break, as well as qualitative parameters (oechsle, acidity, yeast-available nitrogen).

Results. The results showed a different impact of the various pruning techniques on the two grape varieties. Yields were increased for Pinot Noir with both cordon variants, while no significant difference was observed for Müller-Thurgau. Costs were reduced for the cordon variants, mainly because no additional cane tying was necessary. No notable influence was observed between the different pruning variants on the qualitative parameters. Our results demonstrate that it is feasible to adopt a cordon pruning method for one year when vine damage is severe and there is a risk that many of the hail-affected buds may fail to break in the spring. This ensures that there are enough shoots for the following year and allows for choice when it comes to de-budding.