Crop cultural measures to control bunch rot in integrated viticulture

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Grape bunch rot might cause:

- yield reduction
- organoleptic defects
- premature aging
- low wine quality
- mycotoxine contamination
- reduced N contents in must

Could crop cultural measures represent efficient tools to control bunch rot?
Crop cultural measures

A. Cluster-zone leaf removal

B. Cluster division
Crop cultural measures

A. Cluster-zone leaf removal
A. Cluster-zone leaf removal

Cluster-zone leaf removal on the northeast-exposed sides of the canopy

**Varieties:**
- S. blanc (2009)
- Auxerrois (2009)
- Pinot gris (2010)
- Riesling (2010)

**Leaf removal dates:**
- BBCH 57, 63, 68, 73, 77, 81
A. Cluster-zone leaf removal

Cluster-zone leaf removal
→ improved sun and wind exposure
→ less dense cluster structure
A. Cluster-zone leaf removal

The graph shows the disease severity (% of leaves affected) over different leaf removal (BBCH-Code) stages for four different grape varieties: S. blanc, Auxerrois, Pinot gris, and Riesling. Each variety is represented by a different color:
- S. blanc: Green
- Auxerrois: Red
- Pinot gris: Grey
- Riesling: Yellow

The y-axis represents disease severity in percentage, and the x-axis represents the leaf removal (BBCH-Code) stages from Control to 81. Error bars indicate the standard error. The data is based on 4 * 100 clusters.

n = 4 * 100 clusters; error bars = standard error.
A. Cluster-zone leaf removal

Sauvignon blanc, 29.09.2009

Control

Leaf removal
BBCH 73
A. Cluster-zone leaf removal

Equation type: $y = e^{(x-x_0)}$

Disease severity (%)

Assessment date (day of the year)

Riesling, 2010

Control

Leaf removal BBCH 77

Potential prolongation of the maturation period

$R^2 = 0.990; p = 0.0004$

$R^2 = 0.997; p < 0.0001$

Crop cultural measures

B. Cluster division
B. Cluster division

Cluster division

→ Elimination of dense parts in the middle of compact grape clusters
B. Cluster division

2 varieties
- Pinot gris
- Riesling

2 seasons
- 2010
- 2011

5 division dates
BBCH 57  BBCH 73  BBCH 77  BBCH 79  BBCH 81
B. Cluster division

Control = 100%

B. Cluster division

Control = 100%

B. Cluster division
B. Cluster division

Kontrolle    BBCH 57    BBCH 73

BBCH 77    BBCH 79    BBCH 81
B. Cluster division

Cluster-zone leaf removal and cluster division represent efficient crop cultural measures to control grape bunch rot.

Both enable a reduction of pesticide input and can be incorporated in organic as well as in integrated grape protection strategies.

Further, the induction of a delayed bunch rot epidemic allows for a longer maturation period and a higher potential wine quality.
Thank you very much for your attention!
A. Cluster-zone leaf removal

Cluster-zone leaf removal between bloom and bunch-closure

- Reduced assimilation
- Less/smaller berries
- Less dense cluster structure
  - Faster drying processes
  - Improved sun/wind exposure
  - Induration
  - Improved pesticide adsorption
  - Reduced bunch rot
B. Cluster division

Bunch rot disease severity

BBCH stage at cluster division date

57  73  77  79  81