

# Green berries on *Gewürztraminer* (*Vitis vinifera* L.) in South Tyrol, Italy

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## Introduction: New putative ripening disorder?

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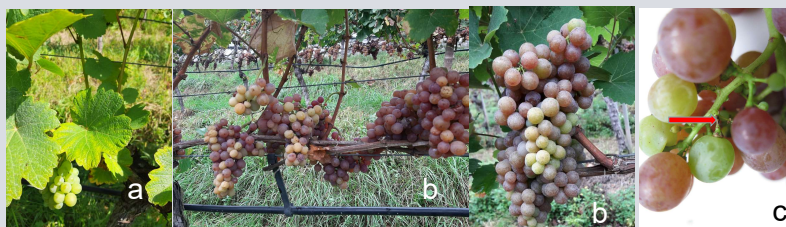
The grape variety *Gewürztraminer* is known to be affected by the two physiological disorders berry shrivel and bunch stem necrosis. In 2014 a new symptomatology of ripening disorder was identified on the variety. The new symptom is characterized by a differentiation of maturation stages of berries within the bunch. Rather than a homogenous ripening, some berries remain at a soft but green stage through harvest. The widespread distribution of these green berry symptoms across different production sites of South

Tyrol has negatively impacted wine berry and wine quality due to the difficulty in eliminating the unripe berries from the bunches prior to harvesting. Therefore, the Laimburg Research Centre began to investigate the causes and origins of this new symptom. This work shows the results of first attempts to find the symptom's causes, as well as the resulting approach to symptom mitigation. Applications of magnesium leaf fertilizer showed the first promising results against this putative disorder.

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Picture 1: Symptoms of magnesium deficit on leaf (a), bunches (b) and rachis (c) of *Gewürztraminer*.

## Methods

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To study the causal effect of the green berries, 30 symptomatic vineyards were selected for monitoring during the 2016 vintage. To evaluate the effect of foliar nutrient treatments, two vineyards were selected for the application of a two magnesium-based products: the more commonly used magnesium sulphate, and magnesium chloride as an alternative.

Leaf and berry nutrient analysis, as well as analysis of principle quality parameters during ripening, were performed. From the moment green berry symptoms became evident, incidence and severity was rated on a scale of 0 to 5 (Table 1) over 100 bunches per treatment replication.

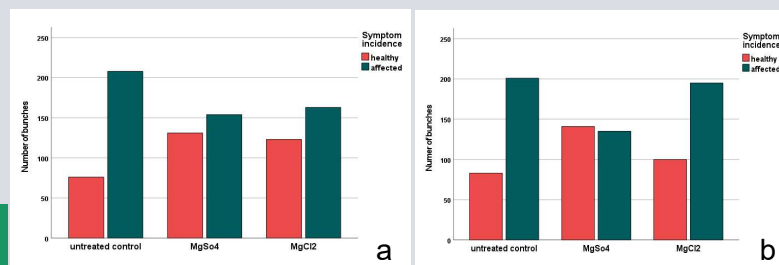


Figure 3: Symptom incidence at harvest of 2020 (a) and 2021 (b)

## Results:

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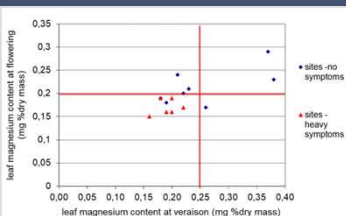


Figure 1: Leaf nutrient analysis of 14 experimental vineyards in 2016

Classes	Percentage of „green berries“ per bunch
0	none
1	0-3%
2	4-10%
3	11-25%
4	26-50%
5	51-90%

Table 1: Class designation for symptom severity evaluation

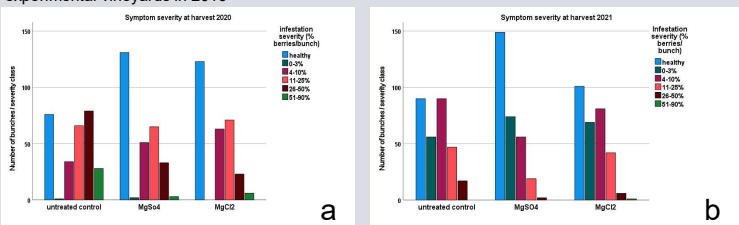


Figure 2: Symptom severity at harvest of 2020 (a) and 2021 (b)

## Discussion

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Most of the symptomatic vineyards of the 2016 monitoring showed light to clear magnesium deficit symptoms on their foliage (Figure 1). Green berry symptoms (Picture 1 and 2) were only found in the vineyards treated with leaf fertilizer during the 2020 and 2021 vintages. Both vintages showed a significant effect of the magnesium treatments to reduce the incidence (Figure 3) and severity (Figure 2) of the symptoms. These results indicate that “green berry” symptoms on *Gewürztraminer* may be correlated with a disturbed uptake of magnesium by the vines.



Picture 2: Symptoms of magnesium deficit on bunches of *Gewürztraminer*.

The “green berry” putative physiological disorder is symptomatically similar to that of “berry shrivel” and is still not entirely understood. This study's two years of field trials showed promising results of symptom mitigation with magnesium leaf fertilizers to stabilize the Mg/K ratio. We could not detect clear differences between the easy available and registered sulphate- and the chloride bound magnesium formulation. Therefore, we propose to use the standard magnesium sulphate version.

Further studies would help gain an understanding of amount of necessary applications and their timing.