# Effect of Nitrogen Management on Souvignier Gris Wine Quality

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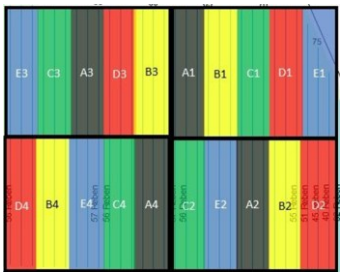
## Introduction

- **Nitrogen** is a key element in **aroma compound** formation and fermentation; Agroscope recommends a YAN > **140 mg/L** for must (white varieties).
- Nitrogen deficiency **negatively** affects wine quality, leading to **stuck fermentation** and **aromatic defects**, such as wet grass, reduced fruit and atypical aging aromas and bitterness.
- **Context:** Souvignier gris, a robust grape variety, is known to produce musts with low YAN levels and was planted on a plot characterized by low nitrogen availability.
- **Goal:** Test different strategies in the vineyards and in the cellar with the goal of increasing YAN to the recommended level.
- **Research question :** Which vineyard strategies increase YAN in musts most effectively and how do they compare to in-cellar supplementation? How do all strategies affect fermentation rate and aroma profile?

## Methodology

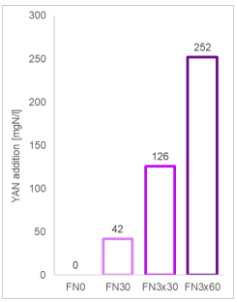
- Vineyard: Wädenswil AU, Switzerland
- Grape Variety: Souvignier gris, rootstock 3309, planted 2016
- Soil Analysis (Nmin, NH4+, NO3- Ntot), Must analysis (Tot Acitidty, YAN, Oechsle), Thiols, Sensory Analysis.

**Vineyard strategies 2022-2024**




Foliar, Organic fertilizer, Seeded greencover crop, Mechanical tillage, Control

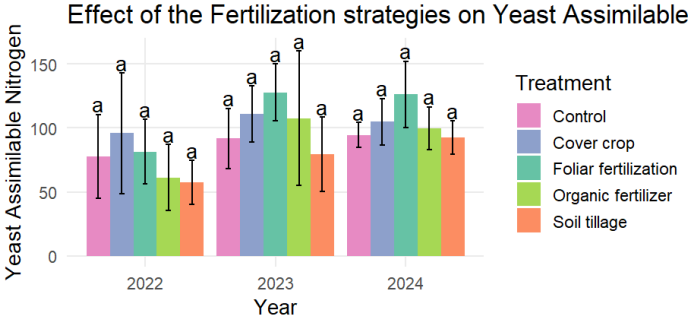
**Cellar strategies 2021-2024**



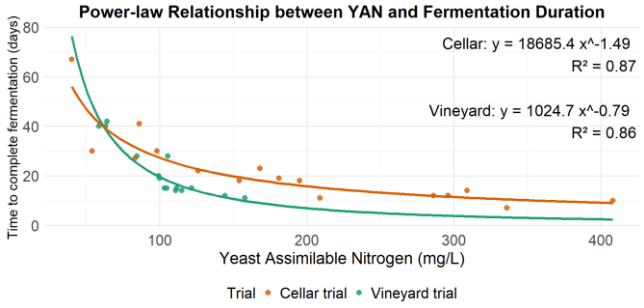

Product : VitaFerm Ultra
- FN0: no added yeast nutrition
- FN30: 1x addition of 30 g hl$^{-1}$
- FN3x30: 3x addition of 30 g hl$^{-1}$
- FN3x60: 3x addition of 60 g hl$^{-1}$

- Randomized block design – 5 treatments, 4 repetitions
- One fermentation per modality (100 L) and year

## Main Results & Discussion

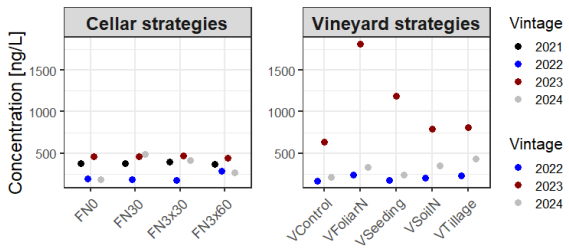



- Vintage has an important effect on YAN levels due to hetereogeneous climatic conditions.
- Foliar fertilization achieved recommendations in 2023 and 2024, but the effects were not statistically significant




- Higher YAN levels reduce fermentation time.
- Vineyard strategies were more efficient in nitrogen use during fermentation and more effective in preventing sluggish fermentation.

**3MH Concentration by Strategie and Vintage**




- 3MH concentration varies with vintage as seen with YAN values.
- 3MH increased the most under vineyard management strategies, particularly with foliar fertilizer applications.
- 4MMP showed low or no detection in most cases.

Summary: Nitrogen management in the vineyard promotes quicker fermentation and enhances the production of characteristic aromatic compounds (3MH) in Souvignier gris. Nitrogen additions in the cellar can provide support, but they have a lesser impact.

Agroscope gutes Essen, gesunde Umwelt

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