

FOLIAR APPLICATION OF SPECIFIC INACTIVATED YEAST TO ENHANCE THE VARIETAL AROMA PRECURSORS ACCUMULATION ON CV. TRAMINER



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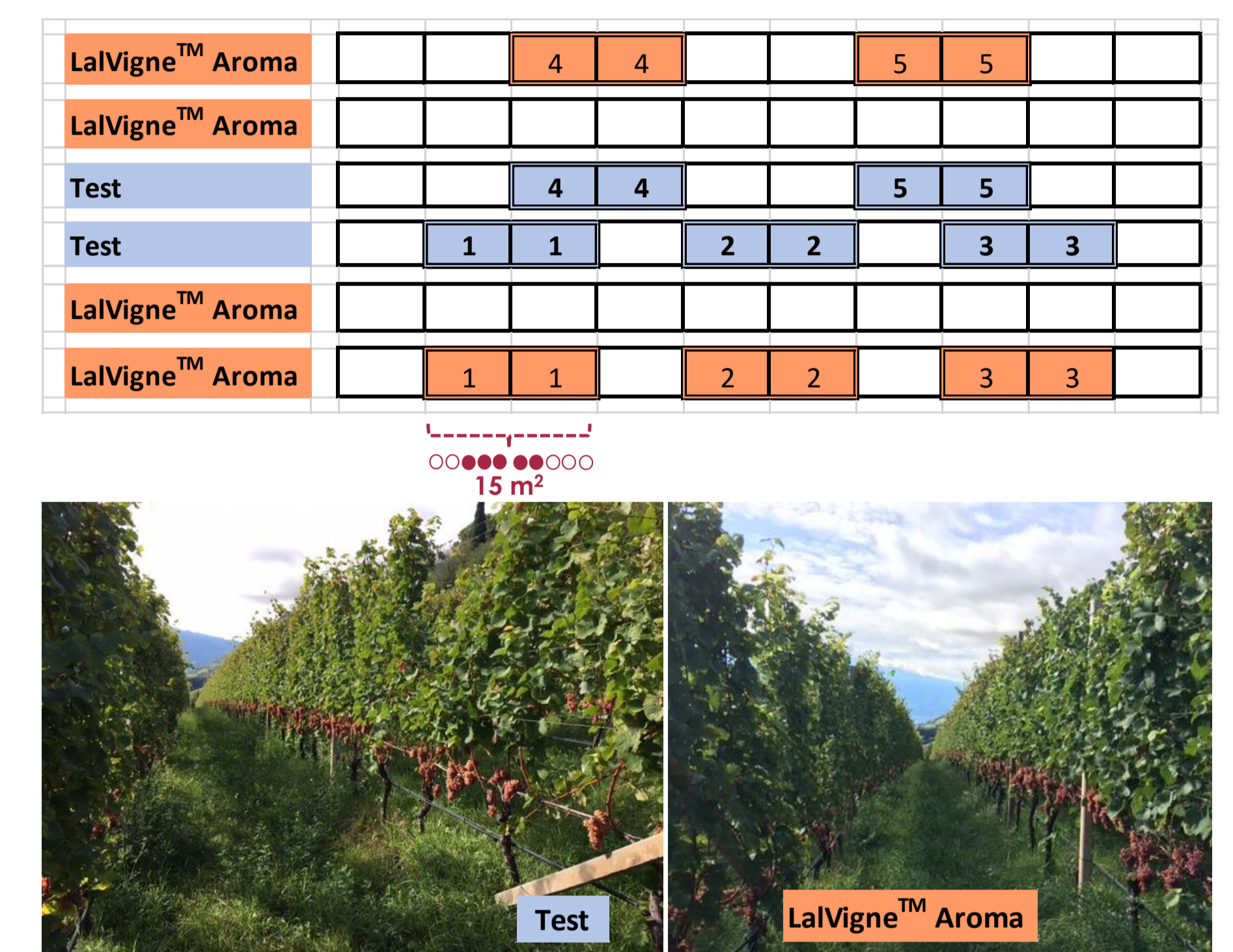


Background

The production of grapes with a balanced composition is one of the main goals that agronomists and oenologists pursue to produce premium quality wines. The gap between technological (sugar/acid ratio) and aromatic maturity is expanding due to the increasing temperature and lack of rainfall during the ripening phase, as registered in the last twenty years. In order to face these changes, winegrowers try to apply agronomical practices that can counteract these effects, although when used in a nonselective way, may promote unwanted results on grape quality and yield.

Material and methods

In three consecutive years 2017, 2018 and 2019 an evaluation was conducted on the elicitor effect of the foliar application of specific inactivated yeast (non-GMO) *Saccharomyces cerevisiae* (LalVigne™ Aroma, Lallemad Inc) on the vine's secondary metabolism, monitoring the aroma precursors accumulation. The trial was carried out in Northeastern Italy at 'Sella di Termeno' (BZ), at 450 m a.s.l. on a natural terrace, in a vineyard planted in 2010 with Traminer/SO4. Vines were trained to Guyot (1.90 m x 0.80 m). Two theses (Test, and LalVigne™ Aroma) five times replicated, in plot of 15 m² were tested.



The application of the specific inactivated yeast was performed according to the producers guidelines, by spraying the product LalVigne™ Aroma in two foliar treatments at 3 kg/ha each, the first at the beginning of veraison and the second ten days later. At harvest, measurements were taken to assess the effect on yield and grape quality, evaluating especially the effect of the treatment on biochemical parameters, free and glycosylated aromatic precursors in grapes with GC/MS. Organoleptic characteristics of the wines obtained with microvinification (in 2017 and 2019) were tested too.

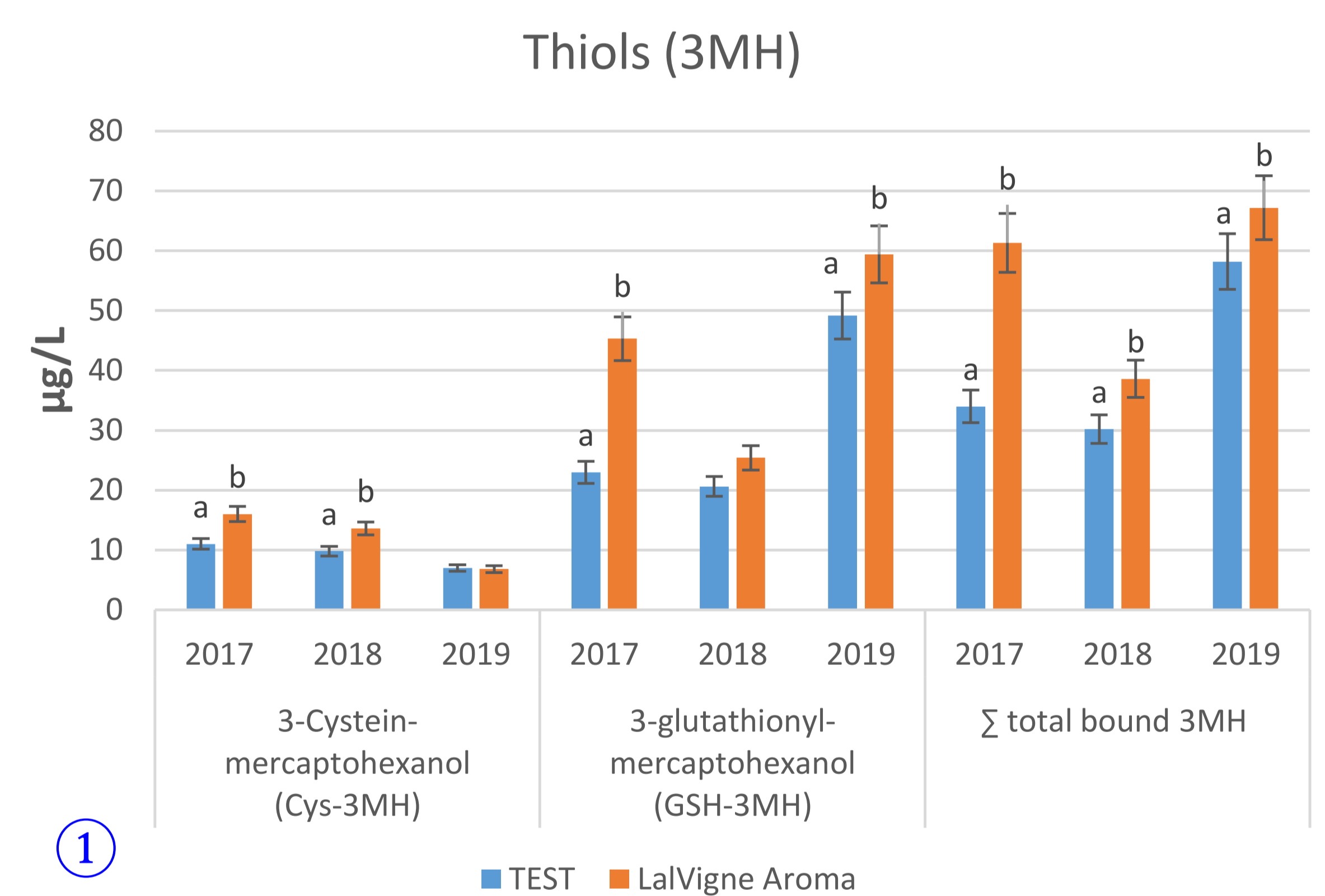
Results and discussion

In the three studied vintages there was no effect of the treatment on yield (n° of clusters/vine, kg/vine, average berry weight, bud fertility) and biochemical parameters (sugar, titratable acidity, malic acid, tartaric acid, pH, and potassium). Only a weak effect was recorded for YAN (Yeast Available Nitrogen), that increased with the treatments of LalVigne Aroma.

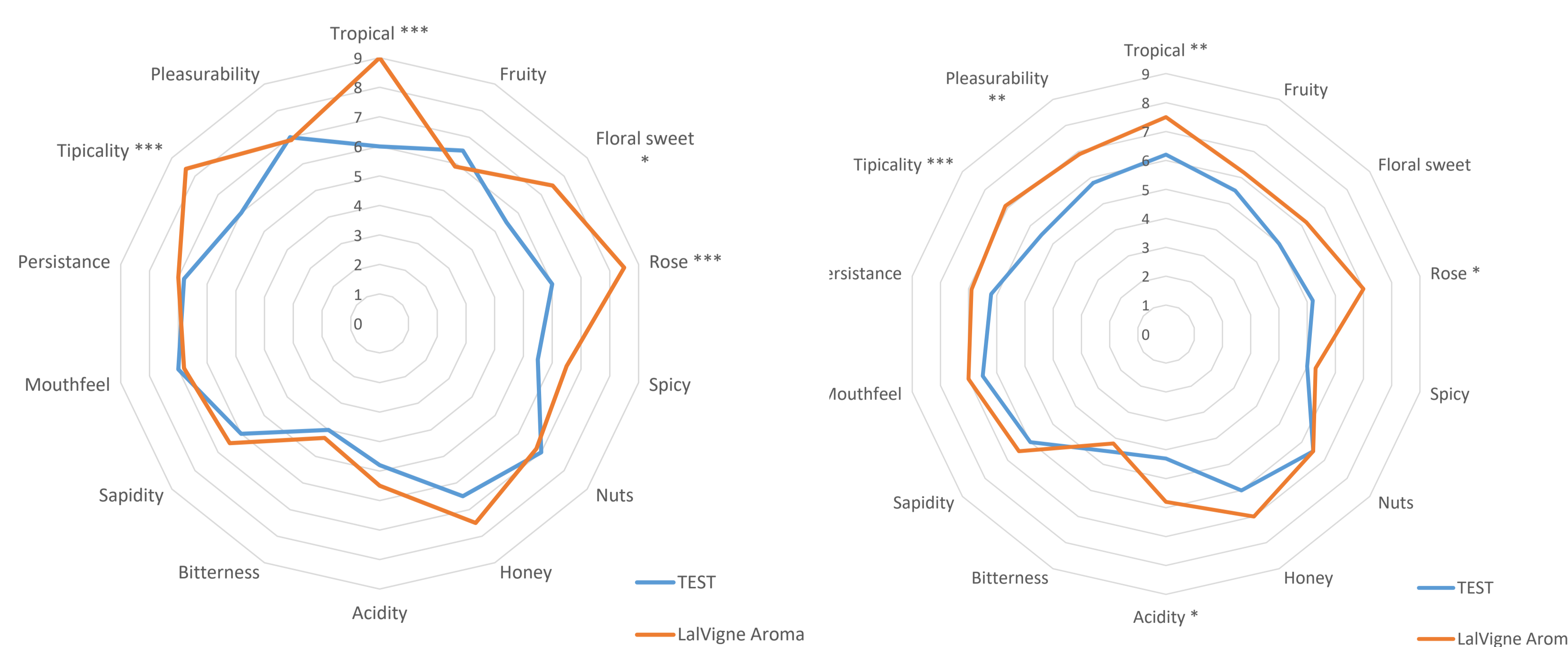
A significant impact on the aroma precursors was observed every year. In particular those compounds responsible for the aromatic typicality of Gewürztraminer, like 3MH and some terpenes were more affected by the treatment. 3MH precursors (graph 1), bound with cysteine and glutathione, responsible for grapefruit and passion fruit flavours were 30% higher (average of the three years) in treated vines than in the control.

A similar trend was observed for bound forms of monoterpene alcohols C₁₀H₁₈O, like geraniol and nerol (graph 2) responsible for sweet rose flavours. Their content increased 20% (average of the three years) in treated grapes; the bound form of methyl ester of salicylic acid (flavour of wintergreen) had an increase of 100% with the treatment, and benzyl alcohol in the free form - C₆H₅-CH₂-OH (flavour of jasmine) showed values 40% higher than the control.

The organoleptic evaluation of the wines (2017 and 2019 – graph 3 and 4) confirmed the analytical results and highlighted how the wines treated were judged to be more typical and varietal.



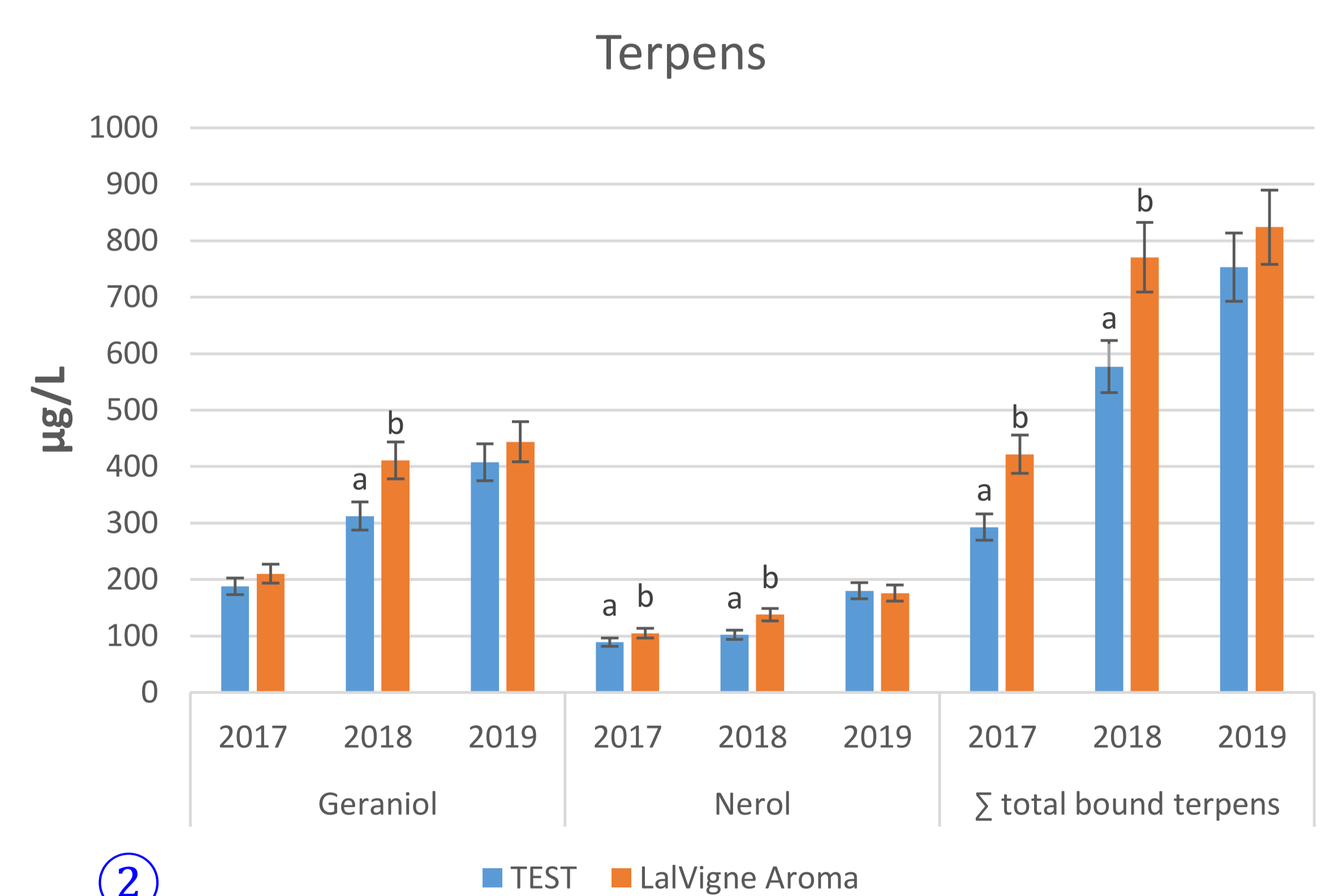
① Comparison of the content of thiolic precursors present in grapes treated with LalVigne™ Aroma and control. Different letters indicate significant differences with values of p < 0.001.



③ Year 2017

④ Year 2019

Sensory profile of Gewürztraminer wines in both modalities (control and treated with LalVigne™ Aroma). (* indicates an organoleptic difference with p < 0.05, and *** is p < 0.001).



② Comparison of the content of Geraniol and Nerol precursors present in grapes treated with LalVigne™ Aroma and control. Different letters indicate significant differences with values of p < 0.001.

Conclusions

The results confirm that the foliar application of the specific inactivated yeast can be used in order to reduce the gap between technological and aromatic maturations. The application of this product is an efficient agronomic tool able to modify the secondary metabolism of the vines related to aroma precursors, increasing the varietal expression, without affecting sugars, acids and pH. The obtained results strongly show this positive impact of LalVigne Aroma in preserving the balance of the grape composition and increasing its varietal typicality.