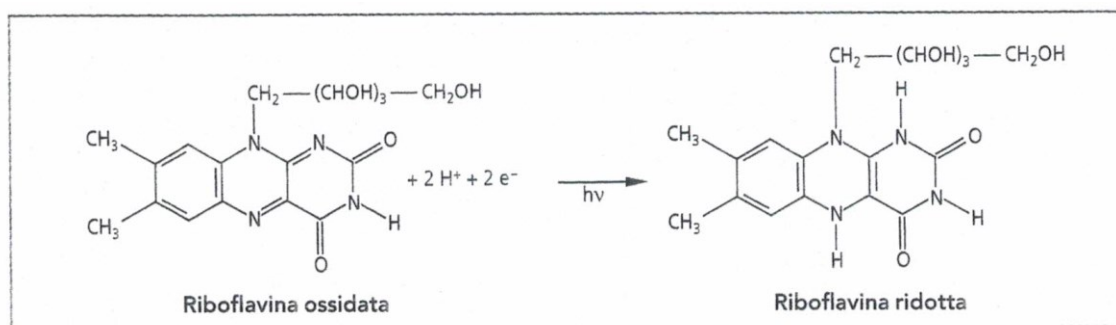


THE LIGHT-STRUCK TASTE: CAUSES, PREVENTION AND ELIMINATION.

The light-struck taste is a defect that is prevalent in white and rosé wines that are bottled in clear glass and are exposed to light for a considerable amount of time. This defect is manifested by a loss of colour and aroma.

Fig. 1 Photochemical reduction of Riboflavin.



This defect is mainly due to Riboflavin (Vitamin B2) photosensitivity. When Riboflavin is exposed to certain wavelengths, 370 and 440 nm, it degrades rapidly following diverse photochemical reactions. These reactions, at the same time, trigger other reactions like the oxidative photodegradation of sulphur containing aminoacids and, in particular, methionine. The final products of this reaction are sulphur containing volatile compounds (methanethiol and dimethyl disulphide) with very low thresholds in wine. The aroma impression of these compounds is often described as cabbage, wet wool, onion or garlic.

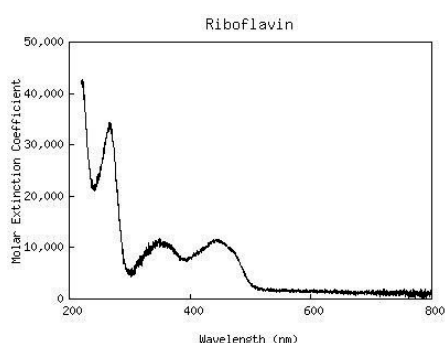


Fig. 2 Absorption spectrum of Riboflavin.

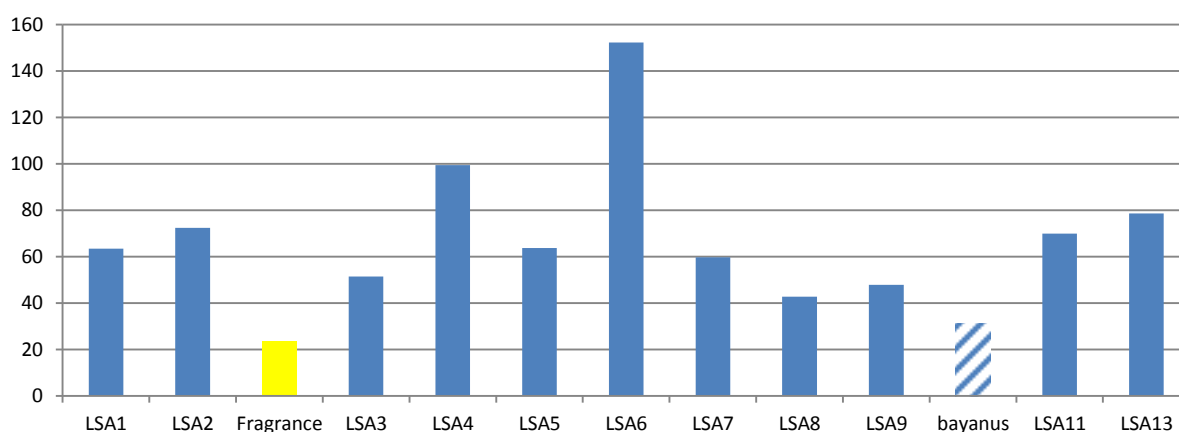
The photochemical alteration of the redox system also leads to the occurrence of sudden changes of colour, a phenomenon known as *browning*, linked to oxidative processes involving chromatic compounds.

The problem is complex and needs to be managed in the winery intervening in particular steps of the winemaking process. We have identified four significant steps where special attention is needed.

1. ALCOHOLIC FERMENTATION – YEAST STRAIN

Riboflavin is mainly produced by yeast during the alcoholic fermentation and so, it is important to use a low riboflavin producing yeast strain. **Fervens Fragrance** is a yeast strain with high-level enological characteristics and it guarantees a very low production of Riboflavin (average between 15-30 ppb). There is a second strain, *bayanus*, which also produces low levels of riboflavin will be available in the coming future.

Fig. 3 Riboflavin production (in ppb), during alcoholic fermentation, by different yeast strains.

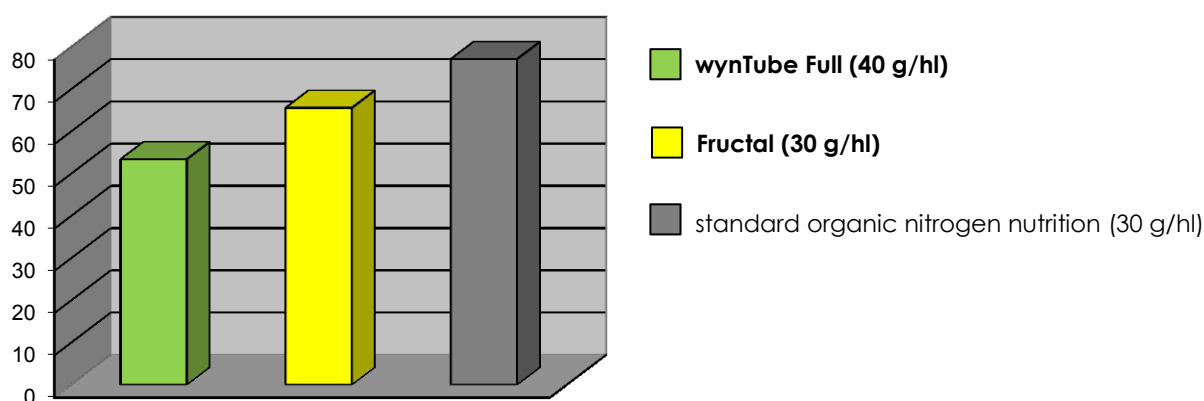


2. ALCOHOLIC FERMENTATION – NUTRIENTS

Recent results have also demonstrated how the different types of nutrients affect the riboflavin production by yeast (contributing to the increase of the final riboflavin concentration by more than 20 ppb) and the concentration of methionine. Particularly, when an organic nitrogen nutrition is wanted, it is important to choose products with a low concentration of riboflavin and S-containing amino acids.

WynTube Full and **Fructal** are new generation fermentation nutrients that guarantee the best organoleptic expression limiting the increase of the compounds responsible for the light-struck taste.

Fig. 4 Nutrient effect on the riboflavin content (in ppb) at the end of the alcoholic fermentation (FAN of all test has been brought to 200 mg/L).

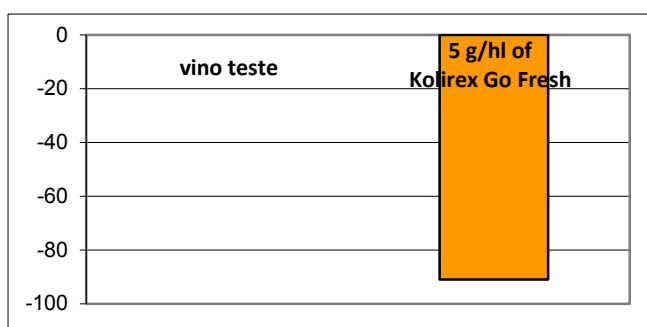


3. CLARIFICATION

The intensity of the light-struck taste and the probability to find it in the bottle depends on the riboflavin concentration that has been degraded by light radiation.

Dal Cin R&D has developed a specific clarifying agent, **Kolirex Go Fresh**, in order to extremely reduce the riboflavin concentration of wine. A proper management of the alcoholic fermentation will allow the use this clarifying agent in low concentrations, with a negligible impact from the organoleptic point of view.

Fig. 5 Riboflavin reduction by Kolirex Go Fresh treatment.



4. PRE-BOTTLING

Finally, it is possible to protect the wine once in the bottle from the negative effects of light exposure, by the addition of components that can:

- protect the wine from the light radiation, slowing down the occurrence of the off-flavour;
- act as a "competitor" reacting with riboflavin instead of the sulphurated precursors;
- eliminate the sulphurated metabolites formed by "binding/capturing" mechanisms.

For this purpose **Redox Longevity** has been developed. It has a broad-spectrum action, leveraging both preventive and curative mechanisms, to preserve the organoleptic quality even in the most complex situations.

Fig. 6 Results on a 2014 Chardonnay, exposed to light radiation.

