Oenological Tool

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Any oenological tool is expected to reveal its goodness once it is used during winemaking. An oenological tool can be any type of element whose use can improve both the winemaking process and the final result. Therefore, use of natural elements such as bee pollen, thanks to its rich composition, could provide nutrients to yeasts and improve fermentation kinetics.

bee pollen | alcoholic fermentation | malolactic fermentation | Tintilla de Rota | kinetic | yeast population | nutrient | activator

1. Introduction

A nutrient deficiency, the presence of residues, and the presence of undesirable substances originating from the treatment of vineyards with pesticides[1][2][3] are some of the main factors that may slow down or even stop the alcoholic fermentation (AF) of grape-musts that winemakers have to face[2][4]. Furthermore, temperature increments due to the current global warming is affecting grape ripening processes and resulting in unbalanced musts[5][6][7]. Many of the problems that are associated with poor compound compensation in grape-musts are triggered by a content deficiency with regard to yeast easily assimilated nitrogen, vitamins, and other micronutrients[8][9][10]. This may eventually lead to cell viability problems[11] that could impact the sensory profile of the final wines[12][13].

2. Data

Yeast assimilable nitrogen (YAN) must content is a crucial factor for the development of yeast populations. Depending on its potential alcoholic strength and fermentation conditions, inorganic and organic nitrogen, as well as ammonium salts and amino acids[14], should be found in grape-musts at over 140 mg/L[5][15][15][16][17][18][19][20]. However, such a concentration level and other compound concentrations may vary depending on the geographical location of the vineyard[21], the cultivar[22] or the rootstock used[23][24], and viticulture techniques that are implemented[23][25][26]. Since wine making yeasts metabolize both YAN and other nutrients while growing and developing biomass[27] as part of the vinification process, a proper YAN level is essential both for indigenous yeasts and commercial strains of active dry yeast[19][28][29][30].

When Saccharomyces cerevisiae yeast is used to ferment wine, it consumes YAN through several molecular mechanisms[31]. If grape-must presents a poor YAN content, wine makers add fermentation activators to induce an

increment of biomass content and enhance their metabolization to enhance the oenological characteristics of final wines[19][32][33]. There are many and diverse products used by wine makers to compensate for nutritional deficiencies. The purpose of such products is to boost fermentation kinetics and cell multiplication, as well as to improve the anaerobic conditions of the fermentation medium[33][34][35][36].

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