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PROGRAMME  
& BOOK OF ABSTRACTS

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**Endogenous formation of fosetyl in wine: conditions of vinification, refinement and role of yeast**Tonidandel L.<sup>1</sup>, Roman T.<sup>1</sup>, Zeni M.<sup>1</sup>, Larcher R.<sup>1</sup><sup>1</sup>Edmund Mach foundation, Foods and processing, San Michele all'Adige, Italy

Ethyl hydrogen phosphonate, better known as fosetyl, represents the active form of fosetyl-Al (Aluminium tris-O-ethylphosphonate). This compound belongs to the class of organophosphorus fungicides and in viticulture it is widely used against *Plasmopara viticola*. Studies carried out by the EFSA (European Food Safety Authority) had shown that fosetyl degrades rapidly into ethanol (lost by volatilization or through incorporation into natural products) and phosphonic acid (main metabolite) [1]. The latter can however be present in plant tissues following the use of pesticides and foliar fertilizers containing sodium or potassium phosphonate; up to now however it is not possible to discriminate its origin.

The current residue definition is established as the sum of fosetyl, phosphonic acid and their salts expressed as fosetyl by the Regulation (EC) No 396/2005. For table and wine grapes coming from conventional agriculture, the Maximum Residue Level (MRL) of fosetyl-Al was fixed at 100 mg/Kg. On the other hand, its use is not allowed in the organic farming and for this products the MLR is lowered to 0.01 mg/Kg (Reg CE 889/2008). The phosphonic acid levels in organic products is found sometimes in higher amounts, not being completely clear the reason, so that research in this filed is still ongoing (i.e. bio-fosf project from CRA-RPS - the Italian Research Center for the Study of Plant-Soil Relationships). Pending a scientific response to the problematic of "phosphites", the MIPAAF (The Italian Ministry of Agricultural Food and Forestry Policies) decided to increase the MRL limit for biological products to 60 mg/L, maintaining mandatory the absence of fosetyl. This situation has also risen in wine produced from organic farming, where, along with the presence of phosphonic acid residue, it has been reported amounts of fosetyl higher than 0.01 mg/L. In the last years, even in the Pesticides Laboratory of the Edmund Mach Foundation, has been observed the presence of levels of fosetyl above the MRL (0.01 mg/L) in several wines obtained from organic-farmed grapes, presenting a phosphonic acid concentration higher than 15/20 mg/L. For that reason, we have verified the possible conditions in which the esterification reaction between phosphonic acid and ethanol can occur. The experiments were performed in must, wine and model wine.

Reference: 1 EFSA Journal 2012;10(11):2961