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Non-targeted Side Effect of Microbial Fungicides on Grapevine: Fact or Fantasy

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Microbial biocontrol agents are commonly regarded as environmentally friendly plant protection products compared to synthetic chemicals, although this does not mean there are no potential hazards associated with them. Based on this concept, the EU Regulation 1107/2009 (1) requires eco-toxicological studies and the evaluation of the fate in the environment for all plant protection products, including microorganisms. When the active ingredient is a microorganism additional questions related to its potential ability to multiply and spread in the environment are often posed by the evaluators. In particular the impact of the application of a microbial fungicide on natural microbial communities, either in soil or phyllosphere, is often questioned. Natural microbial communities in the environment are highly variable and the most competitive species that have adapted to that niche commonly prevail. And so most of the studies report that the release of a microbial fungicide has negligible or only transient effect on resident microflora. In particular the effect of the introduction of a microbial fungicide is expected to be minimal on carbon and nitrogen cycles and never greater than the application of manure or compost. Assessment of the impact on birds and other terrestrial vertebrates, aquatic organisms, arthropods, non-target soil meso- and macrofauna, terrestrial non-target plants or any other plants would be warranted on a case-by-case basis, however, also thanks to the mechanism of action of most of the microbial biocontrol agents and their fate in the environment, almost no observation of impact were reported so far. In case of wine making, if the microbial biocontrol agent can grow in the must and exhibits antagonistic activity against *Saccharomyces cerevisiae*, then possible interference with the fermentation cannot be excluded, therefore specific tests could be necessary in this context. Although the precautionary principle shall always be applied in the registration of a new compound either synthetic or natural, based on the existing scientific literature and the mechanism of action the risk of unwanted side-effects of the application of several microbial fungicides seems to be more phantom than reality. Specific case studies on *Trichoderma atroviride* and *Lysobacter capsici* on grapevine will be discussed.

Keywords: fate in the environment, microbial populations, fermentation, ecotoxicology, *Lysobacter capsici*, *Trichoderma atroviride*

References: (1) Official Journal of the European Union, 24.11.2009, L 309/1

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