

SOIL MICROORGANISMS VS. PESTICIDES. POTENTIAL BIOEFFECTOR MOLECULES FOR AN ENVIRONMENTAL-FRIENDLY VITICULTURE

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The advent of crop protection technology during the 60's has greatly helped the world agriculture to meet the even growing demand of food, fiber and food by-products. It is estimated that at least 50% of the six most important agricultural crops would be lost without the use of chemicals. Thousands of weeds, insects and plant disease affecting crops are controlled or eradicated, with an overall positive impact on the global economy. Despite these benefits, the large use of pesticides, which includes herbicides, insecticides and fungicides, has a negative impact on environment and human health mainly due to their large application and long-time persistence in soils. A sustainable and environmental-friendly agriculture is hence the goal of the next-generation crop and fiber productions by the use of low-impact pesticides and of bioeffector molecules.

Soil is the largest container of biological diversity ("the black box") and it represents a source of biomolecules with high application potential. To elucidate how soil microorganisms might contribute for a sustainable agriculture, a study has been carried out to evaluate the persistence of fungi and bacteria *versus* six different pesticides and their relative active ingredients. Increasing concentrations of two fungicides R6 Albis (fluopicolide) and Scala (pyrimethanil), insecticides such as Pirimor (pirimicarb) and Actara 25WG (thiamethoxan), Chikara (flazasulfuron) and Goal 480SC (oxyfluorfen) as herbicides, have been *in vitro* tested over time in soils collected from conventional and biodinamic grapevines located in Trentino.

Differences found among the two management systems indicate that microorganisms from conventional soil are more "resistant" to pesticides, as consequence of their large use and persistence in soil, in contrast to the biodinamic managment.

The overall ability of the selected strains to survive and growth in poor nutrient solution amended with pesticides assumes that these microorganisms use the above tested chemicals as nutritive substrate for their growth with an active involvement in their degradation pathways.