

WATER TREATMENT

In the last phase of the project, the IFV carried out experiments to study if the photocatalyst could degrade pesticides. The objective is to show the effectiveness of the photocatalyst in reducing pollution linked, for example, to the washing of pesticide sprayers and cellar effluents. Several pesticides were therefore tested (Figure 1). A significant effect of the photocatalyst is observed for fenhexamid and pyrimethanil. These are two widely used fungicides for the vine.

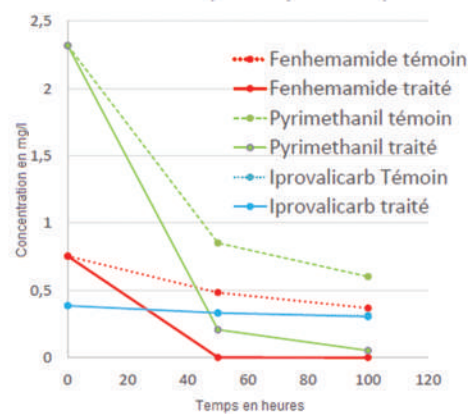


Figure 1: Kinetics of degradation of pesticides by the photocatalyst.

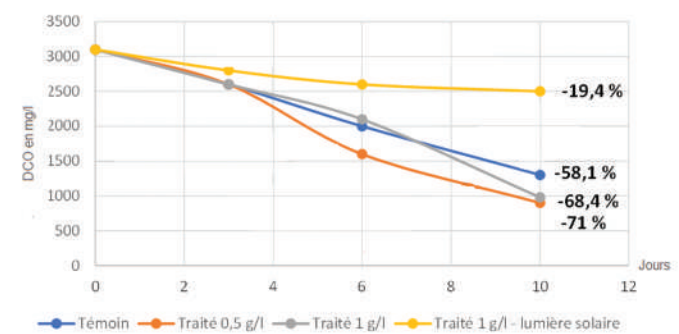


Figure 2: Kinetics of degradation of COD by the photocatalyst.

Also, other studies of the COD (chemical oxygen demand) of different treatments with artificial or solar light have been carried out. The graph (Figure 2) compares the COD degradation kinetics of different conditions. It has been observed that the COD is less important with the activation of the catalyst by sunlight. Indeed, there is too great a fluctuation in brightness over the course of a day. However, this is a prototype. The use of sunlight would allow a reduction in the energy of wastewater treatment plants.

THE WATER TREATMENT PLANT

Figure 3 shows the diagram of the water treatment plant that the NUTRIA project team imagined. It allows large-scale use of the photocatalyst to purify winegrowers' wastewater.

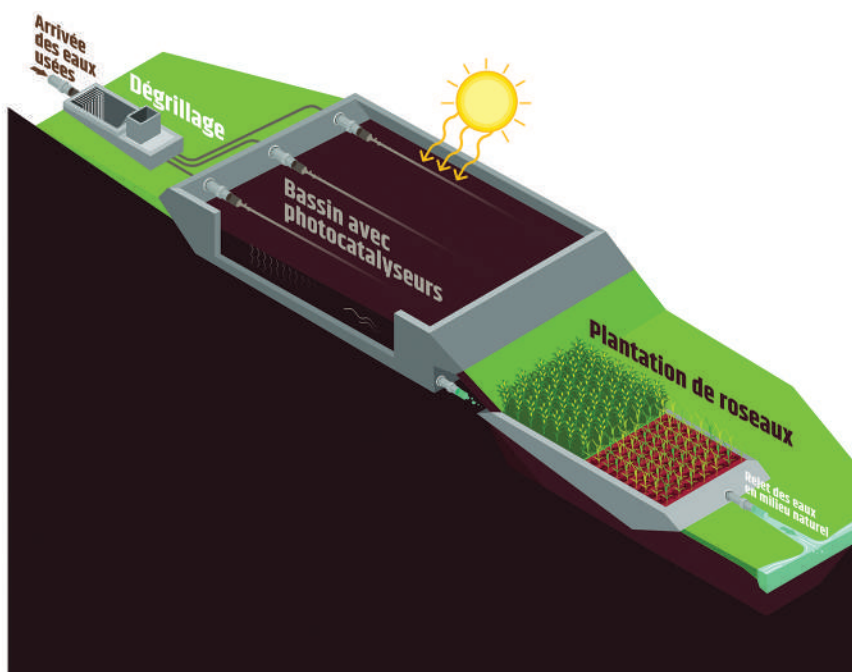


Figure 3: Diagram of the water treatment plant with photocatalysts.

CONCLUSION AND OUTLOOK

The NUTRIA project has made it possible to synthesize photocatalysts capable of treating wine effluents on a small scale. The magnetization of the photocatalyst has demonstrated its usefulness both by intensifying the degradation of the COD but also by its ease of being recovered by a magnet. An optimization of the semi-industrial reactor could be done so that the system is perfectly operational.



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