

## Project abstract

PhytoCOTE is a research project proposed by the pesticide group of LABEX COTE, part of the University of Bordeaux. It has two objectives: first to unify approaches of laboratories in Natural Sciences and in Human & Social Sciences around a common topic; secondly to implement research dealing with the use of pesticides in agricultural systems, their transfers to ecosystems, bioaccumulation, and potential toxicity in the agricultural and estuarine ecosystem continuum.

The diverse nature of the project's objectives calls for a multidisciplinary approach, bringing together specialists from the fields of agronomy, environmental chemistry, ecology, ecotoxicology, and economics. The project will investigate farming and winegrowing practices in the Blaye area, located on the right bank of the Gironde estuary in southwest France. More specifically, it will examine the pesticide pressure generated by those practices.

Analysis and modeling of agricultural modes of production (conventional, agro-biology, agro-ecology, etc.), and farmers' decision-making relating to their use of pesticides will assist in anticipating future evolution trend of plant protection products use. Results will help define scenarios of changes in plant protection practices and analyze how these choices may be influenced by public policy.

In parallel, a full survey of the study site will be carried out to get an overview of the ecosystems contamination in situ (soil, hydrosystem systems) by organic and inorganic pesticides, the potential toxicity of these pesticides and bioaccumulation in biota at different trophic levels.

This work will enable more effective evaluation of contamination risks, as well as gaining a greater understanding of the fluxes of pesticides being transferred both through the air and by water. This research can then be used to examine the complicated question of the changing spatial scales of these processes.

Simulations of the effects of best agro-ecological management practices on the study site will provide a best knowledge of the conditions in which pesticide pressure reduction can be achieved. Bio-economic modeling combined with multi-criteria analysis for decision support will help evaluate the cost of proposed reductions of pesticide use and their acceptability in terms of capacity of farms to change their production practices. The ability to achieve the objectives of phytosanitary inputs, remaining a means to assess sustainability in agro-ecosystems.

With the aim of rationalizing transfer to stakeholders, a development process will be planned once the project implementation so that results achieved would benefit professional actors.