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Spatially explicit modelling of regulating services for evaluation of their levels and trade-offs; exploration of concerted management strategies of agricultural territories through different scenarios.

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In agroecosystems, biodiversity-supported regulating services include many ecological and social components interacting with each other; several guilds can be involved in the delivery of a single service, and a single guild can contribute to several services. Habitats on which guilds directly depend are managed by multiple stakeholders. Understanding dynamics, trade-offs, complementarities or even synergies between those services is a challenge in itself: in order to support the development of an agroecological production, is it possible to suggest agricultural management modalities that benefit several services or do social compromises need to be considered? In the latter case, at which spatiotemporal scale? **The thesis aims to develop a spatial model of regulating services in agricultural landscapes over seasons and years, according to different scenarios of agricultural management.** The approach consists in coupling 2 actions. First, a bibliographic analysis will be conducted on the effects of spatial and temporal habitat heterogeneity in agricultural landscapes on regulating services and their interactions (focusing on top-down and bottom-up biological controls and pollination). Second, a spatial modelling of regulating services will be implemented in the multi-agent platform MAELIA which simulates landscape dynamics. Furthermore, the study will benefit from data provided by the experimental evaluation of the crop fields' capacity to sustain the regulating services by supplying several resources to beneficial species (SEcoMod project).