

**Session topic:** 6.2 Mixing crops, livestock and trees in farms and landscapes for people and planet

**Biotechnical and sociotechnical conditions required to engage an agroecological transition: A case-study of organic sheep-crop integration in South-western France**

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**Abstract**

The environmental, social and economic impacts of the specialization of farms and landscapes are well documented in the scientific literature. To address these impacts and related ecological issues (habitats, watersheds, erosion), an agroecological transition of agri-food systems is promoted in scientific and political spheres at the farm and landscape levels. Diversification of land use and integration of crop and livestock are core principles of agroecology and seems a promising avenue to achieve sustainability (Lurette *et al.*, 2020). It requires addressing biotechnical challenges at elementary levels (animal, herd, field) as well as organizational challenges at landscape level (Garrett *et al.*, 2020). Understanding how the conditions under which these challenges induce lock-ins or, on the opposite, promote agroecological transitions is critical to achieve impacts at scale.

We analyze a case study of innovative combination of technical and organizational options of crop-livestock integration among crop, livestock and vine farmers in organic farming systems in South-western France. Organized around a cooperative of cereal producers, this initiative aims at making the best use of various resources, diversifying crop rotation and strengthening the presence of livestock farmers in a landscape dominated by vineyards.

From a biotechnical perspective, these diversified exchanges depend on the farmers involved. Arable farmers cultivate on bare fields before replanting vines. They integrate fodder legumes into their cropping systems and either let sheep farmers harvest them as hay, or let itinerant pastoralist use them as pasture. Sheep farmers also graze crop residues and vines interalleys in winter dormancy.

From a sociotechnical perspective, these exchanges imply a coordination activity provided by the cooperative in terms of linking supply and demand of farmers for different resources. They also imply a variety of bilateral arrangements between farmers over time, according to resources availability, specific needs and constraints.

Finally, we discuss to what extent this innovative initiative constitutes a model of agroecological transition of farming systems at landscape level, through its biotechnical and sociotechnical benefits and limits (Asai *et al.*, 2018). We identify pathways for development and reinforcement of the initiative, among which, the involvement of third-party organizations seems essential: landowners, forest managers, local authorities.

**Key words:** landscape; crop-livestock integration; collective organization; multiuse

**References:**

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