



## Mixed farming in the Aveyron river basin

In the Aveyron river basin (France), the low-lying, fertile lands are usually used for monocultures, and the higher, less fertile areas for livestock. Recently, a research project has led to the construction of a scenario in which crop farmers would introduce alfalfa into their rotations, in response to more frequently occurring summer droughts. This diversification would not only reduce water and fertiliser needs, but also open opportunities for cooperation with the livestock farmers.



### Teaming up in the Aveyron river basin

Crop farmers in the Aveyron river basin are trying to team up with livestock farmers to develop mutual benefits, with the help and support of local cooperatives. Frequent summer droughts led crop farmers to think about including alfalfa production as a diversification crop in irrigated maize monocultures to reduce water needs, alfalfa requiring less water. In the scenario designed with crop farmers and local stakeholders (supply chain managers, livestock farmers, technical advisors), the alfalfa provides an alternative and local source of protein for the livestock farmers. Excess manure from livestock farms is used as a fertiliser on the crops after composting to reduce the transport costs.

### A move towards mixed farming

Globalising markets and agricultural policies that encourage production have fostered the specialisation of farms and regions so as to increase competitiveness and productivity. In many cases, this has actually lowered flexibility regarding market changes due to a high dependence on external inputs. Specialisation also has a negative impact on the environment, lowering biodiversity, creating water pollution due to excess of manure and mineral fertilisers, and causing the degradation of soils due to the monocultures. This also means that this type of agriculture is less resilient to climate change.

"Developing cooperation between crop and livestock production could be a solution for reaching some level of self-sufficiency at the regional scale", Marc Moraine from ISARA-Lyon who has been involved in this initiative says.

By developing mixed crop-livestock systems at regional level, manure can be recycled to fertilise crops and crops can be diversified to produce fodder for animals. This cooperation allows a more efficient use of local resources and reduces dependence on external inputs, making farms more profitable and above all, more sustainable. Manure recycling reduces pollution and helps to restore soil fertility. A more diverse production also allows more flexibility to adapt to water scarcity, agronomic potential of soils and creates resilience to climate variations. Different crops and types of livestock production respond differently to changes in climate. When a farm produces different crops and livestock products, a drop in market prices for one product may be offset by higher prices for one of the other farm products, and lower yields for one crop may be compensated for by higher yields for another crop or livestock product, so diversification helps to spread risks.

In spite of mixed farming advantages, integrating crop and livestock production at farm level increases management complexity and labour needs which may lead to lower farm profitability. On the other

hand, regional integration can still keep specialised farming benefits while profiting from interchanging manure and fodder between farms.

### Organisation is the key!

After the participatory design workshops and individual interviews conducted during the research project to encourage farmers to work together and decide the best management schemes to introduce new crops, local stakeholders are now reflecting upon the implementation of the scenario.

On the basis of existing cooperation, some work has been carried out with local cooperatives to make the scenario feasible. This would require the dehydration of alfalfa, or at least its solar drying in adequate infrastructures, to lower the transport costs up to livestock farms. It is a whole new supply chain that needs to be developed on the territory of Aveyron river basin. Cooperatives would invest in processing structures but also equipment for alfalfa harvesting, and develop programmes for training local farmers in alfalfa cultivation.

This also offers peer learning and cooperation opportunities between livestock and crop farmers to make the most of local resources.

Further research will be focused on biogas plants to process manure and reduce its volume so that it can be transported more efficiently to lowland crop farms. Biogas plants could also reduce energy bills of livestock farmers increasing their profit.

### More information and contact

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