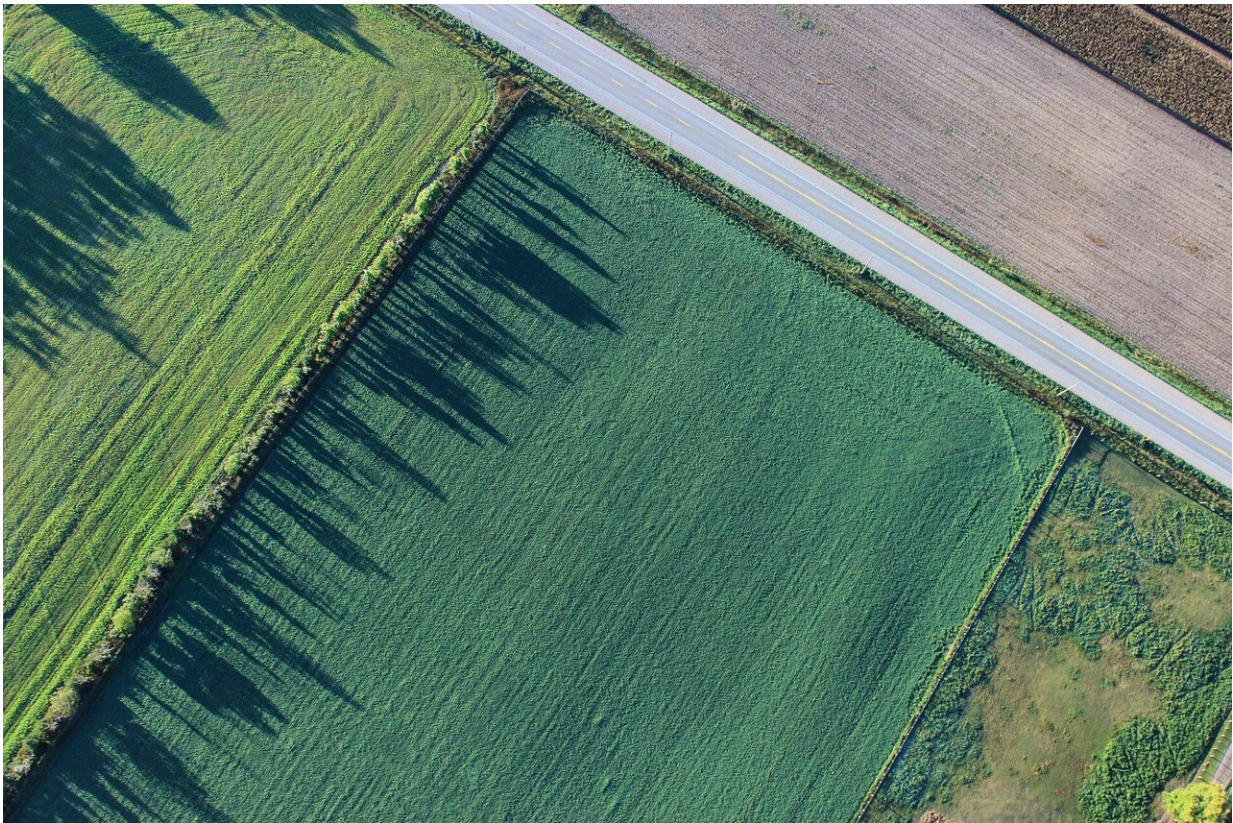


European farms mix things up to guard against food-supply shocks

January 27 2023, by Ethan Bilby



Credit: CC0 Public Domain

Greater diversification could help agriculture withstand climate, economic and geopolitical crises.

"Items in this section have limited availability due to supplier production issues," "Sorry, temporarily out of stock" and "Sold out" are all signs that became familiar as recent global upheavals exposed how precarious our food supply is.

The COVID-19 pandemic led to bare shelves in supermarkets as shipping routes were cut off. The war in Ukraine has affected the supply of essential grains.

But increased [climate change](#) stands to cause even greater disruption. Researchers say part of the solution to mitigating that risk is for farms to become more mixed through some combination of crop cultivation, [livestock production](#) and forestry, a move that would also make agriculture more sustainable.

For Dr. Sara Burbi, assistant professor at Coventry University in the UK until December 2022 and now an independent researcher, COVID-19 was a wake-up call.

"Suddenly, we experienced first-hand what happens when value chains are not resilient to shocks and what happens when globalization, with all its intricacies, does not work anymore," she said. "We saw highly specialized farming systems fail when they over-relied on external inputs that they had no access to."

Climate change, according to Burbi, could provide even bigger global shocks ranging from widespread crop failures to lower yields or damage from flooding. More sustainable agriculture is essential to ensure food supplies can withstand the impact of climate change and unexpected local, national and even global crises.

Beneficial combos

During her tenure at Coventry University, Burbi coordinated the AGROMIX project, which runs until end-October 2024.

As part of the project, pilot farms across Europe are experimenting with combining crop and livestock production in one farm (mixed farming) and with pairing farming and forestry activities (agroforestry). Poultry grazing in orchards is an example of a mixed-farming approach. The results reveal interesting synergies and promising effects, including improvements in [soil health](#).

"For a long time, forestry and [agricultural activities](#) have been considered at odds, as we have pushed for more and more specialized land uses," Burbi said. "This has led to loss of soil fertility and a sharp decline in biodiversity, coupled with an increased dependence on external inputs to compensate."

A combined system can increase the cycling of nutrients needed in the soil for crops to grow. It can also help to regulate air and [water quality](#), prevent land degradation and even provide biomass and food on-site for livestock.

One site in Switzerland, for instance, found that mixed farming helped keep soil quality high, while more specialized farming tended to deplete it.

AGROMIX will use 12 pilot sites and nine experimental ones, spread across three climatic zones (Atlantic, Continental and Mediterranean), to develop recommendations for farmers on combining productivity with greater sustainability and climate resilience.

Although mixed farming has been practiced for a long time, it is only recently that scientists have begun to measure biophysical data on such sites and provide real evidence to support approaches that work.

The project has found that the presence of trees on pasture has measurable benefits to animal health and welfare, especially in extreme heat when they provide a canopy of much-needed shade.

Trees and hedgerows can also offset greenhouse-gas emissions from livestock, increase the carbon sequestration capacity of the land, provide a haven for biodiversity and help prevent flooding.

The project wants to work closely with farmers, taking into account their needs and priorities.

"Knowledge integration can empower key actors, in this case farmers, to embrace the transition to sustainable farming," Burbi said.

The next step will be designing agriculture systems that are totally energy independent and, as a result, even more sustainable.

Forest focus

The [MIXED](#) project at Aarhus University in Denmark is also focused on combining mixed farming systems with agroforestry to make agriculture more efficient and resilient.

"It's not only about economic efficiency, but also environmental and climate efficiency," said Professor Tommy Dalgaard, the project coordinator. "Agriculture needs to be resilient to change, all kinds of change."

Working with around 100 farmers across Europe, MIXED has created networks to study the different ways in which mixed farming and agroforestry can be used.

One focus is on the take-aways that can be gleaned from the traditional

agroforestry techniques used in the Tagus Valley of Portugal, in an area known as the Montado.

"They have these big cork oaks that are often more than 100 years old with grazing cattle below them," said Dalgaard. "In the winter, they can plow the soil and make small fields with cereal so they can harvest a winter crop and then in the dry season the cattle can be there."

It is possible to have these green, vegetated areas because of the ancient oak trees, which create shade and sustain the water cycle.

The concern is that drought may threaten the oaks, so researchers from the project are trying to work out how best to preserve the system as well as how to adapt it to new areas.

Danish farms in the project have taken a different approach, looking at how farmers can use coppicing to create a carbon sink. Coppicing is a pruning technique that cuts trees to ground level, causing new shoots to grow rapidly from the base to form a bush.

These are then usually harvested every 10-20 years for biomass fuel, meanwhile also giving shelter and shadow to free-range, high-value livestock such as sows with piglets. Cutting the bushes to create mulch also helps to improve soil quality and avoids burning them, according to Dalgaard.

The project's ultimate aim is to build up a European database demonstrating examples of mixed farming and agroforestry, highlighting the benefits and advising on best practices. Essentially, it is about inspiring more farmers to adopt mixed farming and agroforestry methods and supporting them in the process.

"We need real-life examples," said Dalgaard. "We now have some

concrete examples of farmers, agricultural landscapes and value chains that can report good results from having done something in a different way."

Research in this article was funded by the EU. This article was originally published in [Horizon](#), the EU Research and Innovation Magazine.

Provided by Horizon: The EU Research & Innovation Magazine

Citation: European farms mix things up to guard against food-supply shocks (2023, January 27) retrieved 24 April 2024 from <https://phys.org/news/2023-01-european-farms-food-supply.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.