



## Crop Diversification: Making European Agriculture More Sustainable

The DiverIMPACTS project aims to achieve the full potential of crop diversification. But what does that mean? Crop diversification refers to increasing crop diversity in a field in space and time. This means moving away from highly-simplified cropping systems (e.g., monocultures) and toward diversified cropping systems including longer rotations, multiple cropping, intercropping, or a combination of these crop diversification strategies (Figure 1).

Figure 1: Crop diversification strategies

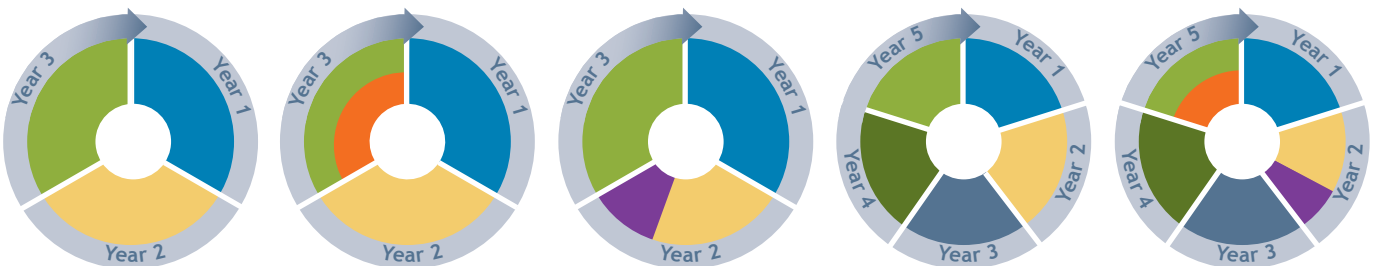
**Low diversity rotation**

**Intercropping:**  
increasing the number of crops that are grown in close proximity within the same land-area

**Multiple cropping:**  
increasing the number of crops that are grown on the same land-area within a year

**Rotation extension:**  
increasing the number of crops that are grown in successive years on the same land-area

**Combining practices:**  
using several diversification practices on the same land-area and over time



Example crops: ● Barley ● Rapeseed ● Wheat ● Pea ● Potato ● Faba bean ● Vetch

### What are the potential benefits of crop diversification?

Over the past few decades, with the objective of increasing the economic efficiency of the agri-food sector, European agriculture has focused on the production of a few crop species and has become reliant on the use of chemical fertilisers and pesticides. This trend has led to a strong decrease in crop diversity. Nowadays, crop production is often characterised by short rotations, or even monocultures, leading to high incidences of pests and diseases, soil erosion, loss of soil fertility, pollution and loss of biodiversity, among other things. In this context, crop diversification can contribute to improved agrobiodiversity and support ecological processes that are necessary for the sustainable production of agricultural products.



Multiple cropping with barley and clover allows barley to be harvested as a grain and the clover can continue growing to feed animals, protect the soil over the winter and build up nutrients.



Making smart use of the potential benefits of crop diversification can:

- secure the production of agricultural products for food, feed, energy and industrial uses,
- enable food and nutrition security,
- enhance ecosystem services provision,
- reduce the use of chemical fertilisers and pesticides,
- increase the efficiency of energy and resource use.

Overall, crop diversification can reduce risks and increase resilience to environmental changes through income diversification, restored biodiversity and soil quality, and climate change.

## What challenges does crop diversification face?

Farmers and other actors in the agricultural sector can face various barriers when trying to implement and support crop diversification.

The benefits of crop diversification vary depending on local conditions, which means there is no 'one size fits all' solution, and trade-offs often exist. There is a need to identify crop diversification strategies that can fit local contexts and actors, while meeting sustainability needs. Most importantly, transitioning from highly-simplified cropping systems with a limited number of crops to diversified cropping systems with a greater range of crops and different production requirements is knowledge-intensive and actors need support in making this transition. Finally, unlocking the potential of crop diversification would not only require new techniques and technologies, but also a different organisation of the agri-food sector and changes to agricultural policies and regulatory systems.



Mixed grains and pulses. When two crops are grown together in a field (intercropping), they often need to be separated after they are harvested in order to process them. This can be a challenge for crop diversification.



Demonstration of DiverIMPACTS strip cropping trial. Strip cropping is a form of intercropping where multiple types of crops are grown in long, narrow strips in a field. This can help reduce pest and disease, promote biodiversity and alleviate soil erosion and compaction.

## What is DiverIMPACTS doing?

To address these challenges, DiverIMPACTS is:

- promoting crop diversification in 25 case studies, which work together with various actors to address crop diversification in local contexts,
- assessing the sustainability of crop diversification for different actors and at different levels in the 25 case studies and in 10 field experiments,
- removing barriers and seeking new opportunities for crop diversification in the case studies and from other experiences across Europe,
- developing strategies for farmers and other actors in the agri-food sector as well as for researchers, professors, teachers, advisors and policy-makers.

For more information as well as examples and results from the project, visit [www.diverimpacts.net/crop-diversification](http://www.diverimpacts.net/crop-diversification)

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