

An aerial photograph of a farm. The left side of the image shows a large field of vibrant green crops, possibly corn, with distinct rows. The right side shows a field of bright yellow crops, likely rapeseed or sunflowers, also in rows. A red tractor is visible in the yellow field, moving from the top right towards the center. The overall scene is a well-maintained agricultural landscape.

# *Farm/IT*

Farming.Simulation.Software.



## CHALLENGES

**#The increased pace of climate change and its consequences on the weather and severity of pests.**

**#The political demand (especially in Europe) to massively decrease greenhouse gas emissions.**

**#The growing demand for detailed carbon disclosure.**

**#An exponential increase in the demand for organic products.**

**#Highly volatile crop prices.**

## OBJECTIVES

**#Establish first think tank related to smart farming in Austria**

**#Support EU and Austrian energy saving and sustainability initiatives**

**#Provide knowledge transfer and sharing between academia and practice**

**#Design, develop and evaluate cost-effective and user-friendly ICT components for smart farming**



## PROJECT

Farm / IT is a cooperation between Vienna University of Technology, BOKU, HBLFA Raumberg-Gumpenstein and Xylem Technologies with partners from agriculture.

The project is co-financed by the FFG under the Research Studios Austria program.



TECHNISCHE  
UNIVERSITÄT  
WIEN



Universität für Bodenkultur Wien



Lehr- und Forschungszentrum  
Landwirtschaft  
[www.raumberg-gumpenstein.at](http://www.raumberg-gumpenstein.at)



FFG

Österreichische  
Forschungsförderungsgesellschaft

## USER GROUPS

Farmers

Companies

Public authorities

Consultants

## BENEFITS

#Farm/IT supports the actors in the interactive planning and simulation of farming scenarios, while taking into account influencing factors, dependencies and interactions.

#Farm/IT presents users with the impact of interventions or unforeseen events (risks) on individual crops, the entire cropping plan or farm.

#Farm/IT addresses the needs of beginners and experts. It allows analysis of complex issues with conflicting outcomes (for example maximising yield while minimising inputs).

#Farm/IT structures the relevant data, visualises it on-screen and enables users to make informed decisions.



# RESEARCH USE CASES

Farm/IT provides its users with six common applications including crop yield forecasting, simulating optimal crop rotation, and optimising resource use. The uniqueness of Farm/IT is its flexibility. Farm/IT can be easily adapted to specific use cases and user requirements.

A large, bold number '1' filled with a close-up image of green wheat stalks.

FORECASTING CROP  
HARVEST DATE AND  
YIELD

A large, bold number '2' filled with a close-up image of green leaves and soil.

OPTIMISING  
FERTILISATION BASED  
ON SPECTRAL  
SENSING AND CROP  
MODELLING

A large, bold number '3' filled with an aerial view of a green valley and hills.

OPTIMISING  
FORAGE QUALITY  
AND  
YIELD IN  
GRASSLANDS

CALCULATION  
AND  
OPTIMISATION  
OF THE  
ECOLOGICAL  
FOOTPRINT

A large, bold number '4' filled with a close-up image of green leafy plants.

EFFICIENT CROP  
WATER  
MANAGEMENT  
BY REMOTE SENSING

A large, bold number '5' filled with a close-up image of water droplets on a green leaf.

OPTIMISATION OF  
RESOURCE USE BY  
CROP ROTATION

A large, bold number '6' filled with an aerial view of a green agricultural field with distinct rows.



# **YIELD FORECASTING**

**Calculation of the expected yield.**

**Calculation of the optimal harvest time.**

**Ongoing optimization (data assimilation) of the model with satellite data.**



# FERTILIZATION OPTIMIZATION

**How can fertilization strategies be optimized to maximize yield and contribution margin and environmental impacts are minimized?**

**Which times are optimal for spreading fertilizer?**

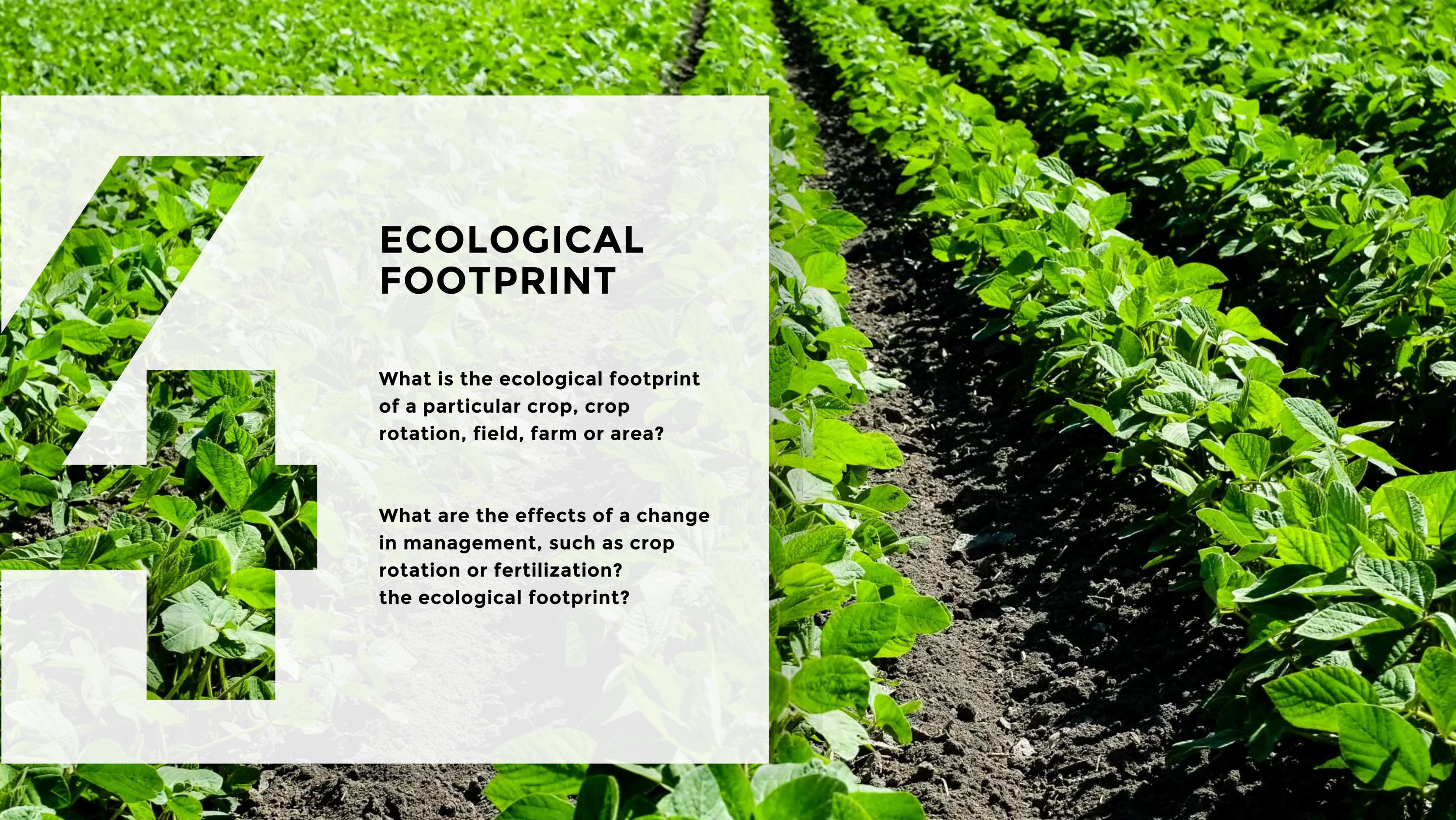


The background of the slide is an aerial photograph of a mountain valley. The valley floor is a mix of green fields and dense forests. The surrounding hills are covered in thick green forests. In the distance, more hills and a small village with red-roofed buildings are visible under a clear blue sky. A large, white, semi-transparent number '3' is overlaid on the left side of the image, partially covering the forested hills.

# GRASSLAND

**What is the optimal relationship between quality (protein content, digestibility) and yield?**

**Which factors have the greatest influence on the development of quality and yield in the economic grassland?**



# **ECOLOGICAL FOOTPRINT**

**What is the ecological footprint  
of a particular crop, crop  
rotation, field, farm or area?**

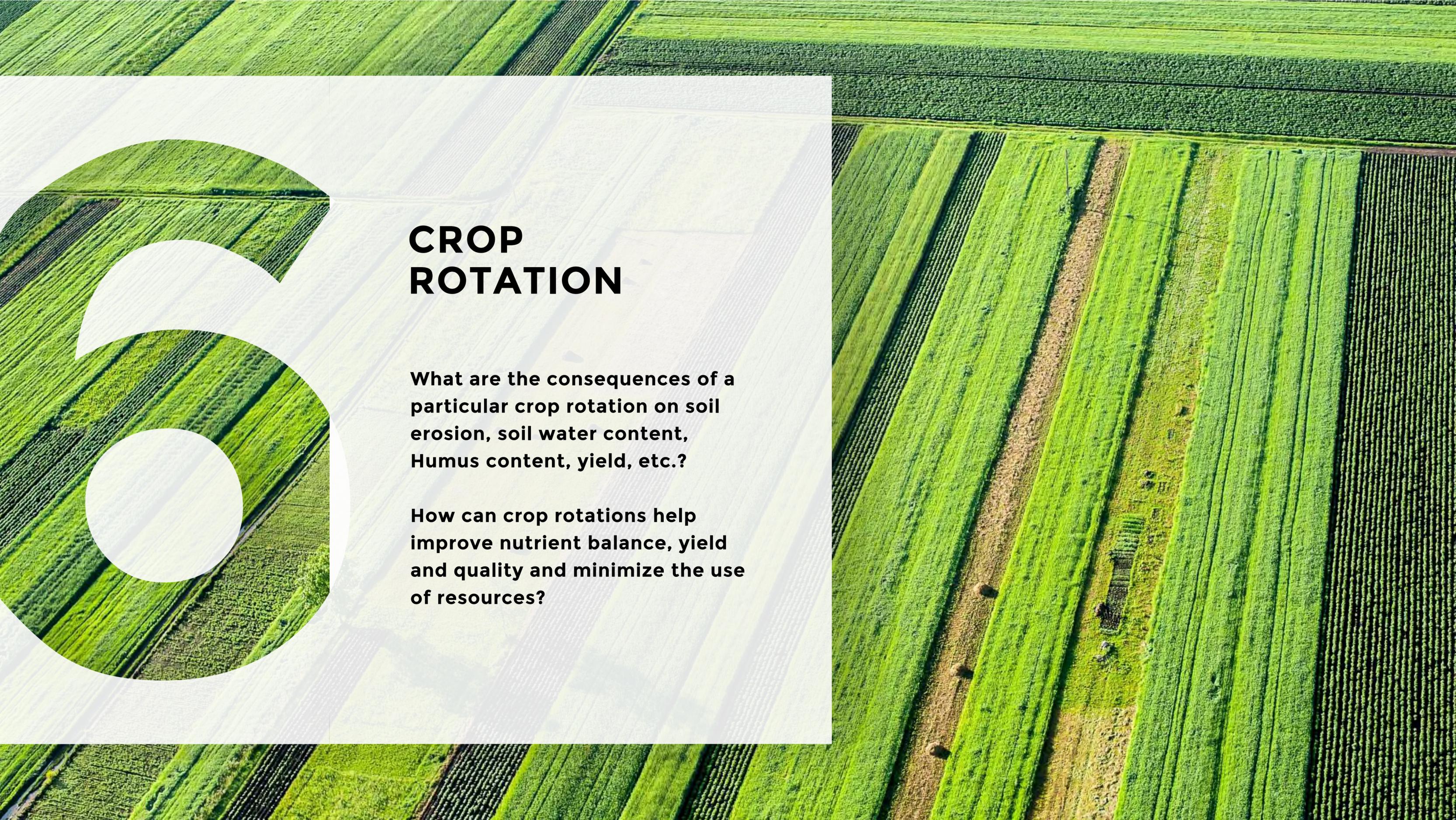
**What are the effects of a change  
in management, such as crop  
rotation or fertilization?  
the ecological footprint?**



# **WATER MANAGEMENT**

**What is the optimal relationship  
between water use and yield?**

**What is the optimal irrigation  
strategy for  
a certain culture?**

An aerial photograph of a vast agricultural field, showing a complex pattern of green crops. The field is divided into numerous rectangular plots, some of which are planted with different types of crops, illustrating crop rotation. The overall color palette is dominated by various shades of green, from bright lime to deep forest green. The perspective is from directly above, looking down on the field.

# **CROP ROTATION**

**What are the consequences of a particular crop rotation on soil erosion, soil water content, Humus content, yield, etc.?**

**How can crop rotations help improve nutrient balance, yield and quality and minimize the use of resources?**

An aerial photograph of a farm. The left side of the image shows a large green field with distinct diagonal furrows. The right side shows a large yellow field, likely rapeseed, also with furrows. A red tractor is visible in the yellow field, moving from the top right towards the center. The text 'Farm/IT' is overlaid on the green field in a white, italicized font.

# *Farm/IT*

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