

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, stylized font, with 'Farming.Simulation.Software.' in a smaller, white, sans-serif font below it.

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



FFG

Österreichische
Forschungsförderungsgesellschaft

USER GROUPS

Farmers

Companies

Public authorities

Consultants

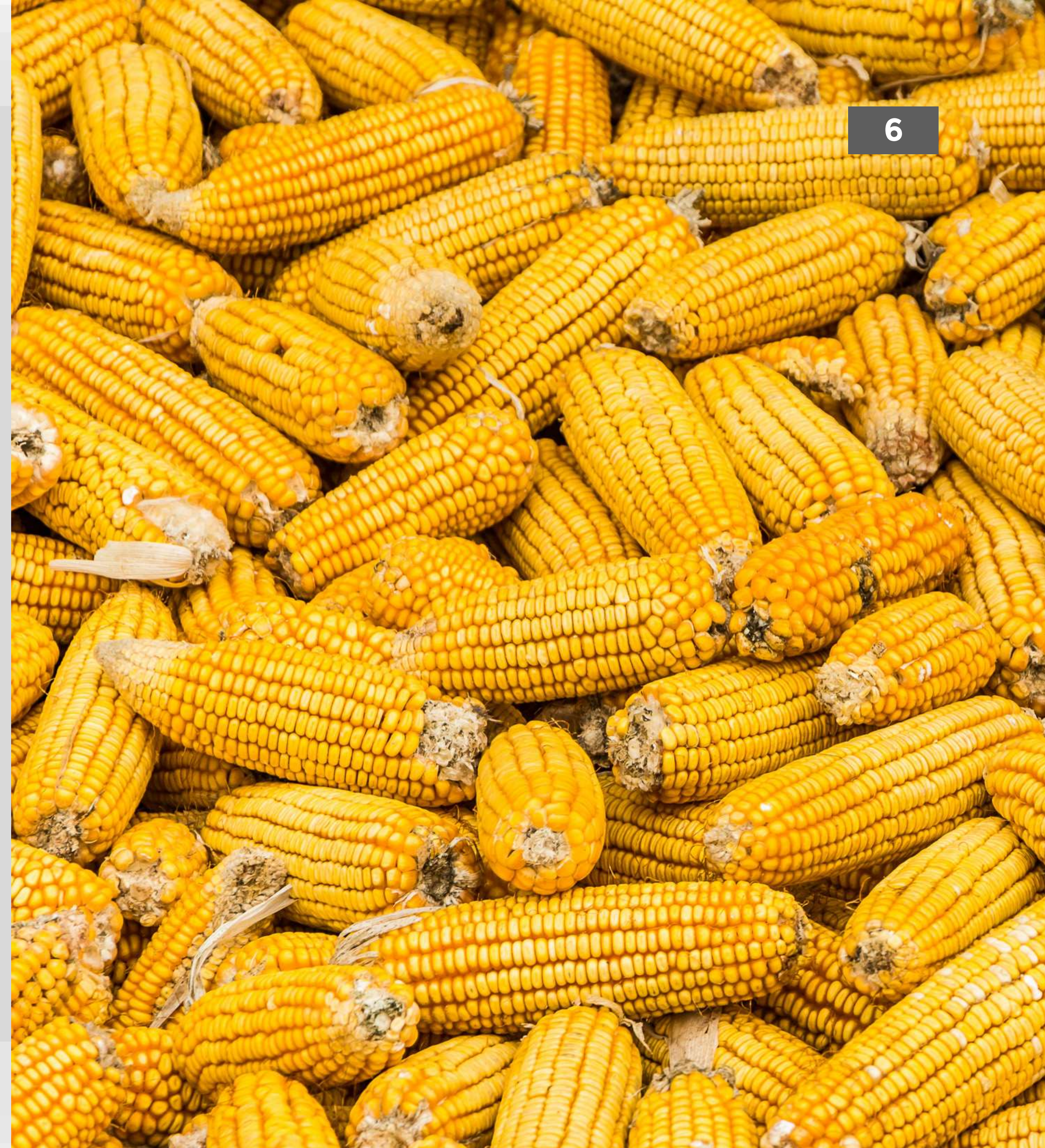
BENEFITS

#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, stylized number '1' filled with a close-up image of green wheat stalks.

FORECASTING CROP
HARVEST DATE AND
YIELD

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

OPTIMISING
FERTILISATION BASED
ON SPECTRAL
SENSING AND CROP
MODELLING

A large, stylized number '3' filled with an aerial view of a green valley with a winding road.

OPTIMISING
FORAGE QUALITY
AND
YIELD IN
GRASSLANDS

CALCULATION
AND
OPTIMISATION
OF THE
ECOLOGICAL
FOOTPRINT

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

EFFICIENT CROP
WATER
MANAGEMENT
BY REMOTE SENSING

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

OPTIMISATION OF
RESOURCE USE BY
CROP ROTATION

A large, stylized 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 mountain ranges are visible under a clear 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 colors range from vibrant green to a slightly darker, more textured green, indicating different stages of growth or different crop types. The overall scene is a well-organized and productive agricultural landscape.

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 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

Dr. Thomas Neubauer
neubauer@farming.software