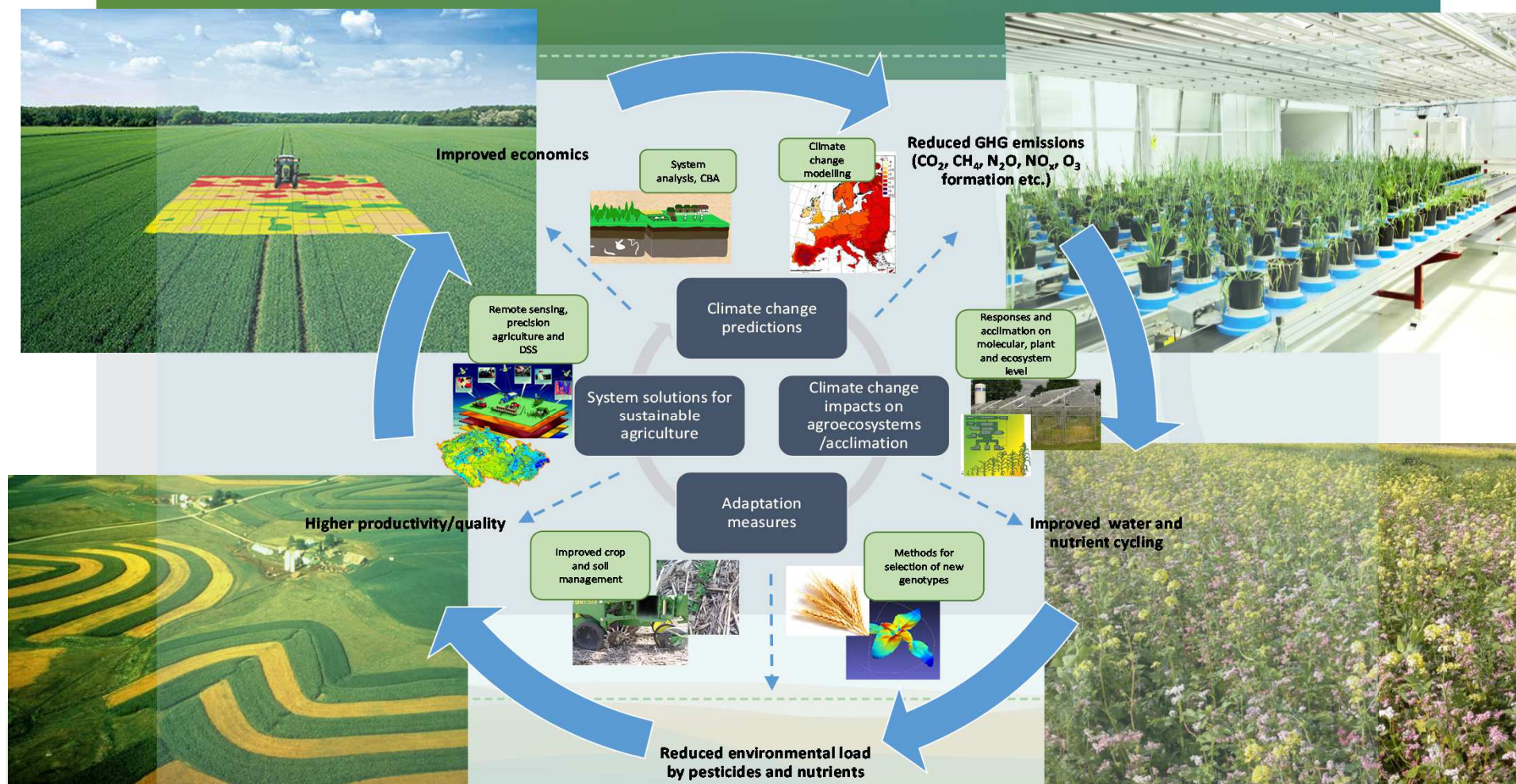


# CSA - Climate Smart Agriculture



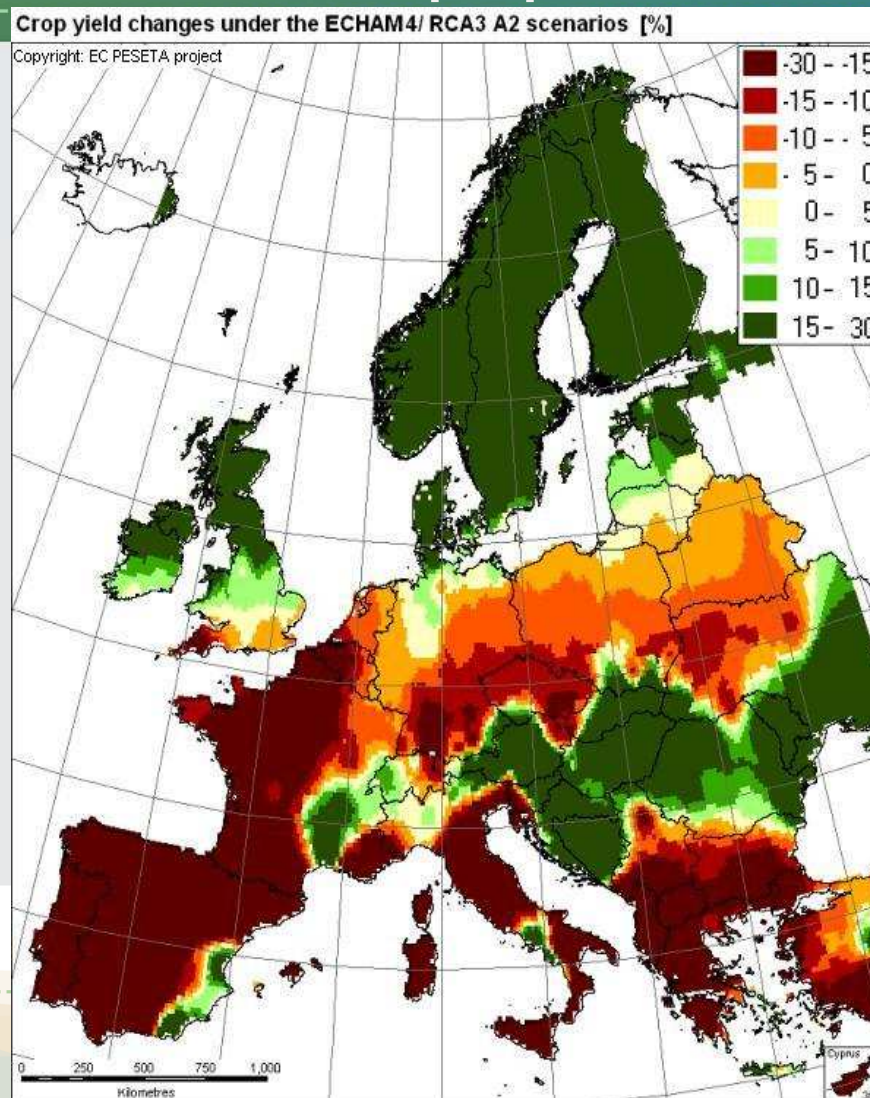


**Agriculture have to feed the growing human population which will according to FAO estimation reach 9 bilion people in 2050**

Simulated crop yield changes by 2080s relative to the period 1961-1990 according to a high emission scenario (A2)



Increasing pressure on maintaining or even increasing ecosystem services



## Contribution of agriculture to total GHG emissions is ca 14%

$\text{N}_2\text{O}$  has 310x higher greenhouse effect than  $\text{CO}_2$

$\text{CH}_4$  has 21x higher greenhouse effect than  $\text{CO}_2$

The contribution of  $\text{N}_2\text{O}$  is 38% from total contribution of agriculture to CC

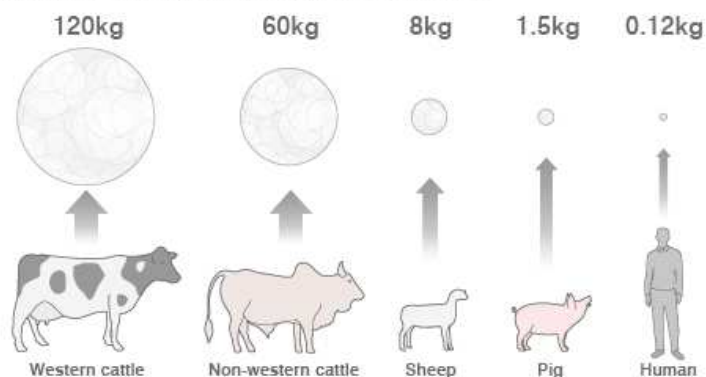
### Methane Reduction Project

- how to reduce methane emission by a minimum of 25%

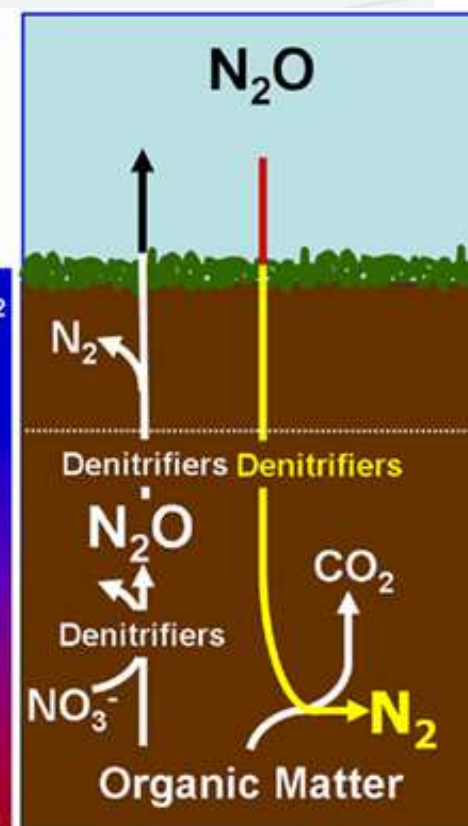
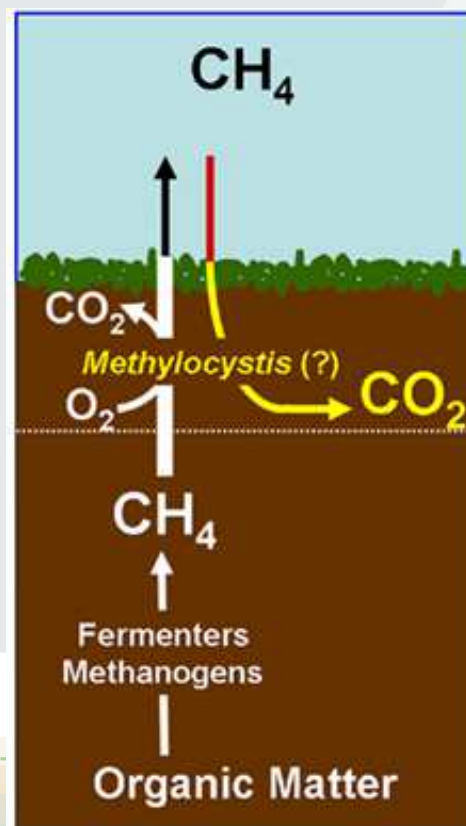
A cow emits 500l of methane per day, which is equivalent to 10% of the energy she would otherwise use for performance and milk production



Methane emissions per animal/human per year



SOURCE: Nasa's Goddard Institute for Space Science





## Current problems in CEE countries

- **Degradation of soil organic matter**
- **Plowing or other intensive soil cultivation**
- **Undersoil compaction, soil structure damage, low stability of soil aggregates**
- **Low water infiltration and retention**



## Current problems in CEE countries

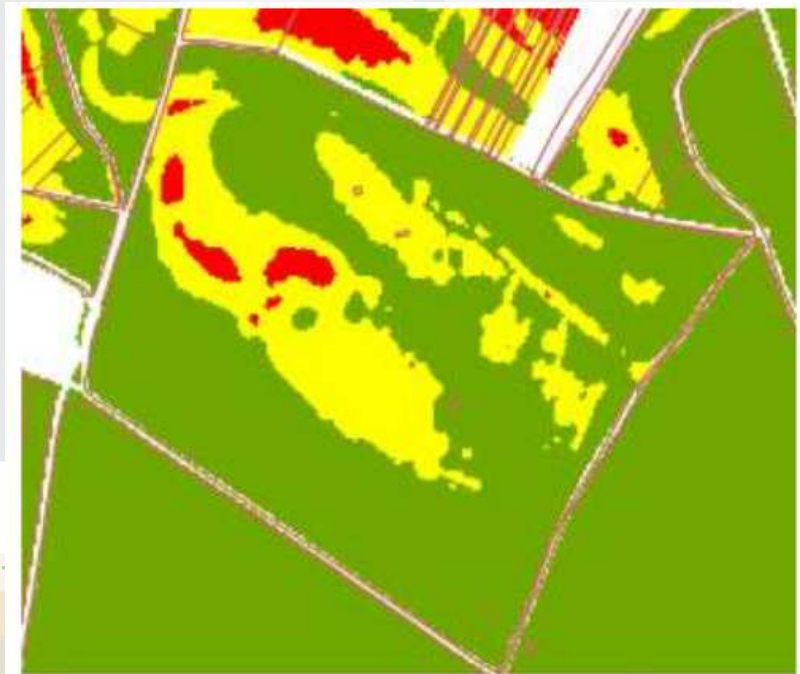
- **Soil erosion – erosion endangered areas are increasing and currently they represents 25% of agricultural land**





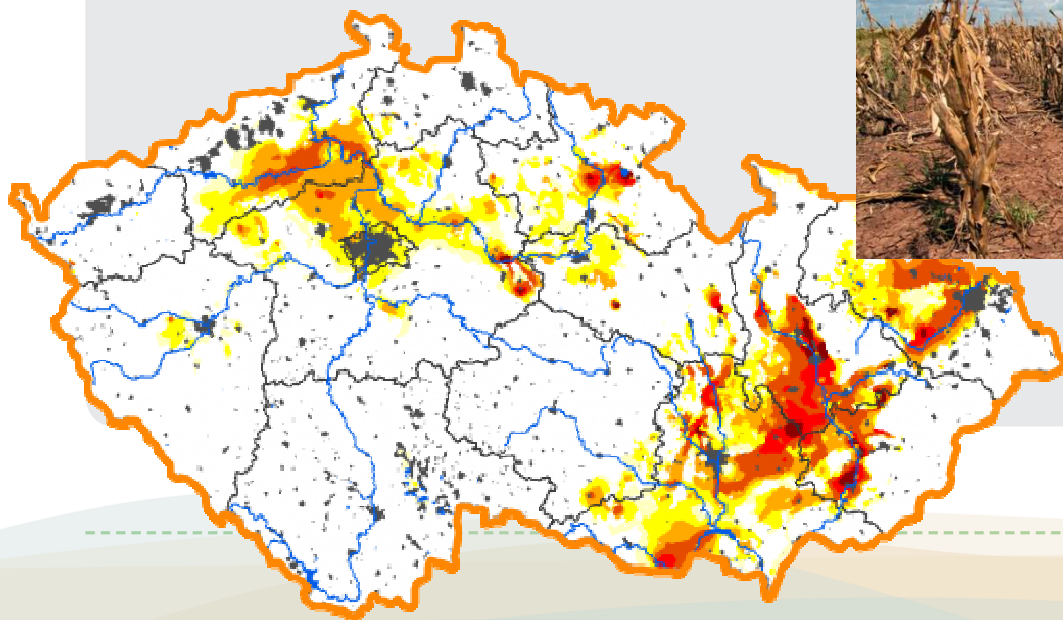
## Current problems in CEE countries

- **Large fields**
- **Soil tillage along slope**
- **Long term bare soil eg. maize after wheat**
- **Intensive soil cultivation without plant residues**



## Current problems in CEE countries

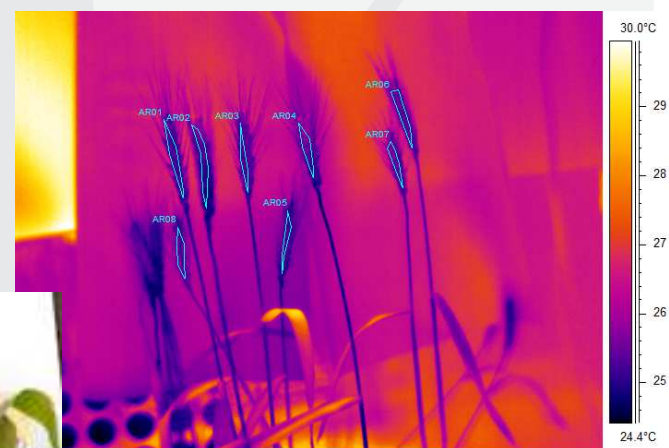
- **Drought episodes**
- **No breeding strategy**
- **Insufficient irrigation infrastructure**





## Current problems in CEE countries

- **High temperatures – heatwaves**
- **The main crops are very sensitive mainly during flowering/anthesis**
- **No breeding strategy**





## Current problems in CEE countries

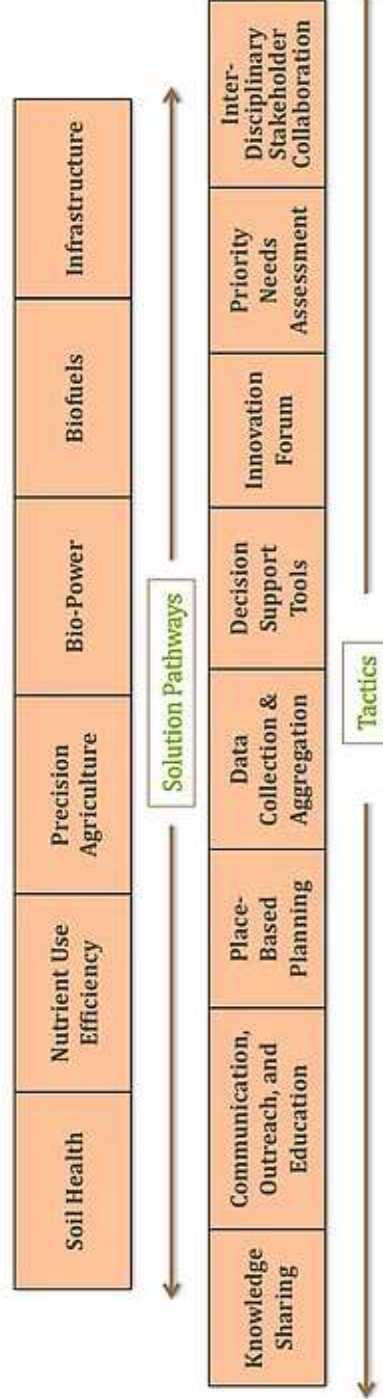
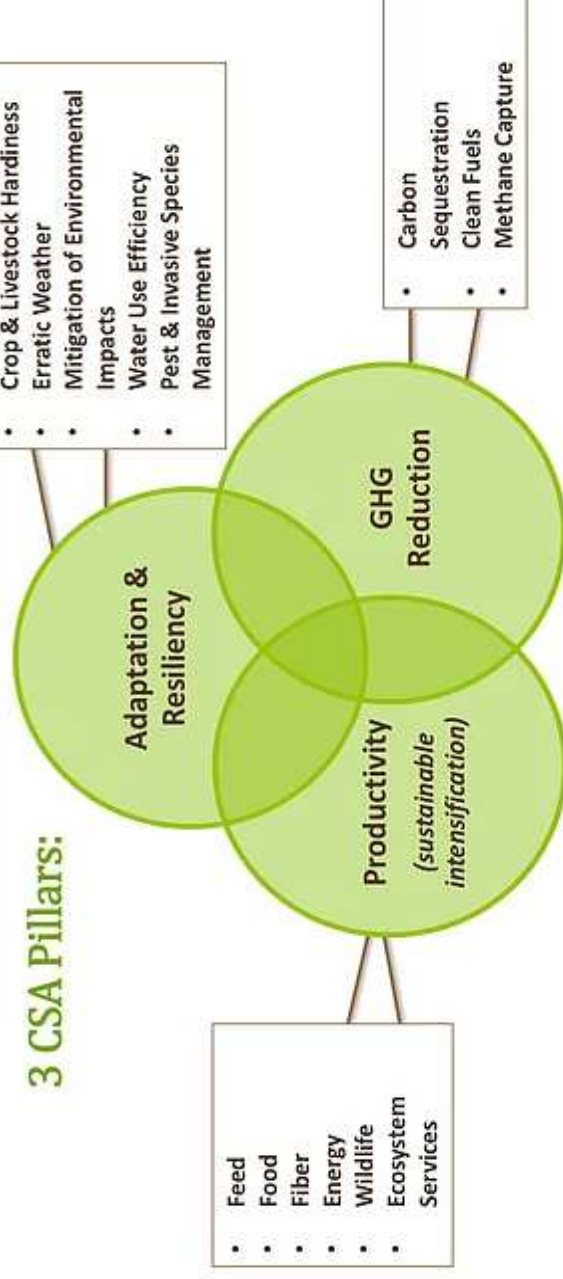
- **Intensive use of N fertilizers and pesticides**
- **Nitrates and pesticides in surface and groundwater drinking water resources**
- **Missing decision support system – although the technology for precision agriculture is available**



## Climate Smart Agriculture

Strategies to enhance the adaptive capacity of agriculture

### 3 CSA Pillars:



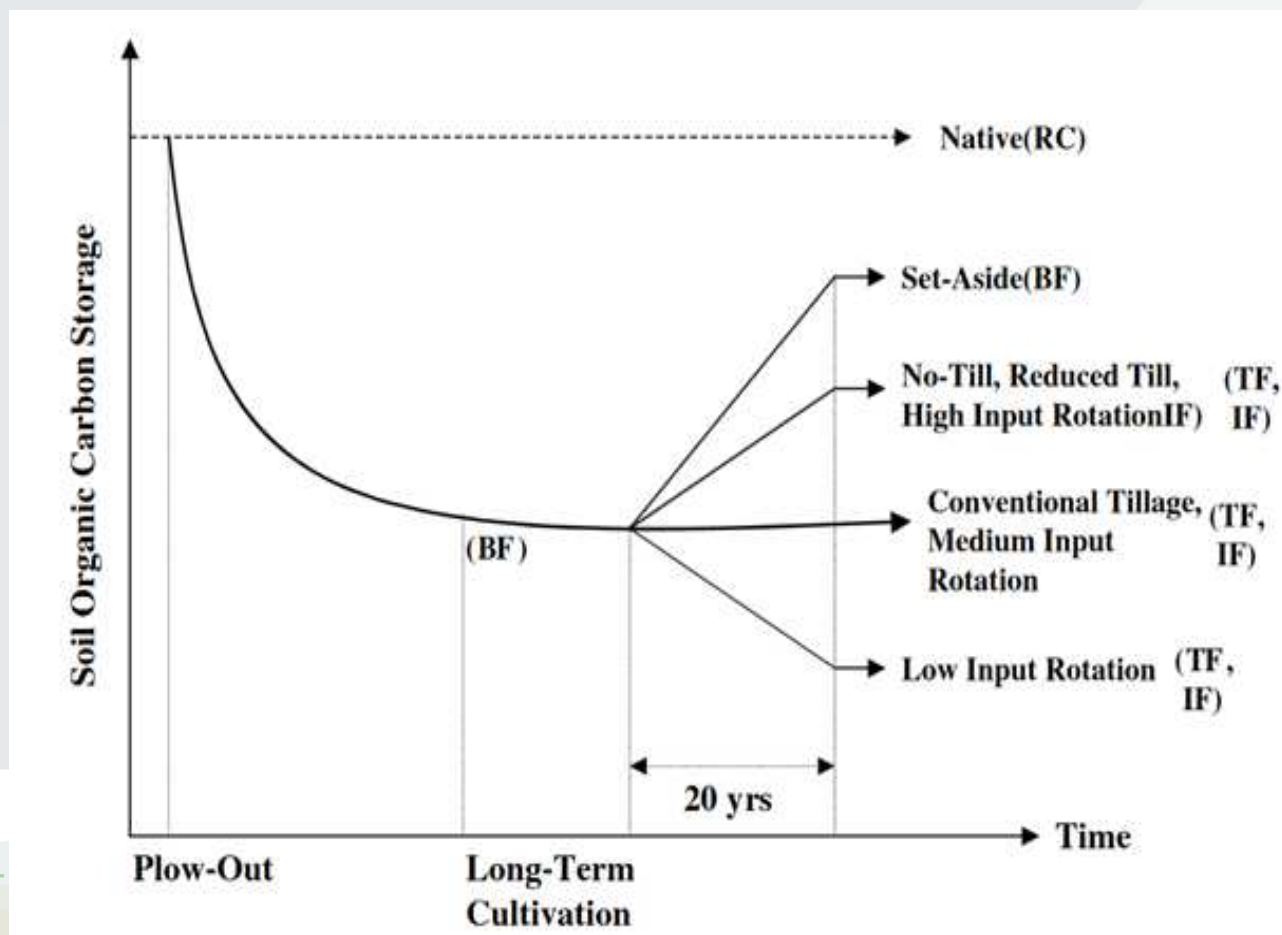


## What is the main objective of CSA hub?

- to build a platform that will facilitate the problem identification, discovering the levers for achieving change and finally enable knowledge exchange between scientists, farmers, industry, advisory services and policy makers
- demonstration of new climate-resilient technologies and transfer to users, and thereby accelerate the process of implementation CSA concept into agricultural practice.



## No-till and cover cropping practices





# No-till and cover cropping practices



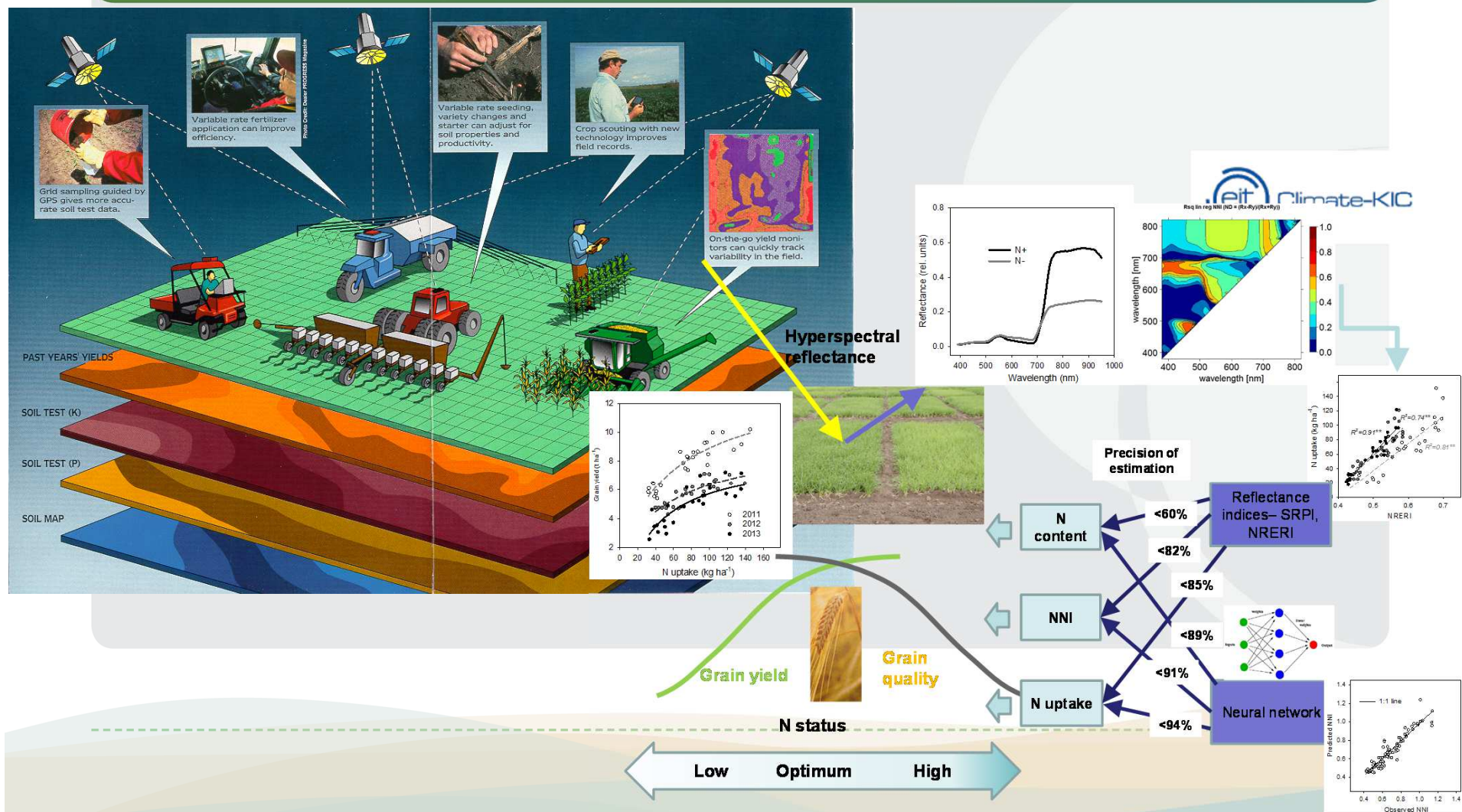


# Biochar application

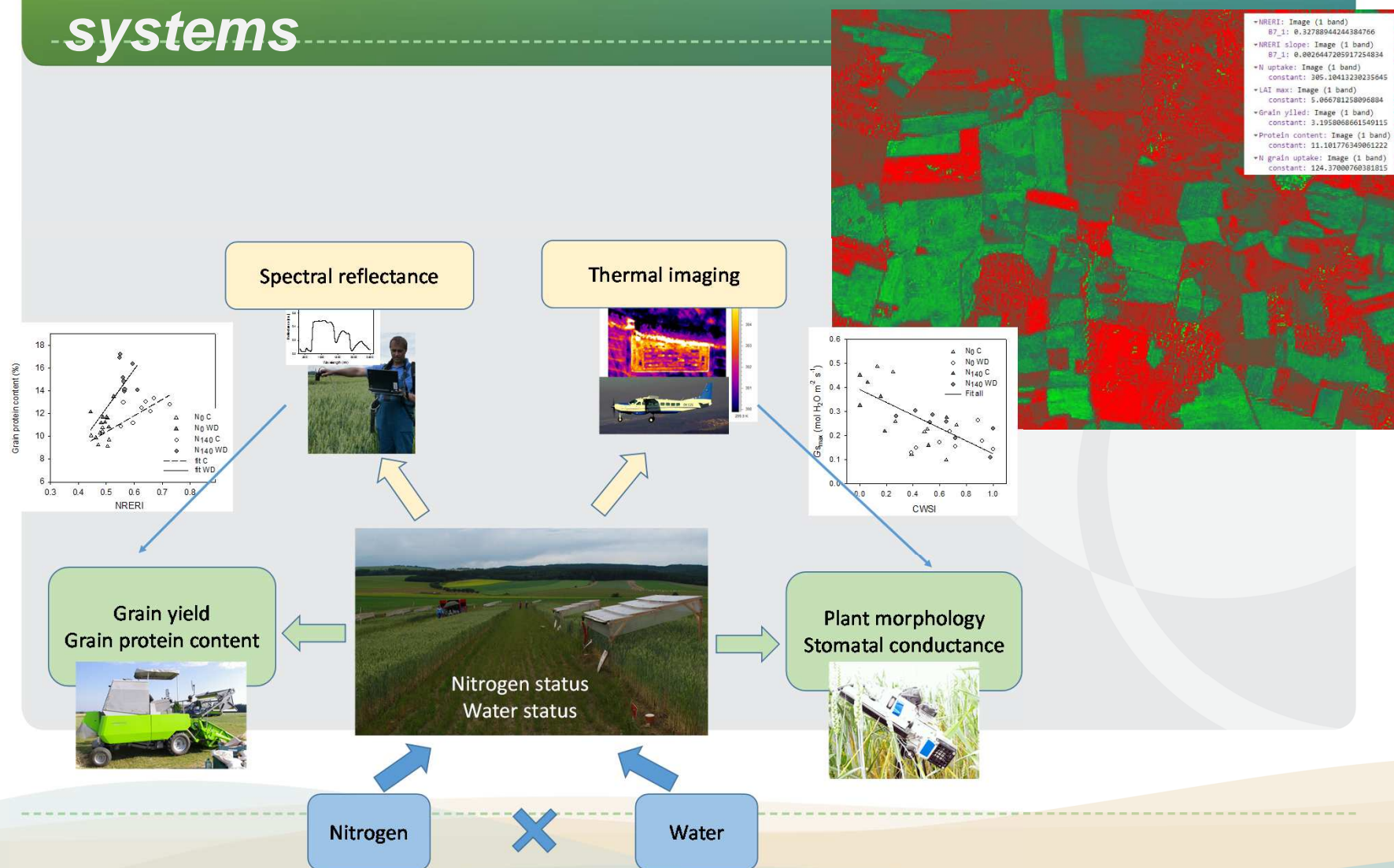




# Precision agriculture and decision support systems

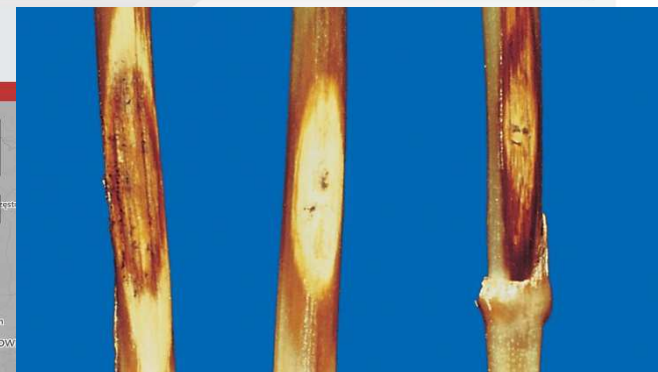
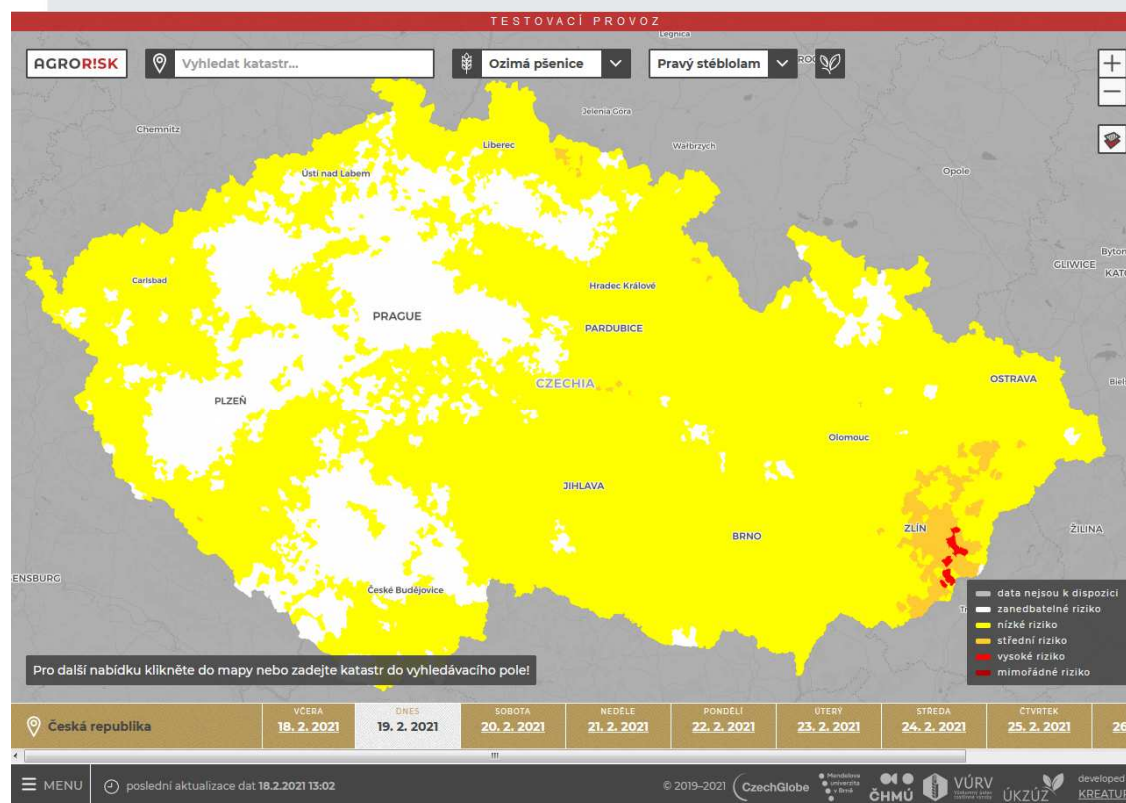


# Precision agriculture and decision support systems



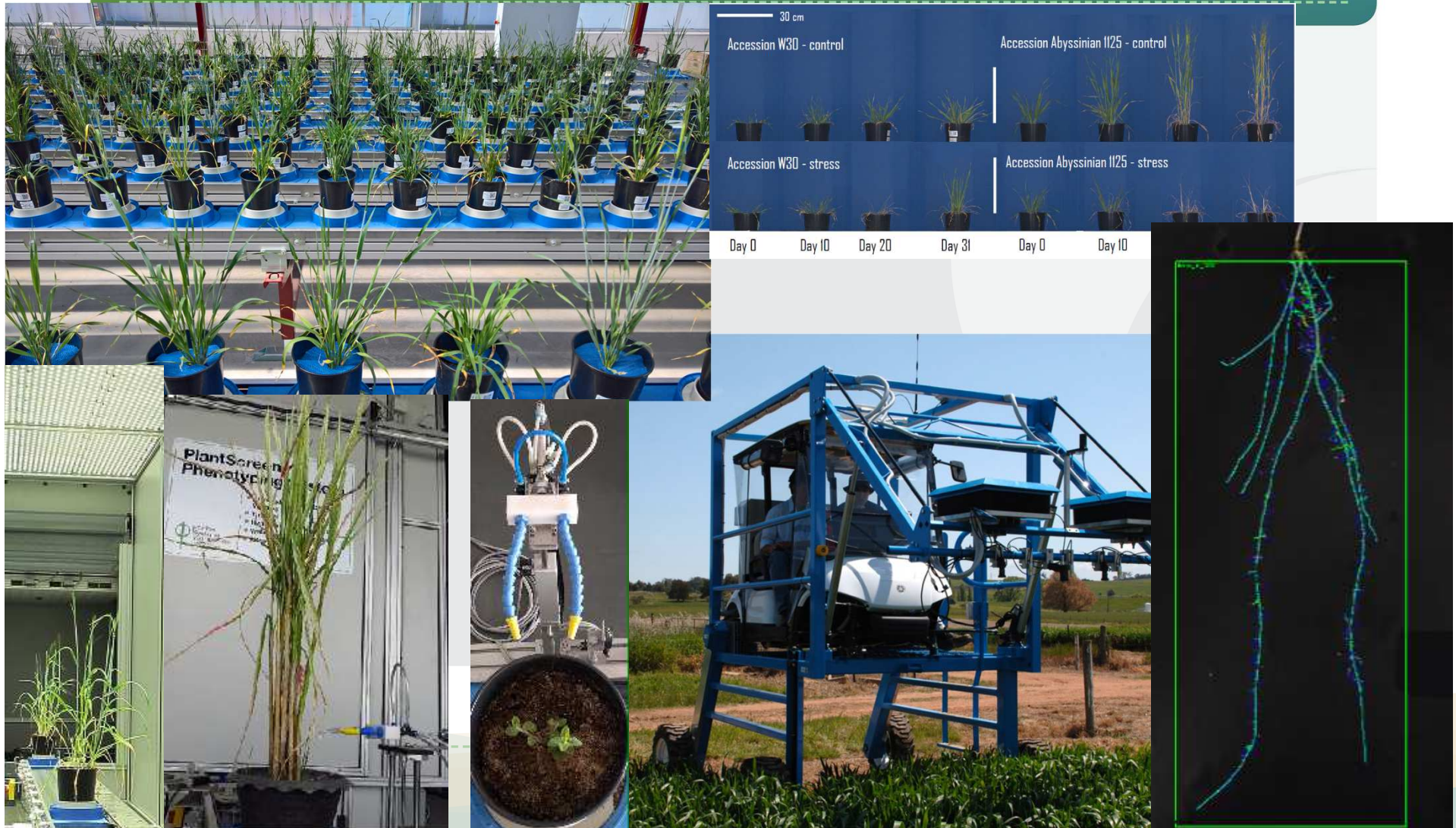


# Precision agriculture and decision support systems



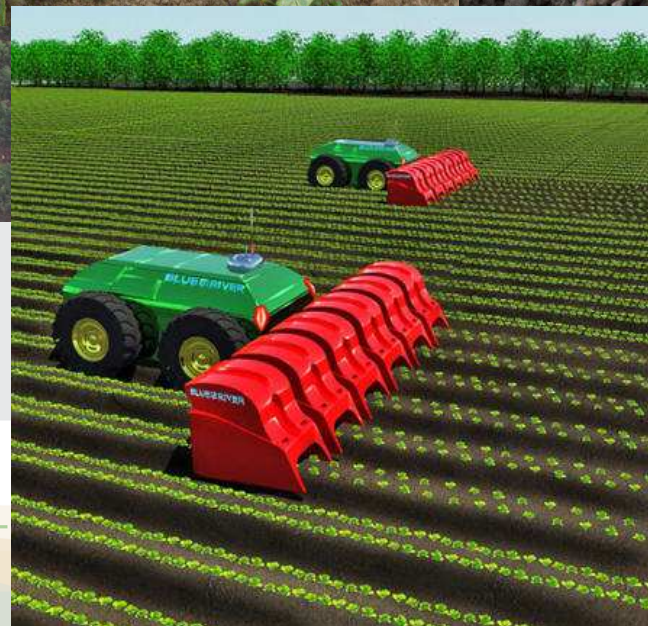


# Improving crop genotypes – plant phenotyping





# *Organic agriculture technologies*





# Biodiversity elements in landscape

## **hedges, windbreaks, forest ties, agroforestry**





## What now?

- **We know the problems (almost)**
- **We have solutions (at least some)**
- **But the action is close to zero**
- **We need to find the way how to enforce change – key players, leverages**