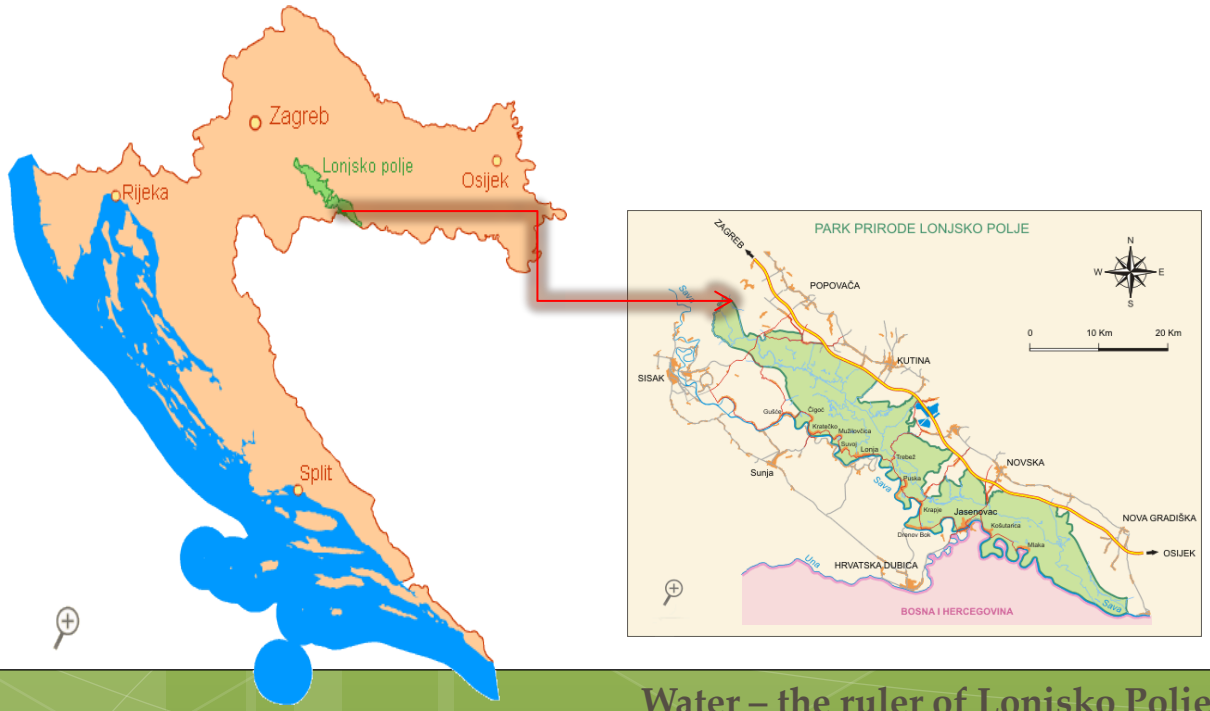
Agriculture and Land Use in Lonja Field

Aleksandra Jurišić & Milan Mesić
University of Zagreb
Faculty of Agriculture
Department of General Agronomy

Lonjsko Polje Nature Park

- Lonja Field is the largest protected wetland in Croatia and in the entire Danube basin
- It covers an area of 505.6 km^2
- According to the criteria of the Birds Directive of the European Union, the park is an important habitat for birds (Important Birds Area - IBA)



- The basic characteristics are the **floods** brought about by the **increased inputs of** the left **tributaries of the Sava** – the Lonja, the Pakra, Veliki Strug, Mali Strug and the Una

- Powerful waves of **water from the Alps and the Dinaridi Mountains raise** the water level of Sava by up to **ten metres**.

- In Lonjsko Polje, these water masses overflow into the forests, pastures and meadows and for this reason the **cities of Zagreb and Sisak** and all the populated areas downstream as far as the confluence with the Danube **are saved from inundation**.

- The hydrological and geo-morphological conditions cause great habitat diversity and thus at the same time very great biodiversity
  - over 550 plant species
  - around 250 bird species
  - the animal world is also extremely diverse and interesting

DANUBEPARKS
network of protected areas

DANUBEPARKS
Transnational cooperation for the preservation of our joint natural heritage

DANUBEPARKS is a network of Protected Areas along the Danube, currently comprising 15 areas represented by different partner institutions (public authorities, public enterprises, NGOs). The Network cooperates in different fields of work that are important to all partners and where solutions depend on a transnationally coherent strategy.

The fields of work are:

- River Morphology and Revitalization
- Floodplain Management and Habitat Network
- Conservation of Danube Flagship Species
- Monitoring and Natura2000
- Nature Tourism

Find

1 From

2 Until

3 Protected Area
All Areas

4 Activities
All Activities

Search

1 Danube Delta Biosphere Reserve
2 Lower Prut Nature Reserve
3 Lower Prut Floodplain Natural Reserve
4 Kalimok-Brushlen Protected Site
5 Rusenski Lom Nature Park
6 Persina Nature Park
7 Đerdap National Park
8 Lonjsko Polje Nature Park
9 Kopački rit Nature Park
10 Gornje Podunavlje Special Nature Reserve
11 Duna-Dráva National Park
12 Duna-Ipoly National Park
13 Fertö-Hánsag National Park
14 Dunajské Luhy Protected Landscape Area
15 Záhorie Protected Landscape Area
16 Donau-Auen National Park
17 Donauauwald Neuburg-Ingolstadt

SOUTH EAST EUROPE

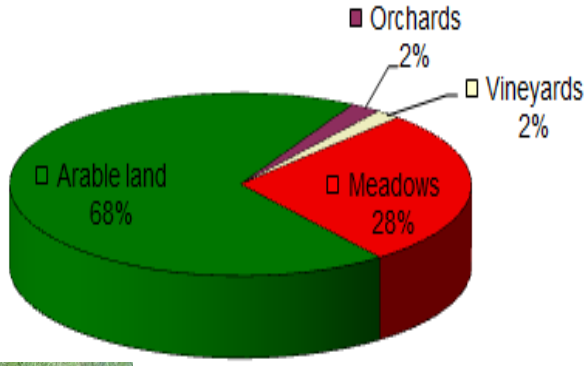
DANUBEPARKS - network of protected areas along the Danube River that constitute unique natural areas of ecological, scientific and cultural importance on an international scale

Land-use: Agriculture

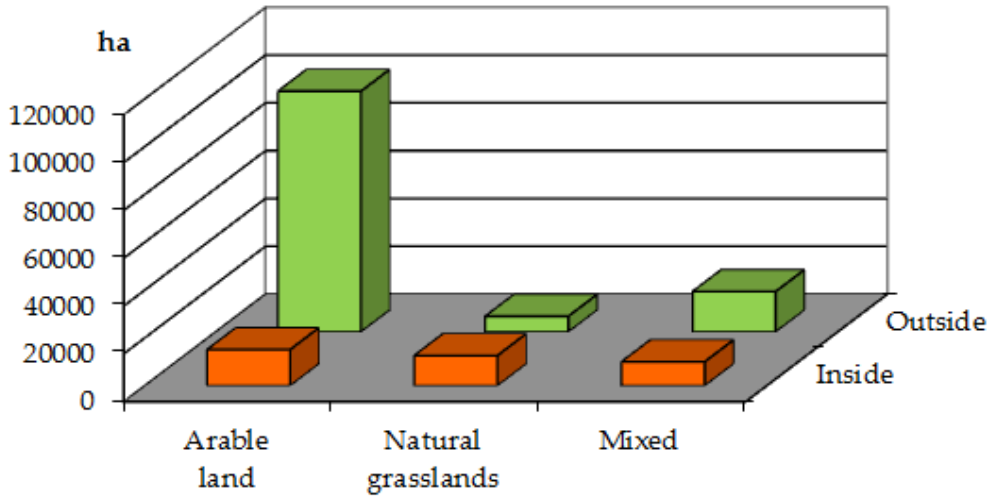
Study of crop production in the Central Sava Basin

Goal:

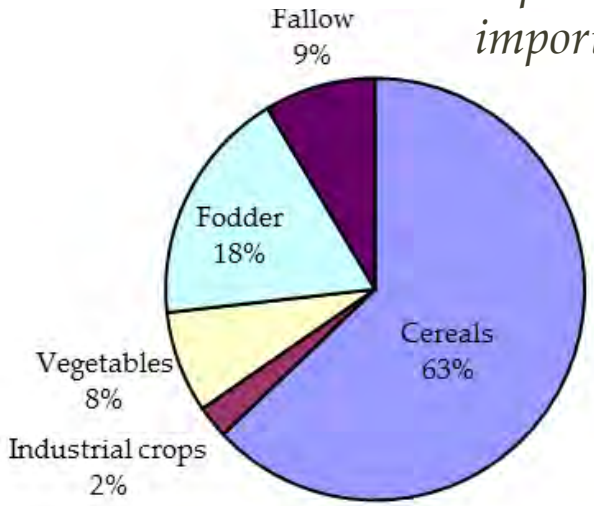
To determine the impact of retention on agricultural crop production

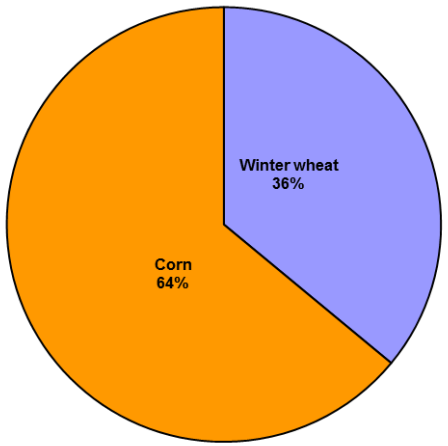


Survey of land use inside and outside of the retentions



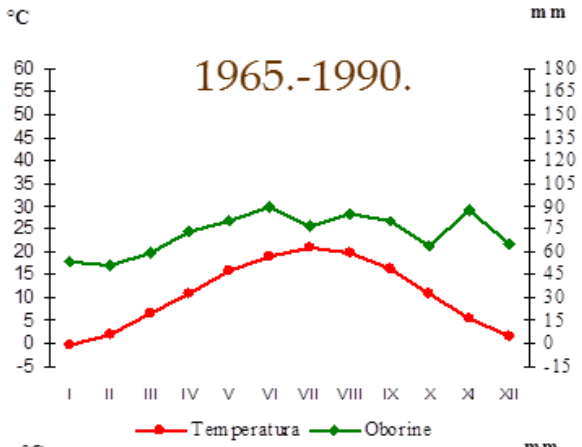
Representation of some important crop groups

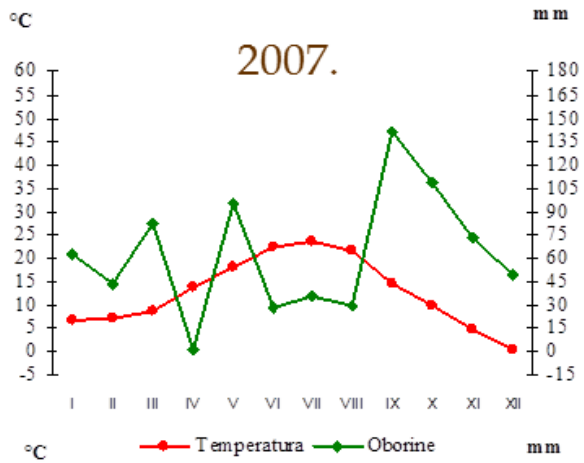


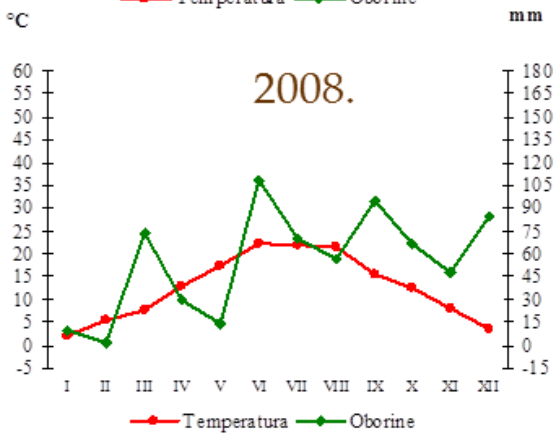


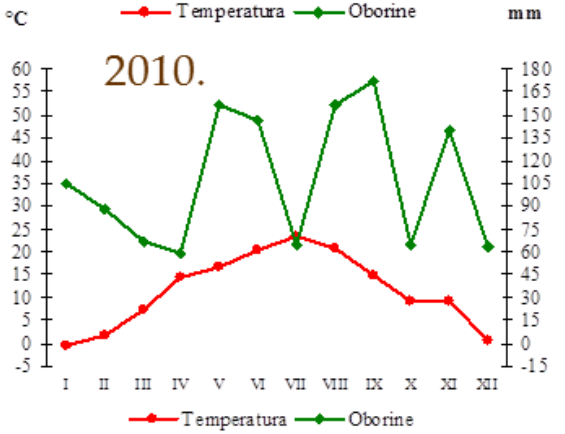
Climate

	Average 1965.-1990.	2007.	2008.	2010.
Sum, mm	865	749	659	1284
T, ºC	10,7	12,6	12,5	11,5







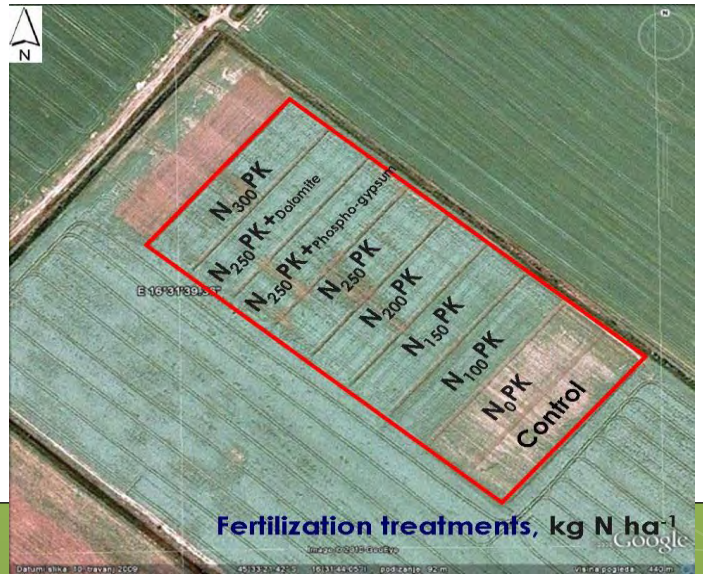


Project name:

Soil Fertilization Acceptable for Environment

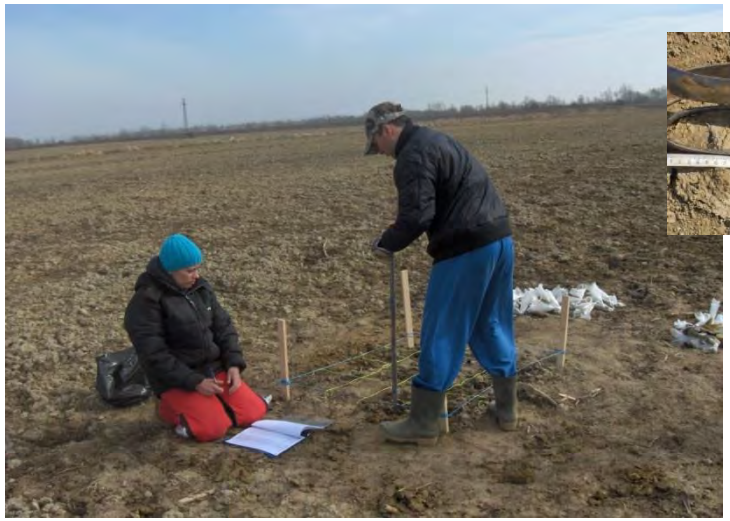
Scientific project funded by Ministry of Science, Education and Sports
Duration: since 1996
Lead by Prof. dr. sc. Milan Mesic

Location and experimental design



Soil samples

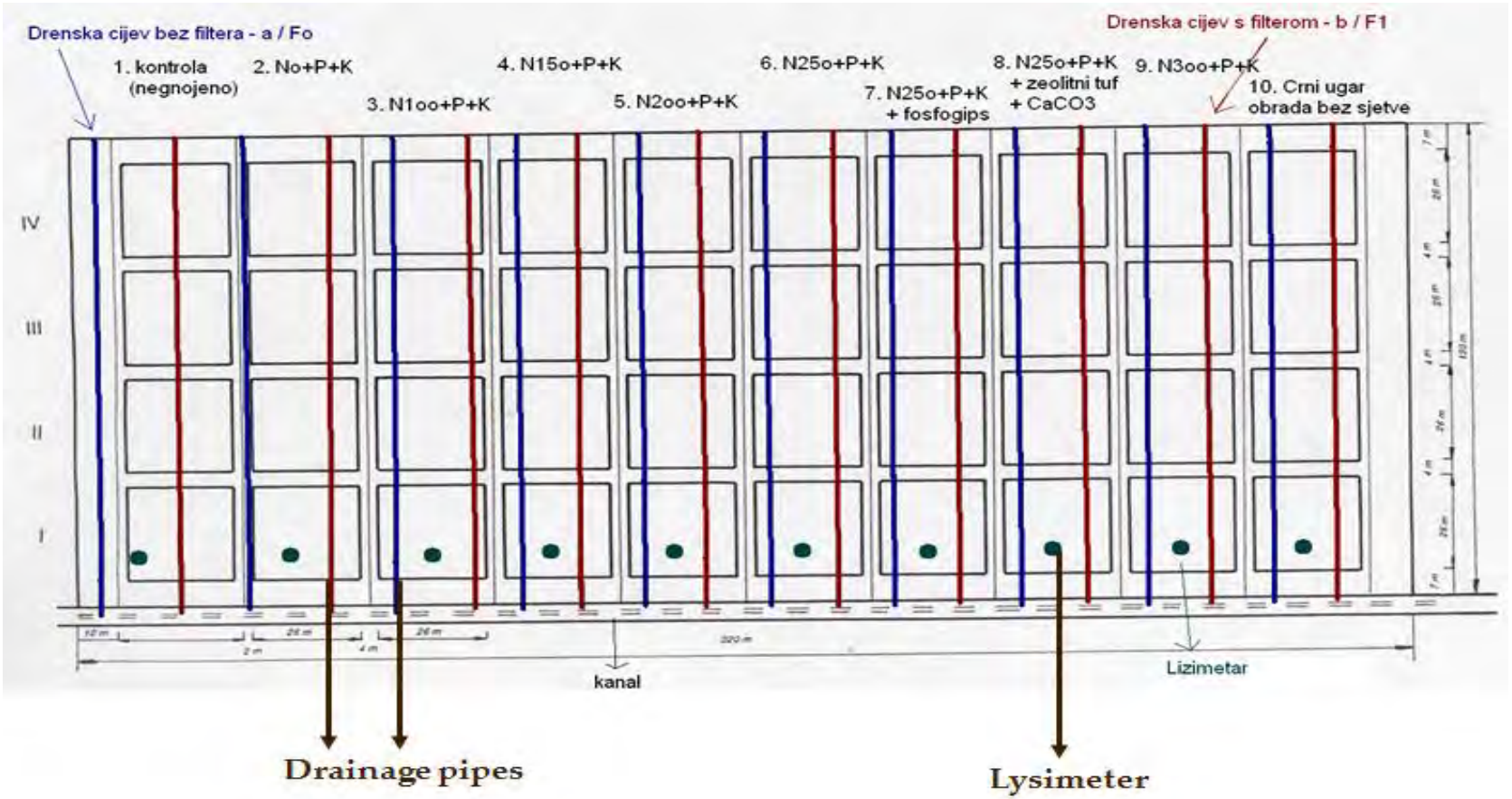
Parameters: pH, EC, P_2O_5, K_2O, OM, TN, TC, TS, NO_3^-, NH_4^+



Patent pending: PCT/HR2011/000021 Rotary Soil Sampling Assembly

Water samples

Parameters: pH, EC, F^-, Cl^-, NO_2^-, NO_3^-, Br^-, SO_4^{2-}, PO_4^{3-}, Li^+, Na^+, K^+, NH_4^+, Ca^{2+}, Mg^{2+}

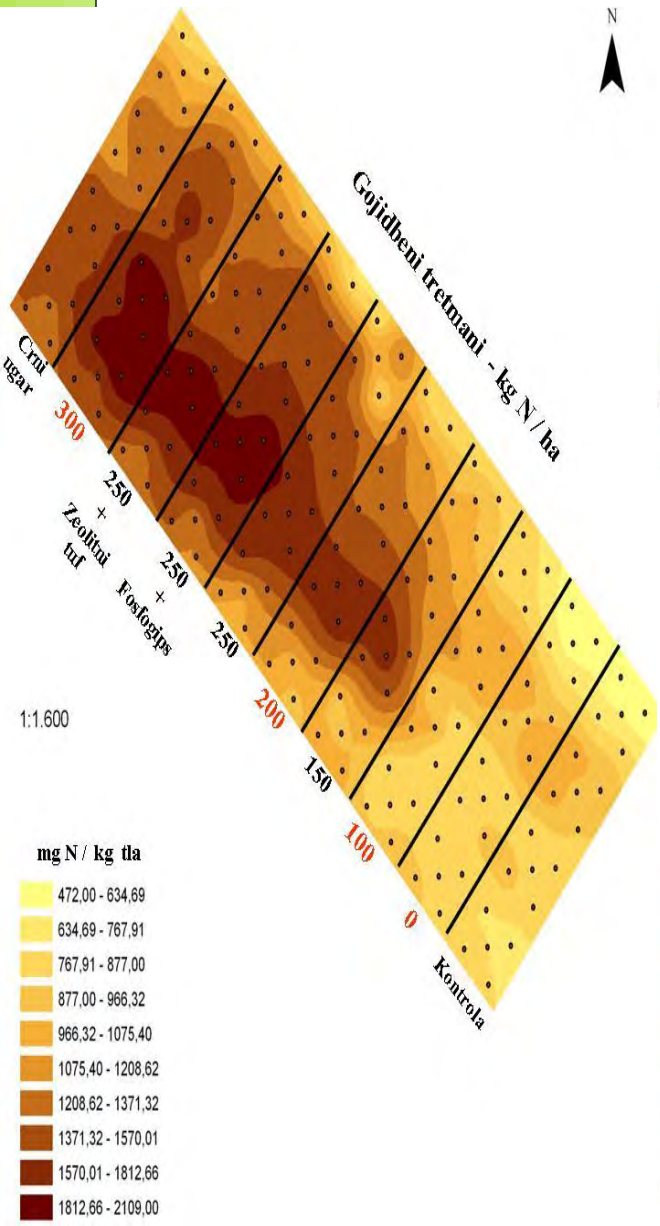


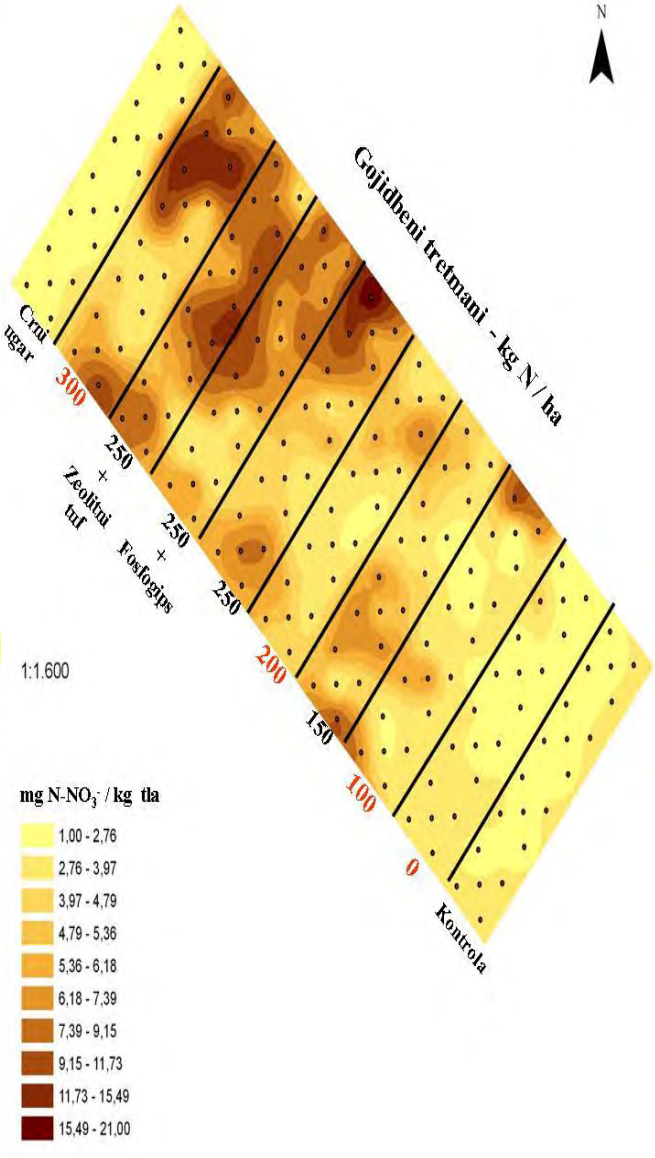
Plant samples

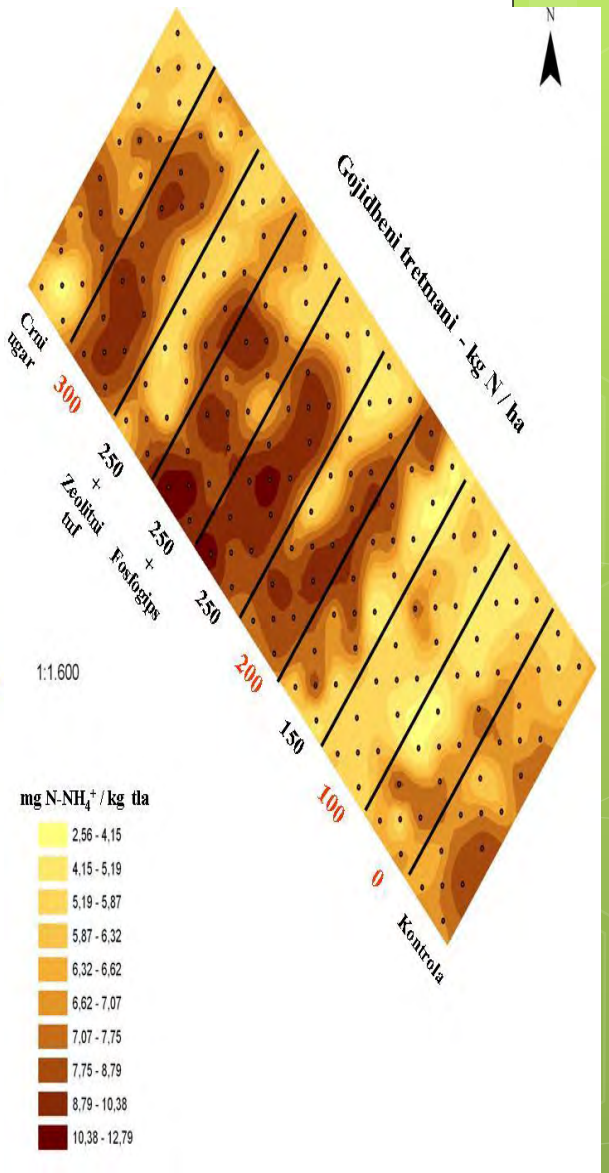
Parameters: yield, TN, TC, TS

- Maize
- Winter wheat
- Soybean
- Oilseed rape

Soil – spatial variability - horizontal

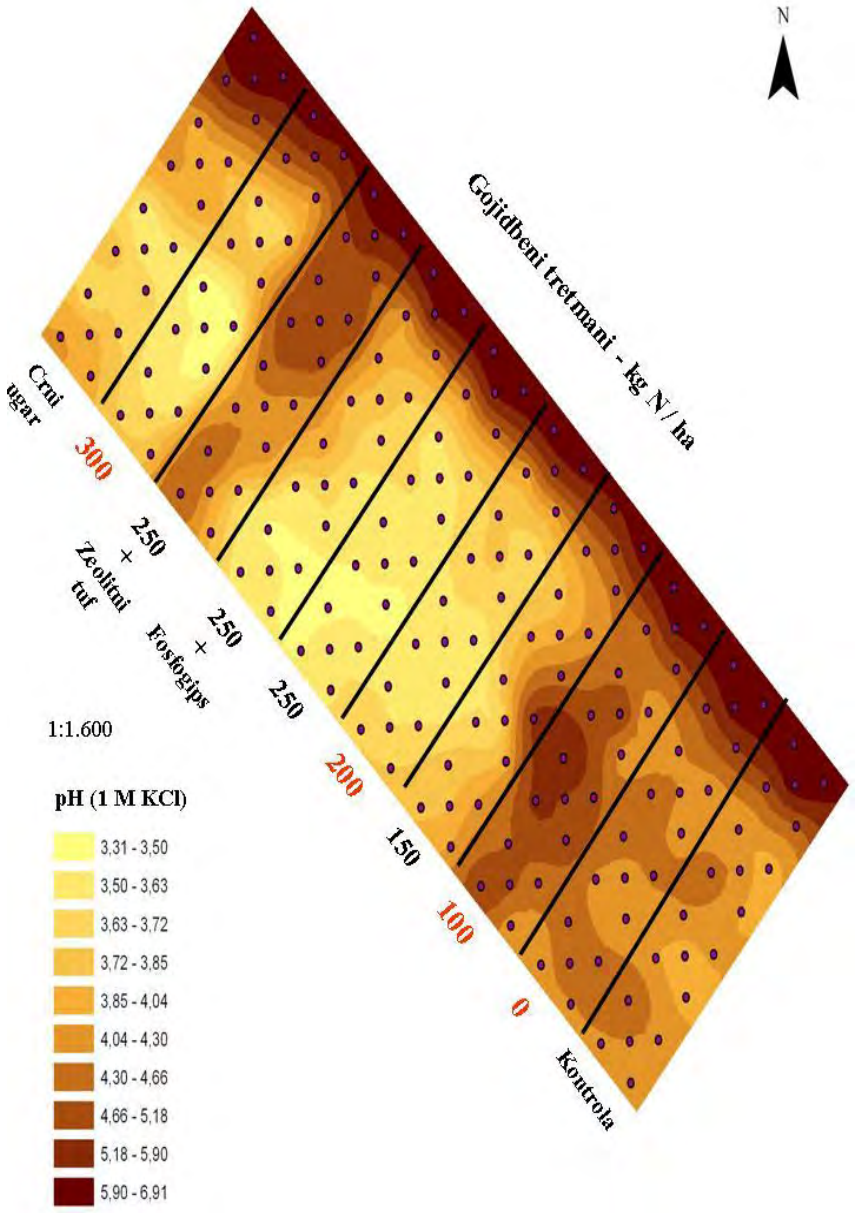




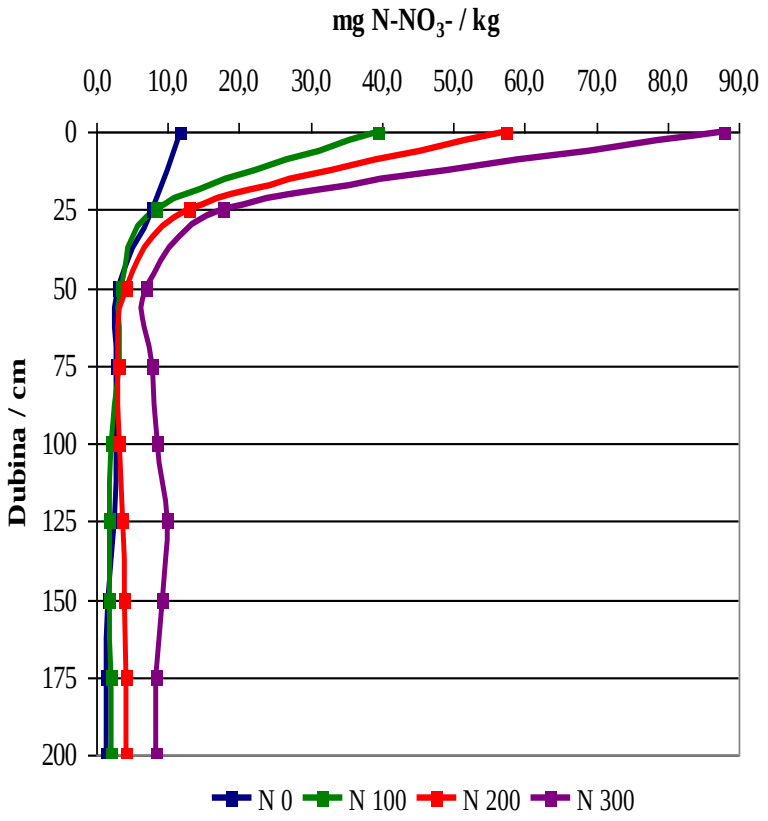


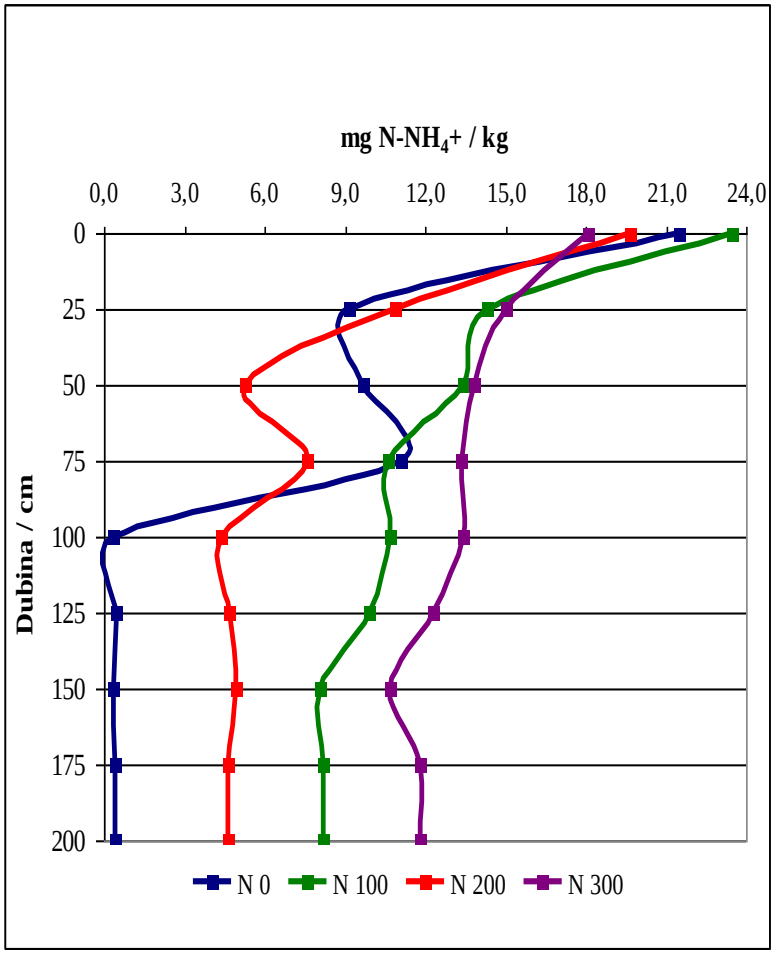
Correlation

Soil parameter	pH
Ukupni N (mg kg^{-1})	- 0,574 ***
$N\text{-}NO_3^-$ (mg kg^{-1})	0,056 NS
$N\text{-}NH_4^+$ (mg kg^{-1})	- 0,540 ***

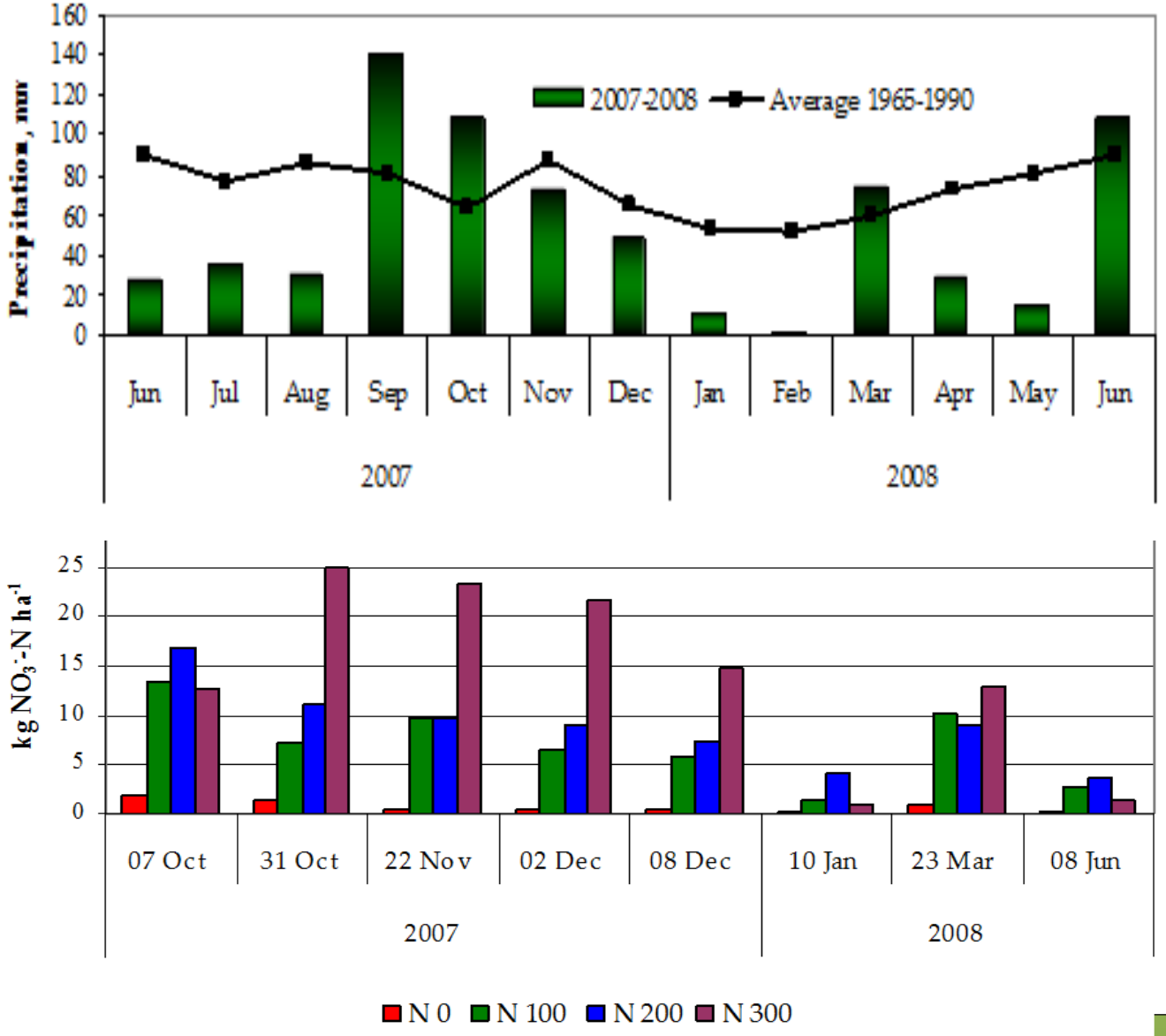


Soil – spatial variability - vertical





Water - Lysimeters

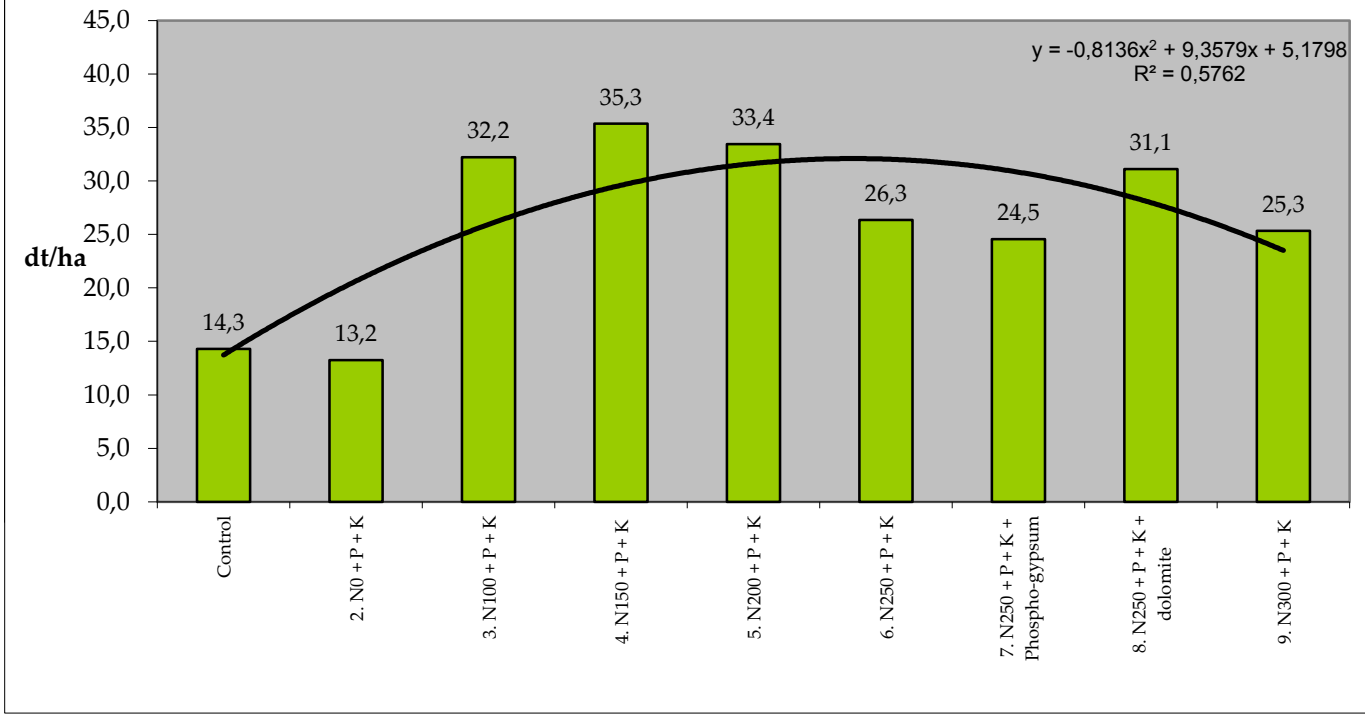


Plant

The yield of winter wheat (dt) in 2007.

The yield of maize (dt) in 2008.

The yield of oilseed rape, 2009.



- Agroecosystem of Lonja field is very sensitive
- Agriculture is a main driver of sustainable development of the Nature park
- There is a need to explain changes in land use in last 40 years (CLC) and to develop scenarios for the future
- Based on the results of modelling, we can prevent negative processes

- University of Zagreb Faculty of Agriculture
  Department of General Agronomy

- Participation in different projects related to
  - agriculture & agroecosystem services
  - land use & soil protection
  - water protection from agriculture

Thank you for your attention!