POPULARIZATION OF SOIL FERTILITY CONTROL AMONG LANDUSERS

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Institute for Soil is Public Institution established in 2001 by the Croatian Goverment

Since July 2009 operating within Croatian Centre for Agriculture, Food and Rural Affairs

From end of July 2013 operating within Agricultural Land Agency

Basic activities:

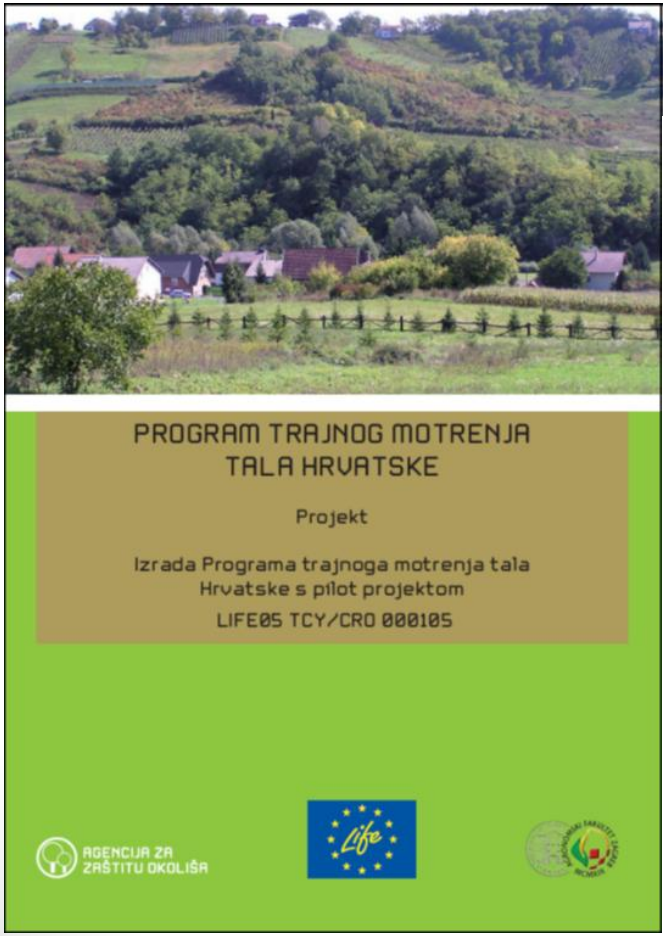
Two departments :

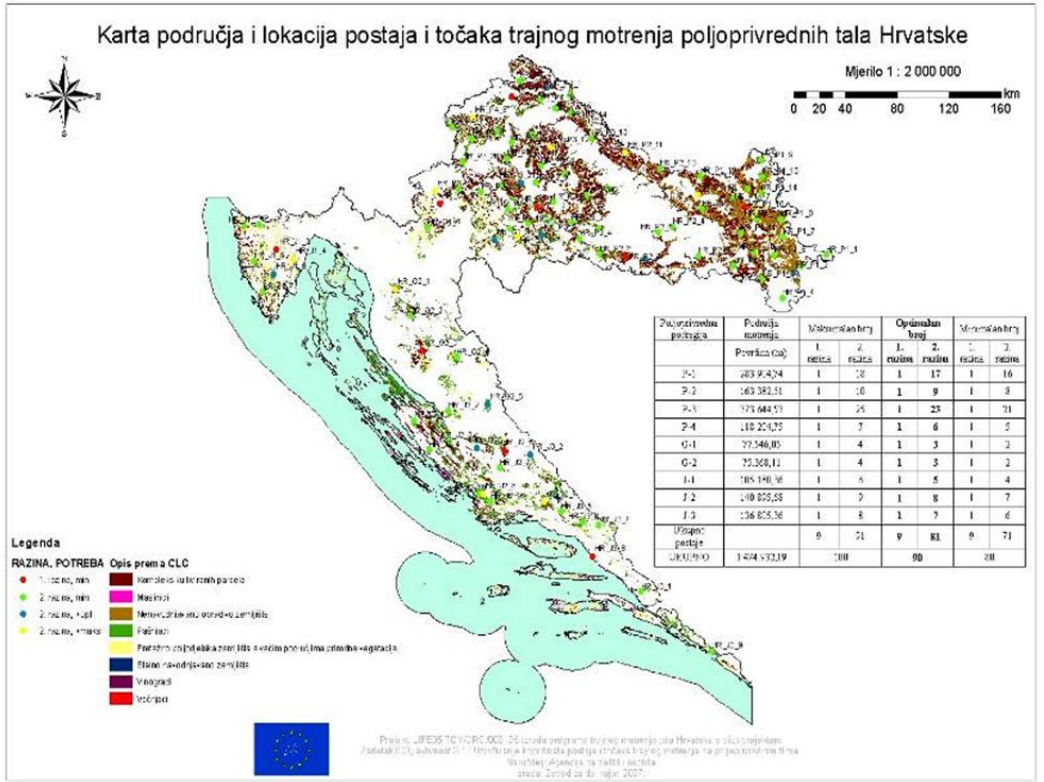
<u>Soil and Land conversation Department</u>

- Agricultural soil monitoring programme
- Digitalisation of the basic pedological map 1:50000
- preparing pedological and hydropedological surveys for management measures of agricultural land (based on soil physical analysis)

Basic activities:

- continuous monitoring of agricultural land (to be prepared)



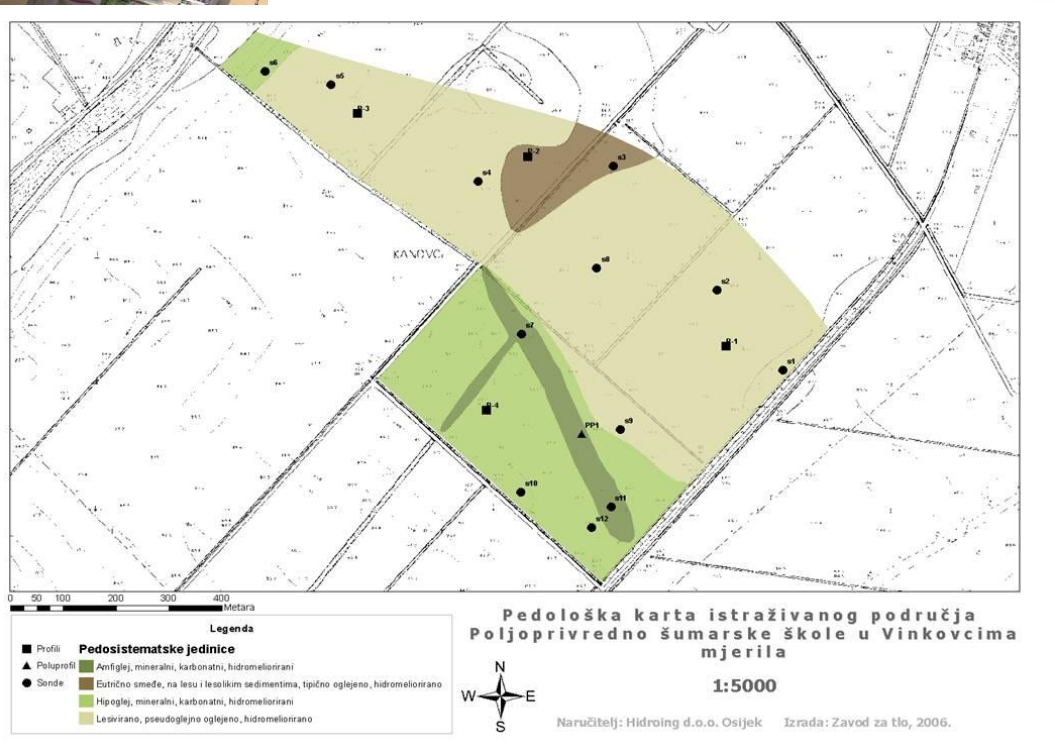


Basic activities:

- Digitalisation of the Basic Pedological Map 1:50.000 – within Croatian Soil Inforamtion System (Croatian Environment Agency)

Basic activities:

- preparing pedological and hydropedological surveys for management measures of agricultural land (based on soil physical analysis)



Basic activities:

Laboratory department

- mostly covers the field of soil analysis – chemical and physical anlysis
- analysis for plant materials, organic manures

Basic activities:

- assessment of the laboratory by the Croatian Accreditation Agency pursuant to *ISO/IEC 17025 - General requirements for the competence of testing and calibration laboratories*

17025 · HAA

1324

POPULARIZATION OF SOIL FERTILITY CONTROL AMONG LANDUSERS - Introduction

- 2003 Institute for soil – Osijek (today as part of Agricultural land agency) in cooperation with Faculty of agriculture Osijek has started project „Soil fertility control on a family farms“
- from 2003 – 2012 were sampled 17400 of soil samples and cover about 108000 ha of arable land
- project task was to determinate the status of nutrients in soil and their availability by applying the system of soil fertility control, via soil chemical analysis of the sample

Goals of this project

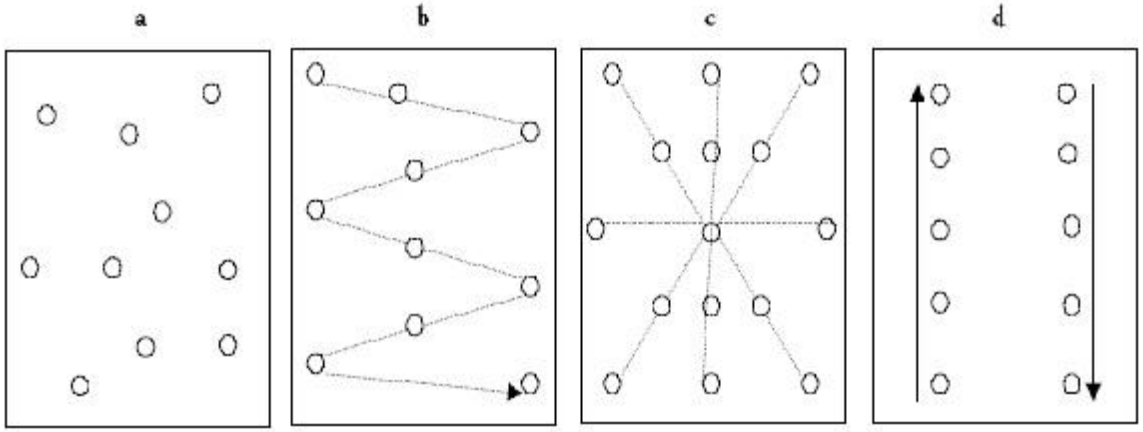
- land users got soil chemical analysis and fertilizations recommendations for a specific culture for an affordable prices
- increased popularization of soil fertility control through soil chemical analysis
- establishing the information system and database of the soil features wich is multiplay useful for the user and local-self goverment and a county for considering the possibilites of agricultural production

Material and methods

- average soil samples for soil analysis are taken by probe
- samples were collected at the same depth that the field is ploughed (0-30cm)

Material and methods

- average soil sample makes 25 subsamples took at random locations throughout one field or area



- soil sampling sites are located with Global positioning system (GPS) and all data are in GIS database
- all the data taken are enterd into a database containing information on a user land

Material and methods

- we put emphasis on amount of phosphorus, potassium, percentage of organic matter and soil reaction in top layer of soil (0-30 cm)
- **Methods used for chemical analysis**
- **determination of available phosphorus** by AL-method - extraction with ammonium-lactate (Test method: Determination of ammonium lactate extractable phosphorus express as P2O5-spectrophotometric determination-In house method)

Material and methods

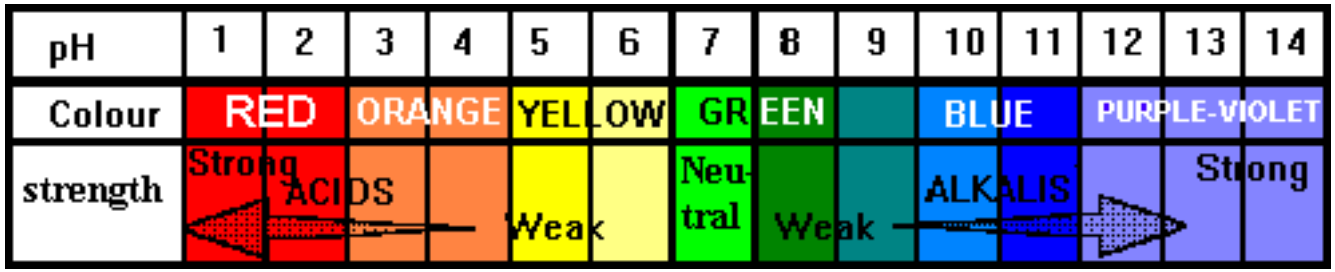
- **determination of available potassium** (Test method: Determination of ammonium lactate extractable potassium express as K2O –-flame photometric determination-In house method)
- **percentage of organic matter** (%) was determined spectrometrically using bichromate method (Test method: Determination of humus bysulfochromic oxidation spectrophotometric determination – In house method)

Material and methods

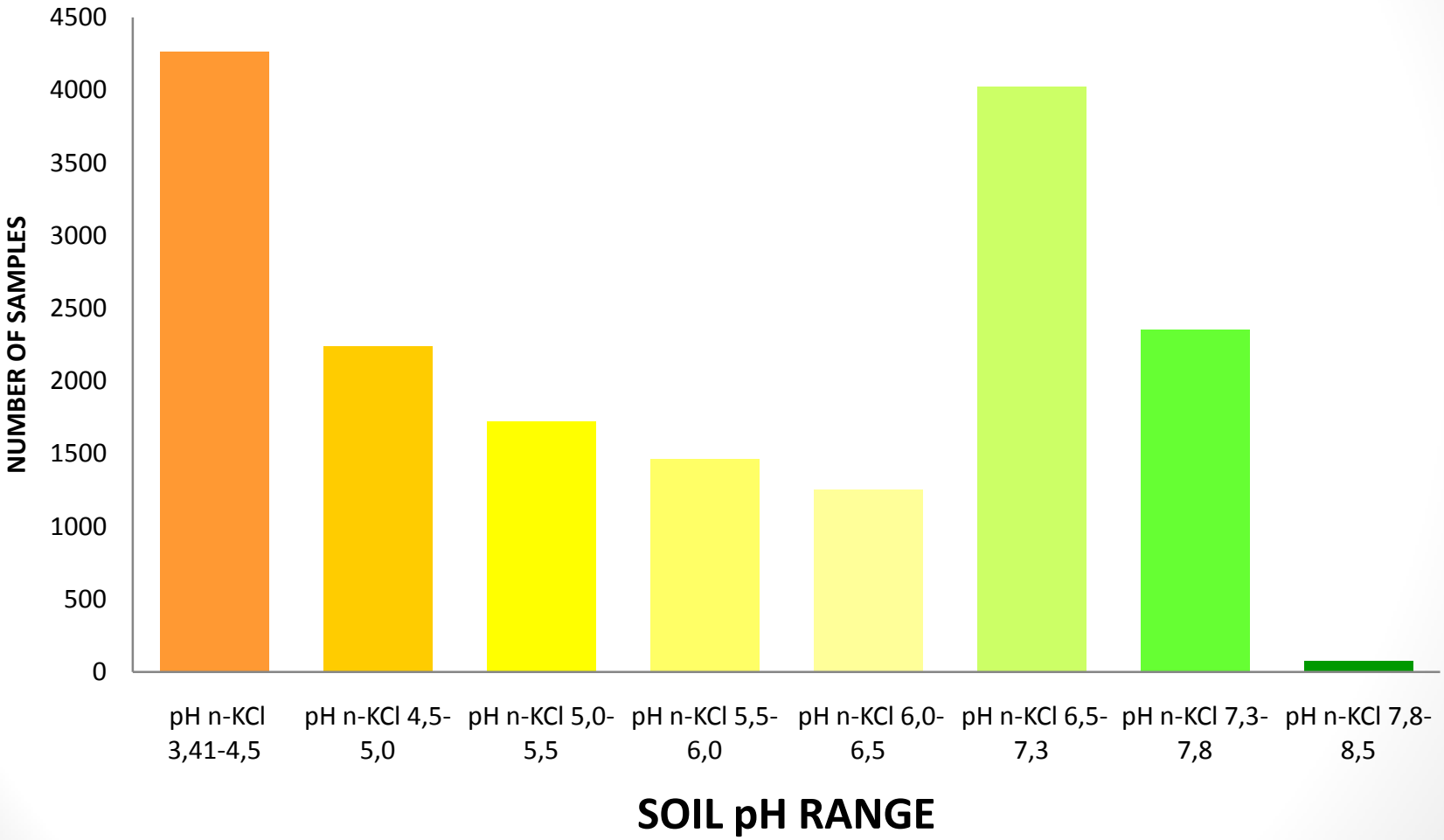
Determination of soil reaction – soil pH

Material and methods

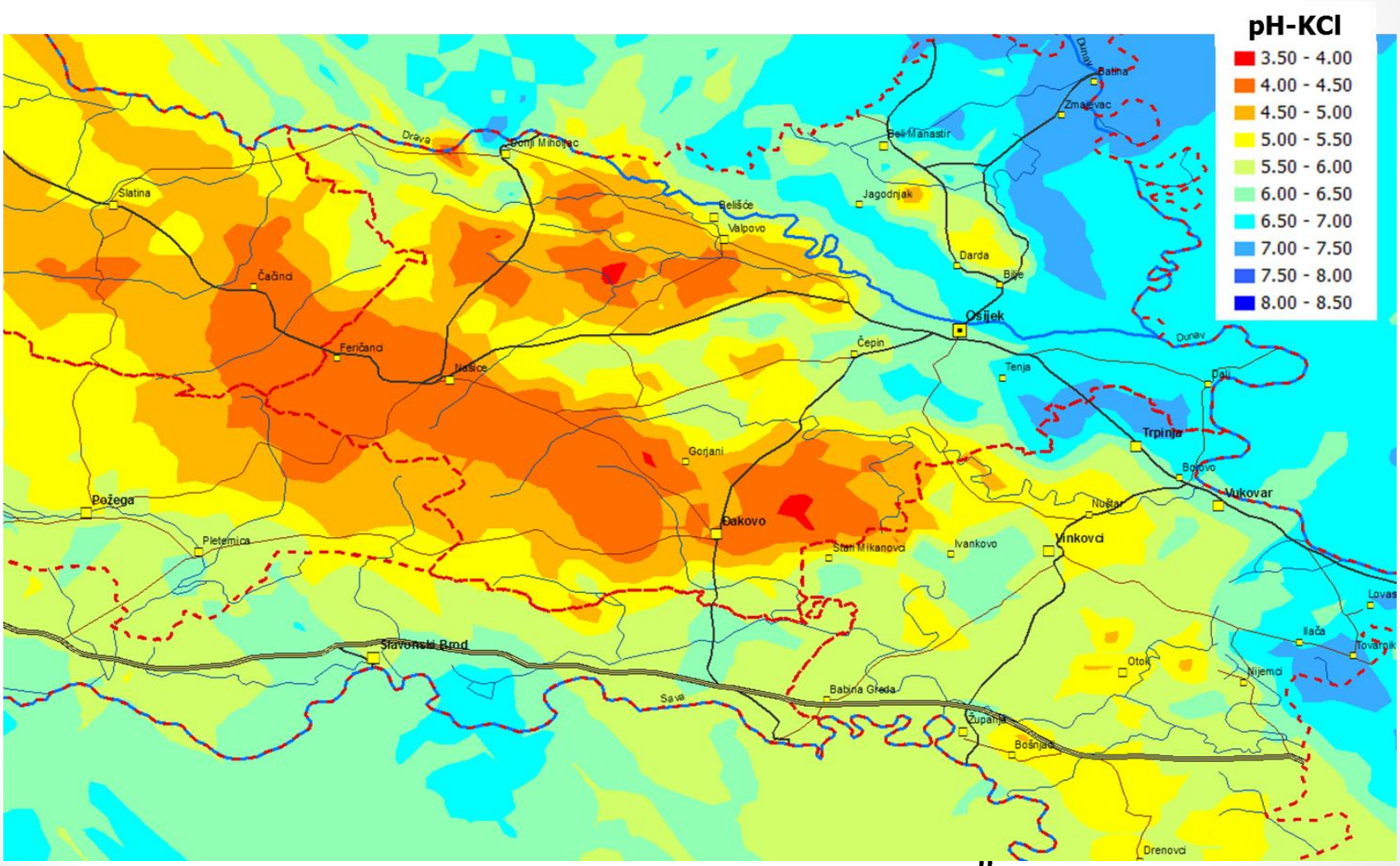
- soil reaction, pH was determined according to HRN ISO 10390:2005
- over a 37% of soil samples from this project had pH strongly acid, 18% moderately acid and rest of the soil samples had neutral to slightly alkane



Results – soil pH

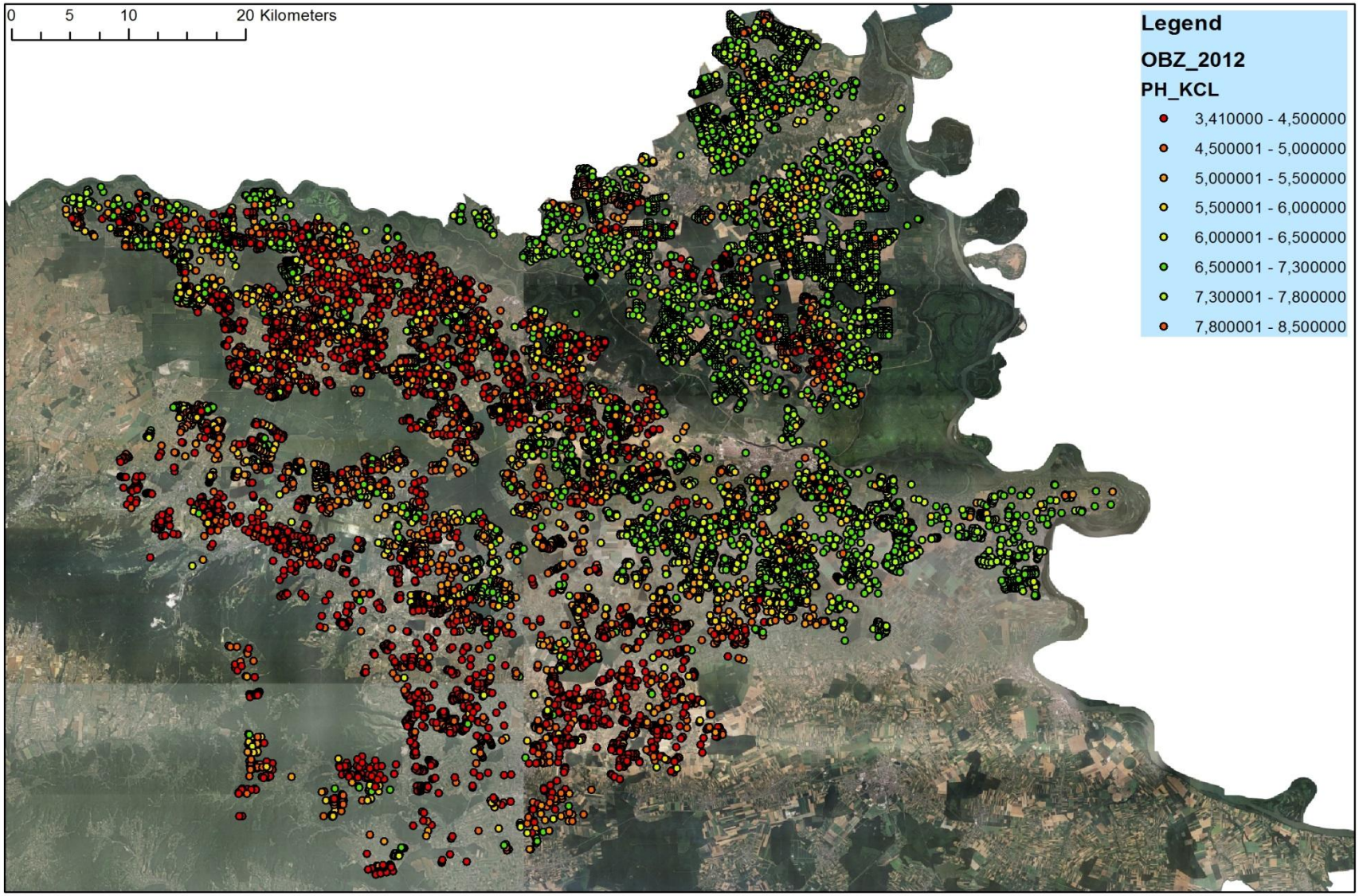


Results – soil pH



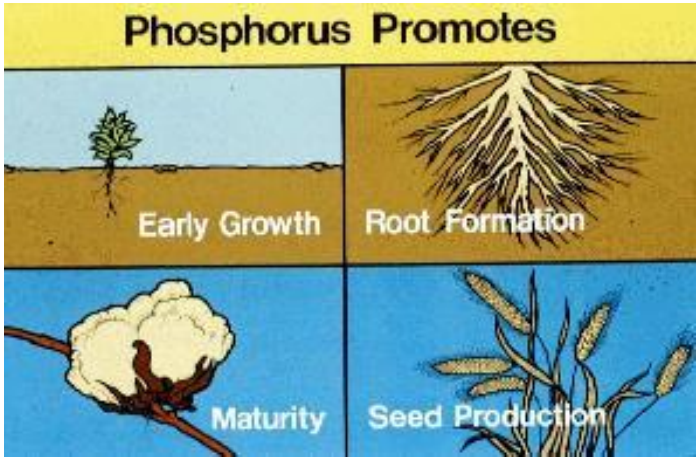
Vukadinovic, Bertic (2009) „Soil fertility control on family farms”

Results – soil pH

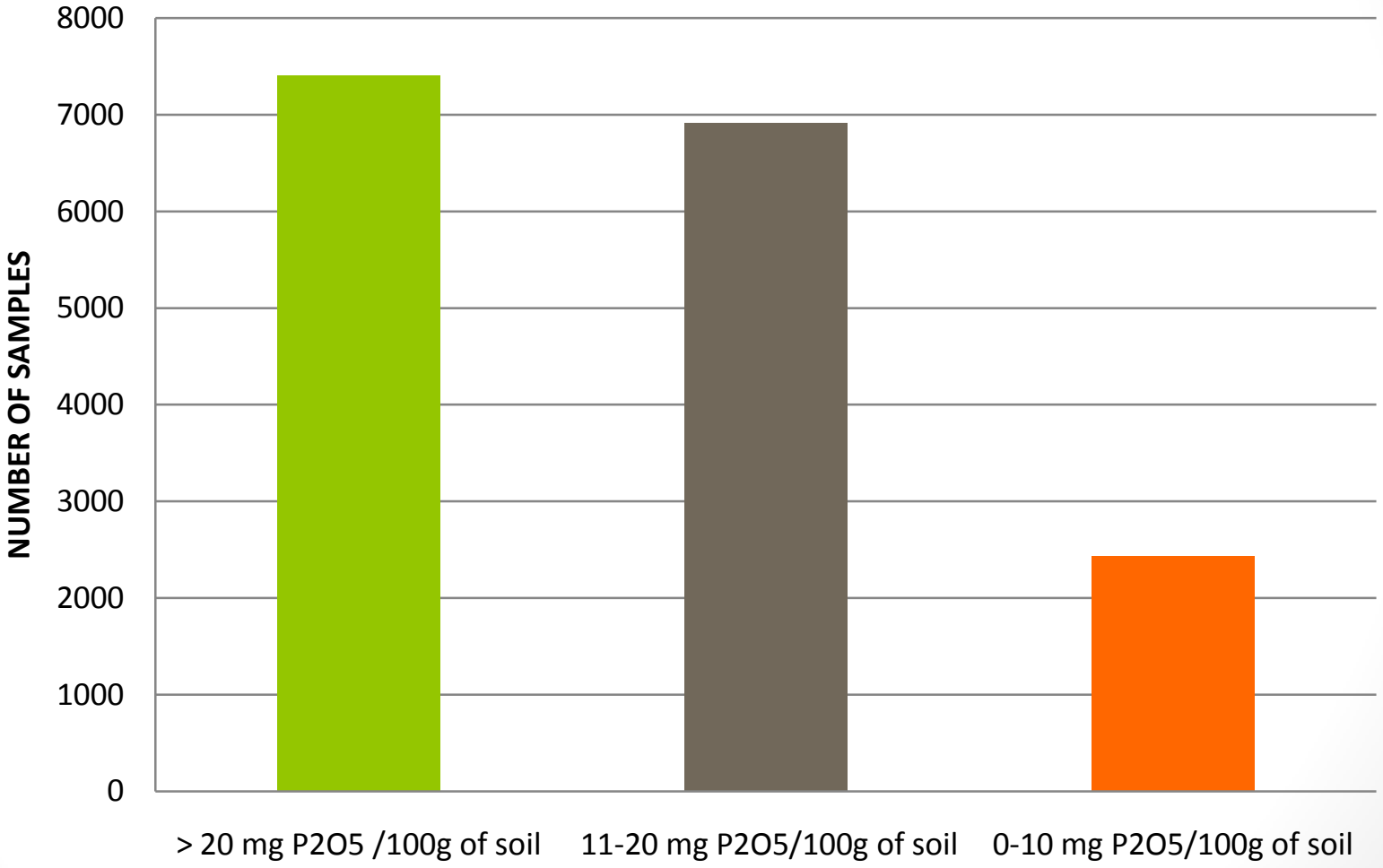


Results - available phosphorus

- **15% of soil samples** had low values of available phosphorus **less than 10 mg** /100**g** of soil, **41%** of soil samples had between **11 and 20 mg**/100g of soil, **44%** of samples had over **20 mg** /100g of soil
- low values of available phosphorus can be linked with strong acidity of more than half of soil samples



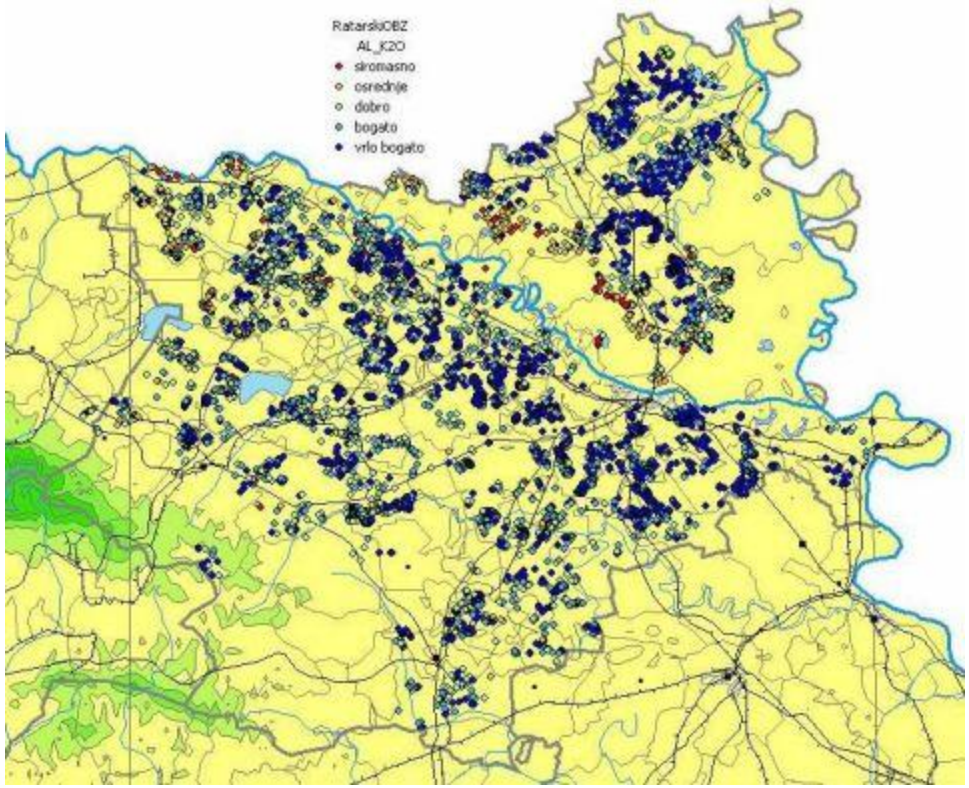
Results - available phosphorus



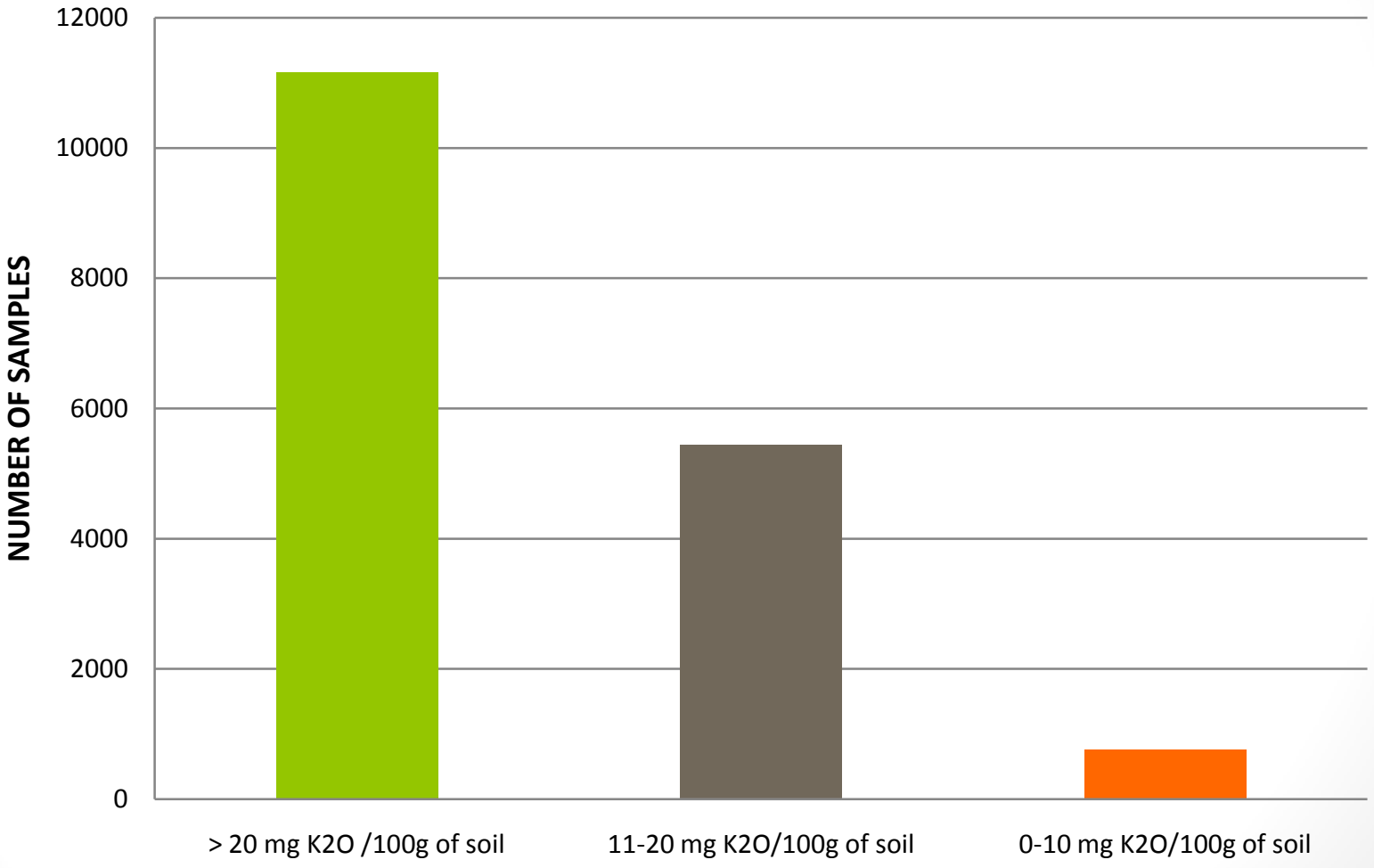
Results - available potassium

- **4%** of samples had less than **10mg**/100g, **31%** of samples had **11 to 20mg**/100g of soil**, 64%** samples had over **20 mg**/100g

❖ might be - increased amount of available potassium is closely linked with intensive fertilization



Results - available potassium

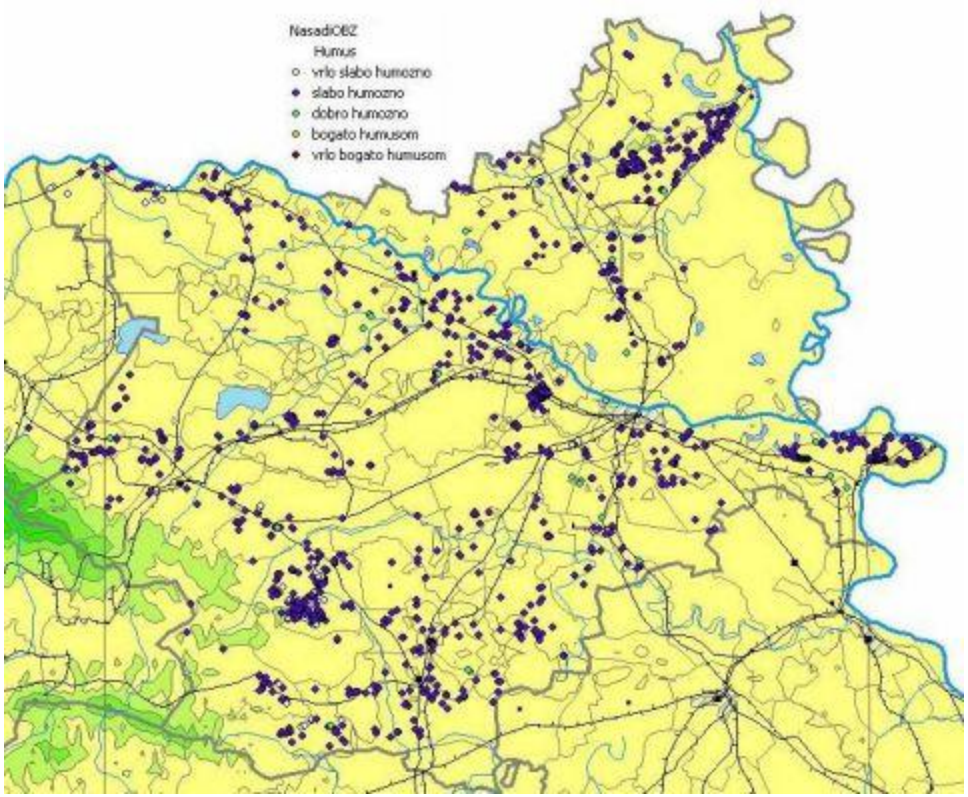


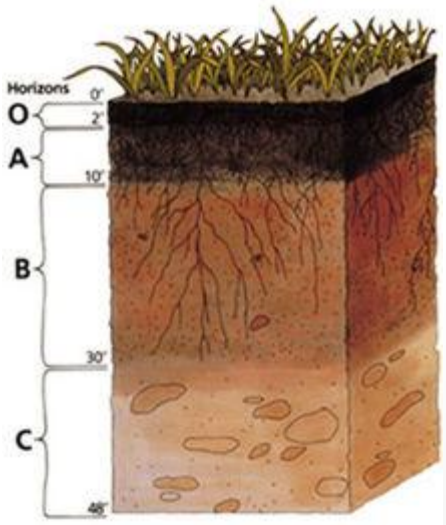
Results

- there is more reason for unevenness in availability of phosphorus and potassium
- the factors can be relate to :
  - pH of soil (soil acidity can affect P-sorption),
  - soil mineral type,
  - temperature or
  - it could be because of excessive use of mineral fertilizers

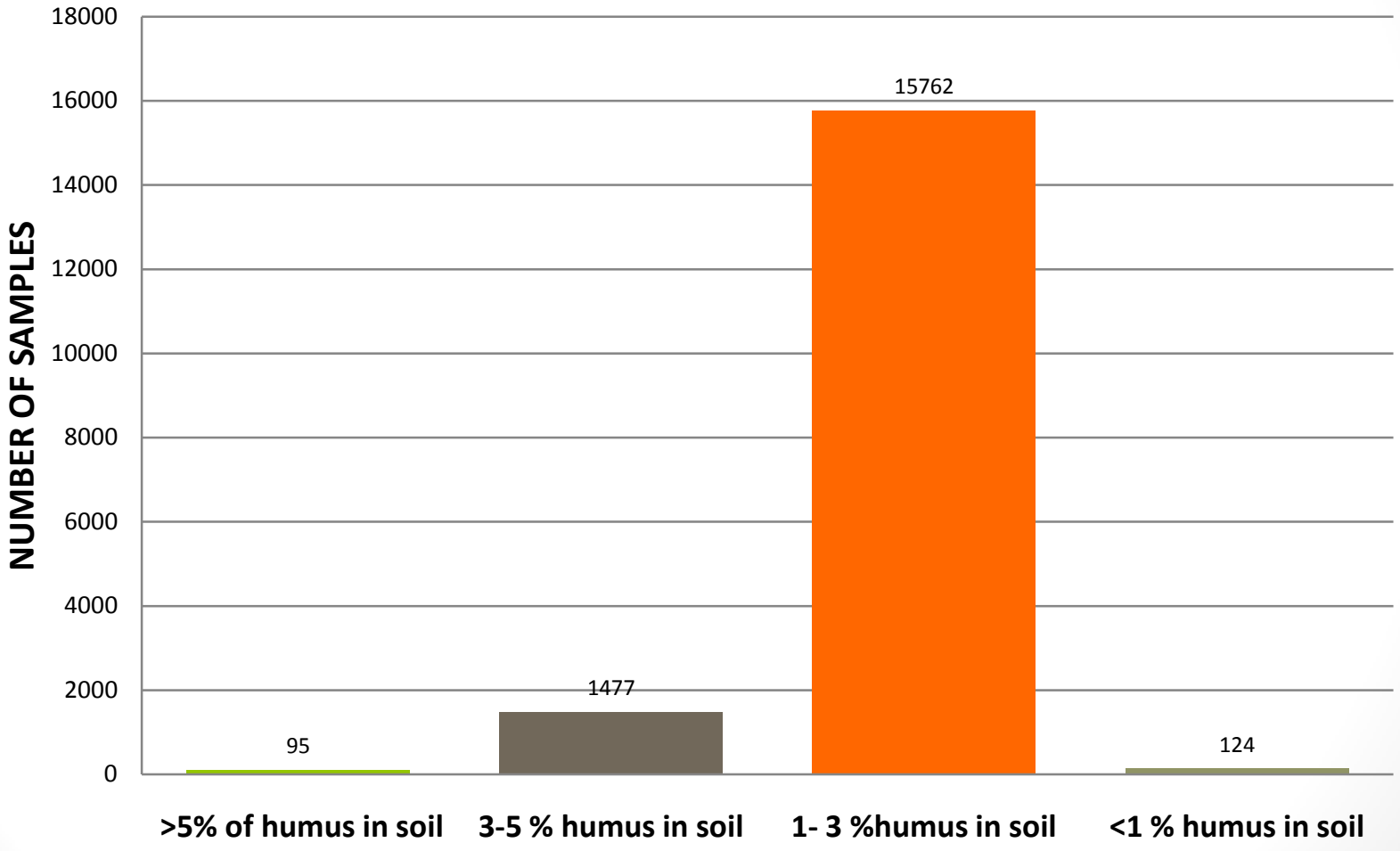
Results – humus

- for 90% surfaces that have been sampled had humus content between 1 and 3 %





Results – humus



Conclusions

- After 10 years of doing this project is still going and the farmers are well satisfied

Conclusions

- BENEFITS
- ✓ land users get chemical

analysis and fertilizations recommendations at low prices (they paid 20% of total price and rest is cover with budget of self-goverments-units and Osijek – Baranja County)

Conclusions

- ✓savings in costs of mineral fertilizers with positive effects on their management inputs
- ✓importance of different chemical properties of a soil
- ✓get early warning indicators of soil degradation and how they relate to the sustainability of agricultural
- ✓database of agricultural soil - can be integrated in other agricultural soil monitoring systems


Thank you for attention