SOILS FOR FUTURE UNDER GLOBAL CHALLENGES
SERBIAN SOCIETY OF SOIL SCIENCE
University of Belgrade, Faculty of Agriculture
Sokobanja, 21-24 September 2021
III International and XV National Congress
https://congress.sdpz.rs/

SOIL FERTILITY IN ORGANIC AND CONVENTIONAL PRODUCTION SYSTEMS

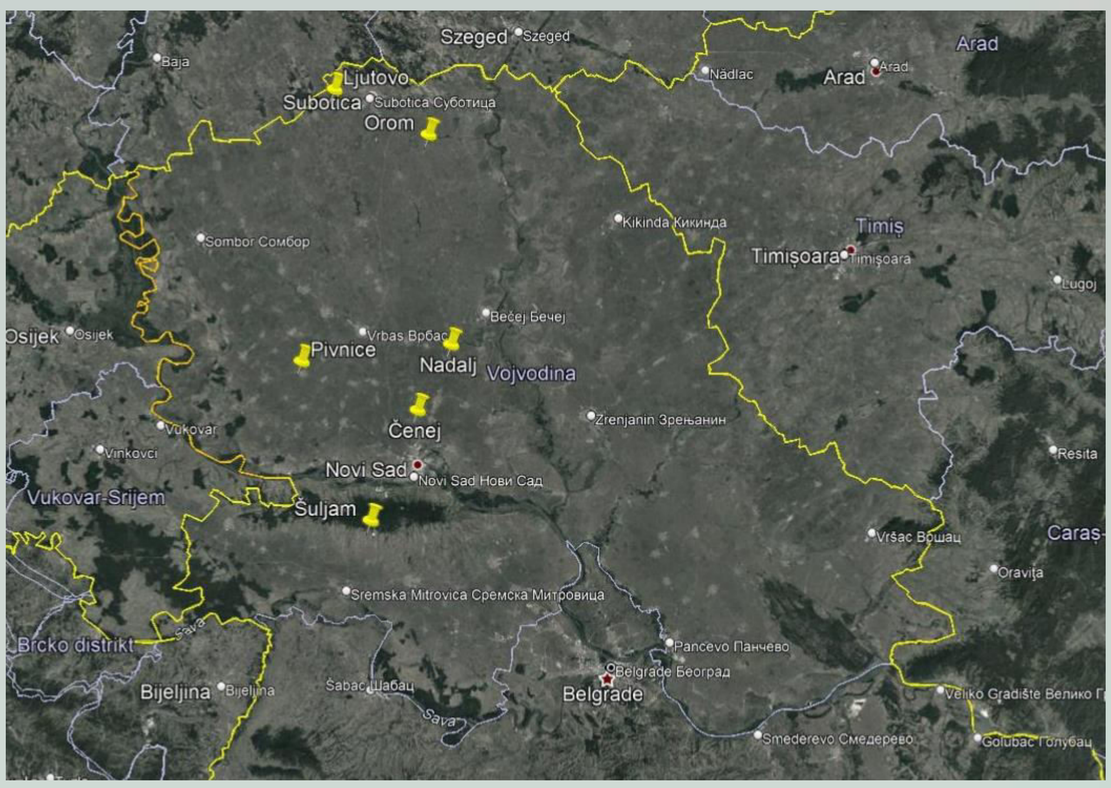
Mirna Štrbac[a], Maja Manojlović[a], Ranko Čabilovski[a], Klara Petković[a], Dragan Kovačević[a]
[a]University of Novi Sad, Faculty of Agriculture, Department for field and vegetable crops, Novi Sad, Serbia
* Corresponding author: mirna.strbac@polj.uns.ac.rs

INTRODUCTION

Agricultural production may lead to a decrease in soil fertility and it depends on the production system, climate, soil type, etc. The aim of the study was to determine the soil fertility of arable land in organic and conventional production systems and compare it with soil fertility under permanent pastures.

MATERIAL AND METHODS

The investigation was carried out on 6 localities in Vojvodina province with the same soil type (Chernozem). At each site, samples were taken from two plots under organic production (min. 7 and max. 13 years in the organic system), one plot under conventional production and one from pastures, from two layers of soil: 0 - 25 and 25 - 50 cm.

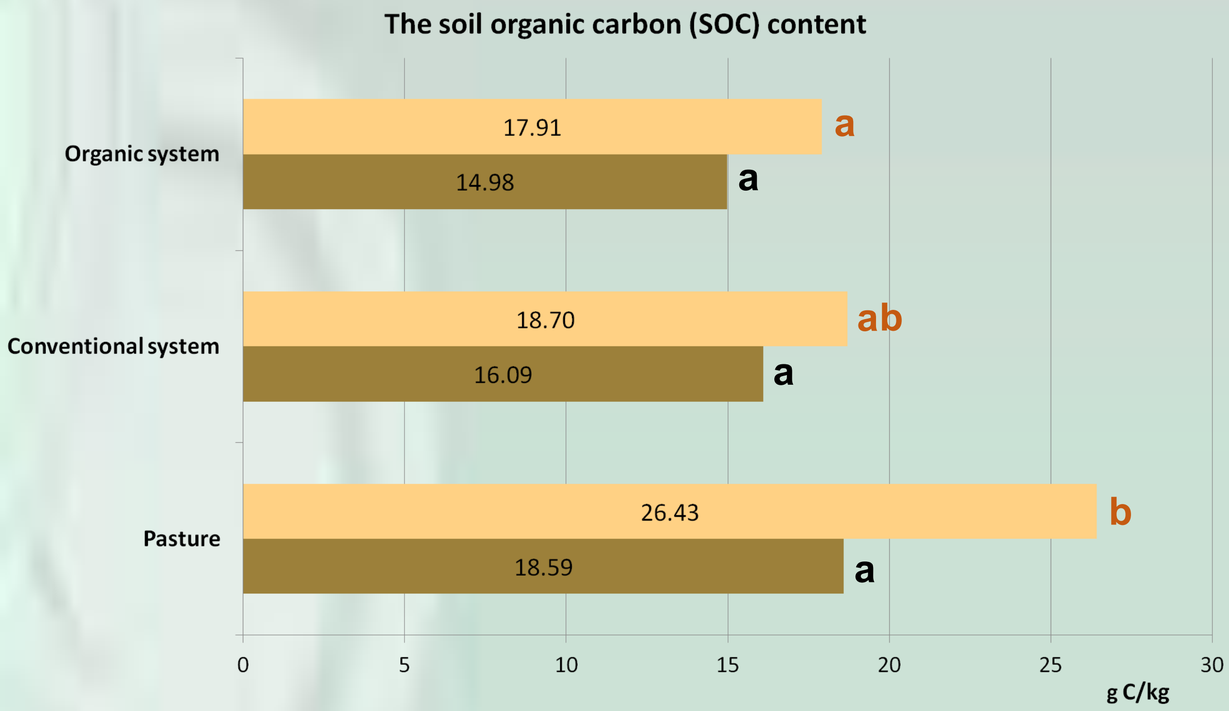


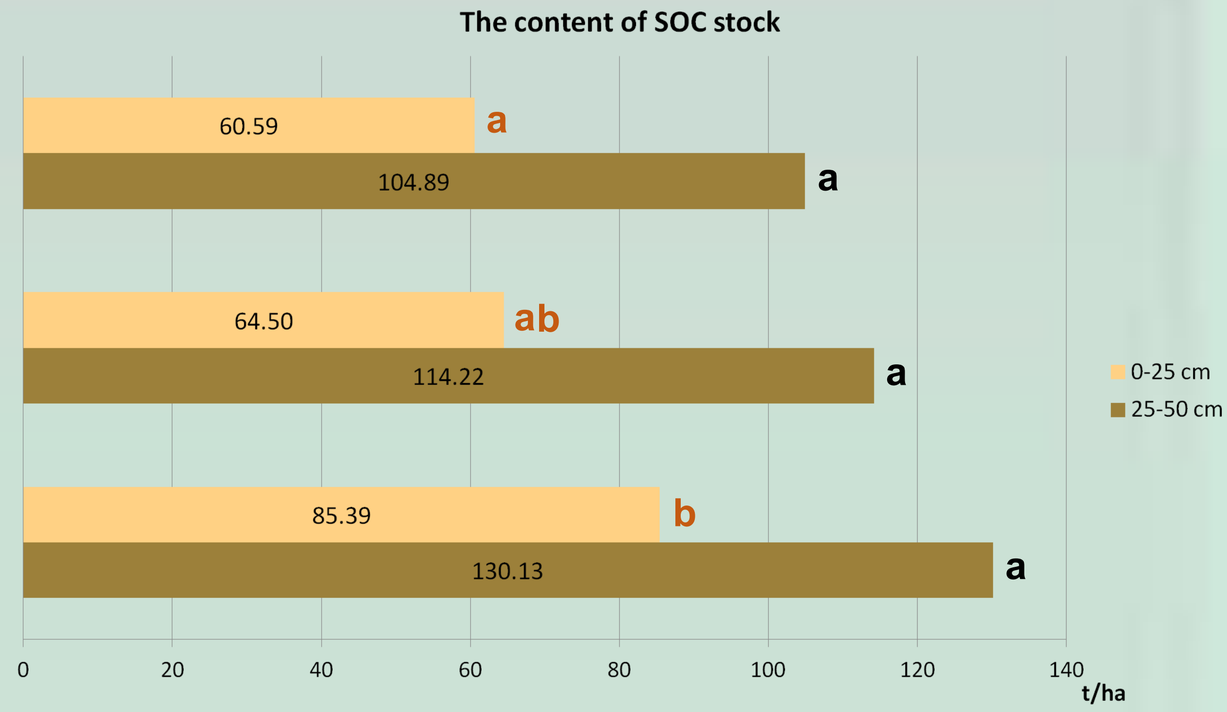
RESULTS AND DISCUSSION

The results show that production systems did not affect the content of plant-available phosphorus and potassium in both layers of the soil.

The obtained results for the soil organic carbon (SOC) content in the soils (layer 0-25 cm) show that there were no differences between the organic and conventional system (17.91 ± 4.10 g kg^{-1} soil and 18.70 ± 3.71, respectively), while on the pasture SOC content was significantly higher (26.43 ± 7.89) in relation to the organic system.

The estimated SOC reserve was in the same order as SOC content; organic (60.59 ± 6.85 t ha^{-1}) ≤ conventional (64.50 ±12.81) production < pasture soil (85.39±23.45).

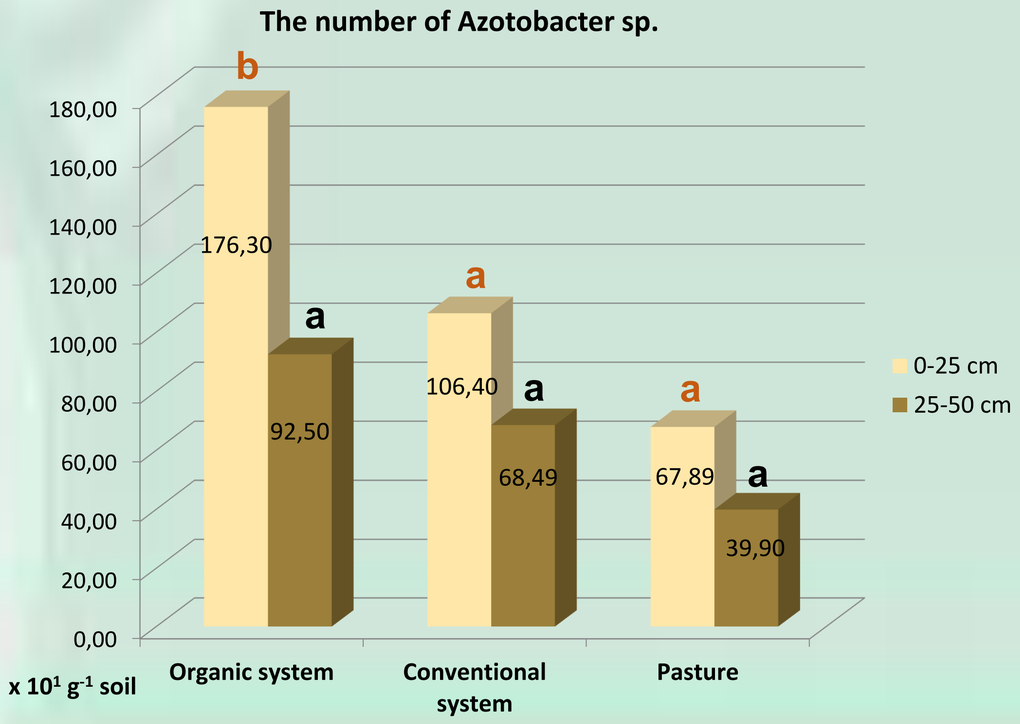


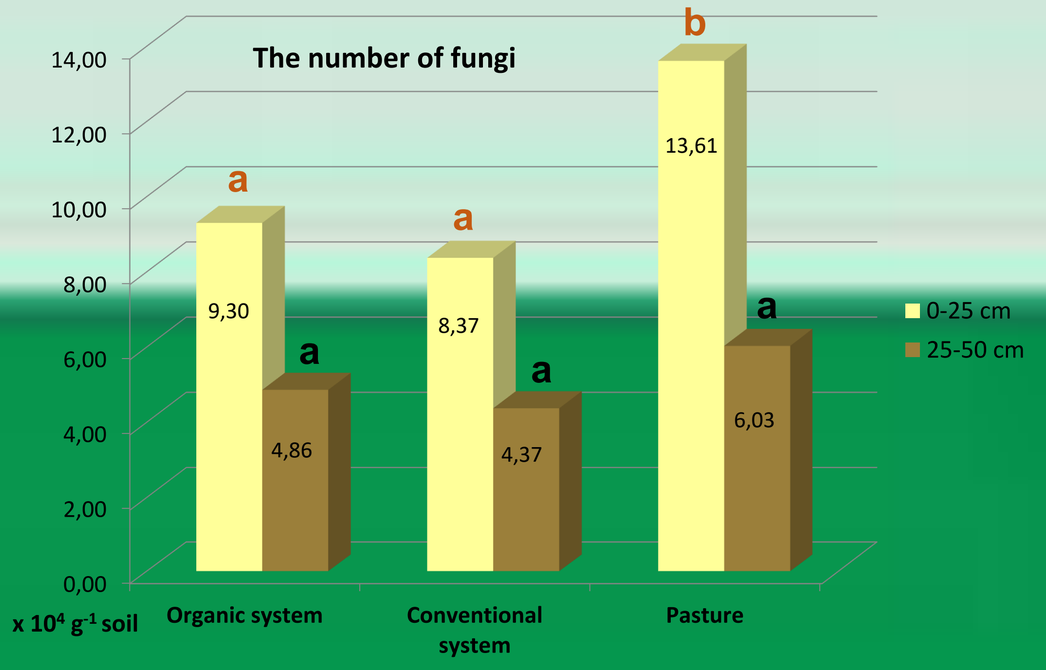


Regarding microbiological properties in the surface layer, there were no significant differences in the total number of bacteria between organic (92.90 x 10^6 g^{-1} ± 35.19) and conventional (79.53 x 10^6 ± 20.97) production and on pasture (67.41 x 10^6 ± 32.59).

A significantly higher number of azotobacters, as an important indicator of soil fertility and nitrogen balance, was determined in organic (176.30 x 10^1 g^{-1} ± 59.33) in relation to conventional production (106.40 x 10^1 ± 21.66) and pasture (67.89 x 10^1 ± 48.96).

There were no significant differences in the number of fungi between organic (9.30 x 10^4 g^{-1} ± 2.06) and conventional (8.37 x 10^4 ± 2.25) production, but their number on pasture (13.61 x 10^4 ± 2.09) was significantly higher in relation to both systems.





In the subsurface layer of the soil, there were no significant differences in the examined chemical properties and microbiological parameters between different production systems and pastures.

The past period since the establishment of organic agriculture can be insufficient to improve all observed fertility parameters, as will be expected in the future.