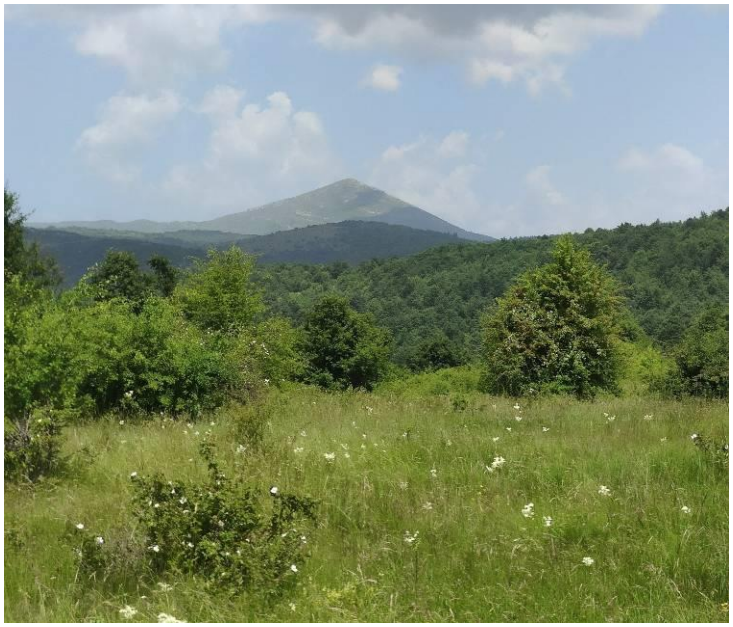
Serbian Society of Soil Science

University of Belgrade, Faculty of Agriculture

BOOK OF ABSTRACTS

3rd International and 15th National Congress

SOILS FOR FUTURE UNDER GLOBAL CHALLENGES



21–24 September 2021

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CHARACTERISTICS OF SOIL QUALITY OF THE SURČIN MUNICIPALITY AND ITS SIGNIFICANCE FOR PLANT PRODUCTION

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Abstract

In order to assess the general suitability for plant production, in the period from June to October 2019, tests of physical and chemical properties of 275 composite soil samples were conducted in the area of Petrovčić and Progar, Surčin municipality, to a depth of 30 cm. According to the distribution of soil regarding the values of hygroscopic moisture, it was determined that the highest number of examined samples is in the range of 2 to 6%, and the lowest - in the range of 6 to 10%. The presence of total sand, dust and clay fractions in the analyzed soil samples indicates a relatively uniform textural composition. 94-98% of the examined soil samples belong to the textural class of light clays that have an unfavorable ratio of total sand/clay fractions, in which the clay fraction prevails. According to the values of substitutional acidity (pH in H_2O), the largest number of samples has a strongly acid (<4.5) to acid (4.51-5.50) reaction. The supply of total nitrogen ranges from 0.12 to 0.20% in 80-85% of samples, and in 2-4% of samples the values of this parameter are from 0.05 to 0.12%. The supply of humus in 97-98% of the samples is in the range of 1.50 to 4.00%, which is a property of slightly clayier soils. In addition, in connection with the examined water-physical properties, it is considered that soils with higher content of clay particles and humus have higher values of hygroscopic moisture, because clay and humus have a large active surface and can bind a large number of water vapor molecules from the air. The content of easily available phosphorus in 91% of samples from the area of Petrovčić is very low, while in the area of Progar 50% of samples have a very low, 18% - low and 16% - medium content of the tested element. In the area of Petrovčić, the largest number of samples (54%) is with medium content of easily available potassium, while 25% of samples have high content. Soil samples, taken in the area of Progar, are richer in potassium, so the largest number of samples is highly provided (43%) and medium provided (37%) with available potassium. The values of adsorptive soil complex parameters indicate the largest number of samples with moderately saturated and moderately unsaturated base cations (85-87%). Most samples have a very low Na^+ content, which ranges from 0-1 meq/l, resulting in very low calculated SAR values. The values of SAR, calculated on the basis of analyzed content of Na^+, Ca^{2+} and Mg^{2+}, indicate that the risk of salinization is very low. The obtained results indicate that the examined soils of Petrovčić and Progar, Surčin Municipality, are suitable for intensive field production, especially wheat, corn and sunflower. Nevertheless, low pH values indicate an adequate application of limestone.

Keywords: Surčin municipality, soil, physical properties, chemical properties, plant production