

## THE INFLUENCE OF MANY YEARS LIMING AND FERTILIZING TO CHANGING OF ADSORPTIVE COMPLEX COMPOSITION OF PSEUDOGLEY SOIL

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### Abstract

Composition and characteristics of soil adsorptive complex are very important to understand physical and chemical processes which affect soil fertility and nutrients availability to plants. The paper deals with influence of many years ameliorative application of lime, manure and mineral fertilizers on adsorptive complex composition of pseudogley soil in Kraljevo valley. Soil belongs to group of extremely acid soil pseudogley type. Two – field crop rotation wheat – maize was applied. Soil samples were taken from opened profiles and numbered 1 (unfertilized variant – control), 2 (NPK) and 3 (NPK+CaCO<sub>3</sub>+manure). Arable lands, pseudogley type, have a high degree of dealkalinization of eluvial, -Ah and Eg-, layers and B<sub>1</sub>tg layer, too. Capacity value of cations exchange and saturation degree of exchangeable – adsorbed alkaline cations (Ca<sup>2+</sup>, Mg<sup>2+</sup> and H<sup>+</sup>(+Al) ions) varied considerably. Their composition and content, especially at -Ah and Eg layers, were unsatisfactory, mainly. According to noticed V – values (< 50%), analyzed soil belongs to group of "moderately unsaturated" soils. Many years, periodically, application of pedo–ameliorative treatments as: liming, phosphatization and humification, influenced increase of degree of alkali saturation (V%) and capacity of cations exchange (T) at Ah layer for more than 40% and 10 m.ekv./100 g soil, respectively. Part of alkaline cations (Ca<sup>2+</sup> and Mg<sup>2+</sup>) was increased, averagely, for 10 m.ekv./100 g soil or about 14.25% in relation with T values. Content of exchangeable – adsorbed K<sup>+</sup>, Na<sup>+</sup>, Ca<sup>2+</sup> and Mg<sup>2+</sup> ions at eluvial horizons (Ah and Eg) was rather low, at analyzed soil profiles. Calcification caused increase of content of exchangeable Ca<sup>2+</sup>, Mg<sup>2+</sup> and K<sup>+</sup> in adsorptive complex of analyzed soil.

**Key words:** adsorptive complex, fertilization, liming, pseudogley, soil.

### Introduction

Pseudogleys cover significant areas of Serbia, accounting for about 285,000 ha or 78.73% of the total land area in Western Serbia (Tanasijevic et al., 1966). These soils are found in moderately moist to moist climates, and they have disturbed water and air relationships characterised by an occasional decrease in very moist i.e. wet and dry phases. Therefore, this soil is unfavourable for the cultivation of most plants. The unfavourable soil moisture regime is due to the compact lower Btg horizon which is poorly permeable or impermeable. Under dry conditions, the soil surface horizon undergoes intense desiccation, whereas the deeper impermeable horizon hardens. During the wet phase, reduction conditions occur in the soil, resulting in the reduction of different elements, primarily iron (Fe<sup>3+</sup> to Fe<sup>2+</sup>), manganese, etc. Since the wet phase is short, only more susceptible substances undergo reduction. During the

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