

# Utjecaj kalcizacije i gnojidbe na promjene kemijskih svojstava lesiviranog pseudoglejnog tla

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## Sažetak

Cilj rada je utvrditi utjecaj kalcizacije i mineralne gnojidbe na kemijska svojstva tla tijekom sedam godina istraživanja. Poljski pokus je postavljen na lesiviranom pseudoglejnom tlu na području istočne Hrvatske. Kalcizacija s  $10 \text{ t ha}^{-1}$  karbokalka (ukupan sadržaj Ca  $344 \text{ g kg}^{-1}$ ) obavljena je u jesen 2002. godine na dubinu od 30 cm, a gnojidba za kukuruz (2003., 2005., 2007., 2009.) i za pšenicu (2004., 2006., 2008.) u tri razine što je rezultiralo sljedećim varijantama: kontrola bez gnojidbe i kalcizacije – 0, kalcizacija – Ca, mineralna gnojidba – NPK ( $200:150:300 \text{ kg ha}^{-1}$  za kukuruz i  $160:150:200 \text{ kg ha}^{-1}$  za ozimu pšenicu, N:P<sub>2</sub>O<sub>5</sub>:K<sub>2</sub>O), gnojidba s kalcizacijom – Ca+NPK i pojačana gnojidba s kalcizacijom – Ca+N<sub>2</sub>P<sub>2</sub>K<sub>2</sub> ( $300:300:450 \text{ kg ha}^{-1}$  za kukuruz i  $240:300:300 \text{ kg ha}^{-1}$  za ozimu pšenicu, N:P<sub>2</sub>O<sub>5</sub>:K<sub>2</sub>O). Uzorci tla su uzimani svake godine nakon žetve, odnosno berbe. Rezultati su pokazali da je na svim tretmanima kalcizacija smanjila hidrolitičku kiselost u prvoj godini istraživanja, dok se njena vrijednost u sljedećim godinama postupno povećavala. Najviše povećanje ( $1,9 \text{ cmol}(+) \text{ kg}^{-1}$ ) postignuto je na tretmanu dvostruke mineralne gnojidbe s kalcizacijom. Na kontroli i tretmanu kalcizacije pristupačnost fosfora i kalija se smanjila tijekom sedam godina poljskog pokusa, a na svim tretmanima koji su uključivali mineralnu gnojidbu, njihova pristupačnost postupno se povećala. Najveće povećanje opskrbljenosti tla fosforom za  $16,6 \text{ mg}(100\text{g})^{-1}$  i kalijem za  $14,6 \text{ mg}(100\text{g})^{-1}$  utvrđeno je na tretmanu pojačane gnojidbe u kombinaciji s kalcizacijom.

Ključne riječi: kalcizacija, mineralna gnojidba, kiselost tla, opskrbljenost hranivima.

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# Liming and mineral fertilization impacts on dystric luvisols chemical properties

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## Abstract

The aim of this paper is to determine liming and mineral fertilization impacts on the soil chemical properties during the seven years of research. The field trial was setup on the dystric luvisol in the eastern Croatia. In the autumn of 2002 soil was limed with 10 t ha<sup>-1</sup> carbocalc (total Ca content 344 g kg<sup>-1</sup>) on the soil depth of 30 cm. Afterwards, the plots were fertilized for maize (2003,2005,2007,2009) and for winter wheat (2004, 2006, 2008) with three different nutrient amounts what resulted in five different treatments: no fertilization and no liming – 0, liming – Ca, mineral fertilization – NPK (200:150:300 kg ha<sup>-1</sup> for maize and 160:150:200 kg ha<sup>-1</sup> for wheat, N:P<sub>2</sub>O<sub>5</sub>:K<sub>2</sub>O), liming with mineral fertilization – Ca+NPK and liming with doubled mineral fertilization – Ca+N<sub>2</sub>P<sub>2</sub>K<sub>2</sub> (300:300:450 kg ha<sup>-1</sup> for maize and 240:300:300 kg ha<sup>-1</sup> for wheat, N:P<sub>2</sub>O<sub>5</sub>:K<sub>2</sub>O). The soil samples were collected every year after the harvest. The results shown that liming decreased hidrolitic acidity in the first year of research, while in the following years hidrolitic acidity was gradually increased on all treatments. The highest increase (1,9 cmol(+)kg<sup>-1</sup>) was achieved on doubled mineral fertilization with liming. On the control and liming treatment availability of soil phosphorus and potassium decreased during seven years of trial, while on all treatments that included mineral fertilization, their availability was increased. The greatest increase, by 16,6 mg(100g)<sup>-1</sup> P<sub>2</sub>O<sub>5</sub>, and by 14,6 mg(100g)<sup>-1</sup> K<sub>2</sub>O respectively, was on doubled mineral fertilization with liming.

Key words: liming, mineral fertilization, soil acidity, nutrient availability.

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