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2nd International and 14th National Congress of Soil Science Society of Serbia

Solutions and Projections for Sustainable Soil Management

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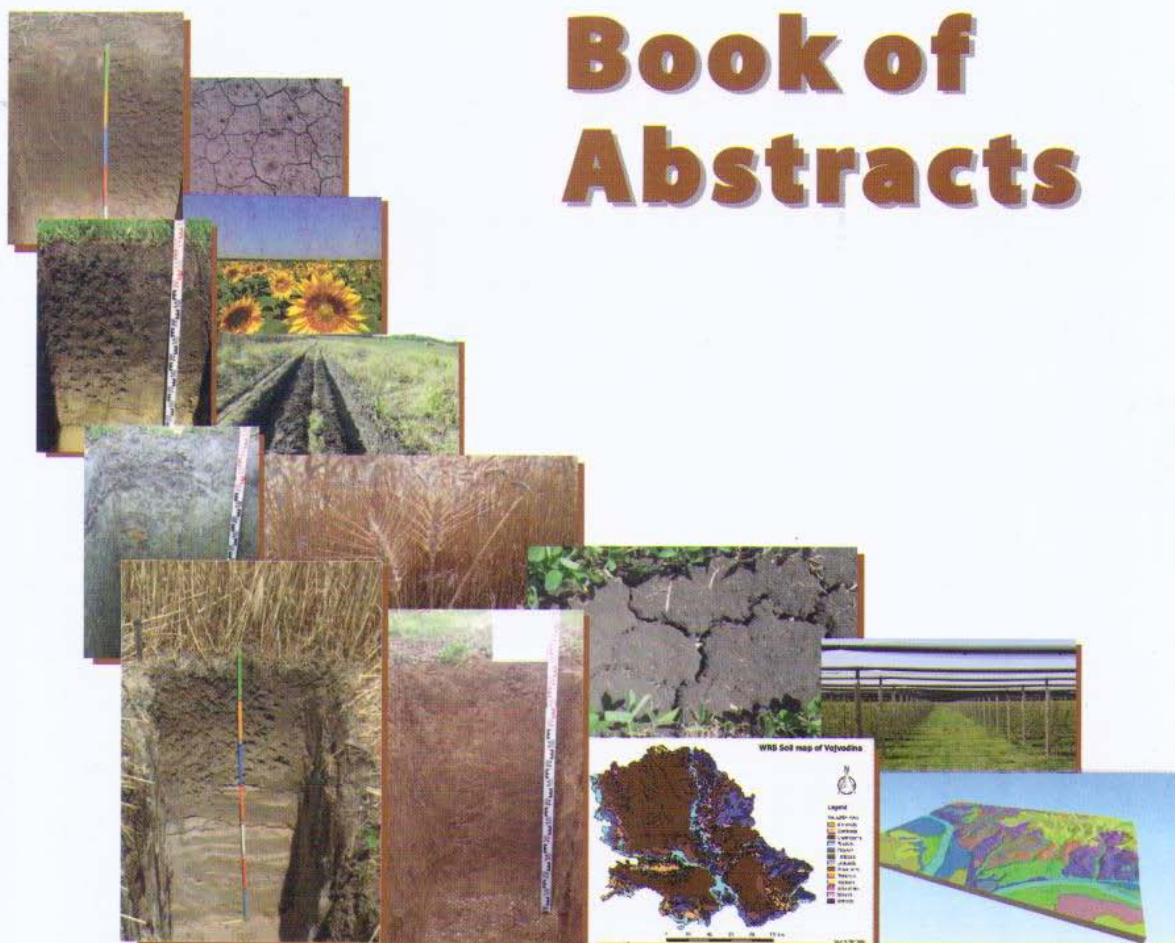
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CONTENT AND MOBILITY OF ALUMINIUM IN ACID SOILS OF CENTRAL SERBIA

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Aluminum (Al) toxicity is the primary limiting factor of crop production on acid soils, which affect much of the earth's arable lands. High content of soluble Al^{3+} in soils with a pH below 5 is very phytotoxic and becomes a major limiting factor of plant productivity in acidic soils. This paper presents a review of the quality of acid soils depending on the content of mobile aluminium. Acid soils in Central Serbia (over 60% of total arable land) are marginal with respect to the cultivation of most plants due to their unfavourable physical, chemical and microbiological properties. Seventy one percent of extremely acid soils in the Republic of Serbia are under forest and grass vegetation. Forests in Serbia cover 2.7 million hectares i.e. just above 30 percent. Strongly acid soils account for 27% of the total land under acid agricultural soils, with about 23% of strongly acid soils being under fields, gardens and permanent orchards. Special attention is devoted to the presence of larger quantities of mobile Al in acid soils issue taking into consideration its harmful effects on cultivated plants, especially sensitive plants genotypes. Excess of mobile Al is especially adverse in plowing layer because it reduces the root penetration depth, accompanied by reduced nutrient uptake from deeper soil layers. The cosequences of it are reduced growth of the above ground plants part and significantly reducing of dry matter yield of plants finally. High content of mobile Al is main cause of decay of young winter wheat plants in spring on acid soils. The low productivity of acid soils in Central Serbia, resulting from low fertility and, in particular, from the very low content of available phosphorus and high levels of mobile aluminium in the humus and, at times, in the subhumus horizon, requires the use of lime, phosphorus and organic fertilizers for soil amending purposes. In order to improve crop yields and fertility of crop land a combination of improved genetics, sustainable management practices, and amending of acid soils should be used.

KEY WORDS: aluminium, acid soil, Central Serbia, content, toxicity.

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