

**RESPONSE OF DIFFERENT MAIZE HYBRIDS TO LIMING**

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**Abstract**

Soil acidity is the major growth-limiting factor for more than 40% of the world's arable land. It is assumed that over 50% of soils in Serbia belong to a group of acid soils and that this percentage is permanently increasing. Species and genotype within species greatly differ in their tolerance to acid reaction and Al toxicity. As the majority of cultivated plants require slightly acid, neutral to alkaline reaction of the soil, a very small number of crops can tolerate an extremely acid reaction and conditions of these types of soils that have been gradually expanding. Six maize hybrids were grown under field conditions on acid soil (pH in 1N KCl = 4.41) in three replicates at the stationary field experiment on the arable land of Kraljevo (pseudogley) for 2-year period (the growing seasons 2007–2008). Fertilization treatments were the following: a = unfertilized (control); b = lime – 3 t ha<sup>-1</sup>; c = lime – 5 t ha<sup>-1</sup>. In addition to the statistical differences between various hybrids greatest difference in yield was achieved when comparing NS 5010 and NS 6010 approximately 1762 kg ha<sup>-1</sup> dry grain. Two-year results, which are used in this study showed that the maize yield was higher in 2008 year which had a favorable agro-meteorological characteristics. Individual highest yield was obtained with hybrid NS 6010 in 2008 year and amounted to 11930 kg ha<sup>-1</sup>. Genetic adaptation of plants to acid reaction and Al toxicity may provide a sustainable strategy to increase crop yield in the tropics at relatively low costs and low environmental impacts.

**Key words:** soil acidity, liming, maize hybrids.

**Introduction**

Acid soils cover approximately 3950 million hectares, corresponding to about 30% of the total ice-free land area on the Earth. Acid soils are found throughout the world, with 41% in the Americas, 26% in Asia, 17% in Africa, 10% in Europe, and 6% in Australia and New Zealand (Von Uexkull and Mutert, 1995). Low pH and Al<sup>3+</sup> stresses are the major causes of poor plants growth in acidic soils (Bose et al., 2010). High concentration of toxic aluminium are the most important cause of reduced yields associated with soil acidity (Tang et al., 2003). Acid soils have in some cases toxic levels of Al and Mn, deficiency of Ca, Mg, P, K and Mo as well. These characteristics limit the fertility of acid soils and inhibit root development, leading to low water and nutrient uptake and low maize yields (Welcker et al., 2005). Maize grain-yield increase has been obtained on acid soils through selection for tolerant cultivars in tropical maize populations (Pandey and Gardner, 1992). Most breeding work designed at increasing productivity on acid soil, focused on tolerance to Al toxicity (Garvin and Carver, 2003). Thus, the use of acid-soil tolerant cultivars might thus have the potential of bringing unproductive acid soils into productive cultivation in the short term with limited

**Impressum**

Fourth International Scientific Symposium „Agrosym 2013“

**Book of Proceedings**

**Published by**

University of East Sarajevo, Faculty of Agriculture, Republic of Srpska, Bosnia  
University of Belgrade, Faculty of Agriculture, Serbia  
Mediterranean Agronomic Institute of Bari (CIHEAM - IAMB) Italy  
International Society of Environment and Rural Development, Japan  
Balkan Environmental Association, B.EN.A, Greece  
Academy of Engineering Sciences of Serbia, Serbia  
Maize Research Institute „Zemun Polje“ Serbia  
Biotechnical Faculty, University of Montenegro, Montenegro  
Balkan Scientific Association of Agricultural Economics, Serbia  
Institute of Agricultural Economics, Serbia  
Faculty of Agriculture, University of Banja Luka, Bosnia and Herzegovina

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**Website:**

<http://www.agrosym.unssa.rs.ba>

CIP - Каталогизacija у публикацији  
Народна и универзитетска библиотека  
Републике Српске, Бања Лука

631(082)(0.034.2)

INTERNATIONAL Scientific Symposium "Agrosym  
Jahorina 2013" (4 ; Jahorina)  
Book of proceedings [Elektronski izvor] /  
Fourth International Scientific Symposium "Agrosym  
2013", Jahorina, October 3-6, 2013 ; [editor in  
chief Dušan Kovačević]. - Istočno Sarajevo :  
Poljoprivredni fakultet, 2013. - 1 elektronski  
optički disk (CD-ROM) : tekst, slika ; 12 cm

CD ROM čitač. - Nasl. sa nasl. ekrana. -  
Bibliografija uz svaki rad.

ISBN 978-99955-751-3-7

COBISS.BH-ID 3919640