

**XVI INTERNATIONAL  
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# **SAFE FOOD**



**PROCEEDINGS**

**NOVI SAD, SERBIA**

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# **SAFE FOOD**

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2012

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- Ecological Movement of Novi Sad

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## ALUMINIUM TOXICITY AND TOLERANCE IN CEREAL PLANTS

### Abstract

This paper presents the toxic effect of increased Al concentrations in cereal plants and their response to Al stress. Aluminium toxicity is the main limiting factor in plant growth and development in most acid soils. The plasma membrane of root tip cells is the major target for Al toxicity. Defense mechanisms against Al toxicity are achieved by the exclusion of Al from the root tip rhizosphere zone and its neutralization in the plant symplasm. This paper also presents current research and interpretations of Al toxicity mechanisms, and the physiological and genetic basis of plant tolerance to Al. Although the identification of Al tolerance genes using molecular markers is under way, the mechanism of their expression is still not elucidated.

**Key words:** *Aluminium, soil, plant, cereals, toxicity.*

### INTRODUCTION

Aluminum (Al) toxicity is the primary factor limiting crop production on strongly acidic soils. At soil pH values of 5 or below, toxic forms of Al are solubilized into the soil solution, inhibiting root growth and function, and thus reducing crop yields. It has been ESTIMATED that over 50% of the world's potentially arable lands are acidic (von Uexkull and Mutert, 1995; Kochian et al., 2005). In the Republic of Serbia, acid





















