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ORGANIC AGRICULTURE FOR AGROBIODIVERSITY PRESERVATION

3rd International Conference Agrobiodiversity

Novi Sad, Serbia, 1st – 3rd June 2017

BOOK OF ABSTRACTS

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ANTIOXIDANT CAPACITY OF BLACK AND YELLOW SOYBEAN GROWN IN ORGANIC *PRODUCTION SYSTEM*

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The purpose of this work was to define whether soybean plants developed from black coloured seeds would be protected from (a)biotic stress during early stage of development in organic system of production in comparison to those from yellow seeds. It is proposed that dark-coloured soybean seeds contain high concentrations of phenolic compounds that contribute to their high stress resistance. The fundamental difference between the organic and conventional system of production is related to soil fertility, which can affect the nutritional composition of the plant, including secondary metabolites. Due to previous statements, lipid peroxidation intensity (LP, biomarker of cell degradation and oxidative stress secondary effects, expressed as nmol malondialdehyde or MDA equivalents/g fresh leaves of investigated plants), total polyhenolic content (TP, important secondary metabolites and antioxidant compounds, given as mg gallic acid equivalents/g dry leaves) and antioxidant capacity (NBT-test, as antioxidant capacity of plant material expressing % of neutralization of reactive oxygen species or ROS produced during oxidative stress) were determined. Plant material tested in this research was soybean [*Glycine max* (L.) Merr.] leaves of two black ('NS Blackstar' and 'NS Pantera') and two yellow ('Fortuna' and 'Galina') soybean cultivars grown in experimental field of Institute of Field and Vegetable Crops, Department for Alternative Crops and Organic Production (certified producer). Leaves were harvested for biochemical analyses at full bloom stage. Leaves of tested plants had similar values of LP intensity (6.97-8.71 nmol MDA/g fresh weight), TP contents (6.97-8.71 mg/g dry weight) and capacity to neutralize ROS (73.80-79.81%), however, 'NS Blackstar' was highlighted with lower LP intensity (1.7-3-fold), higher TP content (1.2-fold) and higher antioxidant activity (3-6%). Since there was no clear difference between black and yellow cultivars in response to oxidative stress during early stage of development, further analyses of biomolecules responsible for colour of seeds could explain which of these compounds participate, among other antioxidants, in oxidative stress defense mechanisms and should propose which cultivar would perform better in organic production system.

***Key words**: antioxidants, coloured soybean, oxidative stress*

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