

Serbian Plant Physiology Society

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Institute for Biological Research „Siniša Stanković”, University of Belgrade

# 2<sup>nd</sup> International Conference on Plant Biology

## 21<sup>th</sup> Symposium of the Serbian Plant Physiology Society

### COST ACTION FA1106 QUALITYFRUIT Workshop



Petnica Science Center, June 17-20, 2015

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Water use profiles of individual plants were recorded during the whole cultivation period from which the efficiency of water usage, as well as the effect of N availability on water utilization was determined. WUE was significantly decreased by N limitation in well watered conditions, as well as in drought stressed plants. This shows that under N-limitation wheat plants have decreased capacity to use soil water. The WUE at the level of seed production was not affected by N limitation under drought stress in two wheat cultivars (NS Avangarda and Siete Cerros). These cultivars could be used as potential parents for development of new wheat cultivars with enhanced production under drought and N-limited conditions.

**Keywords:** wheat, nitrogen nutrition, water use efficiency, drought

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## **Black locust and white poplar ecophysiological adaptations to pollution stress at the fly ash deposits of the 'Nikola Tesla – A' thermoelectric plant (Obrenovac, Serbia)**

**PP8-21**

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The ecophysiological traits of two woody species, *Robinia pseudoacacia* L. (planted) and *Populus alba* L. (naturally colonized), were assessed in terms of trace element (As, B) accumulation, photosynthetic efficiency (Fv/Fm), total chlorophyll (Chla+b) and carotenoid (Tot Carot) content, and MDA levels in populations growing at the 'Nikola Tesla – A' thermoelectric power plant's fly ash ponds, weathered for 3 (L1) and 11 years (L2), compared to their natural habitat. Research showed that the trace element content in leaves of both species at the ash deposits was higher compared to plants from the reference site ( $p < 0.001$ ). Despite decreasing as ash aged, the B content in leaves of both species at both ponds was at toxic levels for plants. As ash age increased, so did As concentrations in both species, with levels in white poplar leaves at L2 and black locust leaves at L1 and L2 being in the toxic range. In such conditions, white poplar exhibited stable photosynthetic efficiency at both ponds due to the stable photosynthetic pigment content and the functional integrity of cell membranes. At L2, symptoms of oxidative stress in black locust manifested in the form of reduced Fv/Fm ( $p < 0.001$ ), elevated levels of lipid peroxidation ( $p < 0.05$ ), and lower levels of chlorophyll and total carotenoids ( $p < 0.001$ ) compared to plants at the reference site. The results show that white poplar exhibited higher adaptive potential at L1 and L2, while black locust had reduced adaptive potential to the stressful conditions on the weathered ash at L2 of the 'TENT-A' ash deposit site.

**Keywords:** fly ash, *Robinia pseudoacacia* L., *Populus alba* L., pollutants, adaptations

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