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N 17 Effects of S-Methylmethionine-Salicylate, a Newly Synthesized Compound Against Cold Stress in Maize

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Maize, due to its tropical origin, is sensitive to cold temperatures. Protecting effects of natural, biologically active compounds S-methylmethionin (SMM) and salicylate (SA) against biotic and abiotic stressors have been evidenced by number of experiments. Based on the success of previous research here we combined the SMM and SA in the hope of creating a more effective new compound: the S-methylmethionine-salicylate (MMS). Recent work aimed to examine the effects of exogenous MMS and compare it with the original compounds SMM and SA, to reveal whether it can further reduce the damage exerted by low temperature. In order to obtain a better understanding of the effect of active compounds we examined the changes in the function of PSII, and the alterations of membrane permeability. At the level of gene expression we followed the changes of the enzymes of phenylpropanoid pathway. Finally, at metabolic level we measured the amount of phenolic compounds and anthocyanins. Based on our expectations the MMS is capable of increasing the plant's defense potential in an environmentally friendly way.

N 18 Effects of Moderate Drought Stress on Photosynthesis, Water Use Efficiency and Biomass Production of Three Poplar Clones

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Breeding of efficient but also drought tolerant poplar clones is very important for short rotation planting because of frequent periods with low precipitation in central Europe. Three clones which showed the most different shoot-root-relations: (1) aspen clone Grossdubrau No.1, (2) new bred aspen clone L316 x L9 No.21 Thermo, (3) poplar clone Max2 were treated by a moderate water stress. Photosynthesis and transpiration was measured. The influence of drought on biometrical parameters of the plants was checked. Intrinsic water use efficiency was calculated. Height growth was lower in stressed plants. Photosynthesis and transpiration decreased differently which is why intrinsic WUE increased for Max2 more than for aspen clones. The poplar clone Max2 showed low water use efficiency after sufficient watering, but could increase this more pronouncedly under water stress as compared with aspen clones. This clone was characterized by an intensive root growth which was more reduced under stress. Unlike this both aspen clones reacted less adaptively under a moderate water.