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## Salt & Water Stress in Plants

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### Contributors



## **Exploring the potential of kresoxim-methyl as a priming agent towards protection of *Medicago truncatula* plants grown under abiotic stress conditions**

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Kresoxim-methyl (KM) belongs to the strobilurins, one of the most important classes of agricultural fungicides, displaying a direct effect on physiological and developmental plant processes thus leading to greening of plants via induction of hormonal biosynthesis. The aim of this study was to examine the effect of KM pre-treatment on *Medicago truncatula* plants (ecotype Jemalong A17) subjected to drought and salinity conditions, evaluating key physiological, biochemical and molecular parameters. Foliar application with 10<sup>-8</sup>M KM resulted in increased stomatal conductance and chlorophyll fluorescence in leaves compared with stressed plants under both stress conditions, while maximum values for both parameters were obtained following control treatment with 10<sup>-8</sup>M KM but no subsequent stress imposition. The protective role of KM was further supported by attenuation of cellular damage indicated by lipid peroxidation and ROS content measurements following KM pre-treatment under both stress conditions. However, while KM pre-treatment resulted in lowering of NO content compared with drought-stressed plants, no significant alterations were observed in NO content under salt stress. Furthermore, molecular analysis of antioxidant gene expression (*AOX*, *GST*, *cAPX*, *FeSOD*) by real-time qRT-PCR revealed differential regulation under both drought and salinity conditions for all the genes examined. KM pre-treatment under salinity conditions resulted in massive induction of all genes compared with stressed samples, whereas suppression of expression levels was observed under drought conditions indicating activation or suppression of the antioxidant pathway following KM pre-treatment, respectively. Moreover, data from microarray analysis using Affymetrix technology indicated a large number of genes belonging to several families that appear to be regulated in response to KM pre-treatment in comparison with respective stressed samples.