

Title Gas exchange and antioxidant response of sweet pepper to foliar urea spray as affected by ambient temperature

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Abstract

This paper analyses the effect of different air temperatures (10, 20 and 30 °C) on the response of sweet pepper plants (*Capsicum annuum* L. cv. Herminio) to foliar urea applications after growing plants for 20 day with and without nitrogen (N) applied to the growing substrate. Leaf CO₂ assimilation, chlorophyll fluorescence, root respiration, lipid peroxidation and antioxidative enzymes were analysed. Spraying plants with urea increased leaf CO₂ assimilation of N-deficient plants when applied at 20 or 30 °C, compared with non-sprayed plants. When plants were sprayed with urea at 10 °C chlorophyll fluorescence of leaves was similar to that of plants that were supplied with full N in the nutrient solution. Root respiration was not affected by urea sprays whilst leaf NO₃⁻ concentration was increased by urea but only when it was sprayed at 10 or 20 °C. Lipid peroxidation and ascorbate peroxidase in N-deficient plants were reduced significantly by urea sprays, especially when plants were sprayed at 20 °C with N-limitation in the growing substrate. This study shows that N-limitation in the growing substrate induces a temperature-dependant increase in the activities of antioxidant enzymes in leaves of pepper and applications of foliar urea can be optimised, when applied at the appropriate temperature, to partly replace the N supplied to the roots of sweet pepper.