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## Physiological Section

[Caulet, Raluca Petronela](#) [1], [Morariu, Aliona](#) [1], [Efrose, Rodica Catalina](#) [1], [Ciobotari, Gheorghii](#) [1], [Dascalu, Marius](#) [1], [Sfichi-Duke, Liliana](#) [1].

### Shade effects on red raspberry plants grown under different soil moisture conditions.

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Environmental conditions, such as water availability and solar irradiation may become stress factors for plants if the dosage is too high or too low. This study assessed the interactive effects of shade and soil moisture on the development of red raspberry plants by analyzing several morphological, biochemical and physiological traits, as well as, the expression of key phenylpropanoid genes. In our field experiments plants were exposed to full sun (100% sunlight) and shade (25% sunlight) conditions under two soil moisture regimes. The well-watered plants were maintained at 90% of field capacity by supplementary irrigation. The water-stressed plants were subjected to soil moisture deficit by withholding irrigation. Irrespective of the water regime, plants adapted to shade produced lower biomass, greater leaf area and lower concentration of chlorophyll and nitrogen per leaf area. Under soil moisture deficit, shaded plants had higher photosynthesis rates than plants grown under full-sun conditions. Also, the activities of several antioxidative enzymes and relative water content were higher than in plants exposed to water stress in full sunlight. It was also noted that shade modified the transcript levels of the most important phenylpropanoid genes (PAL1, PAL2, CHS, 4CL1, 4CL2 and 4CL3) while the total phenolics content decreased. It is suggested that shade reduces injury under water stress by moderating water use and stimulating antioxidative defense rather than accumulation of protective phenolics compounds.

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