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“Bridging the gap between increasing knowledge and decreasing resources”

Physiological Characteristics of two Rose (*Rosa hybrida* L.) Cultivars Grown under Different Levels of Shading

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Abstract

Light is one of the most important environmental factors affecting plant growth and development. However, high light intensities particularly during summer can lead to problems in cut flower production under open field as well as greenhouse condition. Despite the fact that roses prefer sunny places for optimum growth, under greenhouse conditions shading is applied in order to improve the quality of the cut flowers. The applied shading is based on experience and differs among rose producers. Therefore, it is necessary to find the light intensities under which different rose cultivars produce optimum yield with acceptable quality. The present study was conducted in 2011, in a commercial greenhouse in Pakdasht, Iran. Two rose cultivars, “Red One” and “Gulmira” representing red and white colours, were used in this study. The treatments were different light intensities including control without shade application ($1200 \mu\text{mol m}^{-2}\text{s}^{-1}$), and three treatments 640, 520 and $240 \mu\text{mol m}^{-2}\text{s}^{-1}$. Result showed that protein concentration was significantly different among shade treatments ($p \leq 0.05$), as the highest protein concentration of leaves was observed under light intensity of $640 \mu\text{mol m}^{-2}\text{s}^{-1}$. The activity of peroxidase enzyme was affected by different shading treatments as well as by interaction of shading and cultivar ($p \leq 0.05$). The activity of catalase enzyme showed significant difference between two cultivars and there was no significant difference among shading treatments. The highest concentration of anthocyanin of petals was observed in “Red One” cultivar in the $520 \mu\text{mol m}^{-2}\text{s}^{-1}$ treatment. The highest amount of leaf carbohydrate was observed in $520 \mu\text{mol m}^{-2}\text{s}^{-1}$ treatment. This indicates that shading up to a light intensity of $520 \mu\text{mol m}^{-2}\text{s}^{-1}$ is beneficial for quality improvement of the rose cultivars studied.

Keywords: Catalase, light intensity, peroxidase, physiological traits, rose, shading