

Title Nano-silver pulse treatments improve water relations of cut rose cv. Movie Star flowers
Author Peitao Lü, Jinping Cao, Shenggen He, Jiping Liu, Hongmei Li, Guiping Cheng, Yuelian Ding and Daryl C. Joyce
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Abstract

Effects of pulse treatments with nano-silver (NS) particle (2–5 nm diam) solutions on the vase life of cut rose cv. Movie Star flowers were investigated. Pulse treatments of NS at 50, 100 and 250 mg L⁻¹ were for 1 h. Stems were then transferred to deionized water (DI) and evaluated daily for vase life and quality. The 250 mg L⁻¹ NS pulse treatment was phytotoxic. However, pulse treatments for 1 h with 50 and 100 mg L⁻¹ NS solutions extended vase life and suppressed reduction in fresh weight during the vase period. The amounts of water uptake and water loss by the cut flowers decreased upon NS treatment. Stem hydraulic conductance decreased with time, but this decrease was suppressed by pulse treatments of 50 and 100 mg L⁻¹ NS. ICP-AES analyses revealed that the Ag concentration in basal stem ends was generally higher than in upper stem ends, leaves and petals. NS pulse treatments reduced stomatal aperture and inhibited leaf transpiration. They also delayed expression of the aquaporin gene, *Rh-PIP2*. These evidently beneficial effects of NS pulse treatments are discussed.