

## **Abstract**

Rose is one of the most popular flowers in the world, so it is named as the world's queen of flower. Roses are usually used as cut flowers, flower pots or as single plant in home gardens and the major part of export of cut flowers is dedicated to roses. One of the problems in trade of this flower is its low vase life, chemical solution can partly solve it. Silver thiosulfate(STS) is one of the materials that used in the past all around the world but it has environmental risks. Therefore, the use of materials that have less environmental effects have always be one of the issues studied by researchers. Today, the use of materials created by nanotechnology may solve many of these problems. One of these materials is nanosilver because, its environmental effects is low enough to use even in food industry. Another material that increases the vase life of flower and shelf life of agricultural products is the gas form and non toxic substance called 1- methylcyclopropene(1-MCP) and it has been proven that it is an effective preventer of ethylene. The goal of this study was to compare of the effects of 1- methylcyclopropene and nanosilver on vase life of cut rose flower, which has done by puls method. Experimental design was a factorial combination based on completely randomized design with three replications. In the first experiment different concentrations including 0, 5, 10 and 15 ppm of nanosilver and 0, 0.25, 0.5 and 0.75  $\mu\text{l/l}$  of 1-methylcyclopropene were used to determine which concentration is the best in both substances. Third experiment in the comparison of these two substances, optimum concentration of the first experiment was the 10 ppm of nanosilver and the second one was 0.5  $\mu\text{l/l}$  of 1-methylcyclopropene. In the third experiment, the best concentrations of these two substances was compared with control. Vase life, solution absorption, relative fresh weight, leaf chlorophyll, leaf chlorophyll fluorescence, petiol water potential, flower diameter, percentage of flower water and the pH of preservation solution was measured and compared. The results of the first experiment indicated the significant effect of nanosilver on leaf chlorophyll, leaf chlorophyll fluorescence, the water potential, percentage of water of flower, vase life and pH of preservation solution. The results of the second experiment showed that treatment 0.5  $\mu\text{l/l}$  of 1-methylcyclopropene did not have significant effect on the flower diameter, percentage of flower water and preservation solution pH, but had significant effect on leaf chlorophyll, leaf chlorophyll fluorescence, the water potential of petiol, relative fresh weight, absorbed water index and vase life. Results of the third experiment showed that nanosilver treatment related to 1-methylcyclopropene treatment more effective on improved physicochemical properties and increased the vase life of cut rose flowers. Results of this experiments showed that most of these traits had significant differences with control. Vase life increases 53.45 and 22.3% in 10 ppm of nanosilver and 0.5  $\mu\text{l/l}$  of 1-methylcyclopropene, respectively. However the effect of nanosilver on the measured traits was more than 1-MCP, but 1-MCP because of its non-environmental effects is recommended to increase the vase life of cut flower after nanosilver.

**Keywords:** Nanosilver, 1- Methylcyclopropene, Rose, Vase life