



## **Effect of postharvest pretreatments on organic Early Superior Seedless "Sugraone" table grapes assigned to long term storage**

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Every year a significant amount of organic table grapes is lost during postharvest mainly due to the incidence of decay, stem browning and fast alteration of the taste and aroma.

The demand for this fresh product with immaculate appearance and high sensory quality in terms of flavor, is a hard challenge considering the difficulties to conserve them, with alternative safe treatments to the sulphur dioxide ( $\text{SO}_2$ ) which is not allowed in organic product.

The aim of this experiment was to maintain the quality of organic table grapes and extend their shelf-life for medium and long term, in order to reach new distant promising markets, by using safe methods. The effectiveness of the combination of pretreatment with Generally Recognized As Safe (GRAS) compounds, physical means and storage under modified atmosphere packaging (MAP) were performed by using detached organic table grape berries as alternatives to usual industrial  $\text{SO}_2$  application.

The detached organic Early Superior Seedless "Sugraone" berries were pretreated by: i) dipping in ethanol and potassium bicarbonate; ii) massive  $\text{CO}_2$  concentrations; iii) ozone ( $\text{O}_3$ ) fumigation; whereas, untreated berries were included in the trial as control. Moreover, all the samples were packed in thermo-sealed ALPAK bags with MAP of 2%  $\text{O}_2$ :5%  $\text{CO}_2$ :93%  $\text{N}_2$  and stored at 0°C for 45 days. Initially and after 15, 30 and 45 days of storage, weight loss, decay incidence, berry/skin firmness, pedicel detachment force, skin color parameters, SSC, pH, titratable acidity and sensory evaluation scores, were monitored.

After 45 days of storage, the weight loss was higher in the sample pretreated with massive  $\text{CO}_2$  concentration at 70 - 90 % and the control. The samples pretreated with  $\text{CO}_2$  at 70% and  $\text{O}_3$  at 20 ppm maintained the strength of the berry linked to its pedicel, also the berry and skin firmness were statistically higher in samples pretreated with  $\text{CO}_2$  at 90 - 70% and  $\text{O}_3$  at 20 ppm in comparison with the control.

The skin color parameters and titratable acidity decreased, while, pH increased in all samples in comparison with their initial value. Also, the SSC increased in samples treated with  $\text{O}_3$  at 20 ppm,  $\text{CO}_2$  at 70% and dipping.

Finally, the sensory evaluation scores gave the decisive data for the selection of the best combination treatments in order to validate their efficiency and that of the film packaging on late season organic table grape "Scar-lotta/Sugraninteen". The highest scores for crunchiness, firmness, sweetness and sourness were given to samples pretreated by dipping.

In conclusion, the efficiency of both film packaging and MAP inhibited the occurrence of berries decay in all samples including the control. These preliminary results represent the first step to design a treatment approach and develop a postharvest protocol for organic table grapes assigned to long term storage or shipping.