

**EFFECT OF SOME SUPPLEMENTARY
REFRIGERATION TREATMENTS ON
STORAGABILITY OF GRAPES**

BY

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LIST OF APPRIVIATIONS

atm	Atmosphere
CA	Controlled atmosphere storage
Ca1	Defoliation + 1 % CaCl_2 spray at the pea size of berries
Ca2	Defoliation + 2 % CaCl_2 spray at the pea size of berries and two days before harvest
CaCl_2	Calcium chloride
CC	Cool chamber
C.Wr.	Cluster wrapping
HDPE	High density polyethylene bag
KMnO_4	Potassium permanganate
KMS	Potassium metabisulfite
LDPE	Low density polyethylene bag
MA	Modified atmosphere
MAP	Modified atmosphere packaging
MTCA	1-methyl-1,2,3,4-tetra hydro-beta-carboline-3-carboxylic acid
NAA	Naphthalene acetic acid
PD	Polyethylene density
PG2	Plant guard
PP	Micro perforated polyethylene
SO_2	Sulfur dioxide
SMS	Sodium metabisulfite
SSC	Soluble solids contents
STS	Sodium thiosulfate
THCA	1,2,3,4- tetra hydro-beta-carboline-3-COOH
TopsinM	Thiophanate-methyle
T.S.S	Total soluble solids

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1. INTRODUCTION

Grape (*Vitis vinifera* L.) is considered one of the most important fruits in the world. It is the third largest fruit crop by area and value of production in Egypt. The acreage of grape vines in Egypt reached about **152919 Feddan** producing about **1103840 tons (FAO. annually 2003)**.

Superior grape vines is an early maturity cultivar, which meets export needs of the European markets. Therefore, it is necessary to find ways to extend its marketability periods by minimizing loss in quality during cold storage, which will in turn increase the exportation chance in this period.

Calcium chloride application under different levels as a pre-harvest treatment and several post harvest treatments like modified atmosphere packaging (MAP), clusters wrap (C.Wr.) and SO₂ fumigation are considered effective in prolonging storage life of grapes. However, calcium may be a major contributing factor in reducing cluster weight loss, decay percentage and berry shattering. In addition, increasing berry attachment force during cold storage (**EL-Hefnawi and Nomier, 2001**). Whereas, MAP resulted in decreased berry rot (**Lue *et al*, 1993**). Moreover, MAP slowed and reduced changes in sugar and amino acid concentration compared to conventional storage, resulting improved quality (**Mukailov, 1992**). On the other hand, cluster wrapping (C.Wr.) may be one of the most important applications which gives a good effect in transportation by increasing the storage life (**Tian *et al*, 1998**).

The main role of SO₂ fumigation in reducing percentage of decay was obvious (**Taylor *et al*, 1990**), (**Thomas *et al*, 1995**) and (**Xu *et al*, 1998**). Conversely, **Cenci and Ferreira (1996)** demonstrated that, the presence and absence of SO₂ during cold storage of grapes didn't change SSC % or acidity.

For agriculture products with relatively short shelf life, time in transit is a critical factor in determining which transportation method is used. Air shipment of products including grapes is often used due to the short in-transit time.

A high disease incidence and severity occur when cool and wet weather conditions prevail during harvest, and economic losses may occur in the vineyard or more often during transport to markets in the USA or Europe (**Capellini *et al.*, 1986; Bulit and Dubos, 1994**).

The main objective of this work was to evaluate the effect of pre-harvest application of different levels of calcium chloride (CaCl_2) and the effects of post-harvest treatments (MAP, C.Wr., and SO_2 fumigation), during cold storage on shelf life extension and storagability of *Vitis vinifera* L. cv. Superior.