

The effect of transpiration inhibitors on the storability of dates as a step towards sustainable food security

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ABSTRACT

The study was conducted on Barhi date palm fruits from the 2024 season, collected from an orchard in the Abu Al-Khasib area, south of Basra. The fruits were treated with an evaporation inhibitor (Vapor Gard, abbreviated as V.G.) by dipping them in the product at the beginning of the Rutab (ripe) stage at concentrations of 2% and 4%, in addition to a control treatment (distilled water only). The fruits were then packed in 1 kg transparent polyethylene containers and stored at a temperature of $-3 \pm 1^{\circ}\text{C}$. A completely randomized design was used for a two-factor experiment: treatments (three levels) and storage duration (four levels). The difference between the means was tested using the Least Significant Difference (LSD) test at a significance level of 5%. The results showed that the treatment with V.G. concentration (4) % was superior in reducing the percentage of weight loss, reducing the percentage of spoilage, and the lowest percentage of total soluble solids, with a significant difference compared to the comparison treatment, and it was not significantly different from the treatment with V.G. concentration 2%.

Keywords: Evaporation inhibitors; Prim; Storage Capacity; Weight loss; Total Soluble Solids.

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INTRODUCTION

The date palm (*Phoenix dactylifera* L.) belongs to the palm family Arecaceae, which includes various palm species, the most important of which is the date palm. Date palms are widely cultivated in tropical, subtropical, and subtropical regions of the world. Iraq has more than 600 varieties of date palms, many of which are distinguished by their high-quality fruit, making them an important food and economic resource (Al-Bakr, 1972). Cooled storage of date palm fruits is an important method used today to try to keep the fruit in the Rutab (semi-ripe) stage for as long as possible, thus extending the period during which the fruit can be sold in local markets at this stage. Cooled storage reduces the fruit's biological activities, especially respiration and ethylene production, and also limits the growth of pathogens (Desouki *et al.*, 2001). Fruits are essential nutrients in our daily diet, but they are also highly perishable. After harvesting, fruits don't cease to live; they continue their vital processes such as respiration and transpiration (water loss in the form of vapor). This continuous water loss leads to fruit wilting, weight loss and a decline in their market and nutritional value. Therefore, antitranspirants have emerged as a modern and effective technique for preserving fruit quality and extending its shelf life.

Anti-transpirant agents have been used as treatments to reduce water loss in fruits or to decrease transpiration from treated vegetative parts (Abdul Qader, 1990). Hamoud and Mawloud (1988) treated date palm fruits of the Jebchab variety with Vapor Gard at a concentration of 4% and observed an increase in the weight and size of the treated fruits, an increase in their moisture content, and a decrease in the percentage of total soluble solids and total sugars. Abdul Jabbar *et al.* (2009) also indicated the