

## ABSTRACT

**Amany Attia Abd Ellatif Attia. Effect of Modified Atmosphere Storage on Keeping Quality of Strawberry Fruits and Transplants. Unpublished Ph. D. Dissertation, Ain Shams University, Faculty of Agriculture, Department of Horticulture, 2005.**

The present investigation included two experiments to study the effect of modified atmosphere storage on keeping quality and storability of Sweet Charlie strawberry fruits. The first experiment was carried out at Zein El Dien Strawberry Export Farms, Katta, Giza Governorate during the two successive seasons of 2001-2002 and 2002- 2003. Fruits were harvested at three quarter color stage, Pre-cooled directly and wrapped with polyethylene. Then subjected to six treatments of carbon dioxide concentrations viz., control (unwrapped), MAP (wrapped), 10,15,20, and 25% CO<sub>2</sub>. The experimental design was complete randomize dcsign with three replicates. Cartons were placed in a controlled temperaturc room at 0<sup>0</sup>C and relative humidity of 95% for three weeks. Quality characteristics were recorded weekly. In the second experiment, the transplants were treated with calcium nitrate (13% Ca) with three different rates *i.e.* control (without calcium), 100 and 200 Kg/fed of calcium nitrate as fertigation in the nursery. Calcium treated transplants were subjected to five modified atmosphere treatments 0, 10, 20, 30, and 40 % CO<sub>2</sub> before cold storage. Crown diameter, number of leaves and roots per plant, Ca % in roots and crowns, decay percent, early and total yield were recorded. Results of the first experiment indicated that, after three weeks of cold storage, 10 % of CO<sub>2</sub> showed the lowest value of color development without significant difference as compared with 20% CO<sub>2</sub>. Significant

differences in gloss were detected between MAP and 10% CO<sub>2</sub> – enriched atmosphere in the two tested seasons. After three weeks of cold storage, CO<sub>2</sub> at 10 or 15% showed the best calyx color (light green) in the two tested years. Fruits treated with 10% of CO<sub>2</sub> showed no decay after one week in the two tested seasons. After two weeks of cold storage, significant increment in fruit firmness was found to those treated with 15 % CO<sub>2</sub> as compared with all tested treatments. On the other hand, after three weeks, significant decrements were noticed for fruits treated with 20% and 25% as compared with 10% CO<sub>2</sub> . After two weeks of storage, 15% CO<sub>2</sub> treatment showed the highest values of ascorbic acid content without significant difference between it and 10% in the second season . Control treatment was decayed before one week. Weight loss after one week of storage showed a decline in all modified atmosphere treatments when compared with MAP in the two tested seasons. Results also indicated that increasing CO<sub>2</sub> concentration around strawberry fruits decreased total sugars content . However, MAP and those treated with 10% CO<sub>2</sub> showed significant increment in total sugars as compared with those treated with 15% and 20% CO<sub>2</sub> in both seasons. The results of the second experiment indicate that increasing the rate of calcium application during the transplant growth period (26 kg/fed) and carbon dioxide concentration (40%) around transplants during the cold storage resulted in significant decrements in transplant decay, infection percentage, disease severity of root and crowns. There was a positive relationship between calcium nutrition and early yield. Moreover, the highest calcium rate gave the highest total yield.

**Key Words: Strawberry, Transplants, Calcium, Modified atmosphere, CO<sub>2</sub>, Decay, Fruit firmness, Yield.**

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