STUDIES ON HORMONAL REGULATION FOR PRODUCTIVITY, DEVELOPMENT AND RIPENING OF AVOCADO FRUITS "FUERTE"

By

SAID ABDEL-AZIZ MABROUK NASSAR

B.Sc. Agric.Sc. (Horticulture), Minufiya Univ. 2007
M.Sc. Agric. Sci. Minufiya University 2013

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ABSTRACT

Said Abd El-Aziz Mabrouk Nassar: Studies on Hormonal Regulation for Productivity, Development and Ripening of Avocado Fruits "Fuerte". Unpublished Ph.D thesis, Department of Horticulture, Faculty of Agriculture, Ain Shams University, 2016.

This study was carried out during 2013 and 2014 seasons on "Fuerte" avocados trees grown in clay loam soil under surface irrigation at avocado orchard belonging to Horticulture Research Station at El-Kanater El-Khayira, Kalyubeia Governorate, Egypt. Study is divided into two experiments, the first experiment was to study the effect of foliar application of calcium chloride at 1 & 2%, silver nitrate at100 & 200 µm, cobalt sulphate at 100 & 200 µm, C_2H_4 at 100 & 200 ppm, BA at 10 & 25ppm and ABA at 50 &100 µm on yield and fruit quality of "Fuerte" avocado fruits. The second experiment was to study the effect of pre-harvest treatments and storage conditions on storability, fruit ripening and physical and chemical properties. All materials were sprayed at 30 and 75 days after fruit set. The results revealed that 2 % $CaCl_2$ significantly increased the number of fruits/tree, yield and fruit quality properties such as (fruit weight, fruit firmness, TSS, TSS/acid ratio and total chlorophyll content of fruits compared to control and others treatments. This treatment was effective in minimizing the total acidity, total phenols, electrolyte leakage and respiration rate in both seasons.

However, the untreated fruits and the treatment of C_2H_4 and BA with the two concentrations caused the least values of fruit numbers/tree, yield, fruit quality properties such as (fruit weight, fruit firmness, TSS, TSS/acid ratio and total chlorophyll content of fruits compared to control and others treatments. Also, these treatments exhibited the highest values the total acidity, total phenols, electrolyte leakage and respiration rate in both seasons.

Non-significantly effect of the fruit length, fruit diameter and fruit Shape index were recorded in all treatments in both seasons.

Also, the data concerning the effect of treatments for post-harvest storability study revealed that 2 % $CaCl_2$ significantly increased the number of days taken for ripening of fruits and give the highest values of fruit firmness and total chlorophyll content. This treatment led to a reduction of weight loss, discarded fruits, respiration rate, electrolyte leakage %, total phenols and marketable life of fruits compared to control. This treatment was effective in minimizing respiration rate gradually during cold storage which acquire the fruits the chilling injury tolerance.

The untreated fruits and the treatments of C_2H_4 and BA with the two concentrations caused the highest values of weight loss, discarded fruits due to increasing of respiration rate, electrolyte leakage %, total acidity and total phenols. These treatments of C_2H_4 and BA with the two concentrations caused the least values of fruit firmness and total chlorophyll content in both seasons.

Key words: Avocado, Ethylene inhibitors, Ethylene promoting, yield, fruit quality, Storage, Ripening, Physical and chemical properties.

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