Faculty of Agric. (Saba-Basha)
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IMPROVING YIELD, QUALITY AND STORABILITY OF ZAGHLOUL AND SAMANI DATE PALM FRUITS BY SOME PRE- AND POST-HARVEST TREATMENTS

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5- SUMMARY

Improving yield, quality and storability of Samani and Zaghloul date palm fruits by some pre- and post-harvest treatments.

The field experiments were carried out in El Bousily Research Station in El Behira governorate, Egypt to examine the effect of some pre-harvest spraying treatments on yield, fruit quality and extending storage life of Samany and Zaghloul date palm fruits in seasons 2019 and 2020. The pre-harvest growth regulator treatments were as follows:

T1: Control Water Only.

T2: NAA (80 mg/l at hababak stage and 50 mg/l at the beginning of fruit color break).

T3: NAA (90 mg/l at hababak stage and 60 mg/l at the beginning of fruit color break).

T4: CPPU (5 mg/l at hababak stage and 10 mg/l at the beginning of fruit color break).

T5: CPPU (10 mg/l at hababak stage and 15 mg/l at the beginning of fruit color break).

Spraying with tested growth-regulators was carried out for selected 15 Samani and 15 Zaghloul tested tree which are similar in age and uniform in growth The post harvesting treatments interacted with the previous five pre-harvesting treatments as follows:

T6: T2 without dipping the fruits in essential oils.

T7: T3 without dipping the fruits in essential oils

T8: T4 without dipping the fruits in essential oils

T9: T5 without dipping the fruits in essential oils

T10: T2 + dipping the fruits in lemongrass oil at 0.4%.

T11: T2 + dipping the fruits in lemongrass oil at 0.8%.

T12: T2 + dipping the fruits in peppermint oil at 4%.

T13: T2 + dipping the fruits in peppermint oil at 8%.

T14: T3 + dipping the fruits in lemongrass oil at 0.4%.

T15: T3 + dipping the fruits in lemongrass oil at 0.8%.

T16: T3 + dipping the fruits in peppermint oil at 4%.

T17: T3 + dipping the fruits in peppermint oil at 8%.

T18: T4 + dipping the fruits in lemongrass oil at 0.4%.

T19: T4 + dipping the fruits in lemongrass oil at 0.8%.

T20: T4 + dipping the fruits in peppermint oil at 4%.

T21: T4 + dipping the fruits in peppermint oil at 8%.

T22: T5 + dipping the fruits in lemongrass oil at 0.4%.

T23: T5 + dipping the fruits in lemongrass oil at 0.8%.

T24: T5 + dipping the fruits in peppermint oil at 4%.

T25: T5 + dipping the fruits in peppermint oil at 8%.

The obtained results can be summarized as follows:

5.1. Effect of spraying growth-regulators NAA and CPPU on bunch weight, fruit weight, length, diameter and volume for Samani and Zaghloul date-palms.

The Samani and Zaghloul date-fruit yield, bunch weight, fruit weight, length, diameter and volume significantly increased by increasing NAA and CPPU concentrations compared with control treatment (water). It was found the tested second season of 2020 gave values more than the first season of 2019 for all measurements.

5.2. Effect of spraying growth-regulators NAA and CPPU on fruit chemical properties of Samani and Zaghloul palm-date fruit.

5.2.1. Total soluble solids (TSS)

It was found that total soluble solids (TSS) of Samani and Zaghloul date-fruits increased using all spraying growth regulators NAA, CPPU as compared with the control in both seasons. Moreover, TSS increased by increasing NAA, CPPU concentrations. There was no significant difference between NAA and CPPU.

5.2.2. Acidity

The acidity percent of Samani date-fruits significantly decreased using all spraying growth regulators NAA, CPPU as compared with the control in both seasons. The Acidity decreased by increasing tested growth-regulators concentrations. There is no significant difference between NAA and CPPU.

5.2.3. TSS/Acid ratio

The TSS/Acid ratio Samani and Zaghloul date-fruits of significantly increased by spraying NAA, CPPU as compared with the control in both tested seasons. Moreover, TSS/Acid ratio increased by increasing NAA, CPPU concentrations. It was found the tested first season of 2019 gave TSS/Acid values more than the second season of 2020 for all tested treatments.

5.2.4. Vitamin C

Vitamin C of Samani and Zaghloul date-fruits significantly increased by spraying NAA, CPPU as compared with the control in both tested seasons. In addition, vitamin C increased by increasing NAA, CPPU concentrations.

5.2.5. Reducing, non-reducing and total sugars

Reducing, non-reducing and total-sugar percent of Samani and Zaghloul date-fruits significantly increased by spraying NAA, CPPU as compared with the control in both tested seasons. Moreover, reducing, non-reducing and total-sugar percent increased by increasing NAA, CPPU concentrations at both tested seasons.

5.2.6. Tannins

The tannins of Samani and Zaghloul date-fruits significantly decreased by spraying NAA, CPPU as compared with the control and also, by increasing NAA, CPPU concentrations in both seasons of study. It was found the tested second season of 2020 gave tannins values more than the first season of 2019 for all tested treatments.

5.2.7. Chlorophyll

The chlorophyll of Samani and Zaghloul date-fruits significantly increased by spraying NAA, CPPU as compared with the control in both tested seasons. Moreover, chlorophyll increased by increasing NAA, CPPU concentrations at both tested seasons. It was found that the second season of 2020 gave higher chlorophyll values more than the first season of 2019 for all tested treatments.

5.2.8. Carotene and anthothianine

Carotene of Samani date-fruits significantly decreased and anthothianine of Zaghloul date-fruits significantly decreased by spraying NAA, CPPU as compared with the control in both tested in both seasons. Moreover, carotene of Samani and anthothianine of Zaghloul date-fruits significantly decreased by increasing NAA, CPPU concentrations at both tested seasons. It was found that the tested first season of 2019 gave carotene values Samani and anthothianine of Zaghloul date-fruits more than the second season of 2020 for all tested treatments.

5.3. Effect of spraying growth-regulators NAA or CPPU and spraying NAA or CPPU then dipping fruits in oils through cold-storage duration on Samani and Zaghloul date palm fruit :

5.3.1. Weight loss

The fruit-weight loss of Samani and Zaghloul date-fruits significantly decreased with spraying of NAA or CPPU and spraying NAA or CPPU then dipping with lemongrass or peppermint with different concentrations as compared with the control (water) at all tested concentrations, cold-storage durations and in both seasons. Moreover, fruit-weight loss decreased by increasing NAA, CPPU, lemongrass and peppermint oil concentrations at all tested cold-storage durations and seasons. The fruit-weight loss of Samani and Zaghloul date-fruits significantly increased by increasing cold-storage duration at all tested growth-regulators, oils and in both seasons.

5.3.2. Total soluble solids (TSS)

The percentage of Total soluble solids in Samani and Zaghloul date-fruits juice significantly increased by spraying of NAA or CPPU and spraying NAA or CPPU then dipping with lemongrass or peppermint with different concentrations as compared with the control treatment (water) at all tested concentrations, cold-storage durations and in both seasons. Moreover, TSS percentage of Samani and Zaghloul date-fruits increased by increasing NAA, CPPU and peppermint, and by decreasing lemongrass oil concentrations at all tested cold-storage durations and in both seasons. The TSS percentage of Samani and

Zaghloul date-fruits significantly increased by increasing cold-storage duration at all tested growth-regulators, oils and in both seasons.

5.3.3. Acidity

The acidity percent of Samani and Zaghloul date-fruits significantly decreased by spraying of NAA or CPPU and spraying NAA or CPPU then dipping with lemongrass or peppermint with different concentrations as compared with the control treatment at at all tested concentrations, cold-storage durations and in both seasons. In addition , acidity percent for Samani and Zaghloul date-fruits significantly decreased by increasing NAA, CPPU, peppermint and by decreasing lemongrass oil concentrations at all tested cold-storage durations and in both seasons. The acidity percent of Samani and Zaghloul date-fruits significantly decreased by increasing cold-storage duration at all tested growth-regulators, oils and in both seasons.

5.3.4. TSS/Acid ratio

The TSS/Acid ratio of Samani and Zaghloul date-fruits significantly increased by spraying of NAA or CPPU and spraying NAA or CPPU then dipping with lemongrass or peppermint with different concentrations as compared with the control treatment at at all tested concentrations, cold-storage durations and in both seasons. Moreover, TSS/Acid for Samani and Zaghloul date-fruits significantly decreased by increasing NAA, CPPU, peppermint and lemongrass oil concentrations at all tested cold-storage durations and in both seasons.

5.3.5. Vitamin C

The vitamin C of Samani and Zaghloul date-fruits significantly increased by spraying of NAA or CPPU and spraying NAA or CPPU then dipping with lemongrass or peppermint with different concentrations as compared with the control treatment at at all tested concentrations, cold-storage durations and in both seasons. Moreover, vitamin C of Samani and Zaghloul date-fruits significantly increased by increasing NAA, CPPU and peppermint and lemongrass oil concentrations at all tested cold-storage durations and in

both seasons. The vitamin C of Samani and Zaghloul date-fruits significantly decreased by increasing cold-storage duration at all tested growth-regulators, oils and in both seasons

5.3.6. Reducing-sugars

The reducing-sugar percent of Samani and Zaghloul date-fruits significantly increased by spraying of NAA or CPPU and spraying NAA or CPPU then dipping with lemongrass or peppermint with different concentrations as compared with the control treatment at at all tested concentrations, cold-storage durations and in both seasons. Moreover, reducing sugar percent for Samani and Zaghloul date-fruits significantly increased by increasing NAA, CPPU and peppermint and by decreasing lemongrass oil concentrations at all tested cold-storage durations and in both seasons. The reducing-sugar percent of for Samani and Zaghloul date-fruits significantly increased by increasing cold-storage duration at all tested growth-regulators, oils and in both seasons

5.3.7. Non-reducing sugars

The non-reducing sugar percent of Samani and Zaghloul date-fruits significantly increased by spraying of NAA or CPPU and spraying NAA or CPPU then dipping with lemongrass or peppermint with different concentrations as compared with the control treatments at all tested concentrations, cold-storage durations and in both seasons. Moreover, non-reducing sugars percent for Samani and Zaghloul date-fruits significantly increased by increasing NAA, CPPU and peppermint and by decreasing lemongrass oil concentrations at all tested cold-storage durations and in both seasons. The non- reducing sugar percent of for Samani and Zaghloul date-fruits significantly increased by increasing cold-storage duration at all tested growth-regulators, oils and in both seasons. .

5.3.8. Total-sugars

The total-sugars percent in Samani and Zaghloul date-fruits significantly increased by spraying of NAA or CPPU and spraying NAA or CPPU then dipping with lemongrass or peppermint with different concentrations as compared with the control treatment at at all tested concentrations, cold-storage durations and in both seasons. Moreover, total-sugars percent for Samani and Zaghloul date-fruits significantly increased by increasing

NAA, CPPU and peppermint and by decreasing lemongrass oil for Samani and Zaghloul date-fruits significantly increased by increasing cold-storage duration at all tested growth-regulators, oils and in 2019 and 2020.

5.3.9. Tannins

The tannins percent in Samani and Zaghloul date-fruits significantly decreased by spraying of NAA or CPPU and spraying NAA or CPPU then dipping with lemongrass or peppermint with different concentrations as compared with the control treatment at at all tested concentrations, cold-storage durations and in both seasons. Moreover, tannins percent for Samani and Zaghloul date-fruits significantly decreased by increasing NAA, CPPU , peppermint and by decreasing lemongrass oil concentrations at all tested cold-storage durations and in both seasons.

5.3.10. Chlorophyll

The chlorophyll of Samani and Zaghloul date-fruits significantly increased by spraying of NAA or CPPU and spraying NAA or CPPU then dipping with lemongrass or peppermint with different concentrations as compared with the control treatment at at all tested concentrations, cold-storage durations and in both seasons. In addition, chlorophyll of Samani and Zaghloul date-fruits significantly increased by increasing NAA, CPPU and peppermint and lemongrass oil concentrations at all tested cold-storage durations and in both seasons. The chlorophyll of Samani and Zaghloul date-fruits significantly decreased by increasing cold-storage duration at all tested growth-regulators, oils and in 2019 and 2020.

5.3.11. Carotene and anthothianine

The carotene of Samani and anthothianine of Zaghloul date-fruits significantly decreased by spraying with NAA or CPPU and spraying NAA or CPPU then dipping with lemongrass or peppermint with different concentrations as compared with the control treatment at at all tested concentrations, cold-storage durations and in both seasons. In addition, carotene of Samani and anthothianine of Zaghloul date-fruits significantly decreased by increasing NAA, CPPU, peppermint and lemongrass oil concentrations at all

tested cold-storage durations and in both seasons. The carotene of Samani and anthothianine of Zaghloul date-fruits significantly increased by increasing cold-storage duration at all tested growth-regulators, oils and in both seasons

5.3.12. Pathological and physiological disorders

The pathological and physiological disorders of Samani and Zaghloul date-fruits significantly decreased by spraying of NAA or CPPU and spraying NAA or CPPU then dipping with lemongrass or peppermint with different concentrations as compared with the control treatment at at all tested concentrations, cold-storage durations and in both seasons Inaddition, the pathological and physiological disorders of Samani and Zaghloul date-fruits significantly decreased by increasing NAA, CPPU, peppermint and lemongrass oil concentrations at all tested cold-storage durations and seasons. The pathological and physiological disorders of Samani and Zaghloul date-fruits significantly increased by increasing cold-storage duration at all tested growth-regulators, oils and in 2019 and 2020.