

Contents

	Page
I. INTRODUCTION -----	1
II. REVIEW OF LITERATURE -----	5
III. MATERIALS AND METHODS -----	81
IV. RESULTS AND DISCUSSIONS -----	91
IV.I- First Experiment: Effect of irrigation regimes -----	91
IV.I.1-Fruit quality -----	91
IV.I.1.A- Fruit physical properties -----	91
Average fruit weight (g) and size (cm ³) -----	92
Fruit dimensions (polar & equatorial diameters) ---	94
Fruit rind thickness (mm) and weight (g)-----	97
Fruit juice weight (g) and volume (cm ³) -----	102
IV.I.1.B- Fruit chemical properties --	105
Fruit juice total soluble solids percentage (TSS %)-	105
Fruit juice total acidity percentage:-----	107
Fruit juice TSS/acid ratio-----	110
Fruit juice ascorbic acid V.C. content-----	111
IV.I.2- Creasing incidence in Tanarif fruits as related to irrigation regime, localities towards north & south direction and fruit status-----	114
IV.I.3-Nutritional status (leaf and fruit rind mineral composition)-----	118
Leaf and fruit rind nitrogen content (N %)-----	118
Leaf and fruit rind phosphorus content (P %) -----	120
Leaf and fruit rind potassium content (K %)-----	123
Leaf and fruit rind calcium content (Ca %)-----	127

	Page
Leaf and fruit rind magnesium content (Mg %)--	130
Leaf and fruit rind iron content (Fe ppm)-----	134
Leaf and fruit rind manganese content (Mn ppm)-	137
Leaf and fruit rind zinc content (Zn ppm) -----	140
Leaf and fruit rind copper content (Cu ppm)-----	143
IV.II- Second Experiment: Effect of (GA ₃ ; P; K) foliar spray in combination with application date and geographical direction on Tanarif sweet orange cultivar -----	146
IV.II.1-Fruit quality-----	146
IV.II.1.A- Fruit physical properties-----	146
Average fruit weight (g) and size (cm ³)-----	147
Fruit dimensions (polar & equatorial diameters)--	149
Fruit rind thickness (mm) and weight (g)-----	154
Fruit juice weight (g) and volume (cm ³)-----	158
IV.II.1.B- Fruit chemical properties-----	162
Fruit juice total soluble solids percentage (TSS %)	162
Fruit juice total acidity percentage-----	164
Fruit juice TSS/acid ratio-----	168
Fruit juice V.C. "ascorbic acid" content-----	170
IV.II.2- Creasing incidence in Tanarif fruits as related to different folia spray treatments, geographical direction, fruit status and measuring dates-----	174
IV.II.3- Nutritional status (leaf and fruit rind mineral composition)-----	177
Leaf and fruit rind nitrogen content (N %)-	179
Leaf and fruit rind phosphorus content (P %)-	183
Leaf and fruit rind potassium content (K %)-	187
Leaf and fruit rind calcium content (Ca %)-	190
Leaf and fruit rind magnesium content (Mg %)-	195

	Page
Leaf and fruit rind iron content (Fe ppm) -----	198
Leaf and fruit rind manganese content (Mn ppm) -----	201
Leaf and fruit rind zinc content (Zn ppm) -----	204
Leaf and fruit rind cupper content (Cu ppm) ----	207
IV. II.4. Anatomical studies -----	210
A- Peel anatomy of the "Tanarif" orange cultivar-----	210
B- Anatomical development of the creasing area in peel of Tanarif orange -----	212
V. SUMMARY AND CONCLUSION -----	227
VI. LITERATURE CITED -----	248
ARABIC SUMMARY-----	-