## Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>II. REVIEW OF LITERATURE</td>
<td>3</td>
</tr>
<tr>
<td>III. MATERIALS AND METHODS</td>
<td>63</td>
</tr>
<tr>
<td>IV. RESULTS AND DISCUSSIONS</td>
<td>73</td>
</tr>
<tr>
<td>IV. I-1- First experiment: Effect of salinity concentrations, sodium adsorption ratio (SAR) and chloride levels (Cl:SO₄ ratio) in irrigation water on some vegetative growth measurements and chemical contents of the two pear rootstocks transplants</td>
<td>73</td>
</tr>
<tr>
<td>IV. I-1-1- Vegetative growth:</td>
<td>73</td>
</tr>
<tr>
<td>1- Effect on stem height and stem diameter (cm)</td>
<td>74</td>
</tr>
<tr>
<td>2- Effect on Root length and total plant length (cm.)</td>
<td>78</td>
</tr>
<tr>
<td>3- Effect on number of leaves and lateral shoots/ transplant</td>
<td>82</td>
</tr>
<tr>
<td>4- Effect on leaf area and total leaves (assimilation) area (cm²) per plant</td>
<td>86</td>
</tr>
<tr>
<td>5- Effect on fresh and dry weights of plant organs (leaves, stems, roots), top/root ratio and total weight of transplant</td>
<td>90</td>
</tr>
<tr>
<td>I-2- Some physiological properties of leaf</td>
<td>101</td>
</tr>
<tr>
<td>1- Leaf osmotic pressure (L.O.P.)</td>
<td>101</td>
</tr>
</tbody>
</table>
IV  I-3- Some chemical constituents ................................................. 114
   1- Leaves photosynthetic pigments (leaf content of chlorophyll A, B and carotenoids) ........................................... 114
   2- Stem total carbohydrates content ........................................ 120
   2- Leaf proline content ......................................................... 122
   4- Leaf mineral composition .................................................. 126
      4-a- Leaf nitrogen content .................................................. 126
      4-b- Leaf phosphorus content ............................................. 129
      4-c- Leaf potassium content ............................................... 133
      4-d- Leaf calcium content .................................................. 136
      4-e- Leaf magnesium content .............................................. 140
      4-f- Leaf sodium content .................................................... 143
      4-g- Leaf iron content ....................................................... 148
      4-h- Leaf zinc content ....................................................... 151
      4-i- Leaf manganese content ............................................... 155

IV  II. Second experiment: Effect of some growth regulators foliar spray on two pear rootstocks transplants grown under constant level of salinity (irrigated with 6000 ppm salinity water and SAR 6) ..... 159

IV  II-1- Vegetative growth: ....................................................... 160
    a- Effect on stem height (cm.) ............................................ 160
    b- Effect on stem diameter (cm.) ......................................... 160
c- Effect on root length (cm.) .................... 160

d- Effect on total plant length (cm.) ............ 160

e- Effect on fresh and dry weights of plant organs (leaves, stems and roots) top/root ratio and total weight of transplant.. 162

f- Effect on number of leaves per transplant... 166

g- Effect on number of laterals shoots per transplant................................................. 166

h- Effect on leaf area (cm2) and total leaves (assimilation) area (cm2) per plant ......... 166

IV II-2- Some physiological properties of leaf. 168

a- Leaf osmotic pressure (L.O.P.).............. 169

b- Leaf water potential (L.W.P.) ............... 170

c- Leaf relative turgidity (L.R.T.)......... 171

d- Leaf succulence grade (L.S.G.) ......... 172

IV II-3- Some chemical constituents............. 174

1- Leaves photosynthetic pigments (leaf content of chlorophyll A, B and carotenoids) ................. 174

2- Stem total carbohydrate ..................... 176

3- Leaf proline content ....................... 177

4- Leaf mineral composition .................... 179

4-a- Leaf nitrogen content ...................... 179

4-b- Leaf phosphorus content .................. 181

4-c- Leaf potassium content .................... 182

4-d- Leaf calcium content ....................... 183

-III-
4-e- Leaf magnesium content .................. 183
4-f- Leaf sodium content ............. 184
4-g- Leaf iron content ..................... 186
4-h- Leaf zinc content ...................... 187
4-i- Leaf manganese content ............. 188

V. SUMMARY AND CONCLUSION .......... 190
VI. LITERATURE CITED ...................... 207
ARABIC SUMMARY ......................... -