

CONTENTS

	Page
I- INTRODUCTION	1
II- REVIEW OF LITERATURE	3
III- MATERIALS AND METHODS	88
IV- RESULTS AND DISCUSSION	100
IV-I Vegetative growth	100
IV-I-1 Plant height (cm) and net increase of plant height (cm).....	101
IV-I-2 Root length (cm) and number of roots.....	108
IV-I-3 Number shoots and net increase number of shoots.....	114
IV-I-4 Number of leaves/plant and net increase number of leaves/plant.....	120
IV-I-5 Average of area (cm ²) and assimilation area (dec ²).....	125
IV-I-6 Leaves fresh weight (g.) and leaves dry weight (g.).....	128
IV-I-7 Stem fresh weight (g.) and stem dry weight (g.).....	128
IV-I-8 Root fresh weight (g.) and root dry weight (g.).....	128
IV-I-9 Total plant fresh weight (g.) and total plant dry weight (g.).....	128
IV-II Some physiological properties of leaf	137
IV-II-1 Leaf relative turgidity % (L.R.T).....	137
IV-II-2 Leaf osmotic pressure (L.O.P).....	139
IV-II-3 Transpiration rate (T.R).....	142
IV-II-4 Leaf water potential (L.W.P.).....	144
IV-II-5 Leaf succulence grade (L.S.G.).....	147

	Page
IV-II-6 Hard leaf character (H.L.C).....	149
IV-III Chemical composition.....	152
IV-III-1 Photosynthetic pigments (chlorophyll A, B and Carotein content).....	152
IV-III-2 Total carbohydrates% and total sugars%....	157
IV-III-3 Leaf proline content and total free amino acids.....	162
IV-III-4 Catalase and peroxidase enzyme activities..	167
IV-III-5 Leaves mineral content	172
IV-III-5-1 Leaf chloride content.....	172
IV-III-5-2 Leaf sodium content.....	173
IV-III-5-3 Leaf nitrogen content.....	176
IV-III-5-4 Leaf phosphorus content.....	179
IV-III-5-5 Leaf potassium content.....	182
IV-III-5-6 Leaf calcium content.....	185
IV-III-5-7 Leaf magnesium content.....	188
IV-III-5-8 Leaf iron content.....	191
IV-III-5-9 Leaf manganese content.....	193
IV-III-5-10 Leaf zinc content.....	196
IV-IV Anatomical structure.....	200
IV-IV-1 Leaf anatomical.....	200
IV-IV-2 Root anatomical.....	208
V- SUMMARY AND CONCLUSION	215
VI- LITERATURE CITED	229
ARABIC SUMMARY	-