

CONTENTS

INTRODUCTION	Page 1
LITERATURE REVIEW	3
MATERIALS AND METHODS	22
RESULTS AND DISCUSSION	35
I. Growth measurements :	35
1. Plant height	35
2. Stem diameter	39
3. Dry weight/ plant	44
4. Number of green leaves/ plant	49
5. Leaf area/ plant	54
II. Yield and yield components	59
1. Head diameter	59
2. Head dry weight	64
3. Number of seeds/ plant	68
4. 100- seed weight	72
5. Seed weight/ plant	77
6. Seed yield/ faddan	82
7. Seed oil content	88
8. Oil yield/ faddan	93
III. Crop water use	97
1. Seasonal actual evapotranspiration (Etc)	97
2. Daily ET rates	102
3. Potential evapotranspiration (Eto)	108
4. Crop coefficient (Kc)	110
5. Water use efficiency (WUE)	111
IV. Growing degree day (GDD)	116
SUMMARY	120
REFERENCES	129
ARABIC SUMMARY	