

CONTENTS

	Page
1. INTRODUCTION	1
1.1 • Background	1
1.2 • Objectives	3
2. REVIEW OF LITERATURE	4
2.1 • Identification of Sprinkler Irrigation Systems and Equipment	4
2.1.1 • Hand - move system	6
2.1.2 • Mechanical - move system	7
2.1.3 • Continuous mechanical move system. ..	10
2.1.4 • Solid - set system	13
2.2 • Performance Parameters of Sprinkler Irrigation Systems	14
2.2.1 • Water application rate and its distribution pattern	14
2.2.2 • Uniformity of water distribution	16
2.2.3 • Water losses and application efficiency.....	23
2.3 • Field performance capacity and cost analysis.	27
3. MATERIAL AND METHODS	30
3.1 • Evaluation of the Performance of Single Sprinkler head	30

3.1.1 • Sprinkler discharge measurements	34
3.1.2 • Water application rate and its distribution pattern	34
3.2 • Evaluation of Sprinkler Irrigation Systems and Equipment	38
3.2.1 • Survey of sprinkler irrigation systems and equipment mostly used in Egyptian agriculture	38
3.2.2 • Determination of water distribution uniformity for different sprinkler systems under field conditions	52
3.2.3 • Determination of water losses and irrigation efficiency	63
3.3 • Determination of Field Performance Capacity and Estimated Cost :.....	65
4. RESULTS AND DISCUSSION	67
4.1 • The Performance of Single Sprinkler Head	67
4.1.1 • Sprinkler discharge VS. operating pressure	68
4.1.2 • Water application rate, and water distribution pattern under different operating pressures	76

4.2 . The Performance Parameters of the Investigated sprinkler Irrigation Systems	89
4.2.1 . Water distribution pattern and uniformity coefficient	89
4.2.2 . Water losses and irrigation efficiency	117
4.3 . Field Performance Capacity and Estimated Cost for the Investigated Sprinkler Irrigation Systems	123
5. SUMMARY	135
6. REFERENCES	140
7. APPENDIXES	146
8. ARABIC SUMMARY	