

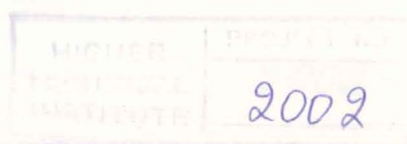
H.T.I  
ELECTRICAL ENGINEERING COURSE  
DIPLOMA PROJECT

MOISTURE SENSING &  
AUTOMATICALLY  
ACTIVATED SPRINGLER SYSTEM

E.790

ERMOGENIDES MARINOS

JUNE 1992



## A B S T R A C T

This project deals with the design ,construction and testing of a moisture sensing and automatically Activated Sprinkler System. In the Agricultural Research Institute of Cyprus similar devices are used for the control of the moisture content of the soil. Different types of tensiometers ( mechanical constructed ) are used to show the moisture tension of the soil.

This device was constructed in such a way to have continuous measurements of moisture content of the soil using the conductivity method. It is used for keeping the soil continuously in a wet condition by activating a sprinkler system when the moisture content reaches a certain level.

To be in a position to satisfy several agriculture needs there was a co-operation with the Agriculture Research Institute.

# C O N T E N T S

	<u>PAGE</u>
ACKNOWLEDGMENTS	
ABSTRACT	1
INTRODUCTION	2
CHAPTER I : SOIL STRUCTURE	3
1.1.Physical properties of the soil	4
1.2.Soil water	5
1.3.Soil moisture content	6
1.4.Units of moisture content	6
CHAPTER II : METHODS OF MEASURING THE SOIL MOISTURE CONTENT	7
2.1.Electrical Methods	8
2.2.Tensiometers	10
2.3.Neutron method for moisture measurements	12
2.4.Using thermal properties	14
CHAPTER III : CALIBRATION METHOD	15
CHAPTER IV : MOISTURE SENSORS	18
CHAPTER V : EXPERIMENTS AND TESTINGS	21
CHAPTER VI : CONSTRUCTION AND OPERATION OF THE MOISTURE SENSING CIRCUIT	27
6.1.Power supply circuit	28
6.2.Moisture sensing circuit	28
6.2.1.Oscillator circuit	28
6.2.2.Constant current generator	32
6.2.3.Positive peak detector	35
6.2.4.Transistor switch circuit	37
CHAPTER VII : PROTECTION FOR SAFETY	38
CONCLUSIONS	40
APPENDICES	