

CONTENTS

	Page
INTRODUCTION	1
1. REVIEW OF LITERATURE	
1.1. General characteristics of the area of study.....	4
1.1.1. Climatology	4
1.1.2. Geomorphology	6
1.1.3. Geology	8
1.1.4. Hydrology	10
1.2. Water relationships with soil as affected by soil properties	14
1.2.1. Soil moisture	15
A. Soil moisture constants of practical use	15
B. Moisture retained by soils as affected by soil properties	19
1.2.2. Hydraulic conductivity	25
1.2.3. Water infiltration	30
2. MATERIALS AND METHODS	36
2.1. Field work	36
2.2. Laboratory work	38
3. RESULTS AND DISCUSSION	41
3.1. General features and profile description of the studied soils	41
3.1.1. General features of the soils	41
3.1.2. Description of profiles	43
Profile 1	43
Profile 2	45
Profile 3	46

Profile 4	47
Profile 5	48
Profile 6	49
Profile 7	50
3.2. Moisture constants in relation to soil properties	51
3.2.1. Field capacity (FC)	52
I. Properties of significant correlation with FC	69
II. Properties of no significant correlation with FC	73
3.2.2. Wilting point WP	74
I. Properties with significant correlation with WP	75
3.2.3. Available moisture (Available water AW)	77
3.2.4. Comparative evaluation of effects of various soil properties	79
A. Effects on field capacity and wilting point	79
B. Effects on available water	82
3.3. Hydraulic conductivity in relation to soil properties	83
3.4. Infiltration rate in relation to soil properties ..	92
3.5. Moisture retention curves of the soils	103
4. GENERAL DISCUSSION AND GENERAL CONCLUSIONS	117
4.1. Main features of soils	117
4.2. Soil moisture at FC and WP as affected by texture and chemical properties	118
4.3. Soil moisture at FC and WP as affected by soil porosity	120

4.4. Available water AW as affected by soil properties	I 21
4.5. Hydraulic conductivity HC as affected by soil properties	I 23
4.6. Infiltration rate as affected by soil properties	I 24
SUMMARY	I 26
REFERENCES	I 29
APPENDIX	I 39