| | : | FOR | ABLI | E CON | IE PENE | ROMETER | TEST | | | |
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| | : | | | • | | COEFFICII | ENT | a = Q 4 | 1 <u>72 </u> kg/ | GRADUAT |
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| GROUND ELEVAT | ION | m | ARE | A OF C | ONE | :1= 6,95 | cm | VELOCIT PENETR | Y OF ATIONL | Con sec |
| DEPTH | RECORD OF P,R | $\begin{array}{c} qc \\ = \beta dR \\ kg/cm \end{array}$ | DEPTH m | SYIMBOL. | DISCRE - PTION | 0 | | ۹c Ю | 20 | kg∕a 30 a |
| | R | 103 | | | | | <u> </u> | | <i></i> | |
| | 123.0 | 303 | | | | | | | | |
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| 4_6 | 240.0 | 16.45 |] . | | А. | | | | | |
| 2.0 | 2450 | 16.80 | | | | | | | <u> </u> | |
| 2.5 | 289.0 | 12.81 | . | | | | | | | |
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| LOCATIO | N | | | EATHER | FINE | SURVEYED BY | S. T. | AKADA | |
| CAPACITY | OF PROVI | | | | Qkg | COEFFICIENT OF COMPARISON | : <u>α</u> =0. : <u>β</u> =α/ | <u>1422</u> kg, A | |
| GROUND ELEVATI | ON | <i>m</i> | ARE | AOFC | ONE | LA=_6 <u>.75_</u> _m | VELOCI PENETI | ATION. | ′c n I GRADUATION 1.cm∕s∞ |
| DEPTH m | RECORD OF P,R R | $= \begin{array}{c} q c \\ \beta d R \\ k9 / cm \end{array}$ | DEPTH m | SYIMBOL | DISCRE - PTION | 05 | q.е Ю | 20 | kg ∕cni 30 40 50 |
| 0.5 | 57.0 | 3.91 | | | | | | | |
| 1.0 | 105.0 | 7.20 | | | | | | | |
| | 241.0 | 16.52 | | | | | | | |
| 2.0 | 320.0. | 2/,94 | | - | | | | <u> </u> | |
| 2,5 | 3.72.0 | 25.50 | | | | | | | } |
| <u>3.0</u> | 457.0 | 22,83 | - | | | | | | |
| - U.S. | - 73-7.0 | | | | | | | | |
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| PROJEC | RU | <u>АСТVАС</u> ИСОЙ МО : 16 <u>2</u> | CINIL | 10 | Sec. Sec. | | la en sen se | BY <u>5.7</u> | | |
| GROUND | Y OF PROVI | | | | 2kø | | | ON : <u>9</u> =a =0, | 06856 | kg/cst GB |
| DEPTH | RECORD | 0.0 | CEPTI | | DISCRE - | | ·YCTT | (PENE | | kg |
| m | R | $= \beta \cdot R$ k9/cm | 711 | - | FILON | <u>.</u> इ.स.स.स.स. | 5 | ю С. 1 1 1 | ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ | <u> </u> |
| <u></u> | - 89.0- | | - | | | | | | | |
| | 145.0 | 2.94 | - | - | | | | | | |
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| 2.0 | 142,0 | 9.73 | - | - | | | | | | |
| _25 | 180.0 | 12.34 | 1 | | | | | | | |
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| | | | • • • • | and the | | | · 1 0 11 13 | kg/ GRACUATION |
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| GROUND | | <i>m</i> | ARE | AOFC | ONE | A= 6.75 m | VELOCITY VELOCITY PENETRATIO | 6 k9/cm GRADUATIC DF DN_1.cm/s= |
| DEPTH m | RECORO OF P,R R | $= \begin{array}{c} qc \\ = \beta \circ R \\ kg/cm \end{array}$ | OEPTH m | SYIMBOL | DISCRE ~ PTION | 0 5 | ۹e XD | kg ∕ant 20 30 40 50 |
| 0.5 | 49.0 | 3.36 | | | | -12-11-51-51-51-51-51-51-51-51-51-51-51-51- | | |
| | 124.0 | 8,50 | - 1 | | | | | |
| | 181.0 | 12, 41 | 1 | | | | | |
| 2.0 | 1730 | 14,12 | | | | | | |
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| 35 | 281.0 | 19.27 | { | | | | | |
| 3,75 | <u></u> | 2516 | { - | | | | | |
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| OCATIO | N C | ESEDERO | WE | ATHER | FINE | SURVEYED 8 | Y <u>S. TRADA</u> | JORTIS |
| | · · · · | | | • | | COEFFICIENT | $\alpha = 0, 44$ | 22 kg/ GRADUATI |
| CAPACITY | OF PROVI | NG RING | | 100 | kg | COEFFICIENT OF COMPARISON | | JS_kg/c.t. GRADUAT |
| GROUND ELEVATI | ON | m | ARE | A OF C | ONE | : <u>A = 6.45 mi</u> | VFLOCITY | OF [ION_1_cm/_see |
| DEPTH | RECORD | $\begin{array}{c} qc \\ = \beta d R \end{array}$ | сертн | SYIMBOL | DISCRE - | | qc | k9 /cm |
| 771 | R | = 30 k kg/cm | m | STIMOVE | PTION | 0 5 | 0 | 20 <u>30</u> 40 |
| 05 | 53.0 | 3,63 | | 5 | | | | |
| 10 | 185,0 | 12.68 | - | | · | | | |
| 2,0 | 1130 | 7.74 | | | | | r <u> </u> | |
| 2.5 | L(Q,Q | 13,44 | - | .* | | | | |
| <u>3</u> 0 | 245.0 | 16,80 | | | | | | |
| 3.5 | 104.0 | 7.13 | | | | | | |
| 40 | 238.0 | 16.32 | | | | | | / |
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| JUATIO | ∎¶e in te Step in tee | | ¥AC | ser ucti | | SURVEYED BY | | | |
| DACITY | OF PROVI | NG PING | · . | 100 | ko | COEFFICIENT OF COMPARISON | | ÷= ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ | GRADUATION |
| | | NO LININO | | | | OF COMPARISON | | 56 ka/c | GRADUATION |
| ROUND LEVATI | ON | 771 | ARE | A OF C | ONE | A= 6.75 cm | VELOCIT | Y OF | + |
| рертн | RECORD OF P,R | q c = β cl. R kg∕cmi | DEPTH | SYIMBOL | DISCRE - PTION | | ۹ c | | kg /cm |
| 111 | R | | m | <u> </u> | | 0 5 | ю | 20 | 30 40 EC |
| 0,3 | JZ.O | 2,50 | | | | | | | |
| 10 | 75.0 | 3,98 | - | | | | | | |
| 2.0 | 55.0 64.0 | 4,38 | . | | , | | | | |
| 25 | 89.0 | 6.10 | i - | | | | | | |
| <u>3.0</u> | 92.0 | 6.31 | | | | | | | |
| 3.5 | 118.0 | 3.09 | | | | | | | |
| 4.0 | _164.0 | 11.24 | · – | | | | | | A |
| 4.5 | 213.0 | 14.60 | | | | | | | |
| 50 | 209.0 | 14,33 | - | | | | | <u> </u> | |
| 5.5 6.0 | 229.0 | | 1 | | | | | 21 | |
| 65 | 229.0 | 15,70 | 1 . | 1 | | | | 1- | |
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| 75 | 373.0 | 25.57 | ł | | | | | <u> </u> | |
| 8.0 | 288.0 | <u>.9.75</u> | - | | | | | | |
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| OCATIO | N Se | the generation | W8 | ATHER | FINE | ś | URVEYED | BY | AKADA | · ··· · · · · · · · · · · · · · · · · |
| | | · | | 1 | | 000 | TOCHT | : <u>a</u> == a | 2 <i>44.23</i> k | 9/ GRADUATI |
| | OF PROVI | NG RING | | | skg | OF | OMPARIS | $ON : \underline{p} = a$ | 1 | |
| ROUND | ION | · . | ARF. | AOF C | ONE | A= | 6.45 cm | VELO | CITY OF | 9/cm GRADUAT |
| | RECORD | ae | ССРТН | | DISCRE - | | | | | kg /crit |
| OEPTH | OF P.R | $= \beta d R$ kg/cm | | SYIMBOL. | PTION | | 5 | эР Ю | 20 | 1. 1. 1. 1. A. |
| <u></u> | R I id D | | | | | | | | ۲۵۰۰ میں ۱۹۹۰ - ۲۹۹۰ میں | |
| 05 | 14,0 | <u> </u> | 100 | | PEAT | | | | | |
| 1.0 | 25.0 | 3,02 | 1 10 | | <u> </u> | | | | | |
| 2.0 | 63.0 | 9.32 | 1 | | | | | | | |
| 2.5 | 25.0 | 1.7/ | 1 | | soft clauf | | | | | |
| 3,0 | 103.0 | 7,06 | 2.20 | | seg clar | | | | | |
| 35 | 152,0 | 10,42 | - | | | | | | | |
| 4.0 | 142,0 | 9.74_ | | | | | | | | |
| 45 | 128,0 | 12.20 | 1. | | | | | | | |
| 50 | 182,0 | 12,48 | | | • | | | | | |
| ک،ک | 232.0 | | | | | | | | | |
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| 6,5_ | 1_128.0_ | 10,83 | | | | | | | <,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, | |
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| 7.5 | 3310 | 25.92 22.69 | · . | | | | | | | <u>}</u> |
| 8.5 | \$15,0 | 28.45 | 850 | | 30H Clay | | | | | |
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| 2.0 | 267.0 | 18.31 | | | | | | 2 |
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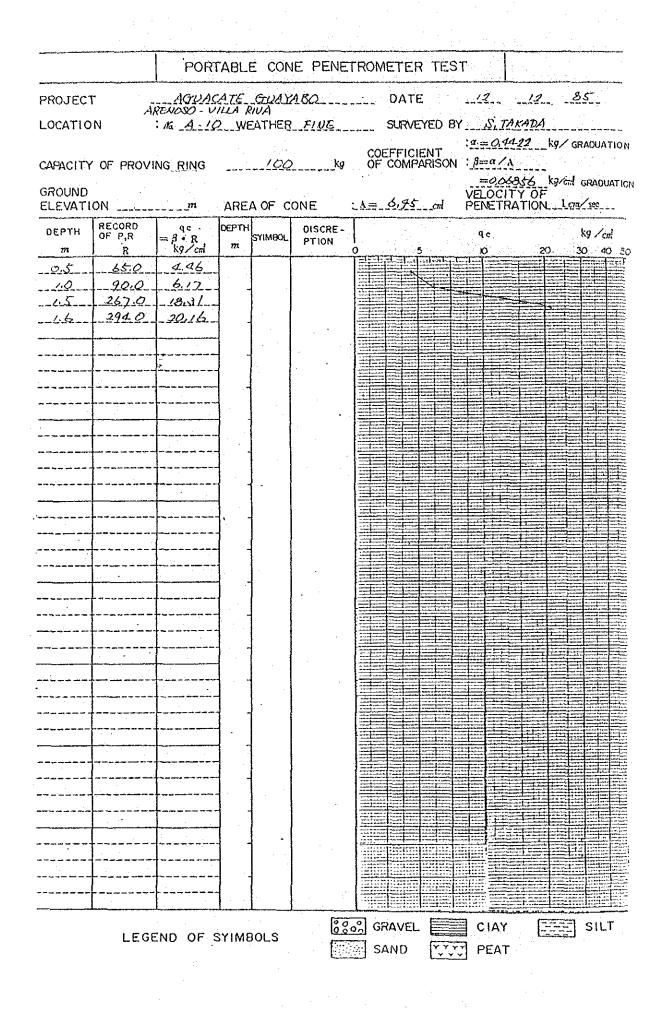
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ANNEX D: SOIL

1. Introduction

Reclamation of the waste lands for increasing agricultural production under the systematic supply of irrigation water would be a prerequisite for successful growth and development of farm economy in the local region. The study area of Aguacate-Guayabo has been selected to be urgently studied in AGLIPO Development Program following the El Pozo Project.

The soil survey in relation with its geological and topographical features presents scientific information useful for making the reasonable and necessary land development.

Objectives of the soil survey undertaken by the Study Team are:

- to conduct soil profile observation for checking/confirming the results of the former soil survey;
- 2) to survey the availability of the peat lands which will be expanded under the drainage system; and
- 3) to investigate suitability and problems of soil and water quality for improving agricultural management aimed at increasing farm production.

The survey was carried out in two phases: Phase I, from August to September 1985, and Phase II in December 1985, in cooperation with the Dominican Institutions and Counterparts.

D-1

2. Geography and Land Use

2.1 General

The study area is located at the northeast of the country, bordering on El Pozo area on the northwest. The area is bounded by the Escocesa Bay and Loma la Cordillera on the north to northeast, by the Samana Bay on the east, by the Yuna River on the south, and by Loma Remanente de Yabacoa on the southwest. Its total area is 24,100 ha, lying between 69°37' and 53' in West Longitude and 19°09' and 16' in North Latitude.

Topographical maps scaled at 1:25,000 were used for the field survey, and the results were checked by the new maps scaled at 1:10,000 which were provided by JICA.

2.2 Topography and Geology

A greater part of the area is mostly flat flood plain formed by the Yuna River. Although slightly undulating at some parts, the plain slopes very gently towards northern and eastern coasts, in elevation from 10 m to 1 m above sea level.

The lands are largely composed of three distinct physiographic forms namely:

- 1) Alluvial plain and delta area
- 2) Natural levee and coastal terrace area
- 3) Marsh and peat area

The natural levees developed along Yuna River and Caño Gran Estero have been used for upland crops cultivation as well as residential district. The alluvial materials transported are mainly clayey in texture, and silty or sandy in limited area of river levee and sea coast.

Mash and peat areas occupy more than half of the area. The peats, of which decomposition grade vary from fibrous to sapric status cover the clayey lagoonal ground formerly built up behind the coastal dunes. Two groups of peat land are found in Aguacate and Guayabo; the former stretches from south to northern sea coast, depth of peat layer often reaching 5 to 10 m nearby the under-surveyed dam site area; the latter prevails on most of Guayabo area towards the Samana Bay, bearing swampy forests in many places.

Areas in higher elevation more than 10 m are divided into two groups; namely, Cordillera piedmonts in the northeast, and Yabacoa remnant hills, in elevation up to 80 m in the area. Fig. D.2.1 is a partial geological map taken from ATLAS Geologico y Mineralogico de 1a Republica Dominicana (1969). It illustrates that the former consists of limestones of tertiary miocene, with karstic topography, while the latter, of limestones and conglomerate of tertiary miocene and oligocene. Detailed descriptions of the geological feature are referred to ANNEX C.

2.3 Vegetations and Land Use

Dominant wild grasses and trees are listed in Tables D.2.1 and D.2.2 in terms of taxinomy and growing place. Most characteristic plants in the area are: Jabilla of levee and delta where cacao and plantain are planted; Dragales and Canutillo growing in peat lands; and groups of mangroves thriving on the coastal terrace. Guayabo is also a representative shrub almost all over Guayabo area.

Paddy rice is the most popular crop on the alluvial plain and delta areas and even planted in the lowlying peat lands where peat layer is shallower than 50 cm. Coconut palms are grown everywhere in the area especially concentrated on the piedomont and monadnock areas. Very few areas are cultivated with upland crops such as maize and peanut, occupying only 2 percent of the whole area. The only crop cultivable on the deep peat lands is Pipiota, Alocasia species. Its tubers of good quality are being exported as well as Yautia which is grown on well-drained sloping lands.

D-3

Details of the present land use are referred in ANNEX F. The peat lands are difficult to be reclaimed for agricultural use even with highest investment. Although partially used as wild pasture at present, these lands whould be preferably left untouched, including swamp and mangrove forests from the viewpoints of natural conservation. This problem is discussed in the latter chapter. TABLE D.2.1 LIST OF POPULAR WILD GRASSES PREVAILING IN THE STUDY AREA

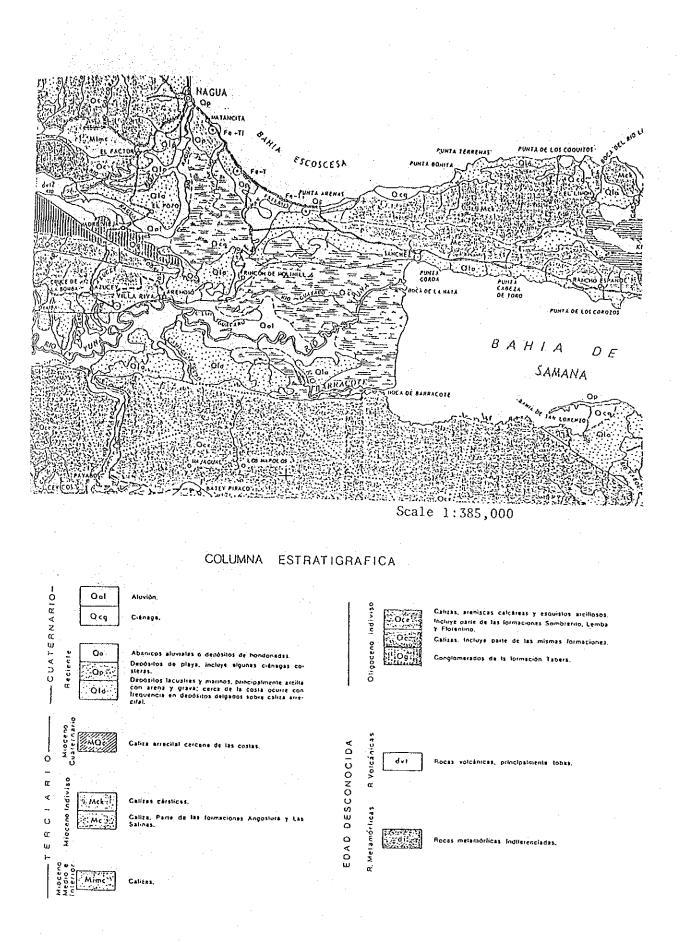
| No. | Local Name | Family | Genus-Species | Growing Area |
|-------|------------------|---------------|--------------------------|----------------------|
| 1 | Canutillo | Gramineae | Hymenachne amplexicaulis | Peat land |
| 2 | Pie Gallo | " | Chloris radiata | Terrace and delta |
| 3 | Pangola | u | Digitaria decumbens | 11 |
| 4 | Yerba de Guinea | 11 | Panicum maximum | ш |
| 5 | Yerba Páez | | " tenérum | 11 |
| - 6 | Papaó Arrocillo | | Themeda quadrivalvis | |
| 7 | Saladillo | 1) | Paspalum distachyon | 11 |
| 8 | Pajón | н | Saugetia fasciculata | 11 |
| ÷ 9 · | Grama | 11 | Echinochloa colonam | 17 |
| 10 | Yaraguá | 17 | Melinis minutiflora | Monadnock |
| 11 | Corta-Corta | Cyperaceae | Cyperus sp. | Terrace and delta |
| 12 | Lambera | 91 | Scleria secans | н . |
| 13 | Junquillo | ii - | Eleocharis interstincta | Delta and Marsh |
| 14 | Pelo de Mico | 11 | Rhynchelytrum repens | Terrace and delta |
| 15 | Enea | Typhaceae | Typha domingensis | Marsh |
| 16 | Yautia Cimarron | Araceae | Alocasia sp. | Terrace and delta |
| 17 | Suelda Consuelda | Commelinaceae | Commelina erecta | Plain and delt |
| 18 | Molinillo | Labiatae | Leonotis nepetifolia | 57 |
| 19 | Yerba Amarga | Compositaceae | Piqueria Trinervia | 11 |
| 20 | Rompe Saraguey | . 11 | Eupaforium odoratum | 11 |
| 21 | Salvia | 23 | Pluchea purpuracens | TP |
| 22 | Pringamosa | Euphorbiaceae | Tragia volabilis | 17 |
| 23 | Moriru Bibil | Leguminosae | Mimosa pudica | Terrace and delta |
| 24 | Berro | Cruciferae | Nasturtium officinale | Plain and mars |
| 25 | Platanito | Amaranthaceae | Philoxerus vermicularis | u |

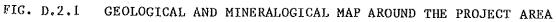
D-5

TABLE D.2.2 LIST OF POPULAR WILD ARBORS AND SHRUBS PREVAILING IN THE STUDY AREA

| | | PREVAILING IN THE STODY ANDA | | | |
|-----|-----------------|------------------------------|-------------------------|------------------------|--|
| | | | | | |
| No. | Local Name | Family | Genus-Species | Growing Area | |
| 1 | Dragales | Leguminosae | Pterocarpus officinalis | Marsh and peat area | |
| 2 | Tamarindo | n | Tamarindus indica | Plain and marsh | |
| 3 | Guamas | u | Inga vera | 11 | |
| 4 | Piñon cubano | . 0 | Gliricidia sepium | u . | |
| 5 | Guayabo | Myrtaceae | Psidium guajava | Terrace and delta | |
| 6 | Guaráno | Sapindaceae | Cupaina americana | *1 | |
| 7 | Mangles prieto | Rhizophoraceae | Conocarpus erectus | Coastal terrace | |
| 8 | 21 | n | Leguncularia racemosa | ti . | |
| 9 | Mangles colorao | 11 | Phizophora mangle | 11 | |
| 10 | н | | Garrya fadyenii | n | |
| 11 | Amapola | Bignoniaceae | Spathodea companulata | Terrace and plain | |
| 12 | Jobo | Anacardiaceae | Spondias mombin | n. It | |
| 13 | Mara | Guttiferae | Calophylum calaba | 11 | |
| 14 | Almendra | Combretaceae | Terminalia catappa | n | |
| 15 | Jaquey | Moraceae | Ficus aurea | 11 | |
| 16 | Hojancha | Polygonaceae | Coccoloba pubecens | 11 | |
| 17 | Behuco | Vitaceae | Masechites repens | | |
| 18 | Behuco caro | II . | Cíccus sicyoides | . I 3 | |
| 19 | Jobilla | Euphorbiaceae | Hura crepitans | Levee and delta | |

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3. Soil Suvery

3.1 General

The study area was already surveyed together with El Pozo Area by FAO and Dominican staff. The survey report was published in 1976 with the map of soil series scaled at 1:50,000. As aforementioned, the present survey has attempted to check the soil map with the intention of concentrated study of peat soil. However, the survey has not been carried out as planned due to the following reasons:

- Marsh and peat area were less accessible than expected under the unsettled weather with frequent heavy showers, causing flood and traffic troubles.
- 2) To complete soil map of the study area, not a few days has to be spent for surveying the piedmont and monadnock areas which were excluded in the FAO Report.

Consequently, within the limited survey period, soil profile observation has been focused upon the development feasible areas including peat lands which are expected to present the informations useful for land suitability classification, too.

3.2 Soil Profile Observation

Pit sites were selected on every typical land group topographically identified. In both survey periods most of the paddy fields were transplanted or being prepared for the next crop. On such fields the boring technique was used for observation and sampling similarly as peat lands occasionally inundated.

Soil profiles observed totalled 94 through the two phases (I and II), resulting in a semi-detailed reconnaissance survey density, around one pit per 250 ha.

pit site distribution was topographically as follows:

| 1) | Marsh peat soil area | 19 sites |
|----|------------------------------|----------|
| 2) | Wetland peaty soil area | 13 sites |
| 3) | Plain and delta soil area | 42 sites |
| 4) | Piedomont and monadnock area | 20 sites |
| | Total | 94 sites |
| | | |

Their locations are given in Tables D.3.1 and D.3.2, and Fig. D.3.1.

Outlines of the survey method are described below:

(1) Pit

The pits were dug up to a depth of 80 to 120 cm from the surface with a width of 100 cm. To observe further the lower layers of the pit, boring was tried using a common posthole type auger.

(2) Soil Hardness Test

Field test was conducted to determine soil hardness. A tester, a kind of cone penetrometer to measure soil compactness, was used since it is handy and portable for the field survey. Compactness of the soil layer is of much importance to determine workability of a land for potentiality classification as well as to distinguish genetic differences in the soil classification process.

Values resulting from the use of the soil hardness tester are categorized as follows:

CRITERIA OF SOIL HARDNESS EVALUATION

| Hardness Category | Tester Index* (mm) | Resistance (kg/cm) | Easiness in Tillage Work |
|----------------------|-----------------------|------------------------|-----------------------------|
| Soft | 8 | 0.98 | Very easy |
| Slightly Hard | 8 - 12 | 0.98 - 1.93 | Easy |
| Hard | 12 - 17 | 1.93 - 4.04 | Slightly difficult |
| Very Hard | 17 - 23 | 4.04 ~ 10.0 | Difficult |
| Extremely Hard | 23 | 10.0 | Very difficult |

* Dr. Yamanaka's Soil Hardness Tester. Index (mm) is a reading of the cone when it penetrates into the solum.

(3) Chemical Tests

Quick chemical reagent tests were tried with every soil profile. These are:

- a. Dilute hydrochloric acid solution (10%) for detecting carbonates (effervescence),
- Benzidin (pp'-diamino-diphenyl salt) solution (one percent in
 10 percent acetic acid solution) for detecting active manganese
 (dark blue color development), and
- c. αα'-dipyridyl solution (0.05 percent in 10 percent acetic acid solution) for detecting ferrous iron (Fe++)(pink-red color development).

The soil profile description followed the method defined in the FAO Guidelines for Soil Profile Description which are now of wider use in the world.

3.3 Sampling and Analysis

3.3.1 Sampling and Field Analysis

Soil horizons of the typical profile were sampled and air-dried. Fine soil samples were then prepared through a 2 mm sieve, when content of gravels (>2 mm) was measured.

As noted in Tables D.3.1 and D.3.2, 132 samples of the fine soil through two phases were analyzed for pH and electrical conductivity (EC) by means of portable electrode meters.

In the course of the soil survey, 67 water samples from various sources were also collected and analyzed similarly as the soil samples. These results are given in Tables D.3.3, D.3.4, D.3.5 and D.3.6, for survey stage (I) and (II), respectively.

3.3.2 Laboratory Analysis

Out of 132 soil samples, the 66 samples (fine soil) were subjected to further physical and chemical analysis at Soil Laboratory of INDHRI. The data are presented in Tables D.3.7, D.3.8, D.3.9 and D.3.10.

| | | • | | | | • | | ÷., | | | | • | | .* | ÷ | • | | · | | ·· . |
|---------------------------|-----------------------|-----------------------|----------------------------|---------------------|----------------|---------------|----------------------------|-------------------|---------------------|------------------------|---------------------|---------------------|---------------|----------------------|----------------|--------------|------------------|---------------|--------------------|-----------|
| mp1e Sum | 4 | œ | 12 | | | · . | 15 | 18 | 21 | • | | | 23 | 26 | | 29 | | 32 | 35 | |
| Soil Sample Number Su | 4 | 4** | 4** | t | 1 | I | 3** | °** | 3** | i I I | | ì | 7 | 0.** ₩ | 1 | ** * | i. Î | 0** \$ | m | ł |
| | | . * | | . * | | * | | | • | | *0 | | ~ | <u> </u> | | | .+ | | | 10 |
| Groundwater Level (cm) | 105 | *0 | 113 | 0 | 0 | * | >100 | >100 | 75 | 34 | | 33 | 28 | U | 46 | 70 | 74 | >200 | 40 | |
| Land Use | Gr (Co) | Gr-Tu | Ar (Prep.) | Gr-Tu (Pi) | Gr-Tu | Ar-Tu | Са | Ca | Gr | Ar | Ar | Gr | Gr-Tu (Ar) | Gr-Tu | Gr-Tu | Gr-Tu | Gr-Tu | Co | Ar (Gr) | Gr |
| Elevation (m) | 1.8 | 2.2 | 1.5 | 1.8 | 2.4 | 2.6 | 2.5 | 5.0 | 3.8 | 2.5 | 3.8 | 4.2 | 1.5 | 1.3 | 2.8 | 1.5 | 2.8 | 25.0 | 2.7 | 5.0 |
| Location | Los Naranjos, El Poso | Cruce Rincón, Sanchez | Ríncón Molinillo, Aguacate | El Catey I, Sanchez | El Catey II, " | La Majagua, " | San Rafael, R.M., Aguacate | San Rafael, " , " | Rincón Molinillo, " | Madrid Sector, Guayabo | El Jobo I, Aguacate | El Jobo II, Guayabo | Milla Seis, " | Milla Cinco, Sanchez | Milla Cinco, " | Los Mango, " | Bucham Javiel, " | La Majagua, " | El Pelao, Aguacate | La Mat, " |
| Pit No. | | 7 | ო | 4 | ١O. | Q | 2 | ω | 6 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |

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TABLE D.3.1 LIST OF SOIL PIT SITES AND SAMPLING (I) (1)

| | | | | | | | ion Land Use | |
|---|---|--|--|--|--|--|---|--|
| Gr >100 | Ģr | | Gr | 6.3 Gr | 6.3 Gr | Aguacate 6.3 Gr | Vieja II., Aguacate 6.3 Gr | Vieja II., Aguacate 6.3 Gr |
| Gr 20* | Gr | | Gr | 6.4 Gr | 6.4 Gr | " 6.4 Gr | de Yuna I., " 6.4 Gr | de Yuna I., " 6.4 Gr |
| Gr (Ar) 30 | Gr (Ar) | | Gr (Ar) | Gr (Ar) | " 6.0 Gr (Ar) | Gr (Ar) | " II., " 6.0 Gr (Ar) | II., " 6.0 Gr (Ar) |
| Ar 23 | Ar | | Ar | Ar | Ar | Ar | Coles," 6.0 Ar | 11 6.0 Ar |
| Gr 42 | Gr | | Gr | 6.4 Gr | abo 6.4 Gr | abo 6.4 Gr | abo 6.4 Gr | 6.4 Gr |
| Ar +15 | Ar | | Ar | Ar | " I.4 AT | B), " I.4 Ar | B), " I.4 Ar | " I.4 AT |
| Gr (Ar) 46 | Gr (Ar) | | Gr (Ar) | Gr (Ar) | Gr (Ar) | 2.4 Gr (Ar) | " 2.4 Gr (Ar) | 2.4 Gr (Ar) |
| Ba (Ca, Pi) 115* | Ba (Ca, Pi) | Pi) | Ba (Ca, Pi) | Ba (Ca, Pi) | Ba (Ca, Pi) | Ba (Ca, Pi) | Carreras, " 4.5 Ba (Ca, Pi) | " 4.5 Ba (Ca, Pi) |
| Gr-Tu 65 | Gr-Tu | Gr-Tu | Gr-Tu | Gr-Tu | Gr-Tu | 8.0 Gr-Tu | 8.0 Gr-Tu | 8.0 Gr-Tu |
| Gr-Tu 19 | Gr-Tu | | Gr-Tu | Gr-Tu | Gr-Tu | 3.8 Gr-Tu | " 3.8 Gr-Tu | 3.8 Gr-Tu |
| Gr (Ar) 32 | Gr (Ar) | | Gr (Ar) | Gr (Ar) | 1.4 Gr (Ar) | 1.4 Gr (Ar) | Guayabo, Guayabo 1.4 Gr (Ar) | 1.4 Gr (Ar) |
| Ar +10 | Ar | | Ar | Ar | Ar | Ar | Ar | Ar |
| Ar +5 | Ar | | Ar | Ar | Ar | Ar | " 2.4 Ar | Ar |
| Ar-Tu 74 | Ar-Tu | Ar-Tu | Ar-Tu | Ar-Tu | Δ τ | { - - | | |
| | | DT | | | | | $D \sim 1 \sim A \sim 1 \sim 2 \sim 2 \sim 2 \sim 1 \sim 1 \sim 1 \sim 1 \sim 1 \sim 1$ | |
| | - | | | | 5 | 4.8 Ar-lu | Pelao, Aguacate 4.8 Ar-Tu | uacate 4.8 Ar-Iu |
| | | | | | 5 | 4.8 Ar-lu | Pelao, Aguacate 4.8 Ar-Tu | Pelao, Aguacate 4.8 Ar-lu |
| Gr >100 | Gr | | Gr | Gr Gr | Gr | 4.8 Ar-lu 6.2 Gr | Pelao, Aguacate 4.8 Ar-Tu to. Abaio. " 6.2 Gr | Pelao, Aguacate 4.8 Ar-lu to. Abaio. " 6.2 Gr |
| - | Ar-Tu | Ar-lu | Ar-lu | Ar-lu | ∆ ** | | | |
| ਰ ਜ | Ba (Ca, Fl) Gr-Tu Gr (Ar) Ar Ar Ar-Tu Ar-Tu | Ba (Ca, Fl) Gr-Tu Gr (Ar) Ar Ar-Tu Ar-Tu | ba (ca, fl) Gr-Tu Gr (Ar) Ar Ar Ar-Tu | ba (ca, fl) Gr-Tu Gr (Ar) Ar Ar Ar-Tu | 4.5 Ba (Ca, Fl) 8.0 Gr-Tu 3.8 Gr-Tu 1.4 Gr (Ar) 1.4 Ar 2.4 Ar 2.4 Ar | 4.5 Ba (Ca, Fl) 8.0 Gr-Tu 3.8 Gr-Tu 1.4 Gr (Ar) 1.4 Ar 2.4 Ar | Carreras, " 4.5 Ba (Ca, Fl) oso, Aguacate 8.0 Gr-Tu Haitises, " 3.8 Gr-Tu uayabo, Guayabo 1.4 Gr (Ar) " , " 1.4 Ar Cacaos, " 2.4 Ar | Carreras, " 4.5 Ba (Ca, Fl) oso, Aguacate 8.0 Gr-Tu Haitises, " 3.8 Gr-Tu uayabo, Guayabo 1.4 Gr (Ar) " , " 1.4 Ar Cacaos, " 2.4 Ar |
| \sim | Ar Gr Ar Gr (Ar) Gr (Ar) Gr-Tu Gr (Ar) Ar Ar Ar | Ar Gr Gr (Ar) Gr (Ar) Ba (Ca, Gr-Tu Gr (Ar) Ar Ar Ar | Ar Gr Ar Gr (Ar) Gr (Ar) Gr-Tu Gr (Ar) Ar Ar | 6.0 Ar 6.4 Gr 6.4 Gr 1.4 Ar 2.4 Gr (Ar) 4.5 Ba (Ca, 4.5 Ba (Ca, 3.8 Gr-Tu 3.8 Gr-Tu 1.4 Gr (Ar) 1.4 Ar 4.8 Ar-Tu | <pre>abo 6.0 Ar Gr abo 6.4 Gr Gr Ar 1.4 Ar Ar Ar Ar Ar Ar Ar Ar Ar Ar Ar Ar Ar</pre> | <pre>6.0 Ar abo 6.4 Gr 1.4 Ar 2.4 Gr (Ar) 2.4 Gr (Ar) 4.5 Ba (Ca, 8.0 Gr-Tu 3.8 Gr-Tu 1.4 Gr (Ar) 1.4 Ar 2.4 Ar</pre> | Coles," 6.0 Ar Coles Abajo, Guayabo 6.4 Gr uayabo (Zona B)," 1.4 Ar on Grande," 2.4 Gr (Ar) on Grande," 2.4 Gr (Ar) Carreras, " 4.5 Ba (Ca, oso, Aguacate 8.0 Gr-Tu Haitises," 3.8 Gr-Tu uayabo, Guayabo 1.4 Gr (Ar) " , " 1.4 Ar Cacaos, " 2.4 Ar | Coles," 6.0 Ar Coles Abajo, Guayabo 6.4 Gr uayabo (Zona B)," 1.4 Ar on Grande," 2.4 Gr (Ar) on Grande," 2.4 Gr (Ar) Carreras," 4.5 Ba (Ca, oso, Aguacate 8.0 Gr-Tu Haitises," 3.8 Gr-Tu uayabo, Guayabo 1.4 Gr (Ar) " , " 1.4 Ar Cacaos, " 2.4 Ar |
| | Gr (Ar) Ar Gr Gr (Ar) Gr (Ar) Ba (Ca, Gr-Tu Gr-Tu Gr (Ar) Ar Ar Ar | Gr (Ar) Ar Gr Gr (Ar) Gr (Ar) Ba (Ca, Gr-Tu Gr-Tu Gr (Ar) Ar Ar | Gr (Ar) Ar Gr (Ar) Gr (Ar) Gr (Ar) Gr-Tu Gr-Tu Ar-Tu Ar-Tu | 6.0 Gr (Ar) 6.0 Gr (Ar) 6.4 Gr 6.4 Gr (Ar) 2.4 Gr (Ar) 4.5 Ba (Ca, 4.5 Ba (Ca, 3.8 Gr-Tu 3.8 Gr-Tu 1.4 Gr (Ar) 1.4 Ar 2.4 Ar | " 6.0 Gr (Ar) 6.0 Ar Ar 6.0 Ar Gr (Ar) 1.4 Ar Ar 2.4 Gr (Ar) 4.5 Ba (Ca, 8.0 Gr-Tu 1.4 Gr (Ar) 1.4 Ar 2.4 Ar Ar-T' | " 6.0 Gr (Ar) 6.0 Ar 6.0 Ar 6.4 Gr (Ar) 1.4 Ar 2.4 Gr (Ar) 4.5 Ba (Ca, 8.0 Gr-Tu 1.4 Ar 1.4 Ar 2.4 Ar 2.4 Ar | aya " II., " 6.0 Gr (Ar) Coles, " 6.0 Ar Coles Abajo, Guayabo 6.4 Gr Uayabo (Zona B), " 1.4 Ar uayabo (Zona B), " 2.4 Gr (Ar) on Grande, " 2.4 Gr (Ar) on Grande, " 2.4 Gr (Ar) on Grande, " 3.8 Gr-Tu uayabo, Guayabo 3.8 Gr-Tu uayabo, Guayabo 1.4 Ar carreras, " 3.8 Gr-Tu uayabo, Guayabo 1.4 Ar uayabo, Guayabo 1.4 Ar oso, Aguacate 2.4 Ar Growso, Manacate 2.4 Ar Cacaos, " 2.4 Ar | aya "II., " 6.0 Gr (Ar) Coles, " 6.0 Gr (Ar) Coles Abajo, Guayabo 6.4 Gr Coles Abajo, Guayabo 6.4 Gr (Ar) uayabo (Zona B), " 2.4 Gr (Ar) on Grande, " 2.4 Gr (Ar) Carreras, " 4.5 Ba (Ca, 0so, Aguacate 8.0 Gr-Tu Haitises, " 3.8 Gr-Tu uayabo, Guayabo 1.4 Gr (Ar) " , " 2.4 Ar Cacaos, " 2.4 Ar |
| Gr (Ar) Gr (Ar) Gr (Ar) Gr (Ar) Gr (Ar) Ba (Ca, Gr-Tu Gr (Ar) Ar Ar Ar-Tu | | | | со о т с 4 с о о о о 4 о о т с 4 с о о о о 4 о о т 4 4 с о о 4 4 с 0 4 о о 4 4 4 с 0 о 4 4 4 с | abo 6.4 6.0 7.4 7.4 8.0 7.4 7.4 7.4 7.4 7.4 7.4 7.4 7.4 7.4 7.4 | abo 6.4 6.0 7.4 7.4 7.4 7.4 7.4 7.4 7.4 7.4 7.4 7.4 | aya de Yuna I., " 6.4 aya " II., " 6.0 coles, " 6.0 Coles Abajo, Guayabo 6.4 Coles Abajo, Guayabo 6.4 uayabo (Zona B), " 1.4 uayabo (Zona B), " 2.4 on Grande, " 2.4 carreras, " 8.0 Haitises, " 3.8 uayabo, Guayabo 1.4 Carreras, " 2.4 coso, Aguacate 8.0 Haitises, " 3.8 uayabo, Guayabo 1.4 oso, Aguacate 2.4 Carcaos, " 2.4 | aya de Yuna I., " 6.4 aya " II., " 6.0 Coles Abajo, Guayabo 6.4 Uayabo (Zona B), " 6.0 Carreras, " 2.4 on Grande, " 2.4 Carreras, " 4.5 oso, Aguacate 8.0 Haitises, " 3.8 uayabo, Guayabo 1.4 " 2.4 Cacaos, " 2.4 |
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| | ω 4 0 0 4 4 4 0 0 8 4 4 4 8 | 4 7 1 1 9 8 7 7 1 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 | 4 2 1 1 1 3 8 4 2 1 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 | | aacaate abo | uacate abo | ega Vieja II., Aguacate aya de Yuna I., " aya " II., " coles, " Coles Abajo, Guayabo uayabo (Zona B), " on Grande, " on Grande, " carreras, " oso, Aguacate Haitises, " uayabo, Guayabo " , " Cacaos, " | ega Vieja II., Aguacate aya de Yuna I., " aya " II., " coles, " Coles Abajo, Guayabo uayabo (Zona B), " on Grande, " on Grande, " carreras, " carreras, " uayabo, Guayabo " , " Cacaos, " Cacaos, " |
| abo = = te | ja II., Aguacate Yuna I., " " II., " hajo, Guayabo (Zona B), " ide, " is, " Guayabo " Guayabo | ja II., Aguacate Yuna I., " " II., " " " II., " " bajo, Guayabo (Zona B), " ide, " is, " ;uacate ;uacate guayabo Guayabo | ja II., Agua Yuna I., " " II., " " II., " " " II., " " (Zona B), " de, " " (Zona B), " is, " ;uacate ;uacate guayabo " " | ja II., Yuna I., " II. " II. " II. " II. (Zona B) (Zona C) (Zona B) (Zona C) (Zona C) (Zona C) (Zona C) (Zona C) (Zona C | Tuna T Son (Zon Guaca Guaca | | Raye Raye Col Guay Col Guay Guay Guay Car | Cienege La Raye La Raye Las Col Las Col Las Col Las Cal Las Cal Los Haj El Guay El Guay Los Cac |
| acate abo | Vieja II., Aguacate de Yuna I., " " II., " es, " es Abajo, Guayabo es Abajo, Guayabo dabo (Zona B), " Grande, " b, Aguacate trises, " trises, " trises, " tabo, Guayabo | Vieja II., Aguacate de Yuna I., " " II., " es, " es Abajo, Guayabo de (Zona B), " Grande, " reras, " reras, " reras, " reras, " rese, " abo, Guayabo | Vieja II., Agua de Yuna I., " " II., " es, " II., " es Abajo, Guayab es Abajo, Guayab es Abajo, Guayab "reras, " reras, " reras, " trises, " trises, " trises, " | Vieja II., de Yuna I., es, " II. es, " es, " es Abajo, Gu es Abajo, Gu es Abajo, Gu es Abajo, Gu teras, " reras, " reras, " reises, " rabo, Guayabo | Vieja I de Yuna " " es, " es Abajo es Abajo Grande, reras, " teras, " trises, " trises, " rabo, Gua | Vie de es, es, ces, feran tera tera tabo, fabo, tas, | | Сіе Г. Г. С. |

TABLE D.3.1 LIST OF SOIL PIT SITES AND SAMPLING (1) (2).

TABLE D.3.1 LIST OF SOIL PIT SITES AND SAMPLING (I) (3)

| Pit No. | Ľ. | Location | Elevation (m) | Land Use | Groundwater Level (cm) | Soil Sample Number Sum | mple Sum |
|------------|-------------------|---|-------------------------|----------------------------------|-----------------------------------|---------------------------|-------------|
| 43 | El Catey, Sanchez | Inchez | 18 | Co | >200 | 1 | |
| 44 | La Lometa de | La Lometa de Rincón, Aguacate | 2.5 | Ba (Ca) | >150 | I | |
| 45 | Caño Cuba Libre, | lbre, Aguacate | 0.4 | Gr | 30 | ļ | |
| 46 | El Catey, Sanches | inches | 17 | Ф Ч | , 83 , | 0,* <i>*</i> | 65 |
| 47 | Cruce Pescadero, | lero, El Pozo | 1.6 | Ca (Co, Ba) | >130 | ო | 68 |
| Note | Note: Land Use: | Ar - rice; Ba-banana, platano; Ca - cacao; Co - Coconut; Ga - guayabo; Gr - grassland; Ma - mango; Mg - mangrove; Pe - peanut; Pi - pipiota; | , platano; mango; Mg | Ca - cacao; Co - mangrove; Pe | - Coconut; Ga - - peanut; Pi - | guayabo; pipiota; | |

Tu - peat land; Ya - Yautia

Groundwater: + marks the depth of surface water.

* Not sampled

** Subjected to the laboratory analysis.

| Pit Location No. | Elevation (m) | Land Use | Groundwater Level (cm) | Soil Sample Number Su | Sum |
|-------------------------------|------------------|----------|---------------------------|--------------------------|-----|
| 48 La Lometa Rincón, Aguacate | 6.4 | Co | >200 | 5 | 5 |
| 49 " " | 8.0 | Co-Gr | 001< | 1 | |
| 50 El Catey, Sanchez | 17.0 | Co (Ga) | >100 | 4 | 9 |
| 51 La Majagua, " | 30.0 | Co (Ma) | >200 | . · • | |
| 52 Los Mangos, " | 26.0 | Ya-Co | >200 | 4 | IO |
| 53 Agua Buena, " | 40.0 | Со-Үа | >200 | ŝ | 13 |
| 54 AC-101 (Sector), Aguacate | 1.8 | Gr (Ar) | 57 | I | |
| 55 El Pelao, " | 4.6 | Ar-Tu | 10 | **7 | 17 |
| 56 Los Haitises, " | 22.0 | Gr | >200 | 2 | 6T |
| 57 Aguacate, " | 7.4 | Gr-Tu | 65 | 4** | 23 |
| 58 Arenoso, Arenoso | 28.0 | Gт | >150 | I | |
| 59 AC-2 (Sector), Aguacate | 4.0 | Ar (Gr) | 54* | I | |
| 60 Aguacate, " | 6.6 | Ar | 60* | I | |
| 61 La Curva, Arenoso | 8.3 | Gr | 120 | I. | |
| 62 Arenoso, " | 15.0 | Gr | >200 | 'n | 28 |
| 63 Yabacoa, " | 30.0 | Gr | >200 | **4 | 32 |
| 64 Los Platanijos, Arenoso | 8.0 | Gr | >180 | ı | |
| 65 La Raya, " | 6.4 | Ar | 50* | ł | |
| 66 Las Coles, Arenoso | 4.6 | Gr | 50 | Ţ | 32 |
| 67 Cruce La Cabirma, Guayabo | 6.6 | Gr (Ar) | 80* | **7 | 36 |
| 68 La Garza. " | 5 7 | Δ. | C S | | |

TABLE D.3.2 LIST OF SOIL PIT SITES AND SAMPLING (II) (2)

| Pit No. | Location | Elevation (m) | Land Use | Groundwater Level (cm) | Soil Sa Number | Sample Sum |
|------------|----------------------------|------------------|----------|---------------------------|-------------------|---------------|
| 69 | Los Cacaos, Guayabo | 6.6 | Ar (Gr) | 67 | . 1 | |
| 70 | Las Carreras, " | 4.4 | Gr (Ar) | 120 | 1 | |
| 11 | El Guayabo, " | 3°8 | Ва | >150 | 4 | 40 |
| 72 | El Mango, " | с. | Gr | 54 | i i | |
| 13: | Los Chicharrojes, Sanchez | 80.0 | Co-Gr | >200 | ł | |
| 74 | Agua Buena, " | 28.0 | Co-Gr | >200 | ł | |
| 7:5 | Km 12, Guayabo | 2.0 | Gr | +17 | 4 | 44 |
| 76 | Rincón Moliníllo, Aguacate | 4.0 | År | +15 | ŝ | 47 |
| 17 | Los Chichones, " | 3.4 | Gr | 20* | 1 | |
| 78 | Ríncón Molinillo, " | 6.0 | Ca | >150 | I. | |
| 29 | Cruce de Rincón, " | 2.0 | Gr | 33* | I | |
| 80 | AC-5 (Sector), " | 4.0 | Gr | 40* | 1 | |
| 10 10 | Aguacate, " | 8.0 | Gr | >200 | 4 | 51 |
| 82 | " , Arenoso | 8.4 | Gr | +5* | t | |
| 83 | Madrid, Aguacate | 3.6 | Gr | 20* | ŝ | 54 |
| 84 | El Jobo, " | 3.8 | Gr | 1 | I, | |
| 85 | | 3.0 | Gr | 40 | 1 | |
| 86 | Atronca Pellos, Aguacate | 4.6 | Gr | 40 | | |
| 87 | La Lometa, " | 2.3 | Tu (Pi) | 0 | m | 57 |
| 88 | н с 11 с 11 | 2.6 | Tu | 0 | | - |
| 89 | El Catey, Sanchez | 25.0 | Co (Gr) | >200 | I | |

LIST OF SOLL PIT SITES AND SAMPLING (II) (3) TABLE D.3.2

| Pit No. | Location | Elevation (m) | Land Use | Groundwater Level (cm) | Soil Sample Number Sum |
|------------|--------------------------------------|------------------|---------------|---|---------------------------|
| 06 | Loma del Catey, Sanchez | 2.0 | Tu-Gr | 0 | |
| 16 | Sanchez, " | 0.8 | Gr-Tu | +10 | 2 59 |
| 92 | Boca del Medio, Guayabo | 0.5 | Mg | 15* | 2 61 |
| 69 | La Bales, " | 0.4 | Ar-Mg | 13* | 3 64 |
| 94 | Rio Guayabo, " | 0.8 | Tu-Ar | 10* | |
| Note | Note: Land Use: Ar - ríce; Ba-banana | , platano; C | a - cacao; Co | ríce; Ba-banana, platano; Ca - cacao; Co - Coconut; Ga - guayabo; | guayabo; |

Gr - grassland; Ma - mango; Mg - mangrove; Pe - peanut; Pi - pipiota;

Tu - peat land; Ya - Yautia

Gramdwater: + marks the depth of surface water.

Not sampled. *

** Subjected to the laboratory analysis.

RESULTS OF FIELD ANALYSIS OF SOIL SAMPLES (1-1)

| Sample No. | Depth cm | Soil Hardness | Soil/Water Ratio | рĦ | EC mmho/cm, 25°(|
|---------------|-------------|------------------|---------------------|------|---------------------|
| P1 -1 | 0-25 | 20 | 1:2 | 5.60 | 0.09 |
| -2 | 25-53 | 23 | t1 | 6.47 | 0.05 |
| -3 | 53-74 | 22 | 11 | 6.54 | 0.04 |
| 4 | 74105 | 18 | 11 - | 6.35 | 0.03 |
| P2 -2 | 0-26 | 7 | 1:4 | 5.60 | 0.51 |
| -2 | 26-42 | 5 | 1:2 | 5.84 | 0.24 |
| -3 | 42-60 | | N . | 6.17 | 0.08 |
| -4 | 60-90 | | 11 | 6.36 | 0.11 |
| P3 -1 | 0-10 | 3 | n. se i | 4.50 | 0.43 |
| -2 | 10-47 | 13 | 11 | 5.66 | 0.30 |
| -3 | 47-95 | 12 | Ft | 7.73 | 0.20 |
| -4 | 95-130 | 16 | 11 | 6.14 | 0.35 |
| P7 -1 | 0-7 | 9 | N | 6.04 | 0.08 |
| -2 | 7-46 | 18 | ii | 6.46 | 0.02 |
| 3 | 46-93 | 23 | U | 6.38 | 0.03 |
| P8 -1 | 09 | 13 | Ħ | 5.73 | 0.13 |
| -2 | 9-21 | 21 | N. S. | 5.58 | 0.04 |
| -3 | 21-125 | 20 | 11 | 6.33 | 0.04 |
| P9 -1 | 0-8 | 7 | 11 | 6.49 | 0.17 |
| -2 | 8-30 | 12 | IT | 6.99 | 1.00 |
| 3 | 30-161 | 12 | н | 8.31 | 1.00 |
| P13-1 | 0-20 | 7 | 1:4 | 5.95 | 1.01 |
| -2 | 20-158 | 5 | 11 | 5.57 | 1.01 |
| P14-2 | 1040 | | 11 | 5.77 | 0.4 |
| -3 | 40-180 | | H (1) | 5.84 | 0.23 |
| -4 | 180-270 | | 11 | 5.32 | 1.70 |
| P16-1 | 0-12 | 7 | 1:2 | 7.47 | 3.31 |
| -2 | 12-33 | 13 | ħ | 6.68 | 3.12 |
| -3 | 33-170 | 18 | 51 | 6.54 | 2.02 |
| P18-1 | 0-5 | 13 | 11 | 6.12 | 0,08 |
| 2 | 58 | 17 | n . | 6.36 | 0,11 |
| -3 | 8-130 | 22 | 11 | 4.66 | 0.02 |
| P19-1 | 0-10 | 6 | 11 | 6.01 | 0.02 |
| -2 | 10-21 | 15 | ** | 8.06 | 0.01 |
| -3 | 21-90 | 12 | ł1 | 7.01 | 0.08 |

| Sample No. | Depth cm | Soil Hardness | Soil/Water Ratio | рН | EC mmho/cm, 25°C |
|---------------|-------------|------------------|---------------------|------|---------------------|
| P21-1 | 0-6 | 12 | 1:2 | 6.56 | 0.21 |
| -2 | 6-23 | 17 | 11 | 7.13 | 0.26 |
| -3 | 23-46 | 17 | 11 | 7.68 | 0.08 |
| P26-1 | 0-5 | 14 | 11 | 6.47 | 0.22 |
| -2 | 5-27 | 18 | 11 | 7.14 | 0,.08 |
| -3 | 27-127 | 20 | 11 | 7.18 | 0.06 |
| P29-1 | 0-6 | 12 | ti | 7.31 | 0.12 |
| -2 | 6-24 | 20 | 11 | 7.30 | 0.01 |
| -3 | 24-130 | 17 | 11 | 8.32 | 0.02 |
| P30-1 | 023 | 11 | 1:4 | 6.64 | 0.34 |
| -2 | 23-50 | 17 | 1:2 | 6.11 | 0.37 |
| -3 | 50-118 | 7 | 11 | 6.21 | 0.13 |
| P35-1 | 0-8 | 6 | 11 | 5.72 | 0.46 |
| -2 | 8-17 | 7 | 11 | 5.75 | 0.32 |
| -3 | 17-107 | 18 | 11 | 5.92 | 0.11 |
| P37-1 | 0-13 | 8 | 1:4 | 5.48 | 0.34 |
| -2 | 1327 | 7 | 11 | 5.44 | 0.33 |
| -3 | 27-140 | 12 | 1:2 | 5.40 | 0.21 |
| P38-1 | 0-9 | 5 | 11 | 8.22 | 1,01 |
| -2 | 9-21 | 7 | 11 | 8.94 | 0.19 |
| -3 | 21-41 | .7 | 11 | 8.88 | 0.18 |
| -4 | 41-52 | 10 | 1:4 | 7.12 | 0.57 |
| -5 | 52-145 | - | 1:2 | 7.55 | 0.08 |
| P421 | 0-17 | 21 | 11 | 5.03 | 0.10 |
| 2 | 17-34 | 21 | 11 | 4.90 | 0,04 |
| -3 | 34-60 | 22 | n | 4.45 | 0.02 |
| -4 | 60-80 | 22 | 11 | 4.44 | 0.02 |
| P46-1 | 0-15 | 11 | 17 | 4.85 | 0.08 |
| -2 | 15-35 | 19 | n | 5.74 | 0,08 |
| -3 | 35-95 | 24 | 17 | 5.75 | 0.08 |
| | | | | | |

TABLE D.3.3 RESULTS OF FIELD ANALYSIS OF SOIL SAMPLES (1-2)

14

17

19

P47-1

-2

-3

0-20

20-31

31-126

н

11

ŧF

5.94

6.40

6.57

0.12

0.06

0.06

| Sample No. | Depth cm | Soil Hardness | Soil/Water Ratio | рН | EC mmho/cm, 25°C |
|---------------|-------------|------------------|---------------------|------|---------------------|
| P48-1 | 0-17 | 12 | 1:2 | 5.49 | 0.09 |
| -2 | 17-102 | 21 | ** | 4.50 | 0.02 |
| P50-1 | 0-9 | 10 | 11 | 4.70 | 0.10 |
| -2 | 9-33 | 18 | 18 | 4.28 | 0.09 |
| 3 | 33-60 | 20 | | 4.41 | 0.07 |
| -4 | 60-122 | 17 | t t | 5.02 | 0.02 |
| P52-1 | 0-10 | 16 | n | 8.24 | 0.34 |
| -2 | 10-15 | 19 | *1 | 8.31 | 0.32 |
| 3 | 15-35 | 20 | 11 | 8.63 | 0.02 |
| -4 | 35-55 | 19 | 11 | 9.05 | 0.01 |
| P53-1 | 0-15 | 17 | U . | 5.77 | 0.12 |
| -2 | 15-35 | 18 | ¥1 | 6.20 | 0.12 |
| 3 | 35-80 | 16 | ** | 7.66 | 0.21 |
| P55-1 | 0-14 | 7 | 11 | 5.57 | 0.44 |
| -2 | 14-31 | 8 | ** | 6.27 | 0.24 |
| -3 | 31-49 | , | 11 | 5,99 | 0.24 |
| -4 | 49-134 | | 1:3 | 5.39 | 0.34 |
| P56-1 | 0-30 | 11 | 1:2 | 8.04 | 0.14 |
| -2 | 30-100 | 11 | 16 | 8.31 | 0.12 |
| P57-1 | 0-6 | 6 | 1:4 | 3.63 | 0.17 |
| -2 | 6-24 | 7 | 1:3 | 3.75 | 0.20 |
| -3 | 24-35 | 8 | 1:2 | 5.53 | 0.41 |
| -4 | 35-93 | 12 | 11 | 5.97 | 0.31 |
| P62-1 | 0-20 | 12 | 11 | 7.58 | 0.36 |
| -2 | 20-35 | 15 | 31 | 7.95 | 0,26 |
| -3 | 35-60 | 16 | 91 | 8.36 | 0.13 |
| -4 | 60-100 | 20 | · 11 | 8.44 | 0.18 |
| -5 | 100-180 | 22 | 19 | 8.45 | 0.18 |
| P63-1 | 0-23 | 20 | ¥1 | 8.18 | 0.18 |
| -2 | 23-41 | 23 | | 8.92 | 0.22 |
| -3 | 41-56 | 24 | 17 | 8.48 | 0.14 |
| -4 | 56-100 | 25 | 11 | 8,60 | 0.14 |

TABLE D.3.4 RESULTS OF FIELD ANALYSIS OF SOIL SAMPLES (II-1)

| Sample No. | Depth cm | Soil Hardness | Soil/Water Ratio | рН | EC mmho/cm, 25°C |
|---------------|-------------|------------------|---------------------|------|---------------------|
| P671 | 0-11 | 20 | 1:2 | 8.21 | 0.16 |
| -2 | 1123 | 18 | 11 | 8.07 | 0.21 |
| -3 | 23-39 | 20 | 11 | 8.13 | 0.22 |
| 4 | 39-90 | 16 | Et . | 7,90 | 0.17 |
| P71-1 | 07 | 14 | н | 8.15 | 0.17 |
| -2 | 7-24 | 18 | 11 | 8,12 | 0.19 |
| -3 | 24-56 | 17 | · • • • • • | 8.14 | 0.17 |
| -4 | 56-130 | 20 | 11 | 8,05 | 0.19 |
| P75-1 | 0-15 | 5 | 11 | 6.08 | 0.33 |
| -2 | 16-45 | 10 | <u> -</u> | - | |
| -3 | 45-85 | 12 | 1:2 | 7.03 | 0.20 |
| -4 | 85-100 | - | n | 7,24 | 0.16 |
| P76-1 | 0-12 | 7 | 11 . | 6.35 | 0.44 |
| -2 | 12-60 | 10 | 12 | 6.47 | 0.41 |
| -3 | 60-100 | - | 11 | 6.54 | 0.19 |
| P81-1 | 0-10 | 20 | 11 | 6.36 | 0.09 |
| -2 | 1019 | 19 | 18 | 6.49 | 0.14 |
| -3 | 19-51 | 19 | ¥1 | 6.83 | 0.06 |
| -4 | 51-90 | 21 | n | 7.16 | 0.08 |
| P83-1 | 0-10 | 8 | 31 | 7.05 | 0.08 |
| -2 | 10-25 | 8 | 31 | 6.27 | 0.14 |
| -3 | 25-55 | 10 | H · | 6.24 | 0.27 |
| P87-1 | 0-30 | 5 | 1:3 | 4.35 | 0,34 |
| -2 | 30-190 | - | 17 | 3.95 | 0.41 |
| -3 | 190-250 | | 1:2 | 5.92 | 0.26 |
| P91-1 | 08 | 2 | 11 | 7.64 | 1.75 |
| -2 | 8-40 | - 5 | 11 | 7.71 | 2.15 |
| P92-1 | 0-14 | 7 | 81 | 8.23 | 0.84 |
| -2 | 14-100 | 10 | 11 | 8.05 | 0.90 |
| P93-1 | 0-10 | 8 | 13 | 8.02 | 2.56 |
| -2 | 10-30 | 10 | 18 | 8.35 | 2.50 |
| -3 | 30-40 | . . | 14 | 8.50 | 2.57 |

TABLE D.3.4 RESULTS OF FIELD ANALYSIS OF SOIL SAMPLES (11-2)

RESULTS OF FIELD ANALYSIS OF WATER SAMPLES (I)

D.3.5

TABLE

| | 1 | | | وبلغ والمعالية والمستعمل والمستعمل والمعالية والم | | | | | | | |
|--|---|------------|--------|---|------|------|--------|--------|---------------|------|-----------------|
| Source Sampling Site PH EC No. Source G P1 5.83 0.44 22 G Source G P3 5.95 1.53 23 G G G G C P1 22 G G G G C C P3 3.30 0.09 24 G G C P1 C P1 D C C P1 D D C< | | Sample | Water | | | | Sample | Water | | | |
| C P1 5.83 0.44 22 C C P4 5.95 1.53 23 C C P5 5.95 1.53 23 C C P5 5.95 1.53 23 C C P5 4.52 0.15 25 C C P3 6.21 1.00 27 R C P12 6.31 0.72 28 C C Ponton 6.08 1.00 27 R C Ponton 6.03 0.72 28 C C Ponton 6.20 0.24 29 C C Aguecate 6.35 0.27 31 C C Aguecate 6.63 0.30 34 C C P14 6.35 0.30 33 C C P14 6.35 0.30 34 C C P14 6.35 0.30 33 C C P14 0.52 | | No. | Source | Sampling Site | Ha | 1 | No. | Source | Sampling Site | Нd | |
| C γ 1 5.83 0.44 22 C $\gamma20$ C $\gamma3$ 5.95 1.53 23 C $\gamma24$ C $\gamma5$ 4.52 0.15 25 C $\gamma25$ C $\gamma9$ 6.21 1.00 26 $\gamma26$ $\gamma26$ C $\gamma10$ 6.08 1.00 27 R $\gammauna R_1$ C $ran Estero, 1 6.46 0.21 29 C \gamma26 C ran Estero, 2 6.35 0.27 21 20 7 7 C ran Estero, 2 6.35 0.23 26 \gamma26 \gamma26 C ran Estero, 2 6.33 0.26 23 7 7 7 C $ | | | ŗ | | | | 1 | | | , | (mmho/cm, 25°C) |
| G $P3$ 5.95 1.53 23 G $P21$ C $P4$ 3.30 0.09 24 G $P24$ C $P3$ 4.52 0.15 25 G $P24$ C $P3$ 6.21 1.00 26 C $P24$ G $P10$ 6.08 1.00 27 R $Vuna Ri$ G $P12$ 6.37 0.72 28 C $P23$ C $Patero, 1$ 6.46 0.31 30 C $P31$ C $Patero, 1$ 6.46 0.31 30 C $P23$ C $Patero, 1$ 6.46 0.31 30 C $P31$ C $Patero, 1$ 6.46 0.31 30 C $P31$ C $Patero, 1$ 6.46 0.31 30 C $P31$ C $Patero, 2$ 6.35 0.27 31 C $P31$ C $Patero, 2$ $Patero, 2$ $Pate$ | | • 1 | U | 14 | 5.83 | 0.44 | 22 | ы | P20 | 5.75 | 0.82 |
| C $P4$ 3.30 0.09 24 C $P24$ C $P5$ 4.52 0.15 25 C $P25$ C $P10$ 6.21 1.00 26 C $P26$ C $P10$ 6.08 1.00 27 R $Yuna Ri C P10 6.03 0.72 28 C P27 C Ponton 6.20 0.24 29 C P23 C Rat Estero, 1 6.46 0.31 30 C P30 C Mat Lomastna 6.51 0.26 32 C P31 C Mat Lomastna 6.51 0.61 33 C P31 C P14 6.35 0.20 34 C P31 D P15 7.63 0.22 31 C P31 C P14 6.35 0.21 32 C P31 C P14 6.35 0.22$ | | 54 | Ċ | P3 | 5.95 | 1.53 | 23 | с , | P21 | 7.42 | 0.56 |
| C PS 4.52 0.15 25 C $P25$ C $P10$ 6.21 1.08 26 C $P26$ C $P10$ 6.08 1.00 27 R $Yuna Ri$ C $P12$ 6.37 0.72 28 C $P27$ C $Pancon$ 6.20 0.24 29 C $P23$ C $Caran Estero, 1$ 6.46 0.31 30 C $P23$ C $Caran Estero, 1$ 6.46 0.31 30 C $P30$ C $Caran Estero, 1$ 6.46 0.31 30 C $P30$ C $Caran Estero, 2$ 6.35 0.27 31 C $P30$ C $Particon Restero, 2$ 6.53 0.20 32 C $P30$ C $P14$ 6.33 0.40 35 C $P30$ C $P14$ 0.52 0.28 0.26 $P30$ $P40$ D $P14$ | | n | υ | Ρ4 | 3.30 | 0.09 | 24 | e | P24 | 7.01 | 0.67 |
| G P9 6.21 1.00 26 C $P26$ G $P10$ 6.08 1.00 27 R $Yuna R_1$ G $P12$ 6.37 0.72 28 C $P27$ C $Panton$ 6.20 0.24 29 C $P23$ C Gan Estero, 1 6.46 0.311 30 C $P30$ C Gan Estero, 2 6.35 0.27 31 C $P31$ C $Rau Lomastna$ 6.51 0.61 32 C $P31$ C $Rat Lomastna$ 6.51 0.61 33 D $(P32)$ C $P14$ 6.35 0.28 0.36 34 C $P34$ D $P15$ 7.63 0.28 0.36 D $Rincon M.$ R Nearby Sanchez 7.63 0.28 0.36 D $Rincon M.$ R Nearby Sanchez 7.80 0.52 37 C $P37$ | | 4 | 0 | PS | 4.52 | 0.15 | 25 | ი | P25 | 7.46 | 0.75 |
| C P10 6.08 1.00 27 R Yuna R1 C P12 6.37 0.72 28 C 27 C Ponton 6.37 0.72 28 C 27 C C Fonton 6.20 0.24 29 C 730 C Gran Estero, 1 6.46 0.31 30 C 730 C Gran Estero, 2 6.35 0.27 31 C 731 C Mat Lomasina 6.51 0.61 332 C 732 C Mat Lomasina 6.51 0.61 332 C 734 C Puld 6.53 0.28 0.30 34 C 734 D Plis 7.63 0.28 0.28 35 C 734 C Plis 7.63 0.28 0.28 734 734 D Plis 7.63 0.28 0.28 734 734 | | Ś | Ċ | 6 đ | 6.21 | 1.08 | 26 | U | P26 | 7.12 | 0.59 |
| G $F12$ 6.37 0.72 28 C $F23$ CPonton 6.20 0.24 29 C $F28$ CGran Estero, 1 6.46 0.31 30 C $F30$ CGran Estero, 2 6.35 0.27 31 C $F33$ CGran Estero, 2 6.51 0.26 32 C $F33$ CMai Lomasina 6.51 0.61 33 C $F34$ CF13 6.03 0.40 34 C $F34$ CF14 6.51 0.60 32 C $F34$ CF14 6.35 0.23 34 C $F34$ DF15 7.63 0.23 35 C $F34$ RNearby Sanchez 7.63 0.23 35 C $F34$ GF15 6.34 0.52 37 C $F34$ RNearby Sanchez 7.80 0.28 36 D $Rincon M.$ RNearby Sanchez 7.80 0.52 37 C $F33$ CF15 6.95 3.16 39 C $F33$ C $F16$ 6.95 2.13 40 C $F33$ C $F17$ 6.63 2.13 40 C $F33$ C $F17$ 6.63 2.13 40 C $F33$ C $F17$ 6.63 2.13 40 C $F40$ | | Ş | ი | P10 | 6.08 | 1.00 | 27 | Ч | Yuna River | 7.95 | 0.18 |
| C Ponton 6.20 0.24 29 C P28 C Gran Estero, 1 6.46 0.31 30 C P30 C Gran Estero, 2 6.35 0.27 31 C P31 C Gran Estero, 2 6.55 0.27 31 C P31 C Aguacate 6.68 0.36 32 C P32 C P13 0.40 34 C P34 C P13 0.40 34 C P34 C P13 0.40 35 C P34 C P13 0.28 0.30 35 C P34 D P15 7.63 0.28 36 D Aguacate R Nearby Sanchez 7.80 0.52 37 C P37 R Nearby Sanchez 7.80 0.52 37 C P37 R Nearby Sanchez 7.80 0.52 37 G P36 P37 R Nearby Sanchez | | 1 | с | P12 | 6.37 | 0.72 | 28 | ი | P27 | 6.77 | 0.26 |
| CGran Estero, 1 6.46 0.31 30 C $P30$ CGran Estero, 2 6.35 0.27 31 C $P31$ CAguacate 6.68 0.36 32 C $P31$ CMai Lomasina 6.51 0.61 33 D (732) CP14 6.51 0.61 33 D (732) CP14 6.35 0.20 34 G $P34$ DP15 7.63 0.28 35 C $P34$ RNarby Sanchez 7.63 0.28 36 D $Rincon M.$ RNearby Sanchez 7.80 0.52 37 C $P37$ GP16 6.95 3.16 39 C $P36$ GP17 6.63 2.13 40 G $P40$ CP17 6.63 2.13 40 C $P40$ | | හ | о | Ponton | 6.20 | 0.24 | 29 | с | P28 | 7.29 | 0.13 |
| CGran Estero, 2 6.35 0.27 31 C 731 CAguacate 6.68 0.36 32 C 732 CMai Lomasina 6.51 0.61 33 D (732) C 713 6.03 0.40 34 C 736 C 714 6.35 0.30 35 C 736 D 716 6.35 0.30 35 C 736 D 716 0.28 0.30 35 C 736 N 7.63 0.28 36 D $Xincon M.$ RNearby Sanchez 7.80 0.52 37 C 737 RNearby Sanchez 7.80 0.52 38 C 737 C 716 6.95 3.16 39 C 730 C 710 0.52 316 6.95 3.16 700 C 710 2.13 40 C 740 | | 6 | U | Gran Estero, l | 6.46 | 0.31 | 30 | ც | P30 | 6.61 | 0.21 |
| C Aguacate 6.68 0.36 32 G P32 C Mai Lomasina 6.51 0.61 33 D (732) C P13 6.03 0.40 34 G F34 C P13 6.03 0.40 34 G F34 C P15 7.63 0.20 35 G F34 D P15 7.63 0.28 35 G F36 R Nearby Sanchez 7.63 0.52 37 G F36 R Nearby Sanchez 7.80 0.52 37 G F36 R Nearby Sanchez 7.80 0.52 37 G F36 G P16 6.95 3.16 9 G F36 G P17 6.63 2.13 40 G F40 C R17 2.18 41 W (F40) | | 10 | υ | Estero, | 6.35 | 0.27 | 31 | U | P31 | 6.10 | 0.21 |
| CMai Lomasina 6.51 0.61 33 D (732) C 713 6.03 0.40 34 G 734 C 714 6.35 0.30 35 G 735 D 715 7.63 0.28 36 D $Rincon M.$ D 715 7.63 0.28 36 D $Rincon M.$ C 715 6.34 0.28 36 D $Rincon M.$ RNearby Sanchez 7.63 0.28 37 G 737 RNearby Sanchez 7.80 0.52 37 G 738 G 715 6.95 3.16 39 G 739 G 717 6.63 2.13 40 G 740 C 717 6.63 2.13 40 G 740 | | 11 | U U | Aguacate | 6.63 | 0.36 | 32 | U | P32 | 6.31 | 0.15 |
| CP13 6.03 0.40 34 G 734 C 714 6.35 0.30 35 G 735 D 715 7.63 0.28 36 D $Rincon M.$ C 715 7.63 0.28 36 D $Rincon M.$ C 715 6.34 0.52 37 G 737 RNearby Sanchez 7.80 0.52 37 G 738 G 716 0.52 3.16 39 G 739 G 717 6.63 2.13 40 G 740 C $Rin< Excerce, 3$ 7.04 2.18 41 W (740) | | 12 | υ | Mai Lomasina | 6.51 | 0.61 | 33 | Ð | (132) | 7.17 | 0.44 |
| G P14 6.35 0.30 35 G P35 D P15 7.63 0.28 36 D Rincon M. G P15 7.63 0.28 36 D Rincon M. G P15 6.34 0.52 37 G P37 R Nearby Sanchez 7.80 0.52 38 G P38 G P16 6.95 3.16 39 G P39 G P17 6.63 2.13 40 G P40 C C Ann Estero, 3 7.04 2.18 41 W (P40) | | 13 | U | P13 | 6.03 | 0.40 | 34 | ں ا | P34 | 6.89 | 0.41 |
| D P15 7.63 0.28 36 D Rincon M. G P15 6.34 0.52 37 G P37 R Nearby Sanchez 7.80 0.52 38 G P38 R Nearby Sanchez 7.80 0.52 38 G P38 G P16 6.95 3.16 39 G P39 G P17 6.63 2.13 40 G P40 C Gran Estero, 3 7.04 2.18 41 W (P40) | | 14 | Ċ | P14 | 6.35 | 0.30 | 35 | с | P35 | 6.07 | 0.57 |
| G P15 6.34 0.52 37 G F37 R Nearby Sanchez 7.80 0.52 38 G F38 R Nearby Sanchez 7.80 0.52 38 G F38 G F16 6.95 3.16 39 G F39 G F17 6.63 2.13 40 G F40 C Gran Estero, 3 7.04 2.18 41 W (F40) | | 15 | Q | P15 | 7.63 | 0.28 | 36 | A | Rincon M. | 6.21 | 0.29 |
| G P15 6.34 0.52 37 G R Nearby Sanchez 7.80 0.52 38 G G P16 6.95 3.16 39 G G P17 6.63 2.13 40 G C Gran Estero, 3 7.04 2.18 41 W | | | • | | | | | • . | | | |
| R Nearby Sanchez 7.80 0.52 38 G G P16 6.95 3.16 39 G G P17 6.63 2.13 40 G C Gran Estero, 3 7.04 2.18 41 W | | 16 | U | PIS | 6.34 | 0.52 | 37 | 0 | P37 | 6.05 | 0.46 |
| G P16 6.95 3.16 39 G G P17 6.63 2.13 40 G C Gran Estero, 3 7.04 2.18 41 W | | 17 | ۲. | | 7.80 | 0.52 | 38 | ы | P38 | 7.19 | 1.18 |
| C P17 6.63 2.13 40 C C Gran Estero, 3 7.04 2.18 41 W | | 18 | с С | P16 | 6.95 | 3.16 | 39 | υ | P39 | 6.47 | 0.56 |
| C Gran Estero, 3 7.04 2.18 41 W | | 10 | U | P17 | 6.63 | 2.13 | 40 | U | P40 | 6.11 | 0.78 |
| | | 20 | U | Estero, | 7.04 | 2.18 | 41 | М | (P40) | 7.73 | 0.50 |
| 21 G P19 7.19 0.27 4.2 G P45 | | 21 | υ | P19 | 7.19 | 0.27 | 42 | U | P4.5 | 7.23 | 2.23 |

| Sample No. | Water Source | Sampling Site | рН | EC mmho/cm, 25°C |
|---------------|-----------------|----------------|------|---------------------|
| 1 | G | P54 | 6.25 | 0.31 |
| 2 | G | P55 | 6.06 | 0.30 |
| 3 | G | P57 | 5.70 | 0.39 |
| 4 | R | Yuna (Arenoso) | 8.06 | 0.29 |
| 5 | С | Near P57 | 7.54 | 0.40 |
| 6 | C | P15-55 | 7.12 | 0.22 |
| 7 . | C | P19-54 | 7.32 | 0.23 |
| 8 | C : 1 | El Poro | 7.09 | 0.22 |
| 9 | С | Naranjo | 6.70 | 0.20 |
| 10 | С | Cororao | 7.07 | 0.76 |
| 11 | C | Matancita | 7.31 | 3.12 |
| 12 | G | P66 | 7.99 | 0.75 |
| 13 | G | P68 | 7.02 | 0.11 |
| 14 | G | P69 | 7.21 | 0.56 |
| 15 | S | P75 | 6.70 | 0.24 |
| 16 | . S = | P77 | 7.80 | 0.36 |
| . 17 | С | Caño Ponton | 6,48 | 0.23 |
| 18 | G | P85 | 7.03 | 2.16 |
| 19 | G | P86 | 6.92 | 3.79 |
| 20 | S | P87 | 4.10 | 0.08 |
| 21 | G | P88 | 4.98 | 0.08 |
| 22 | . S | P90 | 6.76 | 0.40 |
| 23 | S | P91 | 6.92 | 0.70 |
| 24 | R | Guayabo (1 Km) | 6.43 | 0.32 |
| 25 | R | " Mouth | 6.57 | 0.30 |

TABLE D.3.6 RESULTS OF FIELD ANALYSIS OF WATER SAMPLES (II)

Remarks: Water Resources: G - groundwater; C - Canal; D - Drain; R - River; W - Well; S - Surface water

Sample No. 5 to 11 were taken from Caño Gran Estero. The latter 10 and 11 were from nearby mouth, outside of the Project Area.

| Sample | Depth | рН | Saturation | Particle | Size Dis | tribution | . · · · . | CaCO3 |
|------------|---------|---------|------------|----------|----------|-----------|------------|-------|
| No, | CDI | (1:2.5) | x | Clay % | Silt % | Sand % | Texture | * |
| P2 -1 | 0-26 | 6.6 | n.d. | n.d. | n.đ. | n.d. | | t |
| ⊷2 | 26-42 | 6.6 | 60 | 36.3 | 16.0 | 47.7 | SC . | t |
| -3 | 42~60 | 6.7 | 80 | 56.3 | 12.0 | 31.7 | C | t |
| -4 | 6090 | 6.8 | 80 | 69.0 | 14.7 | 46.2 | C | t, |
| 23 -1 | 0-10 | 58 | 80 | 56.3 | 20.0 | 23.7 | C. | t |
| -2 | 10-47 | 6.5 | 94 | 70.3 | 17.0 | 15.7 | C | t |
| 3 | 47-95 | 7.2 | 100 | 79.8 | 18.0 | 2.2 | C | t |
| -4 | 95-130 | 6.4 | . 95 | 71.0 | 14.7 | 14.2 | C | · t |
| 27 -1 | 0-7 | 6.6 | 67 | 41.0 | 36.7 | 22.2 | C | t |
| -2 | 7-46 | 6.8 | 57 | 10.7 | 22.0 | 67.3 | SL | t |
| -3 | 46-93 | 6.9 | 68 | 37.4 | 41.3 | 21.3 | CL | t |
| - 88 | 0-9 | 6.3 | 69 | 46.3 | 33.1 | 20.6 | C | t |
| -2 | 9-21 | 6.3 | 70 | 54.3 | 33.1 | 12.6 | С | . t |
| -3 | 21-125 | 6.7 | . 72 | 48.3 | 30.1 | 12.6 | . C | t |
| 29 -1 | 0-8 | 6.5 | 75 | 56.3 | 23.4 | 20.2 | С | t |
| -2 | 8-30 | 6.9 | 72 | 60.3 | 19.1 | 20.6 | C | t |
| -3 | 30-161 | 7.2 | 95 | 63.3 | 26.1 | 10.6 | C | ť |
| 214-2 | 10-40 | 5.5 | n.d. | n.d. | n.d. | n.d. | - | t |
| -3 | 40-180 | 5.3 | n.d. | n.d. | n.d. | n.d. | | t |
| -4 | 180-270 | 4.8 | n.d. | n.d. | n.d. | n.d. | | t |
| 16-1 | 0-12 | 6.1 | 100 | 55.0 | 22.4 | 22.6 | C · | . t |
| 2 | 13-33 | 6.0 | 100 | 57.0 | 20.4 | 22.6 | С | t |
| -3 | 33-170 | 6.4 | 68 | 43.0 | 42.7 | 14.2 | SIC | t |
| P18-1 | 0~5 | 6.0 | 83 | 51.4 | 34.4 | 14.2 | C | .t. |
| -2 | 58 | 6.0 | 68 | 51.4 | 34.4 | 14.2 | С | t. |
| -3 | 8-130 | 5.3 | 90 | 81.4 | 10.4 | 8.2 | С | t |
| 21-1 | 0-6 | 5.8 | 90 | 49.4 | 34.4 | 16.2 | C | t |
| -2 | 6-23 | 6.1 | 86 | 51.4 | 36.4 | 12.2 | C | t |
| -3 | 23-46 | 6.3 | 75 | 57.4 | 32.4 | 10.2 | С | t |
| 26-1 | 0-5 | 6.0 | 75 | 49.4 | 32.4 | 18.2 | С | t |
| -2 | 5-27 | 6.1 | 68 | 49.4 | 36.4 | 14.2 | С. | t |
| 3 | 27-127 | 6.3 | 63 | 43.4 | 38.4 | 18,2 | С | t |
| 230-1 | 0-23 | 6.0 | n.d. | n.d. | n.d. | n.d. | - | t |
| -2 | 23-50 | n.d. | n.d. | n.d. | n.d | n.d. | | . t |
| -3 | 50-118 | 6.0 | n.đ. | n.d. | n.d. | n.đ. | | t |
| 235-1 | 0-8 | 5.7 | n.d. | n.d. | n.d. | n.d. | _ | t |
| -2 | 8-17 | 5.7 | 80 | 55,0 | 18.4 | 13.4 | C | t |
| -3 | 17-107 | 5.8 | 95 | 77.0 | 8.7 | 13.6 | С | t |
| 238-1 | 0-9 | 6.9 | n.d. | n.đ. | n.d. | n.d. | - | t |
| ~ 2 | 9-21 | 7.0 | 33 | 6.7 | 0.7 | 92.6 | S | 27,8 |
| -3 | 21-41 | 7.0 | 30 | 7.0 | 0.7 | 92.2 | S | 38.0 |
| -4 | 41-52 | 64 | n.d. | n.d. | n.d. | n.đ. | · | t |
| 5 | 52-145 | 6.8 | 50 | 25.0 | 17,1 | 57.9 | SCL | t |
| 242-1 | 0-17 | 5,7 | 54 | 35.6 | 28.7 | 35.7 | SIC | ŧ |
| ~2 | 17-34 | 5.6 | 71 | 61.6 | 16.7 | 21.7 | C | E |
| -3 | 34-60 | 5.0 | 68 | 54.0 | 12.4 | 33.6 | č | Ē |
| -4 | 60-80 | 4.8 | 67 | 52.3 | 10.0 | 37.7 | c | t |
| 246-1 | 0-15 | 5.4 | 48 | 21.0 | 24.4 | 54.6 | SCL | ť |
| ~2 | 15-35 | 5.8 | 88 | 63.0 | 14.7 | 22.2 | C | ' t |
| -3 | 35-95 | 5.8 | 100 | 67.0 | 14.7 | 17.9 | · C | t |

| • • | | | • | . *. | | |
|-------------|------------|------------|----------|---------|---------|-------|
| TABLE D.3.7 | RESULTS OF | LABORATORY | ANALYSIS | OF SOIL | SAMPLES | (A-I) |

Note: n.d. --- not determined; t --- trace.

| Sample | Organic Carbon | Organic Matter | Excha | ingeabl | e Catio | ns (me/ | 100 g) | st | Base |
|--------|-------------------|-------------------|-------|---------|---------|---------|--------|------------------|-------------------|
| No. | (%) | (%) | Na | K | Са | Mg | Tota1 | CEC (me/100g) | Saturation (%) |
| P2 -1 | 20.7 | 39,3 | 1.37 | 0,69 | 42.0 | 12.6 | 56.7 | 74.0 | 77 |
| -2 | 2.30 | 4.4 | 0,32 | 0,18 | 22.7 | 12.4 | 35.6 | 70.0 | 51 |
| -3 | 1,20 | 2.3 | 0.25 | 0.21 | 43.7 | 9.89 | 54.1 | 64.0 | 84 |
| -4 | 3.90 | 7.4 | 0.27 | 0.19 | 41.2 | 13.2 | 54.9 | 64.0 | 86 |
| P3 -1 | 1.20 | 2.1 | 0.25 | 0.54 | 19.3 | 18.4 | 38.5 | 56,0 | 69 |
| -2 | 1.30 | 2.2 | 0.80 | 0.37 | 18.1 | 26.5 | 45.8 | 54.0 | 85 |
| -3 | 0,39 | 0.7 | 0.99 | 0.40 | 24.7 | 22,7 | 48.8 | 49.6 | 98 ⁻ |
| -4 | 1,90 | 3.3 | 1.21 | 0.37 | 22.3 | 19.1 | 43.0 | 61.0 | 70 |
| P7 -1 | 0.39 | 0.7 | 0.12 | 0.32 | 22.6 | 12.5 | 35.5 | 48.4 | 73 🖤 |
| -2 | 0.88 | 1.5 | 0.14 | 0.21 | 21.0 | 6.69 | 28.0 | 36.6 | 77 |
| -3 | 0.39 | 0.7 | 0.18 | 0.14 | 31.5 | 1.47 | 33.3 | 33.2 | 100 |
| 28 -1 | 1,20 | 2.1 | 0,18 | 0.32 | 24.7 | 6.67 | 31.9 | 41.6 | 77 |
| -2 | 0,27 | 0.5 | 0.18 | 0.21 | 19.3 | 14.2 | 33.9 | 38.6 | 88 |
| 3 | 0.49 | 0.8 | 0.25 | 0.22 | n.d. | n.d. | | 35.0 | |
| 9 -1 | 1,90 | 3.3 | 0.57 | 0.32 | 33.9 | 15.9 | 50.7 | 49.0 | 103 |
| -2 | 1,60 | 2.8 | 0.47 | 0.19 | 31.0 | 12.5 | 44.2 | 43.2 | 102 |
| -3 | 0.23 | 0.4 | 0.55 | 0.21 | 43.6 | 5.70 | 50.1 | 42.8 | 117 |
| 214-2 | 30.4 | 57.7 | 1.42 | 0.24 | 43.6 | 5.70 | 51.0 | 86.6 | 59 |
| -3 | 19.5 | 37,0 | 1.12 | 0.30 | 35.4 | 13.8 | 50.6 | 77.6 | 65 |
| -4 | 18.3 | 34.1 | 2,42 | 0.47 | 38.7 | 17.0 | 58.6 | 80.08 | 73 |
| P16-1 | 16.4 | 31.1 | 2.42 | 0,47 | 31.0 | 12.5 | 46.4 | 65.4 | 71 |
| 2 | 17.6 | 33.4 | 3.00 | 0.44 | 54.5 | 1.90 | 59,8 | 68.2 | 88 |
| -3 | 5,80 | 11.0 | 2.75 | 0.91 | 24,5 | 12.2 | 40.4 | 52.4 | 77 |
| P18-1 | 1.70 | 2.9 | 0.11 | 0.21 | n.d. | n.d. | - | 33.0 | ** |
| -2 | 1,20 | 2.1 | 0,16 | 0.15 | 10.7 | 7,10 | 18.1 | 35.8 | 51 |
| 3 | 1.40 | 2.4 | 0,08 | 0.19 | 9.90 | 9.40 | 19.6 | 48.0 | 41 |

TABLE D.3.8 RESULTS OF LABORATORY ANALYSIS OF SOIL SAMPLES (B-I-1)

Note: Organic matter (%) = Organic carbon (%) x 1.724 or x 1.897 (peat) nd -- not determined; t --- trace.

| Sample | Organic | Organic | Excha | ngeabl | e Catio | ns (me/ | '100 g) | CEC | Base Saturation |
|-----------|---------------|---------------|-------|--------|---------|---------|------------|-----------|--------------------|
| No. | Carbon (%) | Matter (%) | Na | ĸ | Ca | Mg | Total | (me/100g) | (%) |
| P21-1 | 1.90 | 3.3 | 0.37 | 0.47 | 35.9 | 9.00 | 45.7 | 51.0 | 90 |
| -2 | 4.40 | 7.6 | 0,40 | 0.29 | n.d. | n.d. | ÷ | 26.0 | ** |
| -3 | 0.93 | 1.6 | 0.22 | 0.18 | n.d. | n.d. | . <u> </u> | 26.0 | - |
| P26-1 | 1.20 | 2.1 | 0.09 | 0.60 | 33.6 | 5,90 | 40.2 | 39.6 | 101 |
| 2 | 1,20 | 2.1 | 0.08 | 0.29 | 32.9 | 2,45 | 35.7 | 37.6 | 95 |
| 3 | 0,78 | 1.3 | 0.07 | 0.18 | 28.8 | 3.10 | 32.2 | 35.4 | 91 |
| P30-1 | 25.3 | 48.0 | 0.77 | 0.40 | 45.6 | 20.4 | 67.2 | 96.6 | 70 |
| -2 | 14.4 | 27.3 | 0.37 | 0.08 | 68.4 | 10.4 | 79.3 | 94.4 | 84 |
| -3 | 23.4 | 44.4 | 0.47 | 0.15 | 68.8 | 20.0 | 89.4 | 95.0 | 94 |
| P35-1 | 7.50 | 14.2 | 0.57 | 0,40 | 36.9 | 28.8 | 66.7 | 71.6 | 93 |
| 2 | 28.9 | 54.8 | 2.25 | 0.25 | 25.5 | 24.8 | 52.8 | 74.6 | 71 |
| 3 | 3.30 | 6.3 | 0.50 | 0.24 | 25.5 | 16.9 | 43.1 | 55.0 | 78 |
| ₽38–1 | 16.7 | 31.7 | 2,08 | 0.24 | 24.3 | 7.92 | 34.5 | 35.0 | 99 |
| -2 | 0.17 | 0.3 | 0.25 | 0.11 | n.d. | n.d. | | 5.0 | |
| -3 | 0.19 | 0.4 | 0.27 | 0.11 | n.d. | n.d. | . <u>.</u> | 5.0 | - |
| -4 | 26.5 | 50.3 | 2.49 | 0.22 | 54.4 | 10.5 | 67.6 | 75.0 | 90 |
| ~5 | 3.30 | 6.3 | 0.77 | 0.21 | 16.3 | 4.10 | 21.4 | 22.0 | 97 |
| P42-1 | 1.20 | 2.0 | 0.02 | 0.07 | 3.44 | 4.37 | 7.9 | 22.2 | 35 . |
| -2 | 0.82 | 1.4 | 0.02 | 0.02 | 4.37 | 5.18 | 9.6 | 19.4 | 49 |
| -3 | 0.31 | 0.5 | 0.01 | 0,05 | 2.04 | 6.18 | 8.3 | 17.0 | 49 |
| -4 | 0.14 | 0.2 | 0.02 | 0.04 | 2.22 | 4.29 | 6.6 | 16.0 | 41 |
| P46-1 | 3.12 | 5.3 | 0.14 | 0.21 | 3.30 | 1.75 | 5.4 | 18.4 | 29 |
| -2 | 0.57 | 1.0 | 0.37 | 0.11 | 4.40 | 0.96 | 5.8 | 20.0 | 29 |
| 3 | 1.20 | 2.1 | 0.25 | 0,11 | 4.90 | 2.52 | 7.8 | 18.8 | 41 |

TABLE D.3.8 RESULTS OF LABORATORY ANALYSIS OF SOIL SAMPLES (B-I-2)

Note: Organic matter (%) = Organic carbon (%) x 1.724 or x 1.897 (peat)

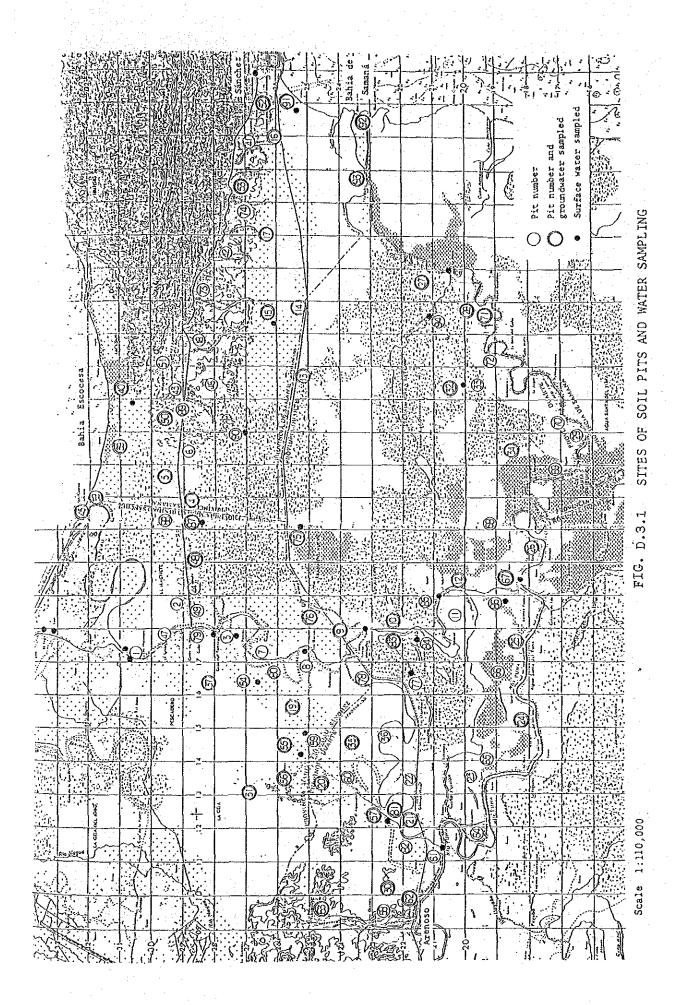
nd -- not determined; t --- trace.

| | | | | | | ••• | | |
|---------------|--------|---------------|-----------------|--------------------|------|------------------------------------|--------------|--------------|
| Sample No. | | рН (1:2.5) | Saturation % | Particle Clay % | | Size Distribution Silt % Sand % | Texture | caco3 |
| P55-1 | 0-14 | 4.8 | n.d. | n.d. | n.d. | n.d. | | LI I |
| -2 | 14-31 | 4.9 | n.d. | n.d. | n.d. | п.d. |) | ் ப |
| က် ၊ | 31-49 | 4.7 | n.d. | n.d. | n.d. | n.d. | | ц |
| -4 | 49-134 | 4.8 | n.d. | n.d. | n.d. | n.d. | J | ų |
| P57-1 | 06 | 4.0 | n.d. | n.d. | n.d. | n.d. | J | ų |
| -2 | 6-24 | 4.0 | n.d. | n.d. | n.d. | n.d. | J. | 4.1 |
| ε Γ | 24-35 | 4.8 | n.d. | n.d. | n.d. | n.d | J | μ |
| -4 | 35-93 | 1•2 | 69 | 50.3 | 14.3 | 35.7 | U | μ |
| P63-1 | 0-23 | 6.2 | 53 | 40.3 | 28.7 | 31.0 | U | 33.2 |
| 21 1 | 23-41 | 6.8 | 52 | 40.3 | 34.0 | 25.7 | υ | 59.0 |
| ິ ເ | 41-56 | 7.0 | 45 | 38.3 | 36.0 | 25.7 | SIC | 76.0 |
| -4 | 56-100 | 7.2 | 20 | 38.3 | 40.0 | 21.7 | SiC | 89.4 |
| P67-1 | 0-11 | 7.2 | 50 | 36.3 | 34.0 | 29.7 | Sic | Ļ |
| -2 | 11-23 | 7.2 | 53 | 38.3 | 42.0 | 19.7 | Sicl | י ג נו |
| ကို | 23-39 | 7.2 | 68 | 50.3 | 34.0 | 15.7 | D | 3.2 |
| -4 | 39-90 | 7.3 | 60 | 50.3 | 26.0 | 23.7 | с С | ц. |

TABLE D.3.9 RESULTS OF LABORATORY ANALYSIS OF SOIL SAMPLES (A-II)

| Sample | Organic | Organic | Excl | <u>t</u> xchangeable | | Cations (me/100 | 8) | C B C | Cottone Co |
|----------|---------|---------------|-------|----------------------|------|-----------------|-------|---------------|------------|
| • ON | (%) | Marter (%) | Na | ĸ | C a | Mg | Total | (me/100g) | (%) |
| P55-1 | 7.00 | 13.3 | 0.34 | 0.22 | 21.7 | 18.3 | 40.6 | 64.6 | 63 |
| -2 | 6.00 | 11.4 | 0.15 | 0.18 | 35.4 | 15.4 | 51.1 | 60.0 | 85 |
| κ) L | 23.0 | 43.6 | 0.20 | 0.11 | 31.3 | 21.4 | 53.0 | 84.0 | 63 |
| -4 | 9.70 | 18.4 | 0.29 | 0.15 | 25.3 | 19.2° | 44.9 | 72.0 | 62 |
| P57-1 | 23.0 | 43.6 | 0.47 | 0.16 | 10.7 | 13.6 | 24.9 | 100.0 | 25 |
| 15 | 23.0 | 43.6 | 0.15 | 0.22 | 14.1 | 2.39 | 17.0 | 92.0 | 6 T |
| ы С | 20.3 | 38.5 | 0.50 | 0.32 | 44.3 | 11.7 | 56.8 | 96.0 | 59 |
| -4 | 4.40 | 7.6 | 0.18 | 0.13 | 17.0 | 16.8 | 34.1 | 46.0 | 74 |
| P63-1 | 3.30 | 5.7 | 0 02 | 0.04 | n.d. | p.u. | 1 | 32.8 | (001<) |
| -2 | 2.00 | 3 4 | 0.02 | 0.04 | n.d. | n.d. | I | 28.6 | (001<) |
| Ϋ́ Ϋ́ | 1.10 | 1.9 | 0.11 | 0.03 | n.d. | n.d. | 1 | 21.0 | (>100) |
| -4 | 0.31 | 0.5 | 0 04 | 0.03 | n.d. | n.d. | • | 18.0 | (001<) |
| P67-1 | 1.30 | 2.2 | 0.08 | 0.18 | n.d. | n d | ľ | 31.0 | 1 |
| 2 | 1.20 | 2.0 | 0.08 | 0.25 | n.d. | n.đ. | : | 32.8 | |
| ကို | 1.30 | 2.2 | 7 I 0 | 0.15 | n.d. | n.d. | l | 38.0 | . I |
| 14 | 1.30 | 2.2 | 0.15 | 0.13 | 25.0 | 15.0 | 40.3 | 39 . 2 | 103 |

TABLE D.3.10 RESULTS OF LABORATORY ANALYSIS OF SOIL SAMPLES (B-II)



D-29

29

4. Soil Classification

Soils are classified mainly based on concepts of soil formation. However, the classification procedures varied widely because of different methods of interpreting soil profile data with relief, climate and geology in terms of the distribution of major soil groups.

Although not all the countries have created their own methods, most of them have adopted one of the representative methods of soil classification developmed by advanced countries.

The Dominican Republic has recently applied the method of the United States Department of Agriculture (USDA). Historical outlines on the soil survey of the study area are introduced below.

4.1 Classification in Higher Categories

4.1.1 Map of Soil Associations (SEA)

The first soil survey of Valle del Cibao at a reconnaissance level was conducted by the staff of SEA from 1965 to 1967. The map of soil associations was made at the scale of 1:250,000. Fig. D.4.1 is a map of the area around the study area, excepted from "Atlas Geologico y Mineralogico" which was complied by R. Zoppis (1969). These associations seem to correspond to soil order level. In view of the present results obtained by the study team, extents of 3-24 (sandy soil with permeable layer, sabanna) and 36-40 (non calcareous clayey soil) are not favourable for agriculture as mentioned questionable in the succeeding chapter. Those of organic soils (peat) do not also reflect the actual status.

4.1.2 Soil Map of the World (FAO/UNESCO)

In 1972, FAO/UNESCO Soil Map of the World Project published a map sheet of Mexico and Central America (Vol. III). Since the map was prepared at the scale of 1:5,000,000, part of Dominica was magnified twice as shown in Fig. D.4.2. This classification has a system of soil group - soil unit which is generally comparable to that of soil order - greater group. To cover all soils in the world, the soil units have been defined in terms of measurable and observable properties, which are combined into so-called "diagnostic horizons".

The study area consists of three soil units with associated soils and inclusions as shown below:

| | e programa de la composición de la composición de la composición de la composición de la composición de la comp | | |
|-----------------|---|---|-------------------------------------|
| Soil Unit | Map Symbol | Associated Soil (≥20%) | Inclusion (< 20%) |
| Eutric Fluvisol | Je442a | Humic Gleysol Calcaric Fluvisol Pellic Vertisol | Thionic Fluvisol Eutric Planosol |
| Mollic Gleysol | Gm11-2a | Eutric Regosol Pellic Vertisol | Eutric Histosol |
| Eutric Planosol | We 15-3a | Eutric Gleysol Ferric Luvisol Plinthic Luvisol | Mollic Gleysol |

Distribution of soil units are largely comparable to the former map (Fig. D.4.1) because the soil identification might be based on the survey

data before 1972. Accordingly, some discrepancies in interpretation of soils and their extents are inevitable with less information as well as worldwide scale of the map. As compared with the latest results of soil survey, distinct differences in soil occurrence can be pointed as follows:

- 1) Je44-2a area should associate with Histosol but probably not include Thionic Fluvisol.
- Gmll-2a area also associate Dystric Cambisol on mountainous slopes; the relief notation should be "abc" (level to steeply dissected).

4.1.3 Semi-detailed Soil Map, SEA/FAO

Formal soil survey on Valle del Cibao was initiated by P.L. Arens et al. in 1974 in cooperation with UNDP/FAO. The project continued to 1975 to cover all of the level plains, and in 1976 a semi-detailed soil map of Rio Yuna Valley was published at the scale of 1:50,000.

Fig. D.4.3 presents the distribution of soil order - suborder classified by USDA method. Soils prevailing on unsurveyed areas of piedmont and monadnock have been supplemented with the results obtained this time. The hectarage of each soil group is as follows:

| Soil Order | Suborder | Area (ha) | Percentage (%) |
|--------------|------------------------------|----------------------|--------------------|
| Vertisol | Udert | 1,690 | 7.0 |
| Inceptisol | Acuept Tropept | 1,000 4,240 | 4.1 17.6 |
| | Sub-total | 5,240 | 21.7 |
| Molisol | Acuol Udol | 490 2,390 | 2.0 10.0 |
| . • | Sub-total | 2,880 | 12.0 |
| Alfisol | Acualf | 550 | 2.3 |
| Histosol | Fibrist Hemist Saprist | 1,985 7,960 85 | 8.2 33.0 0.4 |
| | Sub-total | 10,030 | 41.6 |
| Associations | - | 3,650 | 15.2 |
| Lagoons | | 60 | 0.2 |
| Total | | 24,100 | 100.0 |

Histosol has the greatest extent followed by Inceptisol and Molisol. Since Histosol dominates in every association area, it would occupy approximately 60 percent of the entire area. Moreover when added with histic groups in the other soil orders, it is obvious how broad the organic soils have been developing in the study area.

Formation of these soil orders can be illustrated from view point of soil genesis. Fig. D.4.4 is drawn to show relationships among them in terms of topography and mother materials.

4.2 <u>Classification in Lower Categories</u>

Lower categories such as soil group, soil family and series are discussed hereinafter. These are defined step by step with diagnostic horizon, soil texture, mineral composition and temperature. To avoid complexity, soil series are mainly described hereinafter in relation to soil orders.

4.2.1 Soil Series Identified and Established in the Study Area

The former soil survey conducted by SEA/FAO (1974-1975) established 44 soil series within the study area. The present survey has checked and identified these series and found some sites where the soil profiles do not coincide with those described in the former report. The results are outlined in Tables D.4.1 and D.4.2 together with 4 series newly established in this time on the areas not yet surveyed in the past.

Totally 48 soil series are listed taxonomically in Table D.4.3 with 14 soil associations. Explanations for new soil series are referred in the latter paragraph. With these results the semi-detailed soil map above-mentioned has been revised more or less but at a minimum because pit observations were not enough in number. Boundary and name soil series except for new ones were changed of Pa, EG, Mu, Mo, ERi, PN, LCr, Be, MS, EAg and Na. A new map of soil series has been thus delineated and presented in Fig. D.4.5. Table D.4.4 shows distribution of these series in terms of topography division which is compared to Fig. D.4.4. The hectarage of each series in given in Table D.4.5.

4.2.2 Typical Soil Profiles of Soil Series

Typical soil profiles for formal description were selected from the pit observations carried out in this time. These were also subjected to both field and laboratory analyses, results of which were already given from Table D.3.3 to Table D.3.10.

Descriptions of these soil profiles are arranged in the order shown below, but exclude those of new soil series:

| Soil Order | Soil Series-Pit No. |
|------------|-----------------------------------|
| Vertisol | Pa-P3, CA-P21 |
| Inceptisol | AS-P2, MU-P16, LYa-P38, LCo-P67 |
| Molisol | ERI-P9, PN-P35, RM-P7 |
| Histosol | MOch-P14, Be-P57, EAg-P30, Na-P55 |

Descriptions of the other soil series are referred from the original soil report of SEA/FAO (1976). Fig. D.4.6 (1-4) presents the columnar profiles of all soil series which will help to understand their characteristics.

PROFILE No. P3

| a. Profile No. b. Soil Name c. Date of Examination d. Location | : P3 : Vertisol, Cromudert, acuéntico, familia arcillosa fina, montmorilonitica/mixta, isohipertérmica ; Simbolo: Pa |
|---|--|
| c. Date of Examination | familia arcillosa fina, montmorilonitica/mixta, isohipertérmica ; Simbolo: Pa |
| | montmorilonitica/mixta, isohipertérmica ; Simbolo: Pa |
| | isohipertérmica ; Simbolo: Pa |
| | |
| | |
| d location | : August 22, 1985 |
| | : Rincón Molinillo, 100 m west of |
| | the road from Nagua to Aguacate. |
| | About 1.5 Km south of the |
| | junction of Samana national road |
| | at Cruce de Rincón |
| e. Elevation | : 1.5 m |
| f. Land Form and Slope | : Almost flat, very gently sloping |
| | from west to east (0 - 1%). |
| g. Vegetation and Land-use | : Pit was digged up on grassy part |
| | beside the paddy field which was |
| | being prepared for rice |
| | cultivation. |
| | |
| I. General Information on the | Soil |
| a. Parent Material | : Clayey alluvium of old Rio Yuna |
| | and a few peat |
| b. Drainage | : Well drained |
| c. Depth of Groundwater | : 113 cm from surface |
| d. Presence of Surface Sto | |
| | : None |
| e. Evidence of Erosion | : None |

Note: In profile description, figures in parenthesis which are put after compactness are index values obtained by soil hardness

tester.

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III. Profile Description

0-10 cm

А

В

С

IIC

IIIC

Dark grayish brown (10YR4/2) moist and grayish brown (10YR5/2) dry, clay; strong fine angular blocky; very sticky, friable (3) moist; many fine surface cracks at every 5 - 10 cm width; many yellow brown mottles; many fine roots; clear smooth boundary; pH 4.50 (Sample No. P3-1) Gray (5Y5/1) moist and grayish brown (10YR5/2) dry, clay; massive with large cracks at every 30 cm width; very sticky, hard (13) moist; many brown mottles (5YR3/6); common fine roots; gradual smooth boundary; pH 5.66 (Sample No. P3-2)

47-95 cm

10-47 cm

Grayish green (10BG5/1) with grayish olive (10Y3/2) parts, moist and grayish yellow (2.5Y6/3) dry, clay; massive with large cracks; very sticky, hard (12) moist; few reddish brown mottles; few fine roots; clear smooth boundary; pH 7.73 (Sample No. P3-3)

95-130 cm Grayish olive green (2.5GY4/1) moist and grayish olive (2.5Y4/1) dry, clay; weak platy with thin hemic peat layer about 1 cm thick alternatively; very sticky, hard (16) wet; no mottle; no root; gradual smooth boundary; pH 6.14 (Sample No. P3-4)

130-165 cm Dark grayish olive (7.5Y2/1) wet, silt loam; weak medium platy; slight sticky, hard (14) wet; common thin fibric peat layer alternatively; clear smooth boundary

IVC 165-200+cm Very similar to horizon above but grayish green (10BG5/1) wet, clay; very sticky Very prompt reaction of ferrous iron throughout profile, but none of carbonate and manganese.

PROFILE No. P21

| 1. | Inf | ormation on the Site | : | |
|-----|--------|-------------------------|----|---|
| | a. | Profile No. | : | P21 |
| | b. | Soll Name | : | Vertisol, Cromudert ácuico, |
| ъ. | | | | familia arcillosa, montmorillonitica, isohipertérmica; Simbolo: CA |
| | c. | Date of Examination | : | August 28, 1985 |
| | d. | Location | : | Cienega Vieja I. About 300 m |
| | | | | southeast of the road from Nagua to Arenoso. 1.2 Km northeast from junction with road along Rio |
| | | | | Yuna. |
| | е. | Elevation | : | 7.4 m |
| ÷ | f. | Land Form and Slope | : | Almost flat, very gently sloping |
| | | | | toward north (0 - 1%). |
| • | g. | Vegetation and Land-use | : | Grass land for pasture. Grasses are composed of graminae, mainly Caguai (local name). Adjacent to |
| | 1. | | | corn field and wild forests. |
| II. | Gen | eral Information on the | Sc | pil. |
| | a. | Parent Material | : | Fine clayey alluvium of Rio Yuna. |

b. Drainage : Moderately well drained

c. Depth of Groundwater : 70 cm from surface

d. Presence of Surface Stones, Others

: None

e. Evidence of Erosion : Almost

III. Profile Description

Very dark brown (10YR2/3) moist and brown Ap 0-6 cm (10YR5/3) dry, clay; strong fine subangular blocky with narrow cracks; very sticky, slightly hard (12) moist; no mottle; many fine roots; clear smooth boundary; pH 6.56 (Sample No. 21-1) Very dark gray (10YR3/1) moist and brown 6-23 cm В2 (10YR5/3) dry, clay; strong medium angular blocky with few narrow cracks every about 40 cm and clear slickensides; very sticky, hard (17) moist; common dark brown mottles; few to common fine roots; gradual smooth boundary; pH 7.13 (Sample No. 21-2) Dark gray (5Y4/1) moist and grayish brown C1 23-46 cm (2.5Y5/3) dry, clay; strong medium subangular blocky with clear slickensides; very sticky, hard (17) moist; common slight yellowish brown mottles; almost no root; gradual smooth boundary; pH 7.68 (Sample No. 21-3) Light olive brown (2.5Y4/1) moist, clay; weak C2 46-130 cm coarse platy with moderately clear slickensides; very sticky, hard moist; common slight yellowish brown mottles; no root.

Only weak reaction of manganese throughout profile.

PROFILE No. P2

•

| 1. | Information on the Site | | |
|-----|---|-----|-----------------------------------|
| | a. Profile No. | : | P2 |
| ÷ | b. Soil Name | ţ | Inceptisol, Tropacuept histico, |
| | | | familia limosa fina a arcillosa, |
| | (a) A set of the se | | écuica, mixta, isohipertérmica; |
| · | | | Simbolo: AS |
| | c. Date of Examination | : | August 22, 1985 |
| | d. Location | : | Cruce Rincón. 200 m north of the |
| | | | national road from El Pozo to |
| | | | Sanchez. Approximately 0.8 Km |
| | | | east of Cruce Rincón corner. |
| | e. Elevation | : | 2.2 m |
| | f. Land Form and Slope | : | Almost flat marshy area, very |
| | | | slightly sloping toward north (0 |
| | | • | - 1%) about 1 Km from pit |
| | g. Vegetation and Land-us | e: | Well growing grass land, mainly |
| | | | consisting of graminae species, |
| | | | about 1 m high. |
| | | • | |
| II. | General Information on the | S | oil |
| | a. Parent Material | • : | Clayey alluvium of old Rio Yuna |
| | | | and peat material |
| • | b. Drainage | : | Very poorly drained |
| | c. Depth of Groundwater | : | Almost same level as soil surface |
| | d. Presence of Surface St | on | es, Others |
| | | : | None |
| | e. Evidence of Erosion | : | None at site |

D-39

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III. Profile Description

26-42 cm

011 0-26 cm

0i2

Very dark brown (10YR2/2) wet and very dark grayish brown (10YR3/2) dry, fibrous peat with decayed timbers; no sturucture; non-sticky, soft (6) moist; no mottle; many fine roots; abrupt smooth boundary; pH 5.60 (Sample No P2-1) Very dark brown (10YR2/2) wet and black (10YR2/1) dry, sandy clay with hemic peat and decayed timbers; no structure; no mottle; slightly sticky and loose (5) wet; no reaction of carbonate and oxidized manganess but very prompt reaction of ferrous iron; few fine roots; gradual smooth boundary; pH 5.84 (Sample No. P2-2)

IIC1 42-60 cm

Grayish olive green (2.5GY4/1) wet and dark gray (10YR4/1) dry, clay with some hemic peat; massives; no mottle; sticky and slightly compact; almost no root; same reaction as above layer; gradual smooth boundary; pH 6.17 (Sample No. P2-3)

IIC2 60-90+cm

Grayish olive green (2.5GY5/1) wet and gray (10YR5/1) dry, clay with some hemic to sapric peat; no structure; no mottle; very sticky and compact; prompt ferrous iron reaction; pH 6.36 (Sample No. P2-4)

PROFILE No. P16

Information on the Site Ι.

- Profile No. а.
- Soil Name b.
- с. Date of Examination
- d. Location

- - Elevation e.
 - f. Land Form and Slope
 - g.

- : P16
 - : Inceptisol, Tropacuept histico, familia arcillosa, no-ácida, isohipertérmica.
 - Simbolo: MU
 - : August 26, 1985
 - : Los Mango de Sanchez. About 1.4 Km south of national road to Samana. Approximately 2.2 Km east of Sanchez Town. The site is nearby the railway.
 - : 1.5 m
- : Almost flat, very gently sloping to southeast 1 Km from pit. Vegetation and Land-use: Grass land nearby rice field. Main grass families are Gramineae, Cyperaceae and Leguminosae. Big Community of Canutillo is characteristic in the land.
- II. General Information on the Soil
 - : Peats of fibrous grasses and Parent Material a. timbers, and alluvial clay deposits : Imperfectly drained b. Drainage Depth of Groundwater : 70 cm from surface c. Presence of Surface Stones, Others đ. : None
 - : None Evidence of Erosion e.

0i1 0-12

Dark brown (10YR3/3) moist and brown (10YR4/3) dry, clay with fibric peat; no structure; slightly sticky, loose (7) moist; common yellowish brown mottles; abundant fine roots; clear smooth boundary; pH 7.47 (Sample No. P16-1)

012 12-33 cm

Very dark brown (10YR2/3) moist and very dark grayish brown (10YR3/2) dry, clay with fibric peats and decayed timbers; weak coarse platy; slightly sticky, slightly compact (13) moist; common coarse clay blocks; no mottle; few fine roots; abrupt smooth boundary; pH 6.68 (Sample No. P16-2)

IIC 33-170+cm

Very dark gray (10YR3/1) moist and grayish brown (2.5Y5/2) dry, silty clay with few to common sapric peat blocks; no structure; very sticky, compact (18) moist; strong reaction of ferrous iron; no root; pH 6.54 (Sample No. P16-3)

PROFILE No. P38

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| | ÷ | | | |
|-----|------|-------------------------|----|-----------------------------------|
| Ι. | Info | ormation on the Site | | |
| | a. | Profile No. | : | P38 |
| | b. | Soil Name | : | Inceptisol, Eutropept tipico, |
| | | | | familia franca mixta, no ácida, |
| | | | | isohipertérmica; |
| | t ee | | | Simbolo: LYa |
| | с. | Date of Examination | ; | September 2, 1985 |
| | d. | Location | : | Caño Gran Estero. About 30 m |
| | | | | south of the road along Bahia |
| | | | | Escocesa. Approximately 1.2 Km |
| | | | | east of the Caño mouth. |
| | е. | Elevation | : | 2 m |
| | f. | Land Form and Slope | : | Almost flat, very gently sloping |
| | | | | towards south about 500 m from |
| | | | | pit. Recent terraces developed |
| | | | | along sea coast. |
| | g. | Vegetation and Land-use | : | Grass land not used, of Gramineae |
| | | | | and Leguminosae. |
| | | · · · · · | | |
| II. | Gene | eral Information on the | Sc | oil . |
| | a. | Parent Material | ; | Coarse alluvium deposits of old |
| | | | | Rio Yuna and sea |
| | b. | Drainage | : | Poorly drained |
| | с. | Depth of Groundwater | : | 90 cm from surface |
| • | d. | Presence of Surface Sto | ne | es, Others |
| | | | : | None |
| | e. | Evidence of Erosion | : | None |
| | | | | |

| 0e_ | 0-9 cm | Very dark grayish brown (10YR3/2) moist and dark grayish brown (10YR4/2) dry, hemic peat; no |
|--------|-----------|--|
| | | structure; non-sticky, friable (5); no mottle; |
| | | many fine roots; abrupt smooth boundary; pH 8.22 |
| | | (Sample No. P38-1) |
| B1 | 9-21 cm | Grayish olive (7.5 Y4/2) moist and olive gray |
| | | (5Y5/2) dry, sand; single granular; non-sticky, |
| | | soft (7) moist; no mottle; almost no root; |
| | | abrupt smooth boundary; pH 8.94 (Sample No. |
| | | P38-2) |
| B2 | 21-41 cm | Very similar to horizon above, but gray (5Y4/1) |
| | • • | moist and olive gray (5Y5/2) dry; pH 8.88 |
| | | (Sample No. P38-3) |
| 0e | 41-52 | Very dark brown (10YR2/2) moist and dark grayish |
| | ÷ | olive (2.5Y2/2) dry, sandy loam, hemic peat; no |
| | | structure; non-sticky, slightly hard (10) moist; |
| | | abrupt smooth boundary; pH 7.12 (Sample No. |
| | | P38-4) |
| IIB | 52-145+cm | Grayish olive (2.5Y4/2) moist and grayish brown |
| | | (2.5Y5/2) dry, sandy clay loam; single granular; |
| - - | | non-sticky, hard wet; pH 7.55 (Sample No. P38-5) |
| | | Reaction of carbonate was visible throughout |
| | | profile , especially strong in second, third and |
| | | last horizons. Reaction of ferrous iron |

D-44

increased with increase in depth,

PROFILE No. P67

| т ^с | T E | | |
|----------------|---------|--|-----------------------------------|
| Ι. | | ormation on the Site | |
| | | A second s | P67 |
| . ' | b. | Soil Name : | Inceptisol, Tropept-Eutropept |
| · . | | | fluvacuéntico, familia franca |
| | | | fina, mixta, isohipertérmica; |
| ÷ | | | Simbolo: LCo |
| | C. | Date of Examination : | December 10, 1985 |
| | d. | Location : | Cruce la Cabirma, Guayabo. 100 m |
| | • | | north of Rio Yuna road, |
| | | | Approximately 300 m north west of |
| | | | junction at Cabolla with the road |
| | | | from Rincón Molinillo. |
| | e. | Elevation : | 6.6 m |
| | f. | Land Form and Slope : | Flat. The land very gently |
| | 5. 1 | | slopes toward northeast about 2 |
| | | | Km from pit. |
| t a di L | g. | Vegetation and Land-use: | Idle paddy field with abundant |
| | | | gramineae grasses (Braquiaria) in |
| | • | $\frac{1}{2} \left(\frac{1}{2} - \frac{1}{2} \right) = \frac{1}{2} \left(\frac{1}{2} - \frac{1}{2} \right) \left(\frac{1}{2}$ | good growth status. |
| | | | |
| II. | Gen | eral Information on the S | oil |
| | a. | Parent Material : | Fine alluvial particles |
| | | | transported by Rio Yuna. |
| | b. | Drainage : | Imperfectly drained |
| | c. | Depth of Groundwater : | 80 cm from surface |
| | d. | Presence of Surface Ston | es, Others |
| | • | • • • • • • • • • • • • • • • • • • • | None |

e. Evidence of Erosion : Almost none

| | Ap | 0-11 cm | Grayish olive $(7.5Y4/1)$ and dark grayish brown |
|---|------|------------|--|
| | | | (2.5Y4/2) moist, and brown (10YR4/3) dry, silty |
| | | | clay; weak coarse angular blocky with frequent |
| | | | surface cracks; very sticky and very hard (20) |
| | | | moist; no mottle; common fine roots; clear |
| | | | smooth boundary; pH 8.21 (Sample No. P67-1) |
| | A2 | 11-23 cm | Dark grayish brown (10YR4/2) moist and light |
| | | | yellowish brown (10YR6/4) dry, silty clay loam; |
| | | | weak coarse angular blocky; very sticky and very |
| | | | hard (18) moist; common brownish mottles; few |
| | | · | fine roots; gradual smooth boundary; pH 8.07 |
| , | | | (Sample No. P67-2) |
| | B1 | 23-39 cm | Very similar to above horizon but brown |
| | | | (10YR4/3) moist, clay; very hard (20) moist; |
| | | | almost no root; abrupt smooth boundary ; pH 8.13 |
| | | | (Sample No. P67-3) |
| | B2 | 39-90 cm | Very similar to above horizon but moderate fine |
| | | | granular; hard (16) moist; many reddish brown |
| | | | mottles; abrupt smooth boundary; pH 7.90 (Sample |
| | | | No. P67-4) |
| | IIC | 90-150 cm | Brown (10YR4/3) moist, sandy loam; massives not |
| | | | sticky and slight compact wet; abrupt smooth |
| | | | boundary. |
| | IIIC | 150-170cm+ | Almost similar to above horizon but loamy sand. |
| | | | |
| | | | Strong reaction was only detectable in surface |
| | | | handware with the formation during the second |

horizon with ferrous iron reagent.

| Ι. | Information on the Site | |
|-----|--|---------------------------------------|
| | a. Profile No. | : P9 |
| | b. Soil Name | : Molisol |
| ۰. | | Argiacuol vértico, familia |
| • | | arcillosa fina, mixta, |
| | | isohipertérmica; |
| | $\frac{1}{2} = \frac{1}{2} \left(\frac{1}{2} + \frac{1}{2} \right) \left(\frac{1}{2}$ | Simbolo: ERi |
| | c. Date of Examination | : August 23, 1985 |
| | d. Location | : Molinillo. 20 m south of old |
| | | railway. About 1.2 Km northeast |
| | | of Rincón Molinillo. |
| | e. Elevation | : 3.8 m |
| | f. Land Form and Slope | : Flat, very gently sloping toward |
| | | east (0 - 1%) |
| | g, Vegetation and Land- | use: Grass land, mainly consisting of |
| | | gramineae and cyperaceae species. |
| | | Adjacent fields were planted for |
| | | rice. |
| | | м. Т |
| 11. | . General Information on t | he Soil |
| | a. Parent Material | : Clayey alluvium of old Rio Yuna. |
| | b. Drainage | : Imperfectly drained |
| | c. Depth of Groundwater | : 57 cm from surface |
| | d. Presence of Surface | Stones, Others |
| | | : None at site |
| | e. Evidence of Erosion | : None |

0-8 cm

А

В

С

Dark yellowish brown (10YR3/4) moist and brown (10YR4/3) dry, clay, covered with residual plant mat 2 cm thick (not sampled); weak medium subangular blocky; very sticky, soft (7) moist; common yellowish brown mottles; many fine roots; clear smooth boundary; pH 6.49 (Sample No. P9-1) Very dark grayîsh brown (10YR3.5/2) moist and dark grayish brown (10YR4/2) dry, clay; weak medium subangular blocky; very sticky, hard (12); many reddish brown mottles; common fine roots; clear smooth boundary; pH 6.99 (Sample No. P9-2)

30-161+cm

8-30 cm

Grayish green (10GY5/1) and grayish olive (10Y5/2) moist, and brown (10YR5/3) dry, clay; almost massive; very sticky, hard (12) moist; common fine dark reddish brown mottles (5YR2/4); no roots; pH 8.31 (Sample No. P9-3)

Manganese reaction was clear to weak from surface to last horizon, while strong reaction of ferrous iron was observed throughout profile.

| Ι. | Information on the Site | |
|---------|------------------------------|-------------------------------------|
| | a. Profile No. | : P35 |
| | b. Soil Name | : Molisol, Haplacuol histico, |
| · · · · | | familia arcillosa fina, mixta |
| • | | isohipertérmica. |
| · | | Simbolo: PN |
| | c. Date of Examination | : August 30, 1985 |
| | d. Location | : El Pelao, El Aguacate. 50 m east |
| | | of the road from El Aguacate |
| | | junction. Approximately 2 Km |
| | e and state for the | east of El Aguacate. |
| | e. Elevation | : 4.8 m |
| | f. Land Form and Slope | : Almost flat, very gently sloping |
| | | towards south $(0 - 1\%)$. |
| .1 | g. Vegetation and Land-us | e: Rice field under preparation for |
| | | planting. |
| 2 | | |
| 11. | . General Information on the | Soil |
| | a. Parent Material | : Fibrous peat and clayey alluvium |
| - | | of old Rio Yuna |
| | b. Drainage | : Moderately well drained |
| | c. Depth of Groundwater | : 74 cm from surface |
| | d. Presence of Surface St | ones, Others |
| | | : None |
| | | |

e. Evidence of Erosion : None

| - | | |
|-----|-----------|--|
| 0al | 0-8 cm | Black (10YR2/1) moist and very dark grayish |
| | | brown (10YR3/2) dry. sapric peat and silty clay |
| | , | loam; strong fine granular; slightly sticky, |
| | | friable (6) moist; no mottle; many fine roots; |
| | | clear smooth boundary; pH 5.72 (Sample No. |
| | | P35-1) |
| 0e2 | 8-17 cm | Black (10YR2/1) moist and dark grayish brown |
| | | (10YR4/2) dry, hemic peat and clay; weak coarse |
| | | subangular blocky; slihgtly sticky, soft (7) |
| | | moist; few dark brown mottles; few fine roots; |
| | | abrupt smooth boundary; pH 5.72 (Sample No. |
| | | P35-2) |
| IIC | 17-107+cm | Grayish olive green (7.5GY5/1) moist and dary |
| | | gray (5Y4/1) dry, clay with some fibric peat; no |
| | | structure (massive); very sticky, compact (18) |
| | | moist; common brown mottles; few decayed |
| | | timbers; strong reaction of ferrous iron, almost |

no root; pH 5.92 (Sample No. P35-3)

| I. | Inf | ormation on the Site | | |
|--------------|--|-------------------------|----|-----------------------------------|
| | а. | Profile No. | 1. | P7 |
| • | Ъ. | Soil Name | ; | Molisol, Hapludol tipico, familia |
| | A C | | | franca fina, mixta, |
| | | | | isohipertérmica; |
| | an an an an an an an an an an an an an a | | | Simbolo: RM |
| | с. | Date of Examination | : | August 23, 1985 |
| | d. | Location | : | San Rafael, Rincón Molinillo. 70 |
| | | | | m east of the road from Nagua to |
| | | | | R.Molinillo, About 2.5 Km south |
| · · | | | | of the junction of Samana road at |
| . " | | | | Cruce de Rincón. |
| - | е. | Elevation | : | 2.5 m |
| | f. | Land Form and Slope | : | Almost flat, very gently sloping |
| | | | | toward south. |
| | g | Vegetation and Land-us | e: | Cacaos, 50 years old, shadowed by |
| | · . | | | tall natural trees (Jabilla). |
| • : | | | | |
| II. | Gen | eral Information on the | S | 011 |
| | а. | Parent Material | ; | Alluvium of old Rio Yuna. |
| | b. | Drainage | : | Well drained |
| | с. | Depth of Groundwater | : | Unknown but certainly more than |
| • | | | | 1.5 m, no influence on profile |
| н 1. т. ж | d. | Presence of Surface Sto | on | es, Others |
| | | | : | None at site |
| | e. | Evidence of Erosion | ; | None |
| | .t., | | | |
| | | · . | | |

| A1 | 0-7 cm | Dark grayish brown (7/5YR2/2) moist and brown |
|------|-----------|--|
| | | (10YR4/3) dry, clay; moderate fine granular; |
| | | sticky, friable (9) moist; no mottle; slight |
| | | hemic; common fine roots; clear smooth boundary; |
| | | pH 6.6 (Sample No. P7-1) |
| A2 | 7-46 cm | Dark brown (10YR3/3) moist and yellowish brown |
| | | (10YR4/3) dry, sandy loam; moderate coarse |
| | | subangular blocky; sticky, very hard (18) moist; |
| | | few yellowish brown mottles; many slickensides; |
| | | few to common fine roots; gradual smooth |
| | | boundary; pH 6.8 (Sample No. P7-2) |
| IIC | 46-93 | Dark yellowish brown (10YR4/4) moist and |
| | | yellowish brown (10YR5/4) dry, clay loam; |
| | | moderate coarse blocky or massive; very sticky, |
| | | extremely hard (23) moist; many yellowish brown |
| | | mottles; no root; gradual smooth boundary; pH |
| | | 6.9 (Sample No. P7~3) |
| IIIC | 93-162+cm | Dark yellowish brown (10YR3/4) moist, sandy |
| | | loam; massive; non sticky, very hard moist; |
| | | common mottles. |
| | | |

Only slight reaction of manganese throughout profile

D~52

| I. Information on the Site | |
|--------------------------------|-------------------------------------|
| a. Profile No. | : P14 |
| b. Soil Name | : Histosol, Tropohemist, familia |
| | eúica, isohipertérmica; |
| | Simbolo: MOch |
| c. Date of Examination | : August 26, 1985 |
| d. Location | : Milla Cinco, Sanchez. 20 m north |
| | of the old railway. |
| | Approximately 7.2 Km west of |
| | Sanchez Town along the railway. |
| e. Elevation | : 1.3 m |
| f. Land Form and Slope | : Almost flat, gently sloping |
| | towards north about 2 Km from |
| | pit. |
| g. Vegetation and Land-us | e: Grass land with developing peat. |
| | Grasses are composed of tall |
| | gramineae, Cyperaceae and |
| | Alismataceae species. |
| | |
| II, General Information on the | Soil |
| a. Parent Material | : Peat developed on old lagoon |
| | inside of Bahia Samana, |
| | consisting mainly of fibrous |
| | grass materials. |
| b. Drainage | : Very poorly drained |
| c. Depth of Groundwater | : 0 cm, same level as peat surface |
| d. Presence of Surface St | ones, Others |
| | : None |
| e. Evidence of Erosion | : None |
| | |

| 0 i 1 | 0-10 cm | Very dark brown (10YR2/3) wet and very dark |
|--------------|------------|--|
| | | brown (10YR2/2) dry, fibric peat; no structure; |
| | - · · | non-sticky, friable wet; abundant fine to medium |
| | | roots; clear smooth boundary (Not sampled) |
| 0e2 | 10-40 cm | Dark brown (6.5 YR2/1) wet and black (10YR2/1) |
| | | dry, hemic peat; no structure; non-sticky, soft |
| | | wet; many fine roots; clear smooth boundary; pH |
| | | 5.77 (Sample No. P14-2) |
| 013 | 40-180 cm | Very similar to horizon above but fibric peat; |
| | • • • | many decayed roots; pH 5.84 (Sample No. P14-3) |
| 0 i 4 | 180-270 cm | Very similar to horizon above but very dark |
| 1 A. | | brown (10YR2/3) wet and very dark gray (10YR3/1) |
| | | dry; no root; pH 5.32 (Sample No. P14-4). |
| IIC | 270-300+cm | Dark gray (10YR4/1) wet, silty clay; massive; |
| | | very sticky, compact; |
| | | |

Throughout profile no reaction of carbonate and manganese but apparent reaction of ferrous iron, the deeper the stronger.

| Ι. | Inf | ormation on the Site | |
|-----|---------|---------------------------|-----------------------------------|
| | a. | Profile No. : | Р56 |
| | b. | Soil Name : | Histosol Trophemist térrico, |
| | | | familia eúica, isohipertérmica; |
| | · · | | Simbolo: Be |
| | c. | Date of Examination : | December 6, 1985 |
| | d. | Location : | Aguacate, Aguacate. 1 Km |
| | | | southwest of Aguacate village. |
| | 14 J. 1 | | 50 m west of the road to Arenoso. |
| | e. | Elevation : | 7.4 m |
| | f. | Land Form and Slope : | Almost flat, very gently sloping |
| | | | toward south (0 - 1%) |
| | g. | Vegetation and Land-use: | Grass land in very poor growth. |
| | | | Rice fields are developed nearby. |
| | | | |
| 11. | Gen | eral Information on the S | oil |
| | a, | Parent Material : | Clayey alluvium of Rio Yuna and |
| | | | peat |
| : | b. | Drainage : | Poorly drained |
| | c. | Depth of Groundwater : | 65 cm from surface |
| | d. | Presence of Surface Ston | es, Others |
| | | : | None |
| | e. | Evidence of Erosion : | NOne |

,

D--55

| 0e1 | 0-6 cm | Dark brown (7.5YR2/3) dry and very dark brown |
|-------|------------|--|
| | | (10YR2/2) moist, hemic peat; non sticky, loose |
| | | (6); no mottle; many fine roots; abrupt smooth |
| | | boundary; pH 3.63 (Sample No. P57-1) |
| 0e2 | 6-24 cm | Very similar to horizon above but hemic peat; |
| | | few fine roots; abrupt smooth boundary; pH 3.75 |
| | | (Sample No. P57-2) |
| 013 | 24-35 cm | Dark yellowish brown (7.5YR3/4) dry and dark |
| | | brown (7.5YR3/2) moist, fibric peat; non sticky, |
| | | loose (8); no root; abrupt smooth boundary; pH |
| | | 5.53 (Sample No. P57-3) |
| C1 | 35-93 cm | Dark gray (5Y4/1) dry and grayish olive |
| | | (7.5Y3/1) moist, clay; massive; very sticky, |
| | | slightly hard (12) moist; many red brown mottles |
| | | (5YR4/6); gradual smooth boundary; pH 5.97 |
| н | | (Sample No. P57-4) |
| IIC | 93-115 cm | Grayish green (10GY4/1) moist, sandy clay loam; |
| | | massive; sticky, slightly hard; no mottle; wavy |
| | | smooth boundary (Not sampled) |
| 0e4 | 115-133 cm | Dark yellowish brown (7.5YR2/3) moist, hemic and |
| | | fibric peat; non sticky, slightly hard; no |
| | | mottle (Not sampled) |
| | | |

Only ferrow iron was detected, the deeper horizon the stronger.

| 1. A. | | | | |
|-------|-------|-------------------------|----|--------------------------------------|
| Ι. | Inf | ormation on the Site | | |
| | a. | Profile No. | : | P30 |
| • | b, | Soil Name | ; | Histosol, Tropohemist tipico, |
| .* | | | | familia eúica, isohipertérmica; |
| | | | | Simbolo: EAg |
| | c, | Date of Examination | ÷ | August 29, 1985 |
| | d. | Location | : | Arenoso, Aguacate. 100 m east of |
| · . | i di | | | the Loma remanente, Arenoso. |
| ÷ | 14 g. | | | Approximately 1 Km northeast of |
| | | | | Arenaso Twon. |
| | e. | Elevation | : | 8 m |
| | f. | Land Form and Slope | : | Almost flat, very gently sloping |
| ÷. 4. | | | | towards east $(0 - 1\%)$ about 500 m |
| | | | | from pit. |
| | g. | Vegetation and Land-use | | Grass land with developing peat. |
| | | | | Grasses are composed of tall |
| | • | | | Gramineae and Cyperaceae species |
| | | | | (Enea). |
| | 1.1 | | | |
| II. | Gen | eral Information on the | Se | pil |
| | a. | Parent Material | : | Peat of fibrous grass origin. |
| | Ъ. | Drainage | : | Very poorly drained |
| | c, | Depth of Groundwater | : | 65 cm from surface |
| | d. | Presence of Surface Sto | me | es, Others |
| | • | | | None |

e. Evidence of Erosion : None

.

| 0e1 | 0-23 cm | Very darkbrown (10YR2/2) moist and very dark |
|-----|------------|--|
| | | brown (10YR2/2) dry, hemic peat; weak coarse |
| | | blocky; non-sticky, slightly hard (11) moist; |
| | | many fine roots; gradual smooth boundary; pH |
| | | 6.64 (Sample No. P30-1) |
| 0e2 | 23-50 cm | Very dark brown (10YR2/3) moist and black |
| | | (10YR2/1) dry, hemic peat; weak coarse blocky; |
| | | non-sticky, soft (7) moist; no mottle; few fine |
| | | root; clear smooth boundary; pH 6.11 (Sample No. |
| | · · · · | P30-2) |
| 0i3 | 50-118 cm | Dark yellowish brown (10YR3/4) moist and very |
| | | dark brown (10YR2/2) dry, fibric peat; no |
| : | • • | structure; non-sticky; soft (7) wet; not root; |
| | | pH 6.21 (Sample No. P30-3) |
| IIC | 118-130+cm | Grayish olive green (7.5GY4/1) wet, clay; almost |
| | | massive; very sticky. slight compact; no mottle; |
| | | no root. |
| | | |

Only ferrous iron reaction was found below the third horizon.

| Ι. | Inf | ormation on the Site | | |
|----------|-------|-------------------------|-----|----------------------------------|
| | 4 j | Profile No. | : | P55 |
| | b. | Soil Name | : | Histosol Troposaprist térrico, |
| | | | | familia arcillosa, eúica, |
| | | | | isohipertérmica; |
| | | | | Simbolo: Na |
| | с. | Date of Examination | ; | December 6, 1985 |
| | d. | Location | : | El Pelao, Aguacate. 3 Km |
| | : | | | northeast of Aguacate village. |
| | ÷., • | | | 300 m west of the road to Cruce |
| | • . | | | de Rincón. |
| | e. | Elevation | : | 4.6 m |
| | f. | Land Form and Slope | : | Almost flat, very gently sloping |
| · . | • | | | toward east (0 - 1%) |
| | g. | Vegetation and Land-use | 2: | Paddy field. Local variety, |
| | | | | Ingles in good growth, just |
| | : | | | before heading. |
| | | | | |
| 11. | Gen | eral Information on the | S | oil |
| | a. | Parent Material | : | Clayey alluvium of old Rio Yuna |
| · · · | | | | and peat |
| | ь. | Drainage | : | Poorly drained |
| | c. | Depth of Groundwater | : | 10 cm from surface |
| • | d. | Presence of Surface Sto | one | es, Others |
| | | | : | None |
| | e. | Evidence of Erosion | ; | None |

Very dark grayish brown (10YR3/2) dry and black 0-14 cm 0a1 (10YR1.5/1) moist, silt loam; non structure and sapric peat; slightly sticky and loose (7) wet; no mottle; many fine roots; clear smooth boundary; pH 5.57 (Sample No. P55-1) Dark yellowish brown (10YR3/4) dry and black 14-31 cm 0a2(10YR2/1) moist, silt loam; non structure and sapric peat; slightly sticky and loose (8) wet; few fine roots; abrupt smooth boundary; pH 6.27 (Sample No. P55-2) C1 Very similar to horizon above but olive gray 31-49 cm (5Y5/2) moist, clay; very sticky; no root; pH 5.98 (Sample No. P55-3) Very dark grayish brown (10YR3/2) dry and very 49-134 cm 014 dark brown (10YR2/2) moist, loam; non structure and fibric peat; slightly sticky and soft; abrupt smooth boundary; pH 5.39 (Sample No. P55~4) Grayish olive (10Y5/1) moist, clay; non IIC 134-150cm+ structure; very sticky and slight compact (Not sampled)

Very strong reaction of ferrous iron with chemical reagent throughout profile, but non of carbonate and manganese.

4.2.3 Descriptions of New Soil Series

Four new soil series, Yab, LM, AB and ECa named after the site where each of them was first observed, were added to complete soil map of the study area.

These are soils developed on limestone and classified into Inceptisol since they do not have any decisive diagnostic horizon to be compiled in the other soil orders. All of them occur on the northeastern piedmont areas, Cordillera, and on the southwestern monadnocks, Yabacoa, whose geological origin is largely composed of limestones of tertiary miocene.

The soil profile differs each other due probably to the differences in mineral composition and progress of weathering under specific climatic condition. According to the results of survey and analysis, these soil series can be characterized as follows:

| Soil | Texture | | | | Base |
|--------|-------------------|--------------------|--------------------|---------|----------------|
| Series | (Upper) (30cm) | (Lower) (<30cm) | Diagnostic Horizon | рН | Saturation (%) |
| Yab | SiCL-C | SiC | Mollic A horizon | 8.0-8.8 | > 50 |
| LM | SiC-C | C* | Umbric A horizon | 5.0-6.0 | < 50 |
| AB | SiCL-C | С | Cambic B horizon** | 4.5-5.0 | < 50 |
| ECa | SL-SCL | L-C | Umbric A horizon | 4.3-5.0 | < 50 |

Note: * - With many debrises of weathered limestone.

** - Occasionally with hard or soft manganese concretions.

Yab occurs on dissected hilly areas in high elevation more than 25 m, followed by LM and AB on lower undulating areas. ECa appearing on the lowest piedmont areas less than 20 cm in elevation is over-laid by sandy layer which is presumably alluvial origin transported in the past. Although different in texture and reaction, the latter three series are commonly underlaid by thick clay horizon with many reddish brown mottles. Although the diagnostic horizons are not so distinct, Yab is classified in Eutropept tipico, and the other three series are grouped into Dystropept tipico.

Profile descriptions are arranged from the next page in the order below:

Yab: P63; LM: P18, P41; AB: P42; ECa: P43, P46, P50

Most of these profiles are supplemented with data of the laboratory analysis. (Refer to Tables D.3.7 - D.3.9.)

| Ι. | Inf | ormation on the Site | |
|-----|-----|---------------------------|-----------------------------------|
| · | a. | Profile No. : | P63 |
| .* | b. | Soil Name : | Inceptisol, Tropept-Eutropept |
| | | | típico, familia franca fina, |
| | | | isohipertérmica; |
| | | | Simbolo: Yab |
| | c. | Date of Examination : | December 10, 1985 |
| | d. | Location : | Yabacoa, Aguacate. 300 m east of |
| | | | the road (Arrove Arenosito). |
| | | | Approximately 3Km north of |
| | | | Arenoso Village, Provincia |
| | ÷., | | Duarte, |
| | e. | Elevation : | 25 m |
| | f. | Land Form and Slope : | Remnant hill sloping toward east |
| | | | (about 25%) for 100 m. Pit was |
| | | | made at the middle of hill. |
| | g. | Vegetation and Land-use: | Pasture dominantly with gramineae |
| | | | grasses (Yabagua) in not so good |
| ÷., | | | growth status |
| | . * | | |
| 11. | Gen | eral Information on the S | oil |
| | а. | Parent Material : | Weathered limestones, mudstones |
| | | · · | and conglomerates of tertiary |
| | b. | Drainage : | Well drained |
| | с. | Depth of Groundwater : | Unknown but probably more than 5 |
| | | | m from surface |
| | d. | Presence of Surface Ston | es, Others |
| | | : | Some pebbles of limestone and |
| | | | mudstone |
| | e. | Evidence of Erosion : | Sheet erosion under heavy |
| | · | | rainfall |

Very dark grayish brown (2.5Y3/2) moist and very А 0-23 cm dark grayish brown (10YR3/2) dry, clay; strong fine subangular blocky; sticky and very hard (20) moist; no mottles many fine roots; clear smooth boundary; pH 8.18 (Sample No. P63-1) Dark grayish brown (2.5Y4/2) moist and grayish AB1 23-41 cm brown (2.5Y5/3) dry, clay; moderate medium subangular blocky; sticky and extremely hard (23) moist; common pale yellow mottles (2.5Y8/4); common fine roots; gradual smooth boundary; pH 8.42 (Sample No. P63-2) B2 41-56 cm Pale yellow (2.5Y8/4) and dark grayish brown (2.5Y4/2) moist, and light gray (2.5Y7/3) dry, silty clay; weak medium angular blocky; sticky and extremely hard (24) moist; few weathered small limestones (2 - 7 cm); few fine roots; gradual smooth boundary; pH 8.48 (Sample No. P63-3) Pale yellow (2.5Y8/4) moist and pale yellow С 56-100 +cm

(2.5Y8/4) dry, silty clay; massive; common weathered limestones (5 - 10 cm); sticky and extremely hard (25); no root; pH 8.60 (Sample No. P63-4)

Throughout profile strong effervescence was observed with 10% HCl solution, and very weak reaction with manganese reagent.

| Ι. | Inf | ormation on the Site | | |
|-----|---------|-------------------------|----|-----------------------------------|
| | a. | Profile No. | : | P18 |
| | b. | Soil Name | : | Inceptisol, Tropept-Dystropept |
| | 11 - | | | tipico, familia arcillosa muy |
| | 1 | | | fina, mixta isohipertérmica; |
| | | | | Simbolo: LM |
| | c. | Date of Examination | : | August 26, 1985 |
| | d. | Location | : | La Majagua de Sanchez. 50 meters |
| | | | | south of the national road. |
| | | | | Approximately 9 Km west from |
| | | | | Sanchez, Samana Province. |
| | e. | Elevation | : | 25 m |
| | f. | Land Form and Slope | : | Undulating mountain foot. Land |
| | | | | slopes gently (2 - 6%) downward |
| | | | | to south about 20 m from pit. |
| | g. | Vegetation and Land-us | e: | Coconut and grass land, in fairly |
| | • | | | good growth. |
| • | | | | |
| II. | Gen | eral Information on the | S | oil |
| | a. | Parent Material | : | Apparently derived 'in situ' from |
| | | | | deeply weathered limestones. |
| | | | | (residium) |
| | b. | Drainage | : | Moderately well drained |
| | ċ. | Depth of Groundwater | : | Unknown, but certainly more than |
| | | | | 2 m, no influence on profile. |
| | d. | Presence of Surface St | on | es, Others |
| | | | • | None |
| | e. | Evidence of Erosion | : | None at site, but slight sheet |
| | | | | erosion in adjacent area. |
| | | | | |

A1 0-5 cm

5-8 cm

8-70 cm

70-130 cm+

Yellowish brown (10YR4/4) moist and yellowish brown (10YR5/4) dry, clay; moderate medium subangular blocky; very sticky, hard (13) moist; no mottle; frequent fine root; clear smooth boundary; pH 6.0 (Sample No. P18-1) Yellowish brown (10YR4/6) moist and brown (10YR5/3) dry, clay; moderate medium subangular blocky; very sticky, hard (17) moist; few yellowish mottles; common fine roots; clear smooth boundary; pH 6.0 (Sample No. P18-2) Brownish yellow (10YR6/6) moist and yellow (10YR7/8) dry, clay; almost massive; very sticky, very hard (22) moist; many yellowish red (5YR5/6) mottles; few to no fine roots; clear smooth boundary; pH 5.3 (Sample No. P18-3) Yellow (10YR7/6) moist, clay; massive; very sticky, extremely hard (23) moist; few dark brown mottles (manganese); few small shell pieces (2 - 5 mm) and few black decayed organic matter; no root (Not sampled)

No visible effervescence with HCl solution except for shell pieces in C horizon.

D--66

A2

B2

Ç

| 1. | Inf | ormation on the Site | | |
|-----|-----|-------------------------|----|-----------------------------------|
| | a. | Profile No. | : | P41 |
| | b. | Soil Name | : | Inceptisol Tropept-Dystropept |
| | 1. | | ÷ | tipico, familia arcillosa muy |
| | | | | fina, mixta isohipertérmica; |
| | | | | Simbolo: LM |
| | c, | Date of Examination | : | September 2, 1985 |
| | đ. | Location | : | Los Mangos, Sanchez. 300 m south |
| | | | | of national road. Approximately |
| | | | | 2.5 Km west from Sanchez, Samana |
| | | | | Province. |
| | е, | Elevation | : | 23 m |
| | f. | Land Form and Slope | : | Rolling hills. Land slopes |
| | | · · · · · | | toward southwest (6 - 12%) about |
| | | | | 50 m from pit. |
| | g. | Vegetation and Land-use | e: | Coconut field including few cacao |
| 2 | | : | | and plantains. Grasses consist |
| | | | | of Gramineae and Cyperaceae |
| | | | | species. |
| | | | | |
| II. | Gen | eral Information on the | S | oil |
| | a. | Parent Material | : | Presumably derived weathered |
| | | | | . . |

.

| | · · · · · · · · · · · · · · · · · · · | limestones |
|----|---------------------------------------|------------------------------------|
| b. | Drainage | : Well drained |
| c. | Depth of Groundwater | : Unknown, but certainly more than |
| | | 4 m, no influence on profile. |
| d. | Presence of Surface St | cones, Others |
| | | : None |
| e. | Evidence of Erosion | : Slight gully erosion under heavy |
| | | |

rain fall in the wet season.

Very dark brown (10YR2/2) moist and brown A 0-13 cm (10YR4/3) dry, silty clay loam; strong medium angular blocky; very sticky, hard (15) moist; no mottle; many fine roots; abrupt smooth boundary. 13-25 cm Dark yellowish brown (10YR3/4) moist and В yellowish brwon (10YR5/5) dry, silty clay; weak coarse angular blocky; very sticky, very hard (20); no mottle; few fine roots; clear smooth boundary, С 25-89+cm Yellowish brown (10YR4/6) moist and very pale brown (10YR7/4) dry, clay; almost massive; very sticky, very hard (21) moist; no mottle but very weak manganese reaction with chemical reagent; almost no root.

| Ι. | Inf | ormation on the Site | | |
|-----|-----|---|----|-----------------------------------|
| | а. | Profile No. | 1 | P42 |
| • • | Ъ. | Soil Name | : | Inceptisol Tropept-Dystropept |
| | | | | tipico, familia arcillosa, |
| | | | | concretiones de manganeso, |
| | | | | isohipertérmica; |
| | | | | Simbolo: AB |
| | c. | Date of Examination | : | September 2, 1985 |
| | d. | Location | : | Agua Buena de Sanchez. 300 m |
| | | | | south of the national road. |
| · | | | | Approximately 6 Km west from |
| | | galan tanàna dia kaominina dia kaominina. Ny INSEE dia mampikambana mampikambana amin'ny fisiana amin'ny fisiana amin' amin' amin' amin' amin' amin' amin' | | Sanchez, Samana Province. |
| | e. | Elevation | : | 23 m |
| | f. | Land Form and Slope | : | Undulating hill slope. Land |
| | : | | | slopes toward southwest (3 - 7%) |
| | | | | about 100 m from pit. |
| | g. | Vegetation and Land-us | e: | Coconut and grass land. Grasses |
| • | | the second second second second second second second second second second second second second second second s | | are mainly Granineae, Cyperaceae |
| | | | • | and Legeminosae species. |
| | | | | |
| II, | Gen | eral Information on the | Se | oil |
| | a. | Parent Material | : | Apparently derived 'in situ' from |
| | | | | deeply weathered limestones. |
| • ; | Ъ. | Drainage | ť | Well drained |
| | с. | Depth of Groundwater | : | Unknown, but certainly more than |
| | | | | 4 m, no influence on profile. |
| | d, | Presence of Surface St | on | es, Others |
| | | | : | None |
| | e, | Evidence of Erosion | : | None at site, but slight sheet |
| | | | | erosion in adjacent area. |
| | | | | |

0-17 cm

¥.

В

17-34 cm

Reddish brown (5YR4/4) moist and yellowish brown (7.5YR4/6) dry, silty clay; strong fine granualr; slight sticky, very hard (21) moist; no mottle, many spherical manganese concretions (4-5 m); frequent fine roots; abrupt smooth boundary; pH 5.03 (Sample No. P42-1) Yellowish red (5YR4/8) moist, yellowish red (5YR5/8) dry, clay; moderate fine to coarse subangular blocky; very sticky, very hard (21); no mottle, common spherical manganese concretions (4-5 mm); few fine and medium roots; clear smooth boundary; pH 4.90 (Sample No. P42-2)

C1 34-60 cm

Reddish yellow (7.5YR6/8) and yellowish red (5YR4/8) moist, and reddish yellow (7.5YR6/8) dry, clay; massive; very sticky, very hard (22) moist; no mottle; no concretion; few medium root; clear smooth boundary; pH 4.45 (Sample No. P42-3)

C2 60-80+cm

Reddish yellow (7.5YR6/8) moist and reddish yellow (7.5YR6/8) dry, clay; massive; very sticky, very hard (22); common reddish brown mottles; no root; pH 4.44 (Sample No. P42-4)

No reaction with chemical reagents was detected throughout profile.

Information on the Site 1. : P43 Profile No. a. Soil Name ь. : Inceptisol Dystropept tipico, familia arenoso a franca, mixta, isohipertérmica; Simbolo: ECa Date of Examination : September 2, 1985 c. : El Catey, Sanchez. 100 m north d. Location of national road. Approximately 10.2 Km west from Sanchez, Samana Province. : 18 m Elevation e. : Undulating hills. Land slopes f. Land Form and Slope toward southwest (3 - 7%) about 50 m from pit. Vegetation and Land-use: Conconut field. Grasses are g. mainly Gramineae and Cyperaceae species. II. General Information on the Soil : Coarse alluvial deposits on Parent Material a. weathered limestone materials : Well drained Drainage Ъ. : Unknown but certainly more than Depth of Groundwater с. 3m Presence of Surface Stones, Others đ. : None : Slight sheet erosion under heavy Evidence of Erosion e. rainfall in wet season.

A1 0-15 cm Very dark grayish brown (10YR3/2) moist and brown (10YR5/3) dry, loamy sand; weak medium subangular blocky; not sticky, slightly hard (11) moist; no mottle but few black soil particles; many fine roots; clear smooth boundary
A2 15-38 cm Dark yellowish brown (10YR3/4) moist and wellowish brown (10YR5/4) dry loamy sand; we

yellowish brown (10YR5/4) dry, loamy sand; weak medium subangular blocky, not sticky, hard (16) moist; no mottle; few fine and medium roots; clear smooth boundary.

B2 38-59 cm

IIC

59-98+cm

Light yellowish brown (10YR6/4) moist and very pale brown (10YR7/4) dry, sandy loam; massive; not sticky, very hard (18) moist; no mottle; very few roots; abrupt smooth boundary. Yellow (10YR7/6) and brown (10YR5/3) moist and yellow (10YR8/6) dry, silty clay; massives; very sticky, very hard (22); many yellowish brown mottles; no root.

No visible reaction with chemical reagents throughout profile.

| | a. | Profile No. | : | P46 |
|-----|-------------|-------------------------|----|----------------------------------|
| • • | b. | Soil Name | : | Inceptisol Dystropept tipico, |
| · | | | | familia arenosa a franca, mixta, |
| | . * | | | disica, isohipertérmica; |
| | | | | Simbolo: ECa |
| | c. | Date of Examination | : | September 3, 1985 |
| | d . | Location | : | El Catey, Sanchez. About 1 Km |
| | н 1 с. 1 | | | south of national road. |
| | | · · · · · | | Approximately 10 Km west from |
| | | | | Sanchez, Samana Province. |
| | е. | Elevation | : | 17 m |
| | f. | Land Form and Slope | : | Undulating hills. Land slopes |
| | | | | towards northeast (2 - 5%) about |
| | | | | 200 m from pit |
| | g. | Vegetation and Land-use | e: | Peanut field, growing moderately |
| ÷ | | | | good. Spraying weedicide |
| | · | | | (Paraguay) on fallow field at |
| | | | | time of examination. |
| | | | | |
| I. | Gen | eral Information on the | S | 011 |
| | a. | Parent Material | : | Coarse alluvial deposits on |
| | | | | weathered limestone materials. |
| | Ъ. | Drainage | : | Moderately well drained |
| | c. | Depth of Groundwater | : | 83 cm from surface |
| | d . | Presence of Surface Sto | 5n | es, Others |
| | | | : | None |
| | e. | Evidence of Erosion | : | Slight sheet erosion under heavy |
| | | | | railfall. |