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Field Observations and Laboratory Analyses of Upland Soils in Thailand

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Tropical Agriculture Research Center
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FIELD OBSERVATIONS AND LABORATORY ANALYSES OF UPLAND SOILS IN THAILAND

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Preface

The morphological characteristics of soil profiles and the physical and chemical characteristics of soils are very important, as an indicator of productivity of agricultural land. This information about soil characteristics is actually utilized for soil amendment and improvement of fertilizer application. Although some literature is available on the physical and chemical characteristics of upland soils in limited areas of Thailand, little work has been done with respect to field observations and analytical data on upland soils in the whole country. This publication is the outcome of field observations and laboratory analyses of upland soils selected in 137 upland sites belonging to various great soil groups in Thailand. The present work was conducted during the senior author's stay in Thailand for two years from September 1973 to August 1975, under the cooperative research work program between the Department of Agriculture of Thailand and the Tropical Agriculture Research Center of Japan.

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Methods of Profile Description and Laboratory Analyses

1. Methods of examination of the profile pit

During the field studies at the selected sites, a pit one meter deep, wherever possible, was dug so that the soil profile could be examined. Profile examination was undertaken for the following items.

1) General information on the site.

(1) Date of examination.

(2) Location.

(3) Land form.

To provide an understanding of the situation of the profile, it is necessary to describe its position and the form of the surrounding land. The following terms are used:

a. Physiographic position.

Foot of mountain, steep land, hill, terrace, stream levee, plain, beach, etc.

b. Surrounding land form.

Flat or almost flat	Slopes not steeper than 2%.
Undulating	Steepest slopes between 2 and 8%.
Rolling	Steepest slopes between 8 and 16%.
Hilly	Steepest slopes between 16 and 30%, the range of elevation being moderate.
Steeply dissected	Steepest slopes above 30%, the range of elevation being moderate.
Mountainous	Topography shows great variations in elevation.

Where there are any natural or artificial forms of microtopography, they should be described. For example, gilgai, terracing, levees (natural or artificial), etc.

(4) Land use or vegetation.

Vegetation should be described in simple terms. If the land is in use, the nature of the use should be indicated. In the case of farmland, the major crops should be listed and as much information as possible given on methods of soil management, use of fertilizer, rotation, yield, etc.

2) General information on the soil.

(1) Parent materials.

This item should include information on the origin of the parent material and, where possible, on the nature of parent rock. For example, colluvial material derived from granitic rocks, residual material derived from basalt, calcareous alluvia of the flood plain, etc.

(2) Drainage condition

The following definition for soil drainage classes is used. Drainage classes are estimated by judging ground water level, topography, existence of compact layer, soil texture, development of soil structure. etc. More exact determination of this property requires actual physical measurements.

Very poorly drained: Water is removed from the soil so slowly that the water table remains at or on the surface, most of the time.

Poorly drained: Water is removed so slowly that the soil remains wet for a long period of time. The water table is commonly at or near the surface during a considerable part of the year.

Imperfectly drained: Water is removed from the soil slowly enough to keep it wet for a long period of time but not all the time.

Moderately well drained: Water is removed from the soil somewhat slowly, so that the profile is wet for a short period of time.

Well drained: Water is removed from the soil readily but not rapidly.

Somewhat excessively drained: Water is removed from the soil rapidly.

Excessively drained: Water is removed from the soil very rapidly.

3) Soil profile description.

(1) Thickness and boundary of soil horizons.

a . Identification of soil horizons.

At first the soil profile is divided into different horizons by means of any visible characteristics. Individual soil horizons identified are designated according to the ABC system of horizon nomenclature.

b . Boundary.

Boundary is recorded according to the clarity as follows:

Abrupt ·····Changing with 1 cm width.
Clear ·····Changing 1 to 3 cm width.
Gradual ·····Changing 3 to 5 cm width.
Diffuse ·····Changing over 5 cm width.

Shapes of boundary may be described as "smooth", "wavy" or "irregular".

(2) Soil texture.

For the determination of the textural classes in this study, the soil textural classification system of the International Society of the Soil Science (ISSS) is adopted, using the data of the size of soil particles divided into three fractions by means of Bouyoucos' hydrometer method[2].

(3) Gravel.

The absence or presence, size, quantity, shape, the degree of weathering of gravel and stones larger than 2 mm in diameter and/or kind of rock if possible are recorded.

a . Size.

Very fine ·····Less than 0.5cm in the longest diameter.
Fine ·····0.5 to 2 cm in the longest diameter.
Medium ·····2 to 10 cm in the longest diameter.
Coarse ·····More than 10 cm in the longest diameter.

b . Quantity. (on the basis of exposed surface)

Few·····Less than 5%.
Common ·····5 to 10%.
Many ·····10 to 20%.
Abundant ·····20 to 50%.
Gravel layer·····More than 50%.

(4) Humus.

When the laboratory results are available, humus contents are divided into the following four classes:

Less than 2% ·····None
2 to 5% ·····With some humus (dark gray in color)
5 to 10% ·····Rich in humus (very dark color)
10 to 20% ·····Very rich in humus (black in color)
More than 20% ·····Humus soil (deep black and friable)

(5) Peat and muck.

The absence or presence, quantity of peat and muck are recorded.

(6) Soil color.

Under the field conditions, soil color is determined by comparison with the Standard Soil Color Chart published by Nippon Shikisai-Sha, Tokyo, expressed in the same color notation as the Munsell Soil Color Chart. Soils are not always homogeneous, often stained and mottled showing mosaic-like pattern, therefore, component colors are described according to Munsell color notation.

(7) Soil structure.

Soil structure in the field is described according to the shape, size and degree of distinctness.

a . Shape.

Plate-like : Plate-like, with one dimension (the vertical) limited and considerably less than the other two ; arranged around horizontal plane ; faces mostly horizontal.

Prismatic : Prism-like, with one dimension (the horizontal) limited and considerably less than the vertical; arranged around a vertical line; vertical faces well defined; vertices angular.

Columnar : Prism-like, as the above, but caps of prism are round.

Angular blocky : Blocks or polyhedrons arranged around a point ; all three dimensions are of almost equal magnitude ; plane or curved surfaces that are casts of the molds formed by the faces of the surrounding peds ; faces flattened ; most vertices sharply angular.

Sub-angular blocky : Blocks or polyhedrons, as the above, but with mixed round and flattened faces with many rounded vertices.

Granular : Spheroid or polyhedrons, arranged around a point ; all three dimensions are of almost equal magnitude ; plane or curved surfaces which have slight or no accommodation to the faces of surrounding peds. Peds are relatively non-porous.

Crumb : Spheroid or polyhedrons as the above, but peds are porous.

b . Grade.

Structureless : No observable aggregation nor orderly arrangement of natural lines of weakness : coherent material , **massive ;** non coherent material , **single grain.**

Weak : Poorly formed indistinct peds barely observable in place.

Moderate : Well formed distinct peds, moderately durable and evident, but not distinct, in undisturbed soil.

Strong : Durable peds that are evident in undisplaced soil, adhere weakly to one another, withstand displacement and become separated when soil is disturbed.

c . Size.

	Very fine	Fine	Medium	Coarse	Very coarse
Granular, crumb.	<1 mm	1-2	2-5	5-10	>10 mm
Plate-like	<1 mm	1-2	2-5	5-10	>10 mm
Angular blocky, Sub-angular blocky.	<5 mm	5-10	10-20	20-50	>50 mm
Prismatic, columnar.	<10 mm	10-20	20-50	50-100	>100 mm

(8) Pores.

Pores are concerned with cavities within the soil mass and clod surface. The nature and abundance of pores are undoubtedly of importance in relation to the physical properties of the soil.

a . Size.

The size may be divided on the basis of the diameter into the following classes:

Very fine ·····Less than 0.5 mm
Fine ·····0.5 to 2 mm
Medium ·····2 to 5 mm
Coarse ·····More than 5 mm

b . Abundance.

The abundance is described by evaluating the proportion occupied by the pores, as follows:

Few·····Pore space occupies less than 5% of the clod.
Common ·····Pore space occupies 5 to 10% of the clod.
Many ·····Pore space occupies 10 to 30% of the clod.
Abundant ·····Pore space occupies more than 30% of the clod.

(9) Oxidative sediments (Mottlings).

The presence of oxidative sediments or color mottlings in a soil profile may be of great significance in relation to soil forming process or drainage pattern. Oxidative sediments mainly consist of various compounds of iron and manganese oxides. The shape, abundance, contrast and

color of mottles should be recorded.

a . Shape.

Tubular : Tube-shaped hollow mottles, formed around coarse root channels more than 2 mm in diameter.

Fine tubular : Tube-shaped mottles formed around root channels less than 2 mm in diameter.

Diffuse tubular : Tubular mottles with diffuse borders.

Filmy : Film-like mottles with dominant two-dimensional extensions.

Spotty : Round shaped mottles with slightly diffuse borders

Cloudy : Faint mottles with three dimensional extensions and diffuse borders.

Concretion : Round shaped hard separation, with concentric internal structure.

b . Abundance.

Few·····Mottles occupy less than 2% of the exposed surface.
Common ·····Mottles occupy 2 to 10% of the exposed surface.
Many ·····Mottles occupy 10 to 20% of the exposed surface.
Mosaic ·····Mottles occupy more than 50% of the exposed surface.

c . Contrast.

Faint : Indistinct mottles, detected only on close examination ; hue and chroma of matrix and mottles closely related.

Distinct : Mottles not striking but readily seen ; matrix and mottles differ by 1 to 2 hues and several units in chroma and value.

Prominent : Conspicuous mottles are an outstanding feature of the horizon ; matrix and mottles differ by several units of hue, value and chroma.

d . Color of mottles.

In most cases, the standard color name may be given to describe the color of mottles Munsell color notation should be applied if necessary.

(10) Manganese oxide detection (Benzidine reaction).

Manganese oxides accumulated in spot or concretions are easily identified by benzidine reaction. Spray benzidine solution on profile wall or soil clods. After a while, record the accumulation degree of manganese oxides indicated by violet tint. The form and abundance of manganese oxides should be recorded as was described in item (9).

Preparation of benzidine solution : Dissolve lg of benzidine in 500 ml of 10% acetic acid.

(11) Detection of reducing spot and gley horizon. (2,2'-dipyridyl reaction).

Dark blue or greenish gray colored reducing spots are described in form and abundance. Dark green, dark bluish green or bluish gray colored horizon against which the ground water lies may be designated as gley horizon. Such reducing spots or gley horizon usually contain a large amount of ferrous iron compounds which can be easily detected by 2,2'-dipyridyl solution. Degree of 2,2'-dipyridyl reaction should be described as follows:

Instant and distinct : After spraying of 2,2'-dipyridyl solution, red color appears instantly and distinctly, indicating the formation of ferrous-dipyridyl.

Moderate : Red color appears slowly but distinctly after spraying of 2,2'-dipyridyl solution.

Faint : Red color appears very slowly and faintly after spraying of 2,2'-dipyridyl solution.

No : No color change occurs.

Preparation of 2,2'-dipyridyl solution : Dissolve lg of 2,2'-dipyridyl in 500 ml of 10% acetic acid.

(12) Compactness.

Compactness is determined with Yamanaka's cone penetrometer. Values in mm read on this apparatus show the strength of resistance of the soil to the penetration of conical part of the instrument, consequently, the values indicate not only the compactness of soil but also its adhesion capacity. The grade is expressd as follows:

	Values recorded
Loose	Less than 10 mm.
Slightly compact	11 to 18 mm.
Compact	19 to 24 mm.
Very compact	24 to 29 mm.
Extremely compact	More than 30 mm.

(13) Plasticity.

For the determination of plasticity in the field, supply enough moisture to the soil material and roll it between thumb and fingers. When the soil material no more adheres to the fingers, it becomes a wire. Degree of plasticity is described as follows:

Non plastic : No wire is formed.

Very slightly plastic : Wire formed but easily deformable.

Slightly plastic : Wire about 2 mm in diameter is formed.

Plastic : Wire about 1 mm in diameter is formed.

Very plastic : Wire more than 1 cm in length is formed.

(14) Stickiness

For the determination of stickiness in the field, soil material is pressed between thumb and fingers, and its adherence is recorded. Degree of stickiness is described as follows:

Non sticky : After release of pressure, practically no soil material adheres to thumb or fingers.

Slightly sticky : After release of pressure, soil material adheres to both thumb and fingers, but comes off from either one rather cleanly.

Sticky : After release of pressure, soil material adheres to both thumb and fingers and tends to stretch somewhat.

Very sticky : After release of pressure, soil material adheres strongly to both thumb and forefinger and is definitely stretched when fingers are separated.

(15) Ped coating.

Clay coating or clay skin, pressure faces, and slickensides are described.

(16) Moisture.

The terms such as dry, semi-dry, semi-moist, moist, wet, etc, are used.

(17) Root distribution.

For each horizon, the distribution of plant root is described on the basis of exposed surface as follows:

Few	Less than 5%.
Common	5 to 10%.
Many	10 to 20%.
Abundant	More than 20%.

The methods described here are nearly the same as those widely used for soil surveys in Japan.[5] They are also devised in referring to Soil Survey Manual[10], Guidance for Soil Profile Description[4] and Soil Survey Handbook for Thailand[3]

2. Methods of soil analysis

Soil samples for laboratory analysis were taken from each horizon at the same time as the profile examination was carried out.

1) Physical properties

The items relating to physical properties examined in this study are as follows:

(1) **Particle size distribution:** The particle size distribution was determined by means of Bouyoucos' hydrometer method[2]. The soil particles were divided into three fractions according to size, namely sand, 2-0.05 mm; silt, 0.05-0.002 mm; clay, less than 0.002mm in diameter, respectively.

(2) **Distribution of three phases at pF 1.5:** Under field conditions, 100 ml of undisturbed soil

in volume was sampled by using a soil sampler consisting of a metal cylinder. After 100 ml core sample was soaked in water for 24 hours, the saturated sample was placed on a porous plate made of a fine sand column for 24 hours. The suction force of pF 1.5 was maintained in the porous plate by regulation of free water level. The weight of dry soil and water was measured by using the oven dry method. Volume of dried soil (solid phase) was obtained by dividing the weight of dry soil by the specific gravity of the soil. Here, the specific gravity of the soil was assumed to be 2.6. Volume of air (air phase) was calculated as the difference of volume between solid and liquid phases from total volumes sampled (100 ml).

(3) **Pore size distribution:** The pore size distribution was measured by determining first the moisture-content-suction curves for the soil which give the volume of water in pores whose diameter is smaller than that corresponding to each suction applied. Then, the slope of the curve was plotted against the suction which gives the frequency distribution of the size of pore. The pore size was calculated by the following equation:

$d=0.3/h$ (this equation is derived from $h=2T/r\cdot\cos\alpha$, where r=radius of circular tube, T=surface tension of the liquid, α=angle of the contact)

where

h(cm) = Suction expressed as height of water

d(cm) = Pore size

(4) **Bulk density:** Bulk density of soil under the field conditions was calculated in dividing the weight of dry soil by the total volume sampled (100 ml). This value was expressed in gram per cubic centimeter.

(5) **Maximum water holding capacity:** 100 ml of undisturbed soil in volume was soaked in water for 24 hours. Then, the water held by the soil was measured in using the oven dry method.

(6) **Soil moisture content at pF 1.0, pF 1.5 and pF 4.0 :** 100 ml of undisturbed soil core in volume was sampled by using the soil sampler, and the sample was soaked in water for 24 hours. Saturated sample was placed on a porous plate which was maintained at the suction of pF 1.0. Then, the weight of the core sample was measured at pF 1.0. Thereafter, this sample was placed on a porous plate which was maintained at the suction of pF 1.5. The moisture content was determined by the dry soil method, expressed in terms of the percentage on a volune basis. Moisture content at pF 4.0 was measured by means of the centrifuge method. In this case, a portion of core soil treated for determination of lento capillary point was used. The soil moisture suction was calculated by the following equation according to Russell et al [8].

$$\log h = \log(r1 - r2) + \log(r1 + r2/2) + 2\log n - 4.9 = pF$$

where

r1 : Radius of revolution at the bottom of porous material (cm)

r2 : Radius of revolution corresponding to the center of gravity of the part of the soil column used for determining moisture content (cm)

n : Revolution per minute

h : Moisture suction (height of water in cm)

The moisture content at pF 4.0 was expressed in terms of percentage on a volume basis, as follows.

$$Pv = Pw(B.D)$$

where

Pv = moisture percent per unit volume

Pw = moisture percent per unit oven dry weight

B.D = bulk density measured at profile experiment

(7) **Lento capillary point :** Soil sample with undisturbed structure was placed in a 100 ml metal cylinder as described in the item on distribution of three phases at pF 1.5. The sample saturated with water was placed on the matric suction apparatus which was controlled under a suction of pF 1.5. Then, the sample was placed on an absorption porous plate for 24 hours, and moisture content was

determined.

The soil moisture content at the lento capillary point is nearly equal to the soil moisture at pF 3.0.

(8) **Water permeability (Laboratory measurement of hydraulic conductivity of soil saturated with water) :** 100 ml of undisturbed soil in volume was sampled by using the core sampler. The sample was soaked in water for 24 hours. The sample saturated with water was placed on an apparatus for permeability measurement, and conductivity was measured by constant - head method and / or falling - head method.

The measurement of water permeability in the laboratory creates some problems when the results are applied in the field. However, this measurement of permeability enables to determine how water is likely to move through the soil in connection with irrigation, drainage, erosion conditions. In this study, O'Neal's permeability classification[6] of saturated subsoils was used with regard to the permeability speed, as follows:

Class	Hydraulic conductivity, K 10^{-5} cm/ sec
Very low	< 3
Low	3-15
Moderately low	15-60
Moderate	60-170
Moderately high	170-350
High	350-700
Very high	>700

(9) **Available water content and easily available water content :** The available water content was obtained by subtracting the water content at the permanent wilting point (pF 4.0) from the water content at the suction of pF 1.5. On the other hand, easily available water content was obtained by subtracting the water content at the lento capillary point from the water content at the suction of pF 1.5. Available and easily available water were expressed in millimeters of water for depth of soil.

2) Chemical properties

After preparation of air-dried fine soil (passed through 2 mm round hole sieve), the soil samples were analyzed with respect to the following items :

(1) **Soil reaction :** Ten grams of air-dried fine soil were suspended in 25 ml of distilled water or 25 ml of N-KCl solution. After standing for 2 hours, the soil suspension was stirred and the pH of the suspension was measured with a glass electrode.

(2) **Total carbon :** The carbon content was determined by the Walkley-Black method[1].

(3) **Total nitrogen :** The nitrogen content was determined by the Kjeldahl digestion method[1].

(4) **Cation exchange capacity (CEC) :** The cation exchange capacity was determined by the Schollenberger's method[5]. CEC was expressed as meq per 100 g of dry soil.

(5) **Exchangeable bases :** The leachate of ammonium acetate (pH 7.0) which had been used for CEC determination was used for the measurement of exchangeable Ca, Mg, Na and K. Exchangeable Ca, Mg and Na contents were determined by the atomic absorption method. Exchangeable K content was determined by flame photometry[7].

(6) **Total phosphorus :** After digestion with perchloric acid, phosphorus content was determined colorimetrically by vanadomolybdophosphoric yellow method[7].

(7) **Available phosphorus :** After extraction with Bray No. 2 solution, phosphorus content was determined colorimetrically by vanadomolybdophosphoric yellow method[7].

(8) **Total potassium :** After digestion with perchloric acid, potassium content was determined by flame photometry[7].

(9) **Extractable SO_4 - S :** Air-dried fine soil was extracted with $Ca(H_2PO_4)_2$ solution containing 500 ppm phosphorus (P). After shaking for 1 hour in soil-solution ratio of 1:2, sulfur content of

filtrate was determined by a turbidimetric procedure[1].

(10) **Extractable Zn :** Air-dried fine soil was extracted with 0.1 N HCl in soil - solution ratio of 1:4 for 1 hour with shaking. Zinc content was determined by the atomic absorption method[7].

(11) **Extractable Cu :** Air-dried fine soil was extracted with 0.1 N HCl in soil-solution ratio of 1:4 for 1 hour with shaking. Copper content was determined by the atomic absorption method[7].

(12) **Exchangeable Mn :** After extraction for 6 hours with occasional shaking with N - CH_3COONH_4 solution adjusted to pH 7, manganese content was determined by the atomic absorption method[7]. Soil-solution ratio was 1:4.

(13) **Easily reducible Mn :** After extraction for 6 hours with occasional shaking with N-CH_3COONH_4 solution containing 0.2 % hydroquinone, manganese content was determined by the atomic absorption method[7]. Soil-solution ratio was 1:4.

(14) **Extractable Fe :** Air-dried fine soil was extracted for 1 hour with shaking with N-CH_3COONH_4 solution adjusted to pH 4.8. Soil-solution ratio was 1:4. Iron content was determined by the atomic absorption method[7].

(15) **Phosphorus absorption coefficient :** Ten grams of air-dried fine soil were shaken with 20 ml of 2.5% $(NH_4)_2HPO_4$ solution adjusted to pH 7.0. After standing for about 24 hours with occasional shaking, an aliquot of the filtrate was taken for colorimetric determination of phosphorus. The amount of phosphorus absorbed by the soil was calculated from the difference between the original amount and the remaining amount of phosphorus. The absorption coefficient of phosphorus was expressed as mg of P_2O_5 absorbed by 100 g on dry soil[5].

(16) **Electrical conductivity :** Four grams of air-dried fine soil were suspended in 20 ml of distilled water. After standing for about 30 minutes, the suspension was analysed with an electrical conductometer[7]. Electrical conductivity was expressed as micromho per cm at 25 °C.

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Profile Description and Analytical Data

Rendzinas

Noncalcic Brown Soils

Red Brown Earths

Gray Podzolic Soils

Red Yellow Podzolic Soils

Profile No. 38

I. Information on the site.

a. Date of examination : 13 December 1973.
b. Location : Nongkae, Huahin, Prachuap Khiri Khan.
c. Land form :
   i. Physiographic position : Beach.
   ii. Surrounding land form : Nearly flat.
d. Land use : Non cultivated virgin soil (scanty bush vegetation).

II. General information on the soil.

a. Soil classification : Regosols.
b. Parent material : Beach sand.
c. Drainage and water permeability : Well drained. Permeability is very high.
d. Moisture condition in profile : Top 30 cm of profile dry, semi-dry below.

III. Profile description.

A_1 0-20 cm Dull yellow orange (10 YR 6/3) dry; loamy sand; single grain and weak, fine subangular blocky; friable; few, very fine pores; very compact (27 mm); non plastic, non sticky; common roots; dry; positive benzidine reaction; gradual smooth boundary to

AC 20-30 cm Dull orange (7.5 YR 7/3) dry; loamy sand; single grain and weak, medium subangular blocky; friable; few, very fine pores; compact (22 mm); non plastic, non sticky; few roots; dry; slightly positive benzidine reaction; gradual smooth boundary to

C_{11} 30-60 cm Dull orange (7.5 YR 7/4) loamy sand; single grain and weak, medium subangular blocky; friable; few, very fine pores; slightly compact (16 mm); non plastic, non sticky; few roots; semi-dry; very slightly positive benzidine reaction; smooth boundary to

C_{12} 60-110 cm + Yellow orange (7.5 YR 7/8) loamy sand; single grain and weak, medium subangular blocky; friable; few, very fine pores; slightly compact (16 mm); non plastic, non sticky; semi-dry; very slightly positive benzidine reaction.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases(%) at pF1-5 Solid	Liquid	Air	Particle size(%) Sand	Silt	Clay
A_1	0-20	9.3	15.2	1.63	62.6	22.3	15.1	88.5	5.3	6.2
AC	20-30	12.9	19.2	1.49	57.5	22.5	20.0	90.3	4.4	5.3
C_{11}	36-60	1.0	1.5	1.47	56.6	22.3	21.1	91.3	3.4	5.3
C_{12}	60-110+	14.4	21.0	1.46	56.1	16.9	27.0	91.3	4.3	4.4

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content(%) pF1.0	pF1.5	pF3.0	pF4.0
A_1	LS	27	1.1×10^{-2}	33.6	29.9	22.3	19.5	—
AC	LS	22	2.1×10^{-2}	37.0	30.4	22.5	20.3	—
C_{11}	LS	16	1.4×10^{-2}	35.1	29.9	22.3	21.0	—
C_{12}	LS	16	1.7×10^{-2}	35.2	26.4	16.9	14.9	—

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Easily available water	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_1	—	10.4	6.0	5.0	0.37	0.026	14.2	0.64	1.76
AC			5.3	4.4	—	0.013	—	—	0.40
C_{11}			5.7	4.5	0.22	0.013	16.9	0.38	0.88
C_{12}			5.5	4.4	0.26	0.012	21.7	0.45	0.80

Horizon	Exchangeable bases Ca	Mg	Na	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	Available (ppm)	Total K_2O (%)
A_1	0.3	0.08	0.05	0.08	26.0	0.022	10.1	0.030
AC	0.0	0.08	0.10	0.03	51.8	0.022	4.8	0.030
C_{11}	0.0	0.06	0.10	0.08	27.0	0.018	7.9	0.024
C_{12}	0.0	0.06	0.10	0.08	29.8	0.018	16.2	0.030

Horizon	Extractable S	Fe	Cu	Zn (ppm)	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_1	4.52	0.63	0.0	0.4	4.4	90	220
AC	1.74	1.03	0.0	0.4	1.4	60	300
C_{11}	1.75	2.00	0.2	0.8	0.6	26	280
C_{12}	1.50	2.34	0.0	0.4	0.4	20	220

Profile No. 41

I. Information on the site.

a. Date of examination : 14 December 1973.
b. Location : Klongwan, Muang, Prachuap Khiri Khan.
c. Land form :
   i. Physiographic position : Beach.
   ii. Surrounding land form : Nearly flat to gently undulating.
d. Land use : Coconut cultivation.

II. General information on the soil.

a. Soil classification : Regosols.
b. Parent material : Beach sand.
c. Drainage and water permeability : Moderately well drained. Permeability is moderately high.
d. Moisture condition in profile : Top 48 cm of profile semi-dry, moist below. Depth of ground water table was 100 cm from the surface on the date of examination.

III. Profile description.

A_p 0-15 cm Dull brown (7.5 YR 5/3) loamy sand; weak, medium subangular blocky; very friable; few, very fine pores; slightly compact (13 mm); non plastic, non sticky; few roots; semi-dry; very positive benzidine reaction; gradual smooth boundary to

A_{12} 15-23 cm Mixed soil dull brown (7.5 YR 5/3) in 7 portions and dull orange (7.5 YR 7/3) in 3 portions; loamy sand; weak, fine subangular blocky, very friable; few, very fine pores; slightly compact (17 mm); non plastic, non sticky; few roots; semi-dry; very positive benzidine reaction; clear, wavy boundary.

AC 23-48 cm Dull orange (7.5 YR 7/3) loamy sand; weak, medium subangular blocky; few, fine and very fine blocky; loose (10 mm); non plastic, non sticky; few roots; semi-dry; very positive benzidine reaction; gradual smooth boundary to

C 48-100 cm + Dull orange (5YR7/3) loamy sand; weak, medium subangular blocky, very friable; few, very fine pores; loose (9 mm); non plastic, non sticky; few roots; moist; positive benzidine reaction.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density (g/cm³)	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)		Solid	Liquid	Air	Sand	Silt	Clay
A_p	0-15	4.9	7.3	1.48	57.0	22.8	20.2	88.2	7.5	4.3
A_{12}	15-23	5.7	9.0	1.58	60.7	22.4	16.9	88.3	7.1	4.6
AC	23-48	14.4	22.4	1.56	60.2	20.3	19.5	89.1	6.3	4.6
C	48-100+	7.8	12.3	1.58	60.7	20.1	19.2	88.7	6.5	4.8

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_p	LS	13	3.8×10^{-3}	38.4	27.3	22.8	8.3	—
A_{12}	LS	17	2.0×10^{-3}	31.8	24.9	22.3	16.7	—
AC	LS	10	2.4×10^{-3}	31.0	24.3	20.2	14.6	—
C	LS	9	1.6×10^{-3}	30.2	22.8	20.1	13.5	—

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_p	—	41.4	6.7	5.8	0.30	0.018	16.7	0.52	0.88
A_{12}			6.7	3.9	0.34	0.017	20.0	0.59	1.12
AC			6.6	3.7	0.30	0.020	15.0	0.52	0.96
C			6.8	6.0	0.15	0.007	21.4	0.26	0.48

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_p	0.4	0.18	0.10	.003	79.7	0.011	11.4	0.018
A_{12}	0.4	0.16	0.10	0.03	60.7	0.011	6.6	0.018
AC	0.4	0.19	0.14	0.08	84.0	0.011	0.4	0.018
C	0.4	0.07	0.10	0.03	114.0	0.022	1.3	0.012

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_p	0.75	0.23	0.2	1.0	5.2	170	180
A_{12}	0.75	0.23	0.4	0.8	4.6	190	160
AC	0.50	0.14	0.2	0.6	3.6	80	200
C	0.50	0.29	0.2	0.6	2.2	12	310

Profile No. 58

I. Information on the site.

a. Date of examination : 28 January 1974.
b. Location : Tungsukha, Si Racha, Chon Buri.
c. Land form :
  i. Physiographic position : Terrace of marine origin.
  ii. Surrounding land form : Flat to gently undulating.
d. Land use : Cassava cultivation.

II. General information on the soil.

a. Soil classification : Regosols.
b. Parent material : Old alluvium.
c. Drainage and water permeability : Drained. Permeability is high.
d. Moisture condition : Top 16 cm of profile dry, semi-dry below.

III. Profile description.

A_p 0-16 cm Light brownish gray (7.5YR7/2) dry; loamy sand; single grain; loose (less than 4 mm); non plastic, non sticky; common roots; dry; positive benzidine reaction; gradual, smooth boundary to

A_{12} 16-30 cm Dull brown (7.5YR5/3) sandy loam, weak, medium subangular blocky; few, fine and very fine pores; very compact (25 mm); non plastic, non sticky; few roots; semi-dry; positive benzidine reaction; clear, smooth boundary to

C 30-75 cm + Dull orange (7.5YR7/4) sandy loam; weak, moderate medium subangular blocky; breaking into single grain; few very fine pores; very compact (25 mm); non plastic, non sticky; few roots; semi-dry; slightly positive benzidine reaction.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density (g/cm³)	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)		Solid	Liquid	Air	Sand	Silt	Clay
A_p	0—16	2.9	4.5	1.54	59.2	23.3	17.5	85.9	8.4	5.7
A_{12}	16—30	3.7	5.8	1.56	60.2	23.6	16.2	84.7	8.4	6.9
C	30—75+	0.6	11.0	1.72	66.0	22.4	11.6	84.9	9.3	5.8

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_p	LS	5>	2.5×10^{-3}	33.2	26.7	23.3	21.2	—
A_{12}	SL	25	2.5×10^{-3}	33.6	29.1	23.6	17.5	—
C	SL	25	1.1×10^{-3}	30.6	24.8	22.4	17.9	—

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_p	—	20.9	5.9	4.0	0.41	0.016	25.6	0.71	0.50
A_{12}			5.9	4.2	0.31	0.016	19.4	0.53	0.60
C			6.1	4.7	0.51	0.017	30.0	0.88	0.50

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_p	2.44	0.11	0.65	0.06	653.0	0.011	9.0	0.018
A_{12}	0.23	0.11	0.34	0.06	122.7	0.009	7.0	0.012
C	0.35	0.18	0.44	0.13	218.4	0.009	13.8	0.005

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_p	0.75	2.84	0.40	0.8	14.8	60	29
A_{12}	0.50	3.40	0.80	1.0	3.6	40	20
C	0.75	1.48	1.00	1.4	16.0	60	34

Profile No. 1

I. **Information on the site.**

a. Date of examination : 15 October 1973

b. Location : Wajiralongkorn Dam, Muangchum, Tha Muang, Kanchanaburi.

c. Land form :

i. Physiographic position : Higher part of stream levee.

ii. Surrounding land form : Nearly flat to gently undulating, slope less than 2%.

d. Land use: Sugar cane cultivation.

II. **General information of the soil.**

a. Soil classification : Alluvial soils on recent freshwater alluvium.

b. Parent material : Recent alluvium.

c. Drainage and water permeability : Moderately well drained Permeability is very low.

d. Moisture condition in profile : Semi-dry throughout the profile.

e. Remark : Visible mica flakes occur throughout the profile.

III. **Profile description.**

A_P 0-20 cm. Dark brown (7.5YR 3/4) silty loam; moderate, medium subangular blocky structure, granular in top 2 cm ; common, medium pores; slightly compact (18 mm) ; slightly plastic, slightly sticky when moist; many roots; semi-dry; smooth boundary to

A_{12} 20-50 cm. Dark brown (10YR 3/4) light clay; weak, medium blocky structure; common, fine pores; slightly compact (16-18 mm); slightly plastic, slightly sticky when moist; common roots; semi-dry; gradual smooth boundary to

A_{13} 50-90 cm. Dark brown (10YR 3/4) silty clay loam; weak, coarse blocky structure; common fine pores; slightly compact (16 mm); slightly plastic, slightly sticky when moist; few roots; semi-dry; abrupt, smooth boundary to

C 90 cm + Brown (10YR4/6) silty loam; weak, coarse blocky structure; few, fine pores; plastic, sticky when moist; few roots; semi-dry

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density (g/cm³)	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)		Solid	Liquid	Air	Sand	Silt	Clay
A_P	0-20	23.5	34.1	1.45	55.5	32.5	12.0	31.4	62.1	6.5
A_{12}	20-50	18.9	31.6	1.76	64.1	31.8	4.2	29.4	44.1	26.5
A_{13}	50-90	19.5	29.4	1.51	58.2	34.0	7.8	29.4	52.1	18.5
C	90+	20.3	—	—	—	—	—	34.3	56.5	9.2

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_P	SiL	18	4.5×10^{-4}	37.0	33.3	32.4	24.8	—
A_{12}	LiC	16—18	8.1×10^{-6}	33.1	32.2	31.8	26.0	—
A_{13}	SiLC	16	7.4×10^{-5}	36.8	34.9	33.9	27.0	—
C	SiL	—	—	—	—	—	—	—

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_P	—	32.6	7.5	6.5	0.82	0.074	11.1	1.41	10.32
A_{12}			6.8	6.0	0.71	0.054	13.2	1.22	11.12
A_{13}			6.4	5.5	0.66	0.042	15.7	1.14	9.36
C			6.3	5.3	0.35	0.036	9.7	0.60	10.32

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_P	10.0	2.08	1.00	0.40	130.4	0.154	175.5	1.386
A_{12}	9.0	1.86	1.48	0.21	112.9	0.154	72.0	1.506
A_{13}	8.5	2.92	1.30	0.18	137.8	0.132	39.1	1.386
C	7.0	1.46	1.04	0.18	93.8	0.143	65.8	1.506

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_P	2.82	0.11	1.8	8.0	0.2	310	67
A_{12}	3.53	0.06	1.4	3.8	0.2	340	32
A_{13}	2.82	0.06	1.4	3.4	0.2	340	25
C	2.35	0.57	2.0	3.0	0.2	350	70

Profile No. 2

I . **Information on the site**

a . Date of examination : 15 October 1973

b . Location : Thalo, Tha Muang, Kanchanaburi

c . Land form :

i . Physiographic position : Higher part of stream levee

ii . Surrounding land form : Nearly flat to gently undulating, slope less than 1%

d . Land use : Virgin soil, under shrubs

II . **General information on the soil**

a . Soil classification : Alluvial soils, on recent freshwater alluvium

b . Parent material : Recent alluvium

c . Drainage : Moderately well drained.

d . Moisture condition in profile : Dry throughout the A horizon

e . Remark : Visible mica flakes occur throughout the profile

III . **Profile description**

A_{11} 0-20 cm. Dark brown (7.5YR3/4) silty clay; moderate, medium subangular blocky structure; common, medium pores; slightly plastic, slightly sticky when moist; many roots; dry; gradual, smooth boundary to

A_{12} 20-50 cm. Dark brown (7.5YR3/4) silty loam; weak, blocky structure; common roots; dry; abrupt, smooth boundary to

C 50 cm + Brown (7.5YR4/4) light clay; weak, coarse blocky structure; few fine pores; slightly plastic, slightly sticky when moist; few roots, dry.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density (g/cm³)	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)		Solid	Liquid	Air	Sand	Silt	Clay

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	

Profile No. 3

I. **Information on the site.**

a. Date of examination : 15 October 1973

b. Location : Thalo, Tha Muang

c. Land form :

i. Physiographic position : Higher part of stream levee

ii. Surrounding land form : Nearly flat to gently undulating, slope less than 1%

d. Land use : Virgin soil was just tilled, onion will be cultivated.

II. **General information on the soil.**

a. Soil classification : Alluvial soils, on recent, freshwater alluvium.

b. Parent material : Recent alluvium.

c. Drainage and water permeability : Moderately well drained. Permeability is very low.

d. Moisture condition in profile : Semi-moist throughout the profile.

e. Remark : Visible mica flakes occur throughout the profile.

III. **Profile description.**

A_P 0-20 cm Dark brown (10YR3/4) silty loam; moderate, coarse subangular blocky structure; common, medium pores; slightly compact (16 mm); slightly plastic, slightly sticky when moist; semi-dry; gradual, smooth boundary to

A_{12} 20-50 cm Dark brown (10YR3/4) silty clay; weak, medium blocky structure; common, fine pores; slightly compact (18-19 mm); slightly plastic, slightly sticky when moist; few roots; semi-dry; abrupt smooth boundary to

C 50 cm + Brown (10YR4/4) heavy clay : weak, coarse blocky structure; common, fine pores; plastic, and sticky when moist; few roots; semi-dry.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)	(g/cm³)	Solid	Liquid	Air	Sand	Silt	Clay
A_P	0-20	24.6	32.5	1.32	50.9	41.7	7.3	22.6	70.4	7.0
A_{12}	20-50	8.0	11.0	1.37	52.7	38.6	8.7	16.9	55.0	28.1
C	50+	21.7	—	—	—	—	—	16.2	34.3	49.5

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_P	SiL	10	4.5×10^{-5}	43.6	42.7	41.7	30.1	—
A_{12}	SiC	18—19	2.2×10^{-5}	40.6	39.7	38.6	30.1	—
C	HC	—	—	—	—	—	—	—

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_P	—	48.7	7.1	6.3	2.00	0.095	21.1	3.45	15.84
A_{12}			6.5	5.5	1.31	0.082	16.0	2.26	17.32
C			6.2	5.5	0.96	0.066	14.6	1.66	16.16

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_P	14.0	2.40	2.35	1.03	124.8	0.263	473.0	1.657
A_{12}	11.0	2.92	1.74	0.46	93.1	0.230	86.6	1.079
C	12.0	3.44	2.13	0.46	111.0	0.241	93.0	1.898

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_P	20.21	0.29	0.8	7.2	1.0	320	107
A_{12}	18.10	0.63	1.6	3.6	0.4	340	52
C	23.27	0.51	1.8	3.8	1.0	390	80

Profile No. 4

I . **Information on the site**

a . Date of examination : 15 October 1973

b . Location : Pakprak, Muang, Kanchanaburi

c . Land form

i . Physiographic position : Higher part of stream levee

ii . Surrounding land form : Nearly flat to gently undulating, slope less than 2%

d . Land use : Tobacco cultivation, rotation system: tobacco-sugar cane.

II . **General information on the soil**

a . Soil classification : Alluvial soils, on recent freshwater alluvium

b . Parent material : Recent alluvium

c . Drainage : Moderately well drained.

d . Moisture condition in profile : Semi-moist throughout the profile

e . Remark : Visible mica flakes occur throughout the profile

III . **Profile description**

A_P 0-15 cm Dark brown (7.5YR3/4) silty loam; moderate, medium subangular blocky structure; common, medium pores; slightly plastic, slightly sticky when moist; many roots; semi-dry; gradual, smooth boundary to

A_{12} 15-45 cm Dark brown (7.5YR3/4) silty loam, weak medium blocky structure; common, fine pores; slightly plastic, slightly sticky when moist; common roots; semi-dry; abrupt, smooth boundary to

C 45 cm + Brown (7.5YR4/6) silty clay loam; coarse blocky structure; fine pores; slightly plastic, slightly sticky when moist; few roots; dry

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density (g/cm³)	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)		Solid	Liquid	Air	Sand	Silt	Clay

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	

Profile No. 16

I . **Information on the site.**

a . Date of examination : 17 November 1973.

b . Location : Si Samrong, Agricultural Exp. St., Sukhothai.

c . Land form :

i . Physiographic position : Higher part of stream levee.

ii . Surrounding land form : Nearly flat, slope less than 1%.

d . Land use : Cotton cultivation.

II . **General information on the soil.**

a . Soil classification : Alluvial soils on recent freshwater alluvium.

b . Parent material : Recent alluvium.

c . Drainage : Well drained . Permeability is moderately low, but permeability of C horizon is high.

d . Moisture condition in profile : Dry throughout the profile.

III . **Profile description.**

A_P 0-15 cm Dull yellow orange (10YR6/4) clay loam; moderate, coarse subangular blocky; common, fine and very fine pores; very compact (29mm); non plastic, non sticky; common roots; dry; positive benzidine reaction; gradual, smooth boundary to

A_{12} 15-40 cm Brown (10YR4/4) loam; moderate, coarse subangular blocky; few, very fine pores; extremely compact (32 mm); non plastic, non sticky; few roots; dry; positive benzidine reaction; gradual, smooth boundary to

C 40-63 cm + Bright brown (7.5YR5/8) loamy sand; single grain structure; very few, fine pores; compact (23 mm); non plastic, non sticky; few roots; dry; slightly positive benzidine reaction.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases (%) at pF1-5 Solid	Liquid	Air	Particle size (%) Sand	Silt	Clay
A_P	0-15	3.1	4.0	1.28	49.4	38.1	12.5	35.4	44.1	20.5
A_{12}	15-40	5.6	7.7	1.38	53.1	39.3	7.6	50.9	43.1	6.0
C	40-63+	3.2	4.2	1.32	50.9	36.7	12.0	86.8	8.4	4.8

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%) pF1.0	pF1.5	pF3.0	pF4.0
A_P	CL	29	4.1×10^{-4}	50.5	40.3	38.1	20.3	—
A_{12}	L	32	1.8×10^{-4}	46.5	42.2	39.3	24.1	—
C	LS	23	1.0×10^{-2}	50.2	40.5	36.7	9.2	—

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Storage Capacity (mm) of Easily available water (of 50 cm deep soil)	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_P	—	72.2	6.3	5.4	0.92	0.093	9.9	1.59	6.48
A_{12}			6.3	5.5	0.75	0.065	11.5	1.29	6.76
C			7.0	5.4	0.46	0.049	9.4	0.79	3.36

Horizon	Exchangeable bases Ca	Mg	Na	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	P_2O_5 Available (ppm)	Total K_2O (%)
A_P	5.0	1.88	0.22	0.10	111.1	0.132	93.9	0.708
A_{12}	5.5	2.08	0.13	0.03	114.5	0.114	65.4	0.708
C	3.0	1.25	0.32	0.03	136.9	0.077	35.1	0.648

Horizon	Extractable S	Fe	Cu	Zn (ppm)	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_P	15.75	0.34	2.6	6.4	9.4	270	48
A_{12}	18.50	0.29	2.4	7.6	5.4	240	46
C	4.25	0.29	1.0	2.8	2.0	130	29

Profile No. 27 (Maejo, Agr. Ex. St., No. 1)

I. **Information on the site.**

a. Date of examination : 23 November 1973.
b. Location : Maejo Agr. Ex. St., Chiang Mai.
c. Land form :
   i. Physiographic position : Semi-recent alluvial terrace.
   ii. Surrounding land form : Terrace.
d. Land use : Just cleared for upland crop cultivation.

II. **General information on the soil.**

a. Soil classification : Low Humic Gley soils.
b. Parent material : Semi-recent alluvial sediments.
c. Drainage : Well drained.
d. Moisture condition in profile : Dry throughout the profile.

III. **Profile description.**

A_{11} 0-9 cm Brownish black (10YR2/2); sandy loam; moderate, fine granular; loose (8 mm); many roots; semi-dry; positive, benzidine reaction; gradual, smooth boundary to

A_{12} 9-14 cm Grayish yellow brown (10YR4/2) sandy clay loam; moderate fine subangular blocky; few, very fine pores; slightly compact (15 mm); common roots; semi-dry; positive benzidine reaction; clear, wavy boundary to

B_2 14-50 cm Dull orange (7.5YR7/4) sandy clay loam; many, slightly weathered, fine and medium subangular gravels; compact (20 mm); few roots; dry, gradual, smooth boundary to

C 50-100 cm + Dull orange (7.5YR7/4), slightly weathered, medium subangular gravel layer; dry.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases (%) at pF1-5 Solid	Liquid	Air	Particle size (%) Sand	Silt	Clay
A_{11}	0-9	—	—	—	—	—	—	—	—	—
A_{12}	9-14	—	—	—	—	—	—	—	—	—
B_2	14-50	—	—	—	—	—	—	—	—	—
C	50-100+	—	—	—	—	—	—	—	—	—

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%) pF1.0	pF1.5	pF3.0	pF4.0
A_{11}	—	—	—	—	—	—	—	—
A_{12}	—	—	—	—	—	—	—	—
B_2	—	—	—	—	—	—	—	—
C	—	—	—	—	—	—	—	—

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Storage Capacity (mm) of Easily available water (of 50 cm deep soil)	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_{11}	—	—	6.2	5.9	1.87	0.093	20.1	3.22	3.24
A_{12}			5.8	5.7	0.61	0.035	17.4	1.05	2.96
B_2			6.0	5.3	0.12	0.013	9.2	0.21	2.48
C			5.4	4.5	0.19	0.012	15.8	0.33	2.48

Horizon	Exchangeable bases Ca	Mg	Na	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	P_2O_5 Available (ppm)	Total K_2O (%)
A_{11}	12.0	4.17	0.17	0.18	510.0	0.070	122.9	0.111
A_{12}	5.5	3.50	0.10	0.13	311.8	0.053	36.9	0.096
B_2	1.5	2.71	0.17	0.13	181.9	0.033	36.9	0.066
C	0.8	3.96	0.13	0.15	203.4	0.097	120.7	0.111

Horizon	Extractable S	Fe	Cu	Zn (ppm)	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_{11}	1.25	0.17	0.8	3.4	8.0	120	100
A_{12}	1.00	0.23	1.0	1.0	2.4	70	50
B_2	1.00	0.51	0.6	1.2	1.2	24	32
C	14.00	0.23	3.0	1.4	2.2	42	35

Profile No. 28 (Maejo Agr. Ex. St., No. 2)

I. Information on the site.

a. Date of examination : 23 November 1973.
b. Location : Maejo Agr. Ex. St., Chiang Mai.
c. Land form :
  i. Physiographic position : Semi-recent alluvial terrace.
  ii. Surrounding land form : Nearly flat.
d. Land use : Sunflower and safflower cultivation.

II. General information on the soil.

a. Soil classification : Low Humic Gley soils.
b. Parent material : Semi-recent alluvial sediments.
c. Drainage : Imperfectly drained.
d. Moisture condition in profile : Top 37 cm of profile semi-dry, moist to wet below. Depth of ground water table was 97 cm from the surface on the date of examination.

III. Profile description.

A_P 0-14 cm Dull yellowish brown (10YR4/3) sandy loam; moderate, fine subangular blocky; slightly compact (18 mm); non plastic, non sticky; common roots; semi-dry; very positive benzidine reaction; clear, smooth boundary to

B_{21} 14-37 cm Dull yellow orange (10YR7/3) sandy clay loam: many, distinct bright yellowish brown (10YR7/6) spotty iron mottles; moderate, coarse subangular blocky; few, fine and very fine pores; very compact (28 mm); non plastic, non sticky; few roots; semi-dry; very positive benzidine reaction; clear, smooth boundary to

B_{22} 37-80 cm Grayish yellow browm (10YR6/2) sandy loam; abundant, distinct reddish brown (5YR4/8) spotty tubular iron mottles; weak, coarse subangular blocky; few, very fine pores; compact (19 mm); non sticky; non plastic; moist; slightly positive benzidine reaction; faint 2,2-dipiridyl reaction, clear, smooth boundary to

C 80-100 cm + Dull yellow orange (10YR7/4) loamy sand; abundant, distinct bright brown (7.5YR5/6) spotty iron mottles; massive; loose (5 mm); non sticky; non plastic; wet; moderate, 2,2-dipyridyl reaction.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases(%) at pF1-5 Solid	Liquid	Air	Particle size(%) Sand	Silt	Clay
A_P	0-14	—	—	—	—	—	—	—	—	—
B_{21}	14-37	—	—	—	—	—	—	—	—	—
B_{22}	37-80	—	—	—	—	—	—	—	—	—
C	80-100+	—	—	—	—	—	—	—	—	—

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content(%) pF1.0	pF1.5	pF3.0	pF4.0
A_P	—	—	—	—	—	—	—	—
B_{21}	—	—	—	—	—	—	—	—
B_{22}	—	—	—	—	—	—	—	—
C	—	—	—	—	—	—	—	—

Horizon	Storage Capacity(mm) of Available water (of 50 cm deep soil)	Easily available water (of 50 cm deep soil)	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_P	—	—	7.9	6.8	0.57	0.041	13.9	0.98	3.04
B_{21}			7.8	6.4	0.12	0.009	13.3	0.21	1.28
B_{22}			7.8	6.2	0.12	0.007	17.1	0.21	1.08
C			7.6	6.5	0.12	0.006	20.0	0.21	1.04

Horizon	Exchangeable bases Ca (me/100g)	Mg	Na	K	Base saturation degree (%)	P_2O_5 Total (%)	Available (ppm)	Total K_2O (%)
A_P	0.9	0.30	0.10	0.18	47.1	0.066	190.9	0.187
B_{21}	0.9	0.36	0.05	0.08	108.2	0.033	66.7	0.211
B_{22}	0.8	0.32	0.04	0.11	117.8	0.037	61.0	0.217
C	0.5	0.28	0.10	0.03	82.7	0.022	22.2	0.136

Horizon	Extractable S (ppm)	Fe	Cu	Zn	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_P	3.75	2.11	2.2	2.4	5.6	110	80
B_{21}	0.50	2.97	1.2	0.8	2.2	40	45
B_{22}	1.75	3.14	1.4	0.8	2.2	22	40
C	2.25	1.77	0.8	0.6	0.8	2	50

Profile No. 29 (Maejo Agr. Exp. St. No. 3)

I. Information on the site.

a . Date of examination : 23 November 1973.
b . Location : Maejo Agr. Ex. St., Chiang Mai.
c . Land from :
  i . Physiographic position : Semi-recent alluvial terrace.
  ii . Surrounding land form : Nearly flat.
d . Land use : Vegetable cultivation.

II. General information on the soil.

a . Soil classification : Low Humic Gley soil.
b . Parent material : Semi-recent alluvial sediments.
c . Drainage : Imperfectly drained.
d . Moisture condition in profile : Top 76 cm of profile semi-dry , moist below.

III. Profile description.

A_p 0-18 cm. Dull brown (7.5YR5/3) sandy loam; moderate; fine granular; slightly compact (13 mm); common roots; semi-dry; positive, benzidine reaction; clear smooth boundary to

B_{21} 18-76 cm. Dull orange (7.5YR7/3) loam; many manganese concretions (7.5YR4/3); moderate, medium subangular blocky; common, fine and very fine pores; compact (23 mm); non plastic, non sticky; few roots; semi-dry; very positive benzidine reaction; faint, 2,2'-dipyridyl reaction; clear, smooth boundary to

B_{22} 76-100 cm+ Dull orange (7.5YR7/3) light clay; many, manganese concretions (7.5YR5/2); weak, coarse subangular blocky; common, fine and very fine pores; slightly compact (15 mm); non plastic, slightly sticky; moist; very positive,benzidine reaction; moderate 2,2'-dipyridyl reaction.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases(%) at pF1-5 Solid	Liquid	Air	Particle size(%) Sand	Silt	Clay
A_p	0-18	—	—	—	—	—	—	—	—	—
B_{21}	18-76	—	—	—	—	—	—	—	—	—
B_{22}	76-100+	—	—	—	—	—	—	—	—	—

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content(%) pF1.0	pF1.5	pF3.0	pF4.0
A_p	—	—	—	—	—	—	—	—
B_{21}	—	—	—	—	—	—	—	—
B_{22}	—	—	—	—	—	—	—	—

Horizon	Storage Capacity(mm) of Available water (of 50 cm deep soil)	Easily available water	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_p	—	—	6.6	6.0	0.35	0.028	12.5	0.60	2.00
B_{21}			7.5	6.3	—	0.019	—	—	0.96
B_{22}			7.1	5.9	—	0.016	—	—	1.60

Horizon	Exchangeable bases Ca	Mg	Na	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	P_2O_5 Available (ppm)	Total K_2O (%)
A_p	1.5	0.33	0.24	0.08	107,3	0.029	64.5	0.078
B_{21}	0.9	0.4.	0.17	0.03	156.3	0.018	6.4	0.084
B_{22}	3.8	0.36	0.27	0.11	283.4	0.022	12.3	0.090

Horizon	Extractable S	Fe	Cu	Zn (ppm)	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_p	2.00	0.23	1.6	1.4	5.2	160	80
B_{21}	2.00	0.17	0.8	0.6	1.8	100	40
B_{22}	11,24	0.34	1.6	0.8	3.2	510	40

Profile No. 30 (Maejo Agr. Ex. St., No. 4)

I. Information on the site.

a . Date of examination : 23 November 1973.
b . Location : Maejo Agr. Exp. St., Chiang Mai.
c . Land form :
  i . Physiographic position : Semi-recent alluvial terrace.
  ii . Surrounding land form : Nearly flat.
d . Land use : Vegetable cultivation.

II. General information on the soil.

a . Soil classification : Low Humic Gley soils.
b . Parent material : Semi-recent alluvial sediments.
c . Drainage : Moderately well drained.
d . Moisture condition in profile : Semi-dry throughout the profile.

III. Profile description.

A_p 0-23 cm Dull brown (7.5YR5/4) loam; moderate, fine granular; slightly compact (12 mm); common roots; semi-dry; positive benzidine reaction; clear, smooth boundary to

B_{21} 23-50 cm Dull orange (7.5YR7/3) sandy clay; common, faint orange (7.5YR7/6) spotty iron mottles; weak, coarse subangular blocky; common, fine and very fine pores; compact (24 mm); non plastic, non sticky; few roots; semi-dry; positive benzidine reaction; clear, smooth boundary to

B_{22} 50-100 cm + Dull orange (7.5YR7/3) light clay; many, distinct bright brown (7.5YR5/8) sportty iron mottles; few, manganese concretions; moderate medium subangular blocky; few, very fine pores; compact (21 mm); semi-dry; positive benzidine reaction.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density (g/cm³)	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)		Solid	Liquid	Air	Sand	Silt	Clay
A_p	0-23	—	—	—	—	—	—	—	—	—
B_{21}	23-50	—	—	—	—	—	—	—	—	—
B_{22}	50-100+	—	—	—	—	—	—	—	—	—

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_p	—	—	—	—	—	—	—	—
B_{21}	—	—	—	—	—	—	—	—
B_{22}	—	—	—	—	—	—	—	—

Horizon	Storage Capacity (mm) of (of 50 cm deep soil)		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water	Easily available water	H_2O	KCl					
A_p	—	—	7.2	7.0	0.42	0.048	8.8	0.72	1.36
B_{21}			4.6	4.0	0.08	0.010	8.0	0.14	2.40
B_{22}			6.0	5.3	0.08	0.009	8.9	0.14	2.40

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_p	4.5	0.77	0.17	0.26	419.1	0.068	614.3	0.217
B_{21}	0.8	0.71	0.10	0.24	77.1	0.022	9.2	0.199
B_{22}	1.2	0.19	0.04	0.15	96.1	0.029	8.8	0.217

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_p	41.00	0.19	4.8	3.2	3.2	100	150
B_{21}	45.75	0.69	3.4	2.1	2.6	38	120
B_{22}	19.75	0.51	0.8	1.2	3.4	310	140

Profile No.31 (Maejo Agr. Ex. St., No. 5)

I. Information on the site.

a. Date of examination : 23 November 1973.
b. Location : Maejo Agr. Ex. St., Chiang Mai.
c. Land form :
  i. Physiographic position : Semi-recent alluvial terrace.
  ii. Surrounding land form : Nearly flat.
d. Land use : Soybean cultivation.

II. General information on the soil.

a. Soil classification : Low Humic Gley soils.
b. Parent material : Semi-recent alluvial sediments derived from calcareous rock.
c. Drainage : Well drained.
d. Moisture condition in profile : Semi-dry throughout the profile.

III. Profile description.

A_p 0-19 cm Mixed soil dull yellow orange (10YR6/3) in 8 portions and orange (7.5YR7/6) in 2 portions; loam; moderate, fine granular; loose (8 mm); non plastic, non sticky; common roots; semi-dry; positive benzidine reaction; clear, smooth boundary to.

B_2 19-80 cm + Grayish yellow brown (10YR6/2) silty loam; many, fine and medium subangular gravels; friable moist; very compact (25 mm); few roots; semi-dry; positive benzidine reaction.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density (g/cm³)	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)		Solid	Liquid	Air	Sand	Silt	Clay
A_p	0-19	—	—	—	—	—	—	—	—	—
B_2	19-80+	—	—	—	—	—	—	—	—	—

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_p	—	—	—	—	—	—	—	—
B_2	—	—	—	—	—	—	—	—

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_p	—	—	7.9	7.0	0.16	0.034	4.7	0.28	1.92
B_2			8.1	7.1	0.16	0.021	7.6	0.28	1.28

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_p	1.1	0.32	0.24	0.15	91.7	0.029	63.6	0.187
B_2	1.7	0.28	0.40	0.18	200.0	0.033	25.9	0.211

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_p	6.00	0.17	1.4	2.4	5.0	370	500
B_2	13.25	0.17	0.0	0.0	1.6	14	220

Profile No. 36

I. Information on the site.

a. Date of examination : 12 December 1973.

b. Location : Bannong, Yao, Cha-am, Petchaburi (Thai-Israel joint agricultural project area).

c. Land form :

i. Physiographic position : Semi-recent alluvial terrace.

ii. Surrounding land form : Nearly flat to gently undulating.

d. Land use : Corn, banana, sugar cane cultivation.

II. General information on the soil.

a. Soil classification : Low Humic Gley soils.

b. Parent material : Semi-recent alluvial sediments.

c. Drainage : Moderately drained. Permeability is moderate to moderately low.

d. Moisture condition in profile : Top 47 cm of profile semi-dry, moist below, Depth of ground water table was 90 cm from the surface on the date of examination.

III. Profile description.

A_p 0-18 cm Dull yellowish brown (10YR4/3) clay loam; moderate fine subangular blocky; friable moist; few, fine and very fine pores; slightly compact (15 mm); non plastic, non sticky; common roots; semi-dry; positive benzidine reaction; gradual smooth boundary to

B_1 18-34 cm Brown (10YR4/4) clay loam; moderate, fine subangular blocky, friable moist; few, very fine pores; compact (19 mm); non plastic, non sticky; common roots; semi-dry; positive benzidine reaction; gradual smooth boundary to

B_2 34-47 cm Dull yellowish brown (10YR5/4) loam; moderate, fine subangular blocky, friable moist; common, fine and very fine pores; compact (19 mm); non plastic, non sticky; few roots; semi-dry; positive benzidine reaction; clear, smooth boundary to

C 47-100 cm + Bright yellowish brown (10YR6/6) sandy loam; single grain; loose (9 mm); few roots; moist; positive benzidine reaction.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases (%) at pF1-5 Solid	Liquid	Air	Particle size (%) Sand	Silt	Clay
A_p	0-18	11.8	16.3	1.38	53.1	24.3	22.6	59.3	24.6	16.1
B_1	18-34	13.8	22.6	1.64	63.3	25.1	11.6	58.6	24.9	16.5
B_2	34-47	10.8	15.6	1.44	55.3	21.8	22.9	62.6	22.9	14.5
C	47-100+	5.5	7.9	1.44	55.3	18.9	25.8	83.2	11.5	5.3

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%) pF1.0	pF1.5	pF3.0	pF4.0
A_p	CL	15	4.8×10^{-3}	32.8	28.1	24.3	19.6	—
B_1	CL	19	1.8×10^{-4}	28.6	26.4	25.1	21.3	—
B_2	L	19	1.3×10^{-3}	32.0	26.1	21.8	17.7	—
C	SL	9	9.2×10^{-3}	34.6	24.3	18.9	17.1	—

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Easily available water	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_p	—	21.1	5.5	4.9	0.81	0.055	14.7	1.40	4.00
B_1			5.5	4.6	0.70	0.045	15.6	1.21	3.28
B_2			5.0	4.1	0.44	0.037	11.9	0.76	2.00
C			5.2	4.3	0.08	0.010	8.0	0.14	1.28

Horizon	Exchangeable bases Ca (me/100g)	Mg	Na	K	Base saturation degree (%)	P_2O_5 Total (%)	Available (ppm)	Total K_2O (%)
A_p	1.1	0.25	0.10	0.26	42.7	0.039	16.2	0.151
B_1	1.0	0.20	0.09	0.24	46.6	0.039	14.0	0.159
B_2	0.9	0.22	0.05	0.15	66.2	0.029	3.7	0.151
C	0.8	0.22	0.09	0.18	100.7	0.011	2.9	0.129

Horizon	Extractable S (ppm)	Fe	Cu	Zn	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_p	0.75	0.86	0.6	1.4	17.0	220	70
B_1	0.75	2.63	0.2	0.8	23.0	190	40
B_2	0.50	4.0	0.2	0.4	14.0	130	30
C	4.75	2.4	0.2	0.6	4.0	130	18

Profile No. 37

I. Information on the site.

a. Date of examination : 13 December 1973.
b. Location : Hupkaphong, Cha-am, Petchaburi.
c. Land form :
  i. Physiographic position : Semi-recent alluvial terrace.
  ii. Surrounding land form : Nearly flat to undulating or rolling.
d. Land use : Cassava cultivation.

II. General information on the soil.

a. Soil classification : Low Humic Gley soils.
b. Parent material : Semi-recent alluvial sediments.
c. Drainage : Well drained. Permeability is moderately high to moderate.
d. Moisture condition in profile : Semi-dry throughout the profile.

III. Profile description.

A_p 0-15 cm Dull yellowish brown (10YR4/3) sandy loam; single grain, and weak, fine subangular blocky; friable moist; common, fine pores; slightly compact (11 mm); common roots; semi-dry; positive benzidine reaction; gradual smooth boundary to

B_1 15-24 cm Dull yellow orange (10YR5/3) sandy loam; weak, fine subangular blocky; very friable; few, fine pores; slightly compact (15 mm); non plastic, non sticky; common roots; semi-dry; positive benzidine reaction; faint 2,2'-dipyridyl reaction; gradual smooth boundary to

B_2 24-72 cm Dull yellow orange (10YR6/4) sandy loam; weak, fine subangular blocky; very friable moist; few, fine and very fine pores; slightly compact (16 mm); non plastic, non sticky; few roots; semi dry; positive benzidine reaction; faint 2,2'dipyridyl reaction; clear, smooth boundary to

C 72 cm + Bright yellowish brown (10YR6/6) sandy loam; common, fine subangular gravels; single grain; slightly compact (11 mm); non plastic, non sticky; semi-dry; positive benzidine reaction.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density (g/cm³)	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)		Solid	Liquid	Air	Sand	Silt	Clay
A_p	0-15	0.3	0.4	1.35	52.1	23.1	24.8	78.2	14.5	7.3
B_1	15-24	8.0	11.4	1.42	54.8	24.5	20.7	77.3	14.4	8.3
B_2	24-72	5.8	18.0	1.38	53.2	21.8	25.0	79.4	12.5	8.2
C	72+	0.2	—	—	—	—	—	76.4	13.4	9.2

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_p	SL	11	4.1×10^{-3}	35.6	30.2	23.0	20.2	—
B_1	SL	15	2.6×10^{-3}	37.7	29.1	24.5	21.6	—
B_2	SL	16	1.5×10^{-3}	34.7	25.8	21.8	18.5	—
C	SL	11	—	—	—	—	—	—

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_p	—	15.4	5.3	4.3	0.48	0.028	17.1	0.83	2.16
B_1			5.0	4.2	0.45	0.024	18.8	0.78	2.08
B_2			5.1	4.2	0.19	0.013	14.6	0.33	1.36
C			5.7	4.0	0.26	0.017	15.3	0.45	1.36

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_p	0.3	0.20	0.04	0.01	27.7	0.029	4.6	0.072
B_1	0.2	0.13	0.04	0.08	19.0	0.022	3.3	0.078
B_2	0.2	0.19	0.09	0.08	37.3	0.018	0.9	0.096
C	0.3	0.24	0.10	0.08	49.0	0.022	1.3	0.111

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_p	0.50	2.23	0.2	0.8	10.8	160	180
B_1	0.75	2.23	0.4	0.6	8.0	120	220
B_2	0.75	2.00	0.4	0.6	3.8	36	240
C	0.75	1.77	0.6	0.8	3.8	28	170

Profile No. 71

I. Information on the site.

a. Date of examination : 27 March 1974.
b. Location : Buri Ram Sericulture Research Station.
c. Land form :
  i. Physiographic position : Low terrace.
  ii. Surrounding land form : Flat.
d. Land use: :Mulberry cultivation.

II. General information on the soil.

a. Soil classification : Low Humic Gley soils.
b. Parent material : Alluvial sediment.
c. Drainage and water permeability : Imperfectly drained. Permeability is low.
d. Moisture condition in profile : Dry throughout the profile.

III. Profile description.

A_p 0-15 cm Dull orange (7.5YR7/4) dry, dull brown (7.5YR5/4) moist; loam; moderate, fine subangular blocky structure; few, fine and very fine pores; very compact (27 mm); non plastic, non sticky; common roots; dry; slightly positive benzidine reaction; gradual smooth boundary to

B_{21} 15-45 cm Dull orange (7.5YR7/4) dry, dull brown (7.5YR5/4) moist; common, distinct bright reddish brown (5YR5/8) spotty iron mottles; moderate, medium subangular blocky structure; few, very fine pores; very hard when dry; extremely compact (32 mm); non plastic, non sticky; few roots; dry; slightly positive benzidine reaction; gradual, smooth boundary to

B_{22} 45-90 cm Dull orange (7.5YR7/4) dry, dull orange (7.5YR6/4) moist; light clay; abundant, distinct bright brown (7.5YR5/8) spotty iron mottles; moderate, medium subangular blocky structure; few, fine and very fine pores; very hard when dry; extremely compact (32 mm); slightly plastic, slightly sticky; few roots; dry; clear, smooth boundary to

C 90 cm + Grayish brown (7.5YR6/2) light clay; reddish brown (2.5YR4/8) laterite concretions (weathered); massive; few, very fine pores; very hard when dry; extremely compact (34 mm); plastic, sticky; semi-dry.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)	(g/cm³)	Solid	Liquid	Air	Sand	Silt	Clay
A_p	0-15	10.3	14.8	1.43	54.8	33.6	11.6	51.5	36.6	11.9
B_{21}	15-45	10.0	14.7	1.47	56.5	33.9	9.6	51.7	40.6	7.7
B_{22}	45-90	5.2	8.0	1.53	58.7	32.9	8.4	41.2	14.9	37.9
C	90+	15.8	25.4	1.61	61.8	37.8	0.4	31.7	24.5	43.8

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_p	L	27	9.0×10^{-4}	38.5	35.1	33.6	21.0	6.9
B_{21}	L	32	9.0×10^{-5}	38.3	35.2	33.9	27.8	7.2
B_{22}	LiC	32	7.3×10^{-5}	38.4	34.6	32.9	27.8	7.9
C	LiC	34	Imper meable	39.2	38.2	37.8	32.8	27.6

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_p	132.7	27.6	4.5	3.7	0.69	0.045	15.3	1.19	2.40
B_{21}			7.0	5.7	0.63	0.032	19.7	1.09	3.20
B_{22}			5.3	3.5	0.58	0.030	19.3	1.00	5.04
C			5.1	3.3	—	0.017	—	—	11.76

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_p	1.70	0.33	0.91	0.79	155.4	0.055	72.4	0.072
B_{21}	1.95	0.83	0.73	1.26	148.8	0.033	35.5	0.072
B_{22}	1.45	0.27	0.36	0.16	44.4	0.048	4.0	0.078
C	3.25	0.25	3.05	0.11	56.5	0.048	2.9	0.178

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_p	51.50	18.20	0.80	1.0	2.0	4	280
B_{21}	14.50	7.24	1.40	1.2	1.6	34	80
B_{22}	2.75	3.48	1.00	0.6	2.8	8	20
C	0.50	2.96	1.00	1.2	3.6	10	20

Profile No. 73

I. Information on the site.

a. Date of examination : 27 March 1974.
b. Location : Surin Sericulture Research Station (No. 1)
c. Land form :
  i. Physiographic positon : Low terrace.
  ii. Surrounding land form : Flat.
d. Land use : Guava and peanut cultivation.

II. General information on the soil.

a. Soil classification : Low Humic Gley soils.
b. Parent material : Alluvial sediment.
c. Drainage and water permeability : Imperfectly drained. Permeability is very low.
d. Moisture condition in profile : Semi-dry throughout the profile.

III. Profile description.

A_p 0-12 cm Dull orange (7.5YR7/3) dry, dull brown (7.5YR5/4) moist; loam; moderate, fine granular; slightly compact (14 mm); non plastic, non sticky; common roots; dry; very positive benzidine reaction; clear, smooth boundary to

B_2 12-94 cm + Dull orange (7.5YR7/4) dry, dull orange (7.5YR6/4) moist; loam; many, distinct bright brown (7.5YR5/8) spotty iron mottles; few, distinct brown (7.5YR4/6) manganese mottles; few, fine and very fine pores; extremely hard (35 mm); very hard when dry; slightly plastic, slightly sticky; few roots; semi-dry; positive benzidine reaction.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases (%) at pF1-5 Solid	Liquid	Air	Particle size (%) Sand	Silt	Clay
A_p	0-12	5.2	7.1	1.37	52.7	30.0	17.3	58.6	28.9	12.5
B_2	12-94+	4.3	6.1	1.82	70.0	28.3	1.7	57.1	36.7	6.7

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%) pF1.0	pF1.5	pF3.0	pF4.0
A_p	L	14	9.9×10^{-4}	37.7	32.9	30.0	17.2	6.8
B_2	L	35	3.0×10^{-6}	29.9	28.8	28.3	23.1	12.8

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Storage Capacity (mm) of Easily available water (of 50 cm deep soil)	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_p	86.7	35.1	5.1	4.1	0.72	0.029	24.8	1.24	1.68
B_2			6.1	4.7	0.47	0.017	27.7	0.81	2.24

Horizon	Exchangeable bases Ca	Mg	Na	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	Available (ppm)	Total K_2O (%)
A_p	0.90	0.24	0.36	0.16	99.0	0.044	81.6	0.057
B_2	1.10	0.30	0.50	0.05	87.3	0.031	4.4	0.063

Horizon	Extractable S	Fe	Cu	Zn (ppm)	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_p	16.50	13.12	1.80	3.2	30.8	60	132
B_2	1.75	3.00	0.80	1.2	8.0	100	64

Profile No. 74

I. Information on the site.

a. Date of examination : 27 March 1974.
b. Location : Surin Sericulture Research Station (No. 2).
c. Land form :
  i. Physiographic position : Low terrace.
  ii. Surrounding land form : Flat.
d. Land use : Peanut cultivation.

II. General information on the soil.

a. Soil classification : Low Humic Gley soils.
b. Parent material : Alluvial sediment.
c. Drainage and water permeability : Moderately well drained. Permeability is moderate.
d. Moisture condition in profile : Dry throughout the profile.

III. Profile description.

A_p 0—15 cm Dull orange (7.5YR7/3) dry, dull brown (7.5YR5/4) moist; sandy loam; moderate, medium subangular blocky structure; common, fine and very fine pores; extremely compact (34 mm); very hard when dry; non plastic, slightly sticky; common roots; very positive benzidine reaction; clear, smooth boundary to

B_2 15-90 cm + Dull orange (7.5YR7/3) dry; loam; common, distinct brown (7.5YR4/6) spotty manganese mottles; extremely compact (34 mm); very hard when dry; slightly plastic, slightly sticky; few roots; dry.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)	(g/cm³)	Solid	Liquid	Air	Sand	Silt	Clay
A_p	0-15	9.3	13.6	1.47	56.7	31.6	11.7	72.9	22.6	4.5
B_2	15-90+	5.5	8.5	1.54	59.4	34.2	6.4	63.2	32.5	4.3

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_p	SL	34	6.9×10^{-4}	35.5	33.8	31.6	19.8	8.9
B_2	L	34	7.2×10^{-4}	40.3	36.6	34.2	24.3	9.2

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_p	121.6	52.4	6.5	5.6	0.77	0.039	19.7	1.33	2.08
B_2			6.7	5.3	0.38	0.020	19.0	0.66	2.08

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_p	1.60	0.30	0.36	0.11	114.1	0.037	72.0	0.057
B_2	1.80	0.33	0.27	0.16	122.9	0.026	6.6	0.045

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_p	1.75	1.84	0.80	1.8	8.4	220	90
B_2	0.75	3.00	0.60	1.0	2.4	120	41

Profile No. 75

I. Information on the site.

a . Date of examination : 27 March 1974.
b . Location : Surin Sericulture Research Station (No.3).
c . Land form :
  i . Physiographic position : Low terrace.
  ii . Surrounding land form : Flat.
d . Land use : Mulberry and peanut cultivation.

II. General information on the soil.

a . Soll classification : Low Humic Gley soils.
b . Parent material : Alluvial sediment.
c . Drainage and water permeability : Imperfectly drained. Permeability is low.
d . Moisture condition in profile : Dry throughout the profile.

III. Profile description.

A_p 0-16 cm Dull brown (7.5YR5/3) clay loam; moderate, fine granular; slightly compact (16 mm); non plastic, slightly sticky; common roots; dry; positive benzidine reaction; gradual smooth boundary to

A_{12} 16-28 cm Dull brown (7.5YR5/3) clay loam; moderate, medium and coarse subangular blocky structure; common, fine and very fine pores; very hard when dry; very compact (28 mm); non plastic; slightly sticky; common roots; dry; positive benzidine reaction; clear smooth boundary to

B_{21} 28-92 cm Dull orange (7.5YR6/4) clay loam; many, distinct orange (7.5YR6/8) spotty iron mottles; moderate, medium and coarse subangular blocky structure; few fine pores; very hard when dry; extremely compact (32 mm); slightly plastic, slightly sticky; few roots; dry; gradual, smooth boundary to

B_{22} 92 cm + Dull orange (7.5YR7/3) clay loam; common, distinct reddish brown (2.5-YR4/8) spotty iron mottles; slightly compact (18 mm); semi-dry,

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases(%) at pF1-5 Solid	Liquid	Air	Particle size(%) Sand	Silt	Clay
A_p	0-16	10.2	14.8	1.45	55.6	31.5	12.9	54.5	30.6	14.9
A_{12}	16-28	6.5	10.6	1.64	63.0	29.3	7.7	54.4	28.7	16.9
B_{21}	28-92	7.5	12.0	1.61	61.9	30.7	7.4	52.6	26.6	20.8
B_{22}	92+	13.0	20.9	1.61	61.8	31.3	6.9	52.4	24.6	23.0

Hcrizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content(%) pF1.0	pF1.5	pF3.0	pF4.0
A_p	CL	16	9.6×10^{-4}	38.1	34.0	31.5	15.9	8.0
A_{12}	CL	28	8.3×10^{-4}	33.4	30.3	29.3	22.0	10.2
B_{21}	CL	32	3.2×10^{-5}	35.8	32.4	30.7	19.5	9.6
B_{22}	CL	18	5.1×10^{-5}	33.3	31.7	31.3	18.9	11.9

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Easily available water	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_p	100.9	58.4	4.9	3.9	0.69	0.034	20.3	1.19	1.84
A_{12}			5.0	3.8	0.80	0.030	26.7	1.38	1.92
B_{21}			4.5	3.3	0.38	0.017	22.4	0.66	2.32
B_{22}			4.6	3.4	0.41	0.013	31.5	0.71	2.40

Horizon	Exchangeable bases Ca	Mg	Na	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	Available (ppm)	Total K_2O (%)
A_p	0.95	0.21	0.18	0.11	78.5	0.033	23.7	0.039
A_{12}	0.90	0.20	0.18	0.05	69.5	0.040	28.5	0.045
B_{21}	0.70	0.14	0.02	0.01	37.2	0.044	3.7	0.051
B_{22}	0.25	0.06	0.03	0.01	14.8	0.026	1.3	0.063

Horizon	Extractable S	Fe	Cu	Zn (ppm)	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_p	4.25	9.84	1.20	1.6	47.2	140	73
A_{12}	4.25	14.52	15.20	5.2	52.0	140	38
B_{21}	6.80	5.44	1.00	1.0	5.2	40	54
B_{22}	1.50	3.72	2.60	2.0	0.8	6	26

Profile No. 76

I. Information on the site.

a . Date of examination : 27 March 1974.
b . Location : Surin Sericulture Research Station (No. 4).
c . Land form :
  i . Physiograhic position : Low terrace.
  ii . Surrounding land form : Flat.
d . Land use : Mulberry cultivation.

II. General information on the soil.

a . Soil classification : Low Humic Gley soils.
b . Parent material : Alluvial sediment.
c . Drainage and water permeability : Moderately well drained. Permeability is moderate.
d . Moisture condition in profile : Semi-dry throughout the profile.

III. Profile description.

A_p 0-14 cm Dull brown (7.5YR5/4) clay loam; moderate, fine granular; slightly compact (14 mm); non plastic, non sticky; common roots; semi-dry; slightly positive benzidine reaction; gradual, smooth boundary to

A_{12} 14-22 cm Dull brown (7.5YR5/4) sandy loam; weak medium subangular blocky structure, friable; few, fine pores; compact (23 mm); non plastic; non sticky; common roots; semi-dry; slightly positive benzidine reaction; clear, smooth boundary to

B_{21} 22-73 cm Orange (7.5YR7/6) sandy clay; common, distinct orange (7.5YR6/8) spotty iron mottles; moderate, medium and coarse, subangular blocky structure; few, fine and very fine pores; very hard when dry; extremely compact (31 mm); few roots; semi-dry; gradual smooth boundary to

B_{22} 73-93 + cm Dull orange (7.5YR7/4) sandy loam; common, distinct orange (7.5YR7/6) spotty iron mottles; weak, medium subangular blocky structure, very friable; few, very fine pores; slightly compact (18 mm); semi-dry.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases (%) at pF1-5 Solid	Liquid	Air	Particle size (%) Sand	Silt	Clay
A_p	0-14	11.7	15.8	1.35	51.8	29.3	18.9	61.4	20.3	18.3
A_{12}	14-22	11.1	18.2	1.64	63.0	28.8	8.2	63.9	16.2	19.9
B_{21}	22-73	13.6	20.6	1.52	58.4	31.0	10.6	59.4	16.1	24.5
B_{22}	73-93+	8.8	13.0	1.48	57.0	35.0	7.6	69.8	22.1	8.1

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%) pF1.0	pF1.5	pF3.0	pF4.0
A_p	CL	14	1.8×10^{-3}	39.5	32.8	29.3	11.4	7.7
A_{12}	SCL	23	8.3×10^{-4}	31.1	29.5	28.8	18.9	10.8
B_{21}	SCL	31	7.5×10^{-4}	34.1	32.8	31.0	19.6	12.0
B_{22}	SC	18	1.7×10^{-3}	42.1	38.1	35.4	15.6	3.6

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Storage Capacity (mm) of Easily available water (of 50 cm deep soil)	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_p	97.8	67.7	5.2	3.3	0.72	0.037	19.5	1.24	2.16
A_{12}			4.4	3.3	0.66	0.024	27.5	1.14	1.92
B_{21}			4.6	3.7	0.44	0.018	24.4	0.76	3.04
B_{22}			4.5	3.8	0.38	0.112	3.4	0.66	1.04

Horizon	Exchangeable bases Ca (me/100g)	Mg (me/100g)	Na (me/100g)	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	P_2O_5 Available (ppm)	Total K_2O (%)
A_p	0.35	0.10	0.59	0.05	5.05	0.055	38.6	0.045
A_{12}	0.35	0.05	0.27	0.05	38.0	0.044	11.9	0.039
B_{21}	0.45	0.06	0.77	0.05	44.0	0.055	1.8	0.057
B_{22}	0.20	0.04	0.13	0.03	38.6	0.031	0.9	0.024

Horizon	Extractable S (ppm)	Fe (ppm)	Cu (ppm)	Zn (ppm)	Mn (ppm) Exchangeable	Mn (ppm) Easily red.	Electrical conductivity (μ mho)
A_p	3.00	39.40	1.00	1.4	24.8	42	62
A_{12}	2.00	30.00	0.60	1.0	20.0	44	37
B_{21}	12.50	5.48	0.20	0.8	16.0	22	38
B_{22}	0.50	2.20	0.40	0.8	0.8	6	38

Profile No. 95

I. Information on the site.

a. Date of examination : 20 April 1974.
b. Location : Kohong Rubber Research Center, Hat Yai.
c. Land form :
  i. Physiographic position : Low terrace.
  ii. Surrounding land form : Flat to gently undulating.
d. Land use : Rubber cultivation.

II. General information on the soil.

a. Soil classification : Low Humic GIey soils.
b. Parent material : Old alluvial sediment.
c. Drainage and water permeability : Imperfectly drained. Permeability is low.
d. Moisture condition in profile : Top 72 cm of profile semi-dry to moist, wet below.

III. Profile description.

A_1 0-19 cm Dark brown (10YR3/4) sandy loam; weak, medium subangular blocky structure; friable; few, fine and very fine pores; slightly compact (17 mm); slightly plastic, slightly sticky; common roots; semi-dry; faint 2,2-dipyridyl reaction; clear, smooth boundary to

B_{21} 19-46 cm Dull yellow orange (10YR6/3) sandy loam; common, distinct yellowish brown (10YR5/8) spotty iron mottles; weak, medium subagular blocky structure, friable; common, fine and very fine pores; slightly compact (15 mm); slightly plastic, slightly sticky; few roots; moist; faint 2,2-dipyridyl reaction; gradual, smooth boundary to

B_{22} 46-72 cm Light gray (10YR7/1) sandy loam; common, distinct yellowish brown (10YR5/8) tubular iron mottles; weak, medium subangular blocky structure, friable; few fine and very fine pores; slightly plastic, slightly sticky; slightly compact (13 mm); few roots; moist; clear smooth boundary to

B_3 72-93 cm + Mixed soil bright yellowish brown (10YR6/8) in 9 portions and yellow orange (10YR7/2) in 1 portion; clay; common, weathered laterite gravels (7.5YR4/8); weak, fine subangular blocky structure, friable; few, fine and very fine pores; slightly compact (16 mm); wet.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases(%) at pF1-5 Solid	Liquid	Air	Particle size(%) Sand	Silt	Clay
A_1	0-19	17.4	25.4	1.46	56.2	34.5	9.3	74.2	12.8	13.0
B_{21}	19-46	12.0	19.1	1.59	61.3	28.1	10.6	74.2	10.8	15.0
B_{22}	46-72	12.4	20.3	1.64	63.1	29.6	7.3	68.1	17.0	14.9
B_3	72-93+	—	—	—	—	—	—	—	—	—

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content(%) pF1.0	pF1.5	pF3.0	pF4.0
A_1	SL	17	2.1×10^{-3}	39.2	36.8	34.5	21.5	10.5
B_{21}	SL	15	1.1×10^{-4}	30.4	29.8	28.1	19.7	8.0
B_{22}	SL	13	2.0×10^{-4}	32.6	31.7	29.6	14.8	9.0
B_3	—	—	—	—	—	—	—	—

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Easily available water	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_1	108.1	53.3	5.0	3.4	0.97	0.068	14.3	1.67	1.68
B_{21}			5.1	3.3	0.12	0.017	7.1	0.21	1.12
B_{22}			5.1	3.4	0.15	0.013	11.5	0.26	1.18
B_3			—	—	—	—	—	—	—

Horizon	Exchangeable bases Ca	Mg	Na	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	Available (ppm)	Total K_2O (%)
A_1	0.15	0.06	0.07	0.08	21.4	0.048	28.1	0.084
B_{21}	0.10	0.02	0.05	0.08	21.3	0.033	6.6	0.108
B_{22}	0.35	0.08	0.11	0.08	48.3	0.033	3.7	0.127
B_3	—	—	—	—	—	—	—	—

Horizon	Extractable S	Fe	Cu	Zn (ppm)	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A1	5.75	72.72	0.12	3.0	2.4	8	53
B_{21}	5.75	8.00	0.24	1.0	1.2	7	25
B_{22}	5.75	11.70	0.24	2.4	3.2	10	17
B_3	—	—	—	—	—	—	—

Profile No. 111

I. Information on the site.

a. Date of examination : 25 April 1974.
b. Location : Sam Roi Kla, Ron Phibun, Nakhon Si Thamarat.
c. Land form :
  i. Physiographic position : Low terrace.
  ii. Surrounding land form : Flat to gently undulating.
d. Land use : Coconut cultivation.

II. General information on the soil.

a. Soil classification : Low Humic Gley soils.
b. Parent material : Old alluvium.
c. Drainage : Imperfectly drained.
d. Moisture condition in profile : Top 27 cm of profile semi-dry, moist below. Depth of ground water table was 60 cm from the surface on date of examination.

III. Profile description.

A_1 0—13 cm Grayish yellow brown (10YR4/2) clay loam; many, distinct brown (7.5YR 4/4) spotty iron mottles; moderate, medium subangular blocky structure; few fine pores; compact (22 mm); slightly plastic, slightly sticky; common roots; semi-dry; moderate 2,2'-dipyridyl reaction; gradual, smooth boundary to

AB 13-27 cm Grayish yellow brown (10YR6/2) clay loam; many, distinct brown (7.5YR 4/6) tubular iron mottles; moderate, medium subangular blocky structure; few fine pores; compact (20 mm); plastic, sticky; few roots; semi-dry; moderate 2,2'-dipyridyl reaction; gradual, smooth boundary to

B_2 27—72 cm + Light brownish gray (10YR7/1) sandy clay loam; few, distinct bright yellowish brown (10YR6/8) spotty iron mottles; weak, medium subangular blocky structure; few fine pores; slightly compact (18 mm); slightly plastic, sticky; few roots; moist; moderate 2,2'-dipyridyl reaction.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density (g/cm³)	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)		Solid	Liquid	Air	Sand	Silt	Clay
A_1	0-13	—	—	—	—	—	—	—	—	—
AB	13-27	—	—	—	—	—	—	—	—	—
B_2	27-72+	—	—	—	—	—	—	—	—	—

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_1	—	—	—	—	—	—	—	—
AB	—	—	—	—	—	—	—	—
B_2	—	—	—	—	—	—	—	—

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_1	—	—	4.8	3.5	1.61	0.101	15.9	2.78	6.24
AB			4.7	3.4	1.09	0.057	19.1	1.88	3.20
B_2			4.8	3.4	—	0.021	—	—	1.92

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_1	1.05	0.07	0.02	0.11	20.0	0.057	17.6	0.449
AB	0.65	0.04	0.02	0.11	25.6	0.026	11.0	0.443
B_2	0.25	0.04	0.02	0.05	19.2	0.022	6.6	0.407

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_1	1.50	47.16	0.04	2.0	5.2	40	50
AB	0.50	18.50	0.04	0.4	5.6	17	22
B_2	0.50	7.80	0.04	0.8	2.0	8	17

Profile No. 114

I. Information on the site.

a . Date of examination : 13 July 1974

b . Location : Non Sung Agricultural Experiment Station.

c . Land form.

i . Physiographic position : Old alluvial terrace.

ii . Surrounding land form : Nearly flat.

d . Land use : Mung bean cultivation.

II. General information on the soil.

a . Soil classification : Low Humic Gley soils.

b . Parent material : Old alluvium.

c . Drainage and permeability : Imperfectly drained. Permeability is very low.

d . Moisture condition in profile : Top 20 cm. of profile dry, semi-dry below.

III. Profile description.

A_p 0—20 cm Dull yellowish brown (10YR4/3) light clay; moderate, medium subangular blocky structure; common, fine and very fine pores; compact (22 mm), plastic, sticky; common roots; dry; gradual, smooth boundary to

B_{21} 20—32 cm Grayish yellow brown (10YR4/2) light clay; abundant, distinct dull reddish brown (5YR4/4); spotty iron mottles; moderate, medium subangular blocky; common fine and very fine pores; compact (23 mm) plastic, sticky; common roots, semi-dry; gradual smooth boundary to

B_{22} 32-100 cm + Grayish red (2.5YR5/2) heavy clay; abundant, distinct, dull reddish brown (5YR4/4) spotty iron mottles; moderate, medium subangular blocky structure, common fine and very fine pores; very compact (25 mm); plastic, sticky; semi-dry .

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)	(g/cm³)	Solid	Liquid	Air	Sand	Silt	Clay
A_p	0-20	17.3	23.7	1.37	52.8	32.8	14.4	38.8	20.4	40.8
B_{21}	20-32	18.6	29.6	1.59	61.0	33.2	5.8	36.4	20.5	43.1
B_{22}	32-100+	19.8	32.5	1.64	63.0	34.2	2.8	25.9	22.7	51.4

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_p	LiC	22	4.3×10^{-4}	40.2	35.4	32.8	25.9	20.0
B_{21}	LiC	23	Impermeable	35.5	33.6	33.2	30.3	25.7
B_{22}	HC	25	Impermeable	35.1	34.3	34.2	31.9	26.9

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_p	47.7	21.4	4.6	3.8	1.22	0.074	16.5	2.10	7.92
B_{21}			4.9	4.0	—	0.048	—	—	8.00
B_{22}			4.6	3.9	0.91	0.059	15.4	1.57	6.24

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_p	5.50	0.90	1.95	0.16	107.4	0.086	36.2	0.244
B_{21}	6.00	0.83	1.86	0.11	110.0	0.055	4.4	0.286
B_{22}	4.75	0.83	2.00	0.05	122.3	0.055	2.4	0.280

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_p	34.50	6.68	1.20	1.6	57.6	340	500
B_{21}	19.50	3.28	1.00	2.0	29.2	380	640
B_{22}	12.75	3.84	0.80	0.8	29.2	460	690

Profile No. 115

I. Information on the site.

a . Date of examination : 13 July 1974.
b . Location : Non Sung Agricultural Experiment Station.
c . Land form.
  i . Physiographic position : Old alluvial terrace.
  ii . Surrounding land form : Nearly flat.
d . Land use : Jute cultivation.

II. General information on the soil.

a . Soil classification : Low Humic Gley soils.
b . Parent material : Old alluvium.
c . Drainage and water permeability : Moderately well drained. Permeability is very Iow.
d . Moisture condition in profile : Top 14 cm. of profile semi-dry, moist below.

III. Profile description.

A_p 0-14 cm Grayish yellow brown (10YR4/2) light clay; moderate, medium subangular blocky structure; common, fine and very fine pores; very compact (30 mm); plastic, sticky; common roots, dry; gradual, smooth boundary to

B_{21} 14-40 cm Grayish yellow brown (10YR4/2) light clay; many distinct, bright brown (7.5YR5/6) and reddish brown (2.5YR3/6) spotty iron mottles; moderate, medium subangular blocky structure; common fine and very pores; very compact (26 mm) plastic, sticky; few roots; semi-dry; gradual, smooth boundary to

B_{22} 40-93 cm Dull yellowish brown (10YR5/3) clay; abundant, distinct, yellowish brown (10YR5/8) iron mottles; weak, medium subangular blocky structure; common fine and very fine pores; slightly compact (18 mm); plastic, sticky; few roots; semi-dry; gradual smooth boundary to

B_{3g} 93-100 cm + Grayish red (2.5YR5/2) clay; abundant, distinct, yellow orange (10YR7/8) spotty iron mottles; weak, medium subangular blocky structure; common, fine and very fine pores; slightly compact (17 mm); plastic, sticky; moist.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases (%) at pF1-5 Solid	Liquid	Air	Particle size (%) Sand	Silt	Clay
A_p	0-14	16.8	18.6	1.11	42.9	40.0	17.1	33.1	22.9	44.0
B_{21}	14-40	23.4	37.0	1.58	60.8	37.9	1.3	25.2	19.6	55.3
B_{22}	40-93	29.0	43.2	1.49	57.1	38.7	4.2	22.2	16.4	61.4
B_{3g}	93 +	25.1	48.4	1.38	53.1	45.5	1.4	22.0	64.8	13.2

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%) pF1.0	pF1.5	pF3.0	pF4.0
A_p	LiC	30	1.1×10^{-2}	53.6	44.6	40.0	27.2	21.4
B_{21}	HC	26	Impermeable	39.0	38.0	37.9	36.7	36.7
B_{22}	HC	18	Impermeable	40.7	38.7	38.7	36.7	35.0
B_{3g}	SiL	17	Impermeable	45.5	45.5	45.5	43.5	39.2

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Storage Capacity (mm) of Easily available water (of 50 cm deep soil)	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_p	32.9	23.0	4.8	3.8	1.61	0.066	24.4	2.78	12.64
B_{21}			5.1	4.3	0.80	0.042	19.1	1.38	11.12
B_{22}			5.9	4.9	0.74	0.025	29.6	1.28	6.96
B_{3g}			6.9	5.8	—	0.017	—	—	13.36

Horizon	Exchangeable bases Ca	Mg	Na	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	Available (ppm)	Total K_2O (%)
A_p	8.00	1.51	1.68	0.11	89.4	0.077	6.1	0.340
B_{21}	6.00	1.46	1.00	0.16	77.5	0.066	11.0	0.037
B_{22}	8.25	1.46	2.50	0.11	176.9	0.066	7.0	0.334
B_{3g}	9.00	1.46	4.95	0.16	116.5	0.055	6.1	0.304

Horizon	Extractable S	Fe	Cu	Zn (ppm)	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_p	9.25	5.40	1.2	0.6	36.8	300	49
B_{21}	10.50	2.96	0.6	1.0	14.8	440	120
B_{22}	11.25	3.04	0.8	0.6	4.8	260	128
B_{3g}	15.75	6.40	0.2	1.0	3.6	280	280

Profile No. 116

I. Information on the site.

a. Date of examination : 13 July 1974.
b. Location : Non Sung Agricultural Experiment Station.
c. Land form.
  i. Physiographic position : Old alluvial terrace.
  ii. Surrounding land form : Nearly flat.
d. Land use : Jute cultivation.

II. General information on the soil.

a. Soil classification : Gray Podzolic soils.
b. Parent material : Old alluvium.
c. Drainage and water permeability : Moderately well drained. Permeability is low.
d. Moisture condition : Dry throughout the profile.

III. Profile description.

A_p 0-23 cm. Dull brown (7.5YR5/4) sandy loam; weak fine subangular blocky, friable; few, very fine pores; slightly compact (15 mm); positive, benzidine reaction; dry; gradual smooth boundary to

B_{21} 23-82 cm Dull brown (7.5YR5/3) sandy loam; moderate medium subangular blocky; few ronded iron-manganese nodules (1-2 mm); common, fine and very fine pores; extremely compact (36 mm); few roots; dry; positive benzidine reaction; faint, 2, 2′-dipyridyl reaction; gradual smooth bounday to

B_{22} 82-118 cm Dull yellow orange (10YR6/4) sandy loam; common distinct bright yellowish brown (10YR6/6) mottles and few, distinct, brownish black (10YR3/2); weak medium subangular blocky, friable; common fine and very fine pores; extremely compact (36 mm); dry; positive benzidine reaction; faint 2, 2′-dipyridyl reaction; gradual smooth boundary to

B_{3g} 118+ Grayish yellow brown (10YR5/2) loam, abundant, distinct, reddish brown (5YR4/8) iron mottles; friable, weak, medium subangular blocky; common fine and very fine pores; very compact (25 mm); semi-dry; positive 2, 2′-dipyridyl reaction.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density (g/cm³)	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)		Solid	Liquid	Air	Sand	Silt	Clay
A_p	0-23	2.5	3.2	1.28	49.1	34.2	16.7	74.1	16.3	9.6
B_{21}	23-82	6.2	11.1	1.79	68.4	25.7	5.9	71.0	18.3	10.7
B_{22}	82-118	7.4	11.4	1.54	59.0	33.7	7.3	67.2	29.2	3.6

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_p	SL	15	2.0×10^{-4}	46.8	37.6	34.2	14.4	5.9
B_{21}	SL	36	9.8×10^{-5}	26.1	25.7	25.7	23.2	18.4
B_{22}	SL	36	1.8×10^{-4}	38.1	34.5	33.7	26.7	14.5

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_p	84.8	52.3	5.3	3.7	0.83	0.034	24.4	1.43	2.08
B_{21}			6.6	4.5	—	0.021	—	—	2.40
B_{22}			7.8	6.2	—	0.018	—	—	4.48
B_{3g}			8.1	6.5	—	0.011	—	—	3.60

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_p	1.35	0.27	0.68	0.053	113.3	0.044	45.2	0.084
B_{21}	2.50	0.33	1.86	0.053	197.5	0.031	3.3	0.015
B_{22}	2.60	0.24	3.54	0.053	143.6	0.031	13.8	0.127
B_{3g}	9.50	0.38	6.95	0.105	470.4	0.040	9.0	0.190

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_p	0.75	15.40	0.4	0.8	18.0	100	51
B_{21}	15.50	3.24	0.4	1.4	22.0	240	140
B_{22}	47.00	3.00	0.8	1.4	1.6	160	420
B_{3g}	41.75	3.00	1.0	1.6	1.8	140	750

Profile No. 127

I. Information on the site.

a . Date of examination : 17 July 1974.

b . Location : Agricultural Experiment Station, Tambon Makhamthao, Amphoe Muang, Nakhon Phanom.

c . Land form :

i . Physiographic position; Old alluvial low terrace.

ii . Surrounding land form : Flat.

d . Land use : Leguminous crops cultivated as cover crops.

II. General information on the soil.

a . Soil classification : Gray Podzolic soils.

b . Parent material : Old alluvium.

c . Drainage and water permeability : Moderately well drained. Permeability is moderate.

d . Moisture condition in profile : Top 12 cm. of profile semi-dry, moist below.

III. Profile description.

A_p 0-12 cm Brownish black (10YR3/2) sandy loam; moderate medium subangular blocky; common, fine and very fine pores; compact (20 mm); common roots; semi-dry; faint 2, 2′-dipyridyl reaction; gradual smooth boundary to

B_{21} 12-45 cm Bright brown (7.5YR5/6) sandy clay loam; moderate medium subangular blocky; common fine and very fine pores; slightly compact (18 mm); few roots; moist; clear smooth boundary to

B_{22} 45-88 cm + Dull yellow orange (10YR6/4) sandy clay loam; abundant distinct, bright reddish brown (5YR5/8) iron mottles; moderate, medium subangular blocky; common fine and very fine pores; few large size (2.5-3.5 cm) termite holes; slightly compact (17 mm); moist : positive 2, 2′-dipyridyl reaction.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases (%) at pF1-5 Solid	Liquid	Air	Particle size (%) Sand	Silt	Clay
A_p	0-12	13.6	20.8	1.53	58.9	30.3	10.8	76.9	11.3	11.8
B_{21}	12-45	16.8	26.9	1.60	61.7	30.0	8.3	66.1	13.3	20.6
B_{22}	45-88+	18.1	27.9	1.54	59.3	30.8	9.9	62.9	14.4	22.7

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%) pF1.0	pF1.5	pF3.0	pF4.0
A_p	SL	20	5.0×10^{-4}	34.4	32.3	30.3	14.8	8.2
B_{21}	SCL	18	8.0×10^{-4}	32.2	30.8	30.3	22.9	15.7
B_{22}	SCL	17	1.2×10^{-4}	34.0	32.1	30.8	22.5	16.3

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Easily available water (of 50 cm deep soil)	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_p	81.0	46.2	4.8	3.2	0.65	0.039	16.7	1.12	1.28
B_{21}			4.9	3.4	0.43	0.038	11.3	0.74	1.36
B_{22}			4.8	3.0	0.36	0.031	11.6	0.62	1.20

Horizon	Exchangeable bases Ca (me/100g)	Mg (me/100g)	Na (me/100g)	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	P_2O_5 Available (ppm)	Total K_2O (%)
A_p	0.35	0.10	0.07	0.02	42.0	0.046	10.3	0.163
B_{21}	1.10	0.16	0.03	0.04	97.4	0.051	5.3	0.295
B_{22}	0.40	0.16	0.04	0.02	51.8	0.056	2.4	0.331

Horizon	Extractable S (ppm)	Fe (ppm)	Cu (ppm)	Zn (ppm)	Mn (ppm) Exchangeable	Mn (ppm) Easily red.	Electrical conductivity (μ mho)
A_p	1.00	12.52	0.60	1.4	4.0	60	28
B_{21}	1.25	6.24	0.60	1.2	1.6	20	29
B_{22}	7.00	5.00	1.00	1.4	0.8	20	21

Profile No. 128

I. Information on the site.

a. Date of examination : 16 July 1974.
b. Location : Agricultural Experiment Station, Amphong, Nakhon Phanom.
c. Land form :
   i. Physiographic position : Alluvial low terrace.
   ii. Surrounding land form : Flat to gently undulating.
d. Land use : Legume cultivation.

II. General information on the soil.

a. Soil classification : Low Humic Gley soils.
b. Parent material : Old alluvium.
c. Drainage and water permeability : Moderately well drained. Permeability is low.
d. Moisture condition in profile : Top 22 cm. of profile semi-dry, moist below.

III. Profile description.

A_p 0-15 cm Dull yellowish brown (10YR4/3) sandy loam; single grain and weak, fine subangular blocky; friable; loose (10 mm); common roots; semi-dry; faint benzidine reaction; gradual smooth boundary to

A_{12} 15-22 cm Dull yellowish brown (10YR4/3) sandy loam; weak, fine subangular blocky; friable; common, fine and very fine pores; compact (22 mm); common roots; semi-dry; faint benzidine reaction; gradual smooth boundary to

B_{21} 22-50 cm Dull yellowish brown (10YR5/4) sandy clay loam; weak, medium subangular blocky; common, fine and very fine pores; slightly compact (17 mm); few roots; moist; faint 2, 2′-dipyridyl reaction; gradual smooth boundary to

B_{22} 50-100 cm + Dull yellowish brown (10YR5/4) sandy clay loam; many, distinct, bright brown (7.5YR5/6) iron mottles; weak, medium subangular blocky; few fine pores; few fine animal holes; slightly compact (18 mm.); moist.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases (%) at pF1-5 Solid	Liquid	Air	Particle size (%) Sand	Silt	Clay
A_p	0-15	11.3	17.7	1.57	60.3	29.5	10.2	81.1	10.3	8.6
A_{12}	15-22	14.3	24.5	1.67	64.3	27.2	8.5	78.1	12.2	9.7
B_{21}	22-50	18.7	32.2	1.72	66.2	25.3	8.5	66.1	13.1	20.8
B_{22}	50-100+	15.4	24.2	1.57	60.3	25.7	14.0	53.9	13.3	22.8

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%) pF1.0	pF1.5	pF3.0	pF4.0
A_p	SCL	10	7.3×10^{-4}	37.0	31.4	29.5	9.9	5.9
A_{12}	SL	22	1.5×10^{-4}	29.7	28.3	27.2	13.4	5.1
B_{21}	SCL	17	8.4×10^{-4}	27.4	26.4	25.3	16.5	10.7
B_{22}	SCL	18	1.2×10^{-3}	32.9	29.4	25.7	16.4	10.7

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Storage Capacity (mm) of Easily available water (of 50 cm deep soil)	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_p	91.8	63.7	4.5	3.2	0.25	0.022	11.4	0.43	1.36
A_{12}			4.5	3.3	0.25	0.026	11.4	0.43	1.28
B_{21}			4.3	3.2	0.25	0.033	7.6	0.43	1.36
B_{22}			4.6	3.0	0.25	0.029	8.6	0.43	1.28

Horizon	Exchangeable bases Ca	Mg	Na	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	P_2O_5 Available (ppm)	Total K_2O (%)
A_p	0.20	0.04	0.03	0.02	21.5	0.055	43.4	0.184
A_{12}	0.10	0.04	0.07	0.02	17.8	0.055	4.8	0.226
B_{21}	0.10	0.05	0.07	0.02	17.4	0.057	8.6	0.470
B_{22}	0.20	0.04	0.02	0.03	22.8	0.088	7.7	0.494

Horizon	Extractable S	Fe	Cu	Zn (ppm)	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_p	2.50	5.80	0.80	1.6	1.6	40	22
A_{12}	5.25	5.40	0.60	1.4	6.8	60	27
B_{21}	12.25	9.60	0.60	1.0	3.6	40	35
B_{22}	12.25	2.68	0.40	1.4	10.4	40	28

Profile No. 129

I. Information on the site.

a. Date of examination : 17 July 1974.
b. Location : Agricultural Experiment Station, Amphoe Muang, Sakon Nakhon.
c. Land form :
  i. Physiographic position : Low terrace.
  ii. Surrounding land form : Flat.
d. Land use : Soybean cultivation.

II. General information on the soil.

a. Soil classification : Low Humic Gley soils.
b. Parent material : Old alluvium.
c. Drainage and water permeability : Moderately well drained. Permeability is moderately low.
d. Moisture condition in profile : Top 15 cm. of profile dry, semi-dry to moist below.

III. Profile description.

A_p 0-15 cm Brown (7.5YR4/3) sandy loam; single grain and weak, fine subangular blocky; friable; few very fine pores; loose (5 mm); common roots; dry; positive benzidine reaction; gradual smooth boundary to

A_{12} 15-32 cm Dull brown (7.5YR5/3) sandy loam; weak fine subangular blocky; friable; common, fine and very fine pores; compact (20 mm); few roots; semi-dry; positive benzidine reaction; gradual smooth boundary to

B_{21} 32-50 cm Dull orange (7.5YR6/4) sandy loam abundant, distinct, bright reddish brown (5YR5/8) iron mottles; moderate fine; subangular blocky; few very fine pores; few fine termite holes; compact (22 mm); semi-dry; gradual smooth boundary to

B_{22} 50-94 cm + Dull orange (7.5YR6/4) sandy loam; abundant, distinct, reddish brown (5-YR4/8) iron mottles; moderate fine subangular blocky; few fine pores, few fine termite holes; slightly compact (15 mm); moist.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases (%) at pF1-5 Solid	Liquid	Air	Particle size (%) Sand	Silt	Clay
A_p	0-15	10.9	13.5	1.24	47.7	27.7	24.6	81.9	12.3	5.8
A_{12}	15-32	13.7	22.5	1.64	63.1	30.1	6.8	81.9	16.3	1.8
B_{21}	32-50	13.0	20.5	1.58	60.8	27.9	11.3	74.0	20.2	5.8
B_{22}	50-94+	17.2	31.1	1.81	69.5	26.3	4.2	72.8	14.3	12.9

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%) pF1.0	pF1.5	pF3.0	pF4.0
A_p	SL	50	1.9×10^{-3}	38.3	30.2	27.7	9.2	3.6
A_{12}	SL	20	5.5×10^{-5}	33.8	30.7	30.1	18.2	5.0
B_{21}	SL	22	7.1×10^{-5}	33.7	29.1	27.9	10.1	2.9
B_{22}	SL	15	6.0×15^{-6}	27.3	26.5	26.3	21.7	16.0

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Easily available water	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_p	123.8	80.0	5.1	3.9	0.36	0.022	16.4	0.62	1.04
A_{12}			7.3	5.5	0.32	0.018	17.8	0.55	0.96
B_{21}			6.4	4.5	0.06	0.011	5.5	0.10	0.56
B_{22}			4.6	3.1	0.10	0.011	9.1	0.17	0.96

Horizon	Exchangeable bases Ca	Mg	Na	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	Available (ppm)	Total K_2O (%)
A_p	0.45	0.08	0.07	0.06	63.2	0.048	72.4	0.024
A_{12}	1.30	0.12	0.04	0.01	153.4	0.048	72.0	0.024
B_{21}	0.85	0.12	0.02	0.01	178.9	0.048	6.1	0.051
B_{22}	0.35	0.12	0.07	0.01	56.8	0.033	2.4	0.072

Horizon	Extractable S	Fe	Cu	Zn (ppm)	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_p	1.5	10.40	0.40	1.0	10.8	80	52
A_{12}	1.5	3.20	1.40	0.8	2.0	60	113
B_{21}	1.0	3.20	0.60	1.0	2.0	60	29
B_{22}	22.5	3.80	1.00	0.6	2.8	20	75

Profile No. 130

I. Information on the site.

a. Date of examination : 17 July 1974.
b. Location : Agricultural Experiment Station, Amphoe Muang, Sakon Nakhon.
c. Land form.
  i. Physiographic position : Low terrace.
  ii. Surrounding land form : Flat.
d. Land use : Soybean cultivation.

II. General information on the soil.

a. Soil classification : Low Humic Gley soils.
b. Parent material : Old alluvium.
c. Drainage and water permeability : Moderately well drained. Permeability is moderate.
d. Moisture condition in profile : Top 40 cm. of profile semi-dry, below moist.

III. Profile description.

A_p 0-12 cm Brownish black (10YR2/3) sandy loam; single grain and weak, fine subangular blocky; friable; loose (6 mm); common roots; semi-dry; faint benzidine reaction; gradual smooth boundary to

A_{12} 12-23 cm Brownish black (10YR2/3) sandy loam; weak fine subangular blocky, friable; common, fine and very fine pores; slightly compact (18 mm); common roots; semi-dry; faint benzidine reaction; gradual smooth boundary to

B_{21} 23-40 cm Dull brown (7.5YR6/3) sandy loam; abundant, distinct, bright brown (7.5-YR5/6) iron mottles; moderate fine subangular blocky; few pores, few fine ant holes; slightly compact (16 mm); common roots; semi-dry; gradual smooth boundary to

B_{22} 40-85 cm + Dull brown (7.5YR6/3) sandy loam; distinct, bright brown (7.5YR5/8) iron mottles; moderate fine subangular blocky; few pores, few fine ant holes; slightly compact (14 mm); few roots; moist; faint 2,2'-dipyridyl reaction.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density (g/cm³)	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)		Solid	Liquid	Air	Sand	Silt	Clay
A_p	0-12	—	—	—	—	—	—	—	—	—
A_{12}	12-23	—	—	—	—	—	—	—	—	—
B_{21}	23-40	—	—	—	—	—	—	—	—	—
B_{22}	40-85+	—	—	—	—	—	—	—	—	—

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_p	—	—	—	—	—	—	—	—
A_{12}	—	—	—	—	—	—	—	—
B_{21}	—	—	—	—	—	—	—	—
B_{22}	—	—	—	—	—	—	—	—

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_p	—	—	6.1	5.7	0.65	0.036	18.1	1.12	1.20
A_{12}			6.2	4.8	0.47	0.027	17.4	0.81	1.12
B_{21}			5.7	4.0	0.03	0.007	4.3	0.05	0.56
B_{22}			4.8	3.0	0.17	0.012	14.2	0.29	0.96

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_p	0.75	0.13	0.05	0.04	79.3	0.035	18.4	0.018
A_{12}	0.65	0.12	0.01	0.04	72.4	0.033	17.1	0.018
B_{21}	0.25	0.10	0.14	0.02	90.0	0.031	6.1	0.018
B_{22}	0.15	0.12	0.03	0.03	33.9	0.029	3.3	0.045

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_p	2.00	0.56	0.6	1.2	8.8	40	55
A_{12}	1.50	0.84	0.4	0.6	7.2	60	52
B_{21}	1.00	10.00	0.6	0.6	1.6	40	66
B_{22}	1.25	5.60	0.6	0.6	1.6	20	17

Profile No. 135

I. Information on the site.

a. Date of examination : 18 July 1974.

b. Location : Banmai Samrong Agricultural Experiment Station, Amphoe Sikhiu, Nakhon Ratchasima.

c. Land form :

i. Physiographic position : Old alluvial terrace.

ii. Surrounding land form : Flat to gently undulating.

d. Land use : Castor cultivation.

II. General information on the soil.

a. Soil classification : Red Yellow Podzolic soils.

b. Parent material : Old alluvium.

c. Drainage and water permeability : Moderately well drained. Permeability is low.

d. Moisture condition in profile : Top (0-25 cm) of profile dry, semi-dry below.

III. Profile decription.

A_p 0-10 cm Brownish black (10YR2/3) clay loam; moderate, coarse subangular blocky; few, fine and very fine pores; extremely compact (31 mm); slightly plastic; slightly sticky; common roots; dry; very positive benzidine reaction; gradual smooth boundary to

A_{12} 10-25 cm Brownish black (10YR2/3) light clay; moderate coarse subangular blocky; few fine and very fine pores; very compact (25 mm); slightly plastic; slightly sticky; few roots; dry; positive benzidine reaction; positive 2,2'-dipyridyl reaction; gradual smooth boundary to

B_{21} 25-38 cm Dark brown (10YR3/3) light clay; abundant, distinct brown (10YR4/6) iron mottles; moderate, coarse subangular blocky; few very fine pores; very compact (27 mm); slightly plastic; slightly sticky; semi-dry; positive benzidine reaction; gradual, smooth boundary to

B_{22} 38-85 cm + Grayish brown (7.5YR4/2) light clay; distinct brown (7.5YR4/6) iron mottles and brownish black (7.5YR3/1) manganese concretions; moderate, coarse subangular blocky; few, very fine pores; very compact (25 mm); slightly plastic; slightly sticky; semi-dry; very positive benzidine reaction.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)	(g/cm³)	Solid	Liquid	Air	Sand	Silt	Clay
A_p	0-10	10.0	15.5	1.55	59.6	31.2	9.2	54.4	20.6	25.1
A_{12}	10-25	15.9	27.0	1.70	65.4	29.7	4.9	48.3	20.5	31.2
B_{21}	25-38	14.8	24.0	1.62	62.3	30.7	7.0	46.2	20.6	33.2
B_{22}	38-85+	14.0	23.2	1.66	63.8	28.7	7.5	53.9	18.4	27.7

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_p	CL	31	1.7×10^{-5}	35.4	32.6	31.2	25.9	14.4
A_{12}	LiC	25	2.3×10^{-6}	30.2	29.7	29.7	26.3	19.7
B_{21}	LiC	27	3.7×10^{-4}	31.8	31.1	30.7	27.9	21.6
B_{22}	LiC	25	1.8×10^{-3}	31.5	29.5	28.9	24.6	16.2

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_p	58.9	19.2	5.6	4.6	1.06	0.060	17.7	1.83	6.08
A_{12}			5.6	4.4	1.06	0.059	18.0	1.83	6.72
B_{21}			5.3	4.0	0.99	0.053	18.7	1.71	7.36
B_{22}			5.2	3.8	0.64	0.031	20.6	1.10	5.28

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_p	5.00	1.46	0.22	0.40	116.3	0.189	144.8	0.578
A_{12}	4.50	1.67	0.22	0.35	100.2	0.143	109.7	0.753
B_{21}	3.75	1.98	0.25	0.30	85.2	0.138	47.6	0.828
B_{22}	2.50	2.14	0.26	0.35	99.3	0.318	18.7	0.768

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_p	2.00	4.00	1.00	1.4	6.8	260	65
A_{12}	2.00	4.44	0.60	1.2	6.4	300	41
B_{21}	0.50	8.72	0.40	0.8	3.6	100	30
B_{22}	4.25	3.00	0.60	1.4	9.6	40	21

Profile No. 136

I. **Information on the site.**

a. Date of examination : 18 July 1974.

b. Location : Banmai Samrong Agricultural Experiment Station, Amphoe Sikhiu, Nakhon Ratchasima.

c. Land form :

i. Physiographic position : Old alluvial terrace.

ii. Surrounding land form : Flat.

d. Land use : Cassava cultivation.

II. **General information on the soil.**

a. Soil classification : Red Yellow Podzolic soils.

b. Parent material : Old alluvium.

c. Drainage and water permeability : Moderately well drained. Permeability is moderate.

d. Moisture condition in profile : Top 0-30 cm. of profile dry, semi-dry below.

III. **Profile description:**

A_P 0-12 cm Brownish black (7.5YR3/2) sandy loam; moderate, coarse to medium subangular blocky; common, fine and very fine pores; very compact (28 mm); slightly plastic, common roots; dry; very positive benzidine reaction; gradual smooth boundary to

AB 12-30 cm Brownish black (7.5YR3/2) sandy loam; moderate coarse subangular blocky; few, very fine pores; very compact (28 mm); slightly plastic; slightly sticky; few roots; dry; positive benzidine reaction; positive 2,2′-dipyridyl reaction; gradual smooth boundary to

B_{21} 31-48 cm Reddish brown (5YR4/8) light clay; moderate, coarse subangular blocky; few, very fine pores; extremely compact (30 mm); slightly plastic; slightly sticky; few roots; semi-dry; faint positive benzidine reaction; gradual smooth boundary to

B_{22} 48-85 cm + Dark reddish brown (5YR3/6) light clay; moderate, medium subangular blocky; common, fine and very fine pores; compact (23 mm); slightly plastic; slightly sticky; semi-dry; faint positive benzidine reaction.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)	(g/cm³)	Solid	Liquid	Air	Sand	Silt	Clay
A_P	0-12	7.0	10.3	1.47	56.4	33.4	10.2	65.9	20.3	13.8
AB	12-30	9.5	14.8	1.56	60.0	31.0	9.0	54.3	34.6	11.1
B_{21}	30-48	10.0	14.8	1.48	56.9	31.7	11.4	51.9	18.6	29.5
B_{22}	48-85$^+$	12.7	18.2	1.43	55.1	31.8	13.1	51.6	23.4	25.0

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_P	SL	28	4.5×10^{-4}	38.7	35.4	33.4	23.9	9.5
AB	L	28	9.6×10^{-4}	34.7	32.6	31.0	21.8	13.0
B_{21}	LiC	30	9.4×10^{-4}	36.5	33.9	31.7	23.3	16.2
B_{22}	LiC	23	8.6×10^{-4}	37.9	34.7	31.8	21.2	14.7

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_P	92.4	45.7	5.9	4.9	1.09	0.067	16.3	1.88	4.96
AB			6.3	5.0	1.06	0.055	19.3	1.83	3.84
B_{21}			5.2	3.6	0.77	0.045	17.1	1.33	3.44
B_{22}			5.0	3.7	0.70	0.027	25.9	1.21	3.20

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_P	4.50	0.79	0.20	0.65	123.8	0.165	141.3	0.467
AB	3.25	0.75	0.26	0.56	125.5	0.116	64.3	0.693
B_{21}	2.05	0.79	0.19	0.59	105.2	0.101	34.2	0.919
B_{22}	1.90	0.73	0.20	0.53	105.2	0.162	16.2	0.828

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_P	—	—	0.60	1.6	4.8	140	100
AB	—	—	0.20	1.0	1.6	80	70
B_{21}	—	—	0.20	0.6	4.8	240	66
B_{22}	—	—	0.40	0.8	13.6	160	68

Profile No. 54

I. Information on the site.

a. Date of examination : 26 December 1973.
b. Location : Khoksa Loong, Phattana Nikhom, Lop Buri.
c. Land form :
   i. Physiographic position : Semi-recent terrace.
   ii. Surrounding land form : Nearly flat.
d. Land use : Corn and sorghum cultivation.

II. General information on the soil.

a. Soil classification : Grumusols.
b. Parent material : Calcareous stone.
c. Drainage and water permeability : Imperfectly drained. Permeability is very low.
d. Moisture condition : Semi-dry throughout the profile.

III. Profile description.

A_P 0-15 cm Brownish black (10YR3/1) heavy clay; moderate medium subangular blocky; few, very fine pores; very plastic, sticky; common roots; semi-dry.

A_{12} 15-45 cm Brownish black (10YR3/1) heavy clay; moderate, medium subangular blocky; few, very fine pores; very plastic, sticky; few roots; semi-dry.

A_{13} 45-75 cm Brownish black (10YR3/1) heavy clay; moderate medium subangular blocky; few, very fine pores; few marls; very plastic, sticky; semi-dry.

AC 75-90 cm + Brownish gray (10YR4/1) heavy clay; moderate, medium subangular blocky; few, very fine pores; common, secondary lime nodules; semi-dry.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases(%) at pF1-5 Solid	Liquid	Air	Particle size(%) Sand	Silt	Clay
A_P	0-15	14.6	19.3	13.2	50.7	48.2	1.1	32.5	16.6	50.9
A_{12}	15-45	21.0	26.0	12.4	47.7	51.6	0.7	34.5	16.6	48.9
A_{13}	45-75	22.0	—	—	—	—	—	28.4	16.4	55.2
AC	75-90+	35.3	—	—	—	—	—	26.4	14.0	59.6

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content(%) pF1.0	pF1.5	pF3.0	pF4.0
A_P	HC	—	imperme-able	52.0	48.9	48.2	39.2	—
A_{12}	HC	—	imperme-able	52.1	51.7	51.6	48.7	—
A_{13}	HC	—		—	—	—	—	—
AC	HC	—		—	—	—	—	—

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Easily available water	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_P	—	23.7	7.9	6.7	0.72	0.077	9.4	1.24	42.96
A_{12}			8.2	6.9	1.03	0.068	15.2	1.78	37.08
A_{13}			8.4	7.0	0.58	0.022	26.4	1.00	36.40
AC			8.5	7.0	0.30	0.017	17.7	0.52	39.72

Horizon	Exchangeable bases Ca	Mg	Na	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	Available (ppm)	Total K_2O (%)
A_P	23.00	1.67	23.04	0.51	112.2	0.070	27.2	0.127
A_{12}	35.00	13.54	29.34	0.51	211.4	0.061	28.9	0.127
A_{13}	26.00	14.58	43.47	0.49	232.2	0.059	20.6	0.114
AC	26.50	16.66	43.47	0.51	219.4	0.061	15.3	0.127

Horizon	Extractable S	Fe	Cu	Zn (ppm)	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_P	43.25	0.28	0.08	0.2	0.8	5200	560
A_{12}	19.50	0.70	0.12	0.2	0.8	5400	390
A_{13}	18.25	0.44	0.12	Tr	0.8	4800	410
AC	23.00	0.20	0.12	0.2	0.4	4400	410

Profile No. 43

I. Information on the site.

a. Date of examination : 24 December 1973.

b. Location : Klangdong, Pak Chong, Nakhon Ratchasima.

c. Land form :

i. Physiographic position : Undulating slope of peneplain.

ii. Surrounding land form : Nearly flat to gently undulating land with slope of 2%.

d. Land use : Custard apple cultivation.

II. General information on the soil.

a. Soil classification : Rendzinas.

b. Parent material : Residuum from marly bed.

c. Drainage and water permeability : Moderately well drained. Permeability is low to moderately low.

d. Moisture condition in profile : Semi-dry throughout the profile.

III. Profile description.

A_p 0-10 cm Grayish yellow brown (10YR 4/2) dry, brown black (10YR 3/2) moist; silty loam; few, subangular limestone gravels (2-3 cm); moderate, fine and medium granular; loose (10 mm); plastic, sticky; common roots; dry; slightly positive benzidine reaction, gradual smooth boundary to

A_{12} 10-30 cm Brown black (10YR 3/2) silty loam; few, weathered subangular limestone nodules (2-3 mm); moderate, medium subangular blocky; friable; few, fine and very fine pores; compact (23 mm); plastic, sticky; few roots; semi-dry; positive benzidine reaction; faint 2,2′-dipyridyl reaction; clear smooth boundary to

AC 30-55 cm Grayish yellow brown (10YR 5/2) silty loam; few; weathered limestone gravels (5-10 mm), some whitish marl; moderate, medium subangular blocky, friable; few, fine and very fine pores; compact (24 mm); plastic, sticky; few roots; semi-dry; positive benzidine reaction; faint 2,2′-dipyridyl reaction; clear, smooth boundary to

C 55-80 cm+ Grayish yellow brown (10YR 6/2) silty loam; whitish marl layer; many, weathered subangular limestone gravels; moderate, medium subangular, very friable; few, fine and very fine pores; compact (22 mm); semi-dry; positive benzidine reaction; faint 2,2′-dipyridyl reaction.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases (%) at pF1-5 Solid	Liquid	Air	Particle size (%) Sand	Silt	Clay
A_p	0-10	9.9	10.8	1.09	41.9	40.9	17.2	23.1	62.4	14.5
A_{12}	10-30	24.2	32.2	1.33	51.5	42.4	6.1	25.0	70.7	8.8
AC	30-55	19.0	29.8	1.57	60.3	30.8	8.9	26.4	64.6	9.0
C	55-80+	16.5	24.9	1.51	58.1	30.4	11.5	28.8	60.5	10.7

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%) pF1.0	pF1.5	pF3.0	pF4.0
A_p	SiL	10	1.1×10^{-2}	54.7	48.7	40.9	29.1	—
A_{12}	SiL	23	1.4×10^{-4}	46.9	44.1	42.4	37.5	—
AC	SiL	24	2.9×10^{-4}	32.3	31.8	30.8	26.8	—
C	SiL	22	1.2×10^{-3}	35.5	32.7	30.4	24.7	—

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Storage Capacity (mm) of Easily available water (of 50 cm deep soil)	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_p	—	27.5	7.5	6.8	2.76	0.109	25.3	4.76	25.68
A_{12}			7.5	7.0	0.89	0.095	9.4	1.53	18.80
AC			8.0	7.2	0.63	0.039	16.2	1.09	18.72
C			7.5	7.0	0.52	0.041	12.7	0.90	18.96

Horizon	Exchangeable bases Ca (me/100g)	Mg (me/100g)	Na (me/100g)	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	P_2O_5 Available (ppm)	Total K_2O (%)
A_p	20.0	1.35	0.52	0.26	86.2	0.101	43.9	0.084
A_{12}	15.0	1.25	0.52	0.11	89.8	0.044	24.6	0.066
AC	24.0	1.15	0.65	0.11	138.4	0.029	31.2	0.060
C	18.0	1.25	0.83	0.15	106.7	0.033	14.9	0.060

Horizon	Extractable S (ppm)	Fe (ppm)	Cu (ppm)	Zn (ppm)	Mn (ppm) Exchangeable	Mn (ppm) Easily red.	Electrical conductivity (μ mho)
A_p	15.25	1.31	0	0	1.6	120	310
A_{12}	14.75	1.30	0	0	0.6	24	180
AC	14.50	0.97	0	0	0.6	6	280
C	14.00	1.14	1.0	3.0	0.4	6	290

Profile No. 53

I. Information on the site.

a. Date of examination : 26 December 1973.
b. Location : Muongkom, Chai Badan, Lop Buri.
c. Land form :
  i. Physiographic position : Undulating slope of peneplain.
  ii. Surrounding land form : Undulating and rolling.
d. Land use : Red chilli and sun flower cultivation.

II. General information on the soil.

a. Soil classification : Rendzinas.
b. Parent material : Residuum from marly bed.
c. Drainage and water permeability : Moderately well drained. Permeability is very low.
d. Moisture condition : Top 20 cm of profile dry, semi-dry below.

III. Profile description.

A_p 0-10 cm Dark brown (10YR 3/4) silty loam, few, slightly weathered subangular limestone (size is 2-3 cm in diameter); moderate, fine granular and moderate, medium subangular blocky, breaking into fine granular and crumb, loose (5 mm); plastic, slightly sticky; common roots; dry; positive benzidine reaction; clear, smooth boundary to

A_{12} 10-20 cm Dark brown (10YR 3/4) silty loam; many, weathered subangular limestone (size is 2 cm in diameter); moderate, medium subangular blocky, friable moist; few, very fine pores; very compact (28 mm); plastic, slightly sticky; common roots; dry; positive benzidine reaction; gradual, smooth boundary to.

A_{13} 20-65 cm Dark brown (10YR 3/4) silty loam; moderate, medium subangular blocky; few, very fine pores; very compact (26 mm); plastic, sticky; few roots; semi-dry; slightly positive benzidine reaction; clear, smooth boundary to.

C 65-85 cm+ Dull yellowish brown (10YR 4/3) silty loam; marl layer; few, subangular limestone (size is 4 cm in diameter); friable; very compact (26 mm); semi-dry; positive benzidine reaction.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases(%) at pF1-5 Solid	Liquid	Air	Particle size(%) Sand	Silt	Clay
A_p	0-10	8.0	9.6	1.20	46.0	45.1	8.9	19.2	74.4	6.4
A_{12}	10-20	17.9	27.2	1.52	58.7	36.6	4.7	20.7	72.7	6.6
A_{13}	20-65	30.1	40.6	1.35	51.9	44.4	3.7	20.7	72.7	6.6
C	65-80+	15.3	22.0	1.44	55.6	27.0	17.4	14.5	80.8	4.7

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content(%) pF1.0	pF1.5	pF3.0	pF4.0
A_p	SiL	5	1.1×10^{-3}	52.8	48.4	45.1	30.2	—
A_{12}	SiL	28	1.7×10^{-5}	41.5	38.0	36.6	27.1	—
A_{13}	SiL	26	4.2×10^{-6}	47.8	46.3	44.4	37.2	—
C	SiL	26	4.4×10^{-3}	37.4	30.5	27.0	19.4	—

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Storage Capacity (mm) of Easily available water (of 50 cm deep soil)	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_p	—	46.0	7.4	6.4	1.44	0.094	15.3	2.48	48.68
A_{12}			7.3	6.5	0.89	0.077	11.6	1.53	44.60
A_{13}			7.1	6.1	1.37	0.071	19.3	2.36	65.32
C			7.4	6.5	0.65	0.034	19.1	1.12	26.76

Horizon	Exchangeable bases Ca (me/100g)	Mg (me/100g)	Na (me/100g)	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	P_2O_5 Available (ppm)	Total K_2O (%)
A_p	55.00	2.92	2.50	2.00	128.2	0.215	31.6	0.362
A_{12}	65.00	2.29	2.61	1.28	159.6	0.235	13.8	0.256
A_{13}	65.00	2.29	2.28	0.83	107.8	0.092	13.2	0.289
C	60.00	0.94	2.07	0.46	237.2	0.066	13.2	0.379

Horizon	Extractable S (ppm)	Fe (ppm)	Cu (ppm)	Zn (ppm)	Mn (ppm) Exchangeable	Mn (ppm) Easily red.	Electrical conductivity (μ mho)
A_p	3.75	1.00	0.08	0.2	5.2	460	148
A_{12}	6.50	0.56	0.08	0.2	1.2	450	128
A_{13}	10.75	0.90	0.08	0.2	0.8	430	110
C	9.50	1.20	0.08	0.4	1.6	260	134

Profile No. 5

I. Information on the site.

a. Date of examination : 5 November 1973

b. Location : Mae Klong Yai Irrigation Experiment Station, Tungkwang, Kamphang Saen, Nakhon Pathom

c. Land form

i. Physiographic position : Semi-recent terrace

ii. Surrounding land form : Nearly flat

d. Land use : Rice and sunflower cultivation.

II. General information on the soil.

a. Soil classification : Noncalcic Brown soils

b. Parent material : Semi-recent alluvium

c. Drainage and water permeability : Moderately well drained. Permeability is very low.

d. Moisture condition in profile : Moist throughout the profile. Depth of ground water table was 93 cm from the surface on the date of examination.

e. Remark : Fine mica flakes occur in all horizons.

III. Profile description

A_p 0-20 cm Brown (7.5YR 4/4) silty loam; moderate, coarse subangular blocky; common, fine pores; compact (20 mm); non plastic, non sticky; many roots; semi-dry; positive benzidine reaction.

B_{21} 20-43 cm Brown (10YR 4/4) silty loam; weak, coarse subangular blocky; few, very fine pores; slightly compact (16-18 mm); slightly plastic, slightly sticky; few roots; moist; positive benzidine reaction; gradual, smooth boundary to

B_{22} 43-100 cm+ Brown (10YR 4/6) silty loam; moderate, medium and coarse subangular blocky; few, very fine pores; slightly compact (18 mm); slightly plastic, slightly sticky; friable moist; few roots; west; positive benzidine reaction.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases(%) at pF1-5 Solid	Liquid	Air	Particle size(%) Sand	Silt	Clay
A_p	0-20	16.4	23.5	1.43	55.1	36.5	8.4	24.6	67.2	8.2
B_{21}	20-43	23.6	40.0	1.69	65.1	36.7	−1.8	20.3	72.7	7.0
B_{22}	43-100+	24.8	37.4	1.51	58.2	40.6	1.2	41.7	50.6	7.7

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content(%) pF1.0	pF1.5	pF3.0	pF4.0
A_p	SiL	20	4.5×10^{-4}	43.8	39.4	36.5	26.7	—
B_{21}	SiL	16-18	2.5×10^{-5}	38.5	37.2	36.7	32.6	—
B_{22}	SiL	18	2.6×10^{-5}	43.7	41.4	40.5	30.3	—

Horizon	Storage Capacity(mm) of Available water (of 50 cm deep soil)	Easily available water	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_p	—	36.2	7.8	7.2	0.55	0.059	9.3	0.95	11.76
B_{21}			7.7	7.1	0.24	0.043	5.6	0.41	12.48
B_{22}			8.0	7.2	—	0.018	—	—	6.00

Horizon	Exchangeable bases Ca	Mg	Na	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	Available (ppm)	Total K_2O (%)
A_p	17.0	3.12	1.48	0.54	183.3	0.158	122.0	1.687
B_{21}	16.5	2.60	1.26	0.62	168.1	0.158	136.0	1.687
B_{22}	25.0	2.92	0.39	0.24	475.9	0.112	86.0	1.205

Horizon	Extractable S	Fe	Cu	Zn (ppm)	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_p	58.28	0.67	2.0	3.6	1.0	330	174
B_{22}	43.01	0.63	1.6	4.0	0.6	430	390
B_{22}	114.68	0.97	0	0	0.2	250	390

Profile No. 6

I. Information on the site

a. Date of examination : 5, November 1973
b. Location : Nongwanprieng, Tunkok, Song Phi Nong, Suphan Buri
c. Land form :
  i. Physiographic position : Semi-recent terrace
  ii. Surrounding land form : Nearly flat
d. Land use : Virgin soil, under mixed deciduous forest

II. General information on the soil

a. Soil classification : Noncalcic Brown Soils
b. Parent material : Semi-recent alluvium
c. Drainage : Well drained
d. Moisture condition in profile : Semi-dry throughout the profile
e. Remark : Fine mica flakes occur in all horizons

III. Profile description

A_1 0-20 cm Brown (10YR 4/6) clay loam; moderate fine subangular blocky; few, fine pores; non plastic, non sticky; many roots; semi-dry; gradual smooth boundary to

B_{21} 20-70 cm Brown (7.5YR 4/4) clay loam; weak, medium subangular blocky; few, very fine pores; non sticky; many roots; semi-dry; gradual smooth boundary to

B_{22} 70 cm+ Yellowish brown (10YR 5/6) clay loam; weak, medium subangular blocky; few, very fine pores; non plastic, non sticky; few roots; semi-dry; slightly positive benzidine reaction.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)	(g/cm³)	Solid	Liquid	Air	Sand	Silt	Clay

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	

Profile No. 7

I. Information on the site

a. Date of examination : 6 November, 1973

b. Location : U-Thong Agricultural Experiment Station. Rangpho Farm, U-Thong, Suphan Buri

c. Land form :

i. Physiographic position : Semi-recent terrace

ii. Surounding land form : Nearly flat, slope less than 1%.

d. Land use : Corn, cotton, soybean, peanut cultivation.

II. General information on the soil

a. Soil classification : Noncalcic Brown soils

b. Parent material : Semi-recent alluvium

c. Drainage and water permeability : Moderately well drained. Permeability is low.

d. Moisture condition in profile : Dry throughout the profile.

e. Remark : Fine mica flakes occur in all horizons.

III. Profile description

A_p 0-20 cm Dark brown (10YR 3/4) clay loam; moderate, medium to coarse subangular blocky; few, very fine pores; loose (5 mm); non plastic, non sticky; common roots; dry; gradual smooth boundary to

B_2 20-70 cm Dark brown (10YR 3/4) light clay; moderate, coarse subangular blocky; few, fine pores; extremely compact (32 mm); non plastic, non sticky; few roots; dry; gradual smooth boundary to

BC 70 cm+ Bright brown (7.5YR 4.5/6) light clay; moderate, coarse subangular blocky; few, fine and very fine pores; extremely compact (32 mm); slightly plastic, slightly sticky; few roots; dry.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density (g/cm³)	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)		Solid	Liquid	Air	Sand	Silt	Clay
A_p	0-20	7.7	8.9	1.15	44.2	34.8	21.0	37.6	40.4	22.0
B_2	20-70	9.2	13.7	1.49	57.3	34.0	8.7	29.7	38.3	32.0
BC	70+	9.2	—	—	—	—	—	28.1	36.1	35.8

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_p	CL	5	2.4×10^{-4}	46.8	38.1	34.8	25.4	—
B_2	LiC	32	5.8×10^{-5}	40.5	36.2	34.0	23.2	—
BC	LiC	—	—	—	—	—	—	—

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_p	—	51.2	5.8	5.2	1.04	0.066	15.8	1.79	8.40
B_2			5.7	5.0	1.04	0.078	13.3	1.79	9.52
BC			5.9	5.0	0.37	0.086	4.3	0.64	9.52

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_p	5.0	1.25	0.96	1.43	108.8	0.147	104.4	1.504
B_2	5.5	1.79	0.47	0.40	80.0	0.154	22.4	1.326
BC	5.0	1.88	1.00	0.40	92.2	0.169	55.7	1.567

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_p	19.51	0.51	1.0	2.6	12.4	270	140
B_2	21.39	0.57	1.2	1.6	12.4	240	146
BC	1.88	0.29	1.8	2.8	2.6	280	42

Profile No. 8

I. Information on the site.

a. Date of examination : 6 November 1973.
b. Location : U-Thong Agricultural Experiment Station.
c. Land form :
   i. Physiographic position : Semi-recent terrace.
   ii. Surrounding land form : Nearly flat.
d. Land use : Corn, sorghum cultivation.

II. General information on the soil.

a. Soil classification : Noncalcic Brown soils.
b. Parent material : Semi-recent alluvium.
c. Drainage and water permeability : Moderately well drained. Permeability is moderately low.
d. Moisture condition in profile : Top 30 cm of profile semi-dry, moist to wet below. Depth of ground water table was 110 cm from the surface on the date of examination.

III. Profile description.

A_p 0-30 cm Dark brown (10YR 3/3) silty loam; moderate, medium subangular blocky; few very fine pores; compact to very compact (22-27 mm); slightly plastic, slightly sticky; common roots; semi-dry; positive benzidine reaction; gradual smooth boundary to

B_{21} 30-88 cm Brown (10YR 4/4) silty loam; moderate, coarse and medium subangular blocky; friable moist; few, very fine pores; slightly compact (16 mm); slightly plastic, slightly sticky; few roots; moist; few manganese concretions; very positive benzidine reaction; gradual smooth boundary to

B_{22} 88-115 cm + Brown (10YR 4/4) silty loam (or light clay); moderate medium and coarse subangular blocky; friable moist; few very fine pores; slightly compact (17 mm); plastic, sticky; wet; few manganese concretions; very positive benzidine reaction.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)	(g/cm³)	Solid	Liquid	Air	Sand	Silt	Clay
A_p	0-30	66.0	99.6	1.51	58.0	33.1	8.9	31.1	58.6	10.3
B_{21}	30-88	104.8	147.8	1.41	54.1	35.0	10.9	23.3	68.3	8.4
B_{22}	88-115+	86.1	128.3	1.49	57.5	35.2	7.3	24.4	64.7	10.9

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_p	SiL	22-27	1.2×10^{-4}	37.5	35.5	33.1	25.7	—
B_{21}	SiL	16	3.5×10^{-4}	38.1	36.4	34.9	26.2	—
B_{22}	SiL	17	7.0×10^{-5}	38.2	36.4	35.2	25.1	—

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_p	—	39.6	7.5	6.4	1.53	0.084	18.2	2.64	14.64
B_{21}			8.2	7.0	0.69	0.044	15.7	1.19	16.16
B_{22}			8.0	7.2	0.45	0.041	11.0	0.78	14.24

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_p	13.0	3.96	1.22	1.10	131.7	0.263	778.8	1.657
B_{21}	17.0	8.21	1.70	1.51	157.3	0.268	807.4	1.808
B_{22}	25.0	7.29	1.61	2.41	254.9	0.268	749.2	1.868

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_p	25.00	0.17	1.0	6.0	0.2	360	112
B_{21}	25.50	0.83	0	0	0.2	460	120
B_{22}	19.04	0.23	0.2	1.2	0	320	162

Profile No. 9

I. Information on the site.

a. Date of examination : 6 November 1973.
b. Location : Talad Ket, Phanom Thuan, Kanchanaburi.
c. Land form :
  i. Physiographic position : Semi-recent terrace.
  ii. Surrounding land form : Nearly flat.
d. Land use : Sorghum cultivation.

II. General information on the soil.

a. Soil classification : Noncalcic Brown soils.
b. Parent material : Semi-recent alluvium.
c. Drainage : Moderately well drained.
d. Moisture condition in profile : Semi-dry throughout the profile.

III. Profile description.

A_p 0-30 cm Brown (10YR4/4) silty loam; moderate, medium subangular blocky; few, very fine pores; non plastic, non sticky; common roots; dry; positive benzidine reaction; gradual smooth boundary to

B_{21} 30-65 cm Brown (7.5YR4/4) silty clay loam; moderate, medium subangular blocky; few, very fine pores; slightly plastic, slightly sticky; few roots; semi-dry; positive benzidine reaction; gradual smooth boundary to

B_3 65-80 cm Brown (7.5YR4/6) silty loam; moderate, coarse subangular blocky; few, very fine pores; slightly plastic, slightly sticky; few roots; semi-dry; very positive benzidine reaction; gradual smooth boundary to

C 80 cm + Bright brown (7.5YR5/6) silty loam; moderate, coarse subangular blocky; few, very fine pores; slightly plastic, slightly sticky; few roots, semi-dry; very positive benzidine reaction, few fine mica flakes.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases(%) at pF1-5 Solid	Liquid	Air	Particle size(%) Sand	Silt	Clay
A_p	0-30	—	—	—	—	—	—	—	—	—
B_2	30-65	—	—	—	—	—	—	—	—	—
B_3	65-80	—	—	—	—	—	—	—	—	—
C	80+	—	—	—	—	—	—	—	—	—

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content(%) pF1.0	pF1.5	pF3.0	pF4.0
A_p	—	—	—	—	—	—	—	—
B_2	—	—	—	—	—	—	—	—
B_3	—	—	—	—	—	—	—	—
C	—	—	—	—	—	—	—	—

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Easily available water	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_p	—	—	7.2	6.5	0.75	0.049	15.3	1.29	6.56
B_2			6.9	6.0	0.66	0.038	17.4	1.14	10.64
B_3			6.0	6.4	1.04	0.039	26.7	1.79	13.04
C			7.6	7.0	0.47	0.034	13.8	0.81	13.68

Horizon	Exchangeable bases Ca	Mg	Na	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	Available (ppm)	Total K_2O (%)
A_p	5.5	1.56	1.43	0.26	133.3	0.132	44.8	1.205
B_2	6.5	2.08	1.04	0.21	92.4	0.136	29.4	1.326
B_3	10.0	2.50	1.22	0.18	106.6	0.158	125.5	1.506
C	15.0	2.92	1.52	0.18	143.4	0.186	28.5	1.567

Horizon	Extractable S	Fe	Cu	Zn (ppm)	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_p	1.18	0.11	1.6	2.4	1.0	330	42
B_2	5.64	0.40	1.6	2.0	0	222	46
B_3	0.47	0.57	1.6	3.2	0	420	100
C	0.47	0.11	1.2	3.4	0	480	150

Profile No. 10

I. Information on the site

a. Date of examination : 6 November 1973
b. Location : Nongbo, Song Phi Nong, Suphan Buri
c. Land form :
   i. Physiographic position : Semi-recent terrace
   ii. Surrounding land form : Nearly flat
d. Land use : Sugar cane cultivation

II. General information on the soil

a. Soil classification : Noncalcic Brown Soils
b. Parent material : Semi-recent alluvium
c. Drainage : Moderately well drained
d. Moisture condition in profile : Semi-dry throughout the profile

III. Profile description

A_p 0-30 cm Dark brown (10YR3/4) light clay; moderate, medium and fine subangular blocky; few, fine pores; slightly plastic, slightly sticky; many roots; dry; gradual smooth boundary to

A_{12} 30-45 cm Brown (10YR4/6) light clay, moderate, medium subangular blocky; few, fine pores; slightly plastic, slightly sticky; few roots; semi-dry; gradual smooth boundary to

B_2 45-90 cm Brown (7.5YR4/6) heavy clay; moderate, medium subangular blocky; few, fine pores; plastic, sticky; few roots, semi-dry.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases (%) at pF1-5 Solid	Liquid	Air	Particle size (%) Sand	Silt	Clay
A_p	0-30	—	—	—	—	—	—	—	—	—
A_{12}	30-45	—	—	—	—	—	—	—	—	—
B_2	45-90	—	—	—	—	—	—	—	—	—

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%) pF1.0	pF1.5	pF3.0	pF4.0
A_p	—	—	—	—	—	—	—	—
A_{12}	—	—	—	—	—	—	—	—
B_2	—	—	—	—	—	—	—	—

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Storage Capacity (mm) of Easily available water (of 50 cm deep soil)	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_p	—	—	6.3	5.6	1.40	0.086	16.3	2.41	14.64
A_{12}			5.3	4.3	1.93	0.064	30.2	3.33	13.92
B_2			5.2	3.9	1.35	0.055	24.6	2.33	13.20

Horizon	Exchangeable bases Ca	Mg	Na	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	P_2O_5 Available (ppm)	Total K_2O (%)
A_p	8.5	2.60	2.00	0.59	93.5	0.230	210.6	1.687
A_{12}	5.0	2.19	2.17	0.40	70.1	0.132	47.8	1.898
B_2	3.5	2.08	1.48	0.40	56.2	0.241	41.7	2.018

Horizon	Extractable S	Fe	Cu	Zn (ppm)	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_p	6.11	0.23	1.0	5.2	4.6	280	72
A_{12}	2.59	2.29	1.6	2.8	6.0	180	86
B_2	3.29	3.89	1.8	2.2	3.6	100	52

Profile No. 14

I. Information on the site.

a. Date of examination : 17 November 1973.
b. Location : Thasao Kadong, Muang, Kampang Phet.
c. Land form :
  i. Physiographic position : Semi-recent terrace.
  ii. Surrounding land form : Nearly flat to gently undulating, slope less than 2%.
d. Land Use : Sugar cane cultivation.

II. General information on soil.

a. Soil classification : Noncalcic Brown soils.
b. Parent material : Semi-recent alluvium.
c. Drainage and water permeability : Moderately well drained; Permeability is low.
d. Moisture condition in profile : Semi-dry throughout the profile.

III. Profile description.

A_p 0-17 cm Mixed soil grayish brown (7.5YR5/2) in 9 portions and dull brown (7.5YR 5/4) in 1 portion; sandy clay loam; moderate coarse subangular blocky; common, fine and very fine pores; extremely compact (32 mm); non plastic, non sticky; common roots; dry; positive benzidine reaction; clear, smooth boundary to

B_{21} 17-60 cm + Dull orange (7.5YR7/4) sandy loam; moderate coarse subangular blocky; few, fine and very fine pores; very compact (28 mm); non plastic, non sticky; few roots; semi-dry.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases(%) at pF1-5 Solid	Liquid	Air	Particle size(%) Sand	Silt	Clay
A_p	0-17	7.7	12.5	1.62	62.4	27.2	10.4	71.9	8.7	19.4
B_{21}	17-60+	17.9	17.9	1.74	66.8	24.5	8.7	75.0	14.4	10.6

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content(%) pF1.0	pF1.5	pF3.0	pF4.0
A_p	SCL	32	4.9×10^{-4}	31.2	28.1	27.2	17.1	—
B_{21}	SL	28	7.9×10^{-5}	27.2	25.2	24.4	18.3	—

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Easily available water	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_p	—	34.0	5.2	4.4	0.88	0.056	15.7	1.52	2.00
B_{21}			5.1	4.4	0.82	0.033	24.9	1.41	2.68

Horizon	Exchangeable bases Ca	Mg	Na	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	P_2O_5 Available (ppm)	Total K_2O (%)
A_p	2.5	0.42	0.13	0.03	154.1	0.070	22.4	0.081
B_{21}	2.0	0.38	0.13	0.03	94.9	0.154	101.4	0.066

Horizon	Extractable S	Fe	Cu	Zn (ppm)	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_p	1.00	1.71	0.4	1.6	5.6	220	23
B_{21}	1.00	1.14	0.6	1.4	7.6	60	39

Profile No. 39

I. Information on the site.

a. Date of examination : 13 December 1973.
b. Location : Silalog, Pran Buri, Prachuap Khiri Khan.
c. Land form :
  i. Physiographic position : Semi-recent terrace.
  ii. Surrounding land form : Nearly flat to gently undulating.
d. Land use : Sugar cane, pineapple cultivation.

II. General information on the soil.

a. Soil classification : Noncalcic Brown soils.
b. Parent material : Semi-recent alluvium.
c. Drainage and water permeability : Imperfectly drained. Permeability is low.
d. Moisture condition in profile : Top 70 cm of profile semi-dry, moist below.

III. Profile description.

A_p 0-14 cm Brown (7.5YR4/6) loam; moderate, fine subangular blocky; friable moist; few, very fine pores; loose (9 mm); non plastic; slightly sticky; common roots; dry; slightly positive benzidine reaction; gradual smooth boundary to

A_{12} 14-14 cm Brown (7.5YR4/6) clay loam; moderate, medium subangular blocky, friable; common, fine and very fine pores; slightly compact (17 mm); non plastic, slightly sticky; few roots; semi-dry; slightly positive benzidine reaction; clear, smooth boundary to

B_{21} 41-57 cm Mixed soil bright reddish brown (5YR5/6) in 7 portions and orange (7.5YR 6/6) in 3 portions; clay loam; moderate, medium subangular blocky; common, fine, very fine and coarse pores; slightly compact (18 mm); slightly plastic, slightly sticky; few roots; semi-dry; very slightly positive benzidine reaction; faint 2,2′-dipyridyl reaction, gradual smooth boundary to

B_{22} 57-70 cm Dull yellow orange (10YR6/4) clay loam; many, distinct bright reddish brown (5YR5/8) spotty iron mottles; moderate, coarse subangular blocky, friable moist; common, fine, very fine and coarse pores; slightly compact (15 mm); slightly plastic, slightly sticky; few roots; semi-dry; faint 2,2′-dipyridyl reaction; clear, smooth boundary to

B_{23} 70-90 cm + Dull yellow orange (10YR7/4) sandy clay; common distinct reddish brown (5YR4/8) spotty iron mottles; moderate, coarse subangular blocky, very friable moist; common, fine and very fine pores; slightly compact (16 mm); slightly plastic, slightly sticky; few roots; moist; faint 2,2′-dipyridyl reaction.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)	(g/cm³)	Solid	Liquid	Air	Sand	Silt	Clay
A_p	0-14	21.6	27.4	1.27	48.9	30.0	21.1	60.5	26.8	12.7
A_{12}	14-41	22.0	34.3	1.56	60.1	29.3	10.6	58.7	26.6	14.7
B_{21}	41-57	14.7	23.4	1.59	60.9	28.7	10.4	58.8	20.5	20.7
B_{22}	57-70	12.5	19.3	1.54	59.2	27.1	13.7	54.5	22.7	22.8

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_p	L	9	2.2×10^{-3}	40.6	33.1	33.0	14.5	—
A_{12}	CL	17	3.8×10^{-5}	31.6	30.4	29.2	19.4	—
B_{21}	CL	18	3.7×10^{-5}	29.7	28.9	28.7	20.1	—
B_{22}	SC	16	9.8×10^{-5}	31.6	29.3	27.0	21.5	—

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_p	—	55.9	5.1	4.2	0.67	0.053	12.6	1.16	3.52
A_{12}			5.7	4.3	0.70	0.048	14.6	1.21	3.36
B_{21}			5.1	4.1	0.67	0.052	12.9	1.16	4.80
B_{22}			4.9	4.0	0.45	0.040	11.3	0.78	4.96
B_{23}			5.1	4.0	0.45	0.039	11.5	0.78	3.68

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_p	0.4	0.75	0.10	0.15	39.8	0.029	7.9	0.241
A_{12}	0.5	0.91	0.14	0.15	50.6	0.029	6.4	0.262
B_{21}	0.5	0.79	0.14	0.11	32.1	0.029	5.3	0.286
B_{22}	0.4	0.57	0.14	0.08	24.0	0.029	4.8	0.301
B_{23}	0.4	1.01	0.22	0.08	47.7	0.022	4.8	0.301

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_p	0.15	9.20	0.2	0.8	5.4	36	200
A_{12}	1.50	6.34	0.4	1.0	5.6	32	160
B_{21}	1.25	5.60	0.2	0.6	2.8	12	180
B_{22}	1.25	5.14	0.8	0.6	0.8	4	190
B_{23}	2.25	4.75	0.4	0.6	1.0	4	200

Profile No. 40

I. Information on the site.

a. Date of examination : 13 December 1973.
b. Location : Kui Buri, Prachuap Khiri Khan.
c. Land form :
   i. Physiographic position : Semi-recent terrace.
   ii. Surrounding land form : Nearly flat to gently undulating.
d. Land use : Sugar cane cultivation.

II. General information on the soil.

a. Soil classification : Noncalcic Brown soils.
b. Parent material : Semi-recent alluvium.
c. Drainage : Moderately well drained.
d. Moisture condition in profile : Top 15 cm of profile semi-dry, moist below. This area is sometimes flooded.

III. Profile description.

A_p 0-15 cm Brown (10YR4/4) sandy loam; moderate, fine subangular blocky; common, fine and very fine pores; non plastic, non sticky; common roots; semi-dry; positive, benzidine reaction; gradual smooth boundary to

A_{12} 15-40 cm Brown (10YR4/4) clay loam; many, distinct brown gray (10YR5/1) spotty gley mottles; non plastic, slightly sticky; common roots; moist; positive benzidine reaction; moderate 2,2′-dipyridyl reaction; grandual smooth boundary to

B_2 40-90 cm + Orange (7.5YR6/8) sandy clay loam; weak, medium subangular blocky; few, very fine pores; slightly plastic, slightly sticky; few roots, moist.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density (g/cm³)	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)		Solid	Liquid	Air	Sand	Silt	Clay

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	

Profile No. 45

I. Information on the site.

a. Date of examination : 24 December 1973.

b. Location : Chan Thunk, Pak Chong, Nakhon Racthasima.

c. Land form :

i. Physiographic position : Peneplain.

ii. Surrounding land form : Nearly flat to gently undulating.

d. Land use : Corn cultivation.

II. General information on the soil,

a. Soil classification ; Red Brown Earths.

b. Parent material : Residuum from limestone.

c. Drainage and water permeability : Moderately well drained. Permeability is very low.

d. Moisture condition : Top 15 cm of profile dry, semi-dry below.

III. Profile description.

A_p 0-15 cm Dark reddish brown (5 YR 3/2) light clay; strong, fine granular and moderate, medium subangular blocky; loose (6 mm): slightly plastic, slightly sticky; common roots; dry; positive benzidine reaction; gradual smooth boundary to

A_{12} 15-24 cm Dark reddish brown (5 YR 3/3) light clay; moderate, medium subangular blocky; breaking into fine and medium subangular blocky; common, very fine pores; slightly compact (16 mm); slightly plastic, slightly sticky; common roots; semi-dry; positive benzidine reaction; clear, smooth boundary to

B_{21} 24-80 cm Dark reddish brown (2.5 YR 3/4) heavy clay; moderate, coarse subangular blocky; breaking into medium subangular blocky; common, fine and very fine pores; compact (23 mm); slightly plastic, sticky; few roots; semi-dry; positive benzidine reaction; clear smooth boundary to.

B_{22} 80 cm + Dark reddish brown (2.5 YR 3/4); common, weathered fine and medium subangular limestone.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases (%) at pF1-5 Solid	Liquid	Air	Particle size (%) Sand	Silt	Clay
A_p	0-15	9.7	11.3	1.17	44.8	45.2	10.0	40.2	28.6	31.2
A_{12}	15-24	17.7	17.9	1.01	39.0	37.0	24.0	41.5	24.9	33.6
B_{21}	24-80	23.4	33.9	1.45	55.3	34.5	20.2	37.7	16.6	45.7
B_{22}	80+	19.7	—	—	—	—	—	29.4	59.1	11.5

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%) pF1.0	pF1.5	pF3.0	pF4.0
A_p	LiC	6	1.7×10^{-3}	57.1	49.5	45.2	27.4	—
A_{12}	LiC	16	1.1×10^{-2}	55.0	47.7	37.0	28.7	—
B_{21}	HC	23	3.8×10^{-6}	36.8	35.7	34.5	30.8	—
B_{22}	SiL	—	—	—	—	—	—	—

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Storage Capacity (mm) of Easily available water (of 50 cm deep soil)	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_p	—	43.8	6.2	5.8	1.87	0.151	12.4	3.22	26.16
A_{12}			6.3	5.9	1.91	0.148	12.9	3.29	26.08
B_{21}			5.8	5.2	1.00	0.104	9.6	1.72	24.48
B_{22}			7.5	6.5	0.78	0.098	8.0	1.34	26.32

Horizon	Exchangeable bases Ca (me/100g)	Mg	Na	K	Base saturation degree (%)	P_2O_5 Total (%)	Available (ppm)	Total K_2O (%)
A_p	12.5	6.25	0.48	0.51	75.5	0.136	35.5	0.193
A_{12}	13.5	7.08	0.48	0.49	82.6	0.103	47.0	0.166
B_{21}	12.0	7.92	0.48	0.18	84.1	0.131	12.7	0.193
B_{22}	14.0	6.56	0.39	0.24	77.3	0.103	16.2	0.187

Horizon	Extractable S (ppm)	Fe	Cu	Zn	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_p	1.50	0.29	2.4	2.2	1.0	860	120
A_{12}	3.25	0.23	0.6	2.4	0.4	840	100
B_{21}	13.00	0.23	4.8	1.0	0.6	940	110
B_{22}	13.25	0.80	0	0	0	1180	200

Profile No. 51

I. Information on the site.

a. Date of examination : 25 December 1973.
b. Location : Nong Bua Khok, Chatturat, Chaiyaphum.
c. Land form :
   i. Physiographic position : Peneplain
   ii. Surrounding land form : Flat to gently undulating.
d. Land use : Cassava cultivation.

II. General information on the soil.

a. Soil classification : Red Brown Earths.
b. Parent material : Residuum from limestone.
c. Drainage : Well drained. Permeability is moderately low.
d. Moisture condition : Top 15 cm of profile dry, semi-dry below.

III. Profile description.

A_p 0-15 cm Dull reddish brown (2.5 YR 4/4) dry; heavy clay; few, iron-manganese concretions (size is 2-3 mm); moderate, fine granular and moderate, medium subangular blocky; few, very fine pores; slightly compact (12 mm); slightly plastic, slightly sticky; common roots; dry; clear, smooth boundary to

B_2 15-71 cm + Dark reddish brown (2.5 YR 3/6) heavy clay; moderate, medium subangular blocky; breaking into fine subangular blocky, friable moist; few, very fine pores; patchy thin clay coating on ped faces; very compact (25 mm); plastic, slightly sticky; few roots; semi-dry.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)	(g/cm³)	Solid	Liquid	Air	Sand	Silt	Clay
A_p	0-15	10.8	13.1	1.21	46.9	41.0	12.1	33.5	20.4	46.1
B_2	15-71+	20.8	27.9	1.34	51.5	43.8	4.7	23.1	12.6	64.3

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_p	HC	12	6.3×10^{-3}	50.9	45.8	41.0	28.4	—
B_2	HC	25	3.2×10^{-4}	46.9	45.3	43.8	36.0	—

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_p	—	57.4	5.7	4.6	1.06	0.076	14.0	1.83	16.92
B_2			4.5	3.7	0.47	0.050	9.4	0.81	10.72

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_p	11.50	3.96	0.65	1.09	101.6	0.040	5.3	1.506
B_2	8.50	4.37	0.96	0.72	135.8	0.057	8.6	1.928

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_p	2.00	0.30	0.08	0.2	3.2	40	62
B_2	5.75	0.92	0.08	0.2	2.8	10	18

Profile No. 55

I. Information on the site.

a. Date of examination : 26 December 1973.
b. Location : Nikom, Muang, Lop Buri.
c. Land form :
  i. Physiographic position : Peneplain.
  ii. Surrounding land form : Nearly flat.
d. Land use : Corn and sorghum cultivation.

II. General information on the soil.

a. Soil classification : Red Brown Earths.
b. Parent material : Residuum from limestone.
c. Drainage : Moderately well drained. Permeability is very low.
d. Moisture condition : Dry throughout the profile.

III. Profile description.

A_p 0-10 cm Reddish brown (5YR 4/8) light clay; moderate, fine granular and moderate, medium subangular blocky; few, very fine pores; loose (5 mm); slightly plastic, slightly sticky; common roots; dry; positive benzidine reaction; gradual, smooth boundary to

A_{12} 10-20 cm Reddish brown (5YR 4/8) light clay; moderate, medium subangular blocky; few, very fine pores; extremely compact (31 mm); plastic, slightly sticky; common roots; dry positive benzidine reaction; gradual, smooth boundary to

B_2 20-65 cm + Dark reddish brown (2.5 YR 3/6) light clay; moderate, medium subangular blocky; common, fine and very fine pores; extremely compact (32 mm); plastic, slightly sticky; few roots; dry to semi-dry.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)	(g/cm³)	Solid	Liquid	Air	Sand	Silt	Clay
A_p	0-10	4.4	5.5	1.25	48.2	38.2	13.6	31.1	34.4	34.5
A_{12}	10-20	6.9	11.4	1.65	63.5	30.9	5.6	28.7	34.6	36.7
B_2	20-65+	12.1	19.8	1.64	12.9	31.7	5.4	22.6	32.5	44.9

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_p	LiC	5	1.0×10^{-3}	46.0	42.1	38.2	27.9	
A_{12}	LiC	31	2.5×10^{-5}	33.9	31.6	30.9	24.3	
B_2	LiC	32	8.2×10^{-6}	33.9	32.9	31.7	23.4	

Horizon	Storage Capacity (mm) of (of 50 cm deep soil)		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water	Easily available water	H_2O	KCl					
A_p	—	41.8	7.1	5.3	0.96	0.089	10.8	1.66	7.56
A_{12}			6.5	5.1	0.96	0.079	12.2	1.66	7.72
B_2			6.7	5.1	0.75	0.051	14.7	1.29	8.72

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_p	6.00	1.25	0.44	0.72	112.0	0.066	11.0	0.063
A_{12}	6.00	1.04	0.37	0.39	101.0	0.064	11.4	0.059
B_2	7.00	1.25	0.44	0.13	101.1	0.055	7.5	0.048

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_p	3.50	0.08	Tr	Tr	28.8	370	54
A_{12}	1.50	0.12	Tr	Tr	2.4	370	42
B_2	2.75	0.08	0.12	0.40	2.8	140	51

Profile No. 15

I. Information on the site.

a. Date of examination : 17 November 1973.
b. Location : Tanode, Khiri Mat, Sukhothai.
c. Land form :
  i. Physiographic position : Old alluvial terrace.
  ii. Surrounding land form : Nearly flat.
d. Land use : Upland crop cultivation.

II. General information on the soil.

a. Soil classification : Gray Podzolic soils.
b. Parent material : Old alluvial sediment.
c. Drainage and water permeability : Moderately well drained. Permeability is low.
d. Moisture condition in profile : Semi-dry throughout the profile.

III. Profile description.

A_p 0-20 cm Brown (7.5 YR 4/3) loam, moderate, coarse subangular blocky; common, fine and very fine pores; extremely compact (31 mm); non plastic, non sticky; many roots; dry; very positive benzidine reaction; gradual, smooth boundary to

B_{21} 20-50 cm Dark brown (7.5 YR 3/4) clay loam; moderate coarse subangular blocky; common, fine and very fine pores; compact (24 mm); non plastic, non sticky; common roots; semi-dry: very positive benzidine reaction: gradual, smooth boundary to

B_{22} 50-100 cm + Brown (7.5 YR 4/4) sandy clay loam; weak, fine subangular blocky; friable moist: common, fine and very fine pores; slightly compact (15 mm); non plastic, non sticky; few roots; semi-dry; positive benzidine reaction; visible fine mica flakes.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)	(g/cm³)	Solid	Liquid	Air	Sand	Silt	Clay
A_p	0-20	4.9	7.4	1.52	58.4	33.5	8.1	60.2	26.6	13.2
B_{21}	20-50	10.7	17.7	1.65	63.6	33.5	2.9	57.2	24.9	17.9
B_{22}	50-100+	4.0	6.4	1.60	61.4	31.0	7.6	66.4	12.5	21.1

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_p	L	31	1.6×10^{-4}	36.9	35.5	33.5	18.2	—
B_{21}	CL	24	1.0×10^{-4}	35.8	34.0	33.5	21.6	—
B_{22}	SCL	15	5.0×10^{-5}	35.4	34.4	31.0	21.1	—

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_p	—	66.3	6.2	5.6	0.80	0.045	17.8	1.38	3.84
B_{21}			6.2	5.4	0.82	0.056	14.6	1.41	5.28
B_{22}			7.3	5.0	0.56	0.056	12.2	0.97	7.20

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_p	3.5	1.04	0.17	0.03	123.6	0.158	95.7	0.587
B_{21}	4.0	1.25	0.10	0.06	102.4	0.158	125.5	0.593
B_{22}	3.0	1.67	0.15	0.13	68.7	0.158	43.9	0.557

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_p	0.50	0.43	1.2	2.2	15.0	270	20
B_{21}	0.50	0.23	1.4	1.8	5.6	240	25
B_{22}	0.50	0.17	1.2	0.8	3.4	170	28

Profile No. 32

I. Information on the site.

Date of examination : 23 November 1973.

b . Location : Land Development Center, Hang Chat, Lampang.

c . Land form :

i . Physiographic position : Middle terrace.

ii . Surrounding land form : Undulating to gently rolling land with slope of 2%.

d . Land use : Corn, peanut, sesame cultivation.

II. General information on the soil.

a . Soil classification : Gray Podzolic soils.

b . Parent material : Old alluvium.

c . Drainage : Well drained.

d . Moisture condition in profile : Top 65 cm of profile semi-dry, moist below.

III. Profile description.

A_p 0-17 cm Brownish black (10YR 3/2) sandy loam; moderate, fine granular; loose (10 mm); non plastic, non sticky; common roots; semi dry; positive benzidine reaction: gradual smooth boundary to

A_{12} 17-33 cm Brown (7.5YR 4/3) sandy loam; moderate, fine granular; compact (21 mm); non plastic, non sticky; few roots; semi-dry: slightly positive benzidine reaction: clear, smooth boundary to

B_{21} 33-65 cm Dull orange (7.5YR 6/4) sandy loam; common, faint orange (7.5YR 6/6) spotty iron mottles; moderate, fine subangular blocky: friable moist; many, very fine pores; slightly compact (17 mm): non plastic, non sticky: few roots; semi-dry; gradual smooth boundary to

B_{22} 65-100 cm + Dull orange (7.5YR 7/4) sandy clay loam; many, faint orange (7.5YR 6/6) spotty iron mottles; moderate, fine subangular blocky; many, very fine pores; compact (20 mm); non plastic, non sticky; moist.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)	(g/cm³)	Solid	Liquid	Air	Sand	Silt	Clay
A_p	0-17	—	—	—	—	—	—	—	—	—
A_{12}	17-33	—	—	—	—	—	—	—	—	—
B_{21}	33-65	—	—	—	—	—	—	—	—	—
B_{22}	65-100+	—	—	—	—	—	—	—	—	—

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_p	—	—	—	—	—	—	—	—
A_{12}	—	—	—	—	—	—	—	—
B_{21}	—	—	—	—	—	—	—	—
B_{22}	—	—	—	—	—	—	—	—

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_p	—	—	6.6	5.8	0.84	0.039	21.5	1.45	3.84
A_{12}			6.8	6.0	0.42	0.029	14.5	0.72	3.52
B_{21}			6.6	5.9	0.23	0.012	19.2	0.40	1.68
B_{22}			6.0	5.3	0.19	0.018	10.6	0.33	3.12

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_p	2.5	0.44	0.13	0.109	82.8	0.039	92.2	0.054
A_{12}	1.6	0.19	0.07	0.077	55.5	0.039	43.4	0.048
B_{21}	1.3	0.35	0.10	0.109	107.9	0.029	38.2	0.060
B_{22}	0.9	1.05	0.09	0.179	71.0	0.029	11.4	0.060

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_p	0.75	0.29	0.4	2.0	6.8	70	55
A_{12}	0.75	0.23	0.4	0.6	1.4	30	28
B_{21}	1.25	0.23	0.4	0.6	0.4	6	26
B_{22}	1.25	3.09	0.4	0.2	0.2	2	40

Profile No. 46

I. **Information on the site.**

a . Date of examination : 25 December 1973.

b . Location : Agricultural Exp. St., Muang, Chaiyaphum.

c . Land form :

i . Physiographic position : Terrace.

ii . Surrounding land form : Nearly flat to gently undulating.

d . Land use : Upland crops, such as kenaf, mulberry cultivation.

II. **General information on the soil.**

a . Soil classification : Gray Podzolic soils.

b . Parent material : Old alluvium.

c . Drainage and water permeability : Moderately well drained. Permeability is moderately low.

d . Moisture condition in profile : Top 26 cm of profile dry, semi-dry below.

III. **Profile description.**

A_p 0-26 cm Dull brown (7.5YR 6/3) dry; sandy loam; weak, medium subangular blocky, breaking into fine subangular blocky; few, fine and very fine pores, very compact (25 mm); non plastic, non sticky; common roots; dry; slightly positive benzidine reaction; gradual, wavy boundary.

B_2 26-51 cm Yellow orange (7.5 YR 7/8) sandy loam; weak, medium and fine subangular blocky, friable moist; few, very fine pores; compact (24 mm); non plastic, non sticky; few roots; semi-dry; clear, smooth boundary to

C_1 51-63 cm Orange (7.5YR 7/8) sandy clay loam; subrounded iron-manganese nodule layer; friable, very compact (26 mm), semi-dry; clear, wavy boundary.

C_2 63-82 cm + Mixed soil dull orange (7.5 YR 7/4) in 4 portions and dull orange (7.5 YR 6/4) in 6 portions; light clay; abundant, laterite concretions (2.5 YR 4/4); few, rounded iron, manganese nodules (4 mm diameter); moderate, medium subangular blocky; few, very fine pores; very compact (29 mm); semi-dry.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases (%) at pF1-5 Solid	Liquid	Air	Particle size (%) Sand	Silt	Clay
A_p	0-26	1.2	1.7	1.44	55.4	35.5	9.1	82.9	11.4	5.7
B_2	26-51	7.3	11.0	1.50	57.8	32.2	10.0	79.6	11.5	8.9
C_1	51-63	9.8	15.6	1.59	61.3	20.5	18.2	65.5	14.9	19.6
C_2	63-82+	23.7	37.9	1.60	61.5	34.2	4.3	44.0	14.4	41.6

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%) pF1.0	pF1.5	pF3.0	pF4.0
A_p	SL	25	7.4×10^{-4}	39.3	36.6	35.5	23.2	—
B_2	SL	24	3.1×10^{-5}	39.1	34.4	32.2	15.4	—
C_1	SCL	26	1.0×10^{-1}	37.7	21.8	20.5	15.9	—
C_2	LiC	29	impersmeable	34.3	34.3	34.2	30.0	—

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Easily available water	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_p	—	72.3	5.9	4.3	0.65	0.029	22.4	1.12	2.10
B_2			6.0	3.8	0.37	0.016	23.1	0.64	2.40
C_1			6.1	3.6	0.41	0.016	25.6	0.71	4.60
C_2			5.8	3.6	0.41	0.025	16.4	0.71	12.30

Horizon	Exchangeable bases Ca	Mg	Na	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	Available (ppm)	Total K_2O (%)
A_p	0.50	0.17	0.39	0.05	52.8	0.013	10.5	0.223
B_2	0.20	0.18	0.22	0.05	26.9	0.011	2.9	0.072
C_1	0.15	0.25	1.87	0.10	40.7	0.015	2.9	0.151
C_2	1.25	1.41	6.41	0.10	74.6	0.022	8.6	0.428

Horizon	Extractable S	Fe	Cu	Zn (ppm)	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_p	1.50	7.28	0.24	0.6	3.6	100	21
B_2	2.00	4.40	0.20	1.2	1.6	3	17
C_1	1.50	1.72	0.20	9.6	1.2	10	21
C_2	1.00	0.80	0.20	0.2	2.4	10	30

Profile No. 47

I. Information on the site.

a. Date of examination : 25 December 1973.
b. Location : Agr. Exp. St., Muang, Chaiyaphum.
c. Land form :
  i. Physiographic position : Terrace.
  ii. Surrounding land form : Nearly flat to gently undulating.
d. Land use : Mulberry cultivation.

II. General information on the soil.

a. Soil classification : Gray Podzolic soils.
b. Parent material : Old alluvium.
c. Drainage and water permeability : Well drained.
  Permeability is moderately low.
d. Moisture condition in profile : Dry throughout the profile.

III. Profile description.

A_p 0-15 cm Dull brown (7.5 YR 5/4) sandy loam; single grain and weak, fine subangular blocky; few, fine and very fine pores; very compact (25 mm); non plastic, non sticky; common roots; dry; clear, smooth boundary to

B_{21} 15-35 cm Bright brown (7.5 YR 5/8) light clay; moderate, medium subangular blocky; common; fine and very fine pores; extremely compact (31 mm); non plastic, non sticky; common roots; dry; gradual, smooth boundary to

B_{22} 35-76 cm Orange (7.5 YR 6/8) sandy clay; few, rounded iron-manganese nodules (1-2 mm in diameter), common, laterite concretions (2.5 YR 4/8); moderate, medium subangular blocky; few, fine and very fine pores; extremely compact (31 mm); non plastic, non sticky; few, roots; dry; gradual, smooth boundary to.

B_3 76 cm + Dull yellow orange (10 YR 7/4) sandy clay; common, rounded iron-manganese nodules (3 mm in diameter), many, laterite concretions (7.5 YR 5/8); moderate, medium subangular blocky; few, very fine pores; extremely compact (32 mm); few roots; dry.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)	(g/cm³)	Solid	Liquid	Air	Sand	Silt	Clay
A_p	0-15	2.3	3.1	1.36	52.2	36.8	11.0	71.8	18.4	9.8
B_{21}	15-35	9.6	14.4	1.50	57.7	33.7	8.6	55.4	12.8	31.8
B_{22}	35-76	8.7	12.4	1.42	54.6	36.8	8.6	63.3	6.8	29.9
B_3	76+	8.9	—	—	—	—	—	59.6	12.7	27.7

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_p	SL	25	2.4×10^{-3}	44.9	41.1	36.8	13.1	—
B_{21}	LiC	31	2.3×10^{-4}	38.2	35.7	33.7	24.8	—
B_{22}	SC	31	2.5×10^{-4}	40.5	38.7	36.8	25.1	—
B_3	SC	—	—	—	—	—	—	—

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_p	—	71.0	5.6	3.8	0.75	0.035	21.4	1.29	3.30
B_{21}			5.1	3.5	0.65	0.30	21.7	1.12	9.40
B_{22}			5.1	3.5	0.54	0.025	21.6	1.28	8.40
B_3			5.3	4.0	0.47	0.020	23.5	0.81	9.60

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_p	0.50	0.58	0.08	0.10	37.1	0.014	18.2	0.063
B_{21}	0.85	1.35	0.11	0.05	20.0	0.020	7.0	0.145
B_{22}	0.85	0.85	0.11	0.05	22.2	0.020	5.7	0.157
B_3	3.75	2.40	0.70	0.05	71.8	0.014	11.8	0.157

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_p	1.25	44.80	0.12	0.8	11.2	20	20
B_{21}	3.75	3.60	0.36	1.6	3.2	4	20
B_{22}	2.50	1.70	0.32	1.0	1.2	4	16
B_3	1.25	1.10	0.24	0.6	9.2	390	20

Profile No. 48

I. Information on the site.

a. Date of examination : 25 December 1973.
b. Location : Agr. Exp. St., Muang, Chaiyaphum.
c. Land form :
  i. Physiographic position : Terrace.
  ii. Surrounding land form : Nearly flat to gently undulating.
d. Land use : Mulberry cultivation.

II. General information on the soil.

a. Soil classification : Gray Podzolic soils.
b. Parent material : Old alluvium.
c. Drainage : Well drained.
d. Moisture condition in profile : Top 64 cm of profile dry, below.

III. Profile description.

A_p 0-25 cm Dull orange (7.5YR6/4) sandy loam; moderate, fine granular and moderate, medium subangular blocky; few, very fine pores; very compact (27 mm); non plastic, non sticky; common roots; dry; clear, smooth boundary to

A_{12} 25-37 cm Dull orange (7.5YR6/4) sandy loam; weak, medium subangular blocky; few, very fine pores; extremely compact (30 mm); non plastic, non sticky; few roots; dry; clear, smooth boundary to

B_{21} 37-64 cm Dull orange (7.5YR6/4) loam; abundant, laterite concretions (5YR5/8); moderate, medium subangular blocky; common, fine and very fine pores; extremely compact (30 mm); non plastic, non sticky; few roots; dry; gradual, smooth boundary to.

B_{22} 64-96 cm + Dull orange (7.5YR7/4) sandy clay loam; few, iron-manganese nodules (2 mm in diameter), abundant, laterite concretions (5YR5/8); moderate, medium, subangular blocky; common, fine and very fine pores; very compact (25 mm); non plastic, non sticky; few roots; semi-dry.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)	(g/cm³)	Solid	Liquid	Air	Sand	Silt	Clay
A_p	0-25	—	—	—	—	—	—	—	—	—
A_{12}	25-37	—	—	—	—	—	—	—	—	—
B_{21}	37-64	—	—	—	—	—	—	—	—	—
B_{22}	64-96+	—	—	—	—	—	—	—	—	—

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_p	—	—	—	—	—	—	—	—
A_{12}	—	—	—	—	—	—	—	—
B_{21}	—	—	—	—	—	—	—	—
B_{22}	—	—	—	—	—	—	—	—

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_p	—	—	5.7	4.4	0.82	0.049	16.7	1.41	3.00
A_{12}			5.4	3.8	0.41	0.020	20.5	0.71	2.80
B_{21}			5.0	3.5	0.51	0.025	20.4	0.88	6.80
B_{22}			5.0	3.5	0.44	0.021	21.0	0.76	8.30

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_p	0.90	0.65	0.33	0.15	68.0	0.015	17.1	0.045
A_{12}	0.75	0.63	0.08	0.05	53.7	0.009	5.7	0.045
B_{21}	1.30	1.60	0.11	0.05	45.1	0.014	5.3	0.096
B_{22}	1.55	2.19	0.39	0.05	50.3	0.014	3.3	0.121

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_p	1.25	4.80	0.16	2.0	20.0	90	29
A_{12}	0.75	5.80	0.16	2.2	3.6	10	20
B_{21}	1.50	8.84	0.16	1.4	4.0	6	21
B_{22}	2.75	6.00	0.20	0.6	2.8	9	18

Profile No. 49

I. Information on the site.

a. Date of examination : 25 December 1973.
b. Location : Agr. Exp. St., Muang, Chaiyaphum.
c. Land form :
   i. Physiographic position : Terrace.
   ii. Surrounding land form : Nearly flat to gently undulating.
d. Land use : Fallow.

II. General information on the soil.

a. Soil classification : Gray Podzolic soils.
b. Parent material : Old alluvium.
c. Drainage : Moderately well drained.
d. Moisture condition : Top 27 cm of profile dry, semi-dry below.

III. Profile description.

A_p 0-27 cm Orange (7.5YR6/6) sandy loam; single grain and weak, medium subangular blocky; few, very fine pores, very compact (25 mm); non plastic, non sticky; common roots; dry; slightly positive benzidine reaction; clear, smooth boundary to

B_{21} 27-38 cm Bright brown (7.5YR5/8) sandy loam; weak, medium subangular blocky; few very fine pores; very compact (27 mm); non plastic, non sticky; few roots; semi-dry; gradual, smooth boundary to

B_{22} 38-67 cm Orange (7.5YR6/8) sandy loam; weak, medium subangular blocky; common, fine and very fine pores; slightly compact (18 mm); non plastic, non sticky; few roots; semi-dry; clear, smooth boundary to

C_1 67-80 cm Orange (7.5YR6/8) sandy clay loam; rounded iron-manganese nodule layer (size of nodules is 2-3 mm in diameter); friable; very compact (25 mm); non plastic, non sticky; few roots; semi-dry; clear, smooth boundary to

C_2 80 cm + Dull orange (7.5YR7/4) sandy clay loam; few, rounded manganese nodules; abundant, laterite concretions (2.5YR4/8); moderate, medium subangular blocky; few, fine and very fine pores; compact (23 mm); plastic, sticky; few roots; semi-dry.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases (%) at pF1-5 Solid	Liquid	Air	Particle size (%) Sand	Silt	Clay
A_p	0-27	—	—	—	—	—	—	—	—	—
B_{21}	27-38	—	—	—	—	—	—	—	—	—
B_{22}	38-67	—	—	—	—	—	—	—	—	—
C_1	67-80	—	—	—	—	—	—	—	—	—
C_2	80+	—	—	—	—	—	—	—	—	—

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%) pF1.0	pF1.5	pF3.0	pF4.0
A_p	—	—	—	—	—	—	—	—
B_{21}	—	—	—	—	—	—	—	—
B_{22}	—	—	—	—	—	—	—	—
C_1	—	—	—	—	—	—	—	—
C_2	—	—	—	—	—	—	—	—

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Storage Capacity (mm) of Easily available water (of 50 cm deep soil)	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_p	—	—	5.3	3.9	0.51	0.025	20.4	0.88	1.50
B_{21}			4.9	3.6	0.37	0.017	21.8	0.64	2.90
B_{22}			5.2	3.6	0.41	0.021	19.5	0.71	3.90
C_1			5.8	3.7	0.44	0.019	23.2	0.76	4.20
C_2			5.4	3.6	0.47	0.019	24.7	0.81	7.90

Horizon	Exchangeable bases Ca	Mg	Na	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	P_2O_5 Available (ppm)	Total K_2O (%)
A_p	0.20	0.15	0.11	0.05	34.7	0.014	10.3	0.043
B_{21}	0.15	0.13	0.08	0.05	13.9	0.020	3.3	0.043
B_{22}	0.15	0.10	0.65	0.05	24.5	0.022	1.8	0.102
C_1	0.20	0.10	1.09	0.10	35.6	0.018	1.8	0.145
C_2	0.75	0.27	2.72	0.10	48.6	0.033	3.3	0.343

Horizon	Extractable S	Fe	Cu	Zn (ppm)	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_p	1.50	24.60	0.20	1.0	2.0	20	34
B_{21}	6.00	5.40	0.16	1.6	2.0	5	23
B_{22}	4.00	3.24	0.24	0.6	1.2	4	22
C_1	2.00	1.60	0.24	0.6	1.2	6	21
C_2	1.25	0.72	0.24	0.2	8.0	440	22

Profile No. 50

I. Information on the site.

a. Date of examination : 25 December 1973.
b. Location : Agr. Exp. St., Muang, Chaiyaphum.
c. Land form :
  i. Physiographic position : Terrace.
  ii. Surrounding land form : Nearly flat to gently undulating.
d. Land use : Fallow.

II. General information on the soil.

a. Soil classification : Gray Podzolic soils.
b. Parent material : Old alluvium.
c. Drainage : Well drained.
d. Moisture condition : Top 27 cm of profile dry, semi-dry below.

III. Profile description

A_p 0-20 cm Orange (7.5YR6/6) sandy loam; moderate, fine granular and weak, fine subangular blocky; few very fine pores; very compact (27 mm); non plastic, non sticky; common roots; dry; slightly positive benzidine reaction; gradual, smooth boundary to

A_{12} 20-30 cm Orange (7.5YR6/6) sandy loam; weak; fine subangular blocky; few, very fine pores; very compact (26 mm); non plastic, non sticky; few roots; dry; slightly positive benzidine reaction; clear, smooth boundary to

B_2 30-40 cm Yellow orange (7.5YR7/8) sandy clay loam; moderate, medium subangular blocky; common, very fine pores; extremely compact (30 mm); non plastic, non sticky; few roots; dry; clear, smooth boundary to.

C_1 40-72 cm Orange (7.5YR7/6) light clay; subangular iron-manganese nodule layer (size of nodules is 2-10 mm in diameter);extremely compact (32 mm); non plastic, non sticky; dry; clear, smooth boundary to

C_2 70-89 cm + Light brownish gray (7.5YR7/1) heavy clay; abundant; laterite concretions (7.5YR3/6); moderate, medium subangular blocky; few, very fine pores; very compact (26 mm); semi-dry; faint 2,2'-dipyridyl reaction.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases (%) at pF1-5 Solid	Liquid	Air	Particle size (%) Sand	Silt	Clay
A_p	0-20	—	—	—	—	—	—	—	—	—
A_{12}	20-30	—	—	—	—	—	—	—	—	—
B_2	30-40	—	—	—	—	—	—	—	—	—
C_1	40-72	—	—	—	—	—	—	—	—	—
C_2	72-89+	—	—	—	—	—	—	—	—	—

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%) pF1.0	pF1.5	pF3.0	pF4.0
A_p	—	—	—	—	—	—	—	—
A_{12}	—	—	—	—	—	—	—	—
B_2	—	—	—	—	—	—	—	—
C_1	—	—	—	—	—	—	—	—
C_2	—	—	—	—	—	—	—	—

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Easily available water	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_p	—	—	5.2	3.7	0.58	0.028	20.7	1.00	2.40
A_{12}			5.1	3.7	0.54	0.023	23.5	0.93	2.50
B_2			5.2	3.6	0.54	0.026	20.8	0.93	6.40
C_1			5.5	3.6	0.47	0.027	17.4	0.81	10.04
C_2			5.7	3.5	0.47	0.019	24.8	0.81	13.20

Horizon	Exchangeable bases Ca (me/100g)	Mg	Na	K	Base saturation degree (%)	P_2O_5 Total (%)	Available (ppm)	Total K_2O (%)
A_p	0.45	0.25	0.08	0.05	34.5	0.014	8.6	0.063
A_{12}	0.25	0.21	0.08	0.05	23.5	0.015	8.1	0.063
B_2	0.40	0.17	0.37	0.06	15.6	0.018	3.3	0.145
C_1	0.20	0.19	1.24	0.13	17.5	0.033	1.3	0.283
C_2	0.20	0.65	5.22	0.06	46.4	0.018	4.0	0.337

Horizon	Extractable S (ppm)	Fe	Cu	Zn	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_p	1.75	23.00	0.12	1.4	4.4	20	22
A_{12}	2.50	23.60	0.16	0.8	4.4	10	31
B_2	7.25	5.80	0.16	1.0	4.0	10	30
C_1	1.25	1.80	0.20	0.6	7.2	240	25
C_2	0.75	2.00	0.08	0.2	4.8	20	28

Profile No.52

I. Information on the site.

a. Date of examination : 25 December 1975.
b. Location : Nong-Bua Khok, Chatturat, Chaiyaphum.
c. Land form :
   i. Physiographic position : Terrace.
   ii. Surrounding land form : Flat to gently undulating.
d. Land use : Cassava cultivation.

II. General information on the soil.

a. Soil classification : Gray Podzolic soils.
b. Parent material : Old alluvium.
c. Drainage : Moderately well drained. Permeability is moderate.
d. Moisture condition : Top 57 cm of profile semi-dry, moist below.

III. Profile description

A_p 0-25 cm Brown (7.5 YR 4/4) loamy sand: single grain and weak, fine granular; loose (9 mm); non sticky, non plastic, common roots: semi-dry; very positive benzidine reaction; clear, smooth boundary to

B_{21} 25-57 cm Bright reddish brown (5 YR 5/6) sandy loam; faint, bright reddish brown (5 YR 4/8) tubular iron mottles; weak, medium and fine subangular blocky; friable; few, fine pores; slightly compact (17 mm); non sticky, non plastic; common roots; semi-dry; positive benzidine reaction: gradual smooth boundary to.

B_{22} 57-100 cm + Orange (5 YR 6/6) sandy loam; many, distinct bright reddish brown (5 YR 5/8) spotty and tubular iron mottles; weak, medium subangular blocky; friable; few, fine pores, slightly compact (15 mm); non plastic, non sticky; few roots; moist.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density (g/cm³)	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)		Solid	Liquid	Air	Sand	Silt	Clay
A_p	0-25	5.1	6.7	1.32	50.7	31.3	18.0	85.4	8.4	6.2
B_{21}	25-57	9.8	15.6	1.59	60.3	26.7	13.0	84.7	10.3	5.0
B_{22}	57-100+	13.0	20.4	1.57	60.4	27.2	12.4	84.3	10.4	5.3

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_p	LS	9	5.4×10^{-3}	43.4	35.5	31.3	9.2	—
B_{21}	SL	17	7.7×10^{-4}	30.7	28.2	26.7	11.3	—
B_{22}	SL	15	4.6×10^{-4}	30.8	29.5	27.1	20.6	—

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Storage Capacity (mm) of Easily available water (of 50 cm deep soil)	pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
			H_2O	KCl					
A_p	—	93.8	6.9	5.6	0.61	0.027	22.6	1.05	3.16
B_{21}			7.4	6.0	0.37	0.015	24.7	0.64	2.20
B_{22}			7.7	6.3	0.37	0.012	30.8	0.64	1.52

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_p	2.00	0.28	0.22	0.45	93.2	0.009	10.3	0.078
B_{21}	0.70	0.19	0.37	0.39	74.6	0.011	3.3	0.063
B_{22}	1.15	0.28	0.65	0.51	170.7	0.009	1.8	0.096

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_p	2.25	2.44	0.08	1.0	4.0	130	65
B_{21}	1.75	1.92	0.16	0.6	1.6	20	48
A_{12}	1.75	1.44	0.16	1.2	0.8	8	66

Profile No. 57

I. Information on the site.

a. Date of examination : 28 January 1974.
b. Location : Ban Bung, Chon Buri.
c. Land form :
  i. Physiographic position : Terrace of marine origin.
  ii. Surrounding land form : Flat to gently undulating.
d. Land use : Cassava cultivation.

II. General information on the soil.

a. Soil classfication : Gray Podzolic soils
b. Parent material : Old alluvium.
c. Drainage and water permeability : Moderately well drained. Permeability is moderate.
d. Moisture condition : Top 29 cm of profile dry to semi-dry, moist below.

III. Profile description.

A_p 0-19 cm Grayish yellow (10 YR 6/2) dry; sandy loam; single grain and moderate, fine granular; loose (5 mm); non plastic, non sticky; common roots: dry; very positive benzidine reaction; gradual, smooth boundary to

A_{12} 10-20 cm Grayish brown (7.5 YR 5/2) sandy clay loam; many, distinct brownish black (7.5 YR 2/2) spotty manganese mottles; weak, medium subangular blocky; common, fine and very fine pores; very compact (25 mm); non plastic, non sticky: few roots; semi-dry; very positive benzidine reaction; faint 2,2′-dipyridyl reaction; gradual, smooth boundary to

B_{21} 20-56 cm Grayish brown (7.5 YR 6/2) sandy clay loam; many, distinct brownish black (7.5 YR 2/2) spotty manganese mottles; weak, medium subangular blocky; common; fine and very fine pores; slightly compact (18 mm); non plastic, non sticky; few roots; moist; very positive benzidine reaction: faint 2, 2′-dipyridyl reaction; gradual, smooth boundary to

B_{22} 55-80 cm + Grayish brown (7.5YR6/2) sandy clay loam; many, distinct brown (7.5YR4/3) spotty manganese mottles; weak, medium subangular blocky; common, fine pores; slightly compact (14 mm); non plastic, non sticky: few roots; moist; very positive benzidine reaction.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)	(g/cm³)	Solid	Liquid	Air	Sand	Silt	Clay
A_p	0-10	2.2	3.2	1.47	56.5	26.5	17.0	79.9	14.5	5.6
A_{12}	10-20	8.1	15.6	1.92	73.9	21.3	4.8	73.0	12.4	14.6
B_{11}	20-56	10.9	19.1	1.75	67.2	23.4	9.4	74.1	9.3	16.6
B_{22}	56-80+	11.4	20.4	1.79	68.9	22.8	8.3	74.9	9.4	15.7

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_p	SL	5	2.1×10^{-3}	38.6	29.7	26.5	18.5	—
A_{12}	SCL	25	$2.9\times10^{-}{}_{4}$	23.9	22.1	21.1	18.4	—
B_{21}	SCL	18	6.0×10^{-4}	26.9	25.6	23.4	19.7	—
B_{22}	SCL	14	6.1×10^{-4}	26.7	25.0	22.8	18.1	—

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_p	—	22.4	7.2	5.9	0.41	0.029	14.1	0.71	1.10
A_{12}			6.8	5.0	0.41	0.021	13.2	0.71	4.70
B_{21}			6.3	4.6	0.41	0.027	15.2	0.71	3.90
B_{22}			6.0	4.5	0.45	0.023	23.5	0.78	3.50

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_p	1.75	0.25	0.65	0.18	258.9	0.011	11.4	0.054
A_{12}	4.31	0.26	0.74	0.13	115.8	0.018	2.9	0.183
B_{21}	3.69	0.49	0.61	0.39	132.6	0.015	1.3	0.169
B_{22}	2.69	0.65	0.54	0.39	110.8	0.026	1.8	0.163

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_p	1.00	1.80	0.80	2.4	12.8	140	114
A_{12}	0.50	1.24	0.20	2.2	9.1	80	52
B_{21}	1.75	0.60	1.00	0.8	10.8	380	37
B_{22}	1.25	0.60	1.00	0.6	7.6	200	50

Profile No. 59

I. Information on the site.

a. Date of examination : 28 January 1974.
b. Location : Pala, Muang, Rayong.
c. Land form :
  i. Physiographic position : Terrace of marine origin.
  ii. Surrounding land form : Flat to gently undulating.
d. Land use : Cassava and coconut cultivation.

II. General information on the soil.

a. Soil classification : Gray Podzolic soils.
b. Parent material : Old alluvium.
c. Drainage and water permeability : Well drained.
  Permeability is moderate to moderately high.
d. Moisture condition : Top 15 cm of profile dry, semi-dry below.

III. Profile description.

A_p 0-15 cm Dull yellow orange (10YR7/2) dry; loamy sand: single grain; loose (less than 5 mm); non plastic, non sticky; common roots; dry; very positive, benzidine reaction; gradual smooth boundary to

A_{12} 15-20 cm Dull yellowish brown (10YR5/3) sandy loam; weak, medium subangular blocky; breaking into fine subangular blocky; few, very fine pores; compact (22 mm); non plastic, non sticky; common roots; semi-dry; posive benzidine reaction; clear, smooth boundary to

A_{13} 20-45 cm Mixed soil dull yellowish brown (10YR4/3) in 7 portions and dull yellow orange (10YR7/3) in 3 portions; sandy loam; weak, medium subangular blocky, breaking into fine subangular blocky; few, fine and very fine pores; compact (22 mm); non plastic, non sticky; few roots; semi-dry; very positive benzidine reaction; clear, smooth boundary to

B_2 45-85 cm + Dull yellow orange (10YR7/2) sandy loam; common, fine subangular gravels; weak, medium subangular blocky, breaking into single grain; common, fine and very fine pores; compact (19 mm); non plastic, non sticky: semi-dry; slightly positive benzidine reaction.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density (g/cm³)	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)		Solid	Liquid	Air	Sand	Silt	Clay
A_p	0-15	0.8	1.2	1.44	55.3	26.2	18.5	85.9	8.3	4.8
A_{12}	15-20	5.5	8.5	1.54	59.3	26.1	14.6	82.0	11.3	6.7
A_{13}	20-45	8.0	12.4	1.55	60.6	27.7	11.7	79.6	12.4	8.0
B_2	45-85+	6.0	9.2	1.49	57.1	19.2	23.7	84.7	9.3	6.0

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_p	LS	57	7.7×10^{-3}	37.8	31.7	26.2	22.8	—
A_{12}	SL	22	2.8×10^{-3}	34.0	29.9	26.0	22.8	—
A_{13}	SL	22	1.0×19^{-3}	33.5	31.5	27.7	18.3	—
B_2	SL	19	3.6×10^{-3}	33.6	27.7	19.2	16.8	—

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_p	—	34.9	6.4	5.4	0.48	0.029	16.6	0.83	1.30
A_{12}			6.3	5.0	0.55	0.033	16.7	0.95	1.50
A_{13}			6.2	4.9	0.51	0.044	11.6	0.88	2.10
B_2			6.5	4.7	0.41	0.018	22.8	0.71	1.20

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_p	1.06	0.38	0.33	0.197	150.8	0.022	11.9	0.081
A_{11}	1.00	0.30	0.33	0.064	112.9	0.022	7.0	0.075
A_{13}	1.36	0.30	0.52	0.128	110.3	0.025	7.0	0.120
B_2	0.86	0.23	0.34	0.197	135.3	0.013	4.4	0.087

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_p	0.75	0.72	0.80	2.0	17.2	200	65
A_{12}	0.25	0.60	1.40	1.4	18.0	220	46
A_{13}	0.50	1.00	1.20	1.8	20.0	160	32
B_2	0.25	0.96	1.60	1.0	4.4	40	35

Profile No. 60

I. Information on the site.

a. Date of examination : 28 January 1974.
b. Location : Huaypong Agr. Exp. St., Muang, Rayong.
c. Land form :
   i. Physiographic position : Terrace of marine origin.
   ii. Surrounding land form : Flat.
d. Land use : Cassava cultivation.

II. General information on the soil.

a. Soil classification : Gray Podzolic soils.
b. Parent material : Old alluvium.
c. Drainage and water permeability : Well drained.
   Permeability is moderate.
d. Moisture condition in profile : Seme-dry throughout the profile.

III. Profile description.

A_p 0-13 cm Dull yellow orange (10YR6/3)sandy clay; faint, spotty manganese mottles; moderate, medium subangular blocky and fine granular; few, very fine pores; slightly compact (12 mm); non plastic, slightly sticky: common roots: semi-dry; slightly positive benzidine reaction: faint 2, 2′- dipyridyl reaction; clear, smooth boundary to

B_2 13-70 cm + Dull yellow orange (10YR6/4) sandy clay: faint, spotty manganese mottles: weak, medium subangular blocky, friable; few very fine pores; extremely compact (32 mm), very hard when dry; few roots; semi-dry; slightly positive benzidine reaction; faint 2, 2′-dipyridyl reaction.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)	(g/cm³)	Solid	Liquid	Air	Sand	Silt	Clay
A_p	0-13	12.2	17.9	1.47	56.4	28.6	15.0	57.8	6.2	36.0
B_2	13-70+	9.9	15.4	1.56	60.2	28.2	11.6	61.8	4.3	33.9

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_p	SC	12	7.7×10^{-3}	37.9	32.5	28.6	21.4	—
B_2	SC	32	1.5×10^{-3}	36.1	31.8	28.2	19.1	—

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_p	—	43.1	5.4	4.2	0.88	0.055	16.0	1.52	4.30
B_2			5.4	3.7	0.62	0.037	16.8	1.07	3.10

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_p	1.73	0.60	0.33	0.29	68.7	0.048	46.7	0.139
B_2	0.35	0.25	0.33	0.13	33.9	0.037	13.4	0.127

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_p	16.50	3.36	1.2	1.8	9.6	20	70
B_2	22.25	9.48	0.6	1.4	6.4	40	64

Profile No. 64

I. Information on the site.

a. Date of examination : 30 January 1974.
b. Location : Kwianhuk, Khlung, Chantaburi.
c. Land form :
  i. Physiographic position : Terrace of marine origin.
  ii. Surrounding land form : Flat to gently undulating.
d. Land use : Fruit trees such as durian, rambutan.

II. General information on the soil.

a. Soil classification : Gray Podzolic soils.
b. Parent material : Old alluvium.
c. Drainage and water permeability : Well drained.
Permeability is very high to high.
d. Moisture condition in profile : Top 15 cm of profile dry, semi-dry below.

III. Profile description.

A_p 0-15 cm Brown (10YR4/4) dry: sandy clay; moderate, fine granular; very compact (27 mm): non plastic, non sticky: many roots; dry; gradual, smooth boundary to

A_{12} 15-34 cm Brown (10YR4/6) sandy clay; weak, medium subangular blocky, friable; common, fine and very fine pores; compact (20 mm); non plastic, non sticky; many roots: semi-dry; gradual, smooth boundary to

B_{21} 34-74 cm Yellowish brown (10YR5/6) sandy clay; faint, orange (7.5YR6/8) spotty iron mottles; weak, medium subangular blocky, friable; common, fine and very fine pores; compact (22 mm); slightly plastic, non sticky; few roots, semi-dry; gradual smooth boundary to

B_{21} 34-74 cm Yellowish brown (10YR5/6) sandy clay; faint, orange (7.5YR6/8) spotty iron mottles; weak, medium subangular blocky, friable; common, fine and very fine pores; compact (22 mm); slightly plastic, non sticky; few roots, semi-dry; gradual smooth boundary to

B_{22} 74 cm + Dull yellow orange (10YR6/4)sandy clay loam; many, distinct bright reddish brown (5YR5/8) spotty and tubular iron mottles; weak, medium subangular blocky, friable; common, fine and very fine pores; compact (20 mm); semi-dry; faint 2, 2′-dipyridyl reaction.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density (g/cm³)	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)		Solid	Liquid	Air	Sand	Silt	Clay
A_p	0-15	7.1	9.9	1.39	53.5	31.3	15.4	66.6	8.7	24.7
A_{12}	15-34	11.9	13.7	1.15	44.2	30.8	25.0	58.5	10.7	30.8
B_{21}	34-74	10.6	14.5	1.37	52.8	30.7	16.5	68.7	6.5	24.8
B_{22}	74+	10.4	16.2	1.56	60.1	27.7	12.2	72.4	5.1	22.5

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_p	SC	27	4.5×10^{-3}	41.1	37.5	31.0	21.6	—
A_{12}	SC	20	3.5×10^{-2}	49.4	40.4	30.7	21.5	—
B_{21}	SC	22	4.2×10^{-3}	39.5	36.0	30.7	24.2	—
B_{22}	SCL	27	2.8×10^{-3}	33.6	31.0	27.7	19.2	—

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_p	—	42.0	5.3	4.2	1.50	0.105	14.3	2.59	3.90
A_{12}			5.4	4.2	1.54	0.095	16..2	2.65	4.30

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_p	0.68	0.42	0.22	0.06	35.2	0.064	32.0	0.121
A_{12}	1.06	0.35	0.34	0.06	42.2	0.055	14.3	0.122

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_p	0.25	6.20	1.00	1.4	2.4	120	50
A_{12}	0.25	4.84	0.20	1.6	2.8	60	20

Profile No. 65 (Prew Agr. Exp. St., No.1)

I. Information on the site.

a . Date of examination : 30 January 1974.
b . Location : Prew Agr. Exp. St., Khlung, Chantaburi.
c . Land form :
  i . Physiographic position : Terrace of marine origin.
  ii . Surrounding land form : Flat to gently undulating.
d . Land use : Cover crop cultivation

II. General information on the soil.

a . Soil classification : Gray Podzolic soils.
b . Parent material : Old alluvium.
c . Drainage and water permeability : Well drained.
Permeability is moderate to moderately high.
d . Moisture condition : Top 20 cm of profile dry, semi-dry below.

III. Profile description.

A_p 0-20 cm Dull yellowish brown (10YR4/3) sandy clay loam; strong, fine granular; slightly compact (15 mm); non plastic, non sticky; many roots; dry; slightly positive benzidine reaction; faint 2, 2'-dipyridyl reaction; gradual boundary to

A_{12} 20-35 cm Grayish yellow brown (10YR4/2) sandy clay loam; moderate, medium subangular blocky; few, very fine pores; very compact (24 mm); non plastic, non sticky; few roots; semi-dry; slightly positive benzidine reaction; faint 2, 2'-dipyridyl reaction; clear, smooth boundary to

B_2 35-100 cm + Dull yellow orange (10YR6/4) sandy clay; moderate, medium subangular blocky; common, fine and very fine pores; very compact (26 mm); non plastic, non sticky; few roots; semi-dry; slightly positive benzidine reaction; faint 2, 2'-dipyridyl reaction.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density (g/cm³)	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)		Solid	Liquid	Air	Sand	Silt	Clay
A_p	0-20	10.2	11.6	1.14	43.9	24.8	31.3	75.1	8.3	16.6
A_{12}	20-35	11.6	16.4	1.41	54.1	31.1	14.8	68.8	9.4	21.8
B_2	35-100+	11.0	16.8	1.53	58.7	30.4	10.9	61.0	10.3	28.7

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_p	SCL	15	3.1×10^{-2}	39.3	29.7	24.8	17.5	—
A_{12}	SCL	24	2.9×10^{-3}	39.4	34.9	31.0	26.7	—
B_2	SC	26	1.0×10^{-3}	34.9	33.3	30.3	23.3	—

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_p	—	31.6	4.9	3.8	1.56	0.104	15.0	2.69	5.70
A_{12}			5.0	3.9	1.30	0.096	13.5	2.24	4.60
B_2			5.1	3.9	0.86	0.052	16.5	1.48	3.30

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_p	0.74	0.40	0.44	0.20	31.0	0.132	34.2	0.099
A_{12}	0.49	0.32	0.22	0.13	25.1	0.145	41.5	0.127
B_2	0.61	0.33	0.52	0.13	48.4	0.050	40.4	0.169

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_p	1.25	4.56	1.60	1.6	4.8	16	70
A_{12}	1.00	4.84	1.20	1.4	2.0	14	44
B_2	20.00	10.08	1.40	10	0.8	10	31

Profile No. 66 (Prew Agr. Exp. St., No.2)

I. Information on the site.

a. Date of examination : 30 January 1974.
b. Location : Prew Agr. Exp. St., Khlung, Chantaburi.
c. Land form :
  i. Physiographic position : Terrace of marine origin.
  ii. Surrounding land form : Flat to gently undulating.

II. General information on the soil.

a. Soil classification : Gray Podzolic soils.
b. Parent material : Old alluvium.
c. Drainage and water permeability : Well drained. Permeability is moderately high.
d. Moisture condition : Top 12 cm of profile dry, semi-dry below.

III. Profile description.

A_p 0-12 cm Brownish black (10YR3/2) sandy clay loam; strong, fine granular; loose (5 mm); non plastic, non sticky; many roots; dry; faint 2,2'-dipyridyl reaction; gradual, smooth boundary to

A_{12} 12-20 cm Dull yellowish brown (10YR4/3) sandy clay loam; moderate, medium subangular blocky, friable; common, fine and very fine pores; compact (24 mm); non plastic, non sticky; common roots; semi-dry; faint 2,2'-dipyridyl reaction; clear, smooth boundary to

B_2 20-84 cm Dull yellow orange (10YR6/4) sandy clay; moderate, medium subangular blocky; common fine and very and fine pores; extremely compact (31 mm); non plastic, non sticky; few roots; semi-dry; slightly positive benzidine reaction; faint 2,2'-dipyridyl reaction; clear, smooth boundary to

B_3 84 cm + Grayish yellow brown (10YR6/2) heavy clay; few, laterite concretions (2.5-YR4/8); moderate, medium subangular blocky; few, fine and very fine pores; very compact (28 mm); semi-dry; slightly positive benzidine reaction; faint 2,2'-dipyridyl reaction.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)	(g/cm³)	Solid	Liquid	Air	Sand	Silt	Clay
A_p	0-12	9.7	12.2	1.26	48.5	26.3	25.2	75.7	7.5	16.8
A_{12}	12-20	11.9	15.6	1.31	50.3	28.3	21.4	71.0	8.3	20.7
B_2	20-84	8.6	12.3	1.43	54.1	30.2	15.7	66.9	7.5	25.6
B_3	84+	22.4	34.0	1.52	58.6	39.4	2.0	32.2	8.5	59.3

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max. water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_p	SCL	5	3.7×10^{-2}	41.1	35.4	26.3	19.2	—
A_{12}	SCL	24	9.1×10^{-3}	42.2	37.4	28.2	18.3	—
B_2	SC	31	2.6×10^{-3}	38.2	35.1	30.1	19.5	—
B_3	HC	28	7.6×10^{-6}	40.9	40.2	39.4	31.6	—

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_p	—	48.2	5.7	4.8	0.66	0.067	9.9	1.14	3.88
A_{12}			5.9	5.0	0.80	0.063	12.7	1.38	3.72
B_2			4.4	3.6	0.42	0.040	10.5	0.72	3.76

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_p	1.95	0.64	0.13	0.46	81.9	0.035	15.6	0.102
A_{12}	2.05	0.63	0.10	0.19	80.2	0.037	16.0	0.096
B_2	0.50	0.26	0.11	0.06	24.8	0.033	8.1	0.151

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_p	1.75	1.20	0.08	0.8	12.4	40	96
A_{12}	1.25	0.70	0.12	1.0	12.8	50	155
B_2	24.25	6.60	0.12	2.2	1.2	10	57

Profile No. 67 (Huaypong Agr. Exp. St., No. 1)

I. Information on the site.

a. Date of examination : 22 February 1974.

b. Location : Huaypong Agr. Exp. St., Muang, Rayong.

c. Land form :

i. Physiographic position : Terrace of marine origin.

ii. Surrounding land form : Undulating.

d. Land use : Durian cultivation, cover crop was cultivated at the time of examination.

II. General information on the soil.

a. Soil classification : Gray Podzolic soils.

b. Parent material : Old alluvium.

c. Drainage and water permeability : Well drained. Permeability is moderately low.

d. Moisture condition in profile : Dry throughout the profile.

III. Profile description.

A_p 0-10 cm Dull orange (7.5YR7/3) dry, dull yellow orange (10YR7/4) moist; sandy clay; moderate, fine granular and moderate, medium subangular blocky structure; common, fine and very fine pores; slightly compact (13 mm); non plastic, slightly sticky; common roots; dry; slightly positive benzidine reaction; gradual, smooth boundary to

A_{12} 10-15 cm Dull brown (7.5YR6/3) dry, dull brown (7.5YR5/3); sandy clay; moderate, medium subangular blocky structure, friable; common, fine and very fine pores; extremely compact (31 mm); non plastic, slightly sticky; few roots; dry; slightly positive benzidine reaction; clear, smooth boundary to

B_2 15-100 cm + Light yellow orange (7.5YR8/4) dry, dull yellow orange (10YR7/4) moist; sandy clay; moderate, coarse blocky structure; few, fine pores; very hard when dry; extremely compact (31 mm); slightly plastic, slightly sticky; few roots; dry.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density (g/cm³)	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)		Solid	Liquid	Air	Sand	Silt	Clay
A_p	0-10	1.7	2.1	1.23	47.3	28.7	24.0	62.9	9.3	27.8
A_{12}	10-15	6.3	10.0	1.58	60.9	28.5	10.6	67.0	7.3	25.7
B_2	15-100+	4.0	6.5	1.62	62.5	27.7	9.8	59.0	6.3	34.7

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_p	SC	13	1.2×10^{-2}	40.5	35.9	28.7	22.2	—
A_{12}	SC	31	8.7×10^{-4}	36.9	34.1	28.5	18.4	—
B_2	SC	31	4.7×10^{-4}	35.2	31.0	27.7	19.2	—

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_p	—	41.4	5.7	4.8	0.66	0.067	9.9	1.14	3.88
A_{12}			5.9	5.0	0.80	0.063	12.7	1.38	3.72
B_2			4.4	3.6	0.42	0.040	10.5	0.72	3.76

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_p	1.95	0.64	0.13	0.46	81.9	0.035	15.6	0.102
A_{12}	2.05	0.63	0.10	0.19	80.2	0.037	16.0	0.096
B_2	0.50	0.26	0.11	0.06	24.8	0.033	8.1	0.151

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_p	1.75	1.20	0.08	0.8	12.4	40	96
A_{12}	1.25	0.70	0.12	1.0	12.8	50	155
B_2	24.25	6.60	0.12	2.2	1.2	10	57

Profile No. 68 (Huaypong Agr. Exp. St., No. 2)

I. Information on the site.

a. Date of examination : 22 February 1974.
b. Location : Huaypong Agr. Exp. St., Muang, Rayong.
c. Land form :
  i. Physiographic position : Terrace of marine origin.
  ii. Surrounding land form : Flat.
d. Land use : Cassava cultivation.

II. General information on the soil.

a. Soil classification : Gray Podzolic soils.
b. Parent material : Old alluvium.
c. Drainage and water permeability : Well drained. Permeability is moderate.
d. Moisture condition in profile : Top 20 cm of profile dry, semi-dry below.

III. Profile description.

A_p 0-10 cm Dull yellowish brown (10YR5/3) sandy clay, moderate, fine granular and moderate, medium subangular blocky structure; few, fine and very fine pores; loose (5 mm); non plastic, non sticky; common roots; dry; slightly positive benzidine reaction; gradual, smooth boundary to

A_{12} 10-20 cm Dull yellow orange (10YR6/4) sandy clay; moderate, medium subangular blocky structure; common, fine and very fine pores; extremely compact (32 mm); non plastic, slightly sticky; few roots; dry; slightly positive benzidine reaction; clear, smooth boundary to

B_{21} 20-65 cm Bright yellowish brown (10YR7/6) sandy clay; moderate, medium subangular blocky structure; few, fine and very fine pores; very hard when dry; extremely compact (31 mm); slightly plastic, slightly sticky; few roots; semi-dry; gradual, smooth boundary to

B_{22} 65-110 cm + Bright yellowish brown (10YR7/6) heavy clay; moderate, medium subangular blocky structure, friable moist; few, fine and very fine pores; very compact (27 mm); slightly plastic, slightly sticky; few roots; semi-dry;

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases (%) at pF1-5 Solid	Liquid	Air	Particle size (%) Sand	Silt	Clay
A_p	0-10	2.7	3.4	1.25	48.1	26.7	25.2	67.4	8.1	24.5
A_{12}	10-20	7.1	11.4	1.61	61.7	25.7	12.6	67.6	6.1	26.3
B_{21}	20-65	7.1	12.2	1.72	66.1	24.2	9.7	65.4	7.1	27.5
B_{22}	65-110+	14.2	21.3	1.50	57.6	29.8	12.6	47.7	6.0	46.2

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%) pF1.0	pF1.5	pF3.0	pF4.0
A_p	SC	5	9.8×10^{-3}	40.6	34.6	27.7	20.6	—
A_{12}	SC	32	1.7×10^{-3}	32.4	29.1	25.7	19.1	—
B_{21}	SC	31	7.9×10^{-4}	20.7	27.1	24.2	16.2	—
B_{22}	HC	27	4.6×10^{-3}	36.1	31.8	29.8	22.7	—

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Easily available water	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_p	—	36.7	5.5	4.7	1.04	0.076	13.7	1.79	3.78
A_{12}			4.6	3.7	0.70	0.058	12.1	1.21	3.24
B_{21}			4.3	3.5	0.52	0.038	13.7	0.90	2.76
B_{22}			4.1	3.4	0.41	0.040	10.3	0.71	3.96

Horizon	Exchangeable bases Ca	Mg	Na	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	P_2O_5 Available (ppm)	Total K_2O (%)
A_p	2.40	0.40	0.11	0.39	87.0	0.055	87.8	0.096
A_{12}	0.85	0.21	0.11	0.13	40.0	0.042	49.6	0.090
B_{21}	0.50	0.13	0.22	0.13	35.1	0.033	16.0	0.090
B_{22}	0.45	0.14	0.11	0.06	19.1	0.048	8.8	0.151

Horizon	Extractable S	Fe	Cu	Zn (ppm)	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_p	1.75	1.44	0.08	1.0	13.2	60	90
A_{12}	20.00	5.88	0.04	1.2	10.4	40	47
B_{21}	11.00	7.50	0.04	0.8	2.8	4	50
B_{22}	22.00	2.30	0.12	2.0	0.8	3	75

Profile No. 69 (Huaypong Agr. Exp. St., No. 3)

I. Information on the site.

a. Date of examination : 22 February 1974.
b. Location : Huaypong Agr. Exp. St., Muang, Rayong.
c. Land form :
   i. Physiographic position : Terrace of marine origin.
   ii. Surrounding land form : Flat to gently undulating.
d. Land use : Cassava cultivation.

II. General information on the soil.

a. Soil classification : Gray Podzolic soils.
b. Parent material : Old alluvium.
c. Drainage and water permeability : Well drained. Permeability is moderate.
d. Moisture condition in profile : Dry throughout the profile.

III. Profile description.

A_p 0-10 cm Dull yellow orange (10YR7/2) dry, grayish yellow brown (10YR5/2) moist; sandy clay; moderate, fine granular and moderate, medium subangular blocky structure; few, very fine pores; loose (5 mm); non plastic, non sticky; common roots; dry; slightly positive, benzidine reaction; gradual, smooth boundary to

A_{12} 10-20 cm Grayish yellow brown (10YR6/2) dry, grayish yellow brown (10YR5/2) moist; sandy clay loam; moderate, medium subangular blocky structure; few, very fine pores; very compact (29 mm); non plastic, non sticky; common roots; dry; slightly positive, benzidine reaction; clear smooth boundary to

B_2 20-90 cm + Dull yellow orange (10YR7/4) dry, dull orange (7.5YR6/4) moist; sandy clay; moderate, medium subangular blocky structure; common, fine and very fine pores; very hard when dry; extremely compact (32 mm); slightly plastic, slightly sticky; few roots; dry.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases (%) at pF1-5 Solid	Liquid	Air	Particle size (%) Sand	Silt	Clay
A_p	0-10	3.6	4.8	1.34	51.6	30.6	17.8	66.4	8.1	25.5
A_{12}	10-20	6.1	8.8	1.44	55.4	28.0	16.6	70.2	5.1	24.7
B_2	20-90+	6.3	10.5	1.66	63.8	24.5	11.7	64.9	7.2	27.9

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%) pF1.0	pF1.5	pF3.0	pF4.0
A_p	SCL	5	4.8×10^{-3}	41.0	35.4	30.6	24.8	—
A_{12}	SCL	29	3.4×10^{-3}	36.0	33.7	28.0	16.5	—
B_2	SCL	32	1.9×10^{-3}	33.3	28.5	24.5	18.1	—

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Storage Capacity (mm) of Easily available water (of 50 cm deep soil)	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_p	—	36.5	—	—	0.77	0.065	11.9	1.33	3.60
A_{12}			5.2	4.3	0.81	0.059	13.7	1.40	3.76
B_2			5.1	4.1	0.49	0.039	12.6	0.84	2.72

Horizon	Exchangeable bases Ca	Mg	Na	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	Available (ppm)	Total K_2O (%)
A_p	1.75	0.37	0.22	0.39	75.5	0.026	283.0	0.090
A_{12}	1.80	0.31	0.22	0.19	67.0	0.061	276.4	0.446
B_{12}	1.25	0.35	0.11	0.06	65.3	0.064	18.4	0.434

Horizon	Extractable S	Fe	Cu	Zn (ppm)	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_p	3.75	1.28	0.12	1.6	15.2	34	84
A_{12}	1.75	0.80	0.12	1.2	13.6	37	50
B_2	7.25	2.00	0.12	2.2	2.4	7	54

Profile No.72

I. Imformation on the site.

a. Date of examination : 27 March 1974.
b. Location : Prasat, Surin (Land settlement)
c. Land form :
  i. Physiographic position : Alluvial terrace.
  ii. Surrounding land form : Flat.
d. Land use : Mulberry cultivation.

II. General information on the soil.

a. Soil classification : Gray podzolic soils.
b. Parent material : Old alluvium.
c. Drainage and water permeability : Moderately well drained. Permeability is moderately low.
d. Moisture condition in profile : Semi-dry throughout the profile.

III. Profile description.

A_p 0-12 cm Dull orange (7.5YR6/4) loam; weak, medium subangular blocky structure and fine granular; few, very fine pores loose (less than 5 mm); non plastic, slightly sticky; common roots; dry; very positive benzidine reaction; gradual, smooth boundary to

A_{12} 12-22 cm Dull brown (7.5YR5/4) loam; common, distinct brown (7.5YR4/6) spotty iron mottles; weak, medium subangular blocky structure; very friable; few, fine and very fine pores; compact (21 mm); non plastic, slighly sticky; few roots; semi-dry; very positive benzidine reaction: clear, smooth boundary to

B_{21} 22-69 cm Orange (7.5YR6/6) clay loam; common, distinct orange (7.5YR6/8) spotty iron mottles; weak, medium subangular blocky, very friable; few, fine pores; compact (22 mm); non plastic, slightly sticky; few roots; semi-dry; gradual, smooth boundary to

B_{22} 69-80 cm + Dull orange (7.5YR6/4) clay loam; abundant, distinct orange (7.5YR6/8) spotty iron mottles; weak, medium subangular blocky structure; few, fine pores; compact (20 mm); slightly plastic, slightly sticky; semi-dry.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)	(g/cm³)	Solid	Liquid	Air	Sand	Silt	Clay
A_p	0-12	10.4	11.7	1.13	43.5	27.0	29.5	49.4	44.7	5.9
A_{12}	12-22	15.9	25.2	1.58	60.8	32.6	6.6	45.4	42.5	12.1
B_{12}	22-69	14.8	23.2	1.57	60.6	29.5	9.9	45.4	38.5	16.1
B_{22}	68-80+	21.6	31.8	1.47	56.4	35.0	9.6	41.3	36.6	22.1

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_p	L	5	1.4×10^{-3}	37.1	29.7	27.0	15.1	6.1
A_{12}	L	21	2.0×10^{-3}	34.1	33.4	32.6	18.9	9.0
B_{21}	CL	22	4.8×10^{-4}	31.0	30.0	29.5	22.2	12.6
B_{22}	CL	20	1.3×10^{-4}	39.1	36.1	35.0	20.5	13.7

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily avaiiable water	H_2O	KCl					
A_p	96.0	48.4	5.6	4.5	0.34	0.034	10.0	0.59	2.96
A_{12}			4.7	3.8	0.55	0.027	22.9	0.95	3.04
B_{21}			5.2	3.4	0.58	0.021	27.6	1.00	2.16
B_{22}			—	—	—	—	—	—	—

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_p	2.10	0.54	0.18	0.11	99.0	0.022	3.7	0.072
A_{12}	1.40	0.43	0.27	0.11	72.6	0.022	3.7	0.072
B_{21}	0.40	0.16	0.27	0.05	40.8	0.026	1.8	0.109
B_{22}	—	—	—	—	—	—	—	—

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_p	1.00	4.20	0.60	1.6	14.0	54	43
A_{12}	2.25	14.76	0.20	1.4	12.0	46	56
B_{21}	0.75	8.60	0.40	1.2	2.0	10	24
B_{22}	—	—	—	—	—	—	—

Profile No.77

I. Information on the site.

a. Date of examination : 28 March 1974.
b. Location : Si Sa Ket Sericulture Research Station.
c. Land form :
   i. Physiographic position : Old alluvial terrace.
   ii. Surrounding land form : Flat to gently undulating.
d. Land use : Kenaf cultivation.

II. General information on the soil.

a. Soil classification : Gray Podzolic soils.
b. Parent material : Old alluvium.
c. Drainage and water permeability : Moderately well drained. Permeability is moderate.
d. Moisture condition in profile : Top 39 cm of profile semi-dry, dry below.

III. Profile description.

A_p 0-23 cm Bright brown (7.5YR5/6)sandy loam; moderate, fine granular; slightly compact (14 mm); non plastic. non sticky; common roots; semi-dry; very positive benzidine reaction; gradual, smooth boundary to

A_{12} 23-39 cm Bright brown (7.5YR5/6) sandy loam; common, distict brown (7.5YR4/6) spotty manganese mottles; weak, medium subangular blocky structure, friable; few, fine and very fine pores; compact (21 mm); non sticky, non plastic, few roots; semi-dry; very positive benzidine reaction; clear, wavy boundary.

B_2 39-100 cm + Dull orange (7.5YR9/4) sandy loam; common, distinct orange (7.5YR6/8) spotty iron mottles; moderate, medium subangular blocky structure; common, fine and very fine pores; very compact (29 mm); non plastic, non sticky; few roots; dry; slightly positive benzidine reaction.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)	(g/cm³)	Solid	Liquid	Air	Sand	Silt	Clay
A_p	0-23	7.2	10.1	1.41	54.1	27.1	18.8	76.4	14.8	8.8
A_{12}	23-39	8.7	14.5	1.67	64.3	27.7	8.0	78.8	10.4	10.8
B_2	39-100+	6.5	10.0	1.55	59.7	28.1	12.2	72.3	20.9	6.8

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_p	SL	14	2.0×10^{-3}	37.0	30.8	27.1	15.9	3.8
A_{12}	SL	21	6.3×10^{-4}	31.2	28.8	27.7	10.9	5.5
B_2	SL	29	8.9×10^{-4}	34.3	30.9	28.1	12.0	6.2

Horizon	Storage Capacity (mm) of (of 50 cm deep soil)		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water	Easily available water	H_2O	KCl					
A_p	113.2	70.3	4.8	3.9	0.52	0.021	24.8	0.90	0.80
A_{12}			5.1	3.8	0.45	0.015	30.0	0.78	1.12
B_2			4.8	3.5	0.38	0.013	29.2	0.66	1.28

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_p	0.35	0.14	0.27	0.05	101.6	0.031	17.6	0.030
A_{12}	0.45	0.14	0.67	0.05	118.0	0.044	5.7	0.039
B_2	0.35	0.17	0.07	0.02	47.8	0.026	1.8	0.057

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_p	0.50	6.32	0.40	1.6	33.2	70	53
A_{12}	0.50	3.60	1.00	1.0	26.8	78	28
B_2	4.25	3.40	0	0.6	14.4	26	29

Profile No. 81

I Information on the site.

a . Date of examination : 17 April 1974.
b . Location : Sawi Agriculture Exp. St., Sawi, Chumphon.
c . Land form :
  i . Physiographic position : Terrace.
  ii . Surrounding land form : Undulating.
d . Land use : Coconut cultivation.

II General information on the soil.

a . Soil classification : Gray Podzolic soils.
b . Parent material : Old alluvium.
c . Drainage and water permeability : Moderately well drained. Permeability is moderately low.
d . Moisture condition in profile : Dry throughout the profile.

III Profile description.

A_p 0-30 cm Dull yellow orange (10YR6/3) loam; moderate, medium subangular blocky structure; few, fine and very fine pores; very hard when dry; very compact (29 mm); non plastic, non sticky; common roots; dry; faint 2.2' dipyridyl reaction; clear, smooth boundary to

B_2 30-70 cm + Mixed soil bright yellowish brown (10YR6/5) in 8 portions and dull yellow orange (10YR7/4) in 2 portions; clay loam; moderate, medium subangular blocky structure; common, fine and very fine pores; very hard when dry; extremely compact (31 mm); slightly plastic, slightly sticky; few roots; dry; faint 2.2' dipyridyl reaction.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)	(g/cm³)	Solid	Liquid	Air	Sand	Silt	Clay
A_p	0-30	7.8	10.8	1.38	53.2	30.2	16.6	48.9	38.3	17.8
B_2	30-70+	6.1	9.5	1.55	59.6	29.9	10.5	51.1	26.9	22.0

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_p	L	29	2.2×10^{-3}	36.7	32.3	30.2	22.8	9.2
B_2	CL	31	1.5×10^{-4}	34.0	31.6	29.9	22.5	11.5

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_p	99.8	37.0	5.2	3.1	0.39	0.066	5.9	0.67	3.36
B_2			4.8	2.8	0.09	0.034	2.7	0.16	3.60

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_p	1.75	0.31	0.36	0.21	78.5	0.033	7.9	0.202
B_2	0.75	0.21	0.27	0.13	37.9	0.033	2.6	0.229

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_p	4.75	12.10	0.04	1.0	4.8	20	40
B_2	4.75	15.20	0.04	1.8	1.6	2	24

Profile No. 91

I Information on the site.

a . Date of examination : 19 April 1974.
b . Location : Klong Thom Rubber Exp. St., Krabi.
c . Land form :
  i . Physiographic position : Middle terrace.
  ii . Surrounding land form : Flat to gently undulating.
d . Land use : Rubber cultivation.

II General information on the soil.

a . Soil classification : Gray Podzolic soils.
b . Parent material : Old alluvium.
c . Drainge and water permeability : Moderately well drained. Permeability is moderately low.
d . Moisture condition in profile : Top 45 cm of profile dry, semi-dry below.

III Profile description.

A_p 0-15 cm Dull yellow orange (10YR7/3) dry, dull yellow orange (10YR6/4) moist; sandy loam; moderate, fine and medium subangular blocky structure; common, fine pores; compact (22 mm); non plastic, non sticky; very hard when dry, common roots; dry; faint 2,2' - dipyridyl reaction; clear, smooth boundary to

B_{21} 15-45 cm Bright yellowish brown (10YR7/6) dry, yellow orange (10YR7/8) moist; sandy clay loam; moderate, medium subangular blocky structure; common, fine and very fine pores; very hard when dry; extremely compact (31 mm); non plastic, slightly sticky; few roots; dry; faint 2,2' - dipyridyl reaction; gradual, smooth boundary to

B_{22} 45-74 cm Bright yellowish brown (10YR7/6) dry, bright yellowish brown (10YR6/8) moist; light clay; moderate, medium subangular blocky structure; few, fine and very fine pores; very hard when dry; extremely compact (31 mm); slightly plastic, slightly sticky; few roots; semi-dry; clear, smooth boundary to

C 74-90 cm Rounded and subrounded iron-manganese nodule layer (size of nodule is about 1 cm).

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases (%) at pF1-5 Solid	Liquid	Air	Particle size (%) Sand	Silt	Clay
A_p	0-15	2.2	3.2	1.44	55.5	33.2	11.3	66.0	22.6	11.4
B_{21}	15-45	6.5	9.6	1.48	56.9	33.6	9.5	61.6	18.7	19.7
B_{22}	45-74	11.5	—	—	—	—	—	55.4	14.8	29.8
C	74-90+	—	—	—	—	—	—	—	—	—

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%) pF1.0	pF1.5	pF3.0	pF4.0
A_p	SL	22	1.9×10^{-3}	39.8	36.4	33.2	17.0	7.1
B_{21}	SCL	31	2.8×10^{-4}	38.0	36.0	33.6	18.0	11.6
B_{22}	LiC	—	—	—	—	—	—	—
C	—	—	—	—	—	—	—	—

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Easily available water	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_p	116.5	78.9	4.9	3.5	0.45	0.036	12.5	0.78	1.84
B_{21}			4.9	3.0	0.27	0.022	12.3	0.47	3.60
B_{22}			5.0	2.9	0.12	0.020	6.0	0.21	1.84
C			—	—	—	—	—	—	—

Horizon	Exchangeable bases Ca	Mg	Na	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	Available (ppm)	Total K_2O (%)
A_p	0.30	0.13	0.14	0.08	35.2	0.011	7.9	0.057
B_{21}	0.25	0.08	0.18	0.08	16.3	0.011	2.9	0.099
B_{22}	0.10	0.08	0.10	0.08	14.9	0.109	2.6	0.163
C	—	—	—	—	—	—	—	—

Horizon	Extractable S	Fe	Cu	Zn (ppm)	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_p	7.00	5.28	0.16	10	3.6	10	29
B_{21}	6.00	4.60	0.20	3	1.2	3	23
B_{22}	6.50	0.92	0.20	1	0.8	1	17
C	—	—	—	—	—	—	—

Profile No. 94

I Information on the site.

a . Date of examination : 20 April 1974.
b . Location : Kohong Rubber Research Center, Hat Yai.
c . Land form :
  i . Physiographic position : Middle terrace.
  ii . Surrounding land form : Flat to gently undulating.
d . Land use : Rubber cultivation.

II General information on the soil.

a . Soil classification : Gray Podzolic soils.
b . Parent material : Old alluvium.
c . Drainage and water permeability : Moderately well drained. Permeability is low.
d . Moisture condition in profile : Semi-dry throughout the profile.

III Profile description.

A_1 0-22 cm Dull yellowish brown (10YR4/3) sandy loam; weak, medium and fine subangular blocky structure; few, fine pores; compact (22 mm); non plastic, non sticky; common roots; semi-dry; faint 2,2' - dipyridyl reaction; clear, wavy boundary to

B_{21} 22-75 cm Dull yellow orange (10YR7/4) dry, dull yellow orange (10YR6/4) moist; sandy clay loam; moderate, medium subangular blocky structure; friable moist; few fine and very fine pores; very hard when dry; extremely compact (30 mm); slightly plastic, sticky; few roots; dry; faint 2,2' - dipyridyl reation; gradual, smooth boundary to

B_{22} 75-115 cm + Bright yellowish brown (10YR7/6) sandy clay loam; common; distinct bright brown (7.5YR5/8) spotty iron mottles; weak, medium subangular blocky structure, friable moist; common fine and very fine pores; slightly plastic, sticky; compact (22 mm); few roots; semi-dry.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases(%) at pF1-5 Solid	Liquid	Air	Particle size(%) Sand	Silt	Clay
A_1	0-22	9.1	14.1	1.55	59.7	30.4	9.9	72.3	18.6	9.1
B_{21}	22-75	6.2	10.4	1.68	64.5	27.3	8.2	75.6	7.6	16.8
B_{22}	75-115+	7.4	115	1.56	59.9	29.9	10.2	68.3	12.8	18.9

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content(%) pF1.0	pF1.5	pF3.0	pF4.0
A_1	SL	22	7.1×10^{-4}	33.5	31.7	30.4	24.6	5.4
B_{21}	SCL	30	5.0×10^{-5}	30.5	28.1	27.3	16.0	9.4
B_{22}	SCL	22	5.7×10^{-4}	33.2	32.1	29.9	16.6	10.0

Horizon	Storage Capacity(mm) of Available water (of 50 cm deep soil)	Easily available water	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_1	105.1	44.4	4.9	3.5	0.61	0.049	12.5	1.05	1.04
B_{21}			4.7	3.3	0.12	0.016	7.5	0.21	1.44
B_{22}			4.9	3.1	0.21	0.012	17.5	0.36	2.56

Horizon	Exchangeable bases Ca	Mg	Na	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	Available (ppm)	Total K_2O (%)
A_1	0.40	0.16	0.36	0.079	95.2	0.044	45.6	0.060
B_{21}	0.10	0.01	0.32	0.079	35.2	0.033	8.3	0.106
B_{22}	0.10	0.02	0.02	0.079	8.5	0.033	3.7	0.114

Horizon	Extractable S	Fe	Cu	Zn (ppm)	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_1	5.75	20.20	0.12	2.0	2.4	12	55
B_{21}	14.00	9.40	0.12	1.4	0.8	4	22
B_{22}	12.25	2.24	0.12	4.6	0.8	7	26

Profile No. 99

I. Information on the site.

a. Date of examination: 21 April 1974.
b. Location: Sai Buri Rubber Exp. St., Pattani.
c. Land form:
   i. Physiographic position: Terrace.
   ii. Surrounding land form: Flat to gently undulating.
d. Land use : Rubber cultivation.

II. General information on the soil.

a. Soil classification : Gray Podzolic soils.
b. Parent material : Old alluvium.
c. Drainage and water permeability : Well drained.
   Permeability is moderate to high.
d. Moisture condition in profile : Semi-dry throughout the profile.

III. Profile description.

A_1 0-20 cm Dull yellowish brown (10 YR 4/3) sandy loam; single grain and moderate, medium subangular blocky structure; common, fine and very fine pores; compact (23 mm); non plastic, non sticky; common roots; semi-dry; faint 2,2'-dipyridyl reaction; gradual smooth boundary to

B_{21} 20-43 cm Dull yellowish brown (10 YR 5/4) sandy clay loam; weak, medium subangular blocky structure, friable moist; few, fine and very fine pores; compact (23 mm); non sticky; few roots; semi-dry; faint 2,2'-dipyridyl reaction, gradual; smooth boundary to

B_{22} 43-76cm + Bright yellowish brown (10 YR 6/6) sandy clay; moderate, medium subangular blocky structure, friable moist; few, fine and very fine pores; compact (25 mm); non plastic, slightly sticky; few roots; semi-dry; faint 2,2'-dipyridyl reaction.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density (g/cm³)	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)		Solid	Liquid	Air	Sand	Silt	Clay
A_1	0-20	5.6	8.6	1.53	58.7	23.9	17.4	78.8	8.5	12.7
B_{21}	20-43	8.2	11.8	1.44	55.2	22.0	22.8	75.2	8.7	16.1
B_{22}	43-76+	8.2	11.7	1.43	55.1	23.7	21.2	67.7	2.5	29.8

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_1	SL	23	9.8×10^{-3}	35.7	28.4	23.9	17.5	6.7
B_{21}	SCL	23	1.6×10^{-3}	37.4	30.3	22.0	14.4	11.0
B_{22}	SC	25	1.5×10^{-2}	40.4	31.8	23.7	15.3	11.8

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_1	68.0	36.2	4.5	3.3	0.91	0.06	15.2	1.57	1.92
B_{21}			4.3	3.3	0.39	0.04	9.8	0.67	2.40
B_{22}			4.3	3.6	0.36	0.03	12.0	0.62	1.84

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_1	0.30	0.13	0.73	0.68	95.6	0.171	443.3	0.214
B_{21}	0.15	0.08	0.89	0.32	59.8	0.039	15.1	0.274
B_{22}	0.10	0.06	1.00	0.32	80.3	0.27	11.0	0.334

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_1	1.25	9.00	0.08	1.2	0.8	3	66
B_{21}	20.50	15.00	0.08	0.4	0.8	5	70
B_{22}	30.25	8.32	0.08	1.8	0.8	5	49

Profile No. 102

I. Information on the site.

a. Date of examination : 22 April 1974.
b. Location : Khok Pri Meng Rubber Exp. St., Sungai Padi.
c. Land form:
   i. Physiographic position : Low terrace.
   ii. Surrounding land form : Flat to gently undulating.
d. Land use : Rubber cultivation.

II. General information on the soil.

a. Soil classification : Gray Podzolic soils.
b. Parent material : Old alluvial sediment.
c. Drainage and water permeability : Well drained.
Permeability is high to moderately high.
d. Moisture condition in profile : Top 57 cm of profile moist, wet below. Depth of ground water table was 82 cm from the surface on the date of examination.

III. Profile description.

A_1 0-25 cm Dark brown (10YR3/3) sandy loam; moderate fine granular and fine subangular blocky structure; few fine pores; slightly compact (16 mm); non plastic, non sticky; common roots; moist; gradual, smooth boundary to

AB 25-57 cm Dark brown (10YR3/4) sandy loam; weak, medium subangular blocky structure, friable; few, fine pores; compact (20 mm); non plastic, non sticky; few roots; moist; clear, smooth boundary to

B_2 57-100 cm+ Light gray (10YR7/1) sandy clay loam; weak, medium subangular blocky structure, friable; few, fine pores; compact (20 mm); non plastic, slightly sticky; few roots; wet; faint 2,2'-dipyridyl reaction.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)	(g/cm³)	Solid	Liquid	Air	Sand	Silt	Clay
A_1	0-25	21.3	27.9	1.31	50.2	29.9	19.9	83.9	6.3	9.8
AB	25-57	17.4	24.9	1.43	54.9	29.4	15.7	81.8	5.2	13.0
B_2	57-100+	15.6	25.6	1.64	63.1	28.7	8.2	77.8	4.2	18.0

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_1	SL	16	9.1×10^{-3}	41.0	39.2	29.9	24.3	14.0
AB	SL	20	5.5×10^{-3}	38.0	35.2	29.4	26.2	14.5
B_2	SCL	20	8.8×10^{-4}	30.6	29.0	28.7	17.5	17.5

Horizon	Storage Capacity (mm) of (of 50 cm deep soil)		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water	Easily available water	H_2O	KCl					
A_1	77.0	22.0	4.3	3.7	1.67	0.112	14.9	2.88	1.84
AB			4.5	3.5	0.83	0.083	10.0	1.43	1.84
B_2			4.6	3.5	0.45	0.034	13.2	0.78	0.64

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_1	0.15	0.08	0.73	0.08	56.5	0.022	32.0	0.024
AB	0.10	0.06	0.36	0.08	32.9	0.018	28.5	0.024
B_2	0.10	0.02	0.32	0.08	80.9	0.024	12.9	0.045

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_1	4.25	4.60	0.04	0.8	0.4	6	62
AB	2.00	3.00	0.04	0.6	0.4	4	37
B_2	2.25	2.40	0.04	0.2	0.4	9	34

Profile No. 103

I. Information on the site.

a. Date of exmination : 22 April 1974.
b. Location : Bacho Rubber Exp. St. , Narathiwat.
c. Land form :
   i . Physiographic position : Low terrace.
   ii . Surrounding land form : Flat to gently undulating.
d. Land use : Rubber cultivation.

II. General information on the soil.

a. Soil classification : Gray Podzolic soils.
b. Parent material : Old alluvial sediment.
c. Drainage and water permeability : Well drained.
   Permeability is moderately high.
d. Moisture condition in profile : Top 15 cm of profile semi-dry, moist below.

III. Profile description.

A_p 0-15 cm Brownish black (10YR3/2) sandy clay loam; weak, fine granular and moderate, medium subangular blocky strutucture; slightly compact (17 mm); non plastic, non sticky; common roots; semi-dry; clear, smooth boundary to

B_{21} 15-55 cm Dull yellow orange (10YR7/2) light clay; weak; medium subangular blocky structure, friable moist; common, fine and very fine pores; compact (20 mm); plastic, slightly sticky; few roots; moist; gradual, smooth boundary to

B_{22} 55-94 cm + Dull yellow orange (10YR7/2) heavy clay; common, distinct bright brown (7.5YR5/8) spotty iron mottles; weak, medium subangular blocky structure, friable moist; few fine and very fine pores; compact (19 mm); slightly plastic, slightly sticky; few roots; moist.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)	(g/cm³)	Solid	Liquid	Air	Sand	Silt	Clay
A_P	0-15	13.4	21.0	1.57	60.2	26.4	13.4	63.4	14.4	22.2
B_{21}	15-55	13.0	21.7	1.67	64.3	24.9	10.8	53.7	12.3	34.0
B_{22}	55-94+	16.3	26.2	1.61	61.9	27.3	10.8	39.4	14.4	46.2

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_p	SCL	17	6.1×10^{-3}	34.6	30.1	26.4	19.3	9.1
B_{21}	LiC	20	2.4×10^{-3}	30.6	27.3	24.9	16.7	14.3
B_{22}	HC	19	3.4×10^{-3}	33.1	29.4	27.3	21.3	17.4

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_p	63.1	39.4	4.4	3.5	1.87	0.096	19.5	3.22	3.20
B_{21}			4.6	3.4	0.74	0.036	20.6	1.28	3.04
B_{22}			4.6	3.4	0.61	0.032	19.1	1.05	4.56

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_p	0.55	0.16	0.46	0.18	42.0	0.033	73.3	0.401
B^{21}	0.15	0.06	1.14	0.32	54.7	0.022	17.1	0.705
B_{22}	0.15	0.08	0.46	0.32	22.0	0.024	10.3	0.928

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_p	1.25	6.20	0.04	1.8	0.8	9	64
B_{21}	5.50	9.20	0.04	1.2	0.4	6	18
B_{22}	0.75	4.68	0.04	Tr	0.8	9	25

Profile No. 104

I. Information on the site.

a. Date of exmination : 23 April 1974.
b. Location : Bacho Rubber Exp. St. Narathiwat.
c. Land form :
   i . Physiographic position : Low terrace.
   ii . Surrounding land form : Flat to gently undulating.
d. Land use : Rubber cultivation.

II. General information on the soil.

a. Soil classification : Gray Podzolic soils.
b. Parent material : Old alluvial sediment.
c. Drainage : Well drained.
d. Moisture condition in profile : Top 18 cm of profile semi-dry, moist below.

III. Profile description.

A_p 0-18 cm Brownish black (10YR3/2) clay loam; weak, fine granular and moderate, medium subangular blocky structure; non plastic, non sticky; common roots; semi-dry; clear, smooth boundary to

B_{21} 18-42 cm Dull yellow orange (10YR7/2) light clay; weak, medium subangular blocky structure, friable moist; common, fine and very fine pores; slightly plastic, sticky; few roots; moist; gradual, smooth boundary to

B_{22} 42-98 cm + Dull yellow orange (10YR7/2) light clay; common distinct bright brown (7.5YR5/8) spotty iron mottles; weak, medium subangular blocky structure, friable moist; few fine and very fine pores; slightly plastic, slightly sticky, few roots; moist.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)	(g/cm³)	Solid	Liquid	Air	Sand	Silt	Clay
A_p	0-18	—	—	—	—	—	—	—	—	—
B_{21}	28-42	—	—	—	—	—	—	—	—	—
B_{22}	42-98+	—	—	—	—	—	—	—	—	—

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_p	—	—	—	—	—	—	—	—
B_{21}	—	—	—	—	—	—	—	—
B_{22}	—	—	—	—	—	—	—	—

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_p	—	—	4.7	3.4	1.58	0.09	17.6	2.72	2.96
B_{21}			4.4	3.4	1.02	0.05	20.0	1.76	3.68
B_{22}			4.4	4.3	0.97	0.05	19.4	1.67	4.00

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_p	0.45	0.08	1.27	0.32	71.7	0.045	180.8	0.461
B_{21}	0.15	0.06	0.73	0.32	34.1	0.022	17.6	0.669
B_{22}	0.15	0.06	0.27	0.32	20.0	0.024	17.6	0.837

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_p	14.25	18.40	0.08	1.0	0.8	7	34
B_{21}	13.00	13.60	0.08	0.8	1.2	3	44
B_{22}	1.25	12.32	0.04	1.0	0.8	10	46

Profile No. 117

I. **Information on the site.**

a. Date of examination : 14 July 1974.
b. Location : Maha Sarakham Agricultural Experiment Station.
c. Land form :
   i . Physiographic position : Old alluvial terrace.
   ii . Surrounding land form : Flat to gently undulating.
d. Land use : Peanut cultivation.

II. **General information on the soil.**

a. Soil classification : Gray Podzolic soils.
b. Parent material : Old alluvium.
c. Drainage and water permeability : Moderately well drained. Permeability is low.
d. Moisture condition : Semi-dry throughout the profile.

III. **Profile description.**

A_p 0-18 cm Brownish black (7.5YR3/2) sandy loam, single grain and weak, fine granular friable; loose (4 mm); non plastic, non sticky; common roots; dry; gradual smooth boundary to

A_{12} 18-35 cm Brownish black (7.5YR3/2) sandy loam, weak medium subangular blocky; few, fine pores; very compact (25 mm); non plastic, non sticky; few roots; semi-dry; clear smooth boundary to

B_{21} 35-57 cm Dark brown (7.5YR3/4) sandy loam, weak, medium subangular blocky; friable, few fine pores; compact (19 cm); non plastic, non sticky; few roots semi-dry; gradual smooth boundary to

B_{22} 57-93 cm + Reddish brown (5YR4/6) sandy clay loam; weak medium subangular blocky; few fine pores; compact (20 mm), non plastic, non sticky; semi-dry.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases (%) at pF1-5 Solid	Liquid	Air	Particle size (%) Sand	Silt	Clay
A_p	0-18	7.3	8.8	1.21	46.6	24.9	28.5	82.2	11.2	6.6
A_{12}	18-35	7.9	13.0	1.64	63.2	28.3	8.5	78.1	13.2	8.7
B_{21}	35-59	9.5	16.0	1.68	64.7	25.7	9.6	72.2	14.4	13.3
B_{22}	59-93+	9.2	13.9	1.51	58.2	28.5	13.3	70.1	14.4	15.5

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%) pF1.0	pF1.5	pF3.0	pF4.0
A_p	SL	4	2.7×20^{-3}	45.6	29.4	24.9	10.4	2.6
A_{12}	SL	25	1.6×10^{-4}	30.7	29.2	28.3	18.8	5.6
B_{21}	SL	19	5.0×10^{-5}	28.2	26.5	25.7	12.1	6.8
B_{22}	SCL	20	3.4×10^{-4}	34.9	31.6	28.5	10.7	6.4

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Easily available water	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_p	107.1	62.7	5.7	4.8	0.53	0.035	15.1	0.91	1.60
A_{12}			5.3	4.5	0.53	0.035	15.1	0.91	1.76
B_{21}			4.7	3.7	0.46	0.026	17.7	0.79	2.40
B_{22}			4.6	3.7	0.28	0.027	10.4	0.48	2.72

Horizon	Exchangeable bases Ca	Mg	Na	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	Available (ppm)	Total K_2O (%)
A_p	1.00	0.12	0.32	0.11	96.3	0.040	39.1	0.039
A_{12}	0.95	0.17	0.73	0.05	107.8	0.040	12.2	0.045
B_{21}	0.90	0.33	0.73	0.11	85.7	0.040	10.3	.0063
B_{22}	0.50	0.18	0.45	0.05	43.6	.0040	11.0	0.069

Horizon	Extractable S	Fe	Cu	Zn (ppm)	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_p	2.25	3.20	0.80	1.2	10.0	100	5.0
A_{12}	2.00	3.40	0.80	1.6	7.6	80	34
B_{21}	6.50	5.36	0.60	1.0	4.4	60	45
B_{22}	5.25	5.04	0.80	0.8	5.6	60	63

Profile No. 118

I. Information on the site.

a. Date of examination : 14 July 1974.
b. Location : Maha Sarakham Agricultural Experiment Station.
c. Land form :
   i . Physiographic position : Old alluvial terrace.
   ii . Surrounding land form : Gently undulating.
d. Land use : Upland crop cultivation.

II. General information on the soil.

a. Soil classification : Gray Podzolic soils.
b. Parent material : Old alluvium.
c. Drainage and water permeability : Moderately well drained. Permeability is moderate.
d. Moisture condition in profile : Dry throughout the profile.

III. Profile description.

A_p 0-16 cm Brownish black (7.5YR3/2) loamy sand, single grain and weak fine granular; friable; loose (3 mm); non plastic, non sticky; common roots; dry; very positive benzidine reaction; gradual smooth boundary to

A_{12} 16-27 cm Grayish brown (7.5YR4/2) sandy loam, moderate, medium subangular blocky; friable moist; common, fine and very very fine pores; compact (25 mm); dry; few roots; positive benzidine reaction; gradual smooth boundary to

B_2 27-68 cm + Dull orange (7.5YR6/4) sandy loam, moderate, medium subangular blocky; common fine and very fine pores; extremely compact (31 mm); dry; few roots; faint positive benzidine reaction.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases (%) at pF1-5 Solid	Liquid	Air	Particle size (%) Sand	Silt	Clay
A_p	0-16	2.4	3.3	1.36	52.5	27.9	19.6	85.7	8.4	5.9
A_{12}	16-27	2.6	4.0	1.53	58.7	27.8	13.5	84.5	8.5	7.0
B_2	27-68+	2.1	3.2	1.52	58.4	28.5	13.1	83.5	8.4	8.1

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%) pF1.0	pF1.5	pF3.0	pF4.0
A_p	LS	3	4.7×10^{-3}	39.2	32.4	27.9	17.2	2.3
A_{12}	SL	25	3.4×10^{-3}	34.8	31.8	27.8	16.7	3.0
B_2	SL	31	2.6×10^{-3}	38.5	31.7	28.5	9.4	3.8

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Easily available water	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_p	122.6	73.3	5.5	4.8	0.35	0.025	14.0	0.60	1.12
A_{12}			6.0	5.0	0.35	0.015	23.0	0.60	2.08
B_2			5.2	3.8	0.17	0.009	18.9	0.29	1.12

Horizon	Exchangeable bases Ca	Mg	Na	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	Available (ppm)	Total K_2O (%)
A_p	1.35	0.14	0.50	0.16	191.4	0.040	41.0	0.057
A_{12}	1.50	0.13	0.18	0.11	91.9	0.040	42.6	0.045
B_2	0.35	0.05	0.05	0.05	44.9	0.044	27.2	0.057

Horizon	Extractable S	Fe	Cu	Zn (ppm)	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_p	1.50	3.04	0.40	1.4	27.2	160	51
A_{12}	0.50	2.88	0.40	0.8	6.8	120	21
B_2	2.00	5.40	0.60	0.8	8.8	100	18

Profile No. 119

I. Information on the site.

a. Date of exmination : 14 July 1974.
b. Location : Roi Et Agricultural Experiment Station.
c. Land form :
  i . Physiographic position : High terrace.
  ii . Surrounding land form : Flat to gently undulating.
d. Land use : Peanut and leguminous crops cultivation.

II. General information on the soil.

a. Soil classification : Gray Podzolic soils.
b. Parent material : Old alluvium.
c. Drainage and water permeability : Imperfectly drained. Permeability is low.
d. Moisture condition in profile : Top 28 cm of profile dry, semi-dry below.

III. Profile description.

A_p 0-20 cm Grayish yellow brown (10YR5/2) loamy sand, single grain and weak, medium subangular blocky; few very fine pores; slightly compact (15 mm); non plastic; non sticky; common roots; dry; gradual smooth boundary to

A_{12} 20-28 cm Grayish yellow brown (10YR5/2) sandy loam; common distinct, black (7.5-YR2/1) tubular manganese mottles and few faint brown (7.5YR4/6) iron mottles; weak, medium subangular blocky, friable; few very fine pores, compact (22 mm); non plastic, non sticky; few roots; dry; very positive benzidine reaction; gradual smooth boundary to

B_{21} 28-53 cm Orange (7.5YR6/6) sandy loam; distinct black (7.5YR2/1) manganese concretions; weak, medium subangular blocky; friable; few, very fine pores; compact (22 mm); non plastic; non sticky; semi-dry; very positive benzidine reaction; gradual smooth boundary to

B_{22} 53-80 cm + Dull brown (7.5YR5/6) spotty iron mottles and common, black (7.5YR2/1) manganese concretions; weak, medium subangular blocky, friable; few very fine pores; slightly compact (18 mm); semi-dry; faint benzidine reaction; faint 2,2′-dipyridyl reaction.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)	(g/cm³)	Solid	Liquid	Air	Sand	Silt	Clay
A_p	0-20	7.8	9.5	1.22	46.9	24.2	28.9	80.3	13.6	6.1
A_{12}	20-28	8.9	14.2	1.59	61.3	28.1	10.6	83.3	9.5	7.2
B_{21}	28-53	10.7	18.1	1.69	65.1	28.6	6.3	81.5	10.5	8.0
B_{22}	53-80+	13.6	21.5	1.58	60.8	30.2	9.0	81.6	9.4	9.0

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_p	LS	15	1.5×10^{-3}	38.5	27.2	24.2	12.1	3.5
A_{12}	SL	24	1.3×10^{-4}	33.0	29.4	28.1	12.6	7.6
B_{21}	SL	22	1.3×10^{-4}	30.5	29.6	28.6	10.8	6.5
B_{22}	SL	18	2.7×10^{-4}	36.7	31.8	30.2	10.4	6.1

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_p	106.4	75.8	4.6	3.6	0.24	.0018	13.3	0.41	0.72
A_{12}			4.6	3.7	0.24	0.016	15.0	0.41	0.80
B_{21}			4.6	3.8	0.14	0.018	7.8	0.24	0.64
B_{22}			5.7	3.7	0.10	0.017	5.9	0.17	1.36

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_p	0.20	0.03	0.05	0.05	107.9	0.040	114.1	0.024
A_{12}	0.20	0.03	0.18	0.05	57.5	0.032	51.6	0.024
B_{21}	0.25	0.03	0.50	0.05	129.5	0.026	7.5	0.024
B_{22}	0.35	0.05	0.81	0.05	47.0	0.015	4.4	0.045

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_p	2.50	2.30	0.60	0.8	4.8	60	28
A_{12}	3.75	17.08	1.20	1.0	14.8	80	30
B_{21}	10.50	5.20	1.00	1.0	24.8	160	36
B_{22}	12.00	4.40	0.80	0.8	4.8	40	43

Profile No. 120

I. Information on the site.

a. Date of examination : 14 July 1974.
b. Location : Roi Et Agricultural Experiment Station.
c. Land form:
  i. Physiographic position : High terrace.
  ii. Surrounding land form : Flat to gently undulating.
d. Land use : Fallow and sun hemp as green manure.

II. General information on the soil.

a. Soil classification : Gray Podzolic soils.
b. Parent material : Old alluvium.
c. Drainage and water permeability : Moderately well drained. Permeability is low.
d. Moisture condition in profile : Top 13 cm of profile dry, semi-dry below.

III. Profile description.

A_p 0-13 cm Grayish yellow brown (10YR 5/2) sandy loam; single grain and weak, medium subangular blocky; common fine and very fine pores; slightly compact(18mm); common roots; dry; gradual smooth boundary to

A_{12} 13-25 cm Grayish yellow brown (10YR 5/2) sandy loam; moderate, medium subangular blocky; common fine and very fine pores; extremely compact (34 mm); common roots; dry; gradual smooth boundary to

B_{21} 25-38 cm Dull brown (7.5YR 5/3) sandy loam; many distinct dark reddish brown (5YR 3/2) spotty manganese mottles; moderate, medium subangular blocky; common fine and very fine pores; extremely compact (30 mm); semi-dry; positive benzidine reaction; faint 2,2'-dipyridyl reaction; gradual smooth boundary to

B_{22} 38-85 cm + Dull brown (7.5YR 5/4) sandy loam; common bright brown (7.5YR 5/6) iron mottles; moderate, medium subangular blocky; common, fine and very fine pores; slightly compact (15 mm); semi-dry.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases (%) at pF1-5 Solid	Liquid	Air	Particle size (%) Sand	Silt	Clay
A_p	0-13	5.5	7.8	1.42	54.5	30.0	15.5	83.7	11.3	5.0
A_{12}	13-25	3.6	5.6	1.55	59.6	28.9	11.5	84.3	9.6	6.1
B_{21}	25-35	8.1	13.6	1.68	64.6	26.7	8.7	81.4	8.6	10.0
B_{22}	35-85	6.2	9.8	1.58	60.7	32.2	7.1	84.6	7.3	8.1

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%) pF1.0	pF1.5	pF3.0	pF4.0
A_p	SL	18	1.1×10^{-3}	43.6	32.7	30.0	12.1	2.8
A_{12}	SL	34	5.3×10^{-4}	37.1	30.8	28.9	12.3	4.8
B_{21}	SL	30	2.6×10^{-4}	29.0	27.5	26.7	12.9	6.3
B_{22}	SL	15	2.7×10^{-4}	36.6	33.6	32.2	12.2	6.4

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Storage Capacity (mm) of Easily available water (of 50 cm deep soil)	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_p	115.3	77.7	5.0	3.7	0.28	0.017	16.5	0.48	0.96
A_{12}			4.8	3.7	0.24	0.016	15.0	0.41	0.96
B_{21}			4.3	3.7	0.10	0.015	6.8	0.17	1.04
B_{22}			4.6	3.7	0.24	0.013	18.5	0.41	0.88

Horizon	Exchangeable bases Ca	Mg	Na	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	Available (ppm)	Total K_2O (%)
A_p	0.25	0.04	0.18	0.04	54.0	0.055	210.6	0.018
A_{12}	0.25	0.04	0.95	0.04	134.4	0.051	197.5	0.018
B_{21}	0.25	0.04	0.03	0.04	35.2	0.033	14.7	0.030
B_{22}	0.40	0.03	0.01	0.04	53.3	0.033	37.7	0.030

Horizon	Extractable S	Fe	Cu	Zn (ppm)	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_p	0.75	12.72	0.40	1.2	2.4	40	19
A_{12}	0.50	21.88	0.80	0.8	2.2	40	19
B_{21}	8.75	10.00	0.40	1.4	7.2	40	49
B_{22}	9.75	11.68	0.60	0.6	7.6	60	30

Profile No. 121

I. Information on the site.

a. Date of examination : 15 July 1974.

b. Location : Ubon Ratchathani Agricultural Experiment Station.

c. Land form :

i. Physiographic position : Old alluvium on middle terrace.

ii. Surrounding land form : Gently undulating.

d. Land use : Corn cultivation.

II. General information on the soil.

a. Soil classification : Gray Podzolic soils.

b. Parent material : Old alluvium.

c. Drainage and water permeability : Moderately well drained. Permeability is moderate.

d. Moisture condition in profile : Semi-dry throughout the profile.

III. Profile description.

A_p 0-25 cm Brown (7.5YR 4/4) sandy loam; single grain and weak, medium subangular blocky, friable; common, fine and very fine pores; slightly compact (15 mm); common roots; semi-dry; gradual smooth boundary to

A_{12} 25-40 cm Dull brown (7.5YR 5/4) sandy loam; weak, medium subangular blocky, friable; common, fine and very fine pores; slightly compact (18 mm); few roots; semi-dry; faint dipyridyl reaction; gradual smooth boundary to

B_{21} 40-55 cm Bright reddish brown (5YR 5/6) sandy loam; moderate, medium subangular blocky; common, fine and very fine pores; few fine and small animal holes; compact (22 mm); semi-dry; clear smooth boundary to

B_{22} 55-87 cm + Bright reddish brown (5YR 5/8) sandy loam; weak, medium subangular blocky; few fine and very fine pores; few small animal holes; slightly compact (16 mm); semi-dry.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases (%) at pF1-5 Solid	Liquid	Air	Particle size (%) Sand	Silt	Clay
A_p	0-25	9.9	14.0	1.41	54.2	26.4	19.4	82.4	12.5	5.1
A_{12}	25-40	12.1	19.4	1.60	61.6	29.2	9.2	80.3	11.4	8.3
B_{21}	40-55	12.7	20.3	1.60	61.7	25.6	12.7	71.4	16.5	12.1
B_{22}	55-87+	12.5	19.3	1.54	59.3	28.0	12.7	74.5	12.5	12.0

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%) pF1.0	pF1.5	pF3.0	pF4.0
A_p	SL	15	1.2×10^{-3}	41.8	30.4	26.4	13.1	3.1
A_{12}	SL	18	5.6×10^{-4}	34.0	30.8	29.2	11.1	5.5
B_{21}	SL	22	4.8×10^{-4}	31.3	27.7	25.6	13.5	8.1
B_{22}	SL	16	2.1×10^{-3}	35.0	31.3	28.0	12.4	8.4

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Easily available water	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_p	111.3	72.5	4.2	3.4	0.39	0.023	17.0	0.67	0.64
A_{12}			4.1	3.5	0.35	0.027	13.0	0.60	1.28
B_{21}			4.1	3.5	0.28	0.021	13.3	0.48	0.64
B_{22}			4.1	3.7	0.28	0.015	18.7	0.48	0.96

Horizon	Exchangeable bases Ca (me/100g)	Mg	Na	K	Base saturation degree (%)	P_2O_5 Total (%)	Available (ppm)	Total K_2O (%)
A_p	0.40	0.04	0.09	0.092	96.9	0.042	79.0	0.030
A_{12}	0.20	0.04	0.09	0.074	31.8	0.033	30.7	0.045
B_{21}	0.25	0.04	0.09	0.082	71.9	0.033	9.0	0.078
B_{22}	0.20	0.06	0.10	0.082	42.7	0.031	5.3	0.078

Horizon	Extractable S (ppm)	Fe	Cu	Zn	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_p	1.25	8.68	0.40	1.0	1.6	40	37
A_{12}	8.75	11.24	0.80	0.8	3.6	40	58
B_{21}	22.75	8.40	0.80	1.2	4.0	40	85
B_{22}	16.75	5.40	0.80	1.2	3.6	60	64

Profile No. 122

I. Information on the site.

a. Date of examination : 15 July 1974.

b. Location : Ubon Ratchathani Agricultural Experiment Station.

c. Land form :

i. Physiographic position : Old alluvium on middle terrace.

ii. Surrounding land form : Flat to gently undulating.

d. Land use : Kenaf cultivation.

II. General information on the soil :

a. Soil classification : Gray Podzolic soils.

b. Parent material : Old alluvium.

c. Drainage and water permeability : Moderately well drained. Permeability is moderately low.

d. Moisture condition in profile : semi-dry throughout the profile.

III. Profile description.

A_p 0-18 cm Brown (7.5YR 4/6) sandy loam; single grain; weak, medium subangular blocky; common fine and very fine pores; slightly compact (11); common roots; semi-dry; gradual smooth boundary to

A_{12} 18-28 cm Brown (7.5YR 4/6) sandy loam; weak, fine subangular blocky; common fine and very fine pores; compact (20 mm); common roots; semi-dry; gradual smooth boundary to

B_{21} 28-40 cm Bright brown (7.5YR 5/6) sandy loam; weak, medium subangular blocky; common fine and very fine pores; compact (22 mm); semi-dry; faint 2,2'-dipyridyl reaction; gradual smooth boundary to

B_{22} 40-100 cm Bright brown (7.5YR 5/8) sandy loam; moderate, medium subangular blocky; common, fine and very fine pores; slightly compact (15 mm); semi-dry.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases(%) at pF1-5 Solid	Liquid	Air	Particle size(%) Sand	Silt	Clay
A_p	0-18	6.3	8.9	1.41	54.1	23.6	22.3	84.3	10.5	5.2
A_{12}	12-28	9.0	13.4	1.49	57.3	25.4	17.3	83.7	10.4	5.9
B_{21}	28-40	10.3	16.9	1.64	63.2	27.2	9.6	83.8	7.4	8.9
B_{22}	40-100+	11.4	19.0	1.67	64.3	26.6	9.1	75.8	14.4	9.8

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content(%) pF1.0	pF1.5	pF3.0	pF4.0
A_p	SL	11	2.5×10^{-4}	41.4	27.4	23.6	8.1	1.5
A_{12}	SL	20	3.1×10^{-4}	40.8	27.7	25.4	9.6	4.2
B_{21}	SL	22	4.0×10^{-4}	30.6	28.8	27.2	13.2	6.2
B_{22}	SL	15	8.3×10^{-4}	30.9	27.8	26.6	11.7	7.4

Horizon	Storage Capacity(mm) of Available water (of 50 cm deep soil)	Easily available water	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_p	107.2	74.5	4.5	3.4	0.21	0.012	17.5	0.36	0.64
A_{12}			4.5	3.5	0.21	0.010	21.0	0.36	0.88
B_{21}			4.5	3.6	0.28	0.015	18.7	0.48	1.04
B_{22}			4.5	3.7	0.14	0.010	14.0	0.24	1.20

Horizon	Exchangeable bases Ca	Mg	Na	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	Available (ppm)	Total K_2O (%)
A_p	0.40	0.03	0.06	0.01	80.2	0.040	54.4	0.030
A_{12}	0.25	0.03	0.07	0.01	40.1	0.040	47.2	0.030
B_{21}	0.40	0.03	0.07	0.01	47.6	0.031	12.7	0.039
B_{22}	0.25	0.04	0.16	0.01	38.8	0.037	6.1	0.063

Horizon	Extractable S	Fe	Cu	Zn (ppm)	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_p	1.25	7.28	0.60	1.0	1.2	60	18
A_{12}	1.25	7.80	0.40	1.2	1.6	60	20
B_{21}	1.25	8.72	0.20	0.6	4.8	40	29
B_{22}	5.50	6.08	0.40	0.6	1.6	40	32

Profile No. 123

I. Information on the site.

a. Date of examination : 15 July 1974.

b. Location : Agricultural Experiment Station, Mukdahan, Nakhon Phanom.

c. Land form :

i. Physiographic position : Old alluvial terrace.

ii. Surrounding land form : Flat to gently undulating.

d. Land use : Cassava cultivation.

II. General information on the soil.

a. Soil classification : Gray Podzolic soils.

b. Parent material : Old alluvium.

c. Drainage and water permeability : Moderately well drained. Permeability is low.

d. Moisture condition in profile : Top 45 cm of profile dry, semi-dry below.

III. Profile description.

A_p 0-15 cm Dull orange (7.5YR 6/4) sandy loam; weak, fine subangular blocky; common, fine and very fine pores; loose (8 mm); common roots; very positive benzidine reaction; gradual smooth boundary to

A_{12} 15-25 cm Dull brown (7.5YR 5/3) sandy loam; weak fine subangular blocky; common, fine and very fine pores; slightly compact (16 mm); dry; common roots; very positive benzidine reaction; positive 2,2'-dipyridyl reaction; gradual smooth boundary to

B_{21} 25-45 cm Dull yellow orange (10YR 6/4) sandy clay loam; moderate, medium subangular blocky; common, fine and very fine pores; compact (21 mm); dry; few roots; positive 2,2'-dipyridyl reaction; gradual wavy boundary to

B_{22} 45-85 cm + Bright yellowish brown (10YR 6/6) sandy clay loam; moderate, medium subangular blocky; common fine and very fine pores; compact (22 mm); semi-dry; few roots; positive 2,2'-dipyridyl reaction.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density (g/cm³)	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)		Solid	Liquid	Air	Sand	Silt	Clay
A_p	0-15	14.1	20.9	1.48	57.0	32.7	10.3	78.8	16.4	9.8
A_{12}	15-25	15.0	23.6	1.57	60.6	30.4	9.0	75.2	16.2	8.6
B_{21}	25-45	15.6	25.3	1.62	62.2	30.5	7.3	70.1	14.3	15.6
B_{22}	45-85+	15.1	23.9	1.58	60.7	32.2	7.1	66.4	14.1	19.5

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_p	SL	8	3.5×10^{-4}	37.7	34.1	32.7	18.8	7.2
A_{12}	SL	16	3.3×10^{-5}	33.8	31.1	30.4	24.5	9.0
B_{21}	SCL	21	3.8×10^{-6}	32.6	31.3	30.5	21.5	10.4
B_{22}	SCL	22	6.5×10^{-5}	34.2	32.9	32.2	20.1	10.7

Horizon	Storage Capacity (mm) of (of 50 cm deep soil)		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water	Easily available water	H_2O	KCl					
A_p	109.9	49.3	5.8	4.8	0.35	0.024	14.6	0.60	1.44
A_{12}			6.0	4.7	0.28	0.024	11.7	0.48	1.52
B_{21}			6.1	4.6	0.21	0.012	17.5	0.36	1.12
B_{22}			5.5	3.9	0.14	0.016	8.8	0.24	1.04

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_p	1.35	0.60	0.07	0.14	150.8	0.033	4.0	0.127
A_{12}	1.25	0.43	0.07	0.12	122.6	0.033	4.4	0.105
B_{21}	0.70	0.54	0.07	0.14	128.8	0.033	2.9	0.226
B_{22}	0.70	0.47	0.11	0.35	156.3	0.033	1.3	0.295

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_p	0.25	4.80	0.2	1.4	5.2	60	42
A_{12}	2.00	4.44	1.0	1.0	4.8	80	45
B_{21}	0.75	4.08	0.2	1.6	1.2	40	22
B_{22}	0.75	4.72	0.2	0.8	1.4	20	17

Profile No. 124

I. Information on the site.

a. Date of examination : 15 July 1974.

b. Location : Agricultural Experiment Station, Mukdahan, Nakhon Phanom.

c. Land form.

i. Physiographic position : Old alluvial terrace.

ii. Surrounding land form : Flat to gently undulating.

d. Land use : Sapota and tangerine cultivation.

II. General information on the soil.

a. Soil classification : Gray Podzolic soils.

b. Parent material : Old alluvium.

c. Drainage and water permeability : Moderately well drained. Permeability is low.

d. Moisture condition in profile : Semi-dry throughout the profile.

III. Profile description.

A_p 0-18 cm Dark brown (7.5YR 3/3) sandy loam; very fine subangular blocky; common fine and very fine pores; loose (10 mm); semi-dry; common roots; positive benzidine reaction; gradual smooth boundary to

A_{12} 18-32 cm Brownish black (7.4YR 3/2) sandy loam; moderate, medium subangular blocky; common, fine and very fine pores; compact (22 mm); semi-dry; few roots; positive benzidine reaction; gradual smooth boundary to

B_{21} 32-48 cm Reddish brown (5YR 4/6) sandy clay loam; moderate medium subangular blocky; common, fine and very fine pores, few ant holes; compact (22 mm); few roots; semi-dry; positive 2,2'-dipyridyl reaction; gradual smooth boundary to

B_{22} 48-100 cm + Bright reddish brown (5YR 5/8) silty clay loam; moderate, medium subangular blocky; common, fine and very fine pores, few ant holes; slightly compact (19 mm); few roots; semi-dry.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density (g/cm³)	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)		Solid	Liquid	Air	Sand	Silt	Clay
A_p	0-18	11.6	15.5	13.4	51.7	32.4	15.9	80.3	12.2	7.5
A_{12}	18-32	13.0	20.7	15.9	61.3	29.3	9.4	80.3	11.1	8.6
B_{21}	32-48	13.1	23.2	17.7	68.2	24.5	7.3	72.2	9.2	18.6
B_{22}	48-100+	17.0	25.5	15.0	57.5	30.3	12.2	67.3	10.2	22.5

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_p	SL	10	2.5×10^{-3}	43.7	36.6	32.4	14.4	4.9
A_{12}	SL	22	1.2×10^{-4}	31.3	30.1	29.3	17.0	6.3
B_{21}	SCL	22	Impermeable	25.4	24.8	24.5	18.5	13.7
B_{22}	SCL	19	8.4×10^{-4}	35.6	33.1	30.3	19.9	10.9

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_p	101.1	60.4	5.3	4.4	0.43	0.032	13.4	0.74	0.96
A_{12}			5.4	4.0	0.43	0.025	17.2	0.74	1.28
B_{21}			5.2	3.9	0.24	0.017	14.1	0.41	1.28
B_{22}			5.1	3.7	0.10	0.019	5.3	0.17	1.44

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_p	0.50	0.16	0.19	0.14	103.4	0.033	8.1	0.069
A_{12}	0.45	0.16	0.05	0.18	55.6	0.040	6.1	0.084
B_{21}	0.50	0.21	0.19	0.12	79.7	0.048	5.3	0.184
B_{22}	0.25	0.17	0.16	0.14	40.1	0.077	3.3	0.256

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_p	0.25	4.52	0.60	1.2	18.0	60	64
A_{12}	0.75	6.72	0.20	1.0	6.0	80	44
B_{21}	2.25	6.08	0.20	0.8	2.4	60	17
B_{22}	0.75	4.28	0.40	1.0	2.4	40	11

Profile No. 125

I. Information on the site.

a. Date of examination : 15 July 1974.
b. Location : Agricultural Experiment Station, Mukdahan, Nakhon Phanom.
c. Land form :
  i. Physiographic position : Old alluvial terrace.
  ii. Surrounding land form : Gently undulating (slope 3%).
d. Land use : Cotton cultivation.

II. General information on the soil.

a. Soil classification : Gray Podzolic soils.
b. Parent material : Old alluvium.
c. Drainage and water permeability : Moderately well drained. Permeability is very low.
d. Moisture condition in profile : Semi-dry from the top to 45 cm., moist below.

III. Profile description.

A_p 0-15 cm Brownish black (10YR 2/3) sandy loam; weak fine subangular blocky; friable; common fine and very fine pores; slightly compact (13 mm); common roots; semi-dry; positive benzidine reaction; gradual smooth boundary to

A_{12} 15-24 cm Dark brown (10YR 3/3) sandy loam; weak, medium subangular blocky; common, fine and very fine pores; very compact (25 mm); common roots; semi-dry; positive benzidine reaction; clear smooth boundary to

B_{21} 24-45 cm Bright brown (7.5YR 5/6) sandy clay loam; moderate medium subangular blocky; common, fine and very fine pores; few fine animal holes; very compact (26 mm); semi-dry; faint positive 2,2′-dipyridyl reaction, clear smooth boundary to

B_{22} 45-95 cm + Bright reddish brown (5YR 5/9) sandy clay; moderate medium subangular blocky; common fine and very fine pores; few, medium pores compact (22 mm); moist.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density (g/cm³)	Three Phases (%) at pF1-5			Particle siz (%)		
		(W%)	(V%)		Solid	Liquid	Air	Sand	Silt	Clay
A_p	0-15	11.7	17.3	1.48	56.8	32.5	10.7	81.3	11.2	7.5
A_{12}	15-24	12.7	20.3	1.60	61.6	29.5	8.9	76.4	13.1	10.5
B_{21}	24-45	13.2	23.0	1.74	67.1	25.3	7.6	71.1	11.3	17.6
B_{22}	45-95+	16.1	27.4	1.70	65.3	30.0	4.7	67.1	9.3	23.6

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_p	SL	13	1.1×10^{-3}	38.0	34.8	32.5	19.4	6.0
A_{12}	SL	25	7.1×10^{-5}	33.0	30.8	29.5	19.1	6.8
B^{21}	SCL	26	1.1×10^{-5}	27.1	25.9	25.3	19.3	13.0
B_{22}	SC	22	1.6×10^{-5}	31.6	30.5	30.0	22.2	16.7

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_p	92.7	45.5	5.6	4.7	0.57	0.029	19.7	0.98	1.68
A_{12}			5.8	4.7	0.57	0.030	19.0	0.98	1.60
B_{21}			5.7	4.4	0.28	0.020	14.0	0.48	1.52
B_{22}			5.1	3.7	0.10	0.022	4.5	0.17	1.76

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_p	2.65	0.45	0.09	0.14	197.6	0.044	12.3	0.063
A_{12}	1.45	0.43	0.07	0.14	130.9	0.055	9.4	0.090
B_{21}	1.15	0.66	0.04	0.12	129.6	0.048	10.5	0.172
B_{22}	0.45	0.45	0.07	0.12	62.1	0.055	3.9	0.220

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_p	1.00	5.20	0.6	2.0	0.6	80	53
A_{12}	1.00	4.60	0.2	1.8	0.2	100	35
B_{21}	1.50	2.12	0.6	0.6	0.6	40	24
B_{22}	2.75	0.52	0.4	0.6	0.4	40	16

Profile No. 126

I. Information on the site.

a. Date of examination : 16 July 1974.

b. Location : Agricultural Experiment Station, Tambon Makhamthao, Amphoe Muang, Nakhon Phanom.

c. Land form :

i. Physiographic position : Old alluvial low terrace

ii. Surrounding land form : Flat.

d. Land use : Fallow.

II. General information on the soil.

a. Soil classification : Gray Podzolic soils.

b. Parent material : Old alluvium.

c. Drainage and water permeability : Moderately well drained. Permeability is moderately low.

d. Moisture condition in profile : Top 32 cm at profile semi-dry, moist below.

III. Profile description.

A_p 0-18 cm Brownish black (10YR 3/2) sandy loam; moderate, medium subangular blocky; friable; common fine and very fine pores; compact (21 mm); common roots; semi-dry; faint 2,2′-dipyridyl reaction; gradual smooth boundary to

A_{12} 18-32 cm Dark brown (10YR 3/3) sandy loam; moderate medium subangular blocky; friable; common fine and very fine pores; very compact (25 mm); common, roots; semi--dry; faint 2,2′-dipyridyl reaction; gradual smooth boundary to

B_{21} 32-55 cm Dull brown (7.5YR 5/4) sandy clay loam; moderate medium subangular blocky, friable; few fine pores; compact (19 mm); few roots; moist; faint 2,2′-dipyridyl reaction; gradual smooth boundary to

B_{22} 55-96cm + Bright brown (10YR 5/6) sandy clay loam; moderate medium subangular blocky; friable; few fine pores, few, fine animal holes; slightly compact (15 mm); few roots; moist.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases (%) at pF1-5 Solid	Liquid	Air	Particle size (%) Sand	Silt	Clay
A_p	0-18	13.1	21.2	1.62	62.3	29.5	8.2	77.2	10.3	12.5
A_{12}	18-32	14.8	22.9	1.55	59.6	30.5	9.9	74.1	12.3	13.6
B^{21}	32-55	15.3	25.2	1.65	63.4	28.4	8.2	67.9	14.4	17.7
B_{22}	55-96+	16.5	24.6	1.49	57.4	30.3	12.3	69.1	10.3	20.6

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%) pF1.0	pF1.5	pF3.0	pF4.0
A_p	SL	21	1.9×10^{-4}	31.7	30.4	29.5	19.9	10.1
A_{12}	SL	25	9.7×10^{-4}	34.1	32.8	30.5	16.1	9.2
B_{21}	SCL	19	1.2×10^{-4}	30.9	29.5	28.4	18.2	11.7
B_{22}	SCL	15	2.3×10^{-3}	37.0	33.5	30.3	19.3	14.1

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Easily available water (of 50 cm deep soil)	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_p	94.8	55.8	5.7	3.8	0.68	0.038	17.9	1.17	2.08
A_{12}			5.3	3.7	0.64	0.038	16.8	1.10	0.96
B_{21}			4.4	3.7	0.28	0.023	12.2	0.48	1.36
B_{22}			4.7	3.2	0.14	0.024	5.8	0.24	0.96

Horizon	Exchangeable bases Ca (me/100g)	Mg (me/100g)	Na (me/100g)	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	P_2O_5 Available (ppm)	Total K_2O (%)
A_p	0.15	0.05	0.02	0.01	11.4	0.057	47.6	0.109
A_{12}	0.50	0.04	0.01	0.01	58.6	0.050	22.8	0.139
B_{21}	0.30	0.05	0.09	0.01	33.3	0.050	6.6	0.190
B_{22}	0.50	0.08	0.12	0.03	75.8	0.055	3.3	0.226

Horizon	Extractable S (ppm)	Fe (ppm)	Cu (ppm)	Zn (ppm)	Mn (ppm) Exchangeable	Mn (ppm) Easily red.	Electrical conductivity (μ mho)
A_p	7.00	8.80	1.00	0.8	3.2	60	34
A_{12}	18.25	13.20	1.00	1.0	2.0	40	47
B_{21}	24.25	4.28	0.40	0.6	2.0	20	53
B_{22}	15.00	2.40	0.80	1.2	4.4	60	34

Profile No. 132

I. Information on the site.

a. Date of examination : 17 July 1974.

b. Location : Agricultural Experiment Station, Amphoe Yang Talad, Kalasin.

c. Land form :

i. Physiographic position : Old alluvial terrace.

ii. Surrounding land form : Flat to gently undulating.

d. Land use : Peanut and soybean cultivation.

II. General information on the soil.

a. Soil classification : Gray Podzolic soils.

b. Parent material : Old alluvinm.

c. Drainage and water permeability : Moderately well drained. Permeability is low.

d. Moisture condition in profile : Top 31 cm of profile dry, semi-dry below.

III. Profile description.

A_p 0-18 cm Grayish brown (7.5YR 4/2) sandy loam; single grain and weak, fine subangular blocky; common, fine and very fine pores; slightly compact (17 mm), common roots; dry; positive benzidine reaction; gradual smooth boundary to

A_{12} 18-31 cm Grayish brown (7.5YR 4/2) sandy loam; weak, fine subangular blocky; common fine and very fine pores; compact (20 mm); common roots; dry; positive benzidine reaction; gradual smooth boundary to

B_{21} 31-55 cm Dull brown (7.5YR 5/3) sandy loam; weak, fine subangular blocky; friable; common fine and very fine pores; compact (2.4 mm); few roots; semi-dry; faint positive benzidine reaction; gradual smooth boundary to

B_{22} 55-98 cm+ Dull orange (7.5YR 6/4) sandy clay loam; weak fine subangular blocky; few fine and very fine pores; slightly compact (18 mm); semi-dry; faint positive benzidine reaction.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases (%) at pF1-5 Solid	Liquid	Air	Particle size (%) Sand	Silt	Clay
A_p	0-18	6.5	8.8	1.35	51.7	31.9	16.4	77.4	16.4	6.2
A_{12}	18-31	6.6	9.6	1.45	55.9	33.8	10.3	76.7	16.1	7.2
B_{21}	31-55	6.9	11.8	1.71	65.7	25.3	9.0	78.4	14.3	7.3
B_{22}	55-98+	6.8	10.6	1.56	59.9	27.3	12.8	79.3	13.4	7.3

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%) pF1.0	pF1.5	pF3.0	pF4.0
A_p	SL	17	2.1×10^{-3}	41.7	34.7	31.9	13.2	4.5
A_{12}	SL	20	1.5×10^{-3}	38.9	36.8	33.8	8.7	5.9
B_{21}	SL	24	8.7×10^{-5}	28.8	26.2	25.3	10.0	5.6
B_{22}	SCL	18	2.0×10^{-4}	37.6	30.0	27.7	9.8	4.8

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Easily available water (of 50 cm deep soil)	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_p	123.0	95.4	5.3	4.1	0.43	0.035	12.3	0.74	1.20
A_{12}			5.0	3.6	0.43	0.025	17.2	0.74	0.96
B_{21}			4.6	3.6	0.10	0.014	7.1	0.17	0.48
B_{22}			4.6	3.7	0.10	0.010	10.0	0.17	1.12

Horizon	Exchangeable bases Ca	Mg	Na	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	Available (ppm)	Total K_2O (%)
A_p	2.50	0.19	0.02	0.05	230.0	0.167	68.5	0.006
A_{12}	0.30	0.05	0.29	0.01	68.8	0.237	47.2	0.006
B_{21}	0.15	0.03	0.01	0.01	39.2	0.121	10.3	0.012
B_{22}	0.25	0.05	0.14	0.01	39.7	0.042	8.6	0.012

Horizon	Extractable S	Fe	Cu	Zn (ppm)	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_p	1.25	1.48	0.60	2.8	6.4	40	112
A_{12}	2.00	10.00	0.40	1.4	5.2	40	92
B_{21}	1.00	11.00	0.60	1.2	5.2	20	18
B_{22}	1.25	5.80	0.20	0.8	4.0	40	15

Profile No. 11

I. Information on the site

a. Date of examination : 16 November 1973
b. Location : Phayuha Khiri, Nakhon Sawan
c. Land form
   i. Physiographic position : Steep land
   ii. Surrounding land form : Nearly flat to gently undulating, slope less than 2%
d. Land use : Sorghum cultivation

II. General information on the soil

a. Soil classification : Red Yellow Podzolic soils
b. Parent material : Residuum
c. Drainage and water permeability : Well drained. Permeability is moderately low.
d. Moisture condition in profile : Semi-dry throughout the profile

III. Profile description

A_p 0-20 cm Dark brown (7.5YR 3/4) clay loam; few, fine subangular gravels; weak, coarse subangular blocky; common, fine and medium pores; very compact (28 mm); non plastic, non sticky; common roots; dry; very positive benzidine reaction; clear, smooth boundary to

B_{21} 20-40 cm Dark reddish brown (2.5YR 3/4) light clay; many, fine subangular gravels; weak, coarse subangular blocky; few, fine pores; very compact (29 mm); slightly plastic, slightly sticky; common roots; semi-dry; very positive benzidine reaction; gradual smooth, boundary to

B_{22} 40-80 cm+ Dark reddish brown (2.5YR 3/4) light clay; many, fine and medium subangular gravels; weak to moderate, medium and coarse subangular blocky; friable, moist; few, fine pores; compact (21 mm); slightly plastic, slightly sticky; few roots; semi-dry; positive benzidine reaction.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases(%) at pF1-5 Solid	Liquid	Air	Particle size(%) Sand	Silt	Clay
A_p	0-20	9.0	14.9	1.65	63.6	29.4	7.0	47.2	30.7	22.1
B_{21}	20-40	14.1	24.3	1.72	66.2	32.3	1.5	44.1	26.8	32.1
B_{22}	40-80+	10.9	17.1	1.57	60.2	24.3	15.5	41.5	26.6	31.9

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content(%) pF1.0	pF1.5	pF3.0	pF4.0
A_p	CL	28	4.5×10^{-4}	32.0	30.5	29.4	21.6	—
B_{21}	LiC	29	4.0×10^{-4}	35.3	33.1	32.3	27.0	—
B_{22}	LiC	21	6.2×10^{-3}	33.2	26.8	24.3	20.0	—

Horizon	Storage Capacity(mm) of Available water (of 50 cm deep soil)	Storage Capacity(mm) of Easily available water (of 50 cm deep soil)	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_p	—	30.5	5.9	5.3	1.53	0.073	18.5	2.64	12.72
B_{21}			5.7	5.0	0.77	0.046	16.7	1.33	13.36
B_{22}			5.8	5.0	0.75	0.045	16.7	1.29	13.84

Horizon	Exchangeable bases Ca	Mg	Na	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	P_2O_5 Available (ppm)	Total K_2O (%)
A_p	4.0	3.75	1.26	0.08	71.1	0.112	11.0	0.214
B_{21}	7.5	5.00	0.26	0.03	95.7	0.112	7.5	0.271
B_{22}	8.0	4.58	0.19	0.01	92.3	0.097	11.4	0.283

Horizon	Extractable S	Fe	Cu	Zn (ppm)	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_p	1.41	0.11	2.0	3.6	6.6	280	45
B_{21}	0.47	0.11	3.4	2.2	2.4	360	33
B_{22}	0.24	0.91	4.6	2.8	3.4	450	28

Profile No. 12

I. Information on the site.

a. Date of examination : 17 November 1973.
b. Location : Yangtan, Krok Phra, Nakhon Sawan.
c. Land form :
   i. Physiographic position : Steep land.
   ii. Surrounding land form : Nearly flat to gently undulating, slope less than 2%
d. Land use : Corn and sorghum cultivation.

II. General information on the soil.

a. Soil classification : Red Yellow Podzolic soils.
b. Parent material : Residuum.
c. Drainage : Well drained.
d. Moisture condition in profile : Semi-dry throughout profile.

III. Profile description.

A_p 0-15 cm Brownish black (7.5YR 3/2) clay loam; moderate, medium subangular blocky; common, fine pores; slightly plastic, slightly sticky; common roots; semi-dry; very positive benzidine reaction; gradual, smooth boundary to

B_{21} 15-30 cm Dark brown (7.5YR 3/4) clay loam; few, fine and medium subangular gravels (7.5YR 5/8); moderate coarse subangular blocky; few, fine pores; slightly plastic, slightly sticky; few roots; semi-dry; very positive benzidine reaction; gradual, smooth boundary to

B_{22} 30-60 cm Dark brown (7.5YR 3/4) loam; few, fine slightly weathered, subangular gravels; moderate, coarse subangular blocky, friable moist; few, fine pores; slightly plastic, slightly sticky; few roots; semi-dry; slightly positive benzidine reaction; gradual, smooth boundary to

B_{23} 60 cm+ Dark brown (7.5YR 3/4) loam; moderate, medium and coarse subangular blocky; few very fine pores; slightly plastic, slightly sticky; few roots; semi-dry; slightly positive benzidine reaction.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)	(g/cm³)	Solid	Liquid	Air	Sand	Silt	Clay
A_p	0-15	—	—	—	—	—	—	—	—	—
B_{21}	15-30	—	—	—	—	—	—	—	—	—
B_{22}	30-60	—	—	—	—	—	—	—	—	—
B_{23}	60+	—	—	—	—	—	—	—	—	—

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_p	—	—	—	—	—	—	—	—
B_{21}	—	—	—	—	—	—	—	—
B_{22}	—	—	—	—	—	—	—	—
B_{23}	—	—	—	—	—	—	—	—

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_p	—	—	6.2	5.5	1.62	0.076	21.3	2.79	18.88
B_{21}			6.1	5.3	1.06	0.053	20.0	1.83	17.92
B_{22}			5.9	5.4	0.88	0.043	18.0	1.52	17.92
B_{23}			6.4	5.6	0.58	0.038	15.3	1.00	18.48

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_p	10.5	5.21	0.27	0.06	85.1	0.088	11.9	0.307
B_{21}	10.0	5.00	0.17	0.03	84.9	0.083	7.5	0.301
B_{22}	10.0	5.00	0.17	0.06	85.0	0.081	5.3	0.325
B_{23}	11.0	4.79	0.27	0.06	87.2	0.077	7.5	0.295

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_p	4.70	0.57	1.2	2.6	9.6	290	48
B_{21}	2.82	0.34	1.6	1.8	0.4	320	30
B_{22}	3.76	0.46	2.0	1.6	0.4	340	31
B_{23}	0.47	0.86	2.8	2.0	0	470	28

Profile No. 13

I. Information on the site.

a. Date of examination : 17 November 1973.
b. Location : Banglangdad, Krok Phra, Nakhon Sawan.
c. Land form :
   i. Physiographic position : Old alluvial terrace.
   ii. Surrounding land form : Nearly flat to gently undulating, slope less than 1%.
d. Land use : Mung bean and sorghum cultivation.

II. General information on the soil.

a. Soil classification : Red Yellow Podzolic soils.
b. Parent material : Old alluvial sediment.
c. Drainage : Well drained.
d. Moisture condition in profile : Semi-dry throughout the profile.

III. Profile description.

A_p 0-15 cm Brownish black (10YR 2/2) silty clay loam; granular and moderate, fine subangular blocky; few, fine pores; non plastic, non sticky; common roots; semi-dry; very positive benzidine reaction; gradual smooth boundary to

B_{21} 15-32 cm Brownish black (10YR2/3) silty loam; few, fine subangular gravels; weak, medium subangular blocky; few, very fine pores; slightly plastic, slightly sticky; few roots; semi-dry; very positive benzidine reaction; gradual smooth boundary to

BC 32 cm + Brownish black (10YR2/3) clay loam; many medium subangular gravels (lime stone?); friable moist; slightly plastic, slightly sticky; few roots; semi-dry; positive benzidine reaction.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density (g/cm³)	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)		Solid	Liquid	Air	Sand	Silt	Clay
A_p	0-15	—	—	—	—	—	—	—	—	—
B_{21}	15-32	—	—	—	—	—	—	—	—	—

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_p	—	—	—	—	—	—	—	—
B_{21}	—	—	—	—	—	—	—	—

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_p	—	—	7.7	6.5	2.95	0.139	21.2	5.09	39.52
B_{21}			7.5	6.4	2.50	0.178	14.0	4.31	42.40

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_p	6.0	5.00	0.32	0.25	29.3	0.186	100.1	0.438
B_{21}	10.0	4.17	0.40	0.24	34.9	0.092	52.7	0.524

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_p	3.00	1.09	0	0	0.2	740	134
B_{21}	3.00	1.71	0	0	0.2	780	128

Profile No. 17

I. Information on the site.

a. Date of examination : 17 November 1973.
b. Location : Maechey, Pangtonpung, Muang, Uttaradit.
c. Land form :
  i. Physiographic position : Steep land.
  ii. Surrounding land form : Slope 20%.
d. Land use : Shifting cultivation (upland rice).

II. General information on the soil.

a. Soil classification : Red Yellow Podzolic soils.
b. Parent material : Residuum.
c. Drainage : Well drained.
d. Moisture condition in profile : Semi-dry throughout the profile.

III. Profile description.

A_p 0-5 cm Dull yellowish brown (10YR5/4) dry; heavy clay; moderate, fine subangular blocky and granular; common, fine pores; slightly plastic, slightly sticky; common roots; dry; positive benzidine reaction; clear smooth boundary to

B_1 5-25 cm Bright brown (7.5YR5/6) heavy clay; moderate medium subangular blocky; few, very fine pores; slightly plastic, slightly sticky; common roots; dry; gradual, smooth boundary to

B_{21} 25-65 cm Bright brown (7.5YR5/8) heavy clay; weak, medium subangular blocky; few, very fine pores; slightly plastic, slightly sticky; few roots; semi-dry; gradual, smooth boundary to

B_{22} 65-90 cm + Mixed soil bright brown (7.5YR5/8) in 9 portions and bright yellowish brown (10YR6/8) in 1 portion; heavy clay; moderate, medium subangular blocky; friable moist, plastic, sticky; semi-dry; few roots.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases (%) at pF1-5 Solid	Liquid	Air	Particle size (%) Sand	Silt	Clay
A_p	0-5	—	—	—	—	—	—	—	—	—
B_1	5-25	—	—	—	—	—	—	—	—	—
B_{21}	25-65	—	—	—	—	—	—	—	—	—
B_{22}	65-90+	—	—	—	—	—	—	—	—	—

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%) pF1.0	pF1.5	pF3.0	pF4.0
A_p	—	—	—	—	—	—	—	—
B_1	—	—	—	—	—	—	—	—
B_{21}	—	—	—	—	—	—	—	—
B_{22}	—	—	—	—	—	—	—	—

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Easily available water (of 50 cm deep soil)	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_p	—	—	5.6	4.9	1.48	0.135	11.0	2.55	6.40
B_1			5.4	4.3	1.19	0.129	9.2	2.05	6.20
B_{21}			5.5	4.1	1.26	0.090	14.0	2.17	5.92
B_{22}			5.8	4.0	0.84	0.074	11.4	1.45	6.40

Horizon	Exchangeable bases Ca (me/100g)	Mg	Na	K	Base saturation degree (%)	P_2O_5 Total (%)	Available (ppm)	Total K_2O (%)
A_p	2.5	1.04	0.13	0.10	59.0	0.109	13.6	1.341
B_1	2.0	1.04	0.19	0.15	54.5	0.109	4.4	1.310
B_{21}	6.0	2.50	0.15	0.15	148.7	0.103	4.0	1.310
B_{22}	6.5	2.29	0.13	0.13	141.4	0.088	3.3	1.521

Horizon	Extractable S (ppm)	Fe	Cu	Zn	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_p	1.25	0.57	1.8	2.2	15.6	280	42
B_1	11.75	0.69	1.6	1.4	9.6	160	25
B_{21}	7.00	0.17	1.4	1.2	1.4	46	17
B_{22}	1.00	0.17	1.2	1.2	1.6	18	30

Profile No. 18

I. Information on the site.

a. Date of examination : 17 November 1973.
b. Location : Nan Agricultural Experiment Station.
c. Land form :
  i. Physiographic position : Old alluvial terrace.
  ii. Surrounding land form : Nearly flat.
d. Land use : Orange cultivation.

II. General information on the soil.

a. Soil classification : Red Yellow Podzolic soils.
b. Parent material : Older alluvial sediments.
c. Drainage and water permeability : Moderately well drained. Permeability is moderately low.
d. Moisture condition in profile : Semi-dry throughout the profile.

III. Profile description.

A_p 0-20 cm Dark brown (10YR3/3) silty loam; moderate, coarse subangular blocky; common, fine pores; slightly compact (16 mm); slightly plastic, slightly sticky; few roots; semi-dry; positive benzidine reaction; gradual smooth boundary to

B_{21} 20-60 cm Mixed soil brown (10YR4/4) in 9 portions and brown (10YR4/6) in 1 portion; light clay; moderate coarse subangular blocky; common, fine and very fine pores; compact (23 mm); few roots; semi-dry; gradual smooth boundary to

B_{22} 60-80+ cm Brown (10YR4/4) heavy clay; moderate, medium subangular blocky, friable moist; few, very fine pores; compact (22 mm); few, laterite concretions (5YR4/8); few roots; semi-dry.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases (%) at pF1-5 Solid	Liquid	Air	Particle size (%) Sand	Silt	Clay
A_p	0-20	21.9	30.2	1.38	53.0	31.4	15.6	23.4	67.2	9.4
B_{21}	20-60	23.0	36.1	1.57	60.2	32.3	7.5	25.6	28.9	45.6
B_{22}	60-80+	22.2	34.6	1.56	60.1	30.6	9.3	24.7	26.8	48.5

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%) pF1.0	pF1.5	pF3.0	pF4.0
A_p	SiL	16	6.0×10^{-3}	39.8	34.3	31.4	25.0	—
B_{21}	LiC	23	6.7×10^{-4}	35.5	33.1	32.3	26.3	—
B_{22}	HC	22	2.3×10^{-4}	33.1	31.3	30.6	24.4	—

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Easily available water	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_p	—	30.8	7.5	6.3	2.03	0.099	20.5	3.50	6.08
B_{21}			6.6	5.5	1.15	0.092	12.5	1.98	6.56
B_{22}			5.9	4.7	0.85	0.075	11.3	1.47	5.84

Horizon	Exchangeable bases Ca	Mg	Na	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	Available (ppm)	Total K_2O (%)
A_p	8.0	1.46	0.17	0.21	161.9	0.132	243.5	0.828
B_{21}	9.0	1.67	0.19	0.18	168.2	0.088	9.2	0.617
B_{22}	6.5	1.25	0.26	0.15	139.8	0.055	4.8	0.678

Horizon	Extractable S	Fe	Cu	Zn (ppm)	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_p	25.50	0.57	4.8	6.4	3.8	210	142
B_{21}	4.50	0.23	1.2	1.0	4.6	40	72
B_{22}	8.50	0.63	1.0	0.6	1.2	6	31

Profile No. 19

I. Information on the site.

a. Date of examination : 18 November 1973.
b. Location : Rong Kwang, Phrae.
c. Land form :
  i. Physiographic position : Old alluvial terrace.
  ii. Surrounding land form : Nearly flat to gently undulating.
d. Land use : Mung bean cultivation.

II. General information on the soil.

a. Soil classification : Red Yellow Podzolic soils.
b. Parent material : Older alluvial sediments.
c. Drainage : Moderately well drained.
d. Moisture condition in profile : Semi-dry throughout the profile.

III. Profile description.

A_p 0-12 cm Grayish brown (7.5YR5/2) sandy clay loam; moderate, medium subangular blocky; common, fine pores; extremely compact (30 mm); non plastic, non sticky; common roots; semi-dry; positive benzidine reaction; gradual smooth boundary to

B_{21} 12-50 cm Brown (7.5YR4/6) sandy clay; moderate, medium subangular blocky; common, fine and very fine pores; extremely compact (34 mm); non plastic; non sticky; few roots; semi-dry; gradual smooth boundary to

B_{22} 50 cm + Reddish brown (5YR4/8) light clay, single grain; slightly plastic, slightly sticky; few roots; semi-dry.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density (g/cm³)	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)		Solid	Liquid	Air	Sand	Silt	Clay
A_p	0-12	—	—	—	—	—	—	—	—	—
B_{21}	12-50	—	—	—	—	—	—	—	—	—
B_{22}	50+	—	—	—	—	—	—	—	—	—

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_p	—	—	—	—	—	—	—	—
B_{21}	—	—	—	—	—	—	—	—
B_{22}	—	—	—	—	—	—	—	—

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_p	—	—	5.8	4.5	1.24	0.054	23.0	2.14	7.92
B_{21}			5.0	4.0	0.84	0.047	1.45	1.45	3.76
B_{22}			4.9	3.9	0.65	0.031	21.0	1.12	4.72

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_p	9.0	1.25	0.06	0.08	131.1	0.044	12.7	0.151
B_{21}	6.2	2.71	0.10	0.05	228.9	0.059	9.2	0.301
B_{22}	2.5	1.04	0.13	0.05	78.8	0.044	3.5	0.422

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_p	2.50	1.89	0.6	1.4	5.0	38	21
B_{21}	0.25	6.5	0.6	1.0	0.8	2	24
B_{22}	0.25	2.0	0.6	0.6	0.4	2	16

Profile No. 20

I. Information on the site.

a. Date of examination : 18 November 1973.
b. Location : Banpakoy, Ngao, Phrae.
c. Land form :
  i. Physiographic position : Steep land.
  ii. Surrounding land form : Slope 15%.
d. Land use : Shifting cultivation (Peanuts).

II. General information on the soil.

a. Soil classification : Red Yellow Podzolic soils.
b. Parent material : Residuum.
c. Drainage and water permeability : Moderately well drained. Permeability is low. Runoff is rapid.
d. Moisture condition in profile : Semi-dry throughout the profile.

III. Profile description.

A_p 0-10 cm Dark brown (7.5YR3/4) heavy clay; moderate, medium subangular blocky and granular; common, fine and very fine pores; compact (19 mm); non plastic, slightly sticky; common roots; dry; positive benzidine reaction; gradual smooth boundary to

A_{12} 10-20 cm Brown (7.5YR4/4) heavy clay; moderate, medium subangular blocky, friable moist; common, fine and very fine pores; very compact (25 mm); slightly plastic, slightly sticky; common roots; semi-dry; gradual smooth boundary to

B_{21} 20-55 cm Brown (7.5YR4/6) heavy clay; moderate, medium subangular blocky; common, fine and very fine pores; very compact (26 mm); slightly plastic, slightly sticky; few roots; semi-dry; gradual smooth boundary to

B_{22} 55 cm + Reddish brown (5YR4/6) heavy clay; moderate, medium subangular blocky; common, fine and very fine pores; very compact (26 mm); plastic and sticky; no roots; semi-dry.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases(%) at pF1-5 Solid	Liquid	Air	Particle size(%) Sand	Silt	Clay
A_p	0-10	22.5	22.7	1.01	38.9	40.1	21.0	24.8	20.8	54.4
A_{12}	10-20	26.2	34.1	1.30	50.2	41.9	8.0	19.2	18.6	62.2
B_{21}	20-55	28.4	38.3	1.35	52.0	41.8	6.3	18.7	12.8	68.5
B_{22}	55+	29.9	—	—	—	—	—	16.9	10.6	72.5

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content(%) pF1.0	pF1.5	pF3.0	pF4.0
A_p	HC	19	2.2×10^{-2}	45.1	43.4	40.1	31.8	—
A_{12}	HC	25	2.9×10^{-5}	45.4	43.7	41.9	38.3	—
B_{21}	HC	26	1.7×10^{-5}	45.5	43.1	41.8	37.9	—
B_{22}	HC	26	—	—	—	—	—	—

Horizon	Storage Capacity(mm) of Available water (of 50 cm deep soil)	Easily available water	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_p	—	23.6	6.2	5.4	3.33	0.204	16.3	5.74	23.92
A_{12}			5.9	5.2	2.56	0.207	12.4	4.41	21.44
B_{21}			5.3	4.3	1.65	0.142	11.6	2.84	18.16
B_{22}			5.0	4.0	1.30	0.116	11.2	2.24	18.88

Horizon	Exchangeable bases Ca	Mg	Na	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	Available (ppm)	Total K_2O (%)
A_p	30.0	7.92	0.26	0.56	161.9	0.202	55.7	1.521
A_{12}	20.0	8.96	0.19	0.44	138.0	0.186	24.6	1.702
B_{21}	11.0	7.08	0.17	0.26	101.9	0.165	20.0	1.777
B_{22}	11.0	7.92	0.15	0.18	101.9	0.136	11.4	1.958

Horizon	Extractable S	Fe	Cu	Zn (ppm)	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_p	2.00	0.17	0.6	3.6	5.2	300	80
A_{12}	2.00	0.17	1.2	1.4	8.8	290	50
B_{21}	14.50	0.91	2.2	1.0	10.8	160	38
B_{22}	1.50	1.37	2.0	0.4	3.4	70	23

Profile No. 21

I . **Information on the site.**

a . Date of examination : 19 November 1973.

b . Location : Maelao, Dongmada, Muang, Chiang Rai.

c . Land form :

i . Physiographic position : Steep land.

ii . Surrounding land form : Slope 5%.

d . Land use : Virgin soil.

II. **General information on the soil.**

a . Soil classification : Red Yellow Podzolic soils.

b . Parent material : Residuum.

c . Drainage : Well drained. Runoff is rapid.

d . Moisture condition in profile : Semi-dry throughout the profile.

III. **Profile description.**

A_{11} 0-8 cm Dull orange (7.5YR 7/4) heavy clay; moderate medium subangular blocky; common, fine and very fine pores; very compact (26 mm); non plastic, slightly sticky; common roots; semi-dry; slightly positive benzidine reaction; gradual smooth boundary to

B_1 8-20 cm Bright reddish brown (5YR 5/8) heavy clay; moderate, coarse subangular blocky; common, fine and very fine pores; extremely compact (34 mm); slightly plastic, slightly sticky; common roots; semi-dry; gradual smooth boundary to

B_{21} 20-40 cm Orange (5YR 6/8) heavy clay; moderate, coarse subangular blocky; few, very fine pores; extremely compact (30 mm); slightly plastic, slightly sticky; few roots; semi-dry; clear smooth boundary to

C 40-80 cm Orange (5YR 6/8) clay with about 50 percent of fine subangular gravels.

R 80 cm + Rock.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases (%) at pF1-5 Solid	Liquid	Air	Particle size (%) Sand	Silt	Clay
A_{11}	0-8	—	—	—	—	—	—	—	—	—
B_1	8-20	—	—	—	—	—	—	—	—	—
B_{21}	20-40	—	—	—	—	—	—	—	—	—

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%) pF1.0	pF1.5	pF3.0	pF4.0
A_{11}	—	—	—	—	—	—	—	—
B_1	—	—	—	—	—	—	—	—
B_{21}	—	—	—	—	—	—	—	—

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Easily available water	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_{11}	—	—	5.8	3.1	1.22	0.082	14.9	2.10	5.76
B_1			5.1	3.9	1.02	0.073	14.0	1.76	7.60
B_{21}			4.9	3.8	0.84	0.046	18.3	1.45	7.92

Horizon	Exchangeable bases Ca	Mg	Na	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	P_2O_5 Available (ppm)	Total K_2O (%)
A_{11}	12.5	2.71	0.19	0.13	234.8	0.088	17.1	0.844
B_1	5.0	2.08	0.10	0.08	95.4	0.121	8.8	1.085
B_{21}	1.0	2.5	0.15	0.08	47.0	0.088	11.4	1.115

Horizon	Extractable S	Fe	Cu	Zn (ppm)	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_{11}	0.00	0.46	0.8	1.2	0.8	6	56
B_1	0.00	1.77	0.6	0.4	0.2	0	19
B_{21}	0.00	0.86	0.6	0.4	0.8	0	13

Profile No. 22

I. Information on the site.

a. Date of examination : 20 November 1973.
b. Location : Doychampee, Pasaknoi, Ching Saen, Chiang Rai.
c. Land form :
   i. Physiographic position : Steep land.
   ii. Surrounding land form - Slope 5%.
d. Land use : Shifting cultivation (Banana, pineapple).

II. General information on the soil.

a. Soil classification : Red Yellow Podzolic soils.
b. Parent material : Residuum.
c. Drainage : Well drained.
d. Moisture condition in profile : Semi-dry throughout the profile.

III. Profile description.

A_{11} 0-15 cm Dull reddish brown (5YR 4/4) sandy clay; moderate, medium subangular blocky and fine granular; few, fine and very fine pores; slightly compact (18 mm); slightly plastic, slightly sticky; many roots; semi-dry; clear smooth boundary to

A_{12} 15-35 cm Reddish brown (5YR 4/8) heavy clay; moderate, medium subangular blocky; few, very fine pores; very compact (26 mm); slightly plastic, slightly sticky; few roots; semi-dry; gradual, smooth boundary to

B_{21} 35-70 cm Reddish brown (2.5YR 4/8) heavy clay; moderate, medium subangular blocky; few, very fine pores; very compact (28 mm); few roots; semi-dry; gradual, smooth boundary to

B_{22} 70-100+ cm Bright brown (2.5YR 5/8) heavy clay, weak, coarse subangular blocky; few, fine and very fine pores; very compact (28 mm); few roots; semi-dry.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)	(g/cm³)	Solid	Liquid	Air	Sand	Silt	Clay
A_{11}	0-15	—	—	—	—	—	—	—	—	—
A_{12}	15-35	—	—	—	—	—	—	—	—	—
B_{21}	35-70	—	—	—	—	—	—	—	—	—
B_{22}	70-100+	—	—	—	—	—	—	—	—	—

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_{11}	—	—	—	—	—	—	—	—
A_{12}	—	—	—	—	—	—	—	—
B_{21}	—	—	—	—	—	—	—	—
B_{22}	—	—	—	—	—	—	—	—

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_{11}	—	—	5.1	4.3	2.49	0.091	27.4	4.29	5.28
A_{12}			5.1	4.1	1.68	0.095	17.7	2.90	6.96
B_{21}			5.3	4.1	1.15	0.062	18.6	1.98	6.04
B_{22}			5.7	4.4	0.84	0.054	15.6	1.45	4.56

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_{11}	4.0	1.88	0.13	0.02	114.2	0.179	50.0	0.392
A_{12}	4.5	2.08	0.15	0.08	100.7	0.169	17.6	0.497
B_{21}	4.5	1.67	0.09	0.02	103.9	0.147	10.5	0.482
B_{22}	4.0	2.50	0.09	0.02	144.8	0.169	14.9	0.587

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_{11}	0.00	3.43	0.8	2.2	4.4	8.0	36
A_{12}	2.00	1.71	1.4	0.6	3.0	60	23
B_{21}	2.00	0.40	1.2	0.4	1.6	24	18
B_{22}	3.00	0.09	1.0	0.4	1.8	26	18

Profile No. 23

I. Information on the site.

a. Date of examination : 20 November 1973.
b. Location : Namjane, Pongpha, Mae Sai, Chiang Rai.
c. Land form :
  i. Physiographic position : Foothill of high mountain.
  ii. Surrounding land form : Slope 2%.
d. Land use : Wheat and cassava cultivation.

II. General information on the soil.

a. Soil classification : Red Yellow Podzolic soils.
b. Parent material : Residuum.
c. Drainage : Moderately well drained.
d. Moisture condition profile : Semi-dry throughout the profile.

III. Profile description.

A_p 0-15 cm Brown (7.5YR 4/3) light clay; moderate, fine granular; loose (9 mm); slightly plastic, slightly sticky; common roots; semi-dry; gradual smooth boundary to

B_{21} 15-50 cm Bright reddish brown (5YR 5/6) heavy clay; moderate medium subangular blocky; common, very fine pores; very compact (25 mm); slightly plastic, slightly sticky; few roots; semi-dry; gradual, smooth boundary to

B_{22} 50+ cm Bright reddish brown (5YR 5/8) heavy clay; moderate medium subangular blocky; few, very fine pores; slightly plastic, slightly sticky; few roots; semi-dry.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases (%) at pF1-5 Solid	Liquid	Air	Particle size (%) Sand	Silt	Clay
A_p	0-15	—	—	—	—	—	—	—	—	—
B_{21}	15-50	—	—	—	—	—	—	—	—	—
B_{22}	50+	—	—	—	—	—	—	—	—	—

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%) pF1.0	pF1.5	pF3.0	pF4.0
A_p	—	—	—	—	—	—	—	—
B_{21}	—	—	—	—	—	—	—	—
B_{22}	—	—	—	—	—	—	—	—

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Easily available water (of 50 cm deep soil)	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_p	—	—	5.0	4.1	2.37	0.099	23.9	4.09	11.28
B_{21}			5.0	4.2	1.73	0.091	19.0	2.98	8.40
B_{22}			6.0	4.3	1.04	0.061	17.7	1.79	6.08

Horizon	Exchangeable bases Ca	Mg	Na	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	Available (ppm)	Total K_2O (%)
A_p	5.5	2.08	0.19	0.15	70.2	0.204	55.1	0.587
B_{21}	5.5	2.08	0.10	0.08	92.3	0.191	17.1	0.828
B_{22}	5.5	2.71	0.09	0.08	136.4	0.136	17.6	0.738

Horizon	Extractable S	Fe	Cu	Zn (ppm)	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_p	1.75	4.57	1.6	1.2	9.8	210	32
B_{21}	6.25	1.71	1.8	0.4	4.6	90	17
B_{22}	0.50	0.23	1.2	0.4	1.4	50	10

Profile No. 24

I. Information on the site.

a. Date of examination : 20 November 1973.

b. Location : Banchong Tobacco Experiment Station, Mae Sai, Chiang Rai.

c. Land form

i. Physiographic position : Foothill.

ii. Surrounding land form : Slope 1%.

d. Land use : Wheat and tobacco cultivation.

II. General information on the soil.

a. Soil classification : Red Yellow Podzolic soils.

b. Parent material : Residuum.

c. Drainage and water permeability : Moderately well drained. Permeability is moderately low to low.

d. Moisture condition in profile : Semi-dry throughout the profile.

III. Profile description.

A_p 0-14 cm Dark brown (7.5YR 3/4) light clay; moderate, coarse subangular blocky; common, fine and very fine pores; slightly compact (18 mn); slightly plastic, slightly sticky; common roots; gradual smooth boundary to

A_{12} 14-36 cm Dark brown (7.5YR 3/4) light clay; moderate, coarse subangular blocky; common, fine and very fine pores; very compact (26 mm); slightly plastic slightly sticky; common roots; semi-dry; smooth boundary to

B_1 36-60 cm Brown (7.5YR 4/4) heavy clay; moderate, medium and coarse subangular blocky; friable moist; common, fine and very fine pores; very compact (26 mm); common roots; semi-dry; gradual smooth boundary to

B_2 60-100 cm + Reddish brown (5YR 4/6) heavy clay; moderate, coarse subangular blocky; common, fine and very fine pores; compact (23 mm); slightly plastic, slightly sticky; few roots; semi-dry; few laterite concretions (2.5YR 4/8).

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)	(g/cm³)	Solid	Liquid	Air	Sand	Silt	Clay
A_p	0-14	31.6	36.7	1.16	44.0	37.3	18.2	31.2	32.3	36.5
A_{12}	14-36	31.7	45.6	1.44	55.3	35.1	10.1	31.0	28.4	40.6
A_1	35-60	31.5	41.0	1.30	50.0	40.7	9.4	22.5	31.0	46.5
B_2	60-100+	10.7	15.2	1.42	54.8	33.2	12.1	27.8	24.1	48.1

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_p	LiC	18	1.2×10^{-3}	49.5	42.3	37.3	26.7	—
A_{12}	LiC	26	1.8×10^{-4}	35.9	35.2	35.1	26.0	—
B_1	HC	26	4.2×10^{-5}	44.5	42.1	40.6	31.6	—
B_2	HC	23	3.5×10^{-5}	35.2	34.5	33.2	25.8	—

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_p	—	47.5	6.4	3.7	2.47	0.133	18.6	4.26	16.00
A_{12}			5.9	4.9	2.41	0.154	15.7	4.15	16.24
B_1			5.6	4.3	1.63	0.095	17.2	4.58	12.80
B_2			5.8	4.4	1.02	0.057	17.9	1.76	10.48

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_p	25.0	2.71	0.13	0.94	177.1	0.494	245.7	0.918
A_{12}	18.0	3.96	0.15	0.29	137.9	0.476	194.2	0.886
B_1	8.5	2.71	0.09	0.15	89.5	0.884	36.2	0.798
B_2	8.0	3.54	0.17	0.15	113.2	0.340	44.8	0.798

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_p	3.00	0.23	3.4	1.8	3.6	270	125
A_{12}	1.75	5.14	4.8	2.0	8.8	340	59
B_1	15.25	3.71	6.0	1.8	5.2	270	72
B_2	16.50	2.29	4.8	1.4	5.8	350	26

Profile No. 25

I. Information on the site.

a. Date of examination : 21 November 1973.
b. Location : Chiang Rai Agricultural Experiment Station, Chiaeg Rai.
c. Land form :
  i. Physiographic position : Foothill of high mountain.
  ii. Surrounding land form : Slope 2%, gently undulating.
d. Land use : Wheat cultivation.

II. General information on the soil.

a. Soil classification : Red Yellow Podzolic soils.
b. Parent material : Residuum.
c. Drainage and water permeability : Moderately well drained. Permeability is moderately low.
d. Moisture condition in profile : Semi-dry throughout the profile.

III. Profile description.

A_p 0-15 cm Dark brown (7.5YR 3/3) light clay; moderate, fine granular; slightly compact (15 mm); slightly plastic, slightly sticky; common roots; dry; gradual smooth boundary to

A_{12} 15-33 cm Brown (7.5YR 4/3) light clay; moderate, medium subangular blocky; common, fine and very fine pores; very compact (27 mm); slightly plastic, slightly sticky; common roots; semi-dry; gradual, smooth boundary to

B_1 33-60 cm Brown (7.5YR 4/4) heavy clay; moderate, medium subangular blocky, friable moist; common, fine and very fine pores; compact (23 mm); slightly plastic, slightly sticky; few roots; semi-dry; gradual, smooth boundary to

B_{21} 50-85 cm Brown (7.5YR 4/6) heavy clay; common, coarse subangular blocky; friable moist; common, fine and very fine pores; very compact (25 mm); slightly plastic, slightly sticky; few roots; semi-dry; gradual, smooth boundary to

B_{22} 85 cm + Bright brown (7.5YR 5/8) heavy clay; common coarse subangular blocky, friable moist; common, very fine pores; very compact (25 mm); slightly plastic, slightly sticky; few roots; semi-dry.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases (%) at pF1-5 Solid	Liquid	Air	Particle size (%) Sand	Silt	Clay
A_p	0-15	14.2	15.9	1.12	43.2	46.6	10.2	43.7	16.1	40.2
A_{12}	15-33	21.9	26.9	1.23	47.3	38.0	14.7	41.8	14.1	44.1
B_1	33-60	22.7	28.1	1.24	47.6	36.1	16.3	35.5	1.21	52.4
B_{21}	60-85+	23.6	—	—	—	—	—	35.5	12.1	52.4

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%) pF1.0	pF1.5	pF3.0	pF4.0
A_p	LiC	15	9.0×10^{-3}	53.4	49.9	46.6	33.7	—
A_{12}	LiC	27	3.3×10^{-4}	45.0	41.4	38.0	30.9	—
B_1	LiC	23	2.4×10^{-5}	41.7	39.3	36.1	29.0	—
B_{21}	HC	25	—	—	—	—	—	—

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Storage Capacity (mm) of Easily available water (of 50 cm deep soil)	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_p	—	42.5	5.0	3.7	2.69	0.153	17.6	4.64	12.00
A_{12}			4.9	4.0	2.32	0.121	19.2	4.00	12.16
B_1			5.1	4.0	1.51	0.078	19.4	2.60	9.92
B_{21}			5.0	4.0	1.13	0.055	20.6	1.95	7.76
B_{22}			4.4	3.9	0.50	0.053	9.4	0.86	5.44

Horizon	Exchangeable bases Ca	Mg	Na	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	Available (ppm)	Total K_2O (%)
A_p	5.5	2.92	0.17	0.36	74.6	0.165	241.3	0.587
A_{12}	2.0	2.71	0.17	0.29	42.6	0.136	71.5	0.648
B_1	5.0	2.08	0.13	0.18	74.5	0.101	38.0	0.708
B_{21}	4.0	2.08	0.10	0.08	80.6	0.070	21.5	0.678
B_{22}	1.5	2.50	0.15	0.08	77.7	0.070	13.2	0.708

Horizon	Extractable S	Fe	Cu	Zn (ppm)	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_p	23.15	14.29	1.2	6.6	6.6	60	185
A_{12}	12.00	7.14	1.2	3.8	3.8	50	46
B_1	1.25	6.29	0.8	1.6	1.6	20	28
B_{21}	0.50	3.14	1.0	0.6	0.6	8	48
B_{22}	0.50	2.17	0.8	0.4	0.4	4	70

Profile No. 26

I. Information on the site.

a . Date of examination : 22 November 1973.
b . Location : Pakthang, Songkwae, Chom Thong, Chiang Mai.
c . Land form:
  i . Physiographic position : Old alluvial terrace.
  ii . Surrounding land form : Nearly flat.
d . Land use : Kapok cultivation.

II. General information on the soil.

a . Soil classification : Red Yellow Podzolic soils.
b . Parent material : Older alluvial sediments.
c . Drainage : Well drained.
d . Moisture condition in profile : Dry throughout the profile.

III. Profile description.

A_{11} 0-10 cm. Brown (7.5YR 4/4) sandy loam; moderate, fine granular, few, very fine pores; slightly compact (16mm); non plastic, non sticky; common roots; semi-dry; very positive benzidine reaction; clear, smooth boundary to

B_1 10-28 cm Orange (7.5YR 6/6) dry; sandy clay loam; moderate, fine subangular blocky; common, very fine pores; very compact (29 mm); slightly plastic, slightly sticky; common roots; dry; very positive benzidine reaction; gradual, smooth boundary to

B_2 28-72 cm Orange (7.5YR 6/6) dry; clay loam; few, fine and medium round angular gravels; moderate, fine subangular blocky; common very fine pores; extremely compact (31 mm); few roots; dry; very positive benzidine reaction; clear, smooth boundary to

C_1 72-110 cm Orange (7.5YR 4/6) moist; sandy clay loam; many, fine medium round angular gravels; few roots; dry; very positive benzidine reaction; abrupt boundary to

C_2 110 cm + Bright brown (7.5YR 5/8) moist; sandy loam; massive structure; slightly compact (17 mm); dry; very positive benzidine reaction.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases (%) at pF1-5 Solid	Liquid	Air	Particle size (%) Sand	Silt	Clay
A_{11}	0-10	—	—	—	—	—	—	—	—	—
B_1	10-28	—	—	—	—	—	—	—	—	—
B_2	28-72	—	—	—	—	—	—	—	—	—
C_1	72-110	—	—	—	—	—	—	—	—	—
C_2	110+	—	—	—	—	—	—	—	—	—

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%) pF1.0	pF1.5	pF3.0	pF4.0
A_{11}	—	—	—	—	—	—	—	—
B_1	—	—	—	—	—	—	—	—
B_2	—	—	—	—	—	—	—	—
C_1	—	—	—	—	—	—	—	—
C_2	—	—	—	—	—	—	—	—

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Easily available water	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_{11}	—	—	6.2	5.5	0.23	0.026	8.9	0.40	2.08
B_1			6.0	5.3	0.23	0.022	10.5	0.40	2.48
B_2			5.6	4.8	0.19	0.022	8.6	0.33	2.88
C_1			5.8	4.9	0.16	0.028	5.7	0.28	3.12
C_2			5.7	4.6	0.12	0.015	8.0	0.21	2.64

Horizon	Exchangeable bases Ca (me/100g)	Mg	Na	K	Base saturation degree (%)	P_2O_5 Total (%)	Available (ppm)	Total K_2O (%)
A_{11}	3.5	2.92	0.13	0.21	325.1	0.053	30.3	0.178
B_1	5.0	2.29	0.19	0.15	307.7	0.055	19.7	0.211
B_2	3.5	1.67	0.06	0.13	185.9	0.053	11.4	0.178
C_1	5.5	2.92	0.17	0.15	280.4	0.049	6.8	0.199
C_2	3.5	0.84	0.06	0.13	171.4	0.033	3.3	0.223

Horizon	Extractable S (ppm)	Fe	Cu	Zn	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_{11}	0.50	0.34	1.2	3.6	12.0	520	40
B_1	0.75	0.06	1.4	4.4	11.0	600	20
B_2	1.50	0.91	2.0	1.0	5.2	620	12
C_1	1.75	0.51	1.4	2.2	21.0	680	25
C_2	1.25	0.06	1.6	1.4	11.6	540	50

Profile No. 33

I Information on the site.

a . Date of examination : 24 November 1973.
b . Location : Maepa,Thoen, Lampang.
c . Land form :
  i . Physiographic position : Foothill of high mountain.
  ii . Surrounding land form : Undulating.
d . Land use : Peanut cultivation, and partly under shrubs.

II. General information on the soil.

a . Soil classification : Red Yellow Podzolic soils.
b , Parent material : Residuum.
c , Drainage : Well drained.
d . Moisture condition in profile : Semi-dry throughout the profile.

III. Profile description.

A_{11} 0-17 cm Dark brown (7.5YR 3/4) sandy loam; moderate, fine granular; loose (10 mm); non plastic, non sticky; many roots; semi-dry; positive benzidine reaction; gradual smooth boundary to

A_{12} 17-30 cm Mixed soil dull orange (5YR 6/3) in 6 portions and reddish brown (5YR 4/6) in 4 portions; sandy clay loam; moderate, granular and fine subangular blocky, friable moist; few, very fine pores; compact (20 mm); non plastic, non sticky; common roots; semi-dry; positive benzidine reaction; clear, smooth boundary to

B_1 30-48 cm Reddish brown (5YR 4/6) sandy clay loam, moderate, medium fine subangular blocky; few, very fine pores; semi-dry; positive benzidine reaction; gradual smooth boundary to

B_2 48-100 cm+ Reddish brown (5YR 4/8) sandy clay loam, moderate, medium subangular blocky; friable moist; few, very fine pores; compact (19 mm); few roots; semi-dry; very positive benzidine reaction.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases(%) at pF1-5 Solid	Liquid	Air	Particle size(%) Sand	Silt	Clay
A_{11}	0-17	—	—	—	—	—	—	—	—	—
A_{12}	17-30	—	—	—	—	—	—	—	—	—
B_1	30-48	—	—	—	—	—	—	—	—	—
B_2	48-100+	—	—	—	—	—	—	—	—	—

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content(%) pF1.0	pF1.5	pF3.0	pF4.0
A_{11}	—	—	—	—	—	—	—	—
A_{12}	—	—	—	—	—	—	—	—
B_1	—	—	—	—	—	—	—	—
B_2	—	—	—	—	—	—	—	—

Horizon	Storage Capacity(mm) of Available water (of 50 cm deep soil)	Easily available water	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_{11}	—	—	6.6	5.9	1.94	0.083	23.4	3.34	8.72
A_{12}			6.3	5.9	0.92	0.069	13.3	1.59	6.96
B_1			6.1	5.7	0.53	0.039	13.6	0.91	5.28
B_2			6.1	5.7	0.23	0.036	6.4	0.40	5.04

Horizon	Exchangeable bases Ca	Mg	Na	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	Available (ppm)	Total K_2O (%)
A_{11}	4.5	1.88	0.22	0.46	81.0	0.039	31.4	0.211
A_{12}	3.5	1.46	0.09	0.40	78.7	0.029	5.9	0.223
B_1	1.9	1.09	0.22	0.11	62.9	0.022	8.8	0.217
B_2	2.3	0.16	0.15	0.08	52.3	0.018	4.2	0.199

Horizon	Extractable S	Fe	Cu	Zn (ppm)	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_{11}	16.50	0.06	0.0	3.6	4.0	80	180
A_{12}	2.00	0.06	0.4	1.2	1.8	110	50
B_1	1.00	0.06	0.4	0.8	6.0	110	35
B_2	1.00	0.11	0.6	0.6	1.2	110	17

Profile No. 34

I. Information on the site.

a. Date of examination : 12 December 1973.

b. Location : Songpheenong, Tha Yang, Phetchaburi.

c. Land form :

i. Physiographic position : Foothill.

ii. Surrounding land form : Undulating to gently rolling land with slope of 2%.

d. Land use : Corn, cane, cotton, castorbean and banana cultivation.

II. General information on the soil.

a. Soil classification : Red Yellow Podzolic soils.

b. Parent material : Residuum from shale stone.

c. Drainage and water permeability : Well drained. Permeability is very low.

d. Moisture condition in profile : Semi-dry throughout the profile.

III. Profile description.

A_p 0-18 cm Reddish brown (5YR 4/6) silty loam; moderate, medium subangular blocky; common, fine and very fine pores; compact (20 mm); slightly plastic, slightly sticky; common roots; semi-dry; very positive benzidine reaction; gradual smooth boundary to

B_{21} 18-41 cm Reddish brown (2.5YR 4/6) silty loam; moderate, coarse subangular blocky; fine and very fine pores; compact (21 mm); slightly plastic, slightly sticky; few roots; semi-dry; positive benzidine reaction; clear, wavy boundary to

B_{22} 41-65 cm + Reddish brown (2.5YR 4/8) silty loam; abundant, weathered fine to medium subangular gravels (shale stone), friable moist; few, very fine pores; very compact (25 mm); slightly plastic, slightly sticky; few roots; semi-dry; slightly positive benzidine reaction.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density (g/cm³)	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)		Solid	Liquid	Air	Sand	Silt	Clay
A_p	0-18	17.6	26.0	1.48	57.1	33.7	9.2	44.7	46.9	8.4
B_{21}	18-41	15.2	25.1	1.65	63.3	27.2	9.5	47.1	46.7	6.2
B_{22}	41-65+	12.7	—	—	—	—	—	40.9	52.8	6.3

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_p	SiL	20	5.6×10^{-4}	36.8	36.1	33.7	25.3	—
B_{21}	SiL	21	1.1×10^{-5}	28.3	28.2	27.2	22.7	—
B_{22}	SiL	25	—	—	—	—	—	—

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_p	—	25.9	7.5	6.2	1.43	0.144	9.9	2.47	16.16
B_{21}			7.3	6.4	0.67	0.086	7.8	1.16	16.36
B_{22}			7.2	6.4	0.52	0.069	7.5	0.90	16.80

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_p	10.0	0.13	0.22	0.69	68.2	0.101	243.5	0.497
B_{21}	9.0	1.88	0.15	0.46	70.2	0.055	30.3	0.889
B_{22}	9.5	1.98	0.19	0.40	71.8	0.044	18.4	0.828

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_p	3.00	0.69	0.2	2.4	2.6	230	110
B_{21}	2.50	0.51	1.0	2.8	1.6	250	80
B_{22}	2.00	0.69	1.8	1.2	3.6	170	70

Profil No. 35

I. Information on the site.

a. Date of examination : 12 December 1973.
b. Location : Songpheenong, Tha Yang, Phetchaburi.
c. Land form :
  i. Physiographic position : Foothill of high mountain.
  ii. Surrounding land form : Undulating to gently rolling land with slope of 2 %.
d. Land use : Cotton cultivation.

II. General information on the soil.

a. Soil classification : Red Yellow Podzolic soils.
b. Parent material : Residuum from shale stone.
c. Drainage : Well drained.
d. Moisture condition in profile : Dry throughout the profile.

III. Profile description.

A_p 0-25 cm Light yellow orange (7.5YR 8/3) dry; light clay; few, fine to medium subangular gravels (shale stone); moderate, medium to coarse subangular blocky; many, fine and very fine pores; very compact (24 mm); slightly plastic, slightly sticky; common roots; dry; very positive benzidine reaction; clear, smooth boundary to

C 25 cm+ Rock (shale stone).

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases (%) at pF1-5 Solid	Liquid	Air	Particle size (%) Sand	Silt	Clay
A_p	0—25	—	—	—	—	—	—	—	—	—

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%) pF1.0	pF1.5	pF3.0	pF4.0
A_p	—	—	—	—	—	—	—	—

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Storage Capacity (mm) of Easily available water (of 50 cm deep soil)	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_p	—	—	7.6	6.1	1.62	0.174	9.3	2.79	14.20

Horizon	Exchangeable bases Ca (me/100g)	Mg	Na	K	Base saturation degree (%)	P_2O_5 Total (%)	P_2O_5 Available (ppm)	Total K_2O (%)
A_p	21.0	29.2	1.57	0.46	182.8	0.114	81.6	1.024

Horizon	Extractable S (ppm)	Fe	Cu	Zn	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_p	0.75	0.87	0.0	5.0	0.6	160	140

Profile No. 42

I. Information on the site.

a. Date of examination : 14 December 1973.
b. Location : Kangadai, Muang, Prachuap Khiri Kan.
c. Land form :
   i. Physiographic position : Foothill.
   ii. Surrounding land form : Undulating land with slope of 5 %.
d. Land use : Pineapple cultivation.

II. General information on the soil.

a. Soil classification : Red Yellow Podzolic soils.
b. Parent material : Residuum.
c. Drainage : Well drained. Permeability is moderately low. Runoff is rapid.
d. Moisture condition in profile : Top 18 cm of profile dry, semi-dry below.

III. Profile description.

A_p 0-18 cm Bright brown (7.5YR 5/6) clay loam; moderate, fine granular and moderate, fine to medium subangular blocky; common, fine and very fine pores; loose (6 mm); non plastic, slightly sticky; common roots; dry; slightly positive benzidine reaction; gradual smooth boundary to

B_{21} 18-48 cm Reddish brown (5YR 4/8) clay loam; moderate, medium and coarse subangular blocky, friable moist; common, fine and very fine pores; compact (20 mm); common roots; semi-dry; gradual smooth boundary to

B_{22} 48-80 cm + Bright reddish brown (5YR 5/8) light clay moderate, medium subangular blocky, very friable; common, fine very fine and coarse pores; slightly compact (17 mm); slightly plastic, slightly sticky; few roots; semi-dry.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases (%) at pF1-5 Solid	Liquid	Air	Particle size (%) Sand	Silt	Clay
A_p	0—18	3.7	4.5	1.21	46.5	29.4	24.1	54.7	24.6	20.7
B_{21}	18—48	14.3	22.7	1.59	61.2	30.7	8.1	54.7	20.6	24.7
B_{22}	48—80+	13.5	20.9	1.55	59.5	27.6	12.9	47.5	24.3	28.2

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%) pF1.0	pF1.5	pF3.0	pF4.0
A_p	CL	6	4.7×10^{-3}	43.1	33.9	29.4	22.2	—
B_{21}	CL	20	3.7×10^{-4}	33.9	33.2	30.7	25.9	—
B_{22}	LiC	17	6.3×10^{-4}	33.4	30.5	27.6	16.1	—

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Storage Capacity (mm) of Easily available water (of 50 cm deep soil)	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_p	—	28.3	5.8	5.1	1.43	0.101	14.2	2.47	4.24
B_{21}			5.1	4.5	0.89	0.071	12.5	1.53	4.16
B_{22}			5.0	4.1	0.48	0.038	12.6	0.83	2.72

Horizon	Exchangeable bases Ca	Mg	Na	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	P_2O_5 Available (ppm)	Total K_2O (%)
A_p	1.4	1.46	0.46	0.26	83.2	0.055	14.0	0.017
B_{21}	1.0	1.15	0.15	0.27	61.4	0.053	7.9	0.087
B_{22}	0.9	0.94	0.14	0.18	79.4	0.044	4.8	0.193

Horizon	Extractable S	Fe	Cu	Zn (ppm)	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_p	0.50	0.27	0.8	2.2	12.0	200	180
B_{21}	0.50	0.23	0.6	0.8	6.8	74	160
B_{22}	10.50	0.51	0.8	0.6	2.6	24	180

Profle No. 63

I. Infomation on the soil.

a. Date of examination : 30 January 1974.
b. Location : Khao Saming, Trat.
c. Land form :
   i . Physiographic position :
   ii . Surrounding land form : Undulating to gently rolling land with slope of 6 %.
d. Land use : Rubber, partly not cultivated.

II. General information on the soil.

a. Soil classification : Red Yellow Podzolic soils.
b. Parent material. ?
c. Drainage and water permeability : Well drained.
   Permeability is very high.
d. Moisture condition in profile : Semi-dry throughout the profile.

III. Profile description.

A_{11} 0-7 cm Brown (7.5YR 4/6) light clay; many, subrounded laterite gravels (size is 5-10 mm in diameter); strong, fine granular; loose (10 mm); slightly plastic,non sticky; many roots; semi-dry; gradual, smooth boundary to

A_{12} 7-26 cm Bright reddish brown (5 YR 5/6) heavy clay; abundant, subrounded laterite gravels (size is 2-10 mm in diameter); moderate, medium fine granular; compact (21 mm); slightly plastic, non sticky; common roots; semi-dry; gradual, smooth, boundary to

B_2 26-80 cm Bright brown (2.5 YR 5/8) heavy clay; abundant, subrounded laterite gravels (size is 2-10 mm in diameter) ; weak, medium subangular blocky, friable ; few, very fine pores : very compact (27 mm); few roots;

C 80 cm + Mixed soil bright brown (2.5 YR 5/8) in 5 portions and orange (7.5 YR 6/8) in 5 portions; heavy clay; common, subrounded laterite gravels (size is larger than 10 mm in diameter); moderate medium subangular blocky, friable; few,very fine pores; compact (23 mm); plastic, slightly sticky; few roots;

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density (g/cm³)	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)		Solid	Liquid	Air	Sand	Silt	Clay
A_{11}	0-7	14.1	19.2	1.36	52.4	36.0	11.6	44.6	12.6	42.8
A_{12}	7-26	13.7	20.4	1.49	47.1	26.7	16.2	36.6	12.6	50.8
B_2	26-80	15.1	23.4	1.55	59.8	25.9	14.3	34.5	10.4	54.8
C	80+	18.5	25.7	1.39	53.5	38.0	8.5	28.3	5.1	66.6

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_{11}	Lic	10	1.1×10^{-3}	42.1	38.3	35.9	28.8	—
A_{12}	HC	21	5.4×10^{-2}	39.4	29.7	26.7	23.4	—
B_2	HC	27	5.1×10^{-2}	37.6	28.3	25.8	22.0	—
C	HC	23	2.1×10^{-3}	43.7	40.5	38.0	30.2	—

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_{11}	—	20.4	5.2	3.9	1.60	0.108	14.8	2.76	5.50
A_{12}			5.3	3.8	1.13	0.086	13.1	1.95	5.40
B_2			5.4	3.8	0.86	0.059	14.6	1.48	3.00
C			5.6	3.8	0.69	0.053	13.0	1.19	5.60

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_{11}	0.35	0.45	0.33	0.20	24.0	0.053	6.6	0.169
A_{12}	0.29	0.33	0.33	0.06	18.6	0.055	2.2	0.064
B_2	0.35	0.42	0.34	0.06	38.9	0.055	1.8	0.157
C	0.23	0.30	0.33	0.06	16.4	0.059	0.9	0.428

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_{11}	9.25	12.20	0.2	1.4	1.2	60	40
A_{12}	6.00	7.08	0.8	1.0	0.8	6	21
B_2	10.25	1.80	1.4	1.4	1.4	6	22
C	11.75	1.24	0.6	1.0	0.8	4	22

Profile No. 79

I. Information on the site.

a. Date of examination : 17 April 1974.
b. Location : Thongchai, Bang Saphan, Prachuap Khiri Khan.
c. Land form :
   i . Physiographic position : High terrace.
   ii . Surrounding land form : Undulating.
d. Land use : Coconut and pineapple cultivation.

II. General information on the soil.

a. Soil classification : Red Yellow Podzolic soils.
b. Parent material : Old alluvium.
c. Drainage and water permeability : Well drained.
   Permeability is moderate.
d. Moisture condition in profile : Semi-dry throughout the profile.

III. Profile description.

A_p 0—13 cm Brown (7.5 YR 4/4) sandy laom; moderate, fine granular; loose (less than 5 mm); non plastic, non sticky; common roots; semi-dry; very positive benzidine reaction; gradual, smooth boundary to

A_{12} 13—18 cm Brown (7.5 YR 4/4) sandy loam; weak, medium subangular blocky structure, friable: common fine and very fine pores; slightly compact (18 mm); few, very fine pores; non plastic, non sticky; common roots; semi-dry; very positive benzidine reaction; clear, smooth boundary to

B_2 18-66 cm Brown (7.5 YR 4/6) sandy loam; moderate, medium subangular blocky structure; friable; common fine and very fine pores; compact (20 mm); non plastic; non sticky; few roots; semi-dry; slightly positive benzidine reaction; clear smooth boundary to

C 66 cm + Brown (7.5 YR 4/6); rounded and subrounded laterite gravel layer; few roots; semi-dry; slightly positive benzidine reaction.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases(%) at pF1-5 Solid	Liquid	Air	Particle size(%) Sand	Silt	Clay
A_p	0-13	12.6	16.3	1.29	49.6	30.6	19.8	76.9	19.7	3.4
A_{12}	13-18	12.6	18.9	1.50	57.6	30.0	12.4	75.7	22.7	1.6
B_2	18-66	8.5	14.1	1.66	64.0	24.1	11.9	74.6	15.6	9.8
C	66-80+	6.2	—	—	—	—	—	78.8	11.5	9.7

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content(%) pF1.0	pF1.5	pF3.0	pF4.0
A_p	SL	<5	4.0×19^{-3}	42.5	35.2	30.6	14.4	4.6
A_{12}	SL	18	2.5×10^{-3}	36.6	33.2	30.0	15.8	6.0
B_2	SL	20	1.1×10^{-3}	28.9	25.9	24.1	15.9	6.1
C	SL	—	—	—	—	—	—	—

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Easily available water	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_p	103.4	54.1	6.1	4.2	0.82	0.082	10.0	1.41	2.56
A_{12}			6.3	4.3	0.76	0.074	10.3	1.31	2.00
B_2			6.1	3.9	0.24	0.026	9.2	0.41	1.28
C			6.2	3.9	0.21	0.025	8.4	0.36	0.76

Horizon	Exchangeable bases Ca	Mg	Na	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	Available (ppm)	Total K_2O (%)
A_p	2.75	0.52	0.32	0.32	152.5	0.033	27.3	0.133
A_{12}	2.75	0.35	0.27	0.42	189.9	0.034	25.7	0.127
B_2	1.25	0.31	0.36	0.21	167.0	0.027	7.0	0.127
C	1.00	0.21	0.50	0.21	199.8	0.022	4.6	0.127

Horizon	Extractable S	Fe	Cu	Zn (ppm)	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_p	4.50	0.48	Tr	Tr	20.4	160	155
A_{12}	4-50	0.12	0.12	1.2	11.2	150	140
B_2	3.75	0.50	0.04	1.2	7.6	80	33
C	3.25	0.50	0.04	1.0	7.2	90	30

Profile No. 82

I. Information on the site.

a. Date of examination : 18 April 1974.
b. Location : Kra Buri Rubber Exp. St., Ranong.
c. Land form :
   i . Physiographic position : Hill.
   ii . Surrounding land form : Undulating to gently rolling, slope ranges from 4 to 5%.
d. Land use : Coffee cultivation.

II. General information on the soil.

a. soil classification : Red Yellow Podzolic soils.
b. Parent material : Residuum.
c. Drainage and water permeability. Well drained.
   Permeability is moderate. Runoff is rapid.
d. Moisture condition in profile : Semi-dry throughout the profile.

III. Profile description.

A_1 0-10 cm Brown (10 YR 4/4) light clay; strong, fine and medium granular; slightly compact (13 mm); non plastic, slightly sticky; common roots; semi-dry; slightly positive benzidine reaction; gradual, smooth boundary to

B_{21} 10-30 cm Bright brown (7.5 YR 5/8) light clay; moderate, medium subangular blocky structure; friable moist; common fine and very fine pores; compact (23 mm); slightly plastic, sticky; common roots; semi-dry; gradual, smooth boundary to

B_{22} 30-52 cm Bright reddish brown (5 YR 5/8) heavy clay; moderate, medium subangular blocky structure; friable moist; few, fine and very fine pores; compact (24 mm); slightly plastic, sticky; common roots; semi-dry; clear, smooth boundary to

C 52-85 cm + Bright reddish brown (5 YR 5/8); heavy clay; abundant, subangular gravels.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases (%) at pF1-5 Solid	Liquid	Air	Particle size (%) Sand	Silt	Clay
A_1	0-10	21.3	25.1	1.18	45.5	33.5	21.0	45.1	23.0	31.9
B_{21}	10-30	27.8	37.3	1.34	51.5	38.0	10.5	29.1	19.0	51.9
B_{22}	30-50	26.2	131.4	1.30	50.1	41.1	8.8	27.5	16.6	57.9
C	52-85	21-5	—	—	—	—	—	25.4	12.9	61.7

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%) pF1.0	pF1.5	pF3.0	pF4.0
A_1	LiC	13	2.3×10^{-2}	40.1	36.0	33.5	25.7	19.5
B_{21}	LiC	23	1.6×10^{-3}	43.0	40.7	38.0	31.4	27.2
B_{22}	HC	24	8.9×10^{-4}	45.6	43.1	41.1	35.0	30.6
C	HC	—	—	—	—	—	—	—

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Easily available water	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_1	56.6	33.2	5.5	3.9	2.66	0.189	14.1	4.59	9.60
B_{21}			5.1	3.1	0.82	0.095	8.6	1.41	6.96
B_{22}			5.1	3.0	0.79	0.086	9.2	1.36	7.48
C			5.2	3.0	0.63	0.086	7.3	1.09	8.48

Horizon	Exchangeable bases Ca	Mg	Na	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	Available (ppm)	Total K_2O (%)
A_1	2.50	0.94	0.07	0.42	40.9	0.099	15.4	1.160
B_{21}	0.90	0.27	0.46	0.32	27.9	0.093	2.9	1.400
B_{22}	0.45	0.20	0.22	0.18	14.0	0.093	5.3	1.506
C	0.45	0.27	0.68	0.40	21.2	0.099	5.7	1.551

Horizon	Extractable S	Fe	Cu	Zn (ppm)	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_1	5.25	2.88	0.04	0.2	30.0	160	150
B_{21}	24.00	1.84	0.04	1.0	3.2	35	33
B_{22}	16.75	1.40	0.04	0.6	2.4	20	23
C	19.00	1.92	0.16	2.4	3.6	40	18

Profile No. 83

I. Information on the site.

a . Date of examination : 18 April 1974.

b . Location : Kra Buri Rubber Exp. St., Ranong.

c . Land form :

i . Physiographic position : Hill.

ii . Surrounding land form : Undulating to gently rolling

d . Land use : Coffee cultivation.

II. General information on the soil.

a . Soil classification : Red Yellow Podzolic soils.

b . Parent material : Residuum.

c . Drainage : Well drained. Runoff is rapid.

d . Moisture condition in profile : Semi-dry throughout the profile.

III. Profile description.

A_1 0-10 cm Dull yellowish brown (10 YR 5/4) light clay; strong, fine and medium granular; compact (20 mm); non plastic, slightly sticky; common roots; semi-dry; slightly positive benzidine reaction; gradual, smooth boundary to

B_{21} 10-25 cm Orange (7.5 YR 6/6) heavy clay; moderate, medium subangular blocky structure, friable moist; common, fine and very fine pores; compact (24 mm); slightly plastic, sticky; common roots; semi-dry; gradual, smooth boundary to

B_{22} 25-50 cm Bright brown (7.5 YR 5/6) heavy clay; moderate, medium subangular blocky structure, friable moist; few fine; and very fine pores; very compact (26 mm); slightly plastic, sticky; few roots; semi-dry; clear, smooth boundary to

C 50-90 cm + Bright reddish brown (5 YR 5/8) clay loam; abundant, slightly weathered gravels.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases (%) at pF1-5 Solid	Liquid	Air	Particle size (%) Sand	Silt	Clay
A_1	0-10	—	—	—	—	—	—	—	—	—
B_{21}	10-25	—	—	—	—	—	—	—	—	—
B_{22}	25-50	—	—	—	—	—	—	—	—	—
C	50-90+	—	—	—	—	—	—	—	—	—

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%) pF1.0	pF1.5	pF3.0	pF4.0
A_1	—	—	—	—	—	—	—	—
B_{21}	—	—	—	—	—	—	—	—
B_{22}	—	—	—	—	—	—	—	—
C	—	—	—	—	—	—	—	—

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Easily available water (of 50 cm deep soil)	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_1	—	—	5.2	3.4	2.33	0.185	12.6	4.02	7.12
B_{21}			5.0	2.9	—	0.079	—	—	6.00
B_{22}			5.0	2.9	0.85	0.074	11.5	1.47	7.28
C			—	—	—	—	—	—	—

Horizon	Exchangeable bases Ca	Mg	Na	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	Available (ppm)	Total K_2O (%)
A_1	2.15	1.46	0.36	0.99	69.8	0.105	16.7	1.220
B_{21}	0.55	0.33	0.17	0.32	22.9	0.083	38.4	1.506
B_{22}	0.60	0.34	0.14	0.32	19.2	0.094	4.2	1.492
C	—	—	—	—	—	—	—	—

Horizon	Extractable S	Fe	Cu	Zn (ppm)	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_1	5.00	1.92	0.12	0.4	76.0	310	112
B_{21}	9.00	5.08	0.12	0.6	8.0	40	23
B_{22}	11.25	1.92	0.12	2.0	2.8	6	21
C	—	—	—	—	—	—	—

Profile No. 84

I. Information on the site.

a. Date of examination : 18 April 1974.
b. Location : Kra Buri Rubber Exp. St., Ranong.
c. Land form :
   i. Physiographic position : Hill.
   ii. Surrounding land form : Undulating. Slope ranges from 3 to 5%.
d. Land use : Rubber cultivation.

II. General information on the soil.

a. Soil classification : Red Yellow Podzolic soils.
b. Parent material : Residuum.
c. Drainage and water pemeability : Well drained.
   Permeability is moderately high. Runoff is rapid.
d. Moisture condition in profile : Semi-dry throughout the profile.

III. Profile description.

A_1 0-13 cm Brown (7.5 YR 4/3) light clay; strong,fine and medium granular; loose (10 mm), non plastic, slighly sticky; common roots; semi-dry; slightly positive benzidine seaction; clear, smooth boundary to

B_{21} 13-70 cm Reddish brown (5 YR 4/8) heavy clay; moderate, medium subangular blocky structure; few, fine and very fine pores; very compact (25 mm); slightly plastic, sticky; common roots; semi-dry; gradual, smooth boundary to

B_{22} 70-115 cm+ Mixed soil bright reddish brown (5 YR 5/8) in 9 portions and orange (7.5 YR 6/6) in 1 portion; heavy clay; moderate medium subangular blocky structure; few,fine and very fine pores; very compact (25 mm); slightly plastic, sticky; few roots; semi-dry.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases (%) at pF1-5 Solid	Liquid	Air	Particle size (%) Sand	Silt	Clay
A_1	0-13	26.6	29.3	1.10	42.5	38.7	18.8	33.0	25.1	41.9
B_{21}	13-70	33.3	39.6	1.19	45.6	43.7	10.7	23.1	19.0	57.9
B_{22}	70-115+	32.3	40.4	1.25	48.2	44.8	7.0	21.4	14.8	63.8

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%) pF1.0	pF1.5	pF3.0	pF4.0
A_1	LiC	10	4.0×10^{-2}	46.1	41.2	38.7	33.7	25.1
B_{21}	HC	25	2.7×10^{-3}	48.9	45.9	43.7	37.8	32.5
B_{22}	HC	23	4.6×10^{-4}	48.0	45.7	44.8	39.0	34.1

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Storage Capacity (mm) of Easily available water (of 50 cm deep soil)	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_1	59.1	28.3	5.1	3.2	3.03	0.168	18.0	5.22	11.76
B_{12}			5.2	3.0	1.13	0.112	10.1	1.95	7.28
B_{22}			5.2	3.0	0.76	0.085	8.9	1.31	9.76

Horizon	Exchangeable bases Ca (me/100g)	Mg	Na	K	Base saturation degree (%)	P_2O_5 Total (%)	Available (ppm)	Total K_2O (%)
A_1	2.45	5.37	0.16	0.87	75.2	0.099	8.6	1.461
B_{21}	0.50	0.79	0.32	0.40	28.6	0.108	5.3	1.461
B_{22}	0.30	0.81	0.16	0.32	16.3	0.110	4.2	1.551

Horizon	Extractable S (ppm)	Fe	Cu	Zn	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_1	5.00	2.80	0.12	0.6	33.2	420	110
B_{21}	19.00	2.24	0.12	0.6	2.0	70	35
B_{22}	19.00	1.32	0.08	0.4	1.2	20	23

Profile No. 85

I Information on the site.

a . Date of examination : 18 April 1974.
b . Location : Kra Buri Rubber Exp. St., Ranong.
c . Land form :
  i . Physiographic position : hill.
  ii . Surrounding land form : Undulating to gently rolling. Slope ranges from 4 to 5%
d . Land use : Rubber cultivation.

II General information on the soil.

a . Soil classification : Red Yellow Podzolic soils.
b . Parent material : Residuum
c . Drainage : Well drained. Runoff is rapid.
d . Moisture condition in profile : Semi-dry throughout the profile.

III Profile description.

A_1 0-15 cm Dull yellowish brown (10 YR 5/3) sandy clay loam; moderate, fine granular and subangular blocky structure; compact (20 mm); non plastic, slightly sticky; common roots; semi-dry; clear, smooth boundary to

B_2 15-72 cm Dull yellow orange (10 YR 6/4) light clay; common, distinct bright reddish brown (5 YR 5/8) spotty iron mottles; moderate, medium subangular blocky structure; friable moist; few, fine and very fine pores; very compact (26 mm); plastic, sticky; few roots; semi-dry; clear, smooth boundary to

C 72-90 cm Bright yellowish brown (10 YR 7/6) light clay; gravel layer.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases(%) at pF1-5 Solid	Liquid	Air	Particle size(%) Sand	Silt	Clay
A_1	0-15	—	—	—	—	—	—	—	—	—
B_2	15-72	—	—	—	—	—	—	—	—	—
C	72-90+	—	—	—	—	—	—	—	—	—

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content(%) pF1.0	pF1.5	pF3.0	pF4.0
A_1	—	—	—	—	—	—	—	—
B_2	—	—	—	—	—	—	—	—
C	—	—	—	—	—	—	—	—

Horizon	Storage Capacity(mm) of Available water (of 50 cm deep soil)	Easily available water	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_1	—	—	4.7	3.1	1.10	0.087	12.6	1.90	3.68
B_2			4.8	2.5	0.57	0.050	11.4	0.98	4.16
C			—	—	—	—	—	—	—

Horizon	Exchangeable bases Ca	Mg	Na	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	Available (ppm)	Total K_2O (%)
A_1	0.55	0.13	0.32	0.18	32.0	0.105	133.4	1.220
B_2	0.10	0.02	0.18	0.08	9.2	0.077	5.7	1.808
C	—	—	—	—	—	—	—	—

Horizon	Extractable S	Fe	Cu	Zn (ppm)	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_1	4.75	30.40	0.12	3.4	2.0	9	66
B_2	28.0	15.28	0.12	0.6	1.2	3	26
C	—	—	—	—	—	—	—

Profile No. 86

I Information on the site.

a . Date of examination : 18 April 1974.

b . Location : Kra Buri Rubber Exp. St., Ranong.

c . Land form :

i . Physiographic position : Hill.

ii . Surrounding land form : Undulating. Slope ranges from 3 to 4%

d . Land use : Rubber cultivation.

II General information on the soil.

a . Soil classification : Red Yellow Podzolic soils.

b . Parent material : Residuum.

c . Drainage and water permeability : Moderately well drained. Permeability is moderate to moderately low. Runoff is rapid.

d . Moisture condition in profile : Semi-dry throughout the profile.

III Profile description.

A_1 0-20 cm Dull yellowish brown (10 YR 3/3) light clay; moderate, medium subangular blocky structure; common, fine and very fine pores; compact (21 mm); slightly plastic, slightly sticky; common roots; semi-dry; clear, smooth boundary to

B_2 20-99 cm + Dull yellowish brown (10 YR 5/3) heavy clay; abundant, distinct bright brown (7.5 YR 5/8) spotty iron mottles; moderate, medium subangular blocky structure, friable; few, fine and very fine pores; very compact (25 mm); plastic, sticky; few roots; semi-dry.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)	(g/cm³)	Solid	Liquid	Air	Sand	Silt	Clay
A_1	0-20	25.1	33.9	1.35	51.8	40.2	8.0	29.2	32.3	38.5
B_2	20-88+	23.5	33.6	1.43	55.1	39.2	5.7	21.5	25.9	52.6

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_1	LiC	21	1.0×10^{-3}	43.1	41.3	40.2	31.3	23.5
B_2	HC	25	6.8×10^{-4}	41.7	40.2	39.2	33.3	28.5

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_1	65.5	35.5	4.3	2.9	1.43	0.125	11.4	2.47	6.64
B_2			5.1	3.1	0.51	0.067	7.6	0.88	6.56

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_1	0.25	0.13	0.09	0.08	8.2	0.110	14.5	1.235
B_2	0.40	0.25	0.10	0.08	12.6	0.099	4.8	1.808

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_1	6.50	36.40	0.08	2.6	3.2	16	70
B_2	6.50	6.92	0.08	1.2	0.4	12	20

Profile No. 87

I Information on the site.

a . Date of examination : 19 April 1974.
b . Location : Thalang Rubber Exp. St., Phuket.
c . Land form :
  i . Physiographic position : Foot of mountain.
  ii . Surrounding land form : Flat to gently undulating.
d . Land use : Rubber cultivation.

II General information on the soil.

a . Soil classification : Red Yellow Podzolic soils.
b . Parent material : Residuum.
c . Drainage and water permeability : Well drained. Permeability is high to moderately high.
d . Moisture condition in profile : Semi-dry throughout the profile.

III Profile description.

A_p 0-18 cm Dull yellowish brown (10 YR 4/3) sandy clay loam; moderate, fine granular and single grain; slightly compact (16 mm); non plastic, non sticky; common roots; semi-dry; faint 2,2' - dipyridyl reaction; clear, smooth boundary to

B_{21} 18-50 cm Dull yellow orange (10 YR 6/3) sandy clay; moderate, medium subangular blocky; common, fine and very fine pores; compact (24 mm); slightly plastic, slightly sticky: few roots; semi-dry; faint 2, 2' - dipyridyl reaction; gradual smooth boundary to

B_{22} 50-89 cm + Dull yellowish brown (10 YR 5/4) sandy clay; few, distinct bright brown (7.5 YR 5/8) spotty iron mottles; moderate medium subangular blocky structure; common, fine and very fine pores; very compact (26 mm); plastic, sticky; few roots, semi-dry; faint 2,2' - dipyridyl reaction.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density (g/cm³)	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)		Solid	Liquid	Air	Sand	Silt	Clay
A_p	0-18	9.5	12.7	1.34	51.3	24.0	24.7	75.7	8.1	16.2
B_{21}	18-50	13.2	19.0	1.44	55.3	28.1	16.6	61.0	8.3	30.7
B_{22}	50-89	14.0	19.0	1.36	52.2	30.8	17.0	63.2	8.2	28.6

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_p	SCL	16	9.4×10^{-3}	33.8	30.3	24.0	17.0	10.8
B_{21}	SC	24	7.1×10^{-3}	36.2	33.6	28.1	19.2	16.5
B_{22}	SC	26	2.8×10^{-3}	37.8	35.0	30.8	19.9	16.1

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_p	60.9	40.8	4.5	3.2	1.03	0.073	14.1	1.78	1.92
B_{21}			4.4	3.2	0.48	0.031	15.5	0.83	2.76
B_{22}			—	—	0.36	0.034	10.6	0.62	3.84

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_p	0.25	0.09	0.27	0.40	52.7	0.077	76.4	0.099
B_{21}	0.15	0.06	0.46	0.18	31.3	0.066	14.3	0.157
B_{22}	0.15	0.06	0.17	0.08	12.1	0.056	7.5	0.178

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_p	13.75	5.00	0.08	2.8	0.4	9	52
B_{21}	29.50	6.28	0.12	2.2	0.4	4	50
B_{22}	21.25	2.72	0.12	2.6	0.4	3	35

Profile No. 88

I Information on the site.

a . Date of examination : 19 April 1974.
b . Location : Thalang Rubber Exp. St., Phuket.
c . Land form :
  i . Physiographic position : Foot of mountain.
  ii . Surrounding land form : Flat to gently undulating.
d . Land use : Rubber cultivation.

II General information on the soil.

a . Soil classification : Red Yellow Podzolic soils.
b . Parent material : Residuum.
c . Drainage : Moderately well drained.
d . Moisture condition in profile : Semi-dry throughout the profile.

III Profile description.

A_p 0-15 cm Dull yellowish brown (10 YR 4/3) sandy clay loam; moderate, fine granular and single grain; slightly compact (17 mm); non plastic, non sticky; common roots; semi-dry; clear, smooth boundary to

B_2 15-72 cm Dull yellow orange (10 YR 6/4) sandy clay; common, distinct yellowish brown (10 YR 5/8) spotty iron mottles; moderate, medium subangular blocky structure; common, fine and very fine pores; very compact (25 mm); slightly plastic, slightly sticky; few roots; semi-dry; clear smooth boundary to

C 72-90 cm + Dull yellow orange (10 YR 6/4) sandy clay; weathered gravel layer.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density (g/cm³)	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)		Solid	Liquid	Air	Sand	Silt	Clay

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	

Profile No. 89

I Information on the site.

a . Date of examination : 19 April 1974.
b . Location : Wangthang Rubber Exp. St., Thai Muang, Phangnga
c . Land form :
  i . Physiographic position : Foot of mountain.
  ii . Surrounding land form : Flat to gently undulating.
d . Land use : Rubber cultivation.

II General information on the soil.

a . Soil classification : Red Yellow Podzolic soils.
b . Parent material : Residuum
c . Drainage and water permeability : Well drained.
Permeability is very high.
d . Moisture condition is profile : Semi-dry throughout the profile.

III Profile description.

A_p 0-10 cm Yellowish brown (10 YR 5/6) sandy clay; moderate fine granular; slightly compact (17 mm); non plastic, slightly sticky; common roots; semi-dry; gradual, smooth boundary to

B_2 10-77 cm Bright yellowish brown (10 YR 6/6) light clay; moderate, medium subangular blocky structure; fine and very fine pores, friable moist; compact (20 mm); slightly plastic, sticky; few roots; semi-dry; gradual, smooth boundary to

BC 77-100 cm + Bright yellowish brown (10 YR 6/8) gravelly; heavy clay; many, distinct bright reddish brown (5 YR 5/8) spotty iron mottles; weak, medium subangular blocky, friable moist; few, fine pores; compact (20 mm); semi-dry; visible, mica flakes.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)	(g/cm³)	Solid	Liquid	Air	Sand	Silt	Clay
A_p	0-10	15.9	20.5	1.29	49.8	31.8	18.4	60.4	6.6	33.0
B_2	10-77	21.6	27.9	1.29	49.5	33.3	17.2	53.2	8.1	38.7
BC	77-100+	17.5	—	—	—	—	—	38.4	8.4	53.2

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_p	SC	17	1.3×10^{-2}	42.7	36.6	31.8	24.1	16.5
B_2	LiC	20	9.5×10^{-3}	46.1	37.9	33.3	29.1	21.1
BC	HC	—	—	—	—	—	—	—

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_p	64.1	24.5	4.6	3.5	1.07	0.074	14.5	1.84	3.92
B_2			4.9	3.3	1.03	0.073	14.1	1.78	3.36
BC			4.9	3.4	0.82	0.073	11.2	1.41	5.04

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_p	0.15	0.13	0.07	0.08	10.8	0.099	15.8	0.355
B_2	0.45	0.27	0.16	0.08	28.5	0.044	8.6	0.355
BC	0.90	0.86	0.11	0.20	38.8	0.056	11.9	0.419

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_p	32.75	4.92	0.12	1.4	0.4	3	53
B_2	24.50	1.88	0.08	3.8	0.8	9	43
BC	24.75	0.08	0.08	0.8	0.8	9	53

Profile No. 90

I Information on the site.

a . Date of examination : 19 April 1974.
b . Location : Nai Chong Rubber Exp. St., Ao Luk, Krabi.
c . Land form :
  i . Physiographic position: Foothill.
  ii . Surrounding land form : Undulating to gently undulating, with slope ranging from 2 to 3%.
d . Land use : Rubber cultivation.

II General information on the soil.

a . Soil classification : Red Yellow Podzolic soils.
b . Parent material : Residuum from shale.
c . Drainage and water permeability : Moderately well drained. Permeability is very low.
d . Moisture condition in profile : Semi-dry throughout the profile.
e . Remark : Near this site, red soil classified as Reddish Brown Lateritic soil was present.

III Profile description.

A_p 0-15 cm Brown (10 YR 4/4) clay loam; moderate, fine granular and medium subangular blocky structure; slightly compact (18 mm); non plastic, slightly sticky; common roots; semi-dry; slightly positive benzidine reaction; gradual, smooth boundary to

B_{21} 15-45 cm Bright brown (7.5 YR 5/6) light clay; moderate, medium subangular blocky structure; few, fine and very fine pores; friable moist; very compact (27 mm); slightly plastic, sticky; few roots; semi-dry; slightly positive benzidine reaction; gradual smooth boundary to

B_{22} 45-88 cm + Bright brown (7.5 YR 5/8) heavy clay; moderate, medium subangular blocky structure, friable moist; common, fine and very fine pores; compact (24 mm); plastic, sticky; few roots; semi-dry; slightly positive benzidine reaction.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density (g/cm³)	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)		Solid	Liquid	Air	Sand	Silt	Clay
A_p	0-15	21.3	25.3	1.19	45.8	31.0	32.2	39.5	27.9	32.6
B_{21}	15-45	20.9	32.2	1.54	59.1	36.1	4.8	37.0	18.1	44.9
B_{22}	45-88+	23.6	133.0	1.40	53.7	37.9	8.4	28.5	20.4	51.1

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_p	CL	18	1.6×10^{-2}	44.3	36.1	31.0	22.0	17.9
B_{21}	LiC	27	2.3×10^{-6}	37.2	36.5	36.1	28.0	23.6
B_{22}	HC	24	7.3×10^{-5}	40.7	39.2	37.9	30.0	26.6

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_p	62.8	41.2	4.8	3.6	1.32	0.095	13.9	2.28	3.60
B_{21}			4.9	3.4	0.73	0.059	12.4	12.6	2.72
B_{22}			4.9	3.4	0.33	0.041	8.0	0.57	3.20

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_p	0.65	0.28	0.25	0.18	37.8	0.072	9.9	0.078
B_{21}	0.20	0.13	0.06	0.08	16.9	0.077	3.7	0.093
B_{22}	0.60	0.07	0.10	0.08	26.5	0.083	2.6	0.127

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_p	8.25	0.88	0.08	2.0	8.0	150	98
B_{21}	26.25	0.52	0.08	3.2	1.6	50	52
B_{22}	37.00	Tr	0.08	3.0	1.2	60	22

Profile No. 92

I. Information on the site.

a. Date of examination : 20 April 1974.
b. Location : Kaochong Rubber Exp. St., Muang, Trang.
c. Land form :
   i. Physiographic position : Middle terrace.
   ii. Surrounding land form : Undulating to gently rolling with slope ranging from 3 to 8%.
d. Land use : Rubber cultivation.

II. General infomation on the soil.

a. Soil classification : Red Yellow Podzolic soils.
b. Parent material : Old alluvium.
c. Drainage and water permeability : Well drained.
   Permeability is moderate to moderately high. Runoff is rapid.
d. Moisture condition in profile : Semi-dry throughout the profile.

III. Profile description.

A_1 0-20 cm Dull yellowish brown (10 YR 4/3) sandy loam; moderate, fine granular; slightly compact (17 mm); non plastic, non sticky; common roots; semi-dry; faint 2,2'-dipyridyl reaction; clear, smooth boundary to

B_2 20-60 cm Yellowish brown (10 YR 5/8) sandy clay; weak, medium subangular blocky structure; common, fine and very fine pores, friable; slightly compact (18 mm); slightly plastic, sticky; common roots; semi-dry; gradual smooth boundary to

BC 60-80 cm Bright yellowish brown (10 YR 6/8) sandy clay loam; common, fine, subrounded gravels; weak, medium subangular blocky structure, friable; common, fine and very fine pores; slightly plastic, sticky; very compact (27 mm); few roots; semi-dry; clear, smooth boundary to

C 80-97 cm + Bright yellowish brown (10 YR 6/8); abundant, fine subrounded gravels; massive; common, fine pores; friable; slightly compact (18 mm); non plastic, non sticky; few roots; semi-dry.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density (g/cm³)	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)		Solid	Liquid	Air	Sand	Silt	Clay
A_1	0-20	18.7	26.9	1.44	55.3	32.3	12.4	69.2	18.9	11.9
B_2	20-60	20.7	29.6	1.43	54.9	32.0	13.1	62.9	10.9	26.2
BC	60-80	11.3	15.0	1.33	51.3	30.1	18.6	61.1	16.9	22.0
C	80-97+	10.6	—	—	—	—	—	65.2	12.6	22.2

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_1	SL	17	4.0×10^{-3}	39.7	36.3	32.3	25.2	13.2
B_2	SCL	18	1.6×10^{-3}	37.9	35.4	32.0	25.0	18.5
BC	SCL	27	6.9×10^{-3}	40.4	37.0	30.1	20.9	14.7
C	SCL	—	—	—	—	—	—	—

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_1	78.8	35.2	6.7	4.9	1.19	0.087	13.7	2.05	4.88
B_2			6.8	4.8	0.42	0.042	10.0	0.72	3.84
BC			5.7	3.9	0.33	0.022	15.0	0.57	3.52
C			5.3	3.1	0.27	0.016	16.9	0.47	3.76

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_1	0.70	0.29	0.16	0.32	30.0	0.094	42.1	0.304
B_2	0.70	0.14	0.16	0.18	30.7	0.071	9.4	0.358
BC	1.05	0.15	0.25	0.18	46.3	0.072	7.0	0.389
C	0.65	0.13	0.07	0.08	24.7	0.066	12.3	0.380

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_1	5.75	0.64	0.12	0.2	0.8	10	83
B_2	5.75	0.92	0.16	0.6	0.4	10	43
BC	31.50	0.60	0.12	1.4	0.4	50	32
C	34.50	0.76	0.12	0.8	0.8	40	44

Profile No. 93

I. Information on the site.

a . Date of examination ; 20 April 1974.
b . Location : Kaochong Rubber Exp. St., Muang, Trang.
c . Land form :
  i . Physiographic position : Foot of mountain.
  ii . Surrounding land form : Undulating to gently rolling. Slope ranges from 2 to 3%.
d . Land use : Durian and citrus cultivation.

II. General information on the soil.

a . Soil classification : Red Yellow Podzolic soils.
b . Parent material : Residuum.
c . Drainage and water permeability : Moderate, well drained. Permeability is low.
d . Moisture condition in profile : Top 20 cm of profile semi-dry, moist below.

III. Profile description.

A_1 0-20 cm Brown (10 YR 4/4) clay loam; moderate, fine granular and fine subangular blocky structure; few, fine pores; compact (19 mm); non plastic; slightly sticky; common roots; semi-dry; slightly positive benzidine reaction; faint 2,2'-dipyridyl reaction; clear, smooth boundary to

B_{21} 20-50 cm Dull yellowish brown (10 YR 5/4) light clay; moderate, medium subangular blocky structure; few, fine and very fine pores; compact (21 mm); plastic, sticky; few roots; moist; gradual smooth boundary to

B_{22} 50-95 cm + Bright brown (7.5 YR 5/8) light clay; common, distinct reddish brown (2.5 YR 4/6) spotty iron mottles; moderate, medium subangular blocky structure, friable; few, fine and very fine pores; very compact (27 mm); plastic, sticky; few roots; moist.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)	(g/cm³)	Solid	Liquid	Air	Sand	Silt	Clay
A_1	0-20	25.6	33.0	1.29	49.7	39.2	11.1	45.3	32.8	21.9
B_{21}	20-50	23.5	34.1	1.45	55.9	38.9	5.2	42.8	25.0	32.2
B_{22}	50-95+	21.6	31.8	1.47	56.6	37.6	5.8	41.4	22.7	35.9

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_1	CL	19	2.6×10^{-3}	45.9	42.3	39.2	29.6	18.4
B_{21}	LiC	21	5.5×10^{-5}	40.9	39.8	38.9	23.7	22.2
B_{22}	LiC	27	4.0×10^{-5}	39.4	39.0	37.6	28.3	25.4

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_1	91.7	40.8	4.9	3.2	1.34	0.111	12.1	2.31	3.60
B_{21}			5.1	3.4	0.48	0.031	15.5	0.83	2.40
B_{22}			5.4	3.6	0.48	0.045	10.7	0.83	3.60

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_1	0.40	0.20	0.17	0.18	26.5	0.121	19.1	0.813
B_{21}	0.20	0.60	0.10	0.08	18.3	0.083	4.4	0.979
B_{22}	0.15	0.02	0.11	0.08	10.0	0.099	3.7	0.783

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_1	6.00	2.32	0.12	19.2	19.2	160	45
B_{21}	16.75	0.6	0.16	1.6	1.6	100	28
B_{22}	9.75	0.64	0.20	1.2	1.2	40	13

Profile No. 96

I. Information on the site.

a. Date of examination : 21 April 1974.
b. Location : Khok Pho Rubber Exp. St., Pattani.
c. Land form:
  i. Physiographic position : Foot of hill.
  ii. Surrounding land form : Undulating. Slope ranges from 1 to 2 %.
d. Land use : Rubber cultivation.

II. General information on the soil.

a. Soil classification : Red Yellow Podzolic soils.
b. Parent material : Residuum.
c. Drainage and permeability : Moderately well drained. Permeability is low to moderately low.
d. Moisture condition in profile : Top 30 cm of profile semi-dry, moist below.

III. Profile description.

A_1 0-30 cm Brown (7.5YR4/3) sandy loam; weak, medium subangular blocky structure; few, fine and very fine pores; compact (19 mm); non plastic, non sticky; common roots; semi-dry; faint 2,2'-dipyridyl reaction; clear, smooth boundary to

B_{21} 30-55 cm Bright reddish brown (5YR5/6) sandy clay loam; moderate, medium subangular blocky structure, friable; few, fine pores; compact (20 mm); slightly plastic, slightly sticky; few roots, moist; faint 2.2'-dipyridyl reaction; gradual, smooth boundary to

B_{22} 55-95 cm + Bright reddish brown (5YR5/8) sandy clay loam; moderate, medium subangular blocky structure; few, fine and very fine pores; compact (20 mm); slightly plastic, slightly sticky; few roots; faint 2,2'-dipyridyl reaction.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density (g/cm³)	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)		Solid	Liquid	Air	Sand	Silt	Clay
A_1	0-30	10.6	16.2	1.53	59.0	23.3	17.7	73.3	8.9	12.8
B_{21}	30-55	14.2	22.6	1.59	61.3	27.3	11.4	74.1	7.0	18.9
B_{22}	55-95+	15.3	23.3	1.52	58.5	28.7	12.8	72.4	6.8	20.8

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_1	SL	19	8.5×10^{-4}	29.1	27.6	23.3	12.1	8.3
B_{21}	SCL	20	1.8×10^{-4}	31.4	29.8	27.3	20.0	12.9
B_{22}	SCL	20	7.0×10^{-4}	34.7	31.8	28.7	18.1	18.1

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_1	73.8	48.2	4.4	2.9	0.76	0.056	13.6	1.31	3.28
B_{21}			4.5	3.1	0.30	0.032	9.4	0.52	4.80
B_{22}			4.4	3.1	0.15	0.014	10.7	0.26	4.96

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_1	0.35	0.07	0.36	0.08	26.3	0.149	471.7	0.145
B_{21}	0.05	0.01	0.06	0.08	4.0	0.055	10.3	0.253
B_{22}	0.05	0.02	0.16	0.08	6.1	0.056	2.9	0.313

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_1	5.50	30.00	0.08	1.2	1.2	6	40
B_{21}	6.75	31.00	0.08	4.8	0.4	6	27
B_{22}	28.25	8.00	0.08	0.8	0.4	3	50

Profile No. 97

I. Information on the site.

a. Date of examination : 21 April 1974.
b. Location : Khok Pho Rubber Exp. St., Pattani.
c. Land from :
   i. Physiographic position:
   ii. Surrounding land from : Undulating. Slope ranges from 2 to 3 %.
d. Land use : Rubber cultivation.

II. General infrmation on the soil.

a. Soil classification : Red Yellow Podzolic soils.
b. Parent material : Residuum.
c. Drainage and water permeability : Well drained.
   Permeability is high.
d. Moisture condition in profile : Top 42 cm of profile semi-dry, moist below.

III. Profile description.

A_1 0-25 cm Brown (7.5YR4/3)sandy loam; weak, medium, subangular blocky structure, friable; few, fine pores; compact (20 mm); non plastic, non sticky; common roots; semi--dry; moderate 2,2'-dipyridyl reaction; gradual, smooth boundary to

AB 25-42 cm Brown (7.5YR4/6) sandy loam; weak, medium, subangular blocky structure, friable; few, fine and very fine pores; compact (20 mm); non plastic, slightly sticky; few roots; semi-dry; moderate 2,2'-dipyridyl reaction; clear smooth boundary to

B_2 42-70 cm + Bright brown (7.5YR5/6) sandy loam; weak, medium, subangular blocky structure, friable; few, fine pores; slightly compact (16 mm); non plastic, slightly sticky; few roots; moist.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)	(g/cm³)	Solid	Liquid	Air	Sand	Silt	Clay
A_1	0-25	9.7	14.7	1.52	58.6	21.5	19.9	78.1	8.9	13.0
AB	25-42	9.8	14.2	1.45	55.7	28.3	16.0	80.6	6.5	12.9
B_2	42-70+	12.8	18.8	1.47	56.5	28.5	15.0	78.5	8.9	12.6

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_1	SL	20	2.7×10^{-3}	28.0	25.2	21.5	13.4	7.1
AB	SL	20	5.2×10^{-3}	36.9	33.6	28.3	13.6	7.9
B_2	SL	16	5.8×10^{-3}	36.5	32.2	28.5	15.1	6.4

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_1	88.4	56.0	4.4	3.1	0.73	0.047	15.5	1.26	3.20
AB			4.6	3.3	0.45	0.029	15.5	0.78	2.40
B_2			4.5	3.3	0.21	0.022	9.6	0.36	2.00

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_1	0.20	0.06	0.99	0.316	49.3	0.044	74.2	0.208
AB	0.05	0.02	0.91	0.184	48.5	0.026	11.4	0.202
B_2	0.15	0.02	0.55	0.184	45.0	0.022	5.7	0.178

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_1	8.00	25.32	0.08	3.4	0.4	5	48
AB	8.75	21.00	0.08	Tr	0.4	6	28
B_2	8.25	14.60	0.08	1.8	0.4	6	32

Profile No. 98

I. Information on the site.

a . Date of examination : 21 April 1974.
b . Location : Khok Pho Rubber Exp. St., Pattani.
c . Land forme :
  i . Physiographic position : Hill.
  ii . Surrounding land form : Undulating. Slope ranges forme 2 to 3 %.
d . Land use : Rubber cultivation.

II. General information on the soil.

a . Soil classification : Red Yellow Podzolic soils.
b . Parent material : Residuum.
c . Drainage and water prmeability : Well drained.
Permeability is moderate to moderately low.
d . Moisture condition in profile : Top 38 cm of profile semi-dry, moist below.

III. Profile description.

A_1 0-18 cm Dark brown (7.5YR3/3) sandy clay loam; weak, medium subangular blocky structure, friable; few, fine pores; compact (20 mm); non plastic, non sticky; common roots; semi-dry; faint 2,2'-dipyridyl reaction; clear, smooth boundary to

B_{21} 18-38 cm Brown (7.5YR5/6) sandy clay loam; weak, medium subangular blocky structure, friable; few, fine pores; compact (20 mm); non plastic, non sticky; few roots; semi-dry; faint 2,2'-dipryridyl reaction; gradual, smooth boundary to

B_{22} 38-80 cm + Bright brown (7.5YR 5/6) sandy clay loam; weak, medium subangular blocky structure; few, fine pores; compact (21 mm); plastic, sticky; few roots; moist; faint 2,2'-dipyridyl reaction.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density (g/cm³)	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)		Solid	Liquid	Air	Sand	Silt	Clay
A_1	0-18	14.2	21.7	1.53	58.7	27.1	14.2	76.8	8.9	14.3
B_{21}	18-38	14.8	22.3	1.51	57.9	29.3	12.8	75.6	5.9	18.5
B_{22}	38-80+	16.0	24.5	1.53	58.8	27.5	13.7	71.4	6.6	22.0

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_1	SCL	20	1.1×10^{-3}	33.6	31.4	27.1	13.2	7.0
B_{21}	SCL	20	7.1×10^{-4}	33.0	32.0	29.3	15.2	7.6
B_{22}	SCL	21	3.5×10^{-4}	33.5	31.6	27.5	17.8	11.0

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_1	99.4	69.4	4.7	3.1	0.67	0.052	12.9	1.16	2.32
B_{21}			4.8	3.2	0.36	0.034	10.6	0.62	2.32
B_{22}			5.1	3.4	0.21	0.029	7.2	0.36	2.48

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_1	0.10	0.08	0.55	0.18	39.3	0.039	11.0	0.274
B_{21}	0.15	0.08	0.89	0.32	61.9	0.055	4.8	0.358
B_{22}	0.10	0.06	0.77	0.32	50.4	0.041	2.6	0.500

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_1	0.75	16.40	0.08	1.6	0.8	7	28
B_{21}	0.75	23.10	0.08	0.6	0.8	6	26
B_{22}	0.50	14.00	0.08	0.6	0.4	5	16

Profile No. 100

I. Information on the site.

a . Date of examination : 22 April 1974.

b . Location : Khok Pri Meng Rubber Exp. St., Sungai Padi.

c . Land form :

i . Physiographic position : High terrace.

ii . Surrounding land form : Undulating. Slope ranges from 3 to 5%.

d . Land use : Rubber cultivation.

II. General information on the soil.

b . Soil classification : Red Yellow Podzolic soils.

b . Parent material : Residuum.

c . Drainage and water permeability : Moderately well drained. Permeability is low to very low. Runoff is rapid.

d . Moisture condition in profile : Semi-dry throughout the profile.

III. Profile description.

A_1 0-17 cm Bright brown (7.5 YR 5/8) sandy clay: moderate, fine granular and fine subangular blocky structure: few very fine pores; compact (20 mm); slightly plastic, slightly sticky; common roots; semi-dry; gradual, smooth boundary to

B_{21} 17-37 cm Orange (7.5 YR 6/8) sandy clay; moderate, medium subangular blocky structure, friable moist; fine pores; compact (22 mm); slightly plastic, sticky; few roots; semi-dry; gradual smooth boundary to

B_{22} 37-100 cm + Mixed soil bright reddish brown (5 YR 5/8) in 8 portions and yellow orange (7.5 YR 7/8) in 2 portions; sandy clay; moderate, medium subangular blocky structure; few, fine pores; compact (22 mm); plastic, sticky; few roots; semi-dry.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)	(g/cm³)	Solid	Liquid	Air	Sand	Silt	Clay
A_1	0-17	17.3	24.7	1.43	54.9	32.7	12.4	71.7	2.5	25.8
B_{21}	17-37	21.0	31.9	1.52	58.6	34.0	7.4	65.3	4.6	30.1
B_{22}	37-100+	23.2	33.9	1.46	56.1	35.9	8.0	59.2	6.6	34.2

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_1	SC	20	2.9×10^{-3}	40.5	36.8	32.7	24.0	12.2
B_{21}	SC	22	2.5×10^{-5}	36.4	35.0	34.0	26.7	22.7
B_{22}	SC	22	1.9×10^{-4}	38.2	37.4	35.9	26.6	23.8

Horizon	Storage Capacity (mm) of (of 50 cm deep soil)		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water	Easily available water	H_2O	KCl					
A_1	73.2	41.5	5.1	3.5	0.61	0.043	14.2	1.05	2.00
B_{21}			5.3	3.7	0.97	0.031	31.3	1.67	1.20
B_{22}			5.5	4.0	0.36	0.026	13.9	0.62	1.04

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_1	0.15	0.06	0.09	0.184	24.4	0.024	8.6	0.039
B_{21}	0.15	0.15	0.50	0.184	81.6	0.022	3.3	0.039
B_{22}	0.10	0.08	1.36	0.184	166.4	0.027	4.4	0.045

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_1	38.25	5.40	0.08	1.4	0.4	3	50
B_{21}	19.50	2.52	0.08	2.4	Tr	4	30
B_{22}	31.50	1.24	0.08	0.4	28.8	8	19

Profile No. 101

I. Information on the site.

a. Date of examination : 22 April 1974.
b. Location : Khok Pri Meng Rubber Exp. St., Sungai Padi.
c. Land form :
   i. Physiographic position : Terrace.
   ii. Surrounding land form : Undulating slope ranging from 2 to 3%.
d. Land use : Rubber cultivation.

II. General information on the soil.

a. Soil classification : Red Yellow Podzolic soils.
b. Parent material : Residuum.
c. Drainage and water permeability : Moderately well drained. Permeability is moderate to moderately low.
d. Moisture condition in profile : Semi-dry throughout the profile.

III. Profile description.

A_1 0-18 cm Brown (7.5 YR 4/4) sandy clay loam; moderate, fine granular; slightly compact; non plastic, slightly sticky; common roots; semi-dry; gradual, smooth boundary to

B_{21} 18-57 cm Dull brown (7.5 YR 5/4) sandy clay loam; common, distinct bright brown (7.5 YR 5/8) spotty iron mottles; weak, medium subangular blocky structure, friable; few fine pores; compact (22 mm); slightly plastic, sticky; few roots; semi-dry moist; gradual smooth boundary to

B_{22} 57-86 cm + Yellowish brown (10 YR 6/6) sandy clay loam: weak, medium subangular blocky structure, friable; few, fine and very fine pores; compact (20 mm); plastic, sticky.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density (g/cm³)	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)		Solid	Liquid	Air	Sand	Silt	Clay
A_1	0-18	18.8	23.5	1.25	48.1	31.7	20.2	73.5	6.5	20.0
B_{21}	18-57	16.6	25.7	1.55	59.5	33.2	7.3	73.5	4.5	22.0
B_{22}	57-86+	16.4	25.4	1.55	59.4	31.5	9.1	73.7	4.4	21.9

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_1	SCL	18	3.7×10^{-3}	39.4	34.9	31.7	25.6	12.4
B_{21}	SCL	22	9.7×10^{-4}	36.6	35.2	33.2	28.0	18.2
B_{22}	SCL	20	1.0×10^{-4}	35.9	34.1	31.5	24.9	18.4

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_1	82.7	26.0	4.8	3.5	1.19	0.087	13.7	2.05	2.16
B_{21}			4.3	3.5	0.97	0.064	21.1	1.67	2.00
B_{22}			4.2	4.0	0.51	0.043	11.9	0.88	1.04

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_1	0.10	0.06	0.89	0.18	57.0	0.022	13.4	0.039
B_{21}	0.10	0.02	0.59	0.08	39.6	0.018	8.1	0.030
B_{22}	0.j0	0.02	0.46	0.08	63.0	0.020	7.0	0.030

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_1	4.50	44.60	0.08	0.6	0.8	9	50
B_{21}	5.50	57.16	0.08	4.4	0.4	5	46
B_{22}	39.75	33.20	0.08	0.6	Tr	4	62

Profile No. 105

I. Information on the site.

a. Date of examination : 23 April 1974.
b. Location : Thanto Rubber Exp. St., Bannang Sata, Yala.
c. Land form :
  i. Physiographic position : Foot of mountain.
  ii. Surrounding land form : Gently undulating.
d. Land use : Rubber cultivation.

II. General information on she soil.

a. Soil classification : Red Yellow Podzolic soils.
b. Parent material : Residuum.
c. Drainage and water permeability : Moderately well drained. Permeability is low.
d. Moisture condition in profile : Semi-dry throughout the profile.

III. Profile description.

A_p 0-14 cm Dull yellow brown (10YR4.5/3) sandy clay loam; moderate, fine granular; slightly compact (12 mm); non plastic, non sticky; common roots; semi-dry; positive benzidine reaction; gradual, smooth boundary to

AB 14-28 cm Dark brown (10YR3/3) sandy clay loam; common, distinct brown (10YR 4/4) spotty manganese mottles; moderate, medium subangular blocky structure, friable; few, fine pores; compact (20 mm); slightly plastic, slightly sticky; few roots; semi-dry; positive benzidine reaction; faint 2,2'-dipyridyl reaction; gradual smooth boundary to

B_2 28-70 cm + Dull yellowish brown (10YR5/4) light clay; moderate, fine and medium subangular blocky structure, friable; few, fine pores; compact (22 mm); slightly plastic, sticky; few roots; semi-dry.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)	(g/cm³)	Solid	Liquid	Air	Sand	Silt	Clay
A_p	0-14	18.1	25.5	1.41	54.2	29.2	16.6	61.2	16.4	22.4
AB	14-28	16.6	27.4	1.65	63.3	28.7	8.0	61.2	16.3	22.5
B_2	28-70+	20.2	34.9	1.73	66.4	27.0	6.0	42.7	22.4	34.9

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_p	SCL	12	1.8×10^{-2}	36.4	33.4	29.2	19.2	13.1
AB	SCL	20	7.3×10^{-4}	32.9	30.9	28.7	21.7	14.7
B_2	LiC	22	1.3×10^{-4}	30.3	28.9	27.0	21.5	15.8

Horizon	Storage Capacity (mm) of (of 50 cm deep soil)		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water	Easily available water	H_2O	KCl					
A_p	66.7	35.9	4.9	3.6	1.29	0.085	15.2	2.22	3.20
AB			5.3	3.8	1.09	0.068	16.0	1.88	3.04
B_2			5.5	4.0	0.67	0.039	17.2	1.16	4.24

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_p	1.05	0.33	0.27	0.58	69.8	0.075	197.5	0.467
AB	1.15	0.35	0.09	0.58	71.5	0.052	33.4	0.467
B_2	1.55	0.78	0.82	0.58	87.9	0.042	15.1	0.334

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_p	1.25	3.20	0.04	0.8	34.4	228	54
AB	25.50	2.70	0.04	1.0	16.0	160	44
B_2	27.25	1.80	0.08	0.4	1.2	45	44

Profile No. 107

I. Information on the site.

a. Date of examination : 23 April 1974.
b. Location : Yala Rubber Exp. St., Muang, Yala.
c. Land form :
  i. Physiographic position : Middle terrace.
  ii. Surrounding land form : Undulating. Slope is about 10%
d. Land use : Rubber cultivation.

II. General information on the soil.

a. Soil classification : Red Yellow Podzolic soils.
b. Parent material : Old alluvium.
c. Drainage : Well drained. Runoff is rapid.
d. Moisture condition in profile : Top 59 cm of profile semi-dry, moist below.

III. Profile description.

A_1 0-12 cm Dark brown (10YR3/3) sandy clay loam; weak, medium subangular blocky structure, friable; common, fine and very fine pores; slightly compact (17 mm); non plastic, slightly sticky; common roots; semi-dry; clear, smooth boundary to

B_2 12-59 cm Dull yellow orange (10YR6/4) sandy clay loam; weak, medium subangular blocky structure, friable; few, fine pores; slightly compact (15 mm); slightly plastic, slightly sticky; few roots; semi-dry; faint 2,2'-dipyridyl reaction; clear, smooth boundary to

C 56-95 cm + Bright yellowish brown (10YR7/6) sandy clay; abundant, rounded, medium gravels (sand stone); few roots; moist.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density (g/cm³)	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)		Solid	Liquid	Air	Sand	Silt	Clay
A_1	0-12	16.6	25.4	1.53	59.0	29.0	12.0	68.8	14.4	16.8
B_2	12-59	15.4	23.9	1.55	59.7	28.4	11.9	60.1	16.1	23.8
C	59-95+	8.9	—	—	—	—	—	61.9	12.6	25.5

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_1	SCL	17	—	35.0	32.6	29.0	21.7	11.5
B_2	SCL	15	—	33.1	31.2	28.4	21.3	12.4
C	SC	—	—	—	—	—	—	—

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_1	81.8	35.7	4.5	3.4	1.32	0.059	22.4	2.28	3.76
B_2			4.6	3.5	0.70	0.027	25.9	1.21	2.48
C			4.8	3.5	—	0.022	—	—	2.00

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_1	0.10	0.06	0.59	0.32	28.4	0.031	16.7	0.148
B_2	0.05	0.04	0.14	0.05	11.3	0.031	7.0	0.208
C	0.35	0.04	0.02	0.05	23.4	0.055	7.9	0.274

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_1	1.00	20.10	0.08	2.0	0.4	11	31
B_2	0.50	19.10	0.08	1.4	0.8	8	19
C	1.00	8.30	0.24	1.0	Tr	5	19

Profile No. 108

I. Information on the site.

a. Date of examination : 23 April 1974.
b. Location : Yala Rubber Exp. St., Muang, Yala.
c. Land form :
  i. Physiographic position : Middle terrace.
  ii. Surrounding land form : Undulating. Slope is 5%.
d. Land use : Rubber cultivation.

II. General information on the soil.

a. Soil classification : Red Yellow Podzolic soils.
b. Parent material : Old alluvium.
c. Drainage : Well drained. Runoff is rapid
d. Moisture condition in profile : Semi-dry throughout the profile.

III. Profile description.

A_1 0-25 cm Dull yellowish brown (10YR4/3) sandy loam; weak, medium subangular blocky structure, friable; few, fine pores; compact (23 mm); non plastic, non sticky; common roots; semi-dry; clear, smooth boundary to

B_{21} 25-67 cm Dull yellow orange (10YR6/4) sandy clay loam; weak, medium subangular blocky structure, friable; few fine pores; slightly compact (16 mm); non plastic, non sticky; semi-dry; gradual, smooth boundary to

B_{22} 67-105 cm + Mixed soil bright yellowish brown (10YR6.5/6) in 9.7 portions and light gray (10YR7/1) in 0.3 portions; sandy loam; few, rounded, medium gravels (sand stone); weak, medium subangular blocky structure, friable; few fine pores; slightly compact (16 mm); non plastic, slightly sticky; semi-dry.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases (%) at pF1-5 Solid	Liquid	Air	Particle size (%) Sand	Silt	Clay
A_1	0-25	11.1	16.7	1.50	63.5	21.3	15.2	73.8	10.7	15.5
B_{21}	25-67	12.2	22.0	1.81	57.9	30.0	12.1	73.6	10.2	16.2
B_{22}	67-105+	11.8	—	—	69.5	28.5	2.0	73.7	12.7	13.6

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%) pF1.0	pF1.5	pF3.0	pF4.0
A_1	SL	23	—	29.3	24.6	21.3	15.7	9.0
B_{21}	SCL	16	—	36.2	33.9	30.0	15.6	7.9
B_{22}	SL	16	—	35.7	33.3	28.5	12.8	8.1

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Easily available water (of 50 cm deep soil)	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_1	86.0	50.0	4.4	3.4	1.03	0.043	24.0	1.78	2.16
B_{21}			4.6	3.7	—	0.021	—	—	1.36
B_{22}			4.7	3.6	—	0.012	—	—	1.44

Horizon	Exchangeable bases Ca	Mg	Na	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	Available (ppm)	Total K_2O (%)
A_1	0.15	0.04	0.18	0.05	19.8	0.022	21.9	0.081
B_{21}	0.05	0.02	0.09	0.05	15.8	0.018	9.0	0.105
B_{22}	0.05	0.02	0.50	0.05	43.3	0.018	8.1	0.111

Horizon	Extractable S	Fe	Cu	Zn (ppm)	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_1	0.75	23.76	0.04	1.6	0.8	6	36
B_{21}	0.75	16.00	0.04	1.0	0.8	7	18
B_{22}	0.75	15.40	0.04	1.0	0.4	9	20

Profile No. 109

I. Information on the site.

a. Date of examination : 23 April 1974.
b. Location : Yala Rubber Exp. St., Muang, Yala.
c. Land form :
  i. Physiographic position : Middle terrace.
  ii. Surrounding land form : Undulating to rolling. Slope is 10%.
d. Land use : Rubber cultivation.

II. General information on the soil.

a. Soil classification : Red Yellow Podzolic soils.
b. Parent material : Old alluvium.
c. Drainage : Well drained. Runoff is rapid.
d. Moisture condition in profile : Top 34 cm of profile semi-dry, moist below.

III. Profile description.

A_1 0-18 cm Dark brown (10YR3/3) sandy clay loam; moderate, medium subangular blocky structure, friable; common fine and medium pores; slightly compact (18 mm); slightly plastic, slightly sticky; common roots, semi-dry; gradual, smooth boundary to

AB 18-34 cm Dull yellowish brown (10YR4/3) sandy clay loam; weak, medium subangular blocky structure, friable; few, fine pores; slightly compact (18 mm); slightly plastic, slightly sticky; common roots; semi-dry; gradual, smooth boundary to

B_{21} 34-63 cm Yellowish brown (10YR5/6) sandy clay loam; weak, medium subangular blocky structure, friable; few, fine and medium pores; slightly compact (17 mm); plastic, sticky; common roots; moist; gradual smooth boundary to

B_{22} 63-110 cm + Bright yellowish brown (10YR6/6) sandy clay loam; few, rounded, coarse gravels (sand stone); weak, medium subangular blocky structure, friable; few, fine and medium pores; slightly compact (15 mm); plastic, sticky; common roots; moist.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases (%) at pF1-5 Solid	Liquid	Air	Particle size (%) Sand	Silt	Clay
A_1	0-18	20.7	27.7	1.34	51.6	39.6	8.8	65.6	18.7	15.6
AB	18-34	18.7	27.5	1.47	56.7	30.8	12.5	67.2	14.9	17.9
B_{21}	34-63	16.4	25.6	1.56	59.8	30.9	9.3	67.6	12.7	19.6
B_{22}	63-110+	15.8	25.3	1.60	61.5	30.0	8.5	63.6	14.6	21.7

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%) pF1.0	pF1.5	pF3.0	pF4.0
A_1	SCL	18	—	51.0	43.4	39.6	29.2	15.6
AB	SCL	18	—	37.6	32.9	30.8	19.2	10.9
B_{21}	SCL	17	—	37.3	33.5	30.9	20.0	10.8
B_{22}	SCL	15	—	36.3	32.6	30.0	16.4	12.0

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Storage Capacity (mm) of Easily available water (of 50 cm deep soil)	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_1	108.5	54.7	4.7	3.3	1.84	0.078	23.6	3.17	5.04
AB			4.9	3.5	1.06	0.041	25.9	1.83	2.48
B_{21}			4.9	3.3	0.77	0.029	26.6	1.33	2.08
B_{22}			4.9	3.5	0.64	0.026	24.6	1.10	2.48

Horizon	Exchangeable bases Ca (me/100g)	Mg (me/100g)	Na (me/100g)	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	P_2O_5 Available (ppm)	Total K_2O (%)
A_1	0.20	0.10	1.27	0.16	34.4	0.033	20.6	0.163
AB	0.10	0.04	0.34	0.05	21.6	0.037	9.9	0.163
B_{21}	0.15	0.02	0.02	0.05	11.9	0.037	7.0	0.190
B_{22}	0.05	0.02	0.41	0.05	21.5	0.037	6.6	0.198

Horizon	Extractable S (ppm)	Fe (ppm)	Cu (ppm)	Zn (ppm)	Mn (ppm) Exchangeable	Mn (ppm) Easily red.	Electrical conductivity (μ mho)
A_1	1.50	21.80	0.12	0.80	0.8	6	42
AB	0.50	35.52	0.04	0.80	0.4	8	26
B_{21}	0.75	20.40	0.04	0.60	0.4	8	23
B_{22}	0.75	13.20	0.12	1.20	Tr	4	17

Profile No. 110

I. Information on the site.

a. Date of examination : 25 April 1974.

b. Location : Thung Song, Nakhon Si Thamarat.

c. Land form :

i. Physiographic position : Middle terrace.

ii. Surrounding land form : Flat to gently undulating. Slope ranges from 1 to 2%.

d. Land use : Rubber cultivation.

II. General information on the soil.

a. Soil classification : Red Yellow Podzolic soils.

b. Parent material : Old alluvium.

c. Drainage : Moderately well drained.

d. Moisture condition in profile : Semi-dry throughout the profile

III. Profile description.

A_1 0-12 cm Brown (7.5YR4/3) sandy clay loam; moderate, granular; compact (19 mm); slightly plastic, slightly sticky; common roots; semi-dry; gradual, smooth boundary to

AB 12-30 cm Yellowish brown (10YR5/8); sandy clay; moderate, medium subangular blocky structure, friable; common and very fine pores; compact (22 mm); slightly plastic, slightly sticky; common roots; semi-dry; gradual, smooth doundary to

B_{21} 30-54 cm Orange (7.5YR6/6) light clay; moderate, medium subangular blocky structure, friable; few, fine and very fine pores; compact (22 mm); slightly plastic, slightly sticky; few roots; semi-dry, gradual, smooth boundary to

B_{22} 54-94 cm + Mixed soil bright yellowish brown (10YR6/6) in 6 portions, bright brown (7.5YR5/8) in 3 portions and light brownish gray (7.5YR7/1) in 1 portion; light clay; moderate, medium subangular blocky structure; few, fine pores; compact (23 mm); plastic, sticky; few roots; semi-dry.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density (g/cm³)	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)		Solid	Liquid	Air	Sand	Silt	Clay
A_1	0-12	18.5	24.6	1.33	51.2	31.0	17.8	61.6	16.7	21.7
AB	12-30	19.9	28.9	1.45	55.9	35.5	8.6	55.5	14.8	29.7
B_{21}	30-54	22.2	32.0	1.44	55.5	35.1	9.4	48.0	10.5	41.5
B_{22}	54-94+	25.0	34.8	1.39	53.4	38.6	8.0	42.6	13.6	43.8

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_1	SCL	19	—	44.2	34.9	31.0	21.0	12.0
AB	SC	22	—	42.3	37.7	35.5	26.6	15.2
B_{21}	LiC	22	—	42.6	37.3	35.1	28.7	22.1
B_{22}	LiC	23	—	46.8	42.1	38.6	29.0	23.2

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_1	85.3	40.1	4.7	3.5	1.81	0.096	18.9	3.12	4.08
AB			4.6	3.4	1.42	0.067	21.2	2.45	4.48
B_{21}			4.8	3.5	0.93	0.048	19.4	1.49	4.88
B_{22}			4.9	3.5	0.80	0.043	18.6	1.38	4.88

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_1	0.75	0.31	0.02	0.21	31.7	0.059	16.7	0.105
AB	0.30	0.13	0.34	0.11	19.4	0.055	9.9	0.121
B_{21}	0.20	0.07	0.64	0.11	20.8	0.056	7.5	0.139
B_{22}	0.60	0.18	0.14	0.11	20.9	0.088	7.0	0.157

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_1	1.25	10.00	0.04	0.6	3.6	27	48
AB	0.75	11.30	0.04	1.8	1.2	8	30
B_{21}	0.25	4.92	0.04	2.0	0.4	13	34
B_{22}	3.25	3.68	0.04	2.8	0.4	11	23

Profile No. 112

I. Information on the site.

a . Date of examination : 26 April 1974.
b . Location : Bangpo Rubber Exp. St. , Takua Pa, Phangnga.
c . Land form :
  i . Physiographic position : Foot of mountain.
  ii . Surrounding land form : Flat to gently undulating.
d . Land use : Rubber cultivation.

II. General information on the soil.

a . Soil classification : Red Yellow Podzolic soils.
b . Parent material : Residuum.
c . Drainage : Well drained.
d . Moisture condition in profile : Semi-dry throughout the profile.

III. Profile description.

A_1 0-18 cm Brown (10YR4/4) sandy clay loam; weak, fine granular; slightly compact (17 mm); non plastic, slightly sticky; common roots; semi-dry; clear, smooth boundary to

AB 18-32 cm Bright yellowish brown (10YR6/8); sandy clay loam; moderate, medium subangular blocky structure; few, fine pores; slightly compact (18 mm); slightly plastic, slightly sticky; common roots; semi-dry; gradual. smooth boundary to

B_2 32-95 cm + Yellow orange (10YR7/8) sandy clay; moderate, medium subangular blocky structure; few, fine pores; slightly compact (14 mm); plastic, sticky; few roots; semi-dry.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)	(g/cm³)	Solid	Liquid	Air	Sand	Silt	Clay
A_1	0-18	19.8	28.7	1.45	55.8	31.5	12.7	77.3	6.8	15.9
AB	18-32	21.0	28.8	1.37	52.5	32.3	15.2	71.3	6.9	21.8
B_2	32-95+	20.0	28.6	1.43	54.9	34.0	11.1	67.2	6.9	25.9

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_1	SCL	17	—	38.1	35.1	31.5	22.1	14.2
AB	SCL	18	-	42.6	37.3	32.3	21.4	17.5
B_2	SC	14	-	40.5	37.6	34.0	19.7	16.1

Horizon	Storage Capacity (mm) of (of 50 cm deep soil)		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water	Easily available water	H_2O	KCl					
A_1	84.0	57.9	4.7	3.7	1.52	0.088	17.3	2.62	1.92
AB			4.8	3.8	1.09	0.053	20.6	1.88	1.68
B_2			4.8	3.7	0.74	0.031	22.4	1.28	1.44

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A^1	0.20	0.05	0.34	0.16	39.1	0.040	14.5	0.093
AB	0.05	0.04	0.09	0.05	14.0	0.029	4.8	0.121
B_2	0.05	0.04	0.18	0.05	22.7	0.033	3.7	0.130

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_1	1.00	6.63	0.04	1.8	0.4	10	23
AB	0.25	13.40	0.04	0.4	0.4	8	34
B_2	27.00	9.20	0.04	0.4	0.4	8	24

Profile No. 113

I. Information on the site.

a. Date of examination : 26 April 1974.
b. Location : Bangpo Rubber Exp. St., Takua Pa, Phangnga.
c. Land form :
  i. Physiographic position : Foot of mountain.
  ii. Surrounding land form : Flat to gently undulating.
d. Land use : Pepper cultivation.

II. General information on the soil.

a. Soil classification : Red Yellow Podzolic soils.
b. Parent material : Residuum.
c. Drainage : Well drained.
d. Moisture condition in profile : Semi-dry throughout the profile.

III. Profile description.

A_p 0-15 cm Brown (10YR4/4) sandy clay loam; weak, medium subangular blocky structure; few, fine pores; slightly plastic, slightly sticky; common roots; semi-dry; clear, smooth boundary to

B_{21} 15-45 cm Bright brown (7.5YR5/8) sandy clay loam; moderate, medium subangular blocky structure, friable; few, fine pores; slightly plastic, slightly sticky; few roots; semi-dry; gradual, smooth boundary to

B_{22} 45-85 cm + Bright reddish brown (5YR5/8) sandy clay loam; moderate, medium subangular blocky structure, friable; few, fine pores; slightly plastic, slightly sticky; few roots; semi-dry.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)	(g/cm³)	Solid	Liquid	Air	Sand	Silt	Clay
A_p	0-15	—	—	—	—	—	—	—	—	—
B_{21}	15-45	—	—	—	—	—	—	—	—	—
B_{22}	45-85+	—	—	—	—	—	—	—	—	—

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_p	—	—	—	—	—	—	—	—
B_{21}	—	—	—	—	—	—	—	—
B_{22}	—	—	—	—	—	—	—	—

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_p	—	—	5.1	3.9	1.19	0.07	17.0	2.05	1.12
B_2			4.8	3.8	1.09	0.04	27.3	1.88	1.68
B_{22}			4.6	3.8	0.87	0.03	29.0	1.50	2.16

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_p	0.60	0.18	0.02	0.16	84.6	0.066	107.9	0.093
B_2	0.15	0.05	0.02	0.05	16.5	0.037	8.1	0.130
B_{22}	0.15	0.05	0.02	0.11	15.3	0.055	5.3	0.139

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_p	0.50	4.68	0.04	2.6	0.8	12	33
B_2	41.00	4.80	0.04	1.0	0.4	8	38
B_{22}	58.50	0.20	0.04	1.4	0.4	8	49

Profile No. 137

I. Information on the site.

a. Date of examination : 18 July 1974.

b. Location : Banmai Samrong Agricultural Experiment Station, Amphoe Sikhiu, Nakhon Ratchasima.

c. Land form :

i. Physiographic position : Semi-recent terrace.

ii. Surrounding land form : Flat to gently undulating.

d. Land use : Cleared for upland crops.

II. General information on the soil.

a. Soil classification : Red Yellow Podzolic soils.

b. Parent material : Residuum derived from limestone.

c. Drainage and water permeability : Moderately well drained. Permeability is moderate.

d. Moisture condition in profile : Dry throughout the profile.

III. Profile description:

A_p 0-10 cm Dark reddish brown (5YR3/3) silt loam; moderate, medium subangular blocky; common, fine and very fine pores; very compact (27 mm); slightly sticky; common roots; dry; very positive benzidine reaction; gradual smooth boundary to

B_3 10-30 cm Dark reddish brown (5YR3/6) silt loam; moderate coarse subangular blocky; few, fine and very fine pores; extremely compact (30 mm); few roots; dry; very positive benzidine reaction.

C 30-72 cm + Limestone rock.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases (%) at pF1-5 Solid	Liquid	Air	Particle size (%) Sand	Silt	Clay
A_p	0-10	—	—	—	—	—	—	—	—	—
B_3	10-30	—	—	—	—	—	—	—	—	—
C	30-72+	—	—	—	—	—	—	—	—	—

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%) pF1.0	pF1.5	pF3.0	pF4.0
A_p	—	—	—	—	—	—	—	—
B_3	—	—	—	—	—	—	—	—
C	—	—	—	—	—	—	—	—

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Storage Capacity (mm) of Easily available water (of 50 cm deep soil)	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_p			7.5	6.4	1.54	0.119	12.9	2.65	3.76
B_3			7.8	6.5	1.42	0.105	13.5	2.45	5.20
C			—	—	—	—	—	—	—

Horizon	Exchangeable bases Ca	Mg	Na	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	P_2O_5 Available (ppm)	Total K_2O (%)
A_p	25.50	0.49	0.59	0.63	723.6	0.143	29.6	1.220
B_3	26.00	0.49	0.60	0.45	529.4	0.160	14.3	1.371
C	—	—	—	—	—	—	—	—

Horizon	Extractable S	Fe	Cu	Zn (ppm)	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_p	1.25	0.04	0.40	0.4	2.8	280	215
B_3	0.75	0.04	0.00	0.2	2.0	360	185
C	—	—	—	—	—	—	—

Profile No. 44

I. Information on the site.

a. Date of examination : 24 December 1973.
b. Location : Corn and Sorghum Research Center, Pak Chong, Nakhon Ratchasima.
c. Land form :
  i. Physiographic position : Peneplain.
  ii. Surrounding land form : Nearly flat.
d. Land use : Corn and sorghum cultivation.

II. General information on the soil.

a. Soil classification : Reddish Brown Lateritic soils.
b. Parent material : Residuum from shale.
c. Drainage and water permeability : Well drained. Permeability is moderately high.
d. Moisture condition in profile : Dry throughout the profile.

III. Profile description.

A_p 0-16 cm Dark reddish brown (2.5YR3/6) heavy clay; few, rounded iron-manganese nodules (2-3 mm); moderate, fine granular and weak, medium subangular blocky; loose (10 mm); plastic, slightly sticky; many roots; dry; gradual, smooth boundary to

B_2 16-55 cm + Dark reddish brown (2.5YR3/6) heavy clay; weak, medium subangular blocky; few, fine and very fine pores; extremely compact (32 mm); plastic, slightly sticky; few roots; dry.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases (%) at pF1-5 Solid	Liquid	Air	Particle size (%) Sand	Silt	Clay
A_p	0-16	11.0	12.0	1.10	42.4	37.0	20.6	16.1	20.7	63.2
B_2	16-55+	21.1	27.2	1.29	49.5	40.4	10.1	12.3	16.6	71.1

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%) pF1.0	pF1.5	pF3.0	pF4.0
A_p	HC	10	1.1×10^{-2}	50.1	43.8	37.0	28.8	—
B_2	HC	32	2.2×10^{-3}	46.8	43.8	40.4	25.4	—

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Storage Capacity (mm) of Easily available water (of 50 cm deep soil)	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_p	—	64.1	5.0	4.6	1.43	0.119	12.0	2.47	11.04
B_2			4.7	4.1	1.00	0.095	10.5	1.72	10.24

Horizon	Exchangeable bases Ca	Mg	Na	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	P_2O_5 Available (ppm)	Total K_2O (%)
A_p	4.5	0.11	0.91	0.26	52.3	0.121	70.2	0.105
B_2	3.0	0.83	0.78	0.24	47.7	0.103	13.2	0.099

Horizon	Extractable S	Fe	Cu	Zn (ppm)	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_p	14.75	0.29	1.6	1.6	9.4	350	170
B_2	42.00	0.29	1.0	2.0	19.0	240	110

Profile No. 56

I. Information on the site.

a. Date of examination : 26 December 1973.
b. Location : Agr. Exp. St., Phraputtabat. Muang, Lop Buri.
c. Land form :
  i. Physiographic position : Peneplain.
  ii. Surrounding land form : Flat.
d. Land use : Corn, sorghum and cotton cultivation.

II. General information on the soil.

a. Soil classification : Reddish Brown Lateritic soils
b. Parent material : Residuum from shale in association with limestone.
c. Drainage and water permeability : Well drained. Permeability is moderate.
d. Moisture condition : Top 16 cm of profile dry, semi-dry below.

III. Profile description.

A_p 0-10 cm Bright brown (7.5YR5/8) dry; light clay; moderate, fine granular and moderate, medium subangular blocky; few, very fine pores; loose (5 mm); plastic, slightly sticky; common roots; dry; positive benzidine reaction; grandual, smooth boundary to

A_{12} 10-16 cm Reddish brown (5YR4/8) light clay; moderate, medium subangular blocky; few; very fine pores; very compact (28 mm); plastic, slightly sticky; common roots; dry; positive benzidine reaction; clear, smooth boundary to

B_{21} 16-36 cm Dark reddish brown (2.5YR3/6) light clay; moderate medium subangular blocky, breaking into fine subangular blocky, friable moist; common, fine and very fine pores; very compact (29 mm); plastic, slightly sticky; few roots; semi-dry; slightly positive benzidine reaction.

B_{22} 36-82 cm + Dark reddish brown (2.5YR3/6) heavy clay; few iron-manganese nodules (size is 2 mm in diameter); moderate, medium subangular blocky, breaking into fine subangular blocky; common,fine and very fine pores; very compact (25 mm); few roots; semi-dry; plastic, slightly sticky; slightly positive benzidine reaction.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases (%) at pF1-5 Solid	Liquid	Air	Particle size (%) Sand	Silt	Clay
A_p	0-10	3.7	4.8	1.30	49.9	39.4	10.8	40.3	26.6	33.1
A_{12}	10-16	8.7	12.1	1.46	56.2	34.2	9.7	36.0	30.9	33.1
B_{21}	16-36	21.4	32.1	1.50	57.8	31.6	10.6	33.9	24.9	41.2
B_{22}	36-82+	16.5	23.1	1.40	53.9	31.5	14.6	29.9	22.9	47.2

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%) pF1.0	pF1.5	pF3.0	pF4.0
A_p	LiC	5	$3.1+10^{-3}$	48.9	44.2	39.3	19.7	—
A_{12}	LiC	28	4.8×10^{-4}	40.9	39.1	34.2	23.3	—
B_{21}	LiC	29	9.6×10^{-4}	36.7	34.1	31.6	22.5	—
B_{22}	HC	25	2.1×10^{-3}	40.9	35.2	31.5	23.2	—

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Easily available water	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_p	—	56.0	4.7	3.5	0.96	0.070	13.7	1.66	5.92
A_{12}			4.6	3.4	0.96	0.065	14.8	1.66	6.16
B_{21}			4.4	3.4	0.72	0.046	15.7	1.24	6.48
B_{22}			4.2	3.3	0.72	0.044	16.4	1.24	7.08

Horizon	Exchangeable bases Ca	Mg	Na	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	Available (ppm)	Total K_2O (%)
A_p	1.45	0.37	0.44	0.51	46.7	0.077	205.4	0.063
A_{12}	1.25	0.21	0.44	0.45	38.0	0.079	229.1	0.059
B_{21}	1.80	0.42	0.13	0.13	38.2	0.042	7.5	0.059
B_{22}	1.15	0.40	0.11	0.13	25.2	0.042	8.1	0.069

Horizon	Extractable S	Fe	Cu	Zn (ppm)	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_p	2.75	1.30	0.12	0.6	68.0	150	70
A_{12}	8.25	0.18	0.12	0.8	60.0	150	36
B_{21}	31.25	0.48	0.12	0.4	14.0	20	71
B_{22}	33.25	0.68	0.28	0.6	8.0	10	98

Profile No. 80

I. Information on the site.

a. Date of examination : 17 April 1974.
b. Location : Pathin, Chumphon.
c. Land form :
   i. Physiographic position : Middle terrace.
   ii. Surrounding land form : Undulating.
d. Land use : Coconut cultivation. Parts are virgin soils.

II. General information on the soils.

a. Soil classification : Reddish Brown Lateritic soils.
b. Parent material : Old alluvium.
c. Drainage and water permeability : Well drained. Permeability is moderate to moderately high.
d. Moisture condition : Top 37 cm of profile semi-dry, dry below

III. Profile description.

A_1 0-20 cm Dark reddish brown (2.5YR3/5) light clay; moderate, fine granular; loose (10 mm); slightly plastic, slightly sticky; many roots; semi-dry; slightly positive benzidine reaction; gradual, smooth boundary to

AB 20-37 cm Dark reddish brown (2.5YR3/6) heavy clay; moderate, medium subangular blocky structure, friable; common, fine and very fine pores; compact (20 mm); slightly plastic, sticky; common roots; semi-dry; slightly positive benzidine reaction; gradual, smooth boundary to

B_2 37-80 cm + Reddish brown (2.5YR4/8) light clay; moderate, medium subangular blocky structure; few, fine and very fine pores; very compact (29 mm); plastic, sticky; few roots; dry.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)	(g/cm³)	Solid	Liquid	Air	Sand	Silt	Clay
A_1	0-20	21.1	21.9	1.04	40.0	32.7	27.3	47.0	15.3	37.7
AB	20-37	17.9	20.9	1.17	45.0	38.4	16.6	39.3	15.1	45.6
B_2	37-80+	13.3	21.3	1.60	61.4	34.6	4.0	49.0	15.6	35.4

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_1	LiC	10	2.6×10^{-2}	49.7	33.7	32.7	27.0	18.9
AB	HC	20	7.4×10^{-3}	49.2	44.2	38.4	29.7	22.1
B_2	LiC	29	5.4×10^{-4}	35.8	35.2	34.6	27.3	19.3

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_1	75.2	35.7	5.4	3.4	1.31	0.104	12.6	2.26	6.80
AB			5.2	3.0	0.51	0.060	8.5	0.88	5.68
B_2			4.9	2.9	0.45	0.054	8.3	0.78	4.16

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_1	2.25	1.15	0.32	0.95	68.5	0.066	7.5	0.106
AB	1.25	0.73	0.27	0.74	52.6	0.071	4.6	0.106
B_2	0.25	0.19	0.18	0.21	19.9	0.071	3.3	0.084

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_1	4.00	0.40	0.04	0.6	16.0	230	42
AB	15.75	0.04	0.04	1.2	18.8	160	34
B_2	10.50	0.80	0.04	1.4	22.8	80	25

Profile No. 106

I. Information on the site.

a. Date of examination : 23 April 1974.
b. Location : Thanto Rubber Exp. St., Bannang Sata, Yala.
c. Land form :
   i. Physiographic position : Foot of mountain.
   ii. Surrounding land form : Undulating to rolling. Slope ranges from 5 to 6%.
d. Land use : Rubber cultivation.

II. General information on the soil.

a. Soil classification : Reddish Brown Lateritic soils.
b. Parent material : Residuum from rock in association with limestone.
c. Drainage and water permeability : Well drained. Permeability is low. Runoff is rapid.
d. Moisture condition in profile : Semi-dry throughout the profile.

III. Profile description.

A_p 0-15 cm Dark reddish brown (2.5YR3/3) light clay; strong, fine granular; loose (7 mm); slightly plastic, slightly sticky; many roots; semi-dry; very positive benzidine reaction; gradual, smooth boundary to

B_{21} 15-36 cm Dark reddish brown (2.5YR3/4) light clay; moderate, fine granular, and weak, medium subangular blocky structure; few fine pores; slightly compact (15 mm); plastic, sticky; common roots; semi-dry; very positive benzidine reaction; gradual, smooth boundary to

B_{22} 36-70 cm + Dark reddish brown (2.5YR3/4) light clay; moderate, medium subangular blocky structure, friable moist; few, fine pores; slightly compact (17 mm); plastic, sticky; few roots; semi-dry; very positive benzidine reaction.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)	(g/cm³)	Solid	Liquid	Air	Sand	Silt	Clay
A_p	0-15	29.2	30.4	1.04	39.9	36.0	24.1	38.9	26.3	34.8
B_{21}	15-36	30.0	36.6	1.22	46.8	42.0	11.2	34.7	22.8	42.5
B_{22}	36-70+	29.0	38.6	1.33	51.0	42.2	6.8	31.0	26.2	42.8

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_p	LiC	7	9.3×10^{-3}	48.7	42.4	36.0	22.7	17.2
B_{21}	LiC	15	1.4×10^{-4}	46.6	43.7	42.0	32.3	27.2
B_{22}	LiC	17	—	45.3	43.5	42.2	36.7	31.3

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_p	74.5	48.0	5.3	4.2	1.54	0.131	11.8	2.65	9.04
B_{21}			5.7	4.5	1.06	0.079	13.4	1.83	7.92
B_{22}			5.8	4.7	0.67	0.058	11.6	1.16	—

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_p	3.50	0.73	2.09	0.90	79.8	0.108	39.0	0.202
B_{21}	3.75	0.60	0.68	0.40	68.6	0.099	23.7	0.244
B_{22}	0.30	0.56	0.14	0.16	—	0.089	11.0	0.244

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_p	34.75	0.90	0.08	1.0	11.6	7	170
B_{21}	30.00	1.04	0.08	0.6	0.4	900	54
B_{22}	19.75	1.04	0.08	0.2	Tr	970	21

Profile No. 62

I. Information on the site.

a . Date of examination : 29 January 1974.
b . Location : Tha Mai, Chanthaburi.
c . Land form :
  i . Physiographic position : Peneplain.
  ii . Surrounding land form : Flat to gently undulating.
d . Land use : Fruit-trees such as durian, rambutan.

II. General information on the soil.

a . Soil classification : Reddish Brown Latosols.
b . Parent material : Residuum from basalt.
c . Drainage and water permeability : Well drained. Permeability is very high.
d . Moisture condition in profile : Top 25 cm of profile dry, semi-dry below.

III. Profile description.

A_p 0-25 cm Reddish brown (5YR4/4) light clay; moderate, fine subangular blocky, breaking into fine granular, friable; common fine and very fine pores; compact (22 mm); slightly plastic, non sticky; many roots; dry; positive benzidine reaction; gradual, smooth boundary to

B_2 25-70 cm + Dark reddish brown (2.5YR3/5) light clay; moderate medium subangular blocky; breaking into fine granular, friable; many, fine and very fine pores; compact (22 mm); slightly plastic, non sticky; common roots; semi-dry; positive benzidine reaction.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)	(g/cm³)	Solid	Liquid	Air	Sand	Silt	Clay
A_p	0-25	24.9	24.9	1.00	37.7	52.3	10.0	38.5	26.7	34.7
B_2	25-70+	29.0	23.2	0.80	31.0	47.9	21.1	34.7	18.7	46.6

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_p	LiC	22	2.2×10^{-3}	59.6	56.0	52.3	40.1	—
B_2	LiC	22	1.2×10^{-2}	62.0	58.3	47.9	28.1	—

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_p	—	80.0	5.5	4.4	1.77	0.166	10.7	3.05	10.80
B_2			5.9	4.3	1.30	0.105	12.4	2.91	9.40

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_p	0.61	0.58	0.34	1.31	26.3	0.943	112.3	0.189
B_2	0.29	0.25	0.34	1.01	20.0	0.943	93.5	0.149

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_p	14.75	1.8	2.0	2.4	5.6	1680	45
B_2	16.50	0.6	1.6	2.0	1.6	1800	35

Profile No. 61

I. Information on the site.

a. Date of examination : 29 January 1974.
b. Location : Sakdone, Klaeng, Rayong.
c. Land form :
   i. Physiographic position : Old marine terrace.
   ii. Surrounding land form : Flat.
d. Land use : Rubber cultivation.

II. General information on the soil.

a. Soil classification : Red Yellow Latosols.
b. Parent material : Old alluvium.
c. Drainage and water permeability : Well drained. Permeability is high to moderately high.
d. Moisture condition : Semi-dry throughout the profile.

III. Profile description.

A_1 0-18 cm Dark reddish brown (2.5YR3/5) light clay; moderate, medium subangular blocky; few, fine and very fine pores; very compact (27 mm); slightly plastic, slightly sticky; common roots; semi-dry; positive benzidine reaction; gradual, smooth boundary to

B_{21} 18-45 cm Dark reddish brown (2.5YR3/6) light clay; moderate, medium subangular blocky; common fine and very fine pores; friable; very compact (28 mm); slightly plastic, slightly sticky; common roots; semi-dry; slightly positive benzidine reaction; gradual smooth boundary to

B_{22} 45-60 cm + Dark reddish brown (2.5YR3/6) heavy clay; moderate medium subangular blocky, breaking into fine subangular blocky, friable; few, fine and very fine pores; very compact (29 mm); slightly plastic, slightly sticky; few roots; semi-dry; slightly positive benzidine reaction.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases (%) at pF1-5 Solid	Liquid	Air	Particle size (%) Sand	Silt	Clay
A_1	0-18	14.6	19.1	1.31	50.4	33.6	16.0	43.2	16.5	40.3
B_{21}	18-45	17.9	21.7	1.21	46.4	35.7	17.9	39.2	20.4	40.4
B_{22}	45-60+	19.1	24.1	1.26	48.4	38.0	13.6	36.7	12.7	50.6

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%) pF1.0	pF1.5	pF3.0	pF4.0
A_1	LiC	27	3.5×10^{-3}	43.9	36.9	33.5	25.0	—
B_{21}	LiC	28	1.0×10^{-2}	46.9	40.2	35.6	24.8	—
B_{22}	HC	29	1.9×10^{-2}	43.0	41.8	38.0	27.0	—

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Easily available water	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_1	—	50.0	5.2	4.2	1.43	0.112	12.8	2.46	3.70
B_{21}			5.3	3.9	0.41	0.045	9.1	0.71	3.40
B_{22}			5.4	4.0	0.65	0.033	19.7	1.12	3.20

Horizon	Exchangeable bases Ca	Mg	Na	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	Available (ppm)	Total K_2O (%)
A_1	0.81	0.65	0.22	0.29	53.1	0.116	11.4	0.054
B_{21}	0.23	0.30	0.13	0.20	25.2	0.136	2.9	0.060
B_{22}	0.15	0.26	0.33	0.13	27.1	0.134	1.3	0.060

Horizon	Extractable S	Fe	Cu	Zn (ppm)	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_1	28.50	1.44	0.4	1.2	89.6	500	92
B_2	28.25	1.44	1.4	1.0	57.6	300	52
B_{22}	25.25	1.36	0.8	3.0	46.4	200	53

Profile No. 70

I. Information on the site.

a. Date of examination : 26 March 1974.
b. Location : Muang, Nakhon Ratchasima.
c. Land form :
  i. Physiographic position : Alluvial terrace.
  ii. Surrounding land form : Flat to gently undulating.
d. Land use : Cassava cultivation.

II. General information on the soil.

a. Soil classification : Red Yellow Latosols.
b. Parent material : Old alluvium.
c. Drainage and water permeability : Well drained. Permeability is moderate.
d. Moisture condition in profile : Semi-dry throughout the profile.

III. Profile description.

A_p 0-15 cm Brown (7.5YR4/3) sandy loam; strong, medium and fine granular; slightly compact (14 mm); non plastic, non sticky; many roots; semi-dry; very positive benzidine reaction; gradual, smooth boundary to

AB 15-25 cm Pale orange (5YR8/4) sandy loam; moderate, medium subangular blocky structure, very friable; common, fine pores; compact (23 mm); non plastic, non sticky; common roots; dry; positive benzidine reaction; clear smooth boundary to

B_2 25-75 cm + Bright brown (2.5YR5/8) sandy clay loam; moderate, medium subangular blocky structure, very friable; common, fine and very fine pores; common roots; semi-dry.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)	(g/cm³)	Solid	Liquid	Air	Sand	Silt	Clay
A_p	0-15	7.7	9.9	1.28	49.3	32.0	18.7	75.5	14.9	9.6
AB	15-25	5.7	8.9	1.55	59.8	30.4	9.8	78.0	12.4	9.6
B_2	25-75+	8.9	14.3	1.60	61.7	28.2	10.1	71.9	12.4	15.7

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_p	SL	14	3.2×10^{-3}	41.0	35.2	32.0	16.5	4.0
AB	SL	23	1.2×10^{-3}	33.1	31.2	30.4	14.5	4.4
B_2	SCL	15	1.3×10^{-3}	32.3	29.5	28.2	16.6	6.6

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_p	122.0	68.2	6.4	5.4	0.47	0.039	12.1	0.81	2.08
AB			6.5	5.3	0.50	0.016	31.3	0.86	0.80
B_2			5.8	4.4	0.50	0.112	4.5	0.86	1.84

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_p	2.45	0.47	0.32	0.11	160.6	0.048	54.4	0.018
AB	1.10	0.21	1.86	0.16	416.2	0.040	51.6	0.012
B_2	0.75	0.98	0.27	0.05	111.7	0.048	6.1	0.018

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_p	0.25	1.40	1.20	2.6	0.8	280	59
AB	0.25	1.64	0.40	0.6	0.6	200	82
B_2	0.50	2.16	6.00	10.8	8.0	60	42

Profile No. 78

I. Information on the site.

a. Date of examination : 28 March 1974.
b. Location : Chok Chai, Nakhon Ratchasima.
c. Land form :
   i. Physiographic position : High terrace.
   ii. Surrounding land form : Flat to gently undulating.
d. Land use : Cassava and corn cultivation.

II. General information on the soil.

a. Soil classification : Red Yellow Latosols.
b. Parent material : Old alluvial sediment.
c. Drainage and water permeability : Well drained. Permeability is moderately high.
d. Moisture condition in profile : Semi-dry throughout the profile.

III. Profile description.

A_p 0-23 cm Dark reddish brown (2.5YR3/4) light clay; moderate, fine granular and medium subangular blocky structure, friable moist; common, fine and very fine pores; slightly compact (17 mm); non plastic, slightly sticky; common roots; semi-dry; very positive benzidine reaction; gradual, smooth boundary to

B_2 23-55 cm + Dark reddish brown (2.5YR3/6) heavy clay; moderate, medium subangular blocky structure, friable moist; common, fine and very fine pores; compact (20 mm); slightly plastic, slightly sticky; common roots; semi-dry.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases (%) at pF1-5 Solid	Liquid	Air	Particle size (%) Sand	Silt	Clay
A_p	0-23	20.2	27.0	1.35	51.8	35.8	12.4	46.7	24.5	28.8
B_2	23-55+	20.8	25.4	1.22	46.9	36.4	16.7	28.3	24.6	47.1

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%) pF1.0	pF1.5	pF3.0	pF4.0
A_p	LiC	17	1.5×10^{-3}	44.8	39.2	35.8	29.3	21.5
B_2	HC	20	2.6×10^{-3}	46.0	41.1	36.5	27.2	18.4

Horizon	Storage Capacity (mm) of Available water (of 50 cm deep soil)	Easily available water	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_p	81.8	40.1	6.1	4.9	0.80	0.117	6.8	1.38	5.60
B_2			5.1	4.3	0.47	0.069	6.8	0.81	4.00

Horizon	Exchangeable bases Ca	Mg	Na	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	Available (ppm)	Total K_2O (%)
A_p	3.75	1.04	0.73	0.47	107.0	0.314	92.6	0.145
B_2	1.10	0.90	0.11	0.37	62.0	0.272	97.4	0.145

Horizon	Extractable S	Fe	Cu	Zn (ppm)	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_p	4.25	3.00	3.2	6.2	9.6	600	64
B_2	1.50	2.60	4.8	2.8	59.2	80	43

Profile No. 131

I Information on the site.

a . Date of examination : 17 July 1974.
b . Location : Amphoe Muang Kalasin.
c . Land form :
  i . Physiographic position : High terrace.
  ii . Surrounding land form : Slope - 3%.
d . Land use : Shrubs and partly cleared for upland crop cultivation.

II General information on the soil.

a . Soil classification : Red Yellow Latosols.
b . Parent material : Old alluvium.
c . Drainage and water permeability : Well drained. Permeability is high.
d . Moisture condition in profile : Dry throughout the profile.

III Profile description.

A_1 0-12 cm Brownish black (7.5 YR 2/2) sandy loam; single grain and weak, fine granular; loose (5 mm); slightly plastic; slightly sticky; common roots; dry; positive benzidine reaction; gradual smooth boundary to

A_{12} 12-23 cm Brownish black (7.5 YR 3/2) sandy loam; weak, fine subangular blocky, friable; few, fine and very fine pores; slightly compact (15 mm); slightly plastic, slightly sticky; common roots; dry; positive benzidine reaction; gradual smooth boundary to

AB 23-40 cm Bright brown (2.5 YR 5/8) sandy loam; weak, medium subangular blocky; friable few, fine and very fine pores; very compact (25 mm); slightly sticky; common roots; dry; gradual smooth boundary to

B_2 40-100 cm + Dark red (10R3/6) sandy loam; moderate, medium subangular blocky; few, fine and very fine pores; few large size (2-5 cm) ant holes; extremely compact (32 mm); slightly sticky; few roots; dry

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)	(g/cm³)	Solid	Liquid	Air	Sand	Silt	Clay
A_1	0-12	8.9	11.1	1.25	47.9	37.9	14.2	81.3	12.5	6.2
A_{12}	12-23	6.5	8.1	1.24	47.5	40.9	11.6	78.3	16.5	5.2
AB	23-40	2.7	3.7	1.36	52.4	34.0	13.6	86.3	7.5	6.2
B_2	40-100+	4.5	6.6	1.46	56.1	33.0	10.9	82.4	10.5	7.2

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_1	SL	5	1.1×10^{-2}	48.0	42.9	37.9	9.2	4.5
A_{12}	SL	15	9.4×10^{-3}	47.3	42.2	40.9	18.2	5.3
AB	LS	25	7.4×10^{-3}	45.5	37.8	34.0	10.1	4.5
B_2	SL	32	4.5×10^{-3}	39.5	39.5	32.9	16.3	3.7

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_1	158.6	116.6	6.0	4.4	0.94	0.042	22.4	1.62	1.20
A_{12}			6.0	4.4	0.87	0.037	23.5	1.50	1.12
AB			5.7	3.8	0.06	0.013	4.6	0.10	0.64
B_2			5.9	4.4	0.39	0.017	22.9	0.67	0.72

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_1	1.10	0.66	0.05	0.05	154.9	0.046	11.6	0.030
A_{12}	0.85	0.49	0.07	0.07	132.0	0.056	10.5	0.039
AB	0.30	0.14	0.46	0.04	146.3	0.154	7.0	0.018
B_2	0.40	0.16	0.07	0.07	95.8	0.160	4.4	0.039

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_1	1.25	5.60	0.20	2.0	6.8	60	38
A_{12}	1.25	0.00	0.80	1.6	9.2	60	32
AB	0.75	0.08	0.40	0.6	3.2	60	22
B_2	2.00	0.00	0.40	0.6	3.2	60	27

Profile No. 133

I Information on the site.

a . Date of examination : 17 July 1974.

b . Location : Khon Kaen Agricultural Experiment Station, Amphoe Muang, Khon Kaen.

c . Land form :

i . Physiographic position : High terrace.

ii . Surrounding land form : Gently undulating (Slope 2%).

d . Land use : Jute cultivation.

II General information on the soil.

a . Soil classification : Red Yellow Latosols.

b . Parent material : Old alluvium of high terrace.

c . Drainage and water permeability : Well drained. Permeability is moderate.

d . Moisture condition in profile : Dry throughout the profile.

III Profile description.

A_p 0-12 cm Dark reddish brown (5YR3/4) sandy loam; weak, fine subangular blocky, friable; fine and very fine pores; slightly compact (16 mm); dry; common roots; very positive benzidine reaction; gradual smooth boundary to

B_{21} 12-40 cm Dark reddish brown (2.5YR3/6) sandy clay loam; moderate, fine and medium subangular blocky; many fine and very fine pores; compact (24 mm); slightly sticky: non plastic; dry; faint benzidine reaction; gradual smooth boundary to

B_{22} 40-98 cm + Reddish brown (2.5YR4/8) sandy clay loam moderate, fine and medium subangular blocky; many fine and very fine pores; compact (20 mm) slightly sticky; non plastic; dry.

Analytical Data

Horizon	Depth (cm)	Moisture		Bulk density	Three Phases (%) at pF1-5			Particle size (%)		
		(W%)	(V%)	(g/cm³)	Solid	Liquid	Air	Sand	Silt	Clay
A_P	0-12	6.1	8.5	1.40	54.0	29.3	16.7	82.4	9.4	6.4
B_{21}	12-40	4.5	7.4	1.65	63.5	26.1	10.4	70.8	12.8	16.4
B_{22}	40-98+	8.0	12.2	1.52	58.4	28.1	13.5	66.9	10.5	22.6

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content (%)			
					pF1.0	pF1.5	pF3.0	pF4.0
A_P	SL	16	2.7×10^{-3}	40.3	33.0	29.3	12.9	3.6
B_{21}	SCL	24	3.5×10^{-4}	30.0	27.9	26.1	13.9	8.0
B_{22}	SCL	20	1.5×10^{-3}	34.4	32.9	28.1	12.3	10.7

Horizon	Storage Capacity (mm) of		pH		T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
	Available water (of 50 cm deep soil)	Easily available water	H_2O	KCl					
A_P	98.9	72.2	4.9	4.1	0.36	0.017	21.2	0.62	14.4
B_{21}			4.6	3.6	—	0.015	—	—	0.96
B_{22}			4.9	3.5	0.14	0.021	6.8	0.24	1.04

Horizon	Exchangeable bases (me/100g)				Base saturation degree (%)	P_2O_5		Total K_2O (%)
	Ca	Mg	Na	K		Total (%)	Available (ppm)	
A_P	0.35	0.08	0.09	0.04	38.9	0.046	29.0	0.030
B_{21}	0.35	0.08	0.03	0.02	50.4	0.072	8.6	0.039
B_{22}	0.10	0.13	0.13	0.01	35.4	0.105	4.4	0.099

Horizon	Extractable (ppm)				Mn (ppm)		Electrical conductivity (μ mho)
	S	Fe	Cu	Zn	Exchangeable	Easily red.	
A_P	1.25	4.76	0.40	1.6	30.8	100	—
B_{21}	4.75	4.08	0.80	1.2	13.6	60	53
B_{22}	3.25	3.80	0.40	1.0	9.2	40	21

Profile No. 134

I Information on the site.

a . Date of examination : 17 July 1974.

b . Location : Khon Kaen Agricultural Experiment Station, Amphoe Muang, Khon Kaen.

c . Land form :

i . Physiographic position : High terrace.

ii . Surrounding land form : Gently undulating (Slope 3%).

d . Land use : Jute cultivation.

II General information on the soil.

a . Soil classification : Red Yellow Latosols.

b . Parent material : Old alluvium of high terrace.

c . Drainage and water permeability : Well drained. Permeability is moderately low.

d . Moisture condition in profile : Semi-dry throughout the profile.

III Profile description.

A_p 0-18 cm Dark reddish brown (5YR3/4) loamy sand; single grain and weak, fine subangular blocky, friable; few, fine and very fine pores; loose (5 mm); common roots; semi-dry; faint positive benzidine reaction; gradual smooth boundary to

B_{21} 18-40 cm Dark reddish brown (5YR3/6) sandy loam; moderate, medium subangular blocky, friable; few, fine and very fine pores; few fine ant holes; very compact (25 mm); slightly sticky; semi-dry; faint positive benzidine reaction; gradual smooth boundary to

B_{22} 40-100 cm + Dark reddish brown (2.5YR3/6) sandy clay loam; moderate, medium subangular blocky; few, fine and very fine pores; few, fine ant holes; compact (19 mm); slightly sticky; semi-dry; faint positive benzidine reaction.

Analytical Data

Horizon	Depth (cm)	Moisture (W%)	Moisture (V%)	Bulk density (g/cm³)	Three Phases(%) at pF1-5 Solid	Liquid	Air	Particle size(%) Sand	Silt	Clay
A_p	0-18	—	—	—	—	—	—	—	—	—
B_{21}	18-40	—	—	—	—	—	—	—	—	—
B_{22}	40-100+	—	—	—	—	—	—	—	—	—

Horizon	Texture	Compactness (mm)	Water Permeability (cm/sec)	Max.water holding cap. (%)	Moisture Content(%) pF1.0	pF1.5	pF3.0	pF4.0
A_p	—	—	—	—	—	—	—	—
B_{21}	—	—	—	—	—	—	—	—
B_{22}	—	—	—	—	—	—	—	—

Horizon	Storage Capacity(mm) of Available water (of 50 cm deep soil)	Easily available water	pH H_2O	pH KCl	T-C (%)	T-N (%)	C:N	Humus (%)	CEC (me/100g)
A_p	—	—	4.3	3.4	0.36	0.018	20.0	0.62	0.56
B_{21}			4.4	3.5	0.28	0.023	12.3	0.48	0.72
B_{22}			4.4	3.6	0.21	0.021	10.0	0.36	0.96

Horizon	Exchangeable bases Ca	Mg	Na	K (me/100g)	Base saturation degree (%)	P_2O_5 Total (%)	P_2O_5 Available (ppm)	Total K_2O (%)
A_p	0.15	0.05	0.13	0.04	67.5	0.048	83.8	0.039
B_{21}	0.35	0.06	0.15	0.05	85.4	0.046	16.7	0.072
B_{22}	0.25	0.17	0.13	0.03	60.0	0.059	7.7	0.121

Horizon	Extractable S	Fe	Cu	Zn (ppm)	Mn (ppm) Exchangeable	Easily red.	Electrical conductivity (μ mho)
A_p	2.75	4.64	0.40	0.8	14.0	40	40
B_{21}	7.75	4.64	0.20	0.6	15.2	40	65
B_{22}	27.25	3.76	0.40	0.4	4.0	40	81

Phosphorus absorption coefficient.

P_2O_5mg/100g air dry soil

Great soil group	Profile No.	Horizon	Depth cm.	Coeffi-cient	Clay (%) (Silt %)	Location
Regosols	38	A_1	0—20	271	6.2 (5.3)	Huahin,Prachuap Khiri Khan
		AC	20—30	287	5.3 (4.4)	
	41	A_p	0—15	39	4.3 (7.4)	Muang,Prachuap Khiri Khan
		AC	23—48	47	4.5 (6.3)	
Alluvial soils	1	A_p	0—20	527	6.4 (62.0)	Wajiralonkorn Dam
		A_{13}	49—90	647	18.6 (52.0)	
	3	A_p	0—20	567	7.1 (70.4)	Muang, Kancha-naburi
		A_{12}	20—50	887	28.1 (55.0)	
	16	A_p	0—15	367	20.5 (44.1)	Si Samrong Agr.Exp.St.
		A_{12}	15—40	519	6.0 (43.1)	
Low Humic Gley soils (Loamy)	29	A_p	0—18	687	12.0 (20.5)	Maejo Agr. Exp. St.
		B_{21}	18—76	87	15.9 (20.5)	
	71	A_p	0—15	127	11.8 (36.6)	Buri Ram Sericul-ture Res. St.
		B_{21}	15—45	87	7.8 (40.6)	
	74	A_p	0—15	287	4.4 (22.6)	Surin Sericulture Res. St.
		B_2	15—90	207	4.3 (32.5)	
Low Humic Gley soils (Clayey)	114	A_p	0—20	847	40.8 (20.4)	Non Song Agr. Exp. St.
		B_{22}	32-100	687	51.4 (22.7)	
	136	A_p	0—12	87	13.8 (20.8)	Banmai Samrong Agr. Exp. St.
		B_{21}	30—48	687	29.4 (18.6)	
Grumusols	54	A_p	0—15	2447	50.8 (16.6)	Phattana Nikhom, Lop Buri
		A_{12}	15—45	2247	48.8 (16.6)	
Rendzinas	53	A_p	0—10	1487	6.4 (74.4)	Chai Badan, Lop Buri
		A_{13}	20—65	1687	6.6 (72.7)	
	43	A_p	0—10	1471	14.5 (62.4)	Pak Chong, Nakhon Ratchas-ima
		A_{12}	10—30	1495	8.8 (70.7)	

Phosphorus absorption coefficient
(continued)

P_2O_5mg/100g air dry soil

Great soil group	Profile No.	Horizon	Depth cm.	Coefficient	Clay (%) (Silt %)	Location
Noncalcic Brown soils	8	A_p	0—30	167	10.3 (58.6)	U-Thong Agr. Exp. St.
		B_{21}	30—88	687	8.4 (68.3)	
	14	A_p	0—17	87	19.4 (8.7)	Muang, Kampang phet
		B_{21}	17—60	47	10.6 (14.4)	
	39	A_p	0—14	127	12.7 (26.8)	Pran Buri, Prachuap Khiri Khan
		B_{21}	41—57	167	20.7 (20.5)	
Red Brown Earths	45	A_p	0—15	1007	31.2 (28.6)	Muang, Lop Buri
		B_{21}	24—80	1023	45.6 (16.6)	
	55	A_p	0—10	517	34.5 (34.4)	Muang, Lop Buri
		B_2	20—65	543	44.8 (32.5)	
Gray Podzolic soils	46	A_p	0—26	63	5.7 (11.4)	Chaiyaphum Agr. Exp. St.
		B_2	26—51	60	8.9 (11.5)	
	52	A_p	0—25	48	6.1 (8.4)	Chatturat, Chaiyaphum
		B_{21}	25—57	55	5.0 (10.3)	
	69	A_p	0—10	95	25.5 (8.1)	Huaypong, Agr. Exp. St.
		B_2	15-100	122	24.7 (5.1)	
	72	A_p	0—12	287	5.9 (44.7)	Prasat, Surin
		B_{21}	22—69	327	16.1 (38.5)	
	117	A_p	0—18	7	6.6 (11.2)	Maha Sarakham Agr. Exp. St.
		B_{21}	35—59	247	13.3 (14.4)	
	119	A_p	0—20	10	6.1 (13.6)	Roi Et Agr. Exp. St.
		B_{21}	28—53	167	8.0 (10.5)	

Phosphorus absorption coefficient
(continued)

P_2O_5mg/100g air dry soil

Great soil group	Profile No.	Horizon	Depth cm.	Coefficient	Clay (%) (silt %)	Location
Red Yellow Podzolic soils	18	A_p	0—20	767	9.5 (67.2)	Nan Agr. Exp. St.
		B_{21}	28—53	527	45.6 (28.9)	
	22	A_{11}	0—20	847	36.3 (0.7)	Chiang Saen, Chiang Rai
		B_{21}	20—60	607	50.3 (10.5)	
	82	A_1	0—15	127	31.9 (23.0)	Kra Buri Rubber St.
		B_{22}	35—70	807	51.9 (19.0)	
	100	A_1	0—17	535	25.8 (2.5)	Khok Pri Meng Rubber St.
		B_{22}	37—100	487	34.1 (6.6)	
	96	A_1	0—30	—	—	Khok Pho Rubber St.
		B_{21}	30—35	255	18.9 (7.0)	
	42	A_p	0—18	—	—	Muang, Prachuap Khiri Kan
		B_{21}	18—48	127	24.6 (20.6)	
Reddish Brown Lateritic soils	44	A_p	0—16	527	63.2 (20.7)	Corn and Sorghum Res. Center
		B_2	16-55	647	71.1 (16.6)	
	56	A_p	0—10	287	33.1 (26.6)	Phraputtabat Agr. Exp. St.
		B_{22}	36—82	327	47.2 (22.9)	
	106	A_p	0—15	657	34.8 (26.3)	Thanto Rubber St.
		B_{22}	36—70	655	42.8 (26.2)	
Reddish Brown Latosols	62	A_p	0—25	1247	34.8 (26.7)	Thamei, Chanthaburi
		B_2	25—70	1255	46.6 (18.7)	
Red Yellow Latosols	61	A_1	0—18	327	40.3 (16.5)	Klaeng, Rayong
		B_{22}	45—60	447	50.6 (12.7)	
	70	A_p	0—15	247	9.6 (14.9)	Muang, Nakhon Ratchasima
		B_2	25—75	135	15.7 (12.4)	
	131	A_1	0—12	239	6.2 (12.5)	Mang, Kalasin
		B_2	40—100	135	7.2 (10.4)	