Proposed by: V. Thunduan, 1971
Revised by:
1. N. Chorphaka, 1988
2. P. Wiwatwongwana, 2004

## SAMO THOD SERIES — Field Symbol: Sat

**Distribution:** Occupies moderate extent in the Central Highlands, mainly in the central part of the Pa Sak valley.

**Setting:** Samo Thod soils are derived from residuum and local colluvium from intermediate basic rook associated with lime stone. They occur on dissected lava flows and erosion surfaces. relief is undulating to gently rolling. Slopes range from 3 to 10%. Elevation ranges from 70 to 150 cm above sea level. the climate is Tropical Savanna (Koppen 'Aw'). Annual precipitation ranges from 1,100 to 1,500 mm. Mean annual temperature is 26 $^{o}$C.

**Drainage, Permeability and Runoff:** Moderately well drained. Permeability is estimated to be moderate to slow, runoff is rapid. Groundwater level is below 1 m during most of the year, falling below 2 m during the peak of the dry season.

**Vegetation and Land Use:** Originally mixed deciduous or dry evergreen forest; but now largely cleared for upland crops of which maize, cotton, sorghum and beans are most important.

**Characteristic Profile Features:** Samo Thod series is a member of the very fine, smectitic, isohyperthermic Chromic Haplusterts. They are deep, neutral to mildly alkaline over very strongly to strongly acid soils. They are characterized by a dark brown or dark reddish brown, clay loamy, silty clay or clay A horizon overlying a dark brown or brown clay B horizon common to many, distinct reddish brown and red mottles occur in the B horizon. The lower B and C horizon has grayish brown colours, fewer mottles and often contains slickensides and secondary lime concretions.

**Typifying Pedon:** Profile code no. is No.10 (Type Location) (moist colours unless otherwise stated).

**Location:** Ban Hin Dad Noi, Tambon Sab Samo Thod, Amphoe Bung Sam Phan Changwat Phetchabun.
**Sheet Name:** Khao Phra **Sheet No.:** 5140 I
**Coordinate:** 127454 **Elevation:** 75 m (MSL)
**Relief:** gently undulating **Slope:** 3-4%
**Physiography:** erosion surfaces
**Parent material:** colluvium derived from basalt association with limestone
**Drainage:** moderately well drained **Permeability:** rapid over moderate
**Runoff:** rapid **Ground water depth:** >5 m
**Flooding depth:** - **Duration:** - **Frequency:** -
**Annual rainfall:** 1,124.7 mm **Mean temp.:** 27.2 $^{o}$C **Climate type:** Tropical Savannah (Aw)
**Natural vegetation or land use:** Corn and fruit trees (Tamarind, jack fruit and mango)
**Described by:** N. Chorphaka, S. Imsamut and A. Potichan **Date:** 22 January, 1993
**Revised by:** Phusit Wiwatwongwana **Date:** 25 May, 2004

| Horizon | Depth (cm) | Description |
|---|---|---|
| Ap | 0-30 | Dark reddish brown (5YR3/4) silty clay; fine crumb structure in the uppermost, moderate medium and coarse subangular blocky structure in the lower part; firm, sticky, plastic; few fine and medium roots; few fine charcoals; few fine rounded Fe/Mn concretion; neutral (field pH 7.0); clear, wavy boundary. |
| BA | 30-41 | Dark reddish brown (5YR3/4) clay; common fine distinct yellowish brown (10YR5/6) mottles; moderate medium and coarse subangular blocky structure; firm, sticky, plastic; few fine and medium roots; few fine soft Fe/Mn concretions; strongly acid (field pH 5.5); gradual, smooth boundary. |

| | | |
|---|---|---|
| Bw | 41-67 | Red (2.5YR4/6) clay; moderate fine and medium distinct brown (10YR5/3) mottles; moderate medium and coarse subangular blocky structure; firm, sticky, plastic; few fine roots; fine soft Fe/Mn concretions, very strongly acid (field pH 5.0); clear, smooth boundary. |
| Bss1 | 67-98 | Dark yellowish brown (5YR3/6 and 5YR4/4) clay; common fine distinct gray (5YR5/1) mottles; moderate coarse prismatic breaking to medium subangular blocky structure; firm, sticky, plastic; few fine and coarse roots; common fine soft Fe/Mn concretion; few distinct slickensides; strongly acid (field pH 5.5); clear, smooth boundary. |
| Bss2 | 98-146 | Mixed dark brown to brown and red (7.5YR4/4 and 2.5YR4/6) clay; common fine distinct gray (5YR5/1) mottles; moderate coarse prismatic breaking to medium subangular blocky structure; firm, sticky, plastic; few fine roots; common soft Fe/Mn concretions; common distinct slickensides; strongly acid (field pH 5.5); clear, smooth boundary. |
| Cr | 146-160+ | Mixed dark grayish brown (10YR4/2) brownish yellow (10YR6/6) and gray (2.5YR5/0) weathering basalt. |

**Range of Profile Features:**

The A horizon is from 15 to 25 cm thick, has 10YR, 7.5YR or 5YR hues, values of 2 through 3 and chromas of 2 to 3. Structure is granular becoming moderate medium blocky in lower layers.

The B horizon has its lower boundary between 50 and 125 cm of the soil surface and has colours in 10YR or 7.5YR hues with values of 3 through 5 and chromas of 2 to 4. A thin layer with 5YR hues often occurs at the boundary between the A and B horizons. Structure is moderate medium and coarse blocky.

The C horizon consists of weathering basalt and to a lesser degree, weathering andesite and grades to bedrock.

When cultivated, tillage may result in mixing of A and upper B material and structure becomes coarser.

**Similar Soil Series:**

Chai Badan series (Cd): basalt derived, has darker colours, does not contain mottles, has higher pH values, and moderately deep.

**Principal Associated Soils:**

These include the better drained Chai Badan, Lamnarai and Tha Li series soils on dissected lava flows and erosion surfaces.

ANALYSIS RESULTS

(oven dry basis)

Profile code no.: 10

Soil series: Samo Thod (Sat)

| Lab No. | Depth (cm) | Horizon | Particle size distribution analysis (% by weight ) | | | | | | | | Texture | | pH | | $CaCO_3$ % | P, mg $kg^{-1}$ Bray 2 | K, mg $kg^{-1}$ $NH_4OAc$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | USDA grading | | | Sand-fraction grading | | | | | Lab | Field | 1:1 | 1:1 | | | |
| | | | sand | silt | clay | vc | c | m | f | vf | result | estim$^{n}$ | water | KCl | | | |
| 364091 | 0-30 | Ap | 10.5 | 30.8 | 58.7 | 1.9 | 1.8 | 1.5 | 2.5 | 2.8 | c | sic | 5.8 | 4.6 | | 4.9 | |
| 364092 | 30-41 | BA | 8.2 | 30.2 | 61.6 | 1.2 | 1.0 | 1.3 | 2.5 | 2.2 | c | c | 5.2 | 3.9 | | 4.3 | |
| 364093 | 41-67 | Bw | 6.6 | 23.0 | 70.4 | 0.8 | 0.8 | 1.0 | 2.0 | 2.0 | c | c | 4.8 | 3.5 | | 4.3 | |
| 364094 | 67-98 | Bss1 | 9.7 | 23.7 | 66.6 | 2.3 | 1.6 | 1.0 | 1.9 | 2.9 | c | c | 4.8 | 3.4 | | 4.0 | |
| 364095 | 98-146 | Bss2 | 8.4 | 27.3 | 64.3 | 2.3 | 1.3 | 1.0 | 1.8 | 2.0 | c | c | 5.0 | 3.8 | | 3.8 | |
| 364096 | 146-160 | Cr | 14.5 | 49.8 | 35.7 | 5.3 | 3.3 | 2.0 | 2.3 | 1.6 | sicl | c | 7.0 | 5.8 | | 4.9 | |

| Depth (cm) | Air dried to oven dried | C % | N % | Exchange capacity and cations ($cmol_{(+)}$ $kg^{-1}$) | | | | | | | | | Base satur$^{n}$ (%) | | ECEC $cmol_{(+)}$ $kg^{-1}$ (B+D) | Al KCl extr. $cmol_{(+)}$ $kg^{-1}$ (D) | Electrical conduct$^{y}$ ($ECx10^{6}$) dS $m^{-1}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Ca | Mg | K | Na | SUM cations (B) | Extr. acidity (A) | SUM (B+A) | CEC $NH_4OAc$ (C) | CEC 100g Clay | B/Cx100 | (Bx100)/ (B+A) | | | |
| 0-30 | | 1.32 | | 26.80 | 9.10 | 0.50 | 0.70 | 37.10 | 17.70 | 54.80 | 37.2 | 63.4 | 100 | 68 | | nd | 0 |
| 30-41 | | 0.90 | | 22.90 | 7.80 | 0.30 | 0.40 | 31.40 | 21.90 | 53.30 | 36.2 | 58.8 | 87 | 59 | | 0.9 | 0 |
| 41-67 | | 0.75 | | 21.80 | 7.80 | 0.30 | 0.40 | 30.30 | 25.60 | 55.90 | 37.3 | 53.0 | 81 | 54 | | 8.5 | 0 |
| 67-98 | | 0.42 | | 24.00 | 7.80 | 0.30 | 0.40 | 32.50 | 24.00 | 56.50 | 40.8 | 61.3 | 80 | 58 | | 5.8 | 0 |
| 98-146 | | 0.39 | | 31.70 | 8.80 | 0.40 | 0.50 | 41.40 | 20.80 | 62.20 | 43.9 | 68.3 | 94 | 67 | | 0.5 | 0 |
| 146-160 | | 0.27 | | 44.60 | 9.40 | 0.30 | 0.50 | 54.80 | 12.30 | 67.10 | 45.0 | 126.1 | 100 | 82 | | nd | 0 |

Surveyor: N. Chorphaka, S. Imsamut and A. Potichan

Date: 22 January, 1993