LEGENDS, EXPLANATION OF SOIL UNITS AND DEFINITION OF HORIZONS

For SOIL MAP OF JAPAN (1 : 2,000,000)

(This soil map has been compiled and is based on the 1 : 500,000 soil map of the Japanese Economy Planning Agency (1976))

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I. LEGEND

Soils on mountainous regions

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2. Podzols, Brown Forest Soils and Lithosols
3. Brown Forest Soils and Lithosols
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II. EXPLANATION OF SOIL UNITS

note ; Soil names in parentheses are soil unit names found in the FAO/UNESCO World Soil Map.

Map Unit 1. Rockland, Lithosols and Podzols

This mapping unit includes Rockland, Lithosols (Lithosols) and Podzols (Podzols).

Lithosols are soils having an (A)C profile. The (A) horizon is weakly developed and shallow. Podzols are soils which have ABC horizons developed under the forest conditions in cool and humid climates. They have a deep humus-enriched layer, A horizons depleted of iron and aluminum, and B horizons with accumulation of humus and iron.

This unit is distributed on mountainous areas all over the country. In Hokkaido, it is widely distributed in Hidaka range, Mt.Yubari and Mt.Ashibetsu. In the central part of Hokkaido, in the Mt.Taisetsu area, this unit occurs concurrently with the Map Unit 6 "Andic Regosols and Andic Lithosols". In other parts of Hokkaido, this unit has a scattered distribution in the Shiretoko Peninsula, Rishiri and Rebun Islands, and so on. In Tohoku district, this unit is distributed in Mts.Hakkoda, Hachimantai, Kurikoma, Chokai, Iide, Mikuni Range, Azuma, and scattered in both Shimokita and Tsugaru Peninsulas, and also Mt.Iwate above the 1,000 m elevation. In Kanto and Chube districts, distribution of this unit is found on Mt.Mikuni Range, Mts. Tateyama Range, Komagatake Range, Akaishi Range, and on

Mts.Fuji, Yatsugatake, and Togakushi. Along the Japan Sea coast, this unit is distributed sporadically in areas at low elevations in patches.

Map Unit 2. Podzols, Brown Forest Soils and Lithosols

This unit is a complex of Podzols (Podzols), Brown Forest Soils (Cambisols), and Lithosols (Lithosols). Brown Forest Soils are weakly acidic soils having A(B)C horizons; having a blackish-brown A horizon gradually changing to a brown or dark-brown (B) horizon; they have no evidence of sesquioxides and clay movements. Distribution of this unit is restricted to the zone between Map Unit 1 "Rockland, Lithosols and Podzols", and Map Unit 4 " Brown Forest Soils (including Lithosols)", or else to the mountain tops in the southern part of Japan, notably in Mt.Hakusan, in the mountainous areas in the Kii Peninsula and Shikoku, and in Yakushima Island.

Map Unit 3. Brown Forest Soils and Lithosols

This unit is a complex of Brown Forest Soils (Cambisols) and Lithosols (Lithosols).

Distribution of this unit is restricted to and mostly developed on steep to very steep slopes along river valleys in mountainous regions. In this map, river valleys along the Kumano in the Kii Peninsula, the Yoshino in Shikoku, the Ono and Oyodo in Kyushu are shown to have this unit.

Map Unit 4. Brown Forest Soil (including Lithosols)

Brown Forest Soils (Cambisols) are weakly acidic soils having A(B)C horizons; developed under forests in humid, temperate and warm zones; they have blackish-brown A horizon gradually changing to a brown or dark-brown (B) horizon; they show no evidence of sesquioxides and clay movements. This unit is the most widely distributed soil unit in Japan. They are distributed in mountainous regions, except mountain tops and very steep slopes of the valleys where the Map Units 1, 2, 3, or other soil units are predominant.

Map Unit 5. Brown Forest Soils and Andosols

This unit is a complex of Brown Forest Soils (Cambisols) and Andosols (Andosols), and distributed in the area between Map Units 4 "Brown Forest Soils" and 9 "Andosols". It occurs sometimes at the mountain tops or slopes in volcanic regions, or mountain slopes where Brown Forest Soils and Andosols can not be shown separately.

Map Unit 6. Andic Regosols and Andic Lithosols

Andic Regosols (Rhegosols) and Andic Lithosols (Lithosols) are (A)C soils; their parent materials are primary or secondary deposits of the volcanic sand and/or ash and/or fragments produced from the disintegration of the volcanic bodies. The (A) horizon is shallow and weakly developed and the solum grades into or rests directly on the unconsolidated or consolidated materials.

This unit is shown in the Yufutsu Plain, covered by the ejecta of Mt.Tarumae, in Hokkaido, at the feet of Mts.Fuji and Asama, at the north feet of Mts.Haruna and Akagi in Kanto-Chubu districts, and at the feet of Mts.Aso, Kirishima and Sakura-jima, and near Kokubu in Kyushu.

Map Unit 7. Brown Forest Soils and Red-yellow Podzolic Soils

This unit is a complex of Brown Forest Soils (Cambisols) and Red-yellow Podzolic Soils (Helvic Acrisols).

Distribution of this unit is seen in the mountainous or hilly areas at the peripheries of Map Unit 8 "Red-yellow Podzolic Soils and Lithosols", i.e. in the hilly to mountainous regions of Kinki, Chugoku, Shikoku and Northern Kyushu. It is also distributed in islands of the Southwestern part of Japan and in the Nansei Islands and Okinawa.

Map Unit 8. Red-yellow Podzolic Soils and Lithosols (including Reddish Brown Lateritic Soils)

This soil unit is a complex of Red-yellow Podzolic Soils (Helvic Acrisols), Lithosols (Lithosols), on Tertiary or Quaternary deposits, and Reddish Brown Lateritic Soils (Rhodic Luvisols). Red-yellow Podzolic Soils are soils developed under forest in humid climate. The humus content is usually low; the light colored (A) horizon is underlain by the B horizon with high chroma and value. Reddish Brown Lateritic Soils are soils derived from calcareous or basic rocks. The development of the A horizon is weak. The hue

of the B horizon is nearly 5YR; both the chroma and the value are 4 or less. The degree of base saturation is mostly high. Distribution of this unit is seen in hilly and undulating to flat upland regions of Japan ; e.g. upland areas around the Sendai Plain and the Yamagata Basin, in Tohoku district, the Matsuyama hilly area in Kanto district, peripheries of the Niigata and the Toyama Plain and the Noto Peninsula, the Fukui Plain, the Nagano Basin, and a wide area covering the Mikawa Upland, the Mikataga-hara Upland, the Chita and Atsumi Peninsulas, in Chubu district. In Kinki district, at the foot of the Suzuka Mountain Range, the hilly regions of Shiga, Osaka, and Hyogo prefectures, and Awajishima are covered by this unit. It is also extensively developed in the hilly to undulating regions of Chugoku and Shikoku districts, including islands of the Setouchi region. In Kyushu, this unit is widely distributed in Ooita, Fukuoka, Saga, and Nagasaki prefectures, Amakusa, Iki, Tsushima, Goto Islands, Nansei and Okinawa Islands, and in Ogasawara Islands. Distribution of Reddish Brown Lateritic Soils is not extensive in Japan. A fairly wide area is only seen on Akiyoshi-dai, in Chugoku district, and in Okinawa.

Map Unit 9. Andosols (Andosols)

They are originally developed on coarse to fine volcanic ejecta and are characterized by high contents of vitric materials and/or allophane. Most of them have a dark colored A horizon over brown colored B horizon. They are also characterized by low bulk density, usually less than 0.85

gm/cc; cation exchange capacity (CEC) is usually higher than 30 meq/100g (measured with the solution buffered to pH 7.0); the phosphorus absorption coefficient is 1,500 or more.

The distribution of this unit is wide in Japan; it occupies about 60,000 km^2 or 16.4 % of the total area of Japan. It is widely distributed on terraces and upland regions of southern Hokkaido, Tohoku, Kanto, Chubu districts and southern Kyushu.

(Hokkaido)

Is found in the Konsen terraces, the Tokachi and Abashiri Plains, the terraces at the south foot of the Hidaka Mountains, and small areas near Asahikawa, Sapporo and the foot of Mt.Yotei.

(Tohoku district)

Is found in the cervical regions of the Shimokita Peninsula, the terraces in Sanbongi, at the feet of Mts.Iwaki, Iwate, Zao, and Bandai, the mountainous areas of Kitakami and Abukuma, the terraces in Shirakawa and Hanawa, Odate, Yokote, Tono and Fukushima Basins, and a small area around the Lake Towada.

(Kanto district)

Is found at the feet of Mts.Haruna, Akagi, Shirane and Tama Hills, the alluvial fans of the Nasuno Plain, the terraces in Hitachi, Ryoso, and Musashi regions, and the Hatano Basin.

(Chubu district)

Is found at the feet of Mts.Fuji, Yatsugatake, and Togakushi, and part of the Nagano, Iiyama, Ina, and Matsumoto Basins and a small area in the Ono Basin, etc.

(San'in, the Japan Sea coast of Chugoku district)

Is found at the feet of Mts.Daisen and Sanbe.

(Kyushu district)

Is found at the feet of Mts.Aso, Kuju, Kirishima, Unzen and the terraces of the Osumi and Satsuma Peninsulas and Tanegashima Island.

Map Unit 10. Gray Lowland Soils and Brown Lowland Soils

They are (Fluvisols) and (Fluvic Gleysols). This unit consists of soils developed on alluvial sediments. Natural soil drainage is good to rather poor. They are used for upland crops or for rice cultivation with irrigation. They have an (A) horizon and (B) horizon or a mottled gray colored gley horizon. The distribution of this unit is seen in the Fukushima and Aizu Basins and part of the Tsugaru Plain in Tohoku district; part of the Kanto Plain in Kanto district; part of the Toyama and Ishikawa Plains, the Nagano, Matsumoto, Kofu Basins and part of the Nobi Plain in Chubu district; part of the Kyoto and Nara Basins and part of the Osaka and Wakayama Plains in Kinki district; small river plains and the Yoshinogawa and Sanuki Plains in Chugoku and Shikoku districts; the greater part of the Saga and Kumamoto Plains in Kyushu district.

Map Unit 11. Gley Soils (Gleysols)

They are the soils with a gley horizon within 50 cm from the surface. They are distributed mainly in the alluvial areas and mostly used for rice cultivation. A wide distribution is found in alluvial plains of the Tokachi and Ishikari and also in other alluvial plains in Hokkaido. In other districts, wide areas of this unit are found in the Tsugaru, Akita, Shonai, Niigata, Sendai, Osaka, and Izumo Plains, in the lower reaches of the alluvial areas of the Kanto Plain and in the western half of the Nobi Plain. Their distribution is also known in the polder lands of the Hachiro Lagoon and the Kojima Bay.

Map Unit 12. Peat Soils (Histosols)

This unit includes the soils with a peat or muck layer of 50 cm or more in thickness within 1 m depth and those with a peat or muck layer of 20 cm or thicker within 50 cm depth. The peat material is mostly composed of the low moor. The high moor is contained only in Peat Soils found in some parts of the Sarobetsu and Ishikari Plains in Hokkaido.
The Sarobetsu and Ishikari Plains and the Konsen Lowland in Hokkaido have the widest areas of Peat Soils. The Tsugaru Plain comes next and is followed by the Sendai, Shonai, Niigata and Kanto Plains.

Map Unit 13. Sand dune and Sand Dune Soils

Coarse textured (A)C soils; their distribution is mostly confined to well-drained sand dunes of the sea coasts, but

rarely in gravelly areas. The subsoils are usually yellowish brown. They are mostly uncultivated, but sometimes utilized for the windbreak forests and vegetable and flower cultivations. The distribution of this unit is as follows:

(Japan Sea side)

Along the sea coasts of the Tsugaru, Noshiro, Shonai, Niigata and Tottori Plains, in the Yumigahama Peninsula in Tottori Prefecture.

(Pacific Ocean side)

Along the coast of the Shimokita Peninsula and the Sendai Plain and on the coasts of the Sagami, Enshu and Hyuga Seas and on the Kujukuri, Shibushi and Fukiage Beaches.

Map Unit 14. Calcareous Brown Forest Soils (in Okinawa)

Distribution of this unit is restricted to the southern part of Okinawa Island. They have a black-brown A horizon and a yellowish-brown B horizon, and are characterized by a high exchangeable Ca content. They are clayey soils, derived from raised coral reef limestones (Ryukyu Limestone). This unit shows the distribution of soils formerly called Rendzina-like soils.

Map Unit 15. Poorly drained Upland Soils (in Hokkaido)

Distribution of this unit is restricted to Hokkaido. Parent materials are mostly Pleistocene sediments or Tertiary siltstones and mudstones; humus content of the surface soil is low.

This is a very poorly drained clayey soil, having a greyish color. The soils have been called Ju-nen-do (heavy clay soils) in Hokkaido.

They occur mainly along the coasts of the Sea of Okhotsk and of northern Japan Sea and in the Nayoro Basin and the environs of the Ishikari Plain.

Map Unit 16. Andic Regosols over Peat (in Hokkaido)

This unit includes volcanogeneous Regosols that have a peaty layer in the subsoil within 1 m depth.

Distribution of this unit is retricted to a part of the Yufutsu Plain, along the Pacific coast of Hokkaido.

III. DEFINITION OF THE HORIZONS IN THE LEGEND

A horizon : The uppermost surface horizon, characterized by the accumulation of humus and/or the eluviation of soil materials. The symbol, (A), is used for the A horizon, whose humus accumulation is comparatively low and thickness is thin; or, in other words, a weak Al horizon.

B horizon : Usually occurs beneath the A horizon; the accumulation of iron and/or humus and/or clay is the main characteristics. The horizon, in which no accumulation is detected but weathering has advanced and iron

has segregated, is designated as (B), or Color B or Structure B.

C horizon : Usually occurs beneath the A horizon or B horizon, and is not affected by the soil forming processes of the present time.

Gley horizon : Typically occurs under the ground water table, permanently or in most parts of the year, and shows a bluish-gray color due to the iron reduction.

note :

Phosphorus-absorption coefficient

A 100 cc of 2.5% $(NH_4)_2HPO_4$ solution (adjusted to pH 7.0 with dilute NH_4OH or H_3PO_4 solution) is added to 50 g of air dry soil. Stand 24 hours with occasional shaking. Phosphorus contents in the solution added and the filtrate or the supernatant obtained by centrifugation are determined.
Phosphorus absorption coefficient is the difference of phosphorus contents in the two solutions, expressed in mg of P_2O_5 per 100 g of soil.