SONGSAN SERIES

Established Series
KDH, JYH, UKT
6 March, 1973

The Songsan series are members of the coarse loamy, mixed, mesic family of Typic Dystrudepts [Haplic Cambisols (Eutric) classified by WRB]. These soils have brown gravelly sandy loam A horizons, brown gravelly sandy loam BA horizons, brown gravelly sandy loam Bw horizons, and brown gravelly sandy loam C horizons. They are developed in mountainous areas in residuum derived from metamorphic rocks such as biotite, granite-gneiss and schist.

Typifying Pedon: Songsan gravelly sandy loam-pine forest (Colors are for moist soil).

Slope: 30-60%

Elevation: 200 m above m.s.l.

Soil moisture regime: Udic

Soil temperature regime: Mesic

Parent material: Residium on granite

Diagnostic features: An ochric epipedon from a depth of 0 to 20 cm and a cambic horizon from a depth of 44 to 82 cm (A cambic horizon from a depth of 44 to 82 cm by WRB).

Described by: Song, K. C., D. C. Noh, and B. K. Hyun, 7 October, 2013.

Morphological properties of typifying pedon.

A - 0 to 20 cm. Brown (7.5YR 4/3) gravelly sandy loam; weak medium to coarse granular structure; friable, slightly sticky and slightly plastic; many fine to medium roots; common fine pores; few fine micas; few worm holes; 25% gravels; clear wavy boundary.

BA - 20 to 44 cm. Brown (7.5YR 4/3) gravelly sandy loam; weak fine to medium subangular blocky structure; friable, slightly sticky and slightly plastic; common fine to medium roots; common fine pores; few fine micas; few worm holes; 20% gravels and cobbles; gradual wavy boundary.

Bw - 44 to 82 cm. Brown (7.5YR 4/3) gravelly sandy loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; common fine to medium roots; common fine to medium pores; few fine micas; few worm holes; 25% gravels and cobbles; clear wavy boundary.

C - 82 to 160 cm. Brown (7.5YR 5/4) gravelly sandy loam; structureless, massive; slightly sticky and slightly plastic; few fine roots; few medium pores; few fine micas; 30% gravels and cobbles.

The typifying pedon has an ochric epipedon from a depth of 0 to 20 cm and a cambic horizon from a depth of 44 to 82 cm. That can be classified as Inceptisol. It has an udic soil moisture regime and keys out as Udept. Also it meets the requirements of Typic Dystrudept. The typifying pedon has, in the fraction less than in diameter, 15% or more particles with diameters of 0.1 to 75 mm and, in the fine-earth fraction, less than 18% clay at the particle-size control section and mesic soil temperature regime. Therefore it can be classified as coarse loamy, mixed, mesic family of Typic Dystrudept.

Type Location: The entrance of the Yeonhwasan Boriwon, Haegog Dong, Cheoin Gu, Yongin city, Gyeonggi Do (127° 16' 45.9", 37° 11' 21.4").

Range in Characteristics: These soils have ochric epipedons and cambic horizons. Depth to hard rock is more than 2 meters, generally ranging from 2 to 5 meters or more. Base saturation is commonly less than 60 percent. Reaction is strongly to medium acid. A horizons are brown or dark yellowish brown fine gravelly sandy loam or coarse sandy loam. The cambic B horizons are yellowish brown, light yellowish brown, light brown, reddish yellow, or strong brown gravelly sandy loam or coarse sandy loam. C horizons are yellowish brown, pale brown, or light yellowish brown gravelly coarse sandy loam or loamy coarse sand.

Competing Series and Their Differentiae: These are the Osan, Isan and Daesan series. The Osan soils have redder color. The Isan soils are derived from conglomerate rocks. The Daesan soils are derived from phyllite or schist of Ogcheon system.

Setting: The Songsan soils occur on mountainous areas of granite-gneiss and schist. Slopes range from 15 to 100 percent but 30 to 60 percent slopes are dominant.

Principal Associated Soils: The Cheongsan and Osan soils are associated with the Songsan soils

on similar parent materials. The Samgag soils are associated with similar physiographic position which contracts between granite and granite-gneiss or schist areas.

Drainage and Permeability: Somewhat excessively drained. Permeability is moderately rapid. When the soil is saturate, the runoff is rapid or very rapid depending on the slopes.

Use and Vegetation: Most of these soils are used for forest.

Distribution: The Songsan soils are of large extent and are distributed in western and southern parts of the country.

Series Established: Hwaseong Gun, Gyeonggi Do, 1972. **Reviced,** Yongin city, Gyeonggi Do, 2013.

Laboratory data sheets of typifying pedon.

Depth (cm)	Horizon	(--- Total ---)			(-- Clay --)		(-- Silt --)		(------- Sand -------)				
		Clay	Silt	Sand	Fine	Coarse	Fine	Coarse	VF	F	M	C	VC
		LT .002	.002 - .05	.05 - 2	LT .0002	LT .002	.002 - .02	.02 - .05	.05 - .10	.10 - .25	.25 - .50	.5 - 1	1 - 2
		- - - - - - - - - - - Pct of < 2mm (3A1) - - - - - - - - - - -											
0-20	A	20.8	31.3	47.9			16.9	12.4	4.0	8.7	10.1	14.2	10.9
20-44	BA	16.1	17.8	66.1			8.6	9.2	5.3	13.8	18.1	20.6	8.3
44-82	Bw	16.0	18.3	65.6			7.9	10.4	5.5	13.1	16.8	20.8	9.5
82-160	C	15.5	21.1	63.4			8.8	12.3	5.1	13.4	15.5	18.9	10.5

Depth (cm)	Coarse Fractions(mm) Weight				>2mm Wt	Orgn C	Total N	Extr P	Total S	(-- Dith -Cit --) Extractable		
	2-5	5-20	20-75	.1-75	Pct of Whole					Fe	Al	Mn
						6A1c	6B3a	6S3	6R3a	6C2b	6G7a	6D2a
	Pct of < 75mm (3B1)				Soil	Pct < 2mm		g/kg		Pct of < 2mm		
0-20						1.47						
20-44						0.21						
44-82						0.11						
82-160						0.22						

Depth (cm)	Ratio/Clay		Atterberg Limits		(Bulk Density)			COLE	(- Water Content -)				WRD
	CEC	1500 kPa	LL	PI	Field Moist	33 kPa	Oven Dry	Whole Soil	Field Moist	10 kPa	33 kPa	1500 kPa	Whole Soil
	8D1	8D1	4P1	4P	4A3a	4A1d	4A1h	4D1	4B4	4B1c	4B1c	4B2a	4C1
			Pct <0.4mm		- - g/cc - -			cm/cm	-- Pct of <2mm --				cm/cm
0-20	0.55												
20-44	0.57												
44-82	0.58												
82-160	0.56												

Depth (cm)	(NH4OAc Extractable Bases)					Acid-	Extr	(----- CEC -----)			Al
	Ca	Mg	K	Na	Sum	ity	Al	Sum	NH4-	Bases	Sat
	5B5a	5B5a	5B5a	5B5a	Bases			Cats	OAc	+ Al	
	6N2e	6O2d	6Q2b	6P2b		6H5a	6G9a	5A3a	5A8b	5A3b	5G1
	- - - - - - - - - - - - meq / 100g - - - - - - - - - - - -										Pct
0-20	2.2	1.2	0.6	0	4.0	10.2	4.3	14.2	11.5	8.3	52.0
20-44	2.9	2.4	0.4	0.1	5.7	5.6	1.9	11.0	9.1	7.6	24.8
44-82	2.4	2.4	0.6	0.1	5.4	5.6	2.9	11.3	9.3	8.4	34.9
82-160	3.0	1.7	0.5	0.1	5.3	4.3	0.6	9.6	8.7	5.9	10.4

Depth (cm)	(Base Sat)		CO3 as	Res	Cond	(------ pH ------)				Acid	Oxalate Extraction		
	Sum	NH4-	CaCO3			NaF	KCl	CaCl2	H2O	Opt	Al	Fe	Si
		OAc	<2mm					.01M		Den			
	5C3	5C1	6E1g	8E1	8I	8C1d		8C1f	8C1f	8J	6G12	6C9a	6V2
	---- Pct ----			ohms /cm	dS/m		1: 1	1: 2	1: 1		- Pct of <2mm -		
0-20	28.0	34.6					3.9	4.4	5.3				
20-44	50.4	62.7					3.6	4.5	5.4				
44-82	49.1	58.5					3.6	4.4	5.4				
82-160	55.1	61.0					4.1	4.9	5.8				