GAPO SERIES

Established Series
PCS, JYH, UKT
28 Mar., 1977

The Gapo series are members of the loamy skeletal, mixed, mesic family of Typic Fluvaquents [Fluvic Gleyic Hydragric Anthrosols (Eutric) classified by WRB]. These soils have dark grayish brown loam Ap horizons with brown mottles, grayish brown very gravelly sandy loam Cg1 horizons with dark yellowish brown mottles, and very dark gray very gravelly sandy clay loam Cg2 horizons. They are developed on fluvio-marine plains.

Typifying Pedon: Gapo loam-rice paddy (Colors are for wet soil).

Slope: 0-2%

Elevation: 1 m above m.s.l.

Soil moisture regime: Aquic

Soil temperature regime: Mesic

Parent material: Fluvio-marine deposits

Diagnostic features: An ochric epipedon from a depth of 0 to 15 cm (An anthraquic horizon from a depth of 0 to 15 cm and hydragric horizon from a depth of 15 to 62 cm by WRB).

Described by: Song, K. C., D. C. Noh, and B. K. Hyun, 30 Jan., 2013.

Morphological properties of typifying pedon.

Ap - 0 to 15 cm. Dark grayish brown (2.5Y 4/2) loam; few fine prominent brown (7.5YR 4/3) mottles; structureless, puddled; slightly sticky and slightly plastic; many fine to medium roots; no pores; 5% fine gravels; clear smooth boundary.

Cg1 - 15 to 62 cm. Grayish brown (2.5Y 5/2) very gravelly sandy loam; common fine to medium distinct dark yellowish brown (10YR 4/4) mottles; structureless, massive; slightly sticky and slightly plastic; few fine roots; no pores; 60% gravels and cobbles; abrupt wavy boundary.

Cg2 - 62 to 150 cm. Very dark gray (Gley 1 3/N) very gravelly sandy clay loam; structureless, massive; sticky and slightly plastic; no roots; no pores; 70% gravels and cobbles.

The typifying pedon has an ochric epipedon from a depth of 0 to 15 cm. But it does not have other diagnostic horizons. Therefore it can be classified as Entisol. It has aquic conditions for some time in normal years in a layer at a depth between 40 and 50 cm below the mineral soil surface, has a texture class finer than loamy fine sand and, in 50% or more of the matrix, chroma of 2 or less and redox concentrations. That can be classified as Aquents. It has a slope of less than 25% and an organic-carbon content (Holocene age) of 0.2% or more at a depth of 125 cm below the mineral soil surface. That can be classified as Fluvaquent. Also it meets the requirements of Typic Fluvaquent. The typifying pedon has loamy skeletal particle-size class and mesic soil temperature class, and can be classified as sandy skeletal, mixed, mesic family of Typic Fluvaquent.

Type Location: About 500 meters west of Deogchon Noinhoegwan, Garyeo Ri, Georyu Myeon, Goseong Gun, Gyeongsangnam Do (128^{o} 21' 7.4", 34^{o} 59' 49.2").

Range in Characteristics: These soils have ochric epipedons. Depth to hard rock is more than 3 meters. Reaction is medium acid to neutral. These soils have more than 35 percent of coarse fragments throughout the profile. Ap horizons are thin olive gray, gray, dark gray or dark grayish brown loam or slit loam with strong brown mottles. C horizons are dark olive gray, dark gary, or very dark gray very gravelly silt loam, loam, or sandy loam.

Competing Series and Their Differentiae: These are the Gupo, Yulpo, and Yeosu soils. The Gupo soils have coarse loamy texture class and contain shell fragments in the subsoils. The Yulpo soils have fine loamy texture class and contain plenty shell fragments throughout the profile. The Yeosu soils have fine texture class.

Setting: The Gapo soils occur on fluvio-marine plains mainly southern coastal parts of the country. The slopes range from 0 to 2 percent.

Principal Associated Soils: These are the Mangyeong, Gwangpo, Munpo, Dapyeong and Gupo soils in similar positions.

Drainage and Permeability: Poorly drained; rapid permeability; slow runoff.

Use and Vegetation: The Gapo soils are used only for rice paddy.

Distribution and Extent: These soils are relatively small extent distributed on fluvio-marine plains.

Series Established: Changwon city, Gyeongsangnam Do, 1976. **Revised,** Goseong Gun, Gyeongsangnam Do, 2013.

Laboratory data sheets of typifying pedon.

Depth (cm)	Horizon	(--- Total ---) Clay LT .002	Silt .002 - .05	Sand .05 - 2	(-- Clay --) Fine LT .0002	Coarse LT .002	(-- Silt --) Fine .002 - .02	Coarse .02 - .05	(------- Sand -------) VF .05 - .10	F .10 - .25	M .25 - .50	C .5 - 1	VC 1 - 2
		- - - - - - - - - - - Pct of < 2mm (3A1) - - - - - - - - - - -											
0-15	Ap	18.7	36.3	45.1			11.3	25.0	8.3	18.0	10.0	5.5	3.3
15-62	C1	19.9	35.2	44.9			10.7	24.5	7.8	14.9	10.4	7.1	4.7
62-150	C2	20.3	27.0	52.7			8.7	18.3	4.7	15.1	16.5	11.1	5.2

Depth (cm)	Coarse Fractions(mm) Weight 2-5	5-20	20-75	.1-75	>2mm Wt Pct of Whole	Orgn C 6A1c	Total N 6B3a	Extr P 6S3	Total S 6R3a	(-- Dith -Cit --) Extractable Fe 6C2b	Al 6G7a	Mn 6D2a
	Pct of < 75mm (3B1)				Soil	Pct < 2mm		g/kg		Pct of < 2mm		
0-15						1.88						
15-62						1.14						
62-150						0.39						

Depth (cm)	Ratio/Clay CEC 1500 kPa 8D1	8D1	Atterberg Limits LL 4P1	PI 4P	(Bulk Density) Field Moist 4A3a	33 kPa 4A1d	Oven Dry 4A1h	COLE Whole Soil 4D1	(- Water Content -) Field Moist 4B4	10 kPa 4B1c	33 kPa 4B1c	1500 kPa 4B2a	WRD Whole Soil 4C1
			Pct <0.4mm		- - g/cc - -			cm/cm	-- Pct of <2mm --				cm/cm
0-15	0.50												
15-62	0.43												
62-150	0.40												

Depth (cm)	(NH4OAc Extractable Bases) Ca 5B5a 6N2e	Mg 5B5a 6O2d	K 5B5a 6Q2b	Na 5B5a 6P2b	Sum Bases	Acid-ity 6H5a	Extr Al 6G9a	(----- CEC -----) Sum Cats 5A3a	NH4-OAc 5A8b	Bases + Al 5A3b	Al Sat 5G1
	- - - - - - - - - - - - meq / 100g - - - - - - - - - - - -										Pct
0-15	3.7	0.9	0.7	0.4	5.7	9.0	0.1	14.7	9.4	5.9	2.4
15-62	3.9	2.0	0.6	0.6	7.1	5.1	0	12.1	8.5	7.1	0
62-150	2.7	3.1	0.7	1.1	7.5	5.3	0	12.9	8.2	7.5	0

Depth (cm)	(Base Sat) Sum 5C3	NH4-OAc 5C1	CO3 as CaCO3 <2mm 6E1g	Res 8E1	Cond 8I	(------ pH ------) NaF 8C1d	KCl	CaCl2 .01M 8C1f	H2O 8C1f	Acid Oxalate Extraction Opt Den 8J	Al 6G12	Fe 6C9a	Si 6V2
	---- Pct ----			ohms/cm	dS/m		1: 1	1: 2	1: 1		- Pct of <2mm -		
0-15	38.8	61.1					4.8	5.0	5.6				
15-62	58.4	82.9					5.7	6.1	6.8				
62-150	58.5	91.7					6.0	6.5	7.1				