BANGOG SERIES

Established Series
PCS, JYH
10 June, 1977

The Bangog series are members of the fine, mixed, mesic family of Ultic Hapludalfs [Cutanic Luvisols classified by WRB]. These soils have dark brown clay loam Ap horizons, brown clay loam BA horizons, yellowish brown clay loam Bt1 horizons, yellowish brown clay loam Bt2 horizons, brownish yellow clay Bt3 horizons, and reddish yellow clay Bt4 horizons. These soils occur on local valleys derived from unconsolidated gray shale materials.

Typifying Pedon: Bangog silt loam-upland crops (Colors are for moist soil).

Slope: 2-7%

Elevation: 49 m above m.s.l.

Soil moisture regime: Udic

Temperature regime: Mesic

Parent material: Colluvium from unconsolidated grey shale

Diagnostic features: An ochric epipedon from a depth of 0 to 13 cm and an argillic horizon from a depth of 32 to 160 cm (An argic horizon from a depth of 32 to 160 cm by WRB)

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Morphological properties of typifying pedon.

Ap - 0 to 13 cm. Dark brown (10YR 3/3) clay loam; moderate fine to medium granular structure; friable, sticky and plastic; many fine to medium grass roots; clear wavy boundary.

BA - 13 to 32 cm. Brown (10YR 4/3) clay loam; moderate medium subangular blocky structure; slightly firm, very sticky and very plastic; thin patch clay cutans; few fine to medium roots; few fine pores; gradual wavy boundary.

Bt1 - 32 to 59 cm. Yellowish brown (10YR 5/4) and gray (10YR 5/1) clay loam; moderate medium angular blocky structure; slightly firm, very sticky and very plastic; thin continuous clay cutans; few fine roots; few medium pores; clear wavy boundary.

Bt2 - 59 to 87 cm. Yellowish brown (10YR 5/6) and gray (10YR 6/1) clay loam; moderate medium subangular blocky structure; slightly firm, very sticky and very plastic; thin continuous clay cutans; few very fine roots; few fine pores; clear wavy boundary

Bt3 - 87 to 122 cm. Gray (10YR 6/1) and brownish yellow (10YR 6/6) clay; moderate coarse angular blocky structure; firm, very sticky and very plastic; few fine roots; few fine pores; common coarse Mn mottles; diffuse wavy boundary.

Bt4 - 122 to 160 cm. Light gray (10YR 7/1) and reddish yellow (7.5YR 6/8) clay.

The typifying pedon has an ochric epipedon from a depth of 0 to 13 cm and an argillic horizon from a depth of 35 to 160 cm. It has a base saturation (by sum of cations) of 35% or more at 125 cm below the upper boundary of the argillic horizon. That can be classified as Alfisol. It has udic soil moisture regime, and can be classified as Udalf. It meets the requirements of Hapludalf. It has a base saturation (by sum of cations) of less than 60% at a depth of 125 cm below the top of the argillic horizon.

The typifying pedon has more than 35% clay at the particle-size control section and has mesic soil temperature regime. Therefore it can be classified as fine, mixed, mesic family of Ultic Hapludalf.

Type Location: About 500 meters south-east of the Pohang Art High School, Daeyeon Ri, Heunghae Eub, Pohang city, Gyeongsangbug Do (129^{o} 19' 43.4", 36^{o} 2' 57.4")

Range in Characteristics: These soils have ochric epipedons and argillic horizons. The solum thickness ranges from 100 to 200 cm and depth to hard rock is more than 3 meters. Reaction is strongly to medium acid. Base saturation is more than 50 percent. These soils have dark brown or yellowish brown silt loam or loam Ap horizons and very thick dark brown, brown or yellowish brown clay loam or clay Bt horizons.

Competing Series and Their Differentiae: These are the Sirye, Yeongrag, Baesan and Jonggog soils. The Sirye soils occur on rolling to hilly areas of grayish brown shales and fine textured sandstones. The Yeongrag soils occur on coastal lava plains derived from pyroclastic materials. Baegsan soils are fine loamy texture family and derived from granitic rocks. The Jonggog soils are fine loamy texture family and derived from phyllite and schist of Ogcheon system.

Setting: The Bangog soils occur on local valleys derived from unconsolidated gray shale materials. Dominant slopes are 7 to 15 percent. The slope ranges from 2 to 15 percent.

Principal Associated Soils: They are the Maesan, Cheonggye, and Yugye soils. The Maesan soils occur on higher positions and the Cheonggye soils are on similar physiographic positions. The Yugye soils occur on lower positions.

Drainage and Permeability: Well drained. Permeability is very slow and runoff is medium.

Use and Vegetation: These soils are used for upland crops such as barley, soybean and potato. Few areas are wild grass.

Distribution and Extent: The Bangog soils are of small extent and occur on local valleys from unconsolidated gray shale geology in Yeongil areas.

Series Established: Pohang city, Gyeongsangbug Do, 1976. **Revised,** Pohang city, Gyeongsangbug Do, 2006.

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) - - - - - - - - - - -											
0-13	A	24.5	36.5	39.0					16.4	12.0	5.9	3.6	1.1
13-32	BA	26.8	44.9	28.2					7.6	11.0	5.0	3.3	1.3
32-59	Bt1	30.1	43.4	26.4					8.4	9.7	4.5	2.8	1.0
59-87	Bt2	36.4	33.6	30.0					2.5	7.6	4.5	4.5	2.1
87-122	Bt3	37.9	42.8	21.1					6.2	5.6	4.0	3.6	1.7
122-160	Bt4	45.9	39.6	14.5					6.0	3.9	1.9	2.0	0.7

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	6A1c	6B3a	6S3	6R3a	Fe 6C2b	Al 6G7a	Mn 6D2a
	Pct of < 75mm (3B1)				Soil	Pct < 2mm		g/kg		Pct of < 2mm		
0-13						1.22						
13-32						0.92						
32-59						0.71						
59-87						0.57						
87-122						0.43						
122-160						0.38						

Depth (cm)	Ratio/Clay		Atterberg		(Bulk Density)			COLE	(- Water Content -)				WRD
	CEC	1500 kPa	Limits 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
0-13	0.82				1.26				26.5				
13-32	0.63				1.38				29.2				
32-59	0.54				1.46				29.0				
59-87	0.53				1.41				31.3				
87-122	0.54				1.51				26.4				
122-160	0.59												

Depth (cm)	(NH4OAc Extractable Bases)					Acid-ity	Extr Al	(----- CEC -----)			Al Sat
	Ca 5B5a 6N2e	Mg 5B5a 6O2d	K 5B5a 6Q2b	Na 5B5a 6P2b	Sum Bases	6H5a	6G9a	Sum Cats 5A3a	NH4-OAc 5A8b	Bases + Al 5A3b	5G1
	- - - - - - - - - - - - meq / 100g - - - - - - - - - - - -										Pct
0-13	7.9	3.7	0.6	0.2	12.4	18.0	0.3	30.4	20.0	12.7	2.4
13-32	5.6	3.5	0.1	0.2	9.5	16.5	0.5	26.0	16.9	10.0	5.0
32-59	5.7	3.6	0	0.3	9.7	13.0	0.8	22.7	16.3	10.5	7.6
59-87	8.0	5.2	0.1	0.4	13.7	15.5	0.3	29.2	19.4	14.0	2.1
87-122	7.8	5.6	0.1	0.5	14.0	13.5	0.3	27.5	20.3	14.3	2.1
122-160	10.5	8.2	0.1	0.7	19.4	15.0	0.5	34.4	26.9	19.9	2.5

Depth (cm)	(Base Sat)		CO3 as CaCO3 <2mm	Res	Cond	(------ pH ------)				Acid Oxalate Extraction			
	Sum	NH4-OAc				NaF	KCl	CaCl2 .01M	H2O	Opt Den	Al	Fe	Si
	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 -		
0-13	40.8	62.0					4.5	5.1	5.5				
13-32	36.5	55.9					4.0	4.7	5.5				
32-59	42.8	59.8					3.9	4.6	5.2				
59-87	46.9	70.4					4.5	5.2	5.6				
87-122	50.9	69.1					4.4	5.2	5.6				
122-160	56.5	72.2					4.3	5.1	5.7				