REFERENCE: NRCS Official Series Description (http://soils.usda.gov/technical/classification/osd/index.html)

The **Nobe** series consists of very deep, moderately well drained soils that formed in clayey alluvium from sedimentary beds. They are on till plains, alluvial fans, floodplains, stream terraces, and drainageways. Slopes are 0 to 15 percent. Mean annual precipitation is about 12 inches, and mean annual temperature is about 42 degrees F. Cascade Co., Montana

TAXONOMIC CLASS: Fine, smectitic, calcareous, frigid Torrertic Ustorthents

TYPICAL PEDON: Nobe silty clay, grassland (colors are for dry soil unless otherwise noted).

E--0 to 1 inch; light brownish gray (2.5Y 6/2) loam, dark grayish brown (2.5Y 4/2) moist; vesicular crust in upper part and weak very thin platy structure in lower part; slightly hard, friable, slightly sticky and nonplastic; common fine and very fine and few medium roots; common fine and very fine pores; neutral (pH 7.2); abrupt wavy boundary. (1 to 2 inches thick)

Bw--1 to 4 inches; grayish brown (2.5Y 5/2) silty clay, dark grayish brown (2.5Y 4/2) moist; strong fine and medium columnar structure parting to moderate fine and very fine subangular blocky; hard, firm, sticky and very plastic; common very fine and few medium roots; common fine and very fine pores; slightly alkaline (pH 7.6); clear wavy boundary. (0 to 3 inches thick)

By--4 to 9 inches; grayish brown (2.5Y 5/2) silty clay, dark grayish brown (2.5Y 4/2) moist; strong very fine subangular blocky structure; hard, friable, sticky and very plastic; common fine and very fine roots; common fine and very fine pores; many fine threads and masses of gypsum; slightly effervescent; strongly alkaline (pH 8.8); gradual wavy boundary. (0 to 12 inches thick)

Byz1--9 to 25 inches; grayish brown (2.5Y 5/2) silty clay, dark grayish brown (2.5Y 4/2) moist; granular structure (flocculation caused by soluble salts); hard, friable, sticky and plastic; few fine and very fine roots; common fine and very fine pores; many threads and masses of gypsum and other soluble salts; strongly effervescent; strongly alkaline (pH 9.0); diffuse smooth boundary. (8 to 20 inches thick)

Byz2--25 to 66 inches; light brownish gray (2.5Y 6/2) stratified silty clay loam and silty clay, dark grayish brown (2.5Y 4/2) moist; massive; hard, firm, sticky and plastic; few fine and very fine roots; common very fine pores; common threads and masses of gypsum and other salts; soil is moist in this horizon; slightly effervescent; strongly alkaline (pH 9.0).

The **Bock** series consists of very deep, well drained soils that formed in alluvium from mixed sources. Bock soils are on terraces and alluvial fans and have slopes of 0 to 10 percent. Permeability is moderate in the upper part and very rapid in the lower part. The average annual precipitation is about 11 inches and the average annual temperature is about 42 degrees F. Bingham Co., Idaho.

TAXONOMIC CLASS: Coarse-loamy, mixed, superactive, frigid Calcidic Haploxerolls

TYPICAL PEDON: Bock loam, pasture. (Colors are for dry soil unless otherwise noted.)

Ap--0 to 5 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; moderate medium platy structure parting to moderate very fine and fine granular; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine irregular pores; slightly effervescent; slightly alkaline (pH 7.8); gradual smooth boundary. (0 to 10 inches thick)

A--5 to 10 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; weak medium platy structure parting to moderate fine and medium subangular blocky and weak fine and medium granular; hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine and fine tubular pores; slightly alkaline (pH 7.8); gradual wavy boundary. (4 to 8 inches thick)

Bw--10 to 15 inches; brown (10YR 5/3) pale brown (10YR 6/3, crushed) loam, dark brown (10YR 4/3) moist; weak fine and medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine and fine tubular pores; slightly alkaline (pH 7.8); clear wavy boundary. (4 to 14 inches thick)

Bk1--15 to 26 inches; light gray (10YR 7/2) loam, dark grayish brown (10YR 4/2) moist; weak fine and medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine and fine tubular pores; violently effervescent; common fine lime veins and spots; moderately alkaline (pH 8.0); gradual wavy boundary. (0 to 18 inches thick)

Bk2--26 to 35 inches; light brownish gray (10YR 6/2) loam, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure; hard, friable, nonsticky and slightly plastic; common very fine and fine roots; common very fine and fine tubular pores; few cicada krotovinas; violently effervescent, common veins and spots of lime; moderately alkaline (pH 8.0); gradual wavy boundary. (5 to 14 inches thick)

Bk3--35 to 47 inches; light brownish gray (10YR 6/2) fine sandy loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine roots; common very fine and fine tubular pores; few yellowish brown (10YR 5/4) root stains; strongly effervescent, very few lime veins; slightly alkaline (pH 7.8); abrupt wavy boundary. (10 to 20 inches thick)

2Bk4--47 to 60 inches; light brownish gray (10YR 6/2) very gravelly coarse sand; about 15 percent of the pebbles are black or very dark gray; single grain; loose; few very fine and fine roots; many very fine irregular pores; 60 percent pebbles, mostly quartzite; strongly effervescent, pebbles slightly lime-coated on lower side; slightly alkaline (pH 7.6).

The **Rome** series consists of deep, well drained moderately permeable soils on stream terraces. These soils have light olive brown fine sandy loam A horizons, brownish loam, clay loam, and sandy clay loam Bt horizons over mottled brownish yellow sandy clay loam BC horizons. Slopes range from 0 to 6 percent. The mean annual temperature is about 60 degrees F, and mean annual precipitation is about 53 inches. Floyd Co., Georgia.

TAXONOMIC CLASS: Fine-loamy, mixed, semiactive, thermic Typic Hapludults

TYPICAL PEDON: Rome fine sandy loam - cultivated. (Colors are for moist soil unless otherwise stated.)

Ap--0 to 9 inches; yellowish brown (10YR 5/4) fine sandy loam; weak fine granular structure; very friable; common fine roots; few fine pores; 2 percent black concretions; moderately acid; abrupt smooth boundary. (5 to 10 inches thick)

Btl--9 to 20 inches; strong brown (7.5YR 5/6) loam; weak fine subangular blocky structure; friable; few fine roots and pores; 5 percent black concretions; few faint clay films on faces of peds; strongly acid; clear wavy boundary. (9 to 30 inches thick)

Bt2--20 to 34 inches; strong brown (7.5YR 5/6) clay loam; common fine distinct brownish yellow (10YR 6/6) and yellowish red (5YR 4/6) mottles; moderate medium subangular blocky structure; friable; few fine roots and pores; common distinct clay films on faces of peds; 5 percent black concretions; strongly acid; clear wavy boundary. (10 to 26 inches thick)

Bt3--34 to 53 inches; yellowish brown (10YR 5/6) sandy clay loam; common fine and medium prominent yellowish red (5YR 4/6) and few fine prominent very pale brown (10YR 7/4) mottles; moderate medium subangular blocky structure; friable; few fine roots and pores; common distinct clay films on faces of peds; 3 percent black concretions; very strongly acid; clear wavy boundary. (6 to 20 inches thick)

BC--53 to 66 inches; brownish yellow (10YR 6/8) sandy clay loam; many fine distinct pale yellow (2.5Y 7/4) and common medium prominent yellowish red (5YR 4/6) mottles; weak fine subangular blocky structure; friable; very strongly acid. (10 to 20 inches thick)

MIAMI SERIES

The Miami series consists of very deep, moderately well drained soils that are moderately deep to dense till. The Miami soils formed in as much as 46 cm (18 inches) of loess or silty material and in the underlying loamy till. They are on till plains. Slope ranges from 0 to 60 percent. Mean annual precipitation is 1016 mm (40 inches), and mean annual air temperature is 11 degrees C (52 degrees F). Henderson Co., Indiana.

TAXONOMIC CLASS: Fine-loamy, mixed, active, mesic Oxyaquic Hapludalfs

TYPICAL PEDON: Miami silt loam, on a convex, 3 percent slope in a cultivated field at an elevation of about 268 meters (880 feet) above mean sea level. (Colors are for moist soil unless otherwise stated.)

Ap--0 to 20 cm (0 to 8 inches); brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; moderate fine granular structure; friable; neutral; abrupt smooth boundary. [15 to 25 cm (6 to 10 inches) thick]

Bt1--20 to 33 cm (8 to 13 inches); dark yellowish brown (10YR 4/4) silty clay loam; moderate fine subangular blocky structure; firm; many distinct brown (7.5YR 4/4) clay films on faces of peds and as linings of some pores; 1 percent rock fragments; moderately acid; abrupt wavy boundary. [0 to 20 cm (0 to 8 inches) thick]

2Bt2--33 to 58 cm (13 to 23 inches); dark yellowish brown (10YR 4/4) clay loam; strong coarse subangular blocky structure; firm; many distinct brown (7.5YR 4/4) clay films on faces of peds and as linings of some pores; 2 percent rock fragments; strongly acid; clear wavy boundary.

2Bt3--58 to 79 cm (23 to 31 inches); dark yellowish brown (10YR 4/4) clay loam; moderate coarse subangular blocky structure; firm; many distinct brown (7.5YR 4/4) clay films on faces of peds and as linings of some pores; common fine and medium rounded very dark gray (10YR 3/1) masses of iron and manganese accumulation in the matrix; 5 percent rock fragments; moderately acid; clear wavy boundary. [Combined thickness of the 2Bt horizon is 30 to 51 cm (12 to 20 inches).]

2BCt--79 to 91 cm (31 to 36 inches); brown (10YR 4/3) loam; weak coarse prismatic structure; friable; common distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; common fine and medium irregular very dark gray (10YR 3/1) masses of iron and manganese accumulation in the matrix; common medium faint light brownish gray (10YR 6/2) irregularly shaped iron depletions in the matrix; 5 percent rock fragments; slightly effervescent; slightly alkaline; clear irregular boundary. [0 to 25 cm (0 to 10 inches) thick]

2Cd--91 to 203 cm (36 to 80 inches); brown (10YR 5/3) loam; massive; very firm; few fine irregular very dark gray (10YR 3/1) masses of iron and manganese accumulation in the matrix; common medium faint grayish brown (10YR 5/2) irregularly shaped iron depletions in the matrix; 5 percent rock fragments; strongly effervescent; moderately alkaline.

NINCHUUN SERIES

Depth class: shallow or moderately deep to permafrost and glacial till Drainage class: poorly drained
Parent material: loess over glaciofluvial deposits Landform: moraines Slopes: 0 to 35 percent
Mean annual precipitation: about 14 inches Mean annual temperature: about 26 degrees F.

TAXONOMIC CLASS: coarse-loamy, mixed, superactive, subgelic Typic Aquiturbels

TYPICAL PEDON: Ninchuun silt loam - on a slope of 2 percent under black spruce at 1700 feet elevation. (All colors are for moist soil unless noted) . Central Alaska.

Oe--0 to 6 inches (0 to 15); very dark brown (10YR 2/2) moderately decomposed organic matter; many very fine to coarse roots; strongly acid (pH 5.4); clear smooth boundary. (3 to 8 inches thick)

A--6 to 12 inches (15 to 31 cm); black (10YR 2/1) silt loam; weak very fine granular structure; very friable; nonsticky and slightly plastic; slightly acid (pH 6.2); clear wavy boundary. (4 to 8 inches thick)

Bg/Ajj--12 to 16 inches (31 to 41 cm); very dark gray (10YR 3/1) and very dark brown (10YR 2/2) silt loam; weak very fine granular structure; very friable; nonsticky and slightly plastic; common very fine to fine roots; slightly acid (pH 6.2); clear wavy boundary. (3 to 7 inches thick)

Bjjg--16 to 20 inches (41 to 51 cm); dark reddish gray (2.5YR 3/1) and very dark brown (10YR 2/2) silt loam; weak thin platy structure; very friable; slightly sticky and slightly plastic; few very fine to fine roots; common fine distinct dark yellowish brown (10YR 3/6) redoximorphic concentrations; slightly acid (pH 6.2); abrupt wavy boundary. (3 to 7 inches thick)

Bjjgf--20 to 32 inches (51 to 81 cm); dark reddish gray (2.5YR 4/1) and dark gray (10YR 4/1) permanently frozen silt loam; massive; extremely firm; slightly sticky and slightly plastic when thawed; common medium prominent dark yellowish brown (10YR 3/6) redoximorphic concentrations; slightly acid (pH 6.4). (10 to 16 inches thick)

2Cf--32 to 60 inches (81 to 152 cm); light olive brown (2.5Y 5/4) permanently frozen gravelly sandy loam; massive; 20 percent gravel; common medium prominent dark yellowish brown (10YR 3/6) redoximorphic concentrations; slightly acid (pH 6.5).

TIFTON SERIES

The Tifton series consists of very deep, well drained, moderately slowly permeable soils that formed in loamy marine sediments. These soils are on nearly level to gently sloping uplands and have slopes that range from 0 to 8 percent. Tift Co. Georgia

TAXONOMIC CLASS: Fine-loamy, kaolinitic, thermic Plinthic Kandiudults

TYPICAL PEDON: Tifton loamy sand--on a 3 percent convex slope in a pasture. (Colors are for moist soil.)

Apc--0 to 11 inches; dark grayish brown (10YR 4/2) loamy sand; weak fine granular structure; very friable; common fine roots; 9 percent ironstone nodules by volume less than 0.75 inches in diameter; moderately acid; clear smooth boundary. (5 to 12 inches thick)

Btc1--11 to 22 inches; strong brown (7.5YR 5/8) fine sandy loam; weak fine subangular blocky structure; very friable; common fine roots; few fine pores; sand grains bridged with clay; 11 percent ironstone nodules by volume less than 0.75 inches in diameter; strongly acid; gradual wavy boundary.

Btc2--22 to 40 inches; yellowish brown (10YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable; few fine roots; few fine continuous pores; few faint clay films on faces of peds; 10 percent ironstone nodules by volume less than 0.75 inches in diameter; moderately acid; gradual wavy boundary. (Combined thickness of the Btc horizon is 14 to 34 inches)

Btv1--40 to 50 inches; yellowish brown (10YR 5/8) sandy clay loam; moderate fine subangular blocky structure; friable; few fine roots; few medium continuous pores; 5 percent nodular plinthite; common distinct clay films on faces of peds; 4 percent ironstone nodules by volume less than 0.75 inches in diameter; common medium prominent yellowish red (5YR 5/6) and common fine prominent red (2.5YR 4/8) masses of iron accumulation; very strongly acid; gradual wavy boundary.

Btv2--50 to 60 inches; yellowish brown (10YR 5/8) sandy clay loam; moderate medium subangular blocky structure; firm; 15 percent nodular plinthite; few distinct clay films on faces of peds; 2 percent ironstone nodules; common medium prominent red (2.5YR 4/6) and common medium distinct brownish yellow (10YR 4/6) masses of iron accumulation, and common medium prominent light gray (10YR 7/2) iron depletions; very strongly acid; clear wavy boundary. (Combined thickness of the Btv horizon is 20 to 40 inches)

BC--60 to 65 inches; strong brown (7.5YR 5/6) sandy clay; weak coarse subangular blocky structure; firm; few coarse pores; 2 percent ironstone nodules; common medium prominent red (2.5YR 4/6) masses of iron accumulation and light gray (10YR 7/2) iron depletions; very strongly acid; gradual wavy boundary.

C--65 to 80 inches; strong brown (7.5YR 5/8) sandy clay loam; massive; firm; 2 percent plinthite; 2 percent ironstone nodules; many medium prominent red (2.5YR 4/6) masses of iron accumulation, and common medium prominent white (10YR 8/1) iron depletions; very strongly acid.

ARVADA SERIES

The Arvada series consists of very deep, well drained soils formed in alluvium and colluvium derived from sodic shale. Arvada soils are on alluvial fans, fan remnants, fan terraces and hillslopes. Slopes are 0 to 25 percent. The mean annual precipitation is about 12 inches, and the mean annual air temperature is about 46 degrees F. Arizona.

TAXONOMIC CLASS: Fine, smectitic, mesic Ustertic Natrargids

TYPICAL PEDON: Arvada fine sandy loam-rangeland. (Colors are for dry soil unless otherwise stated)

E--0 to 4 inches; light gray (10YR 7/2) fine sandy loam, grayish brown (10YR 5/2) moist; moderate very thin platy structure parting to moderate very fine granular; soft, very friable, nonsticky and nonplastic; many fine and very fine roots; slightly alkaline (pH 7.8); abrupt smooth boundary. (0 to 8 inches thick)

Btn--4 to 14 inches; brown (10YR 5/3) clay, brown (10YR 4/3) moist; moderate medium columnar structure parting to moderate medium angular blocky; extremely hard, firm, sticky and very plastic; common medium roots; many prominent clay films on faces of peds and in root channels; very strongly alkaline (pH 9.2); ESP is 20 percent; clear smooth boundary. (3 to 14 inches thick)

Btkn--14 to 20 inches; brown (10YR 5/3) clay loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; extremely hard, firm, sticky and very plastic; few faint clay films on faces of peds and in root channels; strongly effervescent, few fine segregations of calcium carbonate in thin seams and streaks; strongly alkaline (pH 9.0); 20 percent exchangeable sodium; gradual smooth boundary. (0 to 17 inches thick)

Bkny--20 to 60 inches; light yellowish brown (2.5Y 6/3) clay loam, light olive brown (2.5Y 5/3) moist; massive; hard, friable, sticky and plastic; violently effervescent, common medium soft masses of calcium carbonate and gypsum as crystals in thin seams and as filaments or threads; strongly alkaline (pH 8.8); 20 percent exchangeable sodium.

NIPE SERIES

The Nipe series consists of very deep, well drained, moderately permeable soils on stable ridge tops of hills and mountains in the Humid Mountains and Valleys MLRA. They formed in iron-rich residuum that weathered from serpentinite bedrock. Near the type location, the mean annual temperature is about 75 degrees F., and the mean annual precipitation is about 57 inches. Slopes range from 2 to 20 percent. Puerto Rico.

TAXONOMIC CLASS: Very-fine, ferruginous, isohyperthermic Typic Acrudox

TYPICAL PEDON: Nipe clay--forestland (Colors are for moist soil).

Oi--0 to 2 inches; undecomposed plant material; abrupt smooth boundary. (0 to 3 inches thick)

Ap--2 to 7 inches; dusky red (10R 3/3) clay; strong fine granular structure; hard, firm; slightly sticky, slightly plastic; common fine roots, few medium and coarse roots; few fine irregular pores and common fine vesicular pores; about 3 percent, by volume, iron-manganese concretions; strongly acid; clear smooth boundary. (5 to 13 inches thick)

Ac--7 to 11 inches; dusky red (10R 3/3) clay; strong fine granular structure; hard, firm; slightly sticky, slightly plastic; common fine roots; few fine irregular pores; about 6 percent, by volume, iron-manganese concretions; moderately acid; clear smooth boundary. (0 to 11 inches thick)

Bo1--11 to 22 inches; dusky red (10R 3/4) clay; moderate medium subangular blocky structure; slightly hard, firm; slightly sticky, slightly plastic; few faint clay films on ped faces; few fine roots; few fine tubular and irregular pores; about 2 percent, by volume, iron-manganese concretions; moderately acid; clear smooth boundary.

Bo2--22 to 31 inches; dusky red (10R 3/4) clay; weak medium subangular blocky structure; slightly hard, firm; slightly sticky, plastic; few distinct clay films on ped faces; few fine roots; few fine irregular pores; about 1 percent, by volume, iron-manganese concretions; moderately acid; gradual smooth boundary.

Bo3--31 to 43 inches; dusky red (10R 3/4) clay; weak medium subangular blocky structure; soft, friable; slightly sticky, slightly plastic; few distinct clay films on ped faces; few fine roots; few fine irregular pores; moderately acid; clear smooth boundary.

Bo4--43 to 80 inches; dusky red (10R 3/4) clay; weak medium subangular blocky structure; slightly hard, firm; slightly sticky, slightly plastic; common prominent clay films on ped faces; few fine roots; few fine irregular pores; strongly acid.

LEON SERIES

The Leon series consists of very deep, poorly and very poorly drained, moderately to moderately slowly permeable soils on upland flats, depressions, stream terraces and tidal areas. They formed in sandy marine sediments of the Atlantic and Gulf Coastal Plain. Near the type location, the mean annual temperature is about 68 degrees F., and the mean annual precipitation is about 65 inches. Slopes range from 0 to 5 percent.

TAXONOMIC CLASS: Sandy, siliceous, thermic Aeric Alaquods

TYPICAL PEDON: Leon sand--forested; slash pine, gallberry, wax myrtle, saw palmetto, goldenrod, lyonia ligustrina, dog fennel, and lowbush blueberry. (Colors are for moist soil) Panama City Beach, Florida.

A--0 to 4 inches; 70 percent black (10YR 2/1) and 30 percent light gray (10YR 7/1) sand; weak fine granular structure; very friable; many fine, medium, and large roots; many clean sand grains give a salt-and-pepper appearance; very strongly acid; clear smooth boundary. (2 to 9 inches thick)

Eg1--4 to 10 inches; gray (10YR 6/1) sand; common medium faint very dark gray (10YR 3/1) streaks and splotches of organic matter accumulations deposited in former root channels and krotovinas, ranging from about 20 percent in upper part to 0 percent in lower part; single grain; loose; many fine, medium, and large roots; very strongly acid; clear wavy boundary. (2-12 inches thick)

Eg2--10 to 15 inches; gray (10YR 6/1) sand; 20 percent faint light gray (10YR 7/1) oval splotches of organic matter depletions; single grain; loose; few fine and medium roots; very strongly acid; abrupt smooth boundary. (2 to 13 inches thick)

Bh1--15 to 18 inches; 50 percent dark brown (7.5YR 3/3) and 50 percent black (7.5YR 2.5/1) sand; weak medium and coarse subangular blocky structure; firm; common fine and medium roots; many fine and medium pores; more than 95 percent of sand grains have organic coatings; extremely acid; clear smooth boundary.

Bh2--18 to 22 inches; dark brown (7.5YR 3/4) sand; weak medium and coarse subangular blocky structure; firm; few fine and medium roots; common fine and medium pores; more than 95 percent of sand grains have organic coatings; extremely acid; clear wavy boundary. (Combined thickness of the Bh horizons ranges from 4 to 35 inches)

Bw /Bh--22 to 25 inches; 80 percent (Bw) dark yellowish brown (10YR 4/4) and 20 percent (Bh) dark brown (10YR 3/3) sand; very weak medium and coarse subangular blocky structure; very friable; common fine and medium pores; very strongly acid; clear wavy boundary. (0 to 14 inches thick)

Eg / Bh--25 to 30 inches; 95 percent (Eg) weak red (2.5YR 5/2) and 5 percent (Bh) dark brown (7.5YR 3/3) sand; single grain; loose; common fine and medium pores; very strongly acid; diffuse irregular boundary. (0 to 10 inches thick)

E'g--30 to 42 inches; pinkish gray (7.5YR 7/2) sand; single grain; loose; very strongly acid; clear wavy boundary. (0 to 36 inches thick)

B'h--42 to 77 inches; 50 percent very dark brown (10YR 2/2) and 50 percent dark yellowish brown (10YR 3/4) sand; weak medium and coarse subangular blocky structure; friable; common fine and medium pores; very strongly acid; clear wavy boundary. (0 to 50 inches thick)

B'w / B'h--77 to 108 inches; 60 percent (Bw) brown (10YR 4/3), 40 percent Bh of very dark brown (10YR 2/2) and very dark grayish brown (10YR 3/2) sand; very weak medium and coarse subangular blocky structure; very friable; common fine and medium pores; very strongly acid.

The **Lauderhill** series consists of very poorly drained soils that are 16 to 36 inches thick over limestone. Lauderhill soils formed in organic deposits of freshwater marshes. Broward County, Florida;

TAXONOMIC CLASS: Euic, hyperthermic Lithic Haplosaprists

TYPICAL PEDON: Lauderhill muck--range.

Oa1--0 to 9 inches; black (10YR 2/1) muck; less than 5 percent unrubbed fiber; moderate coarse subangular blocky structure; very friable; 40 percent mineral content; neutral; abrupt smooth boundary.

Oa2--9 to 27 inches; dark reddish brown (5YR 2/2) rubbed and unrubbed muck; 6 percent unrubbed fiber; moderate medium subangular blocky structure; friable; 40 percent mineral content; few fine roots; slightly acid; clear wavy boundary.

Oa3--27 to 31 inches; dark reddish brown (5YR 2/2) rubbed and unrubbed muck; 20 percent unrubbed fiber, moderate medium granular structure; about 75 percent mineral content; friable; few large roots; neutral; abrupt irregular boundary. (thickness of the Oa horizon is 16 to 36 inches)

2R--31 inches; Soft to hard but rippable limestone bedrock.

ARANSAS SERIES

The Aransas series consists of very deep, poorly drained, very slowly permeable soils that formed in clayey alluvial sediments of Holocene age. These nearly level soils are on flood plains on the south Texas coastal plain. Slope ranges from 0 to 1 percent. Mean annual air temperature is about 22 degrees C (72 degrees F) and mean annual precipitation is about 838 mm (33 in). San Patricio County, Texas.

TAXONOMIC CLASS: Fine, smectitic, hyperthermic Typic Natraquerts

TYPICAL PEDON: Aransas clay, on a nearly level flood plain in rangeland at an elevation of 3 m (10 ft). (Colors are for moist soils unless otherwise stated.)

A1--0 to 28 cm (0 to 11 in); very dark gray (10YR 3/1) clay; dark gray (10YR 4/1) dry; moderate fine and very fine granular structure; hard, firm, moderately sticky, moderately plastic; many fine roots; many fine pores; few worm casts; slightly saline; strongly effervescent; neutral; clear smooth boundary.

A2--28 to 61 cm (11 to 24 in); very dark gray (10YR 3/1) clay; dark gray (10YR 4/1) dry; moderate medium and fine subangular and angular blocky structure; very hard, very firm, moderately sticky, moderately plastic; common fine roots; common fine pores; 1 percent very fine threads and masses of calcium carbonate in matrix; slightly saline, strongly effervescent, moderately alkaline; gradual wavy boundary. (combined thickness of the A horizons is 13 to 64 cm [5 to 25 in])

Bkss--61 to 89 cm (24 to 35 in); very dark gray (10YR 3/1) clay; dark gray (10YR 4/1) dry; moderate medium wedge structure parting to moderate fine and medium angular blocky; extremely hard, extremely firm, moderately sticky, moderately plastic; few fine roots; few very fine pores; few faint slickensides; 2 percent fine nodules of calcium carbonate; 1 percent fine weakly cemented iron manganese concretions; moderately saline; strongly effervescent; moderately alkaline; gradual wavy boundary. (13 to 38 cm [5 to 15 in]) thick)

Bkssz1--89 to 112 cm (35 to 44 in); grayish brown (10YR 5/2) clay, light brownish gray (10YR 6/2), dry; moderate medium wedge structure parting to weak fine and medium subangular blocky; extremely hard, very firm, moderately sticky, moderately plastic; few very fine pores; common distinct slickensides; 3 percent fine and medium masses and nodules of calcium carbonate; 1 percent fine weakly cemented iron manganese concretions; 1 percent fine crystals of salt; moderately saline; strongly effervescent; strongly alkaline; gradual wavy boundary.

Bkssz2--112 to 135 cm (44 to 53 in); grayish brown (10YR 5/2) clay, light brownish gray (10YR 6/2), dry; moderate medium wedge structure parting to weak fine and medium subangular blocky; extremely hard, very firm, moderately sticky, moderately plastic; few very fine pores; common distinct slickensides; 3 percent fine nodules of calcium carbonate; 1 percent fine weakly cemented iron manganese concretions; 2 percent fine crystals of salt; strongly saline; strongly effervescent; moderately alkaline; gradual wavy boundary.

Bssz--135 to 178 cm (53 to 70 in); 60 percent grayish brown (10YR 5/2) and 40 percent brown (10YR 5/3) clay, light brownish gray (10YR 6/2) and pale brown (10YR 6/3) dry; moderate medium wedge structure parting to weak fine and medium subangular blocky; extremely hard, very firm, moderately sticky, moderately plastic; few very fine pores; common distinct slickensides; 1 percent fine weakly cemented dark iron manganese concretions; 1 percent fine crystals of salt; strongly saline; strongly effervescent; moderately alkaline; gradual wavy boundary. (combined thickness of the Bkssz and Bssz horizons is 89 to 127 cm [35 to 50 in])

Bz--178 to 231 cm (70 to 91 in); brown (10YR 5/3) clay, pale brown (10YR 6/3) dry; weak fine subangular blocky structure; extremely hard, very firm, moderately sticky, moderately plastic; few very fine pores; 1 percent fine crystals of salt; strongly saline; strongly effervescent; moderately alkaline. (25 to 64 cm [10 to 25 in] thick)

The **Bethlehem** series consists of well drained, moderately deep soils on ridgetops and side slopes in the upper part of the Piedmont. They formed in residuum weathered from the high-grade metamorphic rocks such as sillimanite schist, phyllite schist, and mica schist. Slopes range from 2 to 45 percent. Near the type location, mean annual air temperature is 58 degrees and mean annual precipitation is 49 inches.

TAXONOMIC CLASS: Fine, kaolinitic, thermic Typic Kanhapludults Rutherford County, N.C.

TYPICAL PEDON: Bethlehem gravelly sandy clay loam - in an area of Pacolet-Bethlehem complex, 8 to 15 percent slopes, moderately eroded (Colors are for moist soil unless otherwise stated).

Ap--0 to 7 inches; brown (7.5YR 4/4) gravelly sandy clay loam; weak medium granular structure; friable; few fine roots; few fine flakes of mica; 23 percent, by volume, gravel; very strongly acid; clear smooth boundary. (4 to 8 inches thick)

Bt--7 to 24 inches; red (2.5YR 4/6) clay; moderate medium subangular blocky structure; firm, sticky, and plastic; few fine roots; common distinct clay films on faces of peds; common fine flakes of mica; 10 percent, by volume, gravel; very strongly acid; gradual wavy boundary. (12 to 24 inches thick)

BC--24 to 33 inches; yellowish red (5YR 4/6) gravelly sandy clay loam; weak medium subangular blocky structure; friable; slightly sticky, slightly plastic; few fine roots; 20 percent, by volume, gravel; common fine and medium flakes of mica; very strongly acid; abrupt wavy boundary. (0 to 9 inches thick)

Cr--33 to 60 inches; soft, weathered sillimanite schist; few thin interlayers of hard bedrock; few tongues and thin coatings of material from Bt horizon in fractures.

The **Savannah** series consists of moderately well drained, moderately slowly permeable soils with a fragipan. They formed in loamy marine or fluvial terrace deposits. They are on uplands and terraces that range from nearly level to moderately steep in the Southern Coastal Plain. Slopes range from 0 to 15 percent. Clarke County, Mississippi

TAXONOMIC CLASS: Fine-loamy, siliceous, semiactive, thermic Typic Fragiudults

TYPICAL PEDON: Savannah fine sandy loam - pasture. (Colors are for moist soil unless otherwise stated.)

Ap--0 to 6 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine and medium granular structure; very friable; few fine roots; root channels and worm holes filled with material from the E horizon; few fine black concretions; strongly acid; clear smooth boundary. (5 to 8 inches thick)

E--6 to 11 inches; pale brown (10YR 6/3) silt loam; weak fine and medium granular and medium subangular blocky structure; friable; few fine roots; some fillings of Ap material in root channels and worm holes; few fine brown and black concretions; strongly acid; clear smooth boundary. (0 to 6 inches thick)

E/B--11 to 15 inches; mixed very pale brown (10YR 7/3) (E) and yellowish brown (10YR 5/6) (B) loam; weak medium granular and weak medium subangular blocky structure; friable; few fine roots; few worm holes; few fine brown and black concretions; strongly acid; clear smooth boundary. (0 to 5 inches thick)

Bt1--15 to 22 inches; yellowish brown (10YR 5/6) loam; moderate, medium subangular blocky structure; friable; few fine roots; some material from E horizon in root channels and worm holes in upper part of horizon; sand grains bridged and coated with clay; few fine brown and black concretions; very strongly acid; clear smooth boundary.

Bt2--22 to 28 inches: yellowish brown (10YR 5/6) loam; common, fine, faint, pale brown mottles; moderate fine and medium subangular blocky structure; friable; few fine roots; common fine voids; sand grains bridged with clay; patchy clay films on faces of peds; few fine brown concretions; very strongly acid; clear smooth boundary. (Combined thickness of Bt subhorizons is 12 to 20 inches)

Btx1--28 to 35 inches; mottled yellowish brown (10YR 5/6) and light brownish gray (10YR 6/2) loam; weak very coarse prismatic structure parting to moderate, medium and coarse subangular blocky and angular blocky; hard, compact and brittle in about 70 percent of mass; few fine roots in seams between prisms; common fine voids; sand grains coated and bridged with clay; patchy clay films on faces of peds and in cracks; common fine brown concretions; narrow seams of gray (10YR 6/1) clay loam extend downward between prisms; very strongly acid; gradual smooth boundary.

Btx2--35 to 44 inches; mottled yellowish brown (10YR 5/6), light brownish gray (10YR 6/2), and yellowish red (5YR 4/8) loam; weak very coarse prismatic structure parting to moderate, fine and medium subangular blocky and angular blocky; hard, firm, compact and brittle on about 70 percent of mass; few fine roots in seams between prisms; few fine voids; continuous clay films on faces of peds; seams less than one inch wide of gray (10YR 6/1) clay loam between prisms; very strongly acid; gradual smooth boundary. (Combined thickness of upper Bx subhorizons is 14 to 24 inches.)

Btx3--44 to 56 inches; mottled yellowish brown (10YR 5/6), gray (10YR 5/1), and yellowish red (5YR 4/8) sandy clay loam; weak coarse prismatic structure parting to moderate, medium, and coarse subangular blocky and angular blocky; firm, compact, and brittle in about 60 percent of mass; clay films on faces of peds; seams of gray (10YR 6/1) clay loam between prisms; very strongly acid; gradual smooth boundary. (0 to 20 inches thick)

Btx4--56 to 68 inches; mottled yellowish red (5YR 4/8), gray (10YR 6/1), and yellowish brown (10YR 5/6) sandy clay loam; weak coarse prismatic structure parting to moderate, medium and coarse subangular blocky and blocky; firm, compact and brittle in about 60 percent of mass; seams of gray (10YR 6/1) clay loam between prisms; clay films on faces of peds; very strongly acid.

The **Wequetequock** series consists of very deep, subaqueous soils in submerged stream valleys and terraces. The Wequetequock soils are formed in loamy marine deposits. Slope ranges from 0 to 2 percent, mean annual air temperature is about 10 degrees C., and mean annual precipitation is about 1142 mm. New London County, Connecticut

TAXONOMIC CLASS: Coarse-loamy, mixed, active, nonacid, mesic Typic Sulfaquents

TYPICAL PEDON: Wequetequock silt loam on a south facing, concave slope in a submerged stream valley under 1.3 m of estuarine water. Tidal range is 80 cm. (Colors are for moist soil).

Ag--0 to 15 cm; black (N 2.5/) silt loam; massive; very fluid, 5 percent unrubbed and 5 percent rubbed herbaceous fibers; sulphurous odor; strongly saline; slightly acid (pH 6.3), very strongly acid (pH 4.7) after 8 weeks; clear boundary. (0 to 15 cm thick)

Cg1--15 to 40 cm; black (N 2.5/) silt loam; massive; very fluid; 1 percent unrubbed and 0 percent rubbed herbaceous fibers; sulphurous odor; strongly saline; moderately acid (pH 5.8), very strongly acid (pH 4.9) after 8 weeks; clear boundary.

Cg2--40 to 60 cm; very dark gray (2.5Y 3/1) silt loam; massive; moderately fluid; sulphurous odor; strongly saline; very strongly acid (pH 4.9), extremely acid (pH 4.0) after 8 weeks; clear boundary.

Cg3--60 to 105 cm; very dark gray (2.5Y 3/1) sandy loam; massive; moderately fluid; 6 percent gravel; sulphurous odor; strongly saline; ultra acid (pH 3.1), ultra acid (pH 2.6) after 8 weeks; abrupt boundary. (20 to 90 cm thick)

2Oa--105 to 150 cm; dark brown (7.5YR 3/3) muck, broken face sapric material, very dark gray (10YR 3/1) rubbed; massive; very fluid; about 48 percent mineral content; 16 percent unrubbed and 2 percent rubbed herbaceous fibers; 2650 +/- 40 BP measured and 2600 +/- 40 BP conventional radiocarbon age; sulphurous odor; neutral (pH 6.6), neutral (pH 6.6) after 8 weeks; strongly saline (0 to 45 cm thick)

The **Bellavista** series consists of moderately well drained soils formed alluvium from extrusive igneous rock sources. Bellavista soils are on hummocky basins or adjacent low terraces and have slopes of 0 to 5 percent. The mean annual precipitation is about 12 to 18 inches and the mean annual temperature is about 48 degrees F.

TAXONOMIC CLASS: Fine-loamy, mixed, superactive, mesic Typic Durixeralfs Plumas County, California

TYPICAL PEDON: Bellavista loam - pasture. (Colors for dry soil unless otherwise stated)

Apk--0 to 9 inches; gray (10YR 5/1) loam, dark grayish brown (10YR 4/2) moist; massive, breaking to weak coarse platy structure; soft, friable, slightly sticky, slightly plastic; plentiful very fine and fine roots; common very fine tubular and interstitial pores; moderately alkaline (pH 8.0), strongly effervescent with disseminated lime; clear smooth boundary. (7 to 10 inches thick)

Btk--9 to 20 inches; light gray and light brownish gray (10YR 6/1, 6/2) light fine sandy clay loam; dark grayish-brown (10YR 4/2) moist; massive; hard, friable, slightly sticky, slightly plastic; abundant very fine and plentiful medium roots; many very fine and common fine tubular pores; common thin clay films in pores; moderately alkaline (pH 8.0); strongly effervescent with disseminated lime; abrupt wavy boundary. (8 to 14 inches thick)

Bkm1--20 to 23 inches; grayish brown (10YR 5/2) with light gray lime coatings, dark grayish brown (10YR 4/2) moist with yellowish brown lime streaks; massive; indurated, extremely hard, extremely firm, nonsticky, nonplastic; roots spread out above pan; very few fine tubular pores; upper boundary is capped with 1/4 inch thick layer of silica and lime; moderately alkaline (pH 8.0); violently effervescent, lime is both disseminated and in seams; clear wavy boundary. (1 to 4 inches thick)

Bkm2--24 to 42 inches; light brownish gray (10YR 6/2) with light gray lime streaks, dark brown (10YR 3/3) moist; massive; very hard, very firm, indurated with some soft spots; nonsticky, nonplastic; no roots, few fine tubular pores; moderately alkaline (pH 8.0); violently effervescent with lime disseminated and in seams; clear wavy boundary.

Bkqm--42 to 64 inches; light brownish gray (10YR 6/2) with light gray streaks, loamy coarse sand, dark yellowish brown (10YR 4/4) moist, with very pale brown streaks; strong fine and medium platy structure; hard, very firm, nonsticky and nonplastic; no roots; few fine tubular pores; moderately alkaline (pH 8.0) abrupt, smooth and wavy boundary. The Cm horizon is 12 to 24 inches thick.

2Bkqm--64+ inches; brown (7.5YR 5/4) sandy loam, dark brown (7.5YR 3/2) moist with few faint very dark brown mottles; massive; hard, very firm, nonsticky, nonplastic; no roots; few fine tubular pores; moderately alkaline (pH 8.0).

The **Benham** series consists of very deep and deep, well drained soils formed in layers of aerially deposited dacitic pumice and volcanic ash. Benham soils are on mountain slopes at elevations of 1,800 to 2,800 feet. Slopes are 0 to 90 percent. Average annual precipitation is about 75 inches. Mean annual temperature is about 43 degrees F. Lewis County, Washington

TAXONOMIC CLASS: Pumiceous or ashy-pumiceous over medial, glassy over amorphic, frigid Typic Udivitrands

TYPICAL PEDON: Benham paragravelly sandy loam - under a coniferous forest on a 25 percent convex east facing back slope at an elevation of 2,440 feet. (The soil was moist when described. Colors are for moist soil unless otherwise stated. All textures are apparent field textures.)

Oe--4.5 inches to 0; loose, partially decomposed organic litter, composed of needles, leaves, twigs, cones, bark chips, wood and roots; abrupt smooth boundary. (1 to 6 inches thick)

E--0 to 3 inches; dark gray (10YR 4/1) sandy loam, gray (10YR 6/1) dry; weak fine subangular blocky structure; slightly hard, very friable, nonsticky, nonplastic and weakly smeary; many very fine,fine, medium and coarse roots; 5 percent subangular pumice fragments (2-10 mm in diameter); slightly acid (pH 6.2); abrupt wavy boundary. (0.5 to 3 inches thick)

Bw--3 to 9 inches; dark grayish brown (10YR 4/2) paragravelly sandy loam, light brownish gray (10YR 6/2) dry;many medium prominent dark brown (7.5YR 3/4) mottles, brown (7.5YR 5/4) dry; weak fine subangular blocky structure; slightly hard, very friable, nonsticky, nonplastic and weakly smeary; many very fine, fine, medium and coarse roots; common fine pores; 15 percent subangular pumice fragments (2-10 mm in diameter); moderately acid (pH 6.0); abrupt wavy boundary. (4 to 8 inches thick)

2BC--9 to 13 inches; white (10YR 8/1) and reddish yellow (7.5YR 6/8) very paragravelly loamy sand, white (10YR 8/1) and reddish yellow (7.5YR 7/6) dry; single grain; loose; common very fine, fine, medium and coarse roots; 45 percent subangular pumice fragments (2-10 mm in diameter); slightly acid (pH 6.2); clear wavy boundary. (3 to 6 inches thick)

2C--13 to 27 inches; white (10YR 8/1) and reddish yellow (7.5YR 7/6) very paragravelly sand, white (10YR 8/1) and reddish yellow (7.5YR 8/6) dry; single grain; loose; few very fine and fine roots; 55 percent subangular pumice fragments (2-20 mm in diameter); slightly acid (pH 6.4); abrupt wavy boundary. (12 to 20 inches thick)

3Bsb1--27 to 31 inches; dark gray (10YR 4/1) paragravelly sandy loam; gray (l0YR 6/l) dry; many fine prominent yellowish red (5YR 4/6) mottles, yellowish red (5YR 5/6) and reddish yellow (7.5YR 6/6) dry;weak fine subangular blocky structure; slightly hard, very friable, nonsticky, nonplastic and weakly smeary; common very fine, fine, medium, and coarse roots; common fine pores; 20 percent subangular pumice fragments (2-20 mm in diameter); slightly acid (pH 6.2); clear wavy boundary. (3 to 6 inches thick)

3Bsb2--31 to 40 inches; gray (10YR 6/1) paragravelly sandy loam, light gray (10YR 7/1) dry; many fine and medium prominent yellowish red (5YR 4/6) mottles, reddish yellow (5YR 6/6) dry; weak fine subangular blocky structure; slightly hard, very friable, nonsticky, nonplastic and weakly smeary; common very fine, fine, medium and coarse roots; common fine pores; 20 percent subangular pumice fragments (2-20 mm in diameter); slightly acid (pH 6.2); abrupt wavy boundary. (8 to 20 inches thick)

4Bsb3--40 to 44 inches; strong brown (7.5YR 5/8) very paragravelly loamy sand, reddish yellow (7.5YR 7/6) dry; single grain; loose, common very fine, fine and medium roots; 55 percent subangular pumice fragments (2 mm to 5 cm in diameter); slightly acid (pH 6.2); clear wavy boundary. (4 to 6 inches thick)

4Bsb4--44 to 61 inches; reddish yellow (7.5YR 7/6 and 7.5YR 6/8) extremely paragravelly sand, reddish yellow (7.5YR 8/6 and 7.5YR 7/8) dry; single grain; loose; 70 percent subangular pebble-size pumice fragments and a few cobble-size fragments (3 - 6 inches in diameter); slightly acid (pH 6.4). (10 to 24 inches thick)

The **Minong** series consists of very shallow and shallow, well drained organic soils on lake benches and rocky knolls. They formed in thin organic materials underlain in places by a very thin mineral horizon over bedrock. Permeability is moderately slow. Slopes range from 1 to 60 percent. Mean annual temperature is 45 degrees F. Mean annual precipitation is 32 inches.

TAXONOMIC CLASS: Euic, frigid Lithic Udifolists Keweenaw County, Michigan

TYPICAL PEDON: Minong peat on a 7 percent convex slope in a wooded area. (Colors are for moist soil.)

Oi1--0 to 3 inches; brown (7.5YR 4/4) broken face and rubbed peat (fibric material); about 80 percent fiber, about 75 percent rubbed; weak fine granular structure; very friable; primarily conifer needles; very strongly acid; many roots; abrupt smooth boundary. (2 to 4 inches thick)

Oi2--3 to 7 inches; very dark gray (N 3/0) broken face and rubbed peat (fibric material); about 75 percent fiber, about 70 percent rubbed; weak fine granular structure; very friable; primary conifer needles and herbaceous material; very strongly acid; many roots; abrupt smooth boundary. (3 to 5 inches thick)

Oa--7 to 12 inches; brown (7.5YR 4/4) broken face and rubbed muck (sapric material); less than 10 percent fiber rubbed; moderate very fine granular structure; very friable; primarily conifer needles and herbaceous material; very strongly acid; many roots; abrupt smooth boundary. (4 to 6 inches thick)

C--12 to 15 inches; brown (7.5YR 5/4) loamy coarse sand; single grain; loose; strongly acid; common roots; abrupt smooth boundary. (0 to 4 inches thick)

2R--15 inches; igneous bedrock; roots and organic materials have penetrated cracks in bedrock.

The **Hollybrook** series consists of very deep, somewhat poorly drained soils that formed in loamy soil materials. The Hollybrook soils are on reconstructed landforms on mined areas of till plains. Slope ranges from 1 to 5 percent. Mean annual precipitation is about 1118 mm (44 inches), and mean annual air temperature is about 12 degrees C (54 degrees F).

TAXONOMIC CLASS: Fine-loamy, mixed, active, nonacid, mesic Alfic Udarents

TYPICAL PEDON: Hollybrook silt loam, on a 4 percent slope in a cultivated field at an elevation of about 206 meters (675 feet) above mean sea level. (Colors are for moist soil unless otherwise stated.) Owen County, Indiana

Ap--0 to 20 cm (0 to 8 inches); mixed about 90 percent dark yellowish brown (10YR 4/4) and about 10 percent yellowish brown (10YR 5/4) silt loam, light yellowish brown (10YR 6/4) and brownish yellow (10YR 6/6) dry; weak medium granular structure; friable; many fine roots; 1 percent gravel; neutral; clear smooth boundary. [10 to 25 cm (4 to 10 inches) thick]

A/Cd--20 to 58 cm (8 to 23 inches); mixed about 60 percent dark yellowish brown (10YR 4/4) and about 35 percent yellowish brown (10YR 5/6) silt loam, and about 5 percent yellowish brown (10YR 5/6) silty clay loam; massive; very firm; 0.6 to 2 cm (1/4 to 1 inch) thick platy clods with horizontal cleavage planes and vertical cracks that are 2 to 8 cm (1 to 3 inches) apart; common very fine roots between clods; very few faint grayish brown (10YR 5/2) and brown (10YR 5/3) clay films throughout; 1 percent gravel; brittle; slightly acid; clear smooth boundary. [0 to 51 cm (0 to 20 inches) thick]

2Cd1--58 to 137 cm (23 to 54 inches); mixed about 85 percent yellowish brown (10YR 5/4), about 10 percent dark yellowish brown (10YR 4/4), and about 5 percent gray (10YR 6/1) that consists of about 65 percent clay loam, about 15 percent silt loam, about 10 percent silty clay loam, and about 10 percent loam; massive; extremely firm; 2 to 10 cm (1 to 4 inch) thick clods with horizontal cleavage planes and vertical cracks 8 to 25 cm (3 to 10 inches) apart; few fine flat roots between clods; very few faint grayish brown (10YR 5/2) and brown (10YR 5/3) clay films throughout; 1 percent gravel; 20 percent dark gray (10YR 4/1) parachanners (shale) mixed into lower 10 cm (4 inches); moderately acid; clear smooth boundary. [76 to 127 cm (30 to 50 inches) thick]

3Cd2--137 to 203 cm (54 to 80 inches); mixed about 90 percent dark gray (10YR 4/1) very parachannery silty clay loam and about 5 percent bodies of clay loam; massive; firm; very few faint grayish brown (10YR 5/2) and brown (10YR 5/3) clay films throughout; 50 percent parachanners (shale) and 5 percent channers (sandstone and siltstone); neutral.

The **Finch** series consists of very deep somewhat poorly drained soils formed in sandy glacial outwash, sandy lacustrine deposits or sandy glacial till with a strongly cemented subsoil. These soils are on outwash plains, lake plains and ground moraines. Permeability is moderate or moderately rapid in the ortstein and rapid in the rest of the pedon. Slopes range from 0 to 6 percent. Mean annual temperature is about 43 degrees F, and mean annual precipitation is about 30 inches.

TAXONOMIC CLASS: Sandy, mixed, frigid, shallow, ortstein Typic Duraquods Antrim County, Michigan

TYPICAL PEDON: Finch sand - on a 1 percent north-facing slope in a forested area. (Colors are for moist soil unless otherwise stated.)

A--0 to 2 inches; black (10YR 2/1) sand, dark grayish brown (10YR 4/2) dry, with light gray (10YR 7/1) sand grains from the E1 scattered; weak fine granular structure; very friable; many fine roots; very strongly acid; abrupt wavy boundary. (0 to 4 inches thick)

E1--2 to 10 inches; light gray (10YR 7/1) sand, light gray (10YR 7/2) dry; single grain; loose; few fine distinct very pale brown (10YR 7/3) iron accumulations; many fine roots; moderately acid; abrupt irregular boundary. (4 to 12 inches thick)

E2--10 to 12 inches; light brownish gray (10YR 6/2) sand, light gray (10YR 7/2) dry; single grain; loose; common fine and medium faint light gray (10YR 7/2) iron depletions and very pale brown (10YR 7/3) iron accumulations; many fine roots; moderately acid; abrupt irregular boundary. (0 to 3 inches thick)

Bhsm--12 to 22 inches; very dusky red (2.5YR 2/2) and dark reddish brown (5YR 3/3) sand; massive; very hard; ortstein occupies 95 percent of the horizon and is strongly cemented; common fine prominent strong brown (7.5YR 5/6) iron accumulations; very few fine roots; moderately acid; abrupt irregular boundary. (0 to 15 inches thick)

Bsm--22 to 31 inches; yellowish red (5YR 4/6) sand; massive; very firm; ortstein occupies 95 percent of the horizon and is strongly cemented; very few fine roots; many fine and medium distinct reddish yellow (7.5YR 6/6) iron accumulations; slightly acid; abrupt irregular boundary. (6 to 32 inches thick)

BC--31 to 38 inches; dark yellowish brown (10YR 4/4) sand; single grain; loose; many fine and medium faint brown (10YR 5/3) iron accumulations; neutral; abrupt irregular wavy boundary. (0 to 14 inches thick)

C1--38 to 46 inches; yellowish brown (10YR 5/4) sand; single grain; loose; many fine and medium faint dark brown to brown (10YR 4/3) iron accumulations; slightly alkaline; clear wavy boundary. (0 to 22 inches thick)

C2--46 to 60 inches; light yellowish brown (10YR 6/4) sand; single grain; loose; slightly alkaline.

The **Potter** series consist of very deep, well drained, moderately slowly permeable soils that formed in calcareous sediments of fractured and highly weathered calcrete derived mainly from the Ogallala Formation of Miocene-Pliocene age. Potter soils are on very gently sloping to steep draws, scarps, or valley sides. Slopes range from 1 to 30 percent. The mean annual precipitation is 496 mm (20 in), and the mean annual temperature is 16 degrees C (60 degrees F).

TAXONOMIC CLASS: Loamy-skeletal, carbonatic, thermic Petronodic Ustic Haplocalcids Lubbock County, Texas

TYPICAL PEDON: Potter gravelly loam--on a northeast facing, convex, 3 percent slope in rangeland at an elevation of about 940 meters (3,073 ft). (Colors are for dry soil unless otherwise stated.)

A1--0 to 5 cm (0 to 2 in); grayish brown (10YR 5/2) gravelly loam, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure and moderate fine granular; slightly hard, friable; many very fine and fine roots; 16 percent by volume of strongly cemented calcium carbonate nodules and indurated calcrete fragments; 30 percent of the soil surface is covered with strongly cemented to indurated calcrete fragments 2.5 to 5 cm across the long axis; strongly effervescent; moderately alkaline; gradual smooth boundary.

A2--5 to 15 cm (2 to 6 in); brown (10YR 5/3) very gravelly fine sandy loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; slightly hard, friable; many very fine and fine roots; few fine pores; 48 percent by volume of strongly cemented calcium carbonate nodules and indurated calcrete fragments; violently effervescent; moderately alkaline; clear wavy boundary. (combined thickness of the A horizons is 5 to 25 cm or 2 to 10 inches)

Bkk--15 to 38 cm (6 to 15 in); light brownish gray (10YR 6/2) and light gray (10YR 7/2) very gravelly fine sandy loam, grayish brown (10YR 5/2) and light brownish gray (10YR 6/2) moist; weak fine and medium subangular blocky structure; hard, firm; common very fine and fine roots; few fine pores; 38 percent by volume of strongly cemented calcium carbonate nodules and indurated calcrete fragments; many medium and coarse masses of calcium carbonate; violently effervescent; moderately alkaline; diffuse wavy boundary. (0 to 25 cm or 0 to 10 inches thick)

BCkk1--38 to 74 cm (15 to 29 in); white (10YR 8/1) very gravelly fine sandy loam, light gray (10YR 7/2) moist; 53 percent by volume of very strongly cemented, thin platy calcrete fragments and nodules, 2.5 to 8 cm on the long axis, plates are fractured and undersides have about 2.5 to 6 mm long pendants of calcium carbonate; 32 percent of the volume is carbonate masses and loamy soil material; few fine and medium roots mainly of woody plants between plates; violently effervescent; strongly alkaline; diffuse wavy boundary. (25 to 76 cm or 10 to 30 inches thick)

BCkk2--74 to 140 cm (29 to 55 in); white (10YR 8/1) extremely gravelly fine sandy loam, light gray (10YR 7/2) moist; 61 percent by volume of very strongly cemented, thick platy calcrete fragments and nodules, 2.5 to 15 cm on the longaxis, plates are fractured and common oxide stains on undersides of pendants and plates; 26 percent of the volume is carbonate masses and loamy soil material; few fine and medium roots mainly of woody plants between fractured plates; violently effervescent; strongly alkaline; diffuse wavy boundary. (51 to 76 cm or 20 to 30 inches thick)

BCkk3--140 203 cm (55 to 80 in); white (10YR 8/1) extremely gravelly fine sandy loam, light gray (10YR 7/2) moist; 63 percent by volume of very strongly cemented, thick platy calcrete fragments and nodules, 2.5 to 15 cm on the long axis, plates are fractured and common oxide stains on undersides of pendants and plates; 23 percent of the volume is carbonate masses and loamy soil material; few fine and medium roots mainly of woody plants between fractured plates; violently effervescent; strongly alkaline.