The Iredell series
Parent material: diabase, diorite, gabbro, and other rocks high in ferro-magnesium minerals. They are on uplands throughout the Piedmont.
Slope is dominantly less than 6 percent but ranges up to 15 percent.

TYPICAL PEDON: Iredell sandy loam--pasture.

____—0 to 13 cm; dark grayish brown (2.5Y 4/2) sandy loam; weak medium granular structure; friable, slightly sticky, slightly plastic; many fine and medium roots; 1 percent fine pebbles; few fine black concretions; slightly acid; clear smooth boundary.

____—13 to 18 cm; dark grayish brown (10YR 4/2) loam; moderate medium granular structure; friable, slightly sticky, slightly plastic; many fine and medium roots; few fine black concretions; neutral; abrupt wavy boundary.

_____—18 to 28 cm; brown (10YR 4/3) clay; moderate medium angular blocky structure; very firm, very sticky, very plastic; many fine and medium roots; common distinct clay films on faces of peds; common slickensides; many fine (1 to 2 mm) black concretions; slightly acid; gradual smooth boundary.

____—28 to 50 cm; brown (10YR 4/3) clay; moderate medium and coarse angular blocky structure; very firm, very sticky, very plastic; many fine and medium roots along faces of peds; common distinct clay films on faces of peds; common slickensides and pressure faces; common fine black concretions; few fine weathered feldspar crystals; neutral; gradual smooth boundary.

____—50 to 70 cm; dark grayish brown (2.5Y 4/2) clay; moderate medium and coarse angular blocky structure; very firm, very sticky, very plastic; many fine and medium roots, mostly along faces of peds; few fine pores; common distinct clay films on faces of peds; few medium black concretions; few fine weathered feldspar crystals; slightly acid; gradual smooth boundary.

____—70 to 84 cm; olive (5Y 4/3) loam; common medium distinct very pale brown (10YR 7/3) and few fine distinct dark grayish brown (2.5Y 4/2) and black (N 2/0) mottles; moderate medium and coarse angular blocky structure; firm, sticky, plastic; many fine and medium roots along faces of peds; few medium pores; common distinct clay films on faces of peds; common soft dark grayish brown and black saprolite; neutral; clear wavy boundary.

____—84 to 93 cm; finely mottled dark greenish gray, very pale brown, and yellowish brown loam; 80 percent saprolite that crushes easily; many fine roots and few distinct clay films along cleavage planes; neutral; gradual wavy boundary.

____—93 to 110 cm; finely mottled dark greenish gray, very pale brown, black and yellowish brown sandy loam; 90 percent saprolite that crushes easily; many fine roots and few distinct clay films along cleavage planes; moderately alkaline; gradual wavy boundary.

____—110 to 150 cm; finely mottled dark greenish gray, yellowish brown, black and very pale brown sandy loam; 90 percent saprolite that crushes easily; few fine roots along cleavage planes; 10 percent fragments of hard rock; moderately alkaline.

Mandarin series

Landscape: Lower coastal plain Landform: Marine terrace
Parent Material: Marine sediments Slope: 0 to 3 percent
Mean Annual Air Temperature (type location): 67 degrees F.
Mean Annual Precipitation (type location): 55 inches
Vegetation: mixed oak/pine maritime forest; palmetto/gallberry understory

TYPICAL PEDON: Mandarin fine sand, on a smooth convex 0.5 percent slope, in forest.

____—0 to 10 cm; dark gray (10YR 4/1) fine sand; weak fine granular structure; very friable; extremely acid; clear wavy boundary.

____—10 to 15 cm; light brownish gray (10YR 6/2) fine sand; single grained; loose; extremely acid; clear wavy boundary.

____—15 to 65 cm; light gray (10YR 7/1) fine sand; single grained; loose; strongly acid; abrupt wavy boundary.

____—65 to 76 cm; very dark grayish brown (10YR 3/2) fine sand; weak fine subangular blocky structure; friable; in places sand grains well coated with organic matter; very strongly acid; gradual wavy boundary.

____—76 to 87 cm; very dark brown (10YR 2/2) fine sand; weak fine subangular blocky structure; friable; in places sand grains well coated with organic matter; few medium faint dark brown (10YR 3/3) soft masses of iron accumulation; very strongly acid; clear wavy boundary.

____—87 to 105 cm; black (5YR 2/1) fine sand; moderate medium subangular blocky structure; friable; in places sand grains well coated with organic matter; few fine prominent yellowish brown (10YR 5/4) soft masses of iron accumulation; very strongly acid; gradual wavy boundary.

____—105 to 115; brown (10YR 5/3) fine sand; single grained; loose; moderately acid; gradual smooth boundary.

____—115 to 142 cm; light gray (10YR 7/2) fine sand; single grained; loose; slightly acid; gradual wavy boundary.

____—142 to 157 cm; white (10YR 8/1) fine sand; single grained; loose; few medium faint very pale brown (10YR 7/3) soft masses of iron accumulation; neutral; gradual wavy boundary.

____—157 to 186 cm; grayish brown (10YR 5/2) fine sand; single grained; loose; neutral; gradual wavy boundary.

____—186 to 225 cm; black (10YR 2/1) fine sand; few fine distinct white (10YR 8/1) bodies; weak fine subangular blocky structure; friable; in places sand grains coated with organic matter; moderately acid.

The Cowarts series
They occur on ridge tops and side slopes on uplands of the Coastal Plain.
They formed in loamy marine sediments.
average annual air temperature is 65 degrees F. and the average annual precipitation is 53 inches.

TYPICAL PEDON: Cowarts fine sandy loam--on a convex 6 percent side slope in a cultivated field (Colors are for moist soil).

____—0 to 20 cm; dark grayish brown (10YR 4/2) fine sandy loam; weak fine granular structure; very friable; few fine dark concretions; strongly acid; abrupt wavy boundary.

____—20 to 32 cm; yellowish brown (10YR 5/4) fine sandy loam; weak medium granular structure; very friable; strongly acid; clear wavy boundary.

____—32 to 50 cm; yellowish brown (10YR 5/8) sandy clay loam; weak medium subangular blocky structure; friable; few faint clay films on faces of peds; sand grains coated and bridged with clay; strongly acid; gradual wavy boundary.

____—50 to 82 cm; yellowish brown (10YR 5/8) sandy clay loam; moderate medium subangular blocky structure; firm; few faint clay films on faces of peds; about 3 percent, by volume, nodules of plinthite; many coarse prominent yellowish red (5YR 5/8) and red (2.5YR 4/8) masses of iron accumulation; strongly acid; gradual wavy boundary.

____—82 to 152 cm; about 34 percent red (10R 5/6), about 33 percent yellowish brown (10YR 5/6) and about 33 percent light gray (10YR 7/2) sandy clay loam in a variegated pattern with pockets and strata of coarser and finer textured material; massive; very firm; strongly acid.

Toxaway series

Formed in loamy alluvial deposits on nearly level flood plains of Blue Ridge province. mean annual temperature is 57 degrees F., and mean annual precipitation is 60 inches. Slopes range from 0 to 3 percent.

TYPICAL PEDON: Toxaway silt loam—1% slope, cultivated field.

___—0 to 60 cm; black (10YR 2/1) silt loam; moderate medium granular structure; friable, sticky and slightly plastic; common fine roots; few fine flakes of mica; moderately acid; clear smooth boundary.

___—60 to 90 cm; very dark gray (10YR 3/1) loam; weak medium granular structure; friable; few fine roots; common fine flakes of mica; moderately acid; clear smooth boundary.

___—90 to 115; very dark gray (10YR 3/1) sandy loam; massive; very friable, slightly sticky; common fine flakes of mica; moderately acid; clear smooth boundary.

___—115 to 134 cm; grayish brown (10YR 5/2) sand; few fine prominent yellowish brown (10YR 5/6) mottles; single grained; loose; common fine flakes of mica; moderately acid; clear smooth boundary.

___—134 to 165 cm; gray (N 6/0) sandy clay loam with lenses of sandy loam; massive; friable, slightly sticky and slightly plastic; common fine flakes of mica; moderately acid; clear smooth boundary.

___—165 to 205 cm; gray (N 6/0) loamy sand; single grained; loose; common fine flakes of mica; moderately acid.

Louisa series.
formed over mica gneiss and schist bedrock on Piedmont uplands.
Slopes are 6 to 80 percent.
mean annual temperature is 61 degrees F., and the mean annual precipitation is 51 inches.

TYPICAL PEDON: Louisa gravelly loam—in a hardwood forest.

___—8 to 3 cm; fresh hardwood litter.

___—3 to 0 cm; partly decomposed hardwood litter.

___—0 to 10 cm; very dark grayish brown (10YR 3/2) gravelly loam; weak medium granular structure; very friable; many fine and medium roots; many fine and medium flakes of mica; about 20 percent fragments of quartz and schist; moderately acid; clear smooth boundary.

___—10 to 20 cm; brown (10YR 4/3) gravelly loam; weak medium subangular blocky structure; very friable; many fine and medium roots; few coarse roots; many fine and medium flakes of mica; 20 percent fragments of quartz and schist; strongly acid; clear smooth boundary.

___—20 to 33 cm; brown (7.5YR 4/4) gravelly loam; weak medium subangular blocky structure; friable; common medium and coarse roots; many fine and medium flakes of mica; about 20 percent fragments of quartz and schist; small pockets of clay loam in lower part between tilted layers of broken schist extending from lower horizon, make up about 15 percent by volume; strongly acid; clear wavy boundary.

___—33 to 52 cm; olive gray (5Y 4/2) very channery loam; many fragments of schist have thin discontinuous clay films on surface; few small pockets of clay loam are between tilted layers of schist; very strongly acid; gradual irregular boundary.

___—52 to 90 cm; weathered olive gray (5Y 4/2) mica schist; can be dug with difficulty with spade.

Grover series.

Formed on ridges and side slopes on Piedmont uplands in residuum.
Weathered from high-grade metamorphic rocks high in mica such as biotite gneiss and schist.
Mean annual temperature is 59 degrees F., and mean annual precipitation is 64 inches.
Slope ranges from 2 to 45 percent.

TYPICAL PEDON: Grover loam--forested.

___—3 to 0 cm; brown (10YR 4/3) partially decomposed deciduous organic material.

___—0 to 15 cm; brown (7.5YR 4/4) loamy sand; weak medium granular structure; very friable; many fine, medium, and coarse roots; common fine and medium flakes of mica; very strongly acid; clear smooth boundary.

___—15 to 50 cm; yellowish red (5YR 5/6) loam; weak medium subangular blocky structure; friable; slightly sticky and slightly plastic; few faint clay films on faces of peds; many fine and medium, and few coarse roots; many fine and medium flakes of mica; very strongly acid; gradual wavy boundary.

___—50 to 62 cm; yellowish red (5YR 4/6) loam; weak medium subangular blocky structure; very friable; common fine and medium, and few coarse roots; many fine and medium flakes of mica; strongly acid; gradual wavy boundary.

___—62 to 90 cm; strong brown (7.5YR 4/6) biotite gneiss saprolite that has texture of sandy loam; common very dark brown (10YR 2/2) streaks; massive; very friable; few fine and medium roots; many fine and medium flakes of mica; very strongly acid; clear smooth boundary.

___—90 to 165 cm; multicolored biotite gneiss saprolite that has texture of sandy loam; massive; very friable; few fine and medium roots; many fine and medium flakes of mica; very strongly acid.

The Iredell series
Parent material: diabase, diorite, gabbro, and other rocks high in ferro-magnesium minerals. They are on uplands throughout the Piedmont.
Slope is dominantly less than 6 percent but ranges up to 15 percent.

TYPICAL PEDON: Iredell sandy loam--pasture.

Ap1—0 to 13 cm; dark grayish brown (2.5Y 4/2) sandy loam; weak medium granular structure; friable, slightly sticky, slightly plastic; many fine and medium roots; 1 percent fine pebbles; few fine black concretions; slightly acid; clear smooth boundary.

Ap2—13 to 18 cm; dark grayish brown (10YR 4/2) loam; moderate medium granular structure; friable, slightly sticky, slightly plastic; many fine and medium roots; few fine black concretions; neutral; abrupt wavy boundary.

Btss1—18 to 28 cm; brown (10YR 4/3) clay; moderate medium angular blocky structure; very firm, very sticky, very plastic; many fine and medium roots; common distinct clay films on faces of peds; common slickensides; many fine (1 to 2 mm) black concretions; slightly acid; gradual smooth boundary.

Btss2—28 to 50 cm; brown (10YR 4/3) clay; moderate medium and coarse angular blocky structure; very firm, very sticky, very plastic; many fine and medium roots along faces of peds; common distinct clay films on faces of peds; common slickensides and pressure faces; common fine black concretions; few fine weathered feldspar crystals; neutral; gradual smooth boundary.

Btg—50 to 70 cm; dark grayish brown (2.5Y 4/2) clay; moderate medium and coarse angular blocky structure; very firm, very sticky, very plastic; many fine and medium roots, mostly along faces of peds; few fine pores; common distinct clay films on faces of peds; few medium black concretions; few fine weathered feldspar crystals; slightly acid; gradual smooth boundary.

BC—70 to 84 cm; olive (5Y 4/3) loam; common medium distinct very pale brown (10YR 7/3) and few fine distinct dark grayish brown (2.5Y 4/2) and black (N 2/0) mottles; moderate medium and coarse angular blocky structure; firm, sticky, plastic; many fine and medium roots along faces of peds; few medium pores; common distinct clay films on faces of peds; common soft dark grayish brown and black saprolite; neutral; clear wavy boundary.

C1—84 to 93 cm; finely mottled dark greenish gray, very pale brown, and yellowish brown loam; 80 percent saprolite that crushes easily; many fine roots and few distinct clay films along cleavage planes; neutral; gradual wavy boundary.

C2—93 to 110 cm; finely mottled dark greenish gray, very pale brown, black and yellowish brown sandy loam; 90 percent saprolite that crushes easily; many fine roots and few distinct clay films along cleavage planes; moderately alkaline; gradual wavy boundary.

C3—110 to 150 cm; finely mottled dark greenish gray, yellowish brown, black and very pale brown sandy loam; 90 percent saprolite that crushes easily; few fine roots along cleavage planes; 10 percent fragments of hard rock; moderately alkaline.

Mandarin series

Landscape: Lower coastal plain Landform: Marine terrace
Parent Material: Marine sediments Slope: 0 to 3 percent
Mean Annual Air Temperature (type location): 67 degrees F.
Mean Annual Precipitation (type location): 55 inches
Vegetation: mixed oak/pine maritime forest; palmetto/gallberry understory

TYPICAL PEDON: Mandarin fine sand, on a smooth convex 0.5 percent slope, in forest.

A—0 to 10 cm; dark gray (10YR 4/1) fine sand; weak fine granular structure; very friable; extremely acid; clear wavy boundary.

E1—10 to 15 cm; light brownish gray (10YR 6/2) fine sand; single grained; loose; extremely acid; clear wavy boundary.

E2—15 to 65 cm; light gray (10YR 7/1) fine sand; single grained; loose; strongly acid; abrupt wavy boundary.

Bh1—65 to 76 cm; very dark grayish brown (10YR 3/2) fine sand; weak fine subangular blocky structure; friable; in places sand grains well coated with organic matter; very strongly acid; gradual wavy boundary.

Bh2—76 to 87 cm; very dark brown (10YR 2/2) fine sand; weak fine subangular blocky structure; friable; in places sand grains well coated with organic matter; few medium faint dark brown (10YR 3/3) soft masses of iron accumulation; very strongly acid; clear wavy boundary.

Bh3—87 to 105 cm; black (5YR 2/1) fine sand; moderate medium subangular blocky structure; friable; in places sand grains well coated with organic matter; few fine prominent yellowish brown (10YR 5/4) soft masses of iron accumulation; very strongly acid; gradual wavy boundary.

BE—105 to 115; brown (10YR 5/3) fine sand; single grained; loose; moderately acid; gradual smooth boundary.

E'1—115 to 142 cm; light gray (10YR 7/2) fine sand; single grained; loose; slightly acid; gradual wavy boundary.

E'2—142 to 157 cm; white (10YR 8/1) fine sand; single grained; loose; few medium faint very pale brown (10YR 7/3) soft masses of iron accumulation; neutral; gradual wavy boundary.

E'3—157 to 186 cm; grayish brown (10YR 5/2) fine sand; single grained; loose; neutral; gradual wavy boundary.

B'h—186 to 225 cm; black (10YR 2/1) fine sand; few fine distinct white (10YR 8/1) bodies; weak fine subangular blocky structure; friable; in places sand grains coated with organic matter; moderately acid.

The Cowarts series
They occur on ridge tops and side slopes on uplands of the Coastal Plain.
They formed in loamy marine sediments.
average annual air temperature is 65 degrees F. and the average annual precipitation is 53 inches.

TYPICAL PEDON: Cowarts fine sandy loam--on a convex 6 percent side slope in a cultivated field (Colors are for moist soil).

Ap—0 to 20 cm; dark grayish brown (10YR 4/2) fine sandy loam; weak fine granular structure; very friable; few fine dark concretions; strongly acid; abrupt wavy boundary.

BE—20 to 32 cm; yellowish brown (10YR 5/4) fine sandy loam; weak medium granular structure; very friable; strongly acid; clear wavy boundary.

Bt1—32 to 50 cm; yellowish brown (10YR 5/8) sandy clay loam; weak medium subangular blocky structure; friable; few faint clay films on faces of peds; sand grains coated and bridged with clay; strongly acid; gradual wavy boundary.

Bt2—50 to 82 cm; yellowish brown (10YR 5/8) sandy clay loam; moderate medium subangular blocky structure; firm; few faint clay films on faces of peds; about 3 percent, by volume, nodules of plinthite; many coarse prominent yellowish red (5YR 5/8) and red (2.5YR 4/8) masses of iron accumulation; strongly acid; gradual wavy boundary.

C—82 to 152 cm; about 34 percent red (10R 5/6), about 33 percent yellowish brown (10YR 5/6) and about 33 percent light gray (10YR 7/2) sandy clay loam in a variegated pattern with pockets and strata of coarser and finer textured material; massive; very firm; strongly acid.

Toxaway series

Formed in loamy alluvial deposits on nearly level flood plains of Blue Ridge province. mean annual temperature is 57 degrees F., and mean annual precipitation is 60 inches. Slopes range from 0 to 3 percent.

TYPICAL PEDON: Toxaway silt loam--cultivated field.

A1—0 to 60 cm; black (10YR 2/1) silt loam; moderate medium granular structure; friable, sticky and slightly plastic; common fine roots; few fine flakes of mica; moderately acid; gradual smooth boundary.

A2—60 to 90 cm; very dark gray (10YR 3/1) loam; weak medium granular structure; friable; few fine roots; common fine flakes of mica; moderately acid; clear smooth boundary.

Cg1—90 to 115; very dark gray (10YR 3/1) sandy loam; massive; very friable, slightly sticky; common fine flakes of mica; moderately acid; clear smooth boundary.

Cg2—115 to 134 cm; grayish brown (10YR 5/2) sand; few fine prominent yellowish brown (10YR 5/6) mottles; single grained; loose; common fine flakes of mica; moderately acid; clear smooth boundary.

Cg3—134 to 165 cm; gray (N 6/0) sandy clay loam with lenses of sandy loam; massive; friable, slightly sticky and slightly plastic; common fine flakes of mica; moderately acid; clear smooth boundary.

Cg4—165 to 205 cm; gray (N 6/0) loamy sand; single grained; loose; common fine flakes of mica; moderately acid.

Louisa series.
formed over mica gneiss and schist bedrock on Piedmont uplands.
Slopes are 6 to 80 percent.
mean annual temperature is 61 degrees F., and the mean annual precipitation is 51 inches.

TYPICAL PEDON: Louisa gravelly loam—in a hardwood forest.

0i—8 to 3 cm; fresh hardwood litter.

0e—3 to 0 cm; partly decomposed hardwood litter.

A—0 to 10 cm; very dark grayish brown (10YR 3/2) gravelly loam; weak medium granular structure; very friable; many fine and medium roots; many fine and medium flakes of mica; about 20 percent fragments of quartz and schist; moderately acid; clear smooth boundary.

Bw—10 to 20 cm; brown (10YR 4/3) gravelly loam; weak medium subangular blocky structure; very friable; many fine and medium roots; few coarse roots; many fine and medium flakes of mica; 20 percent fragments of quartz and schist; strongly acid; clear smooth boundary.

Bw/Bt—20 to 33 cm; brown (7.5YR 4/4) gravelly loam; weak medium subangular blocky structure; friable; common medium and coarse roots; many fine and medium flakes of mica; about 20 percent fragments of quartz and schist; small pockets of clay loam in lower part between tilted layers of broken schist extending from lower horizon, make up about 15 percent by volume; strongly acid; clear wavy boundary.

C—33 to 52 cm; olive gray (5Y 4/2) very channery loam; many fragments of schist have thin discontinuous clay films on surface; few small pockets of clay loam are between tilted layers of schist; very strongly acid; gradual irregular boundary.

Cr—52 to 90 cm; weathered olive gray (5Y 4/2) mica schist; can be dug with difficulty with spade.

Grover series.

Formed on ridges and side slopes on Piedmont uplands in residuum.
Weathered from high-grade metamorphic rocks high in mica such as biotite gneiss and schist.
Mean annual temperature is 59 degrees F., and mean annual precipitation is 64 inches.
Slope ranges from 2 to 45 percent.

TYPICAL PEDON: Grover loam--forested.

Oe—3 to 0 cm; brown (10YR 4/3) partially decomposed deciduous organic material.

A—0 to 15 cm; brown (7.5YR 4/4) loamy sand; weak medium granular structure; very friable; many fine, medium, and coarse roots; common fine and medium flakes of mica; very strongly acid; clear smooth boundary.

Bt—15 to 50 cm; yellowish red (5YR 5/6) loam; weak medium subangular blocky structure; friable; slightly sticky and slightly plastic; few faint clay films on faces of peds; many fine and medium, and few coarse roots; many fine and medium flakes of mica; very strongly acid; gradual wavy boundary.

BC—50 to 62 cm; yellowish red (5YR 4/6) loam; weak medium subangular blocky structure; very friable; common fine and medium, and few coarse roots; many fine and medium flakes of mica; strongly acid; gradual wavy boundary.

C1—62 to 90 cm; strong brown (7.5YR 4/6) biotite gneiss saprolite that has texture of sandy loam; common very dark brown (10YR 2/2) streaks; massive; very friable; few fine and medium roots; many fine and medium flakes of mica; very strongly acid; clear smooth boundary.

C2—90 to 165 cm; multicolored biotite gneiss saprolite that has texture of sandy loam; massive; very friable; few fine and medium roots; many fine and medium flakes of mica; very strongly acid.