

## **Preliminary soil survey of the NATL Old Field Plots**

The preliminary soil survey consisted of completing auger borings at 25 m intervals and included auger borings at total of 46 points. The borings were made to a depth of 1 m, or the bottom of the clay, but not to exceed 1.5 m. GPS coordinates were determined at the location of each auger boring. The soil auger borings and soil descriptions were completed by Ronald J. Kuehl, soil scientist, Florida Soil and Environmental Services. Victoria Gardner, graduate teaching assistant, Soil and Water Science Dept., Univ. of FL. determined the GPS coordinates at each auger boring location.

The NATL has a 50 m grid system and each grid intersection is marked. Soil borings were made at the grid intersections and halfway between each intersection. The borings that were made at the grid intersections were identified by the letter and number shown on the grid marker (i.e. F3). The boring made south of F3 and halfway between grid markers F3 and F4 was identified as F3.5. The boring made east of F3 and halfway between F3 and G3 was identified as FG3.

Soil samples were collected of the 0 to 6 inch layer in each boring for fertility analyses. The samples were provided to Dr. Mark Clark.

A brief soil description was completed at each boring to show the estimated field soil textures and depth and thickness of the clay layers. The primary objective of this preliminary soil survey was to identify homogenous soil units so that researchers working on the NATL Old Field Plots can better understand the differences in plant growth and succession taking place.

The soils have been grouped into 3 major units: (1) natural soils; (2) disturbed soils; and (3) highly disturbed soils. Natural soils refer to the soils in which no disturbance was noted above a depth of 150 cm. The disturbed soils contain what appeared to be chunks of clay mixed with the sands. Thick layers of clay were not apparent in the disturbed soils. The highly disturbed soils are the soils that contain thick, distinct layers of clay. The following subgroups were made within each of the major units:

### **1(a) Natural soils - thick brown and yellowish brown sands > 1.5 m in thickness**

#### **Grid Points EF2.5, EF3, EF3.5, EF4.5, EF5, F5.5**

Natural, undisturbed soils consisting of brown and yellowish brown sands that extended to a depth of more than 1.5 m were observed along the west boundary of Plots A and C at the following points: EF2.5, EF3, E3.5, EF 4.5, and EF5. The boring at Grid Point F5.5 along the southern boundary of Plot C also showed thick sands in natural, undisturbed soils. The soils observed in these borings were moist following recent rainfalls. Moisture content increased at a depth of about 1.2 to 1.5 m.

**1 (b) Natural soils - thick light brownish gray and gray sands > 1.5 m in thickness in lower lying areas**

**Grid Points G3, G3.5, GH3.5**

These points are located in lower areas in the west central part of Plot B and showed thick, gray sands. The gray-colored sands are an indication that the soils are wet following periods of heavy rainfall. Water is likely perched above clay in nearby areas.

**1 (c) Natural soils – moderately thick sands 1.1 to 1.5m in thickness overlying loamy soils**

**Grid Points EF4, F3, FG3,**

The borings at these points in slightly lower areas in Plot A showed natural, undisturbed soils consisting of brown, yellowish brown, and light brownish gray sands that extended to a depth of 115 cm and 140 cm, respectively were observed at grid point F3 and in the southwest corner of Plot A at point EF4. The sands were underlain by yellowish brown-colored loamy soils (sandy loam). The soils observed in this boring were moist following recent rainfalls. Moisture content increased considerably at a depth of about 1 m.

**1 (d) Natural soils - thin sands**

**Sands < 80 cm in thickness overlying loamy soils and sandy clay**

**Grid Point EF5.5, FG 5.5, H4, G5.5**

Natural, undisturbed soils consisting of brown, yellowish brown, and light brownish gray sands that extended to a depth of 70 cm was observed along the southern boundary of Plot C at points EF5.5, FG5.5, and G5.5. A boring at Point H4 in the northwest corner of Plot E also showed the thin sands. The sands were underlain by olive brown and light gray-colored loamy soils (sandy clay loams) and gray-colored sandy clay. The soils observed in these borings were moist following recent rainfalls. Moisture content increased considerably at a depth of about 65 cm.

**2 (a) Disturbed soils with layers of clay < 20 cm in thickness overlying natural soils**

**Grid Point GH4** – clay on the surface mixed with a small amount of sand and extending to a depth of 15 cm. Underlying natural soils consisted of sands overlying loamy soils (sandy clay loam) at a depth of 90 cm.

**2 (b) Disturbed soils > 100 cm in thickness consisting of loamy soils and phosphatic rocks overlying sands and loamy soils**

**Grid Point FG4** – mixture of loamy soils (sandy clay loams) with phosphatic rocks about 112 cm in thickness overlying yellowish brown sands (natural soils).

**Grid Point HI4** – mixture of sands with small amount of loamy soils (sandy clay loams) with phosphatic rocks about 105 cm in thickness overlying wet gray loamy soils (sandy loams).

**Grid Point HI5** – mixture of sands with small amount of loamy soils (sandy clay loams) about 125 cm in thickness overlying loamy soils (sandy loams).

**2 (c) Disturbed soils with chunks of clay – mixed, multi-colored sands with chunks of gray and greenish gray clay that begin within a depth of 30 cm of the surface and extend > 36 cm in thickness.**

**Grid Point F3.5, F4, F4.5** – chunks of clay mixed with sands throughout.

**Grid Point G2.5** – Small chunks of clay (about 15%) mixed with the sands from the surface to a depth of about 100 cm. Natural sands below that depth.

**Grid Point GH2.5** – Small chunks of clay (about 10%) mixed with the sands from the surface sands and sandy clay. Soils are very wet above the sandy clay.

**Grid Point GH3** – Small chunks of clay (about 5%) mixed with the sands from the surface to a depth of about 36 cm., overlying natural sands to a depth of about 76 cm. Sandy clay extended from a depth of 76 to 150 cm.

**Grid Point H3.5** – west edge of sinkhole. Sands mixed with chunks of clay from surface to a depth of 25 cm. overlying a thin layer of sands that overlie sandy clay loams at a depth of about 40 cm. Clay at a depth of about 90 cm.

**Grid Point H4.5** – sands mixed with loamy soils (sandy clay loams) and phosphatic rocks overlying sandy clay layer at a depth of 55 cm overlying sands with chunks of clay (30% clay chunks) at a depth of 102 cm that overlie sands at a depth of about 125 cm.

**Grid Point H5.5** – sands mixed with chunks of clay (30% clay chunks) extending to a depth of 36 cm overlying gray sands. Loamy soils (sandy clay loams) at a depth of 150 cm.

**Grid Point I5** – dark sands on the surface to a depth of 28 cm overlying olive brown and light gray sandy clay mixed with sand to a depth of about 110 cm. Sandy soils extend from a depth of 110 to 150 cm.

**2 (d) Disturbed soils with chunks or thinner layers of clay – mixed, multi-colored sands with chunks of gray and greenish gray clay that begin within a depth of 30 cm of the surface and extend < 36 cm in thickness.**

**Grid Point GH5.5** – sand on the surface overlying a layer of gray clay that extends from a depth of 12 to 30 cm. Clay underlain by gray and white “beach” sands.

**Grid Point HI4.5** – A layer of gray clay (80%) on the surface with mixings of sand that extends to a depth of 30 cm. Clay underlain by natural yellowish brown and light gray sands.

**Grid Point IJ5** – A layer of gray clay (90%) on the surface with mixings of sand and burned materials that extends to a depth of 30 cm. Clay underlain by natural yellowish brown and light gray sands.

**Grid Point J5** – thin layer of sand on the surface overlying a layer of gray clay that extends to a depth of 40 cm. Clay underlain by loamy soils.

**3(a) Highly disturbed soils - mixed, multi-colored sands with layers of gray and greenish gray clay > 36 cm in thickness that begin within a depth of 30 cm of the surface.**

**Grid Point F2.5** – layers of dense sandy clay mixed with layers of very dense clay that extended from a depth of 22 to 74 cm.

**Grid Point F5** – a layer of very dense clay extended from a depth of 25 to 95 cm.

**Grid Point FG2.5** – layers of very dense clay extended from a depth of 20 cm to >150 cm.

**Grid Point G5** – mixture of sands with about 5% clay chunks on the surface to a depth of about 15 cm. A layer of very dense clay extended from 15 to 90 cm. The clay was underlain by a layer of loamy soils (sandy clay loams) mixed with about 30% clay.

**Grid Point H5** – mixture of clay (about 50%) and loamy soils (sandy clay loams) on the surface and extend to a depth of 50 cm. A layer of sands extended to a depth of 65 cm overlying a greenish gray very dense clay layer that extended to a depth of 105 cm.

**3 (b) Highly disturbed soils - gray and greenish gray clay on the surface and >75 cm in thickness.**

These borings showed thick layers of gray and greenish gray clay. The clay contained many white phosphatic nodules that typically occur in the Hawthorn geologic formation. The nodules were about 1 to 3 cm in diameter and were mostly soft. Some were hardened and were difficult to break apart in the hand.

**Grid Point FG3.5** – dense clay on the surface that extends to a depth of about 110 cm. Below that depth a thin layer with sand mixings overlying dense clay at a depth of 130 cm.

**Grid Point FG4.5** – dense clay on the surface (35%) with layers of sand to a depth of 25 cm. Only greenish clay (100%) below 25 cm., and clay extended to a depth of 150 cm.

**Grid Point FG5** – dense clay on the surface (85%) with mixings of gray sand to a depth of 20 cm. Only brown and olive brown clay (100%) below 20 cm., and clay extended to a depth of 150 cm.

**Grid Point G4** – dense clay on the surface that extends to a depth of about 78 cm. Sands (natural soils) occur below that depth.

**Grid Point G4.5** – dense clay on the surface (55%) with thinner layers of sand and many phosphatic rocks to a depth of about 40 cm. Only greenish clay (100%) below 40 cm., and clay extended to a depth of 150 cm.

**Grid Point GH4.5** – dense clay on the surface (60%) with thin layers of loamy soils (sandy clay loams) (20%) and sand (20%) to a depth of about 25 cm. Only greenish clay (100%) below 25 cm., and clay extended to a depth of 150 cm.

**Grid Point GH5** – dense clay on the surface (60%) with thin layers of loamy soils (sandy clay loams) (40%) to a depth of about 55 cm. Only greenish clay (100%) below 55 cm., and clay extended to a depth of 150 cm.