



Soil and Plant Science Division Technical Soil Services North Central Soil Survey Region

Soil and Plant Science Division Staff Assist Scientists from University of Nebraska-Lincoln on Study of Human-Induced Soil Change

Hays, Kansas, Major Land Resource Area (MLRA) Soil Survey Office (SSO)

Purpose

Recently, researchers from the University of Nebraska-Lincoln (UNL) requested assistance from Hays, Kansas, MLRA SSO staff on a pit sampling project. The MLRA SSO staff provided digging equipment, logistical support, and local expertise to aid in describing the sampling locations (fig. 1). The project was to test the hypothesis that anthropedogenesis, soil formation driven by human influence, has led to measurable change in soil properties throughout the Great Plains.



Figure 1.—From left to right, Allie Baranowski, Judith Turk, Lucas Scott, and Ryan Still texture soil samples taken from the pit.

Background

For the project, UNL researchers studied pre-2000s lab descriptions of sampling pits throughout MLRA 73, Rolling Plains and Breaks, and selected three lab pedons described in 1968 with one other completed in 1992. UNL researchers worked with the landowners and producers to document land-use history before Hays MLRA SSO staff dug the pits. The Hays MLRA SSO staff and UNL researchers completed rigorous soil descriptions together as a team. The soils described throughout the week included two Harney pits, one Roxbury, and one Armo (fig. 2).

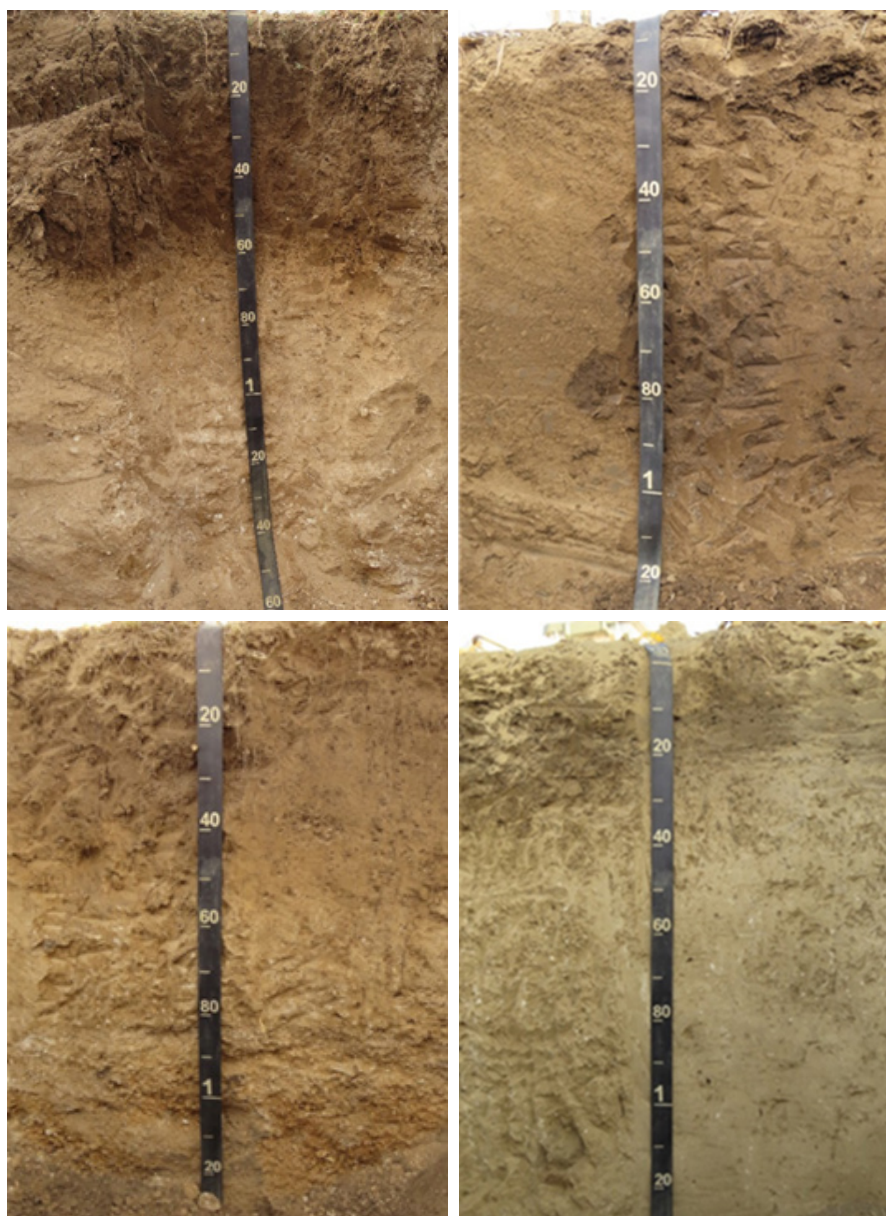


Figure 2.—Top row showing soil pit profiles of Harney (left) and Roxbury (right), and second row showing soil pit profiles of Harney (left) and Armo (right).



The team accounted for differences between the 1968 and 1992 description techniques and the current methods by mirroring techniques from the original samplings. This included soil color documentation using Munsell charts from the years in which the original samplings were completed. The team compared these older color charts with those in modern color books to account for possible differences due to the manufacturing methods of the color chips. These efforts ensure that whatever data is found to be different from the original descriptions can be verified to be a result of the passage of time or agricultural management.

In addition to the descriptions, UNL researchers plan to test samples for properties that are directly comparable to legacy data using the same lab methods from the time of the sampling. This includes physical and chemical properties like bulk density, particle size distribution, pH, estimated organic carbon, calcium carbonate equivalent, and gypsum analysis. UNL researchers also plan to use more modern practices, like computed tomography and gamma spectroscopy, to enhance understanding of landscape changes on the pedogenic level.

Key Outcomes

Hays MLRA SSO staff provided local expertise in support of the UNL researchers' goal of gathering data about soil change as the result of anthropogenesis. Any effort to document these effects will enhance soil knowledge and provide greater insight into land management. By supporting projects like this one, Hays MLRA SSO staff help ensure that the most current and up-to-date soil data is accessible for the benefit of producers as well as researchers.