USDA United States Department of Agriculture

Natural Resources Conservation Service

Soil Science Division

Soil Survey Region 9

Abilene, TX, Soil Survey Office

NRCS and Abilene, Texas, Teachers Workshop

Purpose

Knowledge of soils, land use, and conservation practices are key elements in managing our land for sustainable agriculture. Passing that knowledge along to the next generation will help us guarantee food and fiber is available and improve our quality of life. These fundamental scientific concepts are sometimes hard to comprehend until they are seen on the ground. Understanding the role that native plants and animals play in an ecosystem and the effects they have on each other and the soils is not easily explained. By observing and demonstrating rock, hydrological, carbon, and nitrogen cycles we gain a more valid understanding of these concepts.

Background Information

Texas Science Teachers are required to obtain yearly Continuing Education Credits (CEC). Together with Abilene ISD, NRCS developed a workshop opportunity where teachers could obtain CEC's and learn about local Geology, Soils, Ecology, and Conservation. Teachers can then use this information and demonstrations in their classrooms.

Roel Guerra, Soil Scientist, discussed the geology and soils in the area, with an in-depth discussion of the history, erosion, deposition, and weathering of Permian- and Cretaceous-aged materials found on the site. As Roel talked about dynamic soil properties and explained soil textures, he had the group perform soil texture on the different soils in the area.

The Callahan Divide, a range of hills made of Cretaceous-aged materials, in the background.

Staff from the local NRCS Service Center hosted 11 Abilene ISD teachers with an educational workshop, starting with a plant ID contest followed by introductions, then a demonstration of a Soils Probe Truck and the equipment used for sampling soils.

Lee Knox, District Conservationist, used the Ecological State and Transition Model, to identify and discuss the differences in the ecological states of the area.

Lee Knox led the group in a Soil Properties Demonstration, by having them install infiltration rings on a bare ground site and on a vegetated plot site. Using the rings, they measured water flow, and timed the infiltration rates of each site, demonstrating the differences in infiltration and runoff rates on the different sites. Clods of soil were gathered from both sites and a slake test (measures the stability of soil when exposed to rapid wetting) was demonstrated. The group participated in a simple rain fall simulation on both sites to compare splash height and erosion. Lee then discussed Soil Health Principles, Soils and Ecological Sites, State and Transition Models, C3 versus C4 Respiration, Land Managements versus Crop Production, and Conservation and Carrying Capacity.

Ethan McJames, Soil Conservationist, then led the group up the Mesa to discuss and view treated versus non-treated Juniper. He discussed plant succession, species diversity, and the role soil disturbance plays in plant production. He explained how Ecosystem Management (management actions in response to natural and manmade disturbances to an area), while quoting Aldo Leopold, conservationist and author, "*Conservation is a state of harmony between men and land.*"

Ethan McJames, Soil Conservationist, shows the group treated and non-treated Juniper and discusses the benefits and detriments of both practices.

As the group descended the plateau, they had a wrap-up discussion on the uses of Web Soil Survey how the soils information they had collected during the day could be uploaded into Web Soil Survey, providing everyone access to the soils information for that site.

At the end of the day, the plant ID contest winner was announced…funny, after spending a day in the field with a soil scientist and two soil conservationists…they were all winners!

Group standing on the Callahan Divide looking down on the Permian red beds of Taylor County, Texas.

Key Outcomes

By providing this workshop we have strengthened our relationship with our local School District. The demonstrations provided will give teachers a different way of presenting the Scientific Concepts to students.
Teachers develop a further understanding of:

- Local soil and plant relationships
- Importance of Soil Health
- Importance of Conservation Land Management
- Local Geology and Soils

Future Goals

The Abilene Soil Survey Office and Texas NRCS staff plan on making the workshop a yearly event and developing new relationships with local schools to provide valuable information to the next generation of farmers and ranchers.