Sustainable soils education

The Dirt on Dirt: Part 1—Presenter’s Guide

Introduction

This series of presentations is intended to teach the topic of “Soil Quality.” The concept is approached by way of discussing basic soil science. This has two purposes. First, one cannot be expected to understand soil quality if they do not first have a working knowledge of basic soil science. Second, Soil Quality is subjectively defined, but usually consists of many soil characteristics and parameters. These characteristics and parameters are parts of basic soil science, and therefore it is necessary to discuss them while giving the context of what is “better” or how they may be improved.

This curriculum is intended for use in the Midwest, or “North Central Region.” It may be adaptable to other geographies, but if it is used outside of the American Midwest the presenter should be aware of local differences.

The PowerPoint presentation has speaker’s notes which should be consulted prior to presenting unless the presenter is already familiar with the subject matter. This guide contains laboratory or out of class exercises, as well as in class examples. Many of the out of class exercises are of great value to learning the subject. Additionally, the in-class examples help break up the presentation, and accommodate the use of additional senses in the learning process. Using these also facilitates interaction and active participation.

Educational objectives

Part 1 consists of the most basic parts of soil science: Soil particles, pores and water, how the soil is formed, and the implications thereof. This section contains information that is pertinent to all audiences.

* Participants will understand basic principles of Soil Science.
* Participants will begin gathering information for their property or site.

Activities and discussions

Slide 8

Bring a bucket of soil and ask the participants to take a handful. Ask what they are looking at. Have a discussion based on what is going to be presented in the course.

Slide 10

Have a basketball and a quarter to hold up while discussing the size analogy.

Slide 12

Bring a large sponge and water. Discuss the similarities between a sponge and the soil profile. Putting water on the sponge is identical to water filling pore space in the soil. When the sponge is completely saturated it is the same as a soil being at field capacity. Additional water runs off the sponge. When you squeeze the sponge to remove water it is similar to a plant using the water, at first it is easy. Squeeze the sponge hard to remove most of the water. Despite squeezing it, it still feels wet. Various plant species have different abilities to obtain water from the soil.

Slide 15

If a soil monolith is available you can use one. A simple way of doing this is to have buckets of soil from different soil horizons. You can expand on the last point about clay being a particle size, not a color.

Slide 21

Have samples of a glacial till soil, loess, and a poorly developed entisol to look at.

Slide 33

Go through printed soil surveys. Look at the maps and specific information on various soils.

Slide 35

Use the Web Soil Survey. Participants can look specifically at their site and find pertinent information. As the theme of the class is soil quality, the participants can move from basic soil classifications and descriptions to more interpretive data.

Slide 44

Obtain a calcareous soil. Drip some acid on it and watch it fizz. Discuss management implications regarding iron chlorosis, problems with high pH soils, or potential disease suppression in low pH soils.

Resources

* Slide 1 – Brad Carlson, University of Minnesota
* Slide 2 – Brad Carlson, University of Minnesota
* Slide 3 – Brad Carlson, University of Minnesota
* Slide 4 – Brad Carlson, University of Minnesota
* Slide 8 – Brad Carlson, University of Minnesota
* Slide 9 – B. Keith Bellingham, Stevens Watering Systems Inc.
* Slide 11 – Brad Carlson, University of Minnesota
* Slide 12 – NRCS
* Slide 13 – Ryan Miller, University of Minnesota
* Slide 14 – Debrah Allan, University of Minnesota
* Slide 15 – Andrew Scobbie, University of Minnesota
* Slide 16 – Brad Carlson, University of Minnesota
* Slide 17 – NRCS
* Slide 19 – Andrew Scobbie, University of Minnesota
* Slide 21 – David Grigal, Jim Anderson, Terry Cooper, University of Minnesota
* Slide 22 – unknown
* Slide 23 – Brad Carlson, University of Minnesota
* Slide 24 – Brad Carlson, University of Minnesota
* Slide 26 – Brad Carlson, University of Minnesota
* Slide 30 – Brad Carlson, University of Minnesota
* Slide 33 – Brad Carlson, University of Minnesota
* Slide 34 – NRCS
* Slide 35 – NRCS
* Slide 39 – unknown
* Slide 43 – Brad Carlson, University of Minnesota
* Slide 45 – Brad Carlson, University of Minnesota
* Slide 46 – Brad Carlson, University of Minnesota
* Slide 48 – Warner Brothers



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