



Driftless Prairies: Native Ecosystems

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The Dirt on Driftless Prairies

Lafayette County, which is where Driftless Prairies is located in Wisconsin, is in the Driftless Area. It was named this because the glaciers did not roll over it, leaving picturesque hills and valleys. Soils in the southern part of Wisconsin are different from other parts of Wisconsin, partially because of the lack of glacial drift and partially because it lies in a transition area where tallgrass prairie, oak savanna, and hardwood forests blended together.

Soil is formed from weathering and other eroding processes of parent material and windblown materials. The parent material is from the Ordovician period (490 million years ago) and consists mainly of Galena dolomite along with some Niagara dolomite and Maquoketa shale; the windblown material is mostly loess and covers the majority of the county.

Soils are classified with their own taxonomy much the same as all living organisms. Yes, soil is a living, breathing entity! Although a Russian scientist developed the soil classification system in the 1870s, it wasn't until the 1920s that the US accepted the principles under which these classifications are made. There are 6 categories of classification; they are as follows with the approximate number of units in each category:

12 Order

63 Suborder

319 Great Group

2,484 Subgroup

≈ 8,000 Family

≈ 19,000 Series

Driftless Prairies has 5 series of soils: Chaseburg, Dubuque, Gale, Palsgrove, and Stony & rocky land. Series are usually named after the places where they are located (towns, rivers, counties, etc.). I won't go through a description of each of these here as more information can be obtained from the following link of the Lafayette County Soil Survey. Below is a scan of the soil survey for Westmeath Lane with our general area outlined in red marker that shows the soil types.

When we excavated for our house building, I took the following picture of the soil horizons. There are 5 horizons designated by capital letters O, A, E, B, and C. O is the organic layer at the very top and is generally found in woods. So, if you look at this picture, you can clearly see the A horizon, B horizon, and C horizon. There could be an E horizon, but I certainly can't see it. A is the topsoil, B is the reddish band because it has accumulated iron and aluminum oxides, C is the area below these and can contain structural features of the parent materials.



For more information on Lafayette County soils, check out the Soil Survey, Lafayette County Wisconsin that the US Dept. of Ag Soil Conservation Service created.

If you want to keep learning about soil, this is an excellent

textbook:

The Nature and Properties of Soil by Nyle C. Brady and Ray R. Weil

Other excellent books are already listed in my [Soil and Chocolate Cake](#) blog.



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Soil and Chocolate Cake

Just got a dump truck of soil delivered for our raised bed garden. It looks and smells great!

I've become intrigued with soil. I realize I've been interested in it for some time. I recall as a young un' a book entitled SOIL that my dad owned. I tried to read it once when I was in grade school. I didn't get too far into that masters-level college tome, but the idea of reading it never left me. At a recent prairie conference, one of the speakers reinvigorated my fascination.

That speaker mentioned that the goal for healthy soil is to have the appearance of “chocolate cake.” Perhaps it was the mention of food that really got my attention! His talk revolved about farming practices, but I kept thinking this could all be applied to ecological restoration. I began reading in earnest (and yes, I could understand the books this time!).

These pictures illustrate good soil from bad soil. One is “chocolate cake,” the other, well.....



Healthy soil we had delivered.



The unhealthy soil dug up from our house site.

Soil is complicated. It has to be balanced chemically, biologically, and physically. It has to have good structure (tilth) and texture and it has to provide nourishment to sustain a vibrant group of living entities.

There are almost 90 different chemical elements in the soil, over 50 types of soil organisms, and a variety of combinations of soil texture and tilth. With that many possibilities, I decided to chunk it out and look at those deemed most

important.

Chemical aspects include the 10 most important elements to balance, soil pH, and humus and organic matter. Those 10 elements include: boron, calcium, copper, iron, magnesium, manganese, phosphorus, potassium, sulfur, and nickel. Nitrogen is important for the soil and should be added but less is needed when these 10 are in balance. Soil test provide the data required and fertilizer is the supplement that creates the balance. Soil pH is a measure of the soil's water content, referred to as alkaline or acidic. Humus and organic matter also provide nutrients for balancing plus they provide them in a slow-release form.

Biological aspects encompass the living organisms, collectively known as the soil life. Generally speaking, that includes bacteria, fungi, protozoa, nematodes, arthropods, and earthworms. Good chocolate cake smells delicious and good soil does too. That aroma comes from a terpene solution excreted by actinomycetes, a type of bacteria.

Physical properties are the particle sizes. Sand is the largest, then silt, with clay being the smallest. Loam is equal parts of sand, silt, and clay. Colloids and aggregates from organic matter give the soil "body" and help to maintain nutrients in a form that can be accessed by plants and soil organisms. According to my reading, good garden soil contains 90% loam and 5-10% organic matter.

This is a very simplified account of soil. The more I learn, the more I want to know. I have found a few books that are very good and, as always, I'll keep searching for more! Until then, I need to get out there and haul those mounds of "chocolate cake" to my garden!

Soilfoodweb.com – a great website for lots of good info

Teaming with Microbes by Jeff Lowenfels and Wayne Lewis – a excellent introduction to soil

The Biological Farmer by Gary Zimmer – although geared toward farming, this book has very good info

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