

Testimony for the Regenerative Soils Program:

This bill proposes to establish a regenerative soils program which is admirable. All states in the US, and indeed, countries around the world, should copy what Vermont is proposing here. One modification, or addition, could markedly improve the success of the practices outlined in this bill.

I am Dr. Elaine R. Ingham: a soil ecologist who has worked to understand soil life, and what organisms do to build soil for the last 40 years. Soil is the resource that sustains humanity. If humans convert soil into dirt, humans will cease to exist on this planet. It is critically important to realize that soil can be regenerated, but we have to understand exactly how soil regeneration could occur. The USDA says it takes 100 years to build an inch of soil. That statement is only true if you are completely ignorant of what soil life does. Give me the proper starting materials, and, if you understand soil life, we can build soil overnight.

All the improvements, enhancements, reduction in losses outlined in the bill are totally in the realm of possibility, indeed, we are doing demonstration trials in a number of countries, showing how to build soil. But to be successful at achieving these things, soil life must be understood and clearly included in the management practices.

Most soil scientists over 40 years old have been taught only about the chemistry and physics of soil. When they were in school, there were no methods for assessing the whole food web of soil organisms, and they didn't comprehend what soil life was doing, until the mid-1990's. Add to this that companies that provide inorganic fertilizers, pesticides, and chemical soil conditioners make literally billions of dollars in profit, all of which cause damage to soil and ultimately turns soil into dirt. David Montgomery's book on "Dirt: The Erosion of Civilizations" documents how civilization after civilization destroyed themselves through destruction of their soil. These chemical companies don't want their source of income reduced, and thus are very vocal in claiming that soil can't be built.

Soil is much more than just the mineral part, i.e., the sand, silt and clay components of soil. Every civilization that came before us destroyed soil life, and then soil structure could not be maintained. Once soil organic matter is no longer properly turned into soil by the organisms in that soil, a civilization is doomed. It took the Roman Empire 2000 years to destroy their soil; it is taking less than 200 years for us to destroy our soil.

This bill proposes to establish a regenerative soils program. But to do these things requires a healthy soil food web, i.e., the organisms which perform these processes.

1. Soil cannot be soil without soil organisms performing their jobs. These relationships are pictured in the handout from the USDA's Soil Biology Primer.
2. Thus, measuring these organisms is a critically important part of assessing soil health.
3. As part of this program, the importance of understanding the different organism groups that do the work in soil must be included as one of the important factors that results in success.

4. Page 4: line 5 – 12. Each point in this section requires a healthy food web for topsoil to be built, for carbon to be sequestered, for organic matter to increase.
5. Thus, in the next section, Page 4: line 13 to page 5 line 3, it would be important to add an assessment of bacteria, fungi, protozoa, nematodes and possibly microarthropods. These organisms do the work; we need to increase and balance their biomass and numbers to make certain the work we need done to regenerate soil is present.

This bill would be a landmark step in the right direction of reversing the damage we have done to our soils, which are so critically important to continued human health. Just please, make certain that soil life is clearly a part of the measurements that need to be done to prove that the soils have been regenerated and can perform all the benefits that soil can provide for people.