Effects of Water Balance and Mineral Content on Cropland
Are you helping or harming your land?

Introduction
It is important to understand the components that contribute to the success of cropland. These components include:

- rain infiltration
- groundwater contamination
- drainage and capillary rise
- nitrogen and nitrate content in soils

Researchers in the field of soil and crop science conduct a great deal of research to minimize risk related to detrimental runoff onto cropland, as well as research to insure that the cropland is being utilized to its ability without causing harmful effects on the soil profile.

What are some terms to be aware of?
Whether you are planning to improve your farmland by yourself or employing the help of an expert, there are many terms that will come up to be aware of and to understand. These terms will make you more adept at improving your land by yourself.

- DO stands for dissolved oxygen
- NH₄⁺ is the compound ammonium
- NO₃⁻ is nitrate
- Seepage
- Capillary rise
- Lysimeters are used for sampling the soil/water content

The name of the soil type on your land

Field lysimeters with different slopes 10% (foreground) and 20% (background)—allow scientist to study microbial transport at different flow rates. Photo by Keith Weller.
How do you measure water flow into soils?
Estimations can be made on:
- Swelling soils
- Shrinking soils
- Cracking soils
This is measured through field scale applications based on relationships between two interacting flow domains:
- matrix flow into soil
- macro-flow into the cracks

To Use Pesticides/Herbicides or not use them?
Despite the assumption that pesticide and herbicide use is harmful, they do not contribute to arsenic distribution in groundwater. Research has found that the levels of runoff from these chemicals were minimal, even with irrigation in place. There are already arsenic levels naturally occurring in groundwater from natural ecosystem profiles. Still, the land owner should be sure to use the required amounts of the pesticide or herbicide. If too much is used, this could cause damage by flowing into the watershed.

How do Nitrogen and Nitrate levels affect the soil profile?
Soil drainage class and ground water oxygen reduction have strong effects on Nitrogen leaching in shallow ground water on:
- Cropland soils
- Transformations in riparian ground water
This causes implications for the development of cost-effective nutrient management practices and water quality modeling efforts.

Now what can I do?
The landowner that is looking at improving the cropland, and even those who have just begun farming, should look at their land with a critical eye. Start looking at the soil as well as riparian zones, to become aware of the health of the land. Consult experts, such as extension specialists with research areas in horticulture and range or watershed management. After realizing the health of your land, one should begin to make improvements to the land, while still investing the help of the extension specialists. The health of your land is extremely important; after all it is your livelihood.

Biological science technician Amy Becker and soil scientist Ron Rickman evaluate soil water infiltration in an experiment set up in 1982 to study the long-term effects of no-till production on soil quality and wheat yield. Photo by Scott Bauer.
References:

APA Citation:


