Want to improve soil health? Start with minimizing erosion.

Written by UW Crops & Soils Educator **Steven Okonek**

This article was originally published in Wisconsin Agriculturist Magazine.

Soil health is something we hear a lot about these days. Cover crops, soil health tests, diversity in crop rotations, and reduced compaction are all ways to improve soil health. While it is true, cover crops and diverse rotations can improve soil health and tests to measure progress are good, there is some low hanging fruit that farmers may be missing when it comes to improving soil health.

Minimizing water soil erosion is a way to improve soil health that does not require a large investment in equipment, time, and seed. Erosion damages soil health in two ways. First and most obvious is by thinning the A horizon, or topsoil by soil erosion and exposing less productive subsoil. Second, and possibly the most destructive way soil health is impacted is by raindrop impact and running water sorting soil components and degrading soil by leaving behind less productive components.

The process of erosion is a multi-step process that starts with rain impacting bare soil. Rain impacts with the force of a small bomb exploding and such force can destroy soil structure at the surface. Soil is thrown into the air and when the soil particles fall back to earth, the particles are suspended in water. Sand, silt, clay, and organic matter are separated from one another in the moving water. The heavier sand settles out of the soil water solution sooner than the lighter clay and organic matter. Silt particles fill pores at the soil surface as silt settles out forming a crust, reducing the ability of the soil to absorb water. Clay and organic matter are the lightest weight of the soil particles and are carried the farthest, often leaving the field and entering surface water. Clay and organic matter have a negative charge associated with them and the negative charge holds soil nutrients for plants to use for growth and development. Loss of clay and organic matter reduces the ability of the soil to supply nutrients to plants. Even small changes in percent sand, silt, clay, and organic matter can impact soil productivity. Sand settling out on the field can bury more productive soils and reduce crop productivity.

Crop residue left on the soil surface acts as a cushion against raindrop splash. Think of crop residue as an airbag for your soil. An airbag will keep you from impacting your vehicle's steering wheel or dashboard in an accident. Crop residue will keep the raindrop bomb from exploding on the surface of bare soil. Management of crop residue that leaves the soil surface covered is one of the best ways to improve soil

health, whether or not using cover crops. Tillage that buries residue reduces the impact of cover crops and slows or eliminates the improvement of soil health you are trying to accomplish by planting cover crops. Chisel plowing in a cover crop system can reduce carbon and organic matter accumulation in soil by up to 20% according to research in Minnesota. Reducing erosion is the first step to improving soil health.