

Immediate Release

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Conservation Best Management Practices

The H2Ohio Program announced plans to pay farmers 170 million dollars to adopt 10 conservation best management practices (BMPs) to reduce phosphorus, sediment, and harmful algal blooms in streams, rivers, and lakes. These BMPs include the following:

1. soil testing (which soil nutrients are high or lacking),
2. variable-rate fertilizing (apply fertilizer where needed),
3. subsurface nutrient application,
4. manure incorporation,
5. crop rotation,
6. cover crops,
7. drainage water management (controlled drainage),
8. two-stage ditch construction,
9. edge-of-field buffers, and
10. wetlands.

The goal is to keep fertilizers, manure, pesticides and other soluble nutrients from leaving a farm field, often caused by water erosion during a rain event. While all the BMPs may be helpful, are these the right BMPs to solve the problem?

What is the #1 pollutant, by weight, in most streams? Sediment or topsoil. The average USA soil erosion rate is 7.6 tons of topsoil lost/acre/year or 15,200 pounds. The average USA soybean yield is 50 bushels/acre or 3,000 pounds. On average, farmers lose over 5 pounds of topsoil for every pound of soybean produced. In Ohio, the rate of wind and water erosion is closer to 2.61 tons lost per acre/year or by comparison, 1.7 pounds of topsoil lost for every pound of soybean produced. Neither is a substantiable rate.

What is a substantiable rate of soil erosion or is there one? Many people might think that soil erosion should be zero. However, the fish and water organisms need soluble nutrients to live and survive, so zero soil erosion is not desirable or even possible. Soil regenerates topsoil at a rate of 1000 pounds or 0.5 ton per year. A sustainable rate should be less than 1000 pounds/acre per year (300 to 700#) to maintain and build topsoil.

Sediment or topsoil is high in carbon or soil organic matter (SOM) which holds many soluble nutrients. SOM is the best part of our soil that floats off or erodes easily if it is not attached. The majority of soluble nutrients (55-65%) are attached to eroded soil particles so keeping soil in place solves both soil erosion and soluble nutrient loss.

Cover crops work well with long-term no-till to nearly eliminate soil erosion from a field. Research with long-term no-till and cover crops shows erosion measured in a pounds/acre not tons/acre on conventionally tilled fields. Strip-till is officially included in the definition of no-till. Strip-till works well where a farmer feels a field is too poorly drained for no-till. Long-term no-till farming plus cover crops sequesters carbon, builds SOM, keeps soluble nutrients tied up, and keeps soil in place.

Have no-till and cover crops proven to be effective at keeping sediment and soluble nutrients on the land? The Chesapeake Bay has had a 42-45% improvement in water quality using continuous no-till and cover crops. Maryland pays farmers \$70 per acre/year to plant cover crops. Pennsylvania is now about 70% no-till with cover crops in the Chesapeake Bay area. Those farmers are reducing fertilizer application because they are losing less nutrients with soil and water runoff.

Another option is to apply P and K fertilizer (and manure) at low rates on a growing cover crop that is 2-4 inches tall to keep soluble nutrients tied up in the soil. There needs to be at least 90% cover crop on the whole field and the greater the plant density, the less chance of water and soluble nutrient runoff.

Would a killing frost prevent application? If a cover crop “winter kill”, such as oats, a killing frost will end application. For cover crops that survive the winter, live roots absorb soluble nutrients. A cover crop mix with live winter covers is best option to keep soluble soil nutrients recycling. In spring, spread fertilizer when cover crops are at least 2-4 inches tall. For spreading manure on cover crops, the Ohio Department of Agriculture already has rules to avoid application if 1.0 inch of rain is expected within 24 hours. This is common sense for both manure and fertilizer and farmers need to avoid applying on low lying land at risk of flooding. Keeping sediment and soluble nutrients out of surface water may be difficult but not impossible if the right BMPs are utilized.