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CLIPPINGS

A Weekly Column from Iowa State University Extension and Outreach

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For Immediate Release

Field Restoration after the Pipeline

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The Dakota Access Pipeline has encouraged several phone calls to the Extension office for advice on how to help the land recover after the project is complete. While this is the first project in my 28 years with ISU Extension and Outreach that has affected so many different fields in this area, construction and excavation occurs every year on a smaller scale. The impact to the affected area is the same.

Many soil pores (holes) in undisturbed soil are vertical. These pores are formed by plant roots, earth worms and other living organisms. Water movement is often 5 to 10 times faster going up and down as opposed to sideways. Construction interferes with this natural vertical structure, and even when care is taken to dig up and replace soil in the natural layers, the whole matrix of water and air movement changes to a slower rate of horizontal movement.

Replacing soil in the same layers with black top soil on top is essential to returning the land to pre-construction productivity. Four main ideas to improve the soil structure include:

- Improve Drainage
- Deep Tillage
- Add Organic Matter
- Just Time

I will review pros and cons of these four ideas.

1. Improve Drainage - If there was a drainage problem that naturally flowed across the area prior to disturbance, it will be worse after.

   Pro - An advantage to improving drainage is to reduce problems related to excess water around the disturbed area. It is very likely that the soil will settle unevenly for a year or two and ridges or valleys will allow water to accumulate near the site.

   Con – When adding tile for drainage, you need an outlet for water to go. If you cross the pipeline before settling is complete, there might not be proper grade creating potential for plugging issues. Tile is expensive and must be designed and installed properly to be effective. Be sure to follow all required permits for digging new tile lines and outlets.

2. Use deep tillage to break up construction compaction. Soil that was exposed to heavy equipment and disturbance during wet conditions is very subject to compaction.

Pro – Deep tillage with a v-ripper or an inline ripper has helped reduce compaction in plots throughout the Midwest. The plots show that these tillage methods are most effective when done in the fall with dry soil followed by natural freeze-thaw cycles in winter to help break up clods.

Con – Wet soils like we have had this fall may reduce the benefits of deep tillage that is normally realized in dry soils. The estimated cost of a tillage pass is $20-25 an acre using ISU Custom Rate Survey figures. Loosened soil is more vulnerable to soil erosion.

3. Add organic matter – Due to construction, much of the organic matter has been redistributed. This means that some of the original benefits have been lost.

   Pro – The use of high organic animal manures from poultry, cattle and bedded livestock systems will help improve organic matter content. Planting a cover crop will introduce roots into the soil to help restore soil structure. Restoring some of the surface residue by adding corn stalks or soybean residue would provide cover for earth worms and other organisms.

   Con – It is too late in the season to establish a satisfactory cover crop this year or to get manure or straw applied to the land. While worms are active prior to freeze up, they will not move into disturbed soil until next year. There is a cost to adding anything to the land. Several tons of organic matter are a very small amount of our soil's natural organic matter content.

4. Just wait, and give it time. The environment will improve soil structure over time.

   Pro – The natural environment with its freeze-thaw, wet-dry cycles will restore the soil eventually. Cost is zero in relation to labor, fuel, materials and other inputs. Predicted settling can be leveled with tillage before spending additional money on other interventions that may or may not be cost effective.

   Con – Bare soils, left unprotected after disturbance, may erode during heavy rains. If no action is taken, loss of productivity may last well beyond the 2 or 3 years that is expected.

This overview is a combined summary of my experience and recent discussions with area farmers dealing with the impact of pipeline construction on their land. Be sure to follow any special requirements in working around the new pipeline.

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