

MSU AGRICULTURE INNOVATION DAY

FOCUS ON PRECISION

TECHNOLOGY THAT PAYS

When nutrients applied are lost in the form of runoff, this means a reapplication of those nutrients, which is a waste of the previous nutrients. This is not only a bad choice from an economic standpoint, but also from an environmental standpoint.

Risks: Manure/Nutrient Application

Rain Event:

- Nutrient application shortly before runoff can lead to nutrient loss
- Loss of freshly applied nutrients → must reapply nutrients → economic impact
- Loss of freshly applied nutrients can have environmental impact on nearby streams, lakes, and groundwater

Frozen and snow covered soils:

- Frozen ground: manure not absorbed into the soil; hard to incorporate
- Snow-covered: No contact between manure and soil
- Both situations promote higher potential for nutrient loss during snowmelt or rain on snow events

Saturated Field:

- Soil unable to absorb additional water and runoff will occur
- Likely any nutrients before or during saturated conditions will not be absorbed → likely nutrients would be lost
- Soil compaction from equipment

Drainage of Field:

- If tilled, potential of leaching with heavily saturated fields or rain events
- Direct path for nutrients into surface waters
- Greater slopes can lead to greater nutrient loss

Rewards: How the MI EnviroImpact Tool Helps

Rain Event:

- The tool provides daily forecasts out 7 days with forecast precipitation and temperatures (for snowmelt) incorporated
- Incorporating the tool into short-term application decisions could lead to more efficient applications for the producer and the landscape

Simulated Winter Conditions and Runoff Risk:

- The tool has winter mode (blue grid cells) that is triggered when (1) greater than an inch of snow on the ground or when (2) frozen ground conditions are simulated to promote awareness of these conditions
- When any future runoff is simulated on frozen or snow covered soils the tool will indicate a purple color indicating elevated risk for nutrients applied before or during these conditions

Saturated Conditions:

- Continuous soil moisture modeling enables runoff risk to detect runoff events from small rainfall events when soils are saturated
- Identifies risky conditions for nutrient loss when expected forecast rainfall (or snowmelt only) doesn't catch producer's attention
- Lessens risk of soil damage from equipment

Drainage of Field:

- Tool allows for view of soil saturation to potentially plan for leaching of nutrients
- Also allows for view of precipitation amount (more = higher risk of runoff)



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*It is important to realize that the tool can't account for farm/field specific management, so it is critical to know how certain management practices can play into the potential of runoff risk. Know your land, know your farm, know your soil.