

SATURATED BUFFERS 101

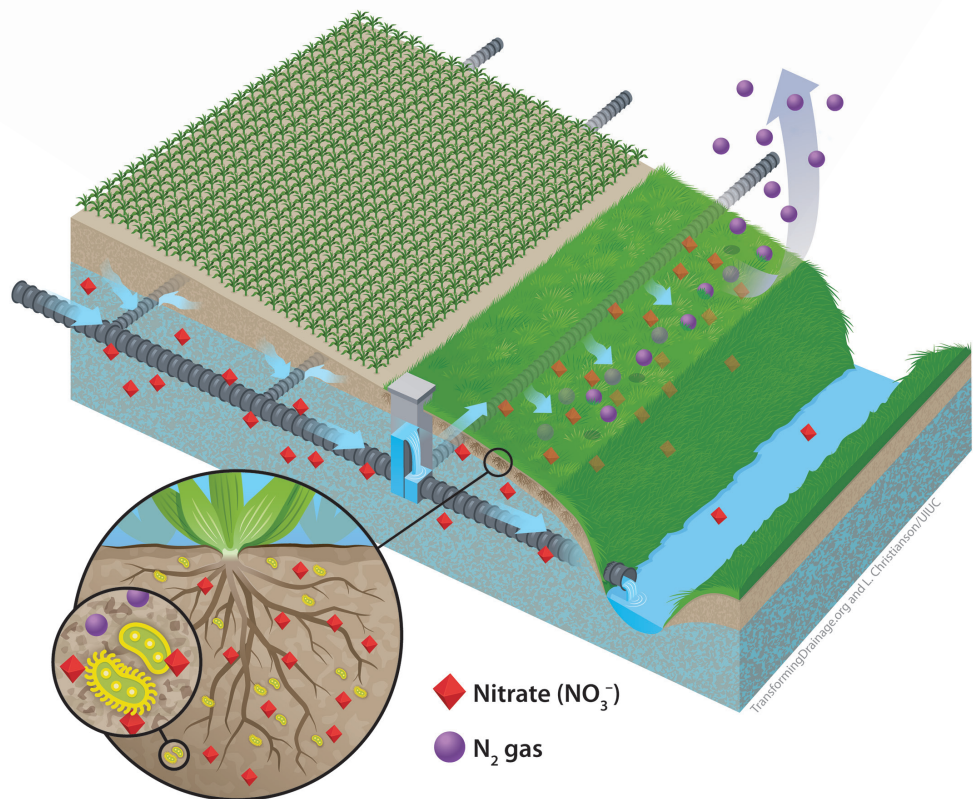
"Buffing Up" Water Quality

Reducing nitrogen loss from tile-drained fields is a major environmental priority in Illinois and across the Midwest.

Subsurface tile drainage systems are a necessary part of maintaining high crop yields in many fields, but tile pipes can also move nitrogen downstream.

A **saturated buffer** is a modification to the edge-of-field drainage system that allows drainage water to flow as shallow groundwater through the buffer's soil reducing nitrogen loss before it moves downstream. This conservation drainage practice consists of a vegetated buffer area between a cropped field and the stream or ditch where the field's tile drainage system outlets. A control structure intersects the main tile pipe and diverts the drainage water to flow underground through a tile pipe that runs parallel to the ditch. As the drainage water seeps through the buffer's soil, natural processes convert the nitrogen in the water into harmless nitrogen gas and the plant's roots take up the water and nitrogen. Both of these processes reduce the amount of nitrogen sent downstream.

During high flow times, a portion of the drainage water bypasses the saturated buffer completely and instead flows straight to the drainage outlet so drainage capacity in the field is not reduced.

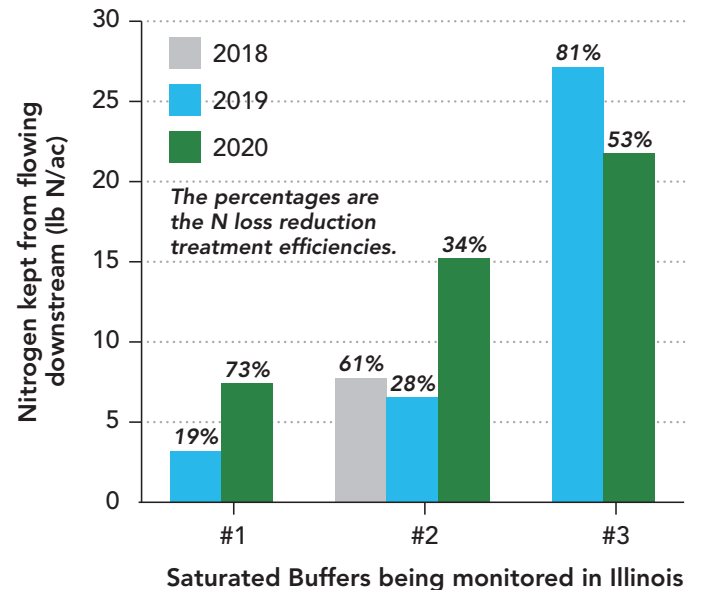


Benefits:

- The Illinois Nutrient Loss Reduction Strategy recommends saturated buffers as a conservation drainage practice that can reduce the amount of nitrogen sent downstream by 40%.
- Saturated buffers do not significantly reduce drainage system capacity or crop yield.
- Saturated buffers are relatively simple to install, require little maintenance, and have a lifespan of more than 15 years.
- Installation expenses can be offset through cost share funds available via the U.S. Department of Agriculture's Natural Resources Conservation Service.
- A vegetated buffer also serves as pollinator and wildlife habitat.
- A saturated buffer can be easily paired with other conservation practices in the field, such as cover crops or drainage water management.

Considerations and Requirements:

- A buffer can be existing, or newly made, but needs to be at least 30 feet wide with perennial vegetation. Saturated buffers tend to have tile distribution pipes that are at least 400 feet long.
- A saturated buffer's soil needs to have at least 1.2% organic matter (or 0.75% organic carbon) in the top two and a half feet.
- There should be a tight layer within the soil profile that allows saturated conditions to develop in the buffer soil. There cannot be a sand lens or gravel layer.
- A stream or ditch bank that is highly erodible or susceptible to sloughing is not recommended for a saturated buffer.



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