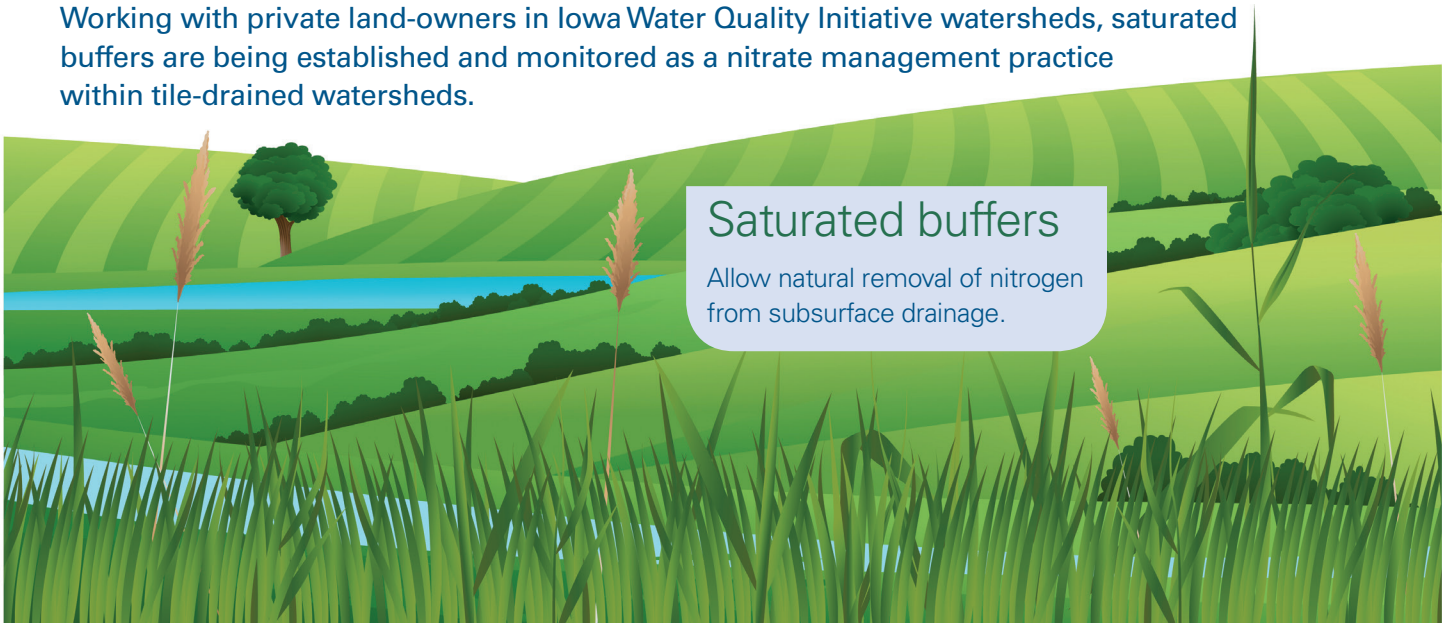
Cleaning Iowa's Waters with Saturated Buffers in Iowa Watersheds

Working with private land-owners in Iowa Water Quality Initiative watersheds, saturated buffers are being established and monitored as a nitrate management practice within tile-drained watersheds.



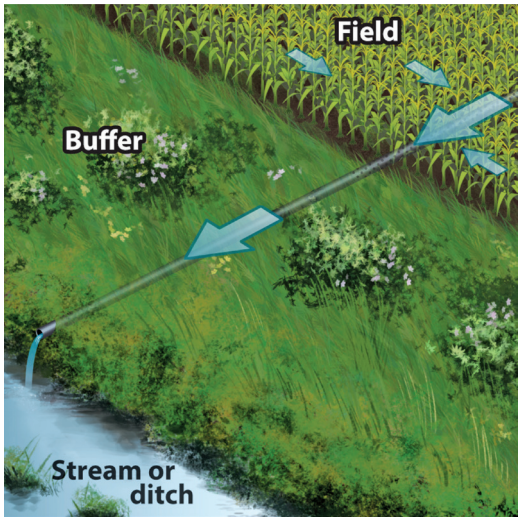
Saturated buffers

Allow natural removal of nitrogen from subsurface drainage.

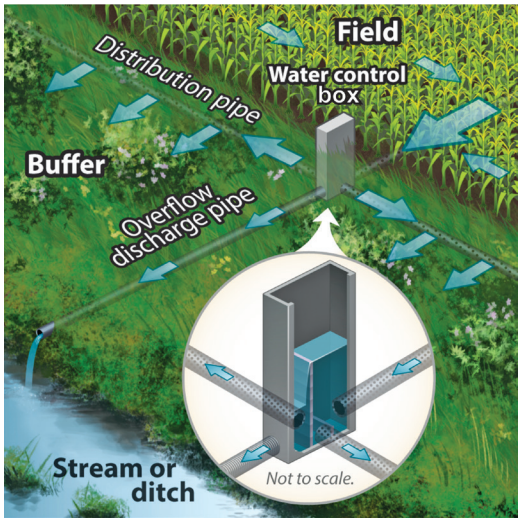
Tile-drained lands

Underground pipes divert water from cropland, reducing stress on plants. A box diverts water flow into the buffer, increasing the shallow groundwater level and nutrient removal. This is a saturated buffer.

CONVENTIONAL OUTLET



OUTLET with SATURATED BUFFER



Source: Frankenburger et al., unpublished

BENEFITS OF A SATURATED BUFFER

- Existing buffer removes sediment, phosphorus and pesticides and provides wildlife habitat
- Nitrate is removed through denitrification and plant uptake

Flooding

- 5% streamflow reduction
- Reduces peak flow in streams

IOWA STATE UNIVERSITY
Extension and Outreach

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INITIAL RESEARCH

Initial research is being conducted within two saturated buffers on privately owned fields located in Hamilton and Story counties, north-central Iowa. Sites were established in 2010 and 2013. Additional monitoring is needed to demonstrate performance at other sites across the state.

DRAINAGE TILE FLOW

first 4 years

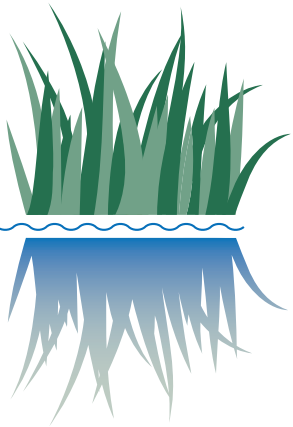
35% to 59% tile flow diverted into buffers

Study: Bear Creek Watershed

NITRATE REMOVAL WITHIN SATURATED BUFFERS

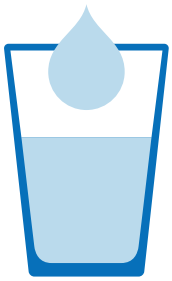
most NITRATE entering the BUFFER

removed by plant uptake, microbial immobilization, and denitrification



IOWA WATER QUALITY INITIATIVE SITES

Additional saturated buffers are being established within Iowa Water Quality Initiative watersheds. Data is being used to develop criteria for installing saturated buffers as a conservation practice.



the end result is CLEANER WATER

Construction of saturated buffer

For more information go to

www.extension.iastate.edu/waterquality

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Iowa Department of Agriculture and Land Stewardship

Iowa Nutrient Research Center

Leopold Center

USDA United States Department of Agriculture National Institute of Food and Agriculture

Iowa Watershed Approach