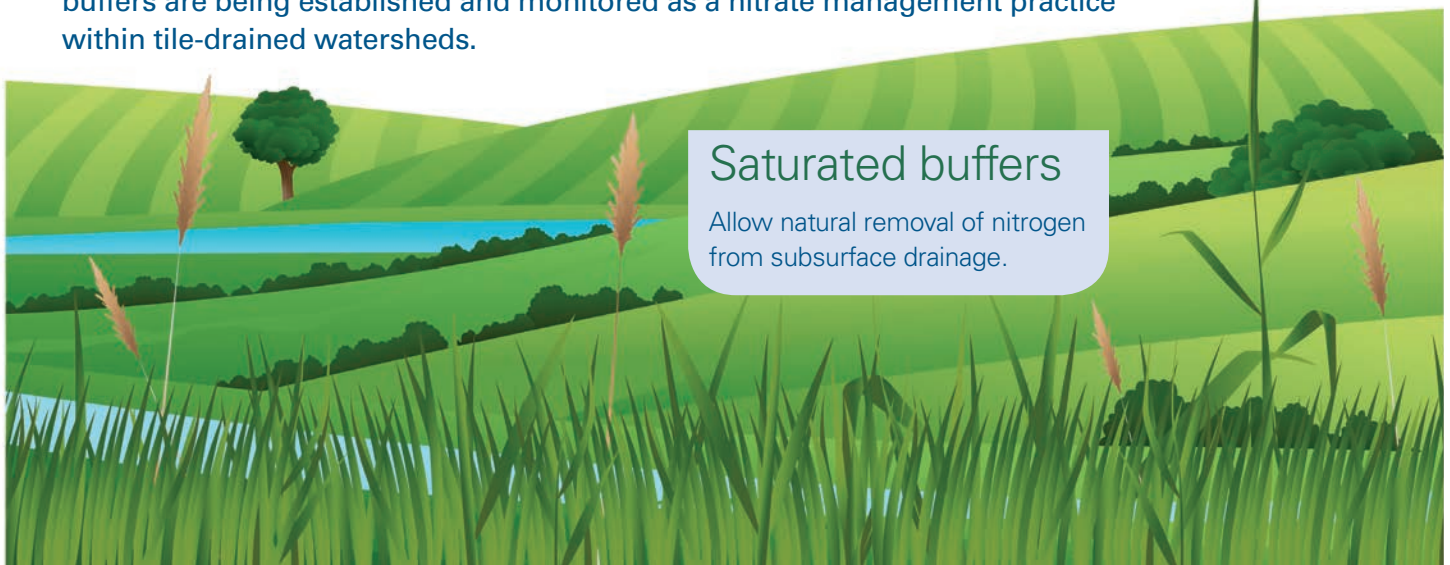


Cleaning Iowa's Waters with Saturated Buffers in Iowa Watersheds

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.



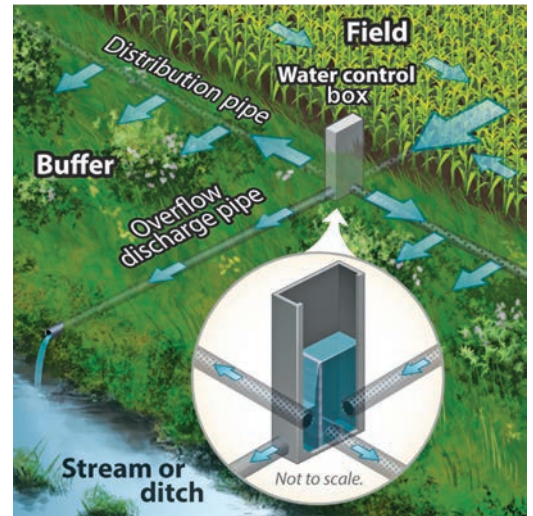
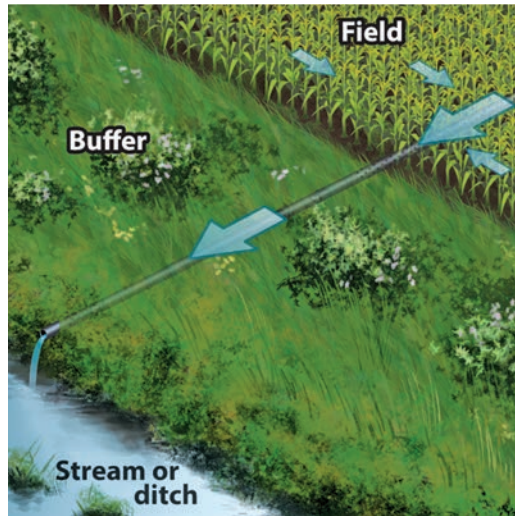
Saturated buffers

Allow natural removal of nitrogen from subsurface drainage.

CONVENTIONAL OUTLET

OUTLET with SATURATED BUFFER

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.

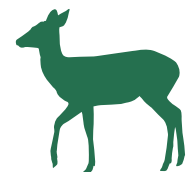


Source: Frankenburger et al., unpublished



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

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



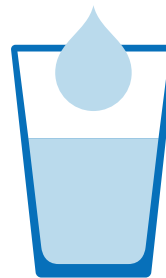
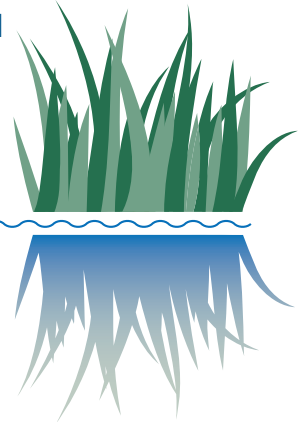
35% to 59% tile flow
diverted into buffers

Study: Bear Creek Watershed

NITRATE REMOVAL WITHIN SATURATED BUFFERS

most NITRATE entering the **BUFFER**

removed by plant uptake, microbial immobilization, and denitrification



the end result is **CLEANER WATER**

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**.



Construction of saturated buffer

For more information go to

www.extension.iastate.edu/waterquality

Prepared by Thomas Isenhardt, associate professor, Natural Resource Ecology and Management, Iowa State University and Dan Jaynes, USDA National Laboratory for Agriculture and Environment.

This project is supported by the Iowa Nutrient Research Center. Initial support was provided by the Leopold Center for Sustainable Agriculture. Additional support is provided by the USDA Agriculture and Food Research Initiative Competitive Grant no. 2013-67019-21384.

Iowa State University Extension and Outreach does not discriminate on the basis of age, disability, ethnicity, gender identity, genetic information, marital status, national origin, pregnancy, race, religion, sex, sexual orientation, socioeconomic status, or status as a U.S. veteran. (Not all prohibited bases apply to all programs.) Inquiries regarding non-discrimination policies may be directed to Ross Wilburn, Diversity Officer, 2150 Beardshear Hall, 515 Morrill Road, Ames, Iowa 50011, 515-294-1482, wilburn@iastate.edu.



Iowa
Nutrient
Research
Center

