

TALKING WITH YOUR LANDLORD:

BIOREACTORS

There are many landowners looking for young, innovative farmers who are promoting a sound conservation ethic as they look at the future care of their land. Gaining conservation, communication and financial skills will help Emerging Farmers stand out in the community and create a competitive advantage for building relationships with future landlords. This publication series lays the initial roadmap to help develop those skills and provide resources for continued growth.

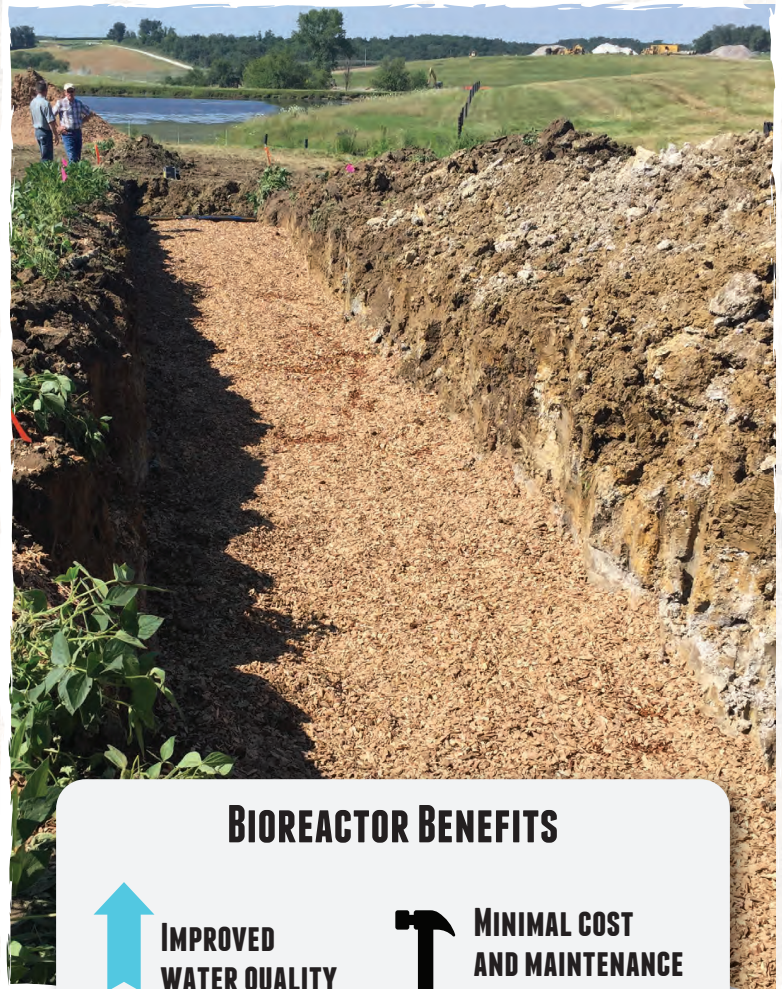
BIOREACTOR BASICS

WHERE SHOULD THEY BE INSTALLED?

Current designs can treat 30-80 acres of tile drained fields. Bioreactors are often 100-120 feet long and 10-25 feet wide. Typically, no land is taken out of production and because they are long and narrow, they fit well in edge-of-field buffer strips and grassed areas.

THE DOLLARS AND SENSE OF BIOREACTORS

Bioreactor installation costs range from \$7,000-15,000, depending on size. Bioreactors can last for ~10 to 15 years with minimal maintenance. After that time, the woodchips in the bioreactor may need to be replaced.



BIOREACTOR BENEFITS



IMPROVED
WATER QUALITY



MINIMAL COST
AND MAINTENANCE
AFTER INSTALLATION



OPPORTUNITY TO
SEED POLLINATOR
HABITAT



EDGE OF FIELD
PRACTICE - NO
IMPACT ON YIELD

Denitrifying practices like wetlands, bioreactors and saturated buffers remove nitrate from tile drainage water through a process called denitrification. Microbes breathe in nitrate (NO_3) and exhale inert N gas back into the atmosphere. These microbes require an anaerobic (oxygen free) environment to ensure that they use the nitrate in the water rather than oxygen as part of their respiration process.

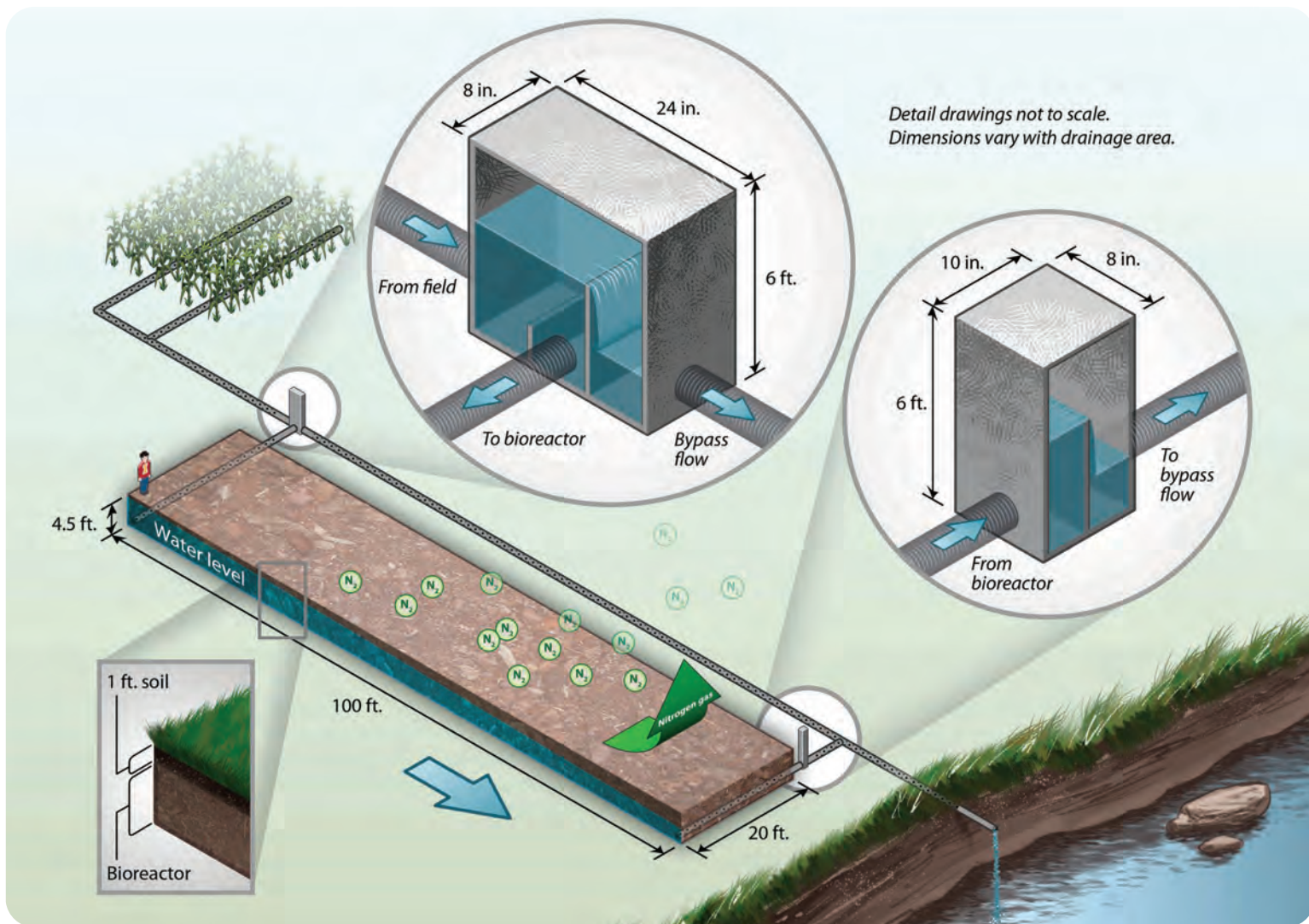


Image from Christianson and Helmers, 2011

HOW IT WORKS

Tile-drained water is routed to a woodchip-filled trench located in a grassed buffer where the tile leaves the field. Once water enters the bioreactor, denitrification begins. Bacteria use the carbon from the woodchips as a food source and the incoming nitrate for their respiration process. **Bioreactors can reduce nitrate levels by 15-60%.**

START SMALL

Working with your landlord to gather information about the practice and addressing any concerns early will help smooth the transition to the new practice and minimize conflicts.

Your local NRCS staff and Iowa State University Extension and Outreach field specialists are available to meet with you and your landlords to help answer questions, provide resources and technical assistance.



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