

Conservation Practice Standard 605



Denitrifying bioreactors can remove a substantial portion of the nitrates flowing off of farm fields and into local waters, reducing the likelihood of habitat degradation and algae blooms, both locally and downstream. Denitrifying Bioreactor was approved as a new NRCS national conservation practice standard (no. 605) in late 2015. Denitrifying The practice has the potential to help with significant water quality challenges such as the hypoxic zones plaguing the Gulf of Mexico and the Chesapeake Bay.

The Denitrifying Bioreactor conservation practice was developed for agricultural application in Iowa, Ohio and South Dakota, in part through funding assistance provided by NRCS's Conservation Innovation Grants program.

A denitrifying bioreactor is a buried trench filled with a carbon source – usually wood chips – installed at the edge of a field. Tile drains from the field carry excess water from the plant root zone, and divert a portion of the drainage water into the bioreactor. Microorganisms on the wood chips consume the nitrates in the water and expel it as nitrogen gas. Performance varies based

on size, location, and a variety of other factors, but the average bioreactor can be expected to remove up to half of the nitrates in water flowing through it.



Excavating the pit for bioreactor installation.

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Denitrifying BIOREACTOR

Characteristics of Denitrifying Bioreactors

- Organic last line of defense against subsurface nitrates;
- Removes 35-50 percent of nitrates from water flowing through it;
- Relatively inexpensive to install and maintain;
- No adverse effects on crop production or drainage.

The Denitrifying Bioreactor is available Nationwide and can be used by farmers for financial assistance as soon as their State NRCS has incorporated the new standard into its handbook. Farmers should check with their local NRCS office for the latest information.



A view of an installed bioreactor, showing the upper control structure and warm season grasses that have re-established in soil covering the bed of wood chips in which water is treated.

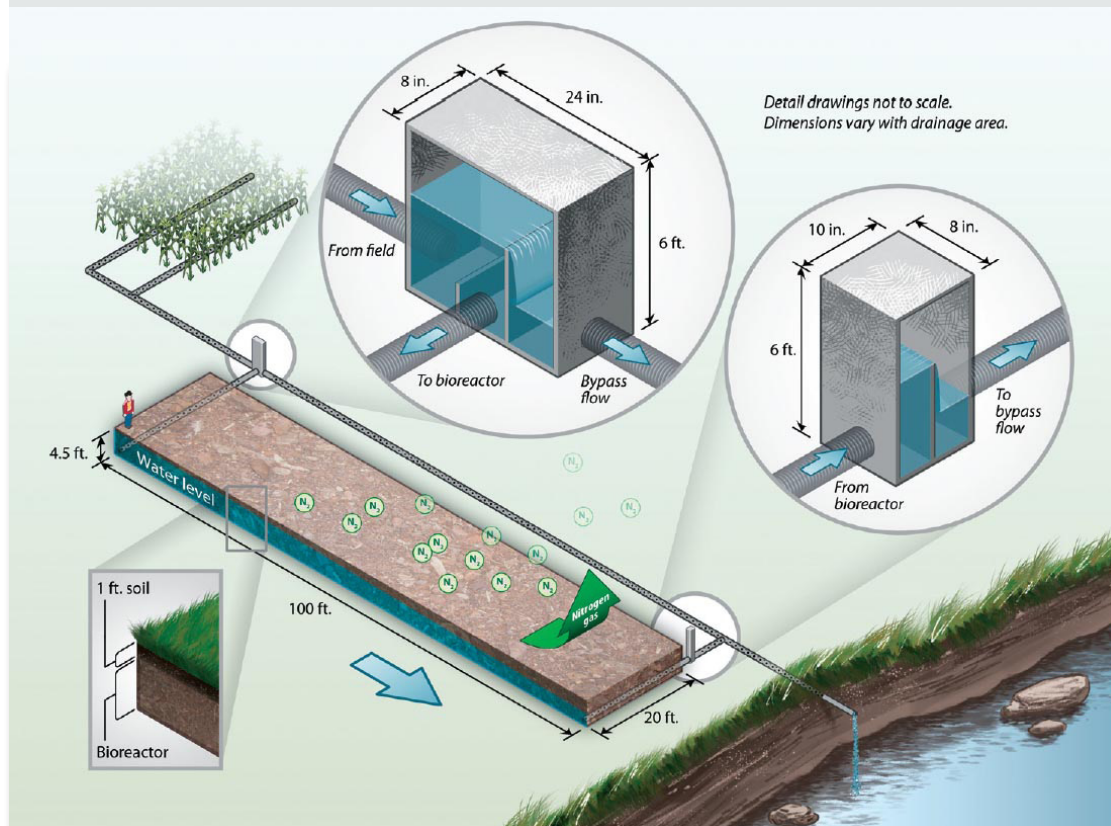


Illustration of a denitrifying bioreactor.

Natural Resources Conservation Service

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