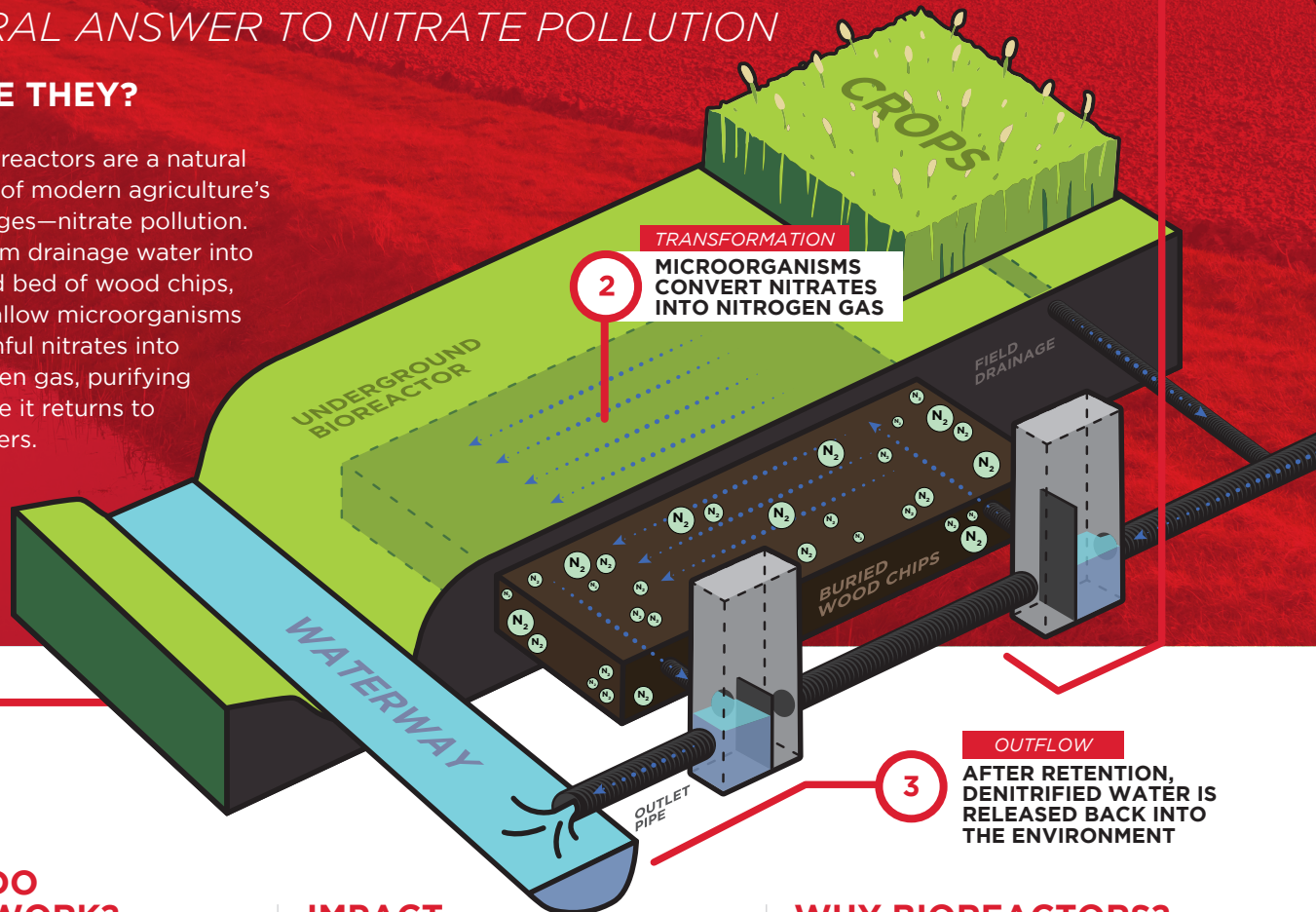


DENITRIFYING BIOREACTORS

A NATURAL ANSWER TO NITRATE POLLUTION

WHAT ARE THEY?

Denitrifying Bioreactors are a natural solution to one of modern agriculture's biggest challenges—nitrate pollution. By diverting farm drainage water into an underground bed of wood chips, these systems allow microorganisms to convert harmful nitrates into harmless nitrogen gas, purifying the water before it returns to streams and rivers.



DIVERSION
DRAINAGE IS
DIVERTED TO
BIOREACTOR

1

TRANSFORMATION

2
MICROORGANISMS
CONVERT NITRATES
INTO NITROGEN GAS

OUTFLOW

3
AFTER RETENTION,
DENITRIFIED WATER IS
RELEASED BACK INTO
THE ENVIRONMENT

HOW DO THEY WORK?

1

Diversion:
A control structure channels part of the drainage water towards the bioreactor.

2

Transformation Zone:
The water percolates through the wood chips, allowing microorganisms to strip away nitrates under anaerobic conditions.

3

Retention and Outflow:
Designed for a 3 to 8 hour retention, these systems efficiently handle 15 percent of peak pipe flow, optimizing nitrate removal.

IMPACT

These systems are most effective when installed alongside drainage systems serving 30 to 100 acres with 6- to 10-inch mains, in locations with consistent water flow to ensure steady treatment.

PERFORMANCE & COST

These bioreactors fit neatly into the farm landscape, typically measuring 100 by 20 feet. They reduce nitrate loads by an average of 24 to 42 percent under steady flow conditions and cost \$10,000 to \$20,000 to install depending on size.

WHY BIOREACTORS?

Space-Efficient | Their relatively small footprint makes them a discreet yet effective addition to the land.

Adaptable Performance | Best suited for drainage systems with a steady flow, they're designed to tackle nitrate runoff head-on.

Environmentally Conscious | An investment in bioreactors is an investment in cleaner waterways and a healthier planet.

SOURCE: AGRICULTURAL DRAINAGE
MANAGEMENT COALITION (ADMC)

Denitrifying Bioreactors stand as a testament to how innovative, nature-based solutions can effectively address agricultural nitrate pollution, marrying environmental sustainability with agricultural efficiency in a single, cost-effective approach.