

EDGE-OF-FIELD MANAGEMENT GUIDE

**Small
Changes.**

**Big
Impact.**



By implementing edge-of-field management practices that improve soil health and water quality, we will be able to preserve Indiana's natural resources today and for agriculture's next generation.

OUR QUICK GUIDE

Nutrient management and soil health can be complicated subjects, but they don't have to be issues in your fields. This guide outlines nine long-term best management practices for managing nutrients and water quality.

Assess these best practices and determine the right mix for your farm — not all of these practices may be appropriate for your operation. Want more information? We've provided a list of organizations and businesses eager to help (see "Resources" on page 22).

AG SOLUTIONS — LED BY AG

The Indiana Agriculture Nutrient Alliance (IANA) strategy was created to improve education and awareness of impactful best management practices. Because farmers are in the best position to determine the practices that are most appropriate on their own farms to achieve reductions in nutrient loss, the IANA strategy will increase partnerships with existing programs to improve nutrient management and soil health and, ultimately, Indiana's water quality.

Aggressive nutrient reduction targets have been set nationally in waterways that Indiana's croplands drain to, like the Gulf of Mexico and the Western Lake Erie Basin. Across the state, a large number of public and private sector agencies and organizations are working toward the same goal — reducing nutrient loss and improving water quality. IANA is focused on bridging the multi-partner efforts to create a practical, cohesive and significant effect across Indiana.

1

UTILIZING BUFFER STRIPS / FILTER STRIPS

Buffer or filter strips are grass strips used along field boundaries to intercept runoff water carrying soil and nutrients, removing up to 50% of nutrients and 70% of sediment.¹

Key considerations

- Target the most environmentally sensitive and least productive areas (e.g., erosive)
- When strategically placed, buffer strips can contain nutrient application zones near environmentally sensitive areas



2 INSTALLING GRASSED WATERWAYS

The term grassed waterways refers to grass strips used to convey concentrated flows of water in erosive areas of the field.¹

Key consideration

- Grassed waterways slow water flow and reduce soil gully erosion
- Installing grassed waterways can improve water quality by trapping sediment and minimizing nutrient runoff



3 ADDING BLIND INLETS

A blind inlet is a structure that is placed at the lowest point of farmed depressions or potholes to minimize the amount of sediment, and potentially other contaminants, that would be transported to receiving ditches and streams.²

Key considerations

- When used effectively, blind inlets should be able to remove at least 90% of sediments from the drainage water
- Farmers can drive equipment over blind inlets as opposed to driving around a standard tile riser



4 MANAGING TILE DRAINAGE WATER

Drainage water management allows farmers to control the timing and amount of water discharged from ag drainage systems.³

Key considerations

- Improving or increasing water infiltration allows water retention for dry periods
- When installing or upgrading tile, plan for water management retrofits



5 CREATING TWO-STAGE DITCHES

A two-stage ditch is a drainage ditch modified by adding grass benches to spread water during times of high flow.⁴

Key consideration

- Two-stage ditches improve water quality by reducing sediment movement and filtering nutrients
- Modifications improve ditch stability and help with flood control



6 BUILDING RIPARIAN BUFFERS

Strips of grass, trees or shrubs along streams and rivers filter or clean runoff and remove contaminants before they reach water bodies.⁵

Key considerations

- Riparian buffers reduce surface nutrient and sediment runoff and provide wildlife habitat
- Widening and connecting stream and river corridors allow riparian buffers to work better



7 UTILIZING BIOREACTORS

A bioreactor is a subsurface trench filled with a carbon source, usually wood chips, that enhances the natural denitrification process as water flows through to the outlet.⁴

Key considerations

- The carbon sources feed naturally occurring soil bacteria that facilitate denitrification
- Install near outlets to limit disruption to crop production
- During periods of high flow, the structure is set to bypass excess water from the bioreactor to avoid flooding



8 INCORPORATING SATURATED BUFFERS

Retain water in the soil of field buffers by using these control structures to divert tile water, which results in reduction of nitrate levels.⁶

Key considerations

- Saturated buffers allow natural removal of nitrogen from subsurface drainage
- The existing buffer removes sediment, phosphorus and pesticides and provides wildlife habitat
- Nitrate removal is supported by denitrification and plant uptake

Photo: Kent Heikens, USDA-ARS-National Laboratory for Agriculture and the Environment



9 RESTORING WETLANDS

Restoring or reconstructing wetlands improves water quality by filtering nitrates and sediments.³

Key considerations

- Wetland restoration removes consistently non-profitable acres from production while reducing nutrient runoff and providing environmental benefits
- These dynamic ecosystems contain plants, soil, bacteria and water that benefit water quality by removing nitrates through denitrification and other processes



RESOURCES

Programs may be available to help finance these practices. Contact one of the local businesses or organizations below to gain more insights into these long-term land investment and water management practices.

- **Certified Crop Advisers (CCAs)**
 - Find a CCA at: <https://www.certifiedcropadviser.org/certifications/professional-search/>
- **Fertilizer retailers**
- **Equipment dealers**
- **Peer network / other farmers**
 - INfield Advantage: www.INfieldAdvantage.org
 - Conservation Cropping Systems Initiative: www.ccsin.org
 - Soil Health Partnership: www.soilhealthpartnership.org
- **Purdue Extension**
 - Contact your local extension office: <https://extension.purdue.edu/Pages/countyoffices.aspx>
- **Soil and Water Conservation District (SWCD)**
 - www.iaswcd.org
- **Indiana State Department of Agriculture (ISDA)**
 - www.in.gov/isda/
- **USDA Natural Resources Conservation Service (NRCS)**
 - <https://www.nrcs.usda.gov/wps/portal/nrcs/main/in/contact/local/>

¹Conservation Technology Information Center. 2016. "Conservation Buffers." Accessed April 2017. Retrieved from: <http://www.ctic.purdue.edu/Core4/Conservation%20Buffers/>

²USDA, Natural Resources Conservation Service. "Water Quality Best Management Practices." Accessed April 2017. Retrieved from: <http://fyi.uwex.edu/drainage/files/2012/06/Blind-Inlet-Factsheet-2012.pdf>

³Christianson, L.E., J. Frankenberger, C. Hay, M.J. Helmers, and G. Sands. 2016. "Ten Ways to Reduce Nitrogen Loads from Drained Cropland in the Midwest." Pub. C1400, University of Illinois Extension

⁴Purdue University, Agricultural & Biological Engineering. "Two-Stage Ditches." Accessed December 2016. Retrieved from: <https://engineering.purdue.edu/watersheds/conservationdrainage/ditch.html>

⁵United States Department of Agriculture, Natural Resources Conservation District. "Riparian Forest Buffer." Accessed December 2016. Retrieved from: https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/landuse/forestry/sustain/guidance/?cid=nrcsdev11_009302

⁶United States Department of Agriculture, National Institute of Food and Agriculture. "Saturated Buffers." Accessed December 2016. Retrieved from: <https://transformingdrainage.org/practices/saturated-buffers/>

INDIANA AG NUTRIENT ALLIANCE

The Indiana Agriculture Nutrient Alliance (IANA) is dedicated to keeping Indiana at the forefront of proactive nutrient management and soil health practices that improve viability and, ultimately, reduce nutrient loss to water.

Learn more at www.inagnutrients.org



IANA Partners: Indiana Soybean Alliance, Indiana Corn Marketing Council, Agribusiness Council of Indiana, Indiana Farm Bureau, USDA Natural Resources Conservation Service, American Dairy Association of Indiana, Indiana Association of SWCDs, Indiana Beef Cattle Association, Indiana Dairy Producers, Indiana Pork, Indiana State Department of Agriculture, Indiana State Poultry Association, Purdue University, The Nature Conservancy of Indiana

Funded through joint-partnership dollars and USDA Natural Resources Conservation Service matching funds.

Published in Spring 2018

insync nutmgt 9311-1
21-MC13-12/16