

Interim BMP: Saturated Buffer

Chesapeake Bay Program Phase 6.0 Modeling Tools

Agriculture Workgroup
July 19, 2018

BMP Name: Saturated Buffer

BMP Definition: This BMP represents the edge-of-field treatment for tile-drained cropland areas through practices that reduce nitrogen pollutant loads by diverting tile-line flow to a subsurface, perforated distribution pipe used to divert and spread drainage system discharge to a vegetated area to increase soil saturation.

Measurement Names to be submitted: length of saturated buffer or area of saturated buffer, all applicable CAST geographies

Model Simulation: Hydrologically connecting tile flow to an edge-of-field vegetated buffer encourages denitrification of nitrate-N in the tile water through the typical biological processes that occur in a soil environment that underlies perennial vegetation. Additionally, a portion of the nitrate-N in the tile water may be subject to uptake by the vegetation in the buffer. The tile flow from the field is directed through the subsoil of the buffer before exiting into a receiving water body, such as a ditch or stream. The Agricultural Ditch Management Expert Panel recommends an efficiency value of 20% for total nitrogen load per acre, to be used for planning purposes only. This value is a conservative estimate subject to change as the Expert Panel continues to formulate final recommendations for a larger suite of agricultural ditch management practices.

States will submit length of saturated buffer or area of saturated buffer in a way consistent with the interim BMP definition. The recommended assumption is that one acre of buffer area identified for planning treats ten upslope acres and will be associated with default pounds of N in the Phase 6.0 Model for representative land use and cropping system. The Agricultural Modeling Subcommittee (AMS) has defined the pounds of N per acre for cropland production based on available literature values. The AMS recommendations have been reviewed and approved by the Agriculture Workgroup (AgWG) for use in the Phase 6.0 modeling tools.

The Chesapeake Bay Program Office will create an interim BMP for Phase 6.0 that will be listed as "DRAFT" in the NEIEN Appendix. This will allow states to use the interim BMP for planning purposes, and to report subsequent implementation information to NEIEN. However, the interim BMP will not receive credit through annual progress reporting until the availability of a partnership approved BMP Expert Panel recommendation report.

References

Jaynes, D.B. and Isenhardt, T.M. Reconnecting tile drainage to riparian buffer hydrology for enhanced nitrate removal. J. Environ. Qual. 43:631-638. 2014.

USDA NRCS. 2016. Conservation Practice Standard 604: Saturated Buffer.

https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/technical/cp/ncps/?cid=nrcs143_026849 (accessed 12 Apr. 2018).

Agricultural Drainage Management Coalition. 2015. Demonstrate and Evaluate Saturated Buffers at Field Scale to Reduce Nitrates and Phosphorus from Subsurface Field Drainage Systems Final Report. NRCS CIG: Grant # 69-3A75-11-205. Dec 15, 2015.

Jaynes, D.B. and Isenhardt, T.M. Performance of Saturated Riparian Buffers in Iowa, USA. J. Environ. Qual., (in review).

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