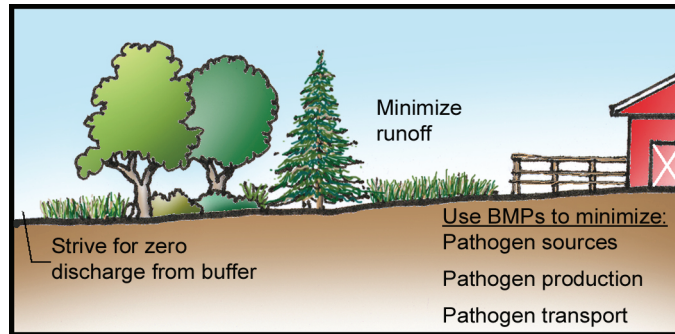




1.11 Buffers for pathogens

Buffers can reduce pathogens in surface runoff from urban lands, pastures, manure-applied fields, and confined animal feeding operations but are generally ineffective by themselves to meet water quality standards. Buffers need to be combined with other best management practices (BMPs) to meet standards.

1.11 References

Atwill, E.R.; Hou, L.; Karle, B.M. [and others]. 2002. Transport of *Cryptosporidium parvum* Oocysts through vegetated buffer strips and estimated filtration efficiency. *Applied and Environmental Microbiology*. 68: 5517-5527.

Chaubey, I.; Edwards, D.R.; Daniel, T.C. [and others]. 1994. Effectiveness of vegetative filter strips in retaining surface-applied swine manure constituents. *Transactions of the American Society of Agricultural Engineers*. 37: 845-850.

Chaubey, I.; Edwards, D.R.; Daniel, T.C. [and others]. 1995. Effectiveness of vegetative filter strips in controlling losses of surface-applied poultry litter constituents. *Transactions of the American Society of Agricultural Engineers*. 38: 1687-1692.

Clinton, B.D.; Vose, J.M. 2006. Variation in stream water quality in an urban headwater stream in the southern Appalachians. *Water, Air, and Soil Pollution*. 169: 331-353.

Collins, R.; Dennison, A.; Ross, C.; McLeod, M. 2004. Attenuation of effluent-derived faecal microbes in grass buffer strips. *New Zealand Journal of Agricultural Research*. 47: 565-574.

Coyne, M.S.; Gilfillen, R.A.; Rhodes, R.W.; Blevins, R.L. 1995. Soil and fecal coliform trapping by grass filter strips during simulated rain. *Journal of Soil and Water Conservation*. 50: 405-408.

Coyne, M.S.; Gilfillen, R.A.; Villalba, A. [and others]. 1998. Fecal bacteria trapping y grass filter strips during simulated rain. *Journal of Soil and Water Conservation*. 53: 140-145.

Dickey, E.C.; Vanderholm, D.H. 1981. Vegetative filter treatment of livestock feedlot runoff. *Journal of Environmental Quality*. 10: 279-284.

Doyle, R.C.; Stanton, G.C.; Wolfe, D.C. 1977. Effectiveness of forest and grass buffer filters in improving the water quality of manure-polluted runoff. ASAE Paper No. 77-2501. St. Joseph, MO: American Society of Agricultural Engineers.

Entry, J.A.; Hubbard, R.K.; Thies, J.E.; Fuhrmann, J.J. 2000. The influence of vegetation in riparian filterstrips on coliform bacteria: I movement and survival in water. *Journal of Environmental Quality*. 29: 1206-1214.

Entry, J.A.; Hubbard, R.K.; Thies, J.E.; Fuhrmann, J.J. 2000. The influence of vegetation in riparian filterstrips on coliform bacteria: survival in soils. *Journal of Environmental Quality*. 29: 1215-1224.

Fajardo, J.J.; Bauder, J.W.; Cash, S.D. 2001. Managing nitrate and bacteria in runoff from livestock confinement areas with vegetative filter strips. *Journal of Soil and Water Conservation*. 56: 185-191.

Hay, V.; Pittroff, W.; Tooman, E.E.; Meyer, D. 2006. Effectiveness of vegetative filter strips in attenuating nutrient and sediment runoff from irrigated pastures. *The Journal of Agricultural Science*. 144: 349-360.

Koelsch, R.K.; Lorimor, J.C.; Mankin, K.R. 2006. Vegetative treatment systems for management of open lot runoff: review of literature. *Applied Engineering in Agriculture*. 22: 141-153.

Lim, T.T.; Edwards, D.R.; Workman, S.R. [and others]. 1998. Vegetated filter strip removal of cattle manure constituents in runoff. *Transactions of the American Society of Agricultural Engineers*. 41: 1375-1381.

Mankins, K.R.; Barnes, P.L.; Harner, J.P. [and others]. 2006. Field evaluation of vegetative filter effectiveness and runoff quality from unstocked feedlots. *Journal of Soil and Water Conservation*. 61: 209-217.

Muirhead, R.W.; Collins, R.P.; Bremer, P.J. 2006. The association of E-coli and soil particles in overland flow. *Water Science and Technology*. 54(3): 153-159.

Pachepsky, Y.A.; Sadeghi, A.M.; Bradford, S.A. [and others]. 2006. Transport and fate of manure-borne pathogens: modeling perspective. *Agricultural Water Management*. 86: 81-92.

1.11 Water Quality

- Rosen, B. H.; Croft, R.; Atwill, E.R. [and others]. 2000. Waterborne pathogens in agricultural watersheds. Washington, DC: Natural Resources Conservation Service, Watershed Science Institute. 64 p.
ftp://ftp-fc.sc.egov.usda.gov/WSI/pdf/files/Pathogens_in_Agricultural_Watersheds.pdf [Date accessed: October 17, 2007].
- Schellinger, G.R.; Clausen, J.C. 1992. Vegetative filter treatment of dairy barnyard runoff in cold regions. *Journal of Environmental Quality*. 21: 40-45.
- Srivastava, P.; Edwards, D.R.; Daniel, T.C. [and others]. 1996. Performance of vegetative filter strips with varying pollutant source and filter strip lengths. *Transactions of the American Society of Agricultural Engineers*. 39: 2231-2239.
- Stout, W.L.; Pachepsky, Y.A.; Shelton, D.R. [and others]. 2005. Runoff transport of faecal coliforms and phosphorus released from manure in grass buffer conditions. *Letters in Applied Microbiology*. 41: 230-234.
- Tate, K.W.; Atwill, E.R.; Bartolome, J.W.; Nader, G. 2006. Significant *Escherichia coli* attenuation by vegetative buffers on annual grasslands. *Journal of Environmental Quality*. 35: 795-805.
- Tate, K.W.; Pereira, M.D.G.C.; Atwill, E.R. 2004. Efficacy of vegetated buffer strips for retaining *Cryptosporidium parvum*. *Journal of Environmental Quality*. 33: 2243-2251.
- Trask, J.R.; Kalita, P.; Kuhlenschmidt, M.S. [and others]. 2004. Overland and near-surface transport of *Cryptosporidium parvum* from vegetated and nonvegetated surfaces. *Journal of Environmental Quality*. 33: 984-993.
- Tyrrel, S.F.; Quinton, J.N. 2003. Overland flow transport of pathogens from agricultural land receiving faecal wastes. *Journal of Applied Microbiology*. 94: 87S-93S.
- Vanderholm, D.H.; Dickey, E.C. 1980. Design of vegetative filters for feedlot runoff treatment in humid areas. *Transactions of the American Society of Agricultural Engineers*. 23: 681-684, 687.
- Walker, S.E.; Mostaghimi, S.; Dillaha, T.A.; Woeste, F.E. 1990. Modeling animal waste management practices: impacts on bacteria levels in runoff from agricultural lands. *Transactions of the American Society of Agricultural Engineers*. 33: 807-817.
- Young, R.A.; Huntrods, T.; Anderson, W. 1980. Effectiveness of vegetated buffer strips in controlling pollution from feedlot runoff. *Journal of Environmental Quality*. 9: 483-487.
- Younos, T.M.; Mendez, A.; Collins, E.R.; Ross, B.B. 1998. Effects of a dairy loafing lot-buffer strip on stream water quality. *Journal of the American Water Resources Association*. 34: 1061-1069.

1.11 Water Quality