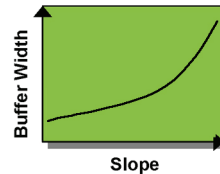


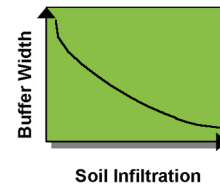
1.9 Slope and soil type adjustments

Land slope and soil type have significant impact on the ability of a buffer to remove pollutants from surface runoff.

Steeper slopes reduce performance by allowing greater pollutant transport and less time for infiltration. Steeper slopes will require wider buffers.



Soils with higher infiltration capacity can reduce runoff to a greater degree than soils having lower infiltration. Soils with lower infiltration capacity will require wider buffers. Finer-textured soils typically have lower infiltration than sandy soils.



1.9 References

- Berglund, E.R.; Ahyoud, A.; Tayaa, M. 1981. Comparison of soil and infiltration properties of range and afforested sites in Northern Morocco. *Forest Ecology and Management*. 3: 295-306.
- Bharati, L.; Lee, K.-H.; Isenhardt, T.M.; Schultz, R.C. 2002. Soil-water infiltration under crops, pasture, and established riparian buffer in Midwestern USA. *Agroforestry Systems*. 56: 249-257.
- Dickey, E.C.; Vanderholm, D.H. 1981. Vegetative filter treatment of livestock feedlot runoff. *Journal of Environmental Quality*. 10: 279-284.
- Dillaha, T.A.; Reneau, R.B.; Mostaghimi, S.; Lee, D. 1989. Vegetative filter strips for agricultural nonpoint source pollution control. *Transactions of the American Society of Agricultural Engineers*. 32: 513-519.
- Dillaha, T.A.; Sherrad, J.H.; Lee, D. [and others]. 1988. Evaluation of vegetative filter strips as best management practices for feed lots. *Journal of Water Pollution Control Federation*. 60: 1231-1238.
- Dosskey, M.G.G. 2001. Toward quantifying water pollution abatement in response to installing buffers on crop land. *Environmental Management*. 28: 577-598.

Dosskey, M.G.G.; Hoagland, K.D.; Brandle, J.R. 2007. Change in filter strip performance over ten years. *Journal of Soil and Water Conservation*. 62: 21-32.

Elderidge, D.J.; Freudenberger, D. 2005. Ecosystem wicks: woodland trees enhance water infiltration in a fragmented agricultural landscape in eastern Australia. *Austral Ecology*. 30: 336-347.

Lado, M.; Paz, A.; Ben-Hur, M. 2004. Organic matter and aggregate size interactions in infiltration, seal formation, and soil loss. *Soil Science Society of America Journal*. 68: 935-942.

Mazurak, A.P.; Kriz, W.; Ramig, R.E. 1960. Rates of water entry into a Chernozem soil as affected by age of perennial grass sods. *Agronomy Journal*. 52: 35-37.

Munoz-Carpena, R.J.; Parsons, J.E.; Gilliam, J.W. 1993. Numerical approach to the overland flow process in vegetative filter strips. *Transactions of the American Society of Agricultural Engineers*. 36: 761-770.

Munoz-Carpena, R.J.; Parsons, J.E.; Gilliam, J.W. 1999. Modeling hydrology and sediment transport in vegetative filter strips. *Journal of Hydrology*. 214: 111-129.

Overcash, M.R.; Bingham, S.C.; Westerman, P.W. 1981. Predicting runoff pollutant reduction in buffer zones adjacent to land treatment sites. *Transactions of the American Society of Agricultural Engineers*. 24: 430-435.

Phillips, J.D. 1989. Evaluation of the factors determining the effectiveness of water quality buffer zones. *Journal of Hydrology*. 107: 133-145.

Parr, J.F.; Bertrand, A.R. 1960. Water infiltration into soils. *Advances in Agronomy*. 12: 311-363.

Pietola, L.; Horn, R.; Yli-Halla, M. 2005. Effects of trampling by cattle on the hydraulic and mechanical properties of soil. *Soil and Tillage Research*. 82: 99-108.

Pluhar, J.J.; Knight, R.W.; Heitschmidt, R.K. 1987. Infiltration rates and sediment production as influenced by grazing systems in the Texas Rolling Plains. *Journal of Range Management*. 40: 240-243.

Robinson, C.A.; Ghaffarzadeh, M.; Cruse, R.M. 1996. Vegetative filter strip effects on sediment concentration in cropland runoff. *Journal of Soil and Water Conservation*. 51: 227-230.

Schultz, R.C.; Isenhardt, T.M.; Simpkins, W.W.; Colletti, J.P. 2004. Riparian forest buffers in Agroecosystems – lessons learned from the Bear Creek Watershed, central Iowa, USA. *Agroforestry Systems*. 61: 35-50.

Seobi, T.; Anderson, S.H.; Udawatta, R.P.; Gantzer, C.J. 2005. Influence of grass and agroforestry buffer strips on soil hydraulic properties for an Albaqualf. *Soil Science Society of America Journal*. 69: 893-901.

Thompson, J.R. 1968. Effect of grazing on infiltration in a western watershed. *Journal of Soil and Water Conservation*. 23: 63-65.

Tromble, J.M.; Renard, K.G.; Thatcher, A.P. 1974. Infiltration for three rangeland soil-vegetation complexes. *Journal of Range Management*. 27: 318-321.

Verchot, L.V.; Franklin, E.C.; Gilliam, J.W. 1997. Nitrogen cycling in Piedmont vegetated filter zones. I. Surface soil processes. *Journal of Environmental Quality*. 26: 327-336.

Zachmann, J.E.; Linden, D.R.; Clapp, C.E. 1987. Macroporous infiltration and redistribution as affected by earthworm, tillage, and residue. *Soil Science Society of America Journal*. 51: 1580-1586.