Ag quick CAST

CAST Special Publication 31-QC
March 2012
Material excerpted from original CAST document

Assessing the Health of Streams in Agricultural Landscapes: The Impacts of Land Management Change on Water Quality

As population has increased, so too has human influence on stream condition.

- With increased urban development in agricultural watersheds comes a multitude of stressors on streams and rivers independent of agriculturally related activity.
- Agriculture's assumed role in the consideration of stream health, or lack thereof, remains large.

The question of whether or not streams have a natural resistance that slows responses to management activities warrants consideration.

- The erodibility of channel materials is a primary determinant of channel response to watershed management.
- Certain compounds can adsorb to sediment particles.
- A wide range of aquatic organisms exists in streams.

When considering factors that might cause variable responses among streams in agricultural landscapes, the following are likely to be important:

- The extent to which historic land management activities have occurred in the watershed.
- The extent to which the geomorphology of a stream channel has been altered by dredging, straightening, bank and bed armoring, etc.
- The extent to which the hydrologic pathways to a stream are influenced by baseflow, overland flow, and interflow tile drainage.
- The extent of each management practice within the watershed.
- The spatial arrangement of management practices.
- The dynamics of ecosystem recovery.

Typical tile drain outlet discharging to a headwater stream or ditch.

Recommendations include the following:

- Examine the use and benefits of biological criteria and biological goal setting.
- Better understand aquatic ecosystem alterations and impacts.
- Adopt and incorporate long-term, large-scale, coordinated stream restoration planning, evaluating, and monitoring.
- Focus funding and monitoring on implementation of the management tools at hand.
- Agricultural management goals aimed at improving water and stream quality should be built upon the understanding that ecological integrity is dependent on multiple factors.

Experts to Contact for More Information:

Rick Cruse (rmc@iastate.edu); Don Huggins (dhuggins@ku.edu); Christian Lenhart (lenh0010@umn.edu); Joe Magner (magne027@umn.edu); Todd Royer (troyer@indiana.edu); Keith Schilling (keith.schilling@dnr.iowa.gov)

To access the complete text of this CAST Special Publication, click here or visit the CAST website (www.cast-science.org) and click on Publications (free for members; $10 for nonmembers). For more information about CAST, visit the website or contact the CAST office, at 515-292-2125.