Innovation in Agricultural Conservation for the Chesapeake Bay

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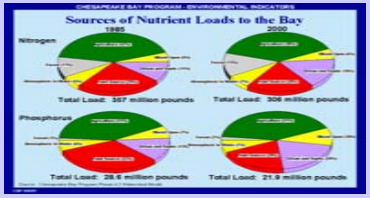
Background

Restoring the Chesapeake Bay will require nutrient – nitrogen and phosphorus – reductions far beyond those already achieved. In April 2003, Maryland, Virginia, Pennsylvania, New York, Delaware, West Virginia, the District of Columbia, and the U.S. Environmental Protection Agency agreed to an aggressive new goal of 175 million pounds per year of delivered nitrogen and 12.8 million lbs per year of delivered phosphorus by the year 2010, more than 50 percent from 1985 levels.

The Chesapeake Bay Program estimates that 41 percent of the nutrients delivered to the Bay still originate from agriculture. It is clear this sector – along with urban and suburban and other sources will need to make significant reductions to remove nutrient impairments to ensure protection of living resources and critical habitats. Experts at a May 2003 Scientific Forum on Innovation in Agricultural Conservation for the Chesapeake Bay helped to identify practices and research necessary to reach nutrient reduction goals. The Forum sponsored by the Scientific and Technical Advisory Committee of the Chesapeake Bay Program focused on evaluating current, near term and long term practices.



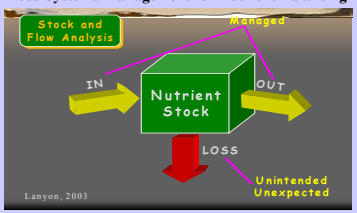
The Chesapeake Bay Program appears to be the only program nationally that has developed a highly sophisticated quantitative BMP tracking and crediting system incorporated into a watershed model to estimate progress.

Bay Model Limitations

- *Different land uses and crops not accounted for*
- *Reduction efficiencies largely based on plot scale data*
- *Assumes general geological areas and conditions*
- *Implementation based on self-reported data, presence of a plan*
- *Assumes all practices are maintained and function in all events*
- *State reported implementation of BMPs*

The scientific community remains somewhat skeptical of the quantitative use of model-based results such as bay-wide nutrient reductions based on reported BMP implementation and efficiency assumptions when they are used to shape policy. Progress is likely to be overestimated as evidenced by the over prediction of observed nutrient reductions. ***However, this model approach must be used to estimate progress and to quantify reductions for nutrient trading and TMDL measures.***

Need Systems Management for Nutrient Balancing



- BMP practices often are implemented without regard for how practices work together to address whole farm water quality concerns.
- Keeping nutrients out of waterways negates later abatement costs and contributes more effectively to maintaining farm nutrient balances.
- As regional animal and nutrient stocks increase, risks to regional water quality increase correspondingly and reductions in feed nutrients or the transport of excess nutrient stocks are the primary alternatives to offset continuing nutrient imports.

RESEARCH NEEDS

Modifications to Existing Program/Practices

- BMPs must show a reduction of actual nutrient losses under real world applications.
- Comprehensive long-term small watershed BMP research is needed to determine watershed efficiencies versus plot-based efficiencies.
- Longevity for current BMPs must be determined under varying climate, physical, and cultural conditions.

New Tools

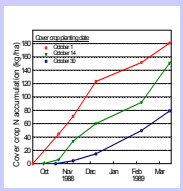
- New BMPs must go beyond tactical controls (e.g. erosion controls, storage sheds) and address nutrient balances at the farmgate and watershed level.
- Novel strategies for industries such as horticulture, aquaculture, organic farming, and expanded poultry or swine production should incorporate nutrient balancing criteria in BMPs.

Systems Change

- Major nutrient imbalances associated with intensive animal production and nutrient-rich crop specialization must consider a systems approach that incorporates alternative crops and/or production systems.

Funding Alignments

- State and federal support for agricultural research funding in the CB should prioritize links between water quality improvement and agricultural profitability.



MANAGEMENT/POLICY

Modifications

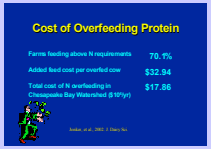
- Farming operations actively participating in nutrient balancing and water quality monitoring should be considered high priority for on-farm research support and technical assistance. Couple with greater flexibility in how they reduce nutrient loadings.

New Tools

- Restructure existing incentive programs toward funding performance-based pollution prevention.
- Chesapeake Bay states should reorder cost-share support and petition federal agencies to prioritize in-state farm grants and subsidies to operations in impaired watersheds participating in performance-based farming systems.

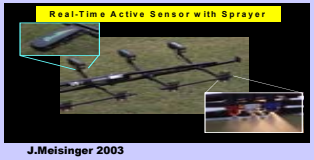
System Changes

- Extension education must engage private sector participants (e.g., dealers, feed industry, integrators, distributors, contract holders) in the implementation of nutrient balances through diet inputs, integrated farming etc. to allow for more strategic versus tactical watershed-based decisions.



Funding

- There is a need to identify opportunities to pursue partnerships with industry and producer organizations for nutrient balance assessments, as well as comprehensive public/private funding programs for integrating systems farming research with increased profitability.



J.Meisinger 2003

Conclusion

The contribution of nutrient loads from agriculture (both phosphorus and nitrogen) to the impairment of the Chesapeake Bay is so significant current BMP practices are insufficient to meet reduction goals. Model estimates likely overestimate the progress from current BMP implementation. Nutrient balancing especially for intensive animal production and nutrient intensive crops will require a systems approach. Research and agricultural assistance programs must address performance-based, watershed level efficiencies showing actual reductions from practices and consider alternative management and crop and animal production systems.

The White Paper "Innovation in Agricultural Conservation for the Chesapeake Bay: Evaluating Progress, Addressing Future Challenges" will be published in early 2004 and be available at http://www.chesapeake.org/stac/workshop.html