

The Facts Behind Nitrogen and Agricultural Practices in Talbot County

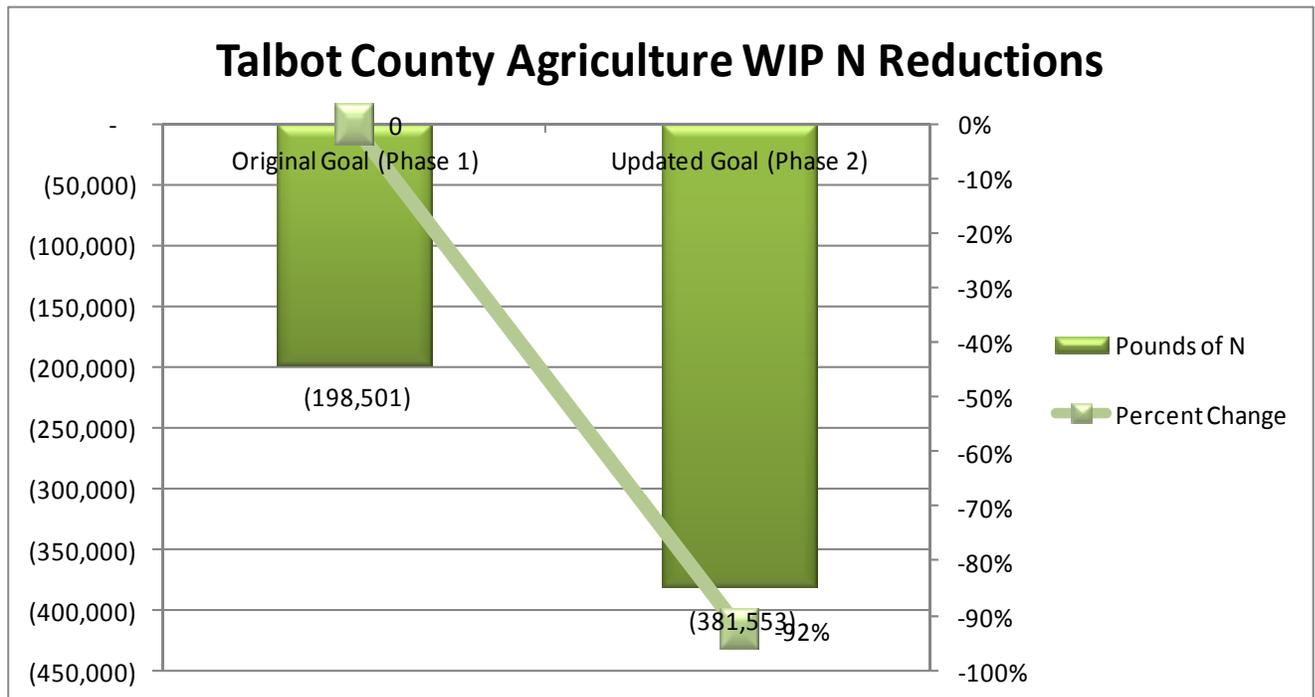
November 1, 2011

Agriculture Conservation

Since their inception the Soil Conservation District and the University of Maryland Extension have been studying, collecting and adapting research to enhance agriculture production and to protect the environment. With that, sound research and practices have been accepted and implemented by farmers and landowners. This document includes information regarding the many ways that farmers manage nutrients, specifically N, on the land.

The graph and chart below illustrate the TMDL Watershed Implementation Plan (WIP) reduction requirements for nitrogen on agriculture land. These reductions have been assigned through the EPA Bay model.

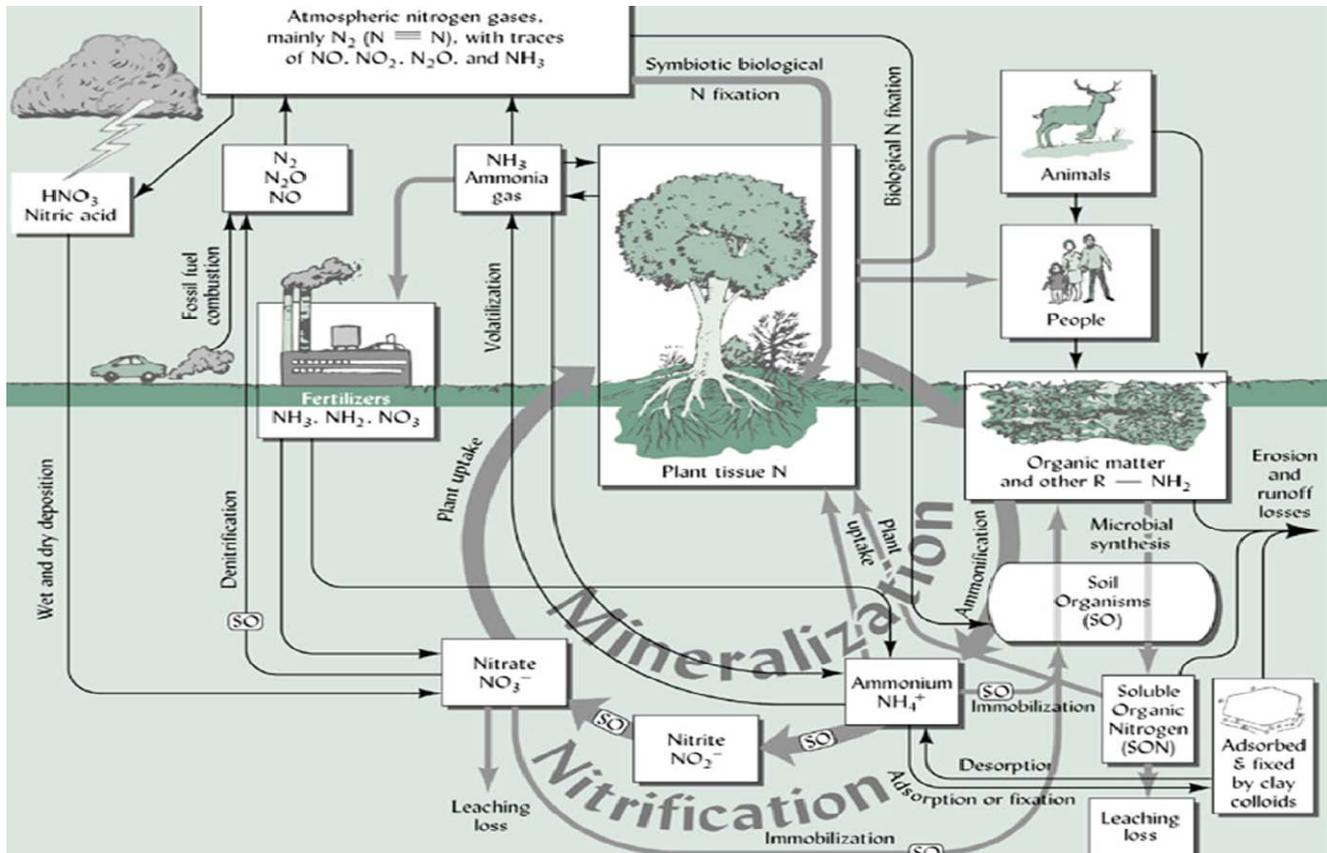
The ag workgroup met following both phase 1 and phase 2 assignments. Several adjustments were made including major BMPs discussed in this document: buffers, cover crops, and nutrient management. Due to the extreme change (92%) from phase 1 to phase 2 the ag workgroup concluded that these reduction numbers are unrealistic.



	6/17/2011	9/26/2011
	Original Goal (Phase 1)	Updated Goal (Phase 2)
Required N Reductions	198,501	381,553
BMP Estimates & Reductions	162,768	156,153
Pounds of N still needed	35,733	225,400

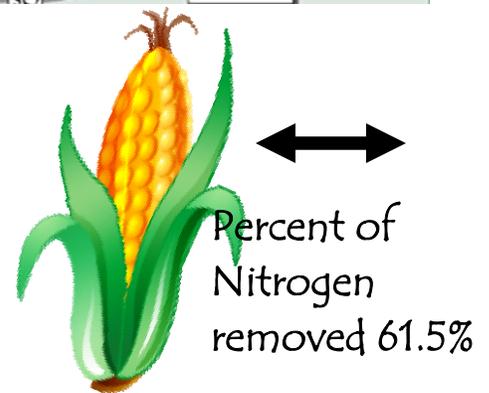
The Nitrogen Cycle (Brady and Weil)

Nitrogen is difficult to manage because it is continually being changed by chemical reactions and microorganisms in the soil (Steinhilber, 1995). For this reason, much research has been conducted to enhance crop production and protect the environment. The nitrogen cycle is the obvious starting point when discussing nutrients. The graphic below shows the volatility of N and the opportunity of managing it in MANY different ways.



Nitrogen and Corn

When looking at nitrogen applications and corn utilization removal rates MUST be factored in. Agricultural crops have nitrogen applied to be utilized. This differs when compared to numbers from urban and wastewater numbers that represent DIRECT loading. In Talbot County crops receiving nitrogen would include corn, some vegetable crops and hay. Soybeans do not receive nitrogen applications because they are a legume.



(Heckman, et al. Nutrient Removal by Corn Grain Harvest)

Major methods Used by Farmers to Reduce Nutrients

1. Nutrient Management

2. Cover Crops

3. Buffers

4. Others can include precision agriculture, PSNT, no till farming and nutrient timing (applying N at optimum times)

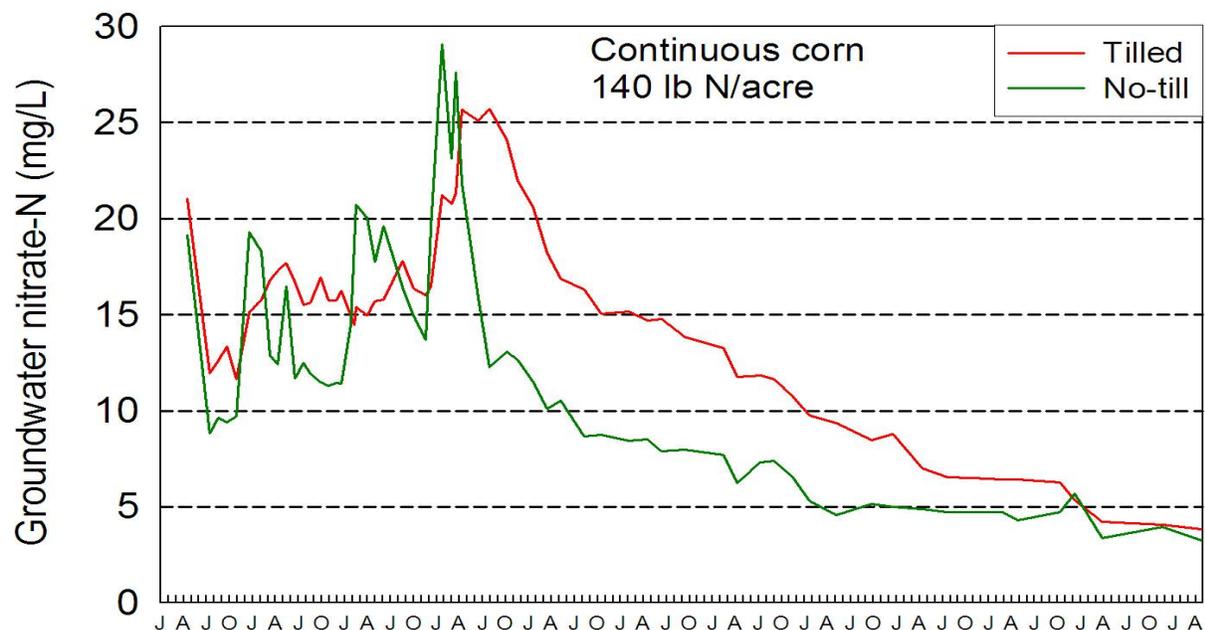
1. Nutrient Management - 99.3% Compliant

Talbot County is Nutrient Management is 99.3% compliant on statewide nutrient management regulations (MDA, Annual Report). This includes 140 farm operations and 73,364 acres under MANAGED plans. Nutrient Management in Maryland is regulated by the Maryland Department of Agriculture (MDA) and apply University of Maryland Research. Steps include:

1. Determining crop yields (*NM-4 Nutrient Management 2010*)
2. Taking a soil test (*NM Focus on Soil Testing*)
3. Following University of Maryland recommendations (*SFM-1 2010*)
4. Keeping records of nutrient applications
5. Reporting yearly to Maryland Department of Agriculture
6. Inspections by the Maryland Department of Agriculture

2. Cover Crops—Necessary for residual N

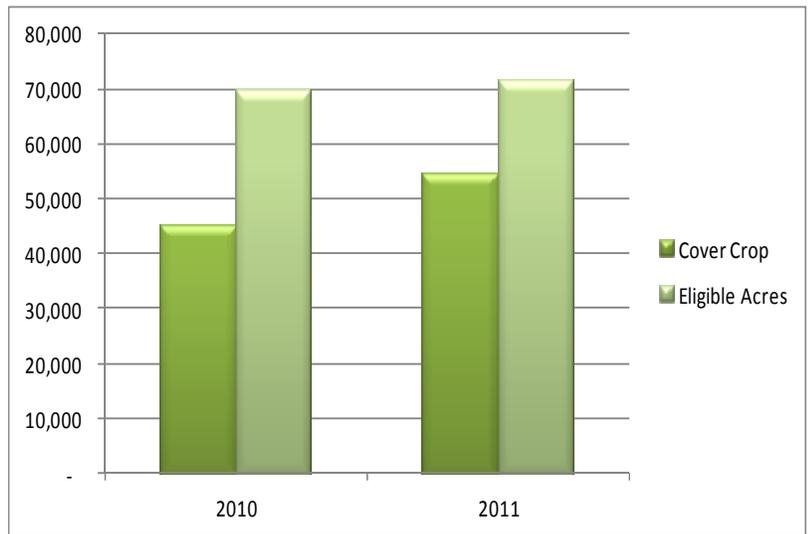
Strategies to mitigate surface runoff sediment and nutrient transport appear to do little to reduce nitrate leaching losses from coastal plain cropland (Staver, 1998). Talbot County continues to lead the state in acres of cover crop. They capture nitrate before it can leach.



(Staver and Brinsfield – 1998)

Cover Crops in Talbot County—54,634.4 acres

Talbot County continues to lead the state in cover crop acreage. In 2010, 65% of eligible acres were planted in Cover Crop. In 2011, 76% of eligible acres have been signed up and are in the process of being planted for the Cover Crop program. Although cover crops were shown to be capable of reducing nitrate concentrations in shallow groundwater in excess of 60%, many years may be required for these reductions to become evident in surface water quality (Staver, 1998).



Note - 2011 cover crop numbers are sign up

3. Buffer Strips & Grassed Waterways—5,407 Acres

Buffers are installed to capture nutrients and sediment as they run off the land. These buffers are most effective when strategically designed using slope, drainage and topographical patterns.

4. Other

There are many other methods and practices that farmers are incorporating on their farm. They include no till, GPS and sensory nutrient applications, crop timing and more. These will evolve as research, science and technology advances. As new technology is field tested over years and environments, farmers have demonstrated they will readily adopt them if they are cost effective and show significant reductions to the environment.

For More Information:

In summary farmers of Talbot County employ not one or two but MANY practices that increase water quality and environmental stewardship. To focus on only one or two methods is not a sound practice, nor is ignoring research and science. If you would like more information about any of these practices talk to a farmer, the Talbot County Soil Conservation District or the University of Maryland Extension office.

References:

Heckman, J.R., J.T. Sims, D.B. Beegle, F.J. Coale, S.J. Herbert, T.W. Bruulsema and W.J. Bamka. Nutrient Removal by Corn Grain Harvest. *Agronomy Journal*. Vol. 95, May—June 2003. Page 587—591.

Staver, Kenneth and Russell Brinsfield. Using cereal grain winter cover crops to reduce groundwater nitrate contamination in the mid-Atlantic coastal plain. *Journal of Soil and Water Conservation*. 1998. Page 230—240.

Steinhilber, P. and J. Salak. Nutrient Manager: Focus on Nitrogen. University of Maryland Extension. Volume 2, Issue 1. 1995.

University of Maryland Extension Fact Sheets (used by consultants, advisors, farmers and researchers)

- NM-4 Estimating Corn Grain Yield, 2010
- Nutrient Manager: Focus on Cover Crops
- Nutrient Manager: Focus on Soil Testing and Nutrient
- SFM-1 Soil Fertility Management, 2010