

**Annual Progress Report on the Neuse Agricultural Rule
(15A NCAC 2B .0238)**

**A report to the NC Environmental Management Commission
from the Neuse Basin Oversight Committee**

November 9, 2006

Summary

The Neuse Basin Oversight Committee (BOC) has received and approved annual reports estimating progress for the 2005 crop year from seventeen Local Advisory Committees (LACs) operating under the Neuse Agricultural Rule as part of the Neuse Basin Nutrient Strategy. For the entire basin, agriculture has achieved an estimated 46% nitrogen reduction compared to the 1991-1995 baseline. This represents an improvement in nitrogen loss reduction compared to a 44% nitrogen reduction reported for 2004. The largest factor in improvement is due to crop shift, with additional acres under soybean production this year. For the third consecutive year, all of the seventeen LACs have achieved their nitrogen reduction goal established by the BOC. Ten counties have been able to maintain their nitrogen reduction of over 40% reported last year, and an additional two counties were also able to reduce their nitrogen loss reduction from agricultural lands to more than 40% in 2005. This results in 12 of the 17 counties reporting a nitrogen loss reduction of more than 40% this year. Nitrogen loss reduction from agricultural land was accomplished through best management practice (BMP) installation, fertilizer application reduction, and cropland attenuation. The BOC will continue to focus their efforts in maintaining the reductions that have been achieved and promoting further implementation of conservation practices.

Rule History and Requirements

In December 1997, the Environmental Management Commission (EMC) adopted the Neuse River Basin Nutrient Sensitive Waters (NSW) Management Strategy. For the first time in state history, mandatory controls were applied not only on point source pollution but also on nonpoint source pollution in the Neuse River basin. The strategy has eight rules that affect both urban and rural areas. The strategy is aimed at reducing the average annual load of nitrogen delivered to the Neuse River Estuary from point and nonpoint source pollution by a minimum of 30% of the average annual load from the period 1991 through 1995 by the year 2003.

The Neuse agricultural rule provides each farmer with the option of becoming part of a collective local strategy for implementing BMPs or implementing standard BMPs as specified in the rule. A Basin Oversight Committee and seventeen Local Advisory Committees were established to implement the Neuse agricultural rule and to assist farmers with complying with the rule.

All seventeen LACs submitted their first annual reports to the BOC in May 2002. All LACs had achieved their nitrogen reduction goal established by the BOC in 2003, and all have continued to meet their goals annually.

Current Status

Nitrogen Reduction from Baseline for 2005

All seventeen LACs submitted their fifth annual report to the BOC in October 2006. For the entire basin, agriculture has achieved a 46% nitrogen reduction when using NLEW to compare the 2005 crop year to the 1991-1995 baseline. This is a two percent increase from last year's reported values, and most counties reported greater nitrogen reduction than that reported last year. For the third consecutive year, all LACs have achieved their nitrogen loss reduction goal established by the BOC. Table 1 lists each county's baseline, its proposed reduction goal, and nitrogen reduction from baseline in 2004 and 2005.

Table 1. Summary of County Baseline and its reduction from Baseline in 2004 & 2005

County	Baseline N Loss* in lbs.	Proposed Percent Reduction	Percent of N Reduction From Baseline in 2004	2005 N Loss* in lbs.	Percent of N Reduction From Baseline in 2005
Carteret	1,590,336	>30%	55.0%	709,418	55.4%
Craven	4,117,771	>30%	59.1%	1,579,114	61.7%
Durham	88,274	>30%	41.2%	43,958	50.2%
Franklin	73,013	30%	64.3%**	23,007	68.5%
Granville	71,141	21%	32.9%	42,535	40.2%
Greene	4,826,509	30%	42.7%	2,842,080	41.1%
Johnston	6,365,245	30%	50.2%	2,517,766	60.4%
Jones	2,887,499	>30%	48.1%	1,587,128	45.0%
Lenoir	4,308,849	>30%	39.0%	2,806,611	34.9%
Nash	1,127,424	30%	30.0%	789,615	30.0%
Orange	182,405	18%	37.6%	98,814	45.8%
Pamlico	2,740,111	>30%	35.6%	1,665,809	39.2%
Person	369,037	26%	25.9%	247,817	32.8%
Pitt	3,140,110	30%	45.5%	1,649,646	47.5%
Wake	554,794	30%	64.8%	117,087	78.9%
Wayne	8,113,993	30%	31.4%	5,246,848	35.3%
Wilson	2,037,003	>30%	55.4%	932,558	54.2%
Collectively for the entire Neuse River Basin	42,593,514		43.9%	22,899,811	46.2%

* The total nitrogen loss value is for comparative purposes only. It represents fertilizer that was applied and neither used by crops nor intercepted by BMPs in a Soil Management Unit, based on NLEW calculations. It may not represent the actual loss from the Soil Management Unit.

**Change in reported value from last year.

As shown in Table 2, nitrogen loss reduction from agricultural land was accomplished through BMP installation, better management of fertilizer, and cropland attenuation. The most significant change this year is due to cropping shift. There was an increase in the amount of soybean acreage, and this crop requires very limited, if any, nitrogen application for production. Staff estimates that these factors contributed to the nitrogen loss in the following percent reduction:

Table 2. Reasons for Nitrogen Loss from Agriculture Land

	2004	2005
BMP Implementation	11%	11%
Fertilization Management	12%	10%
Cropping Shift	5%	8%
Cropland converted to grass/tree	1%	1%
Cropland lost to idle land	10%	11%
Cropland lost to development	5%	5%
TOTAL	44%	46%

BMP Installation

More BMPs have been installed in 2005 due to the increase of financial and technical assistance provided in the 2002 Farm Bill, the additional assistance of the North Carolina Agriculture Cost Share Program (ACSP) and the Conservation Reserve Enhancement Program (CREP). It is estimated that over half of enrolled croplands received treatment from the installed BMPs. BMP installation goals were set by the local nitrogen reduction strategy, which was approved by the EMC in 1999. As shown in Table 3, agriculture has exceeded all of these goals with the exception of nutrient management. There has been a small overall increase in the amount of BMPs receiving nitrogen reduction credits installed in the past year, however the percent reduction from BMP implementation has remained constant at 11% in 2004 and 2005.

Table 3. Best Management Practices Receiving Nitrogen Reduction Credits Installed in the Neuse River Basin from 1996 to 2005

BMP Types	BMP Installation Goals (ac)	1996-2004 (ac)	1996-2005 (ac)	2005 Progress (ac)	Goal Exceedence as of 2005 (ac)
20' vegetated buffer	1,100	30,549	30,156	-393	29,056
30' vegetated buffer	700	9,840	10,356	516	9,656
20' forested buffer	270	38,979	38,732	-247	38,462
50' riparian buffer	2000	141,713	142,665	952	140,665
Scavenger Crop	5,200	39,578	38,371	-1,207	33,171
Nutrient Management	280,000	263,450	266,342	2,892	-13,658
Water Control Structure	42,000	55,812	55,996	184	13,996

Not all types of BMPs provide nitrogen reduction and therefore these additional BMPs do not receive nitrogen reduction credits. However, these types of BMPs, which increased in numbers in 2005, do provide water quality benefits. These BMPs reduce the loss of sediment and other nutrients, such as phosphorus, from agricultural lands to surface water and shallow groundwater. Table 4 lists these types of BMPs installed from 1996 to 2005, which have prevented the erosion of more than 540 thousand tons of soil. Units of BMPs reported in Table 4 are the actual BMP footprint acreage, as opposed to the acreage treated by the BMPs.

Table 4. Best Management Practices Not Receiving Nitrogen Reduction Credits Installed in the Neuse River Basin from 1996 to 2005

BMP Types	1996-2004 *	1996-2005 *	Annual Progress
Conservation Tillage	68,313 acres	72171 acres	3,858 acres
Conservation Tillage-3 Years	7,546 acres	8,543 acres	988 acres
Long Term No-Till	13,397 acres	14,508 acres	1,111 acres
Terraces	13,657 feet	13,657 feet	0
Diversion	130,621 feet	130,901 feet	280 feet
Sod Based Rotation	3,664 acres	4,057 acres	393 acres
Strip Cropping	44 acres	44 acres	0
Field Border	501 footprint acres	542 footprint acres	41 footprint acres
Grassed Waterway	2,054 footprint acres	2,138 footprint acres	84 footprint acres
Livestock Exclusion	58,209 feet	64,298 feet	6,089 feet
Streambank Stabilization	100 feet	300 feet	200 feet
Filter Strip	54 foot print acres	54 foot print acres	0

* Information obtained from NC Agricultural Cost Share Reports 12/1995 through 12/2005. Best Management Practices that were voluntarily installed through various federal programs or without government assistance are not included.

Fertilizer Management

With greater nutrient management and increased costs of fertilizer, farmers in the Neuse River Basin have reduced their fertilizer application since 1996. Table 5 indicates that fertilization rates for most major crops in the basin have been reduced from the baseline period. For corn for grain, soybeans, and tobacco, farmers in the basin have used slightly less fertilizer in 2005 than what was reported in 2004.

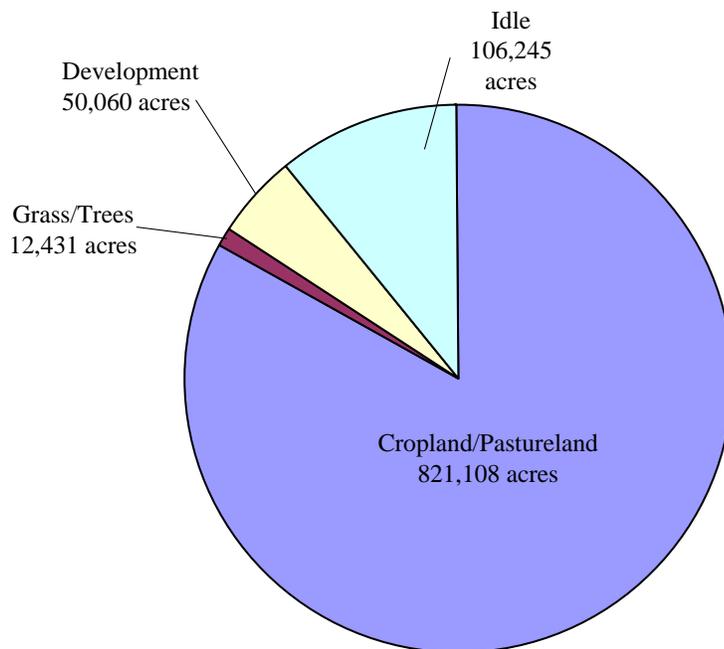
Table 5. Average Fertilization Rate for Major Crops in the Neuse River Basin in 2004 and 2005 Compared to the Baseline Period (1991-1995)

Crop	Baseline Average Fertilization Rate (pounds/acre)	2004 Average Fertilization Rate (pounds/acre)	2005 Average Fertilization Rate (pounds/acre)
Corn for Grain	160	132	128
Soybeans	19	2	0.7
Cotton	84	71	74
Wheat	112	108	108
Tobacco	87	77	74

Cropland Loss and Cropping Shift

Total acres of cropland in the Neuse River basin fluctuate every year. Each year, some cropland is permanently lost to development or converted to grass or forest land. The Neuse River Basin has experienced significant population growth since the 1980s. Durham, Johnston, and Wake Counties are growing the fastest in the upper basin, with Pitt County growing fastest in the lower basin. In the previous report for 2004, 47,478 acres of land were reported being lost to development since the baseline period. As shown in Figure 1, approximately 2,582 more acres of the cropland in the basin have been lost to development in 2005. Cropland loss has contributed significant nitrogen reductions for Johnston, Wake, and Wayne Counties. However, some croplands are also temporarily taken out of the agricultural production each year. Those changes are reported in the idle land category.

Figure 1. Neuse River Basin - Loss of Agricultural Land to other Land Uses Between the Baseline Period (1991-1995) to 2005

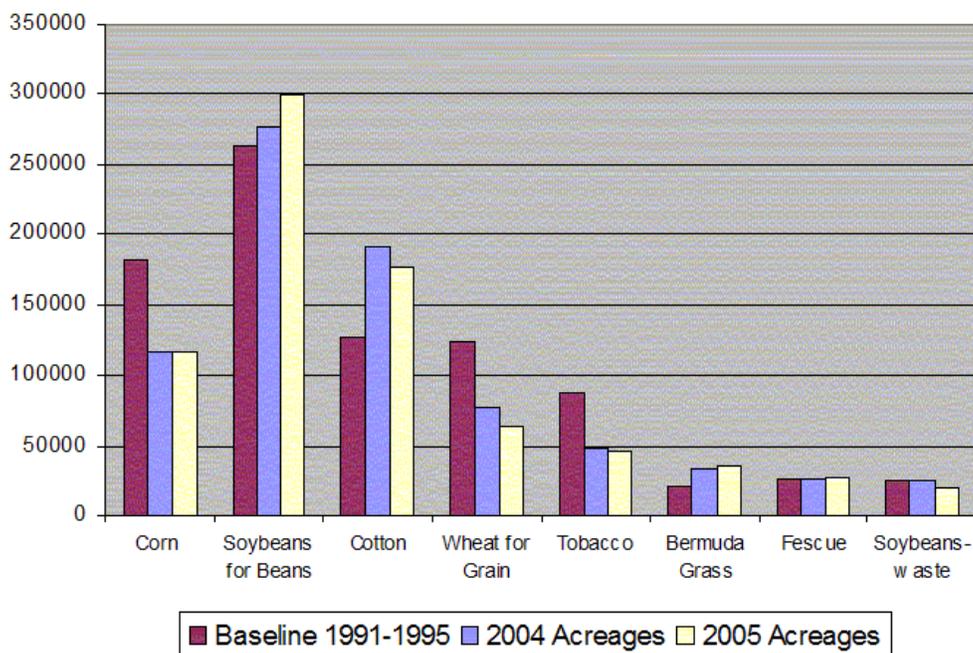


The Basin Oversight Committee recognizes the dynamic nature of agricultural business and science resulting from a variety of factors including:

- Changes in world economies or trade policies
- Changes in government programs (i.e., commodity support or environmental regulations)
- Weather (i.e., long periods of drought or rain)
- Scientific advances in agronomics (i.e., production of new types of crops or improvements in crop sustainment)
- Plant disease or pest problems (i.e, viruses or foreign pests)
- Farm location (i.e., large grain grower renting local farms moves to cash crop as rental lands sold to development)
- Age of farmer (i.e., as retirement approaches farmers may move from row crops to cattle)

Figure 2 shows changes of crop pattern in the Neuse River basin for the baseline period (1991-1995) as compared to 2004 and 2005. It shows that there were increases in acres of soybeans, and slight increases in bermuda grass and fescue acreages. The figure also depicts that there were decreases in acres of wheat, tobacco, and soybeans receiving waste application. The corn acreage remained constant over the past two years. The most notable factor is the increase in soybean acreages in 2005, and this likely lead to the 2% improvement in nitrogen loss reduction, as soybeans do not require significant nitrogen application rates.

Figure 2. Changes in Crop Pattern in the Neuse River Basin:
Baseline Period (1991-1995), 2004, and 2005



While corn acreage has remained consistent over the past few years, it is important to note that nitrogen application rates for corn have dropped significantly relative to the baseline due to intensive nutrient management education efforts and to the increasing cost of nitrogen. Fertilizer management, in combination with the additional acreages of soybeans and BMPs, has allowed the agricultural community in the Neuse River basin to report a 2% improvement in nitrogen loss reduction in 2005.

Agriculture in the Neuse River Basin will continue to change over the next decade. Historical farming practices in North Carolina cannot be used as a reliable predictor for the future agricultural picture in the state. Tobacco and peanut program changes have occurred that will likely result in major changes for many farms in the Neuse River Basin. Conversion of cropped lands to other agricultural and non-agricultural uses also remains a likely scenario in many Neuse River Basin counties. New crops are likely to be grown in the basin as a result of bioenergy and biopharmaceutical production, and this will shape the future of agriculture in the basin.

The Local Advisory Committees have been advised of the need to monitor changes in agriculture for the county and to update strategies to accommodate these changes. The LACs will review and encourage additional BMPs based on changes in crops grown, crop management, BMP management or other factors. In addition, individual farm plans must be updated as any changes occur that will result in changes in nitrogen uses on farmlands.

Future Steps

The Neuse Agricultural Basin Oversight Committee will continue to work with Local Advisory Committees and farmers to reduce nitrogen loss from agricultural lands in the Neuse River Basin. The BOC continues to encourage counties to implement additional BMPs to further reduce nitrogen loss.

Despite significant nitrogen reduction progress observed near the Neuse estuary, the 30% nitrogen reduction target established by the General Assembly has not yet been reached. Nitrogen reduction values presented in this annual summary reflect “edge of field” calculations, which contribute to the overall 30% goal. Significant quantities of agricultural BMPs have been installed since the adoption and implementation of the nutrient management strategy. However, the measurable effects of these BMPs on overall instream nitrogen reduction may take years to develop due to the nature of nonpoint source pollution. In the summer of 2005, the Neuse River Basin concluded data collection for the next basinwide water quality plan. The Basin Oversight Committee, the Division of Soil and Water Conservation and the local Soil and Water Conservation Districts will assist the Division of Water Quality as they draft the Neuse River Basinwide Water Quality Plan over the next year.