

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

A report to Environmental Management Commission by the Neuse Basin Oversight Committee

Summary

The Neuse Basin Oversight Committee (BOC) has received and approved annual reports from 17 Local Advisory Committees (LACs) in September 2003. As a result, for the basin as a whole, the agricultural community in 2002 has achieved a 37% nitrogen (N) reduction compared to the overall baseline. This represents a slight increase in N reduction compared to the 36% N reduction reported in 2001. Sixteen of the seventeen LACs have achieved their nitrogen reduction goal established by the BOC. Nitrogen loss from agricultural land has been reduced by over 40 percent compared to the baseline numbers for Carteret, Craven, Johnston, Wake and Wilson counties. Nitrogen loss reduction from agricultural land was accomplished through best management practice (BMP) installation, fertilizer application reduction and cropland attenuation. The BOC continues to encourage counties that have already achieved their N reduction goals to implement additional BMPs to reduce N loss. The BOC will focus additional efforts to assist the county that currently has not met its reduction goal to implement additional BMPs and to seek alternative BMPs to achieve the N reduction goal.

Background

In December 1997, the N.C. Environmental Management Commission (EMC) adopted the Neuse River Basin Nutrient Sensitive Waters (NSW) Management Strategy. For the first time in state history, mandatory controls are applied not only on point source pollution but also on nonpoint source pollution in the Neuse River basin. The strategy has 8 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 sources by a minimum of 30 percent 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 17 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. Eleven LACs had achieved their nitrogen reduction goal established by the BOC. Nitrogen loss from agricultural land had been reduced by over 40 percent compared to the baseline numbers for Carteret, Craven, Johnston, Wake and Wilson counties. For the basin as a whole, the agricultural community had achieved a 36% N reduction compared to the overall baseline.

Current Status

Nitrogen Reduction from Baseline in 2002

All seventeen LACs submitted their second annual reports to the BOC in May 2003. Additional BMPs, especially nutrient management, have been planned and implemented in the Neuse River basin in the past year. As a result, for the basin as a whole, the agricultural community has achieved a 37% N reduction compared to the overall baseline. Most counties reported increased N reduction compared with what was reported last year. All LACs, except the Pitt LAC, have achieved their nitrogen reduction goal established by the BOC. Efforts have been made in Pitt County to implement additional BMPs, especially nutrient management practices, in the county. The BOC is confident that Pitt County will exceed the 30% reduction goal assigned by the BOC when the BOC reports the progress to the EMC next year. Carteret, Craven, Johnston, Wake and Wilson LACs reported their N reduced by over 40 percent compared to the baseline numbers. Nitrogen loss reduction from agricultural land was accomplished through BMP installation, better management of fertilizer and conversion of cropland into forestland. In addition, land use changes from agriculture to development also played a role in the N reduction for some counties in the basin. Table 1 lists each county baseline within the basin, its proposed reduction goal and N reductions from baseline in 2001 and 2002.

Table 1. Summary of County Baseline and its N Reduction from Baseline in 2001 & 02

| County | Baseline N Loss* in lbs. | Proposed Percent Reduction | 2001 N Loss* in lbs. Add | Percent of N Reduction From Baseline in 2001 | 2002 N Loss* in lbs. | Percent of N Reduction From Baseline in 2002 |
|---|--------------------------|----------------------------|--------------------------|--|----------------------|--|
| Carteret | 1284833 | >30% | 700893 | 45.4% | 698358 | 45.6% |
| Craven | 3928696 | >30% | 2106696 | 46.4% | 2021726 | 48.5% |
| Durham | 81542 | >30% | 64206 | 21.3% | 53859 | 33.9% |
| Franklin | 49688 | 30% | 34132 | 31.3% | 34032 | 31.5% |
| Granville | 60057 | 21% | 46627 | 22.4% | 47663 | 20.6% |
| Greene | 4034046 | 30% | 2542740 | 37.0% | 2511716 | 37.7% |
| Johnston | 6094690 | 30% | 3194085 | 47.6% | 3513695 | 42.3% |
| Jones | 2736562 | >30% | 1808779 | 33.9% | 1706195 | 37.7% |
| Lenoir | 3994989 | >30% | 3421915 | 14.3% | 2586771 | 35.2% |
| Nash | 872259 | 30% | 609184 | 30.2% | 582588 | 33.2% |
| Orange | 181276 | 18% | 146034 | 19.4% | 107598 | 40.6% |
| Pamlico | 2043961 | >30% | 1257096 | 38.5% | 1285313 | 37.1% |
| Person | 339822 | 30% | 231542 | 31.9% | 238019 | 30.0% |
| Pitt | 2892783 | 30% | 2230805 | 22.9% | 2199517 | 24.0% |
| Wake | 557881 | 30% | 305725 | 45.2% | 322581 | 42.2% |
| Wayne | 7774831 | 30% | 5022256 | 35.4% | 5312874 | 31.7% |
| Wilson | 1939073 | >30% | 1133232 | 41.6% | 1131415 | 41.7% |
| Collectively for the entire Neuse River Basin | 38,866,989 | | 24,855,947 | 36.0% | 24,353,920 | 37.3% |

* 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.

BMP Installation

A significant number of BMPs have been installed in 2002 due to the increase of financial and technical assistance provided in the 2002 Farm Bill and the additional assistance of the CREP program. It is estimated that more than half of the enrolled cropland received treatment from the installed BMPs. Table 2 indicates that all BMP installation targets except for nutrient management have been exceeded in 2002. A large number of nutrient management practices have been planned in the mid-basin counties in 2003. The BOC is confident that nutrient management implementation targets will be exceeded during the next year.

Table 2. Best Management Practices Installed in the Neuse River Basin from 1996 to 2002

| BMPs | Goal (ac) | 96-01 (ac) | 96-02 (ac) | Additional Practices Installed in 2002 (ac) |
|-------------------------|-----------|------------|------------|---|
| 20' vegetated buffer | 1,100 | 12,747 | 13,301 | 554 |
| 30' vegetated buffer | 700 | 7,099 | 7,402 | 303 |
| 20' forested buffer | 270 | 30,748 | 30,748 | 0 |
| 50' riparian buffer | 2000 | 17,545 | 18,227 | 682 |
| Scavenger crop | 5,200 | 9,452 | 12,756 | 3,304 |
| Nutrient management | 280,000 | 155,574 | 238,171 | 82,597 |
| Water control structure | 42,000 | 46,716 | 52,183 | 5,467 |

Not all types of BMPs provide N reduction or receive N reduction credits. However, such BMPs do have water quality benefits. Many BMPs are designed to reduce sediment and other nutrients, such as phosphorus, from agricultural lands to surface water and shallow groundwater. Table 3 lists these other types of BMPs installed from 1996 to 2002. Units of BMPs reported in the table are the actual BMP footprint acreage, not acreage treated by these BMPs. Approximately 500 thousand tons of soil has been saved from installation of these BMPs.

Table 3. Additional BMPs Installed in the Neuse River Basin

| BMPs | 1996-2001 | 1996-2002 | Annual Changes |
|----------------------------|----------------------|----------------------|---------------------|
| Conservation Tillage | 52202 acres | 54445 acres | 2243 acres |
| Conservation Tillage 3 Yr. | 2086 acres | 5035 acres | 2949 acres |
| Long Term No-Till | 7377 acres | 8564 acres | 1187 acres |
| Terraces | 3711 ft | 6306 ft | 2595 ft |
| Diversion | 121530 ft | 124380 ft | 2850 ft |
| Sod Based Rotation | 1550 acres | 1550 acres | 0 |
| Strip Cropping | 44 acres | 44 acres | 0 |
| Field Border | 342 foot print acres | 344 foot print acres | 2 foot print acres |
| Grassed Waterway | 237 foot print acres | 312 foot print acres | 75 foot print acres |
| Livestock Exclusion | 10029 ft | 15489 ft | 5460 ft |
| Streambank Stabilization | 100 ft | 100 ft | 0 |
| Filter Strip | 53 foot print acres | 54 foot print acres | 1 foot print acres |

* Information obtained from NC Agricultural Cost Share Reports 12/1995 through 12/2002. This does not include Best Management Practices that were voluntarily installed through various federal programs or without government assistance.

Implementation Cost

In large measure, the success of this program is due to funding from both traditional and non-traditional sources to pay for cost-share, best management practices, and targeted Neuse assistance; due to fund informational literature and workshops for farmers; and due to cover some of the expense of developing our accountability process. These figures do not include the extensive staff time from the DSWC, local SWCD, NCDA&CS, NCCES, and USDA-NRCS.

Listed below are the major sources that we have identified. These figures are for work done through 2002. This is a comprehensive but not complete list. Most of the projects or programs listed are continuing items and will fund this work through the next year or more.

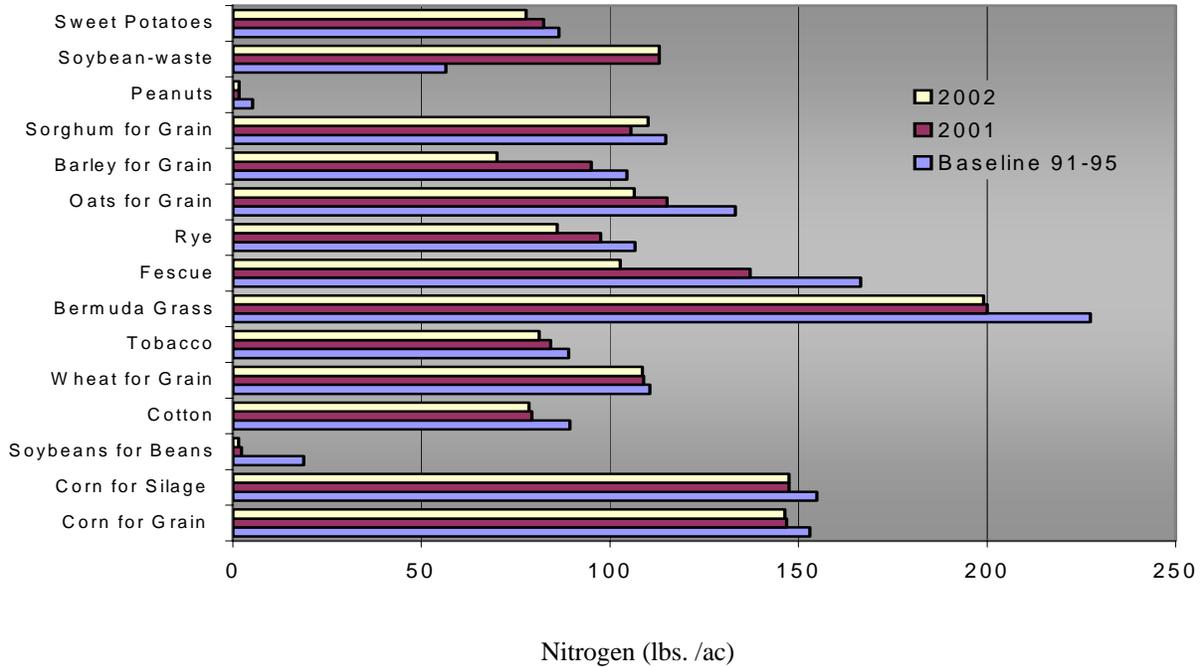
Please note that this does not include the cost to Neuse Basin farmers. We do not have the ability to calculate the out-of-pocket expense to farmers for their portion of cost-share projects or for the practices that they pay for entirely. However, we know that this amount is very substantial and should be acknowledged.

1. Federal Cost Share Funding through the Natural Resource Conservation from the Environmental Quality Incentives Program (EQIP) -\$ 4,770,379 (\$2,080,245 was spent in 2002)
2. The NC Agriculture Cost Share Program – including federal funds sent to the state with state match for the Conservation Reserve Enhancement Program \$ 3,191,076 (\$408,161 was spent in 2002)
3. Clean Water Management Trust Fund \$2,773,010. This amount is not grant totals, but actual amounts spent thus far for practices installed on farms.
4. U.S. Environmental Protection Agency 319 Grant \$1,116,770. This amount is not grant totals, but actual amounts spent thus far for practices installed on farms.
5. The “Neuse Crop Management Project” conducted by NCSU received primary funding from the Pew Charitable Trust and the US Environmental Protection Agency. That funding paid for nutrient management demonstrations, over 113,000 acres of nutrient management, produced a variety of educational fact sheets for Neuse Basin farmers, and covered the \$50,000 computer programming cost for NLEW (the nutrient accountability program approved by the EMC for the Neuse Agricultural Rule), and \$30,000 for nutrient management training (mandated in Neuse Rule .0239) which is also required for most farmers. The total funding for this project including the portion that came from the Clean Water Management Trust Fund was \$967,000.

Fertilizer Management

With greater nutrient management and increased costs of fertilizer, farmers in the Neuse River Basin continued to reduce their fertilizer application in 2002. Figure 1 indicates that fertilization rates for most major crops in the basin have been reduced.

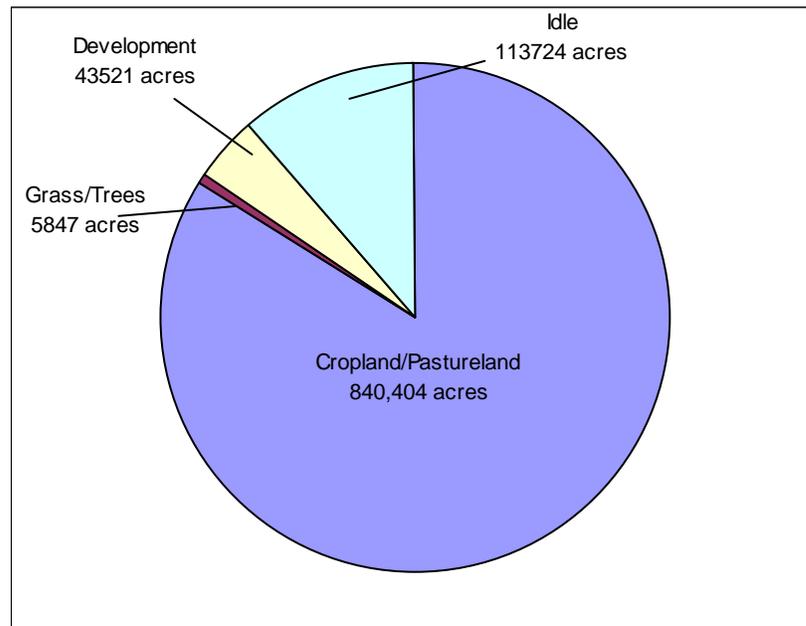
Figure 1. Average Fertilization Rate for Major Crops in the Neuse River Basin in 2002 and 2001 Compared to the Baseline Period (1991-1995)



Cropland Loss

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. Approximately 2540 more acres of cropland in the basin has been lost to development in 2002 (Figure 2). Cropland loss has contributed significant N reductions for Johnston and Wake Counties.

Figure 2. Current (2002) Uses of Land in the Neuse River Basin that was all Agriculture during Baseline Period (1991-1995)



The Basin Oversight Committee recognizes that the business of agriculture and the science of agriculture are under perpetual change as a result of a great number of forces. These forces may include:

- Changes in world economies or trade policies
- Government program changes such as commodity support or environmental regulations
- Weather, i.e., long periods of drought or rain
- New crops brought into production or changes in how crops are grown as a result of research and development
- Plant disease or pest problems such as foreign pest or virus
- 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 farmer may move from row crops to cattle

Figure 3 shows changes of crop pattern in the Neuse River Basin among the baseline period (1991-1995), 2001 and 2002. It showed that there was 10% more corn acreage in 2002 compared to 2001. This is due to a shift from cotton and soybeans to corn production. This change is significant because corn has a considerably higher nitrogen requirement than does cotton. This change in crop production brought about a increase in nitrogen use on agricultural lands in 2002.

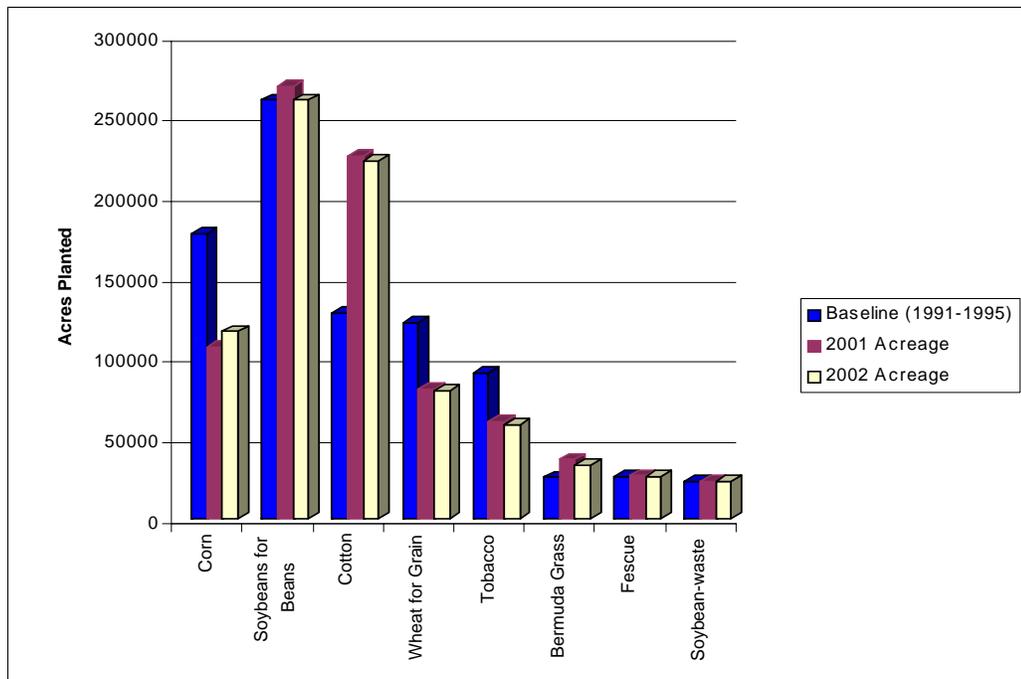
It is important to note, however, that nitrogen application rates for corn have dropped significantly relative to the baseline due to intensive nutrient management education efforts and to the increasing cost of nitrogen. This reduction in corn fertilization rates

mitigated the effect of a shift back to corn at a certain level. Another important factor is that a significant number of BMPs have been installed in 2002 due to the increase of financial and technical assistance provided in the 2002 Farm Bill. As a result, the agricultural community in the Neuse River basin still reported a slight increase in N reduction in 2002 comparing to 2001.

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 recently 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. Agriculture in the Neuse River Basin will continue to change over the next decade.

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. These changes could result in the need to implement additional best management practices or to redesign or reimplement existing practices based on changes in the practice itself over time, or based on the changes in crops grown, crop management, BMP management or other factors. Individual farm plans must be updated as any changes occur that will result in changes in nitrogen uses on farmlands

Figure 3. Changes in Crop Pattern in the Neuse River Basin among Baseline Period (1991-1995), 2001 and 2002



Future Steps

The Neuse Agricultural Basin Oversight Committee will continue to work with Local Advisory Committees and farmers to reduce N loss from agricultural lands in the Neuse River Basin. The BOC continues to encourage the counties that have already achieved their N reduction goals to implement additional BMPs to reduce N loss. The BOC will focus additional efforts to assist the county that currently has not met its reduction goal to implement additional BMPs and to seek alternative BMPs to achieve the N reduction goal.