

**ASSESSING AND DEVELOPING THE
OPPORTUNITIES FOR GREEN PAYMENTS
PROGRAMS FOR MARYLAND'S FARMERS**
Submitted to the Maryland Center for Agro-Ecology, Inc.
December 2005

This report is submitted as two separate sections:

Section I

**ASSESSING AND DEVELOPING THE OPPORTUNITIES FOR GREEN PAYMENTS
PROGRAMS FOR MARYLAND'S FARMERS**

Background, Methods and Results

Principal Investigators:

Michael Heller, Project Coordinator
Farm Manager, Clagett Farm
Chesapeake Bay Foundation

Robert Tjaden, Assistant Director,
Agriculture and Natural Resources
University of Maryland

Ferd Hoefner, Washington Representative
Sustainable Agriculture Coalition

Bryan Butler, Cooperative Extension
University of MD

Mark Waggoner, USDA-NRCS
State Resource Conservationist

Tom Simpson, Prof. and Coordinator
University of Maryland

Jim Hanson, Extension Economist
University of Maryland

Kim Kroll, Associate Director
USDA- SARE

Jim Lewis, Cooperative Extension
University of MD

Section II

**ASSESSING AND DEVELOPING THE OPPORTUNITIES FOR GREEN PAYMENTS
PROGRAMS FOR MARYLAND'S FARMERS**

Policy Recommendations and Education Initiatives

Principal Investigators:

Michael Heller, Chesapeake Bay Foundation

Kim Kroll, USDA- SARE

Ferd Hoefner, Washington Representative

Bryan Butler, Cooperative Extension

Jim Lewis, Cooperative Extension

Tom Simpson, University of Maryland

Table of Contents

Acknowledgements.....	4
Executive Summary	5
Section I	
Background.....	10
Methods.....	14
Results.....	16
Responses to written questionnaires	17
Telephone survey results.....	18
CSP Farm Case Studies	21
Soil Conditioning Index.....	24
Section II	
Policy Recommendations.....	27
Education Initiatives	40
Appendix 1 – Conservation Security Program Workshop Survey	41
Appendix 2 – Draft Telephone Survey Questions	42
Appendix 3 – Case Study #1: Rotational Grazing Beef Operation Conservation Security Program Plan	43
Appendix 4 – Case Study #2: Mid-Sized Cash Grain Operation Conservation Security Program Plan.....	45
Appendix 5 – Case Study # 3: Dairy Operation Conservation Security Program Plan	47
Appendix 6 – Case Study #4: Large Cash Grain Operation Conservation Security Program Plan.....	49
Appendix 7 – Case Study #5: Grass-Based Dairy Conservation Security Program Plan	51
Appendix 8 – Case Study #6: Rotational Grazing Beef Operation Conservation Security Program Plan.....	53
Appendix 9 – Case Study #7: Small Grain Operation Conservation Security Program Plan	55

Appendix 10 – Case Study #8: Mid-size Dairy Operation
Conservation Security Program Plan57

Appendix 11 – Results of Soil Conditioning Index Analysis60

Acknowledgements

We begin the Acknowledgements with a tremendous thanks to the many folks in the Natural Resource Conservation Service (NRCS) who have helped with this report:

Mark Waggoner—who as one of the Principal Investigators for Section I of the report was a constant source of useful insights and understanding about the Conservation Security Program (CSP) for our team

Tim Pilkowski—for his good natured and long and hard work in supporting our analysis of the Soil Conditioning Index

The following NRCS field staff were critical to the development of the eight farm case studies:

Doug Valentine

Mark Seibert

Lindsay Tulloch

Nancy Metcalf

We also acknowledge the efforts of the above and other NRCS staff who were responsible for making the CSP sign-up very successful for eligible Maryland farmers. The farmer surveys and the case studies found that the farmers were very pleased with NRCS staff, finding them helpful in understanding the program and good to work with in going through the sign-up process.

Lamonte Garber, a farm consultant, did an excellent job working with the farmer telephone surveys and case studies. His understanding of farming and the CSP program, and his sensitivity to farmers were invaluable.

Jen Pitz is warmly thanked for her tireless and careful work on the Soil Conditioning Index analysis. Her wonderful enthusiasm and energy were ever present.

We end the acknowledgements with heartfelt thanks to Russ Brinsfield, Sarah Taylor-Rogers, and the Maryland Center for Agro-Ecology, Inc. for their financial support of the project, but also even more for their flexibility, understanding, and support throughout the course of the project as it evolved, and for helping to see it to completion.

Executive Summary

Overview

This report is a collaborative effort to examine the opportunities and obstacles for making ‘green payments’ an effective and significant part of Maryland’s agriculture. Our group’s definition of ‘green payments’ is

“a voluntary incentive payment to a farmer for using farming practices **on working lands** that provides environmental benefits to the broader community.”

The Principal Investigators include farm policy experts, agricultural economics experts, and a number of individuals representing state and federal agencies and organizations with direct connections to key stakeholder groups (farmers, Extension, conservation technical staff, environmentalists, and others).

The report is presented in two sections because two separate teams developed each section. Certain valuable team members wanted to be directly involved with the research and results section of the report, but wished to maintain a healthy distance from any recommendations that were developed, because of the nature of their work responsibilities. These individuals played a key role in the development of Section I of this report (Background, Methods and Results) and are acknowledged. A second team, made up of many of the same individuals, was keenly interested in developing Section II (Policy Recommendations and Education Initiatives).

Section I – Background, Methods, and Results

Interest in the concept and practical tool of ‘green payments’ has intensified over the last couple of years as more and more people question the efficacy and costs of the current federal farm programs. At the same time farmers are being asked to implement costly measures to control agricultural pollution. The green payments approach provides an opportunity to address both of these issues in one farm program.

The Conservation Security Program (CSP) was created in the 2002 Farm Bill to be the first federal program devoted to ‘green payments’. CSP marks tremendous progress in the development of farm conservation programs as it differs from already existing conservation programs in two key ways:

1. It is the first federal conservation program that is designed by law to be an entitlement program, meaning that all eligible farmers who qualify are guaranteed participation (in reality the program has been underfunded and has become a “capped” entitlement).
2. It focuses incentive payments for environmental performance on **working lands of all farmers** regardless of size of farm or type of production system.

The Congressional Budget Office has estimated that about \$1 billion per year would be required to fully implement CSP as designed by law. However, for 2005 only \$204 million has been allocated for CSP. This represents less than 1% of the total farm program funding (estimated to be \$24 billion for 2005). This limited funding has had a profound affect on the

way that USDA's Natural Resources and Conservation Service (NRCS) has been able to design and implement CSP.

This report focuses on recommendations for the design and delivery of CSP in Maryland. Since CSP is a new program and is still being shaped, this is a critical time to provide input. September 9, 2005 is the final date for individuals and organizations to provide recommendations for changes to the program as it is currently designed. CSP has the potential to become a major program with substantially increased funding. This program could bring millions more dollars annually to Maryland's farmers. In its current under-funded state, CSP will bring approximately \$2.6 million additional federal funds annually to 377 Maryland farmers who receive CSP contracts. If the program were run statewide this dollar number could increase ten-fold. The objective of this project is to help shape a CSP program that maximizes the **dual** benefits of supporting Maryland's farmers and helping the environment.

The project methods evolved to take advantage of the inaugural sign-up period of CSP in Maryland. Despite delays, the sign-up began in March 2005 but ended May 31, 2005. The sign-up occurred in just two Maryland watersheds (the Monocacy and the Chester/Sassafras), as the program was limited to a small subset of farmers across the country because of the limited funding allocated by the Administration and Congress for 2005.

CSP is a complex program with many levels of participation; there are three 'tiers' with 15 Categories, four different payment components, and more than 50 qualifying practices and activities. As a result it is difficult to grasp all the different elements and permutations of the program. For this reason stakeholder evaluations were conducted with farmers in the two participating Maryland watersheds (the Monocacy and the Chester/Sassafras) who were most familiar with the program.

Stakeholder input was derived through farmer surveys and through eight farm case study analyses as well as from the members of the project team (all were stakeholders). The Farmer Surveys were conducted on two levels. First, written questionnaires were distributed at NRCS introductory CSP workshops (72 responded). Second, farmers were asked if they would be willing to participate in a more detailed telephone interview to learn their thoughts and opinions on CSP (52 telephone interviews were conducted). The farmer responses were generally very favorable to the program and to the NRCS staff who conducted it. Some concerns about the program design were expressed that were helpful in developing recommendations for program changes.

A total of eight case studies were developed. These case studies were useful for understanding the complexities of the program, what is required of participating farmers, and the benefits they receive. Of the eight case studies; three were cash grain operations of varying sizes, three were dairy operations of varying size (with one of the dairies being a grass-based operation), and two were grass-based beef operations. A case study for a vegetable farm was not done because none were available. The average acreage of the case studies was 392 acres and the average payment was \$6,263 per year over an average of 9.4 contract years.

One element of the project that emerged was an analysis of the NRCS Soil Conditioning Index (SCI). The Soil Conditioning Index (SCI) is a tool used by NRCS to evaluate the effects of farming practices on soil quality. It was found that the SCI was heavily weighted in the determination of farm eligibility and also in the amount of farm payments within the CSP. An analysis of the SCI was made to determine if the Index caused specific inequities or inherent disparities across types of farms. This investigation was a preliminary analysis to determine whether further analysis by NRCS was needed to ensure that the CSP was equitable regionally and across types of farms.

The analysis suggested that certain types of farms such as beef operations (grazing) or vineyards would rate better in their category and in the payments received per acre than a cash grain farm or a dairy farm. Vegetable farms may fare the worst. There were few vegetable farms applying to CSP (and thus few data sets for our comparison). There is a general belief among the project team and some NRCS field staff that this situation is because of the generally low SCI values for vegetable farms, which would have put them in low categories less likely to be funded.

The results of the CSP research and analyses were used by a second team of investigators to help develop the set of recommendations contained in “Section II – Policy Recommendations and Education Initiatives.”

Section II - Policy Recommendations and Education Initiatives

During the course of this project, the Conservation Security Program (CSP) had been implemented in 2004 (no Maryland watersheds were included) and 2005 (two Maryland watersheds participated – the Chester-Sassafras and the Monocacy) under the terms of an interim final rule which became an amended interim final rule. The Maryland Green Payments project team met regularly during this early implementation period, following program developments closely both nationally and in the state. The team incorporated results from the farmer surveys about the program and from the detailed case studies of particular farms representing the variety and diversity of Maryland agriculture. From these analyses 22 recommendations were made to strengthen CSP for Maryland’s farmers and to enhance the program’s environmental benefits. The recommendations focus on strengthening the water quality aspects of CSP and ensuring that Maryland’s farmers receive equitable treatment based on program provisions.

Below is a sampling of some of the 22 recommendations that are made in “Section II – Policy Recommendations and Education Initiatives.” Generally, the recommendations are focused on maximizing water quality benefits and making the program more ‘farmer-friendly.’

NRCS, as the agency responsible for CSP, should develop a Nutrient Index to help assess water quality benefits.

This would balance the heavy weighting of the Soil Conditioning Index (SCI) in determining eligibility and payment rates as currently exist in CSP.

Both the new and the enhancement payment practices should be heavily weighted to water quality and nutrients. (CSP has a payment category called an enhancement payment that provides a specific payment directed toward certain farm practices [such as no-till, or split application of fertilizer] to benefit the environment.)

Maryland should have the flexibility to ensure that:

- These practices support the tributary strategies, as these strategies focus on water quality and include practices with which farmers are familiar and have helped to develop.
- Enhancement payments are weighted based on the relative water quality benefits they provide (the tributary strategies include estimates of practice benefits which can be a guideline for the relative weighting of practices.).

NRCS should conduct an evaluation of the 2-year history of the program and its use of SCI values. The purpose would be to assess the fairness of the program and the

usefulness of SCI to meet program objectives. The assessment should examine regional program equity, farm equity, and whether adequate weight is given to water quality in determining eligibility and payment rates.

The CSP should be implemented as a nationwide program, without geographic restrictions, and should be implemented through a continuous sign-up process. If USDA maintains the current restriction (across limited watersheds and for a short sign-up period), the entire Chesapeake Bay watershed should be designated as a pilot program for CSP as a national priority enrollment area with continuous enrollment for the next ten years.

If a continuous sign-up is not instituted, then it is imperative that a longer sign-up period be provided that partially overlaps with the winter months.

The past CSP sign-up was over a relatively short period of time and during the height of the farmers' workload (late March through the end of May). This timing made it difficult for farmers to apply in a timely manner, and placed a significant burden on the NRCS field staff that had to work with the farm community to implement CSP during a short time frame.

To reduce the program's bias toward large farms (payments are largely acreage based) establish a minimum stewardship payment floor of \$500 annually for farms up to 50 acres and a floor of \$1,000 annually for farms greater than 50 acres. These floors could be across all tiers or could be graduated slightly by tier.

For a state like Maryland with a smaller than average farm size and lower than average rental rates, CSP is not equitably rewarding farmers who are providing good environmental stewardship. The average size farm in Maryland is 169 acres compared to the national average of 432 acres.

Offer more nutrient management practices and activities that qualify for enhancement payments, and make advanced cover cropping practices an enhancement activity, not just a new cost-share practice.

Enhancement payments provide strong incentives for positive environmental practices and it will benefit Maryland's farmers and water quality to include more water quality practices for payments.

SECTION I

ASSESSING AND DEVELOPING THE
OPPORTUNITIES FOR GREEN PAYMENTS
PROGRAMS FOR MARYLAND'S FARMERS

Background, Methods, and Results

Principal Investigators:

Michael Heller, Project Coordinator
Farm Manager, Clagett Farm
Chesapeake Bay Foundation

Robert Tjaden, Assistant Director,
Agriculture and Natural Resources
University of Maryland

Ferd Hoefner, Washington Representative
Sustainable Agriculture Coalition

Bryan Butler, Cooperative Extension
University of MD

Mark Waggoner, USDA-NRCS
State Resource Conservationist

Tom Simpson, Prof. and Coordinator
University of Maryland

Jim Hanson, Extension Economist
University of Maryland

Kim Kroll, Associate Director
USDA- SARE

Jim Lewis, Cooperative Extension
University of MD

Introduction and Background

This report is a collaborative effort to examine the opportunities and obstacles for making ‘green payments’ an effective and significant part of Maryland agriculture. This collaboration has consisted of individuals from the agricultural academic community, farm and environmental communities, Maryland Cooperative Extension, and federal agricultural agencies.

The term ‘green payments’ means incentive payments given to farmers for using farming practices **on working lands** that provide environmental benefits to the broader community. The definition of **working lands** includes any lands producing fruit, vegetables, and grain; and hay, pastureland, and forestland associated with an active agricultural operation; and buffers that are integrated into a working operation.

The ‘green payments’ concept has been actively discussed for over a decade. In 1994 Lynch described a green payment program as one that:

“would be a voluntary program providing direct monetary payments to farmers and/or farm landowners for the provision of environmental benefit(s). Given the general dissatisfaction with existing farm programs, a green support program (GSP) potentially offers great appeal as an alternative approach. The essence of this appeal is that a GSP would be acceptable under the GATT [General Agreement on Tariffs and Trade] and NAFTA [North American Free Trade Agreement], provide farm income support without introducing the distortions in price and commodity supplies that current farm programs promote, and address the public’s growing concern about environmental quality and food safety.”¹

Interest in the concept and practical tool of ‘green payments’ has intensified over the last couple of years as more and more people question the efficacy and costs of the current federal farm programs. At the same time, farmers are being asked to implement costly measures to control agricultural pollution. The green payments approach provides an opportunity to address both of these issues. Below is a brief background on each of these two areas:

1. Federal Farm Program Limitations

Some of the strongest criticisms of the current federal crop subsidy programs include:

- They are unfair in distributing payments across farms and across regions of the country. The federal government expects to pay out \$24 billion to farmers during 2005. Of this, approximately \$3 billion are targeted to conservation and environmental farming practices. The remaining \$21 billion will largely go to big farms growing key program crops (corn, wheat, soybeans, cotton and rice). More than 50% of the funds will go to fewer than 10% of farmers nationally. In Maryland, the largest 12 payment recipients each received more than \$1 million over the eight years from 1995 to 2002. However, only 1 Maryland farmer in 4 (25%) received crop subsidy payments (EWG). Regionally, Maryland and other Bay states receive proportionately less than many other states across the country, thus providing less

¹ Lynch, Sarah (editor). 1994. *Designing Green Support Programs*. Policy Studies Program Report No. 4. Henry A. Wallace Institute for Alternative Agriculture. (December)

support for Maryland farmers and their production and environmental efforts. For instance, in 2002 Maryland received federal funds per unit of production at a rate almost one fourth that of Georgia based upon the agricultural output for each state (3.7 cents of federal funds per dollar of production in MD, compared to 13.3 cents per dollar of production in GA.) (U.S. Ag Census). A major reason for this inequity was that farm subsidies primarily benefited a handful of "program" crops, including corn, soybeans, cotton, rice, wheat and sugar. Livestock and poultry farmers received fewer benefits, and fruit and vegetable farmers received no production subsidies from the government. This 'program' crop imbalance is totally inconsistent with USDA's own nutrition guidelines that recommend Americans increase the amount of fruits and vegetables in their diet. This difference in which crops receive subsidies is largely an historical artifact, dating back to a Depression-era program that was supposed to give temporary relief to farmers for low commodity prices; not a carefully considered approach to farm policy.

- Many federal farm subsidies are considered trade distorting, affecting crop prices internationally. Under the rules of the General Agreement on Tariffs and Trade (GATT), other countries may challenge these payments. A claim by Brazil against U.S. cotton subsidies was recently upheld by the World Trade Organization.
- Certain programs are viewed as causing greater environmental damage by tying payments to yield per acre, which may encourage higher use of crop fertilizers.

2. Agriculture and the Environment

The EPA Chesapeake Bay Program cites agriculture as the single largest source of undesirable nutrients (nitrogen and phosphorus) that fuel the algal blooms which create oxygen-starved water in the Bay and make shallow water too cloudy for underwater grasses to exist (U.S. EPA. 2003. Technical Support Document for Identification of Chesapeake Bay Designated Uses and Attainability. EPA 903-R-03-004. Region III Chesapeake Bay Program Office.).

There was a major increase in nitrogen (N) loads from agriculture during the 1960's and 70's. This was a period of major increases in crop yields and the use of nitrogen fertilizer, as well as a period of major concentration and intensification of animal agriculture, particularly poultry, in the region. Starting in the early 1980's N loads leveled off beginning a slow but steady decline that has continued since that time. This timing corresponds to the increased focus on N pollution in the Chesapeake Bay and implementation of programs, such as nutrient management, to reduce agricultural impacts. This reduction is encouraging, but is just a little more than one third of what is needed to achieve N loading goals.

Agriculture was estimated to contribute about 42% of the nitrogen reaching Chesapeake Bay in 2003 (EPA Chesapeake Bay Program). Nutrient management, cover crops, buffers, and other current practices must be more widely and rigorously implemented. Several underutilized practices such as "enhanced nutrient management" and grasses for bioenergy also offer major opportunities for additional reduction in N losses from agriculture. Innovative new practices, particularly related to feed management, must be refined and broadly implemented. Many of these practices can increase the costs to farmers.

Phosphorus is the other key agricultural nutrient having a significant environmental water quality impact. It is an important plant nutrient, but accumulates in soil when it is

applied at rates above crop needs. Agriculture is the single largest source of phosphorus pollution contributing 49% of the total phosphorus pollution reaching the Chesapeake Bay (EPA Chesapeake Bay Program). The accumulation of excessive soil phosphorus is largely related to increasing size and geographic concentration of confined animal production operations. Research over the last 20 years has shown that phosphorus can be lost in runoff when soil levels are very high, even when erosion is controlled.

It is difficult to treat non-point agricultural pollution, unlike industrial point sources of pollution, after it is generated because of its diffuse nature. Efforts to control agricultural pollution must focus on altering farmers' production practices, which often has an impact on the net financial return for a farmer. Therefore financial assistance to control farm pollution is important. The Chesapeake Bay Program pollution assessment has determined that controlling nutrient pollution from farms is far more cost effective than controlling nutrient pollution from most point sources. But given the tremendous financial and environmental pressures facing Maryland farmers it is critical that funds be identified to provide farmers with financial help to address agri-environmental pollution.

The question of how green payments programs might address these two looming issues (federal farm payment shortcomings and helping farmers address agricultural pollution) is being discussed among stakeholders of both the agricultural and environmental communities. This discussion has intensified with the creation of the new Conservation Security Program (CSP) by Congress in the 2002 Farm Bill. Also fueling interest is the increased concern over further international trade challenges to the U.S. crop subsidy program. There is also genuine recognition that our farm program subsidies are creating unfair competition with underdeveloped countries in which farmers receive little or no government support. In Europe these same concerns have spurred a strong move toward a green payments farm program approach with the new government program called "Environmental Stewardship." In this program farmers earn points for environmental and countryside aesthetic practices, and after reaching a certain number of points, the farmer receives a payment from the government.

In the U.S., the Conservation Security Program (CSP) is a new 'green payments' program that is designed to comply with international trade agreement limits on crop subsidies. CSP marks tremendous progress in the development of farm conservation programs since it differs from already existing conservation programs in two key ways:

1. It is the first federal conservation program that is designed by law to be an entitlement program, meaning that all eligible farmers who qualify are guaranteed participation.
2. It focuses attention on environmental performance on **working lands** of **all farmers** regardless of size or crop production system.

The CSP is a voluntary stewardship incentives program designed to pay farmers for clean water, better soil management, improved habitat, energy efficiency, and other natural resource benefits. The CSP provides income enhancement in a manner consistent with the public interest in natural resource protection, a clean environment, and world trade rules and obligations. The CSP emphasizes support for the stewardship of working lands rather than land retirement, and it emphasizes a conservation-system and performance-based approach rather than simply a traditional practice-based approach. Finally, it provides support to all regions of the country and all types of agriculture rather than favoring specialized production of a small number of crops.

The current debate surrounding CSP has been sharpened by the fact that Congress and the Administration have decided to severely limit funding for the program. The Congressional Budget Office has estimated that to fully implement the program as designed by law about \$1 billion per year would be required. However, for 2005 only \$204 million has been allocated for CSP. This funding represents less than 1% of the total farm program funding (estimated to be \$24 billion for 2005). This limited funding has significantly affected the way that USDA's Natural Resources and Conservation Service (NRCS) has been able to design and implement CSP.

This report focuses on recommendations for the design and delivery of CSP in Maryland. Since CSP is a new program that is still being shaped, this is a critical time to provide input. CSP has the potential to become a major program with substantially increased funding. This program could bring millions more dollars annually to Maryland's farmers. The objective of this project is to help design a program that maximizes the **dual** benefits of supporting Maryland's farmers and helping the environment.

Project Scope

The new federal Conservation Security Program (CSP) was the focus for two reasons:

1. It is the first green payments farm program at the federal level that focuses incentive payments on working agricultural lands. The initial design and implementation will have a strong influence on the direction, interest, and effectiveness of the program throughout its life. The program is currently being shaped and the overall structure of the program will likely be finalized by the end of 2005.
2. CSP is a new program with new funds available for farmers and conservation. CSP has the potential to be significantly expanded with as much as \$1 billion annually available across the nation. This program could bring millions of additional dollars to Maryland's farmers as incentives for environmentally sensitive farming practices.

A well-designed CSP which has the flexibility to address Maryland's specific needs could be a tremendous asset for Maryland's farmers and the environment.

Project Goals

The project had five basic goals:

1. To analyze the Conservation Security Program (CSP) from the perspective of Maryland's needs and opportunities.
2. To use the program analysis to gain informed stakeholder input through a survey to determine Maryland farmers' needs and interests in CSP.
3. To develop case studies which could be used for CSP program assessment, as well as educating others about CSP.
4. To integrate all sources of information to develop a clear set of recommendations for program improvements designed to maximize the benefits of supporting farmers to protect the environment.

5. To provide outreach and education to make beneficial changes in the program design and to increase program interest and effectiveness.

Methods

The Core Team and General Approach

The core team, which is made up of all the Principal Investigators, was designed to ensure that a broad range of perspectives would be incorporated throughout the project and included in the final report. The team includes farm policy experts, agricultural economics experts, and a number of individuals representing state and federal agencies and organizations with direct connection to key stakeholder groups (farmers, Extension, conservation technical staff, and environmentalists).

The project methods evolved to take advantage of the inaugural sign-up period of CSP in Maryland. This sign-up period began in March 2005 and ended May 31, 2005, with numerous delays occurring prior to the sign up. The sign-up occurred in just two Maryland watersheds (the Monocacy and the Chester/Sassafras) as the program was limited to a small subset of farmers across the country because of the limited funding allocated by the Administration and Congress for 2005.

The core group developed a set of guidelines for a realistic program in the state by setting funding levels, eligible acres, and basic eligibility criteria. These guidelines were used as a measuring stick as the team evaluated the CSP and its implementation in Maryland. CSP was tracked at the same time the rules for the program were taking shape. In creating a baseline for a Maryland program the team used the following assumptions:

1. that \$30 million was a reasonable funding level based upon the average of federal farm program funds coming to Maryland over the last several years.
2. that there be some consistency with the CSP as it was emerging, and so adopted some of the positive aspects of the CSP framework as they were emerging:
 - The program structure would include 3 tiers (T= Tier) of participation. The 2002 Farm Bill established 3 tiers of farm participation based upon the amount of the farm (a portion or the whole farm) applying, and the number of different resources (water, soil, wildlife, etc.) of concern being addressed.
 - Resources of Concern (ROC) are a key eligibility criterion. ROC is a USDA Natural Resources Conservation Service (NRCS) designation for different resource conservation priorities.
 - 'Management Intensity' (MI) should be a key to the enhanced payments. MI is a developing concept in which farmers would receive increasing credit (money) for increasing the environmental benefits through increased management within a given practice.
3. that water quality should be a strong program emphasis, ensuring that program eligibility and incentive payments should include evaluation of a farmer's efforts to reduce nutrient losses to the environment.

CSP Evaluation

CSP is a complex program comprising three tiers, 15 categories, four different payment components, and more than 50 qualifying practices and activities. As a result, it is difficult to grasp all the different elements and permutations of the program. For this reason stakeholder evaluations were conducted with farmers who were most familiar with the program. Farmers in the two participating Maryland watersheds (the Monocacy and the Chester/Sassafras) were involved.

Farmer Surveys

Informed input from farmers was essential so the team worked with NRCS to set up the survey. Survey forms (Appendix 1) were distributed at the NRCS introductory workshops on CSP in the two watersheds. The surveys inquired whether the farmers would be willing to do a follow-up telephone interview after they had had time to think about the program and decided whether to apply. Telephone interviews (Appendix 2) were done with all farmers who had agreed and could be reached. All interviews were conducted by the same person to eliminate the possibility of different interpretations by different interviewers.

Farm Case Studies

The case studies were developed around farmers and farms that had gone through the CSP application process. The Core Team identified types of farms to include (i.e. cash grain, dairy, beef, poultry, vegetable, and fruit). Farmers were chosen from those who participated in the telephone interviews because NRCS and the team wanted to respect the confidentiality of participating farmers. Working from this pool, eight farms were selected to use for case studies. Farms were selected to reflect the more common production systems in Maryland that were available in the two participating watersheds. The existing pool to choose from did not include any vegetable, fruit, or poultry farms, so those types of farms are not included as case studies. Each case study farmer was interviewed in person on his or her farm. One person conducted all the interviews to minimize variations in the process. Each interview lasted between 2 and 4 hours and addressed specific case study elements established by the Core Team. Follow-up questions were handled by telephone calls when necessary. To ensure accuracy, the case study write-up was sent to the farmer and to the involved NRCS field staff for review. The case study farmers were guaranteed confidentiality, as they had agreed to provide financial information on their potential CSP contracts.

Soil Conditioning Index

The Soil Conditioning Index (SCI) is a tool used by NRCS to evaluate the effects of farming practices on soil quality. It estimates the rate of soil regeneration compared to the rate of soil loss on a given field by evaluating effects of tillage, rotations, crop yields, field characteristics, and other factors. The SCI value is determined from the NRCS RUSLE2 computer program and provides a fairly sensitive number for soil gain or loss, based on farming practices and field characteristics.

During the analysis it was concluded by the team that the SCI was heavily weighted in the determination of farm eligibility and also in the amount of farm payments within the CSP.

As CSP was compared to the guidelines for a state model program, the team realized this use of SCI was not consistent with the approach to give strong consideration to water quality factors. SCI does have water quality implications, but is not directly tied to nutrient loss reductions in the same way as cover crops or nutrient application. It was decided to do an analysis of the SCI to determine whether we felt that it adequately evaluated the water quality ROC that should be central to an effective CSP for Maryland. There was also concern that SCI might be overvalued for certain tillage systems, and might favor some types of farms over others (beef or cash grain over vegetable).

Working with NRCS, 335 data sets were analyzed for SCI values for farms that had applied to the CSP in both Maryland watersheds. Because there were close to seven hundred data sets that needed to be searched for this SCI information, a subset of the available data was analyzed. Fifty percent of the available data sets were sampled by selecting every other one to analyze. Each data set was examined to determine the following information: SCI value, farm production type, predominant tillage, rotations for length in years and whether it had perennial crops included, use of cover crops, and manure use.

As the data sets were reviewed it became clear that not all of the farmers' fields were in the RUSEL2 Database. Because a farmer enters the CSP program with the lowest SCI value, farmers may have chosen not to enroll or even run Skis on fields that would reduce their category level (from an A to a B) and reduce their likelihood of receiving a contract. This tendency would explain the relatively high SCI values and why most of the farms reviewed were enrolled as Category A (the highest category for eligibility purpose). This tendency might also explain why there were very few vegetable growers in our sample--none that were predominantly (50% or more of the farm operation) vegetable growers. Farmers can use several production systems (cash grain and vegetable), tillage practices, and fertilizers in their rotations. In many cases the categories overlap (e.g. vegetables mixed in with cash grain). To deal with this overlap, a "50% rule" was used in determining data characteristics. For example, if a field spends more than 50% of its time in "Cash Grains" it will be designated as "Cash Grains." The same is true for tillage and manure use. Several different variables were able to be analyzed.

Results

Farmer Surveys

There were 72 responses to the written questionnaires and there were 52 telephone interviews. Through this process, general themes emerged from those who responded. The specific responses to the written questionnaire and the telephone interviews are contained in the two sections following the overall themes.

Overall Themes

1. Of the 52 respondents, 35 completed the self-assessment. Of those, 32 applied to the program and 27 were confident that they qualified.
2. There were 29 farms producing cash grains as their primary commodity. Average size of the cash grain farms was 640 acres (this average acreage is higher if counting hay and pasture ground on some of those farms)
3. Most respondents felt that NRCS staff were helpful and they appreciated the informational meetings

4. Most respondents believed the timing of the spring sign-up period was inconvenient given demands of field work
5. Most were supportive of the CSP's approach of linking environmental stewardship to payments, though reaction was mixed to the idea of replacing commodity programs with a 'green payments' program
6. There is considerable rented ground on the Eastern Shore and dynamics between landowners and farmers complicated the process for many responders, although not for all.
7. Farmers of smaller farms declined to enroll because they felt the money received just was not worth the time involved.
8. Nearly all of the respondents felt they had a good, basic understanding of CSP and most understood the front loading of payments
9. Nearly all supported CSP's use of acreage to help determine funding levels, (although most of the farmers who were not enrolled due to small farm size did not answer this survey question and would have likely thought otherwise).
10. Of those who decided not to apply, there were a variety of reasons for doing so including being too small, not enough time, wrong watersheds, and inadequate records.

Responses to Written Questionnaire (Appendix 1)

1. Have you participated in other agricultural conservation programs?

Soil/Water Conservation Plan	27
EQIP	19
WHIP – 15 CRP/CREP	14

2. How did you learn about this meeting?

Mailing	35
Friend/Family	7
Agency contact	2

3. What was your purpose in attending this meeting?

Seek information	42
Learn how to sign up	21
Curiosity	5

4. Were the presentations at this meeting helpful for you to understand CSP?

Very helpful	35
Moderately helpful	16
Not really helpful	0

5. Based on these presentations, would you guess that your farm or a part of your farm would qualify for the program?

Yes	44
No	2
Unsure	5

6. If you should desire to sign up for CSP, do you anticipate any barriers for your farm operation?

Lack of farm records	11
SCI too low	7
Other	4

7. Do you need additional information to decide whether to participate?

Yes	23
No	21

8. What do you plan to do now?

Proceed with signup	43
Other	4
Not sure	2

Telephone survey results

The 52 telephone interviews consisted of nine questions and typically lasted between 5-10 minutes, although some farmers were interested in talking longer. There were some farmers who did not apply for the program and were not interested or able to answer all of the survey questions (Appendix 2).

1. Did you do the 'CSP self-assessment' for your farm?

Yes	35
No	15

If yes, was the self-assessment understandable and of reasonable length?

Yes	27
No	8

2. Did you apply for a CSP contract?

Yes	32
No	12

If no, why not?

Too small	4
Wrong watershed	2
Timing	3
Other	2
Didn't qualify as farm	2
Farmer (renter) didn't want to	3

3. Did your farm qualify?

Yes	27
No	4
Not sure	4

4. Did you use the payment calculator to assess payments for your farm?

Yes	22
-----	----

No	14
a. Was the ballpark payment estimate higher or lower than you expected?	
Higher	8
Lower	2
About what expected	8
No opinion	4
b. Do you understand the front loading of payments under the CSP?	
Yes	27
No	8
No opinion	2
5. Do you feel you understand the basics of the CSP?	
Yes	35
No	1
Somewhat	1
6. Do you like or dislike or have no opinion on the following questions:	
a. linking environmental farming practices to the income payments?	
Like	28
Like somewhat	4
Dislike	2
No opinion	6
b. the 3-tiered approach?	
Like	23
Like somewhat	2
Dislike	2
No opinion	10
c. Do you understand the concept of the management intensity approach?	
Yes	25
No	7
Not sure	3
d. Do you like, dislike or have no opinion of it?	
Like	16
Like somewhat	4
Dislike	1
No opinion	11
7. For the acreage use to determine payment levels is this: too much emphasis; too little emphasis; just right?	
Just right	28
Too much	1
No opinion	8
8. Do you or have you received commodity program payments?	
Yes	27
No	6
Not sure	2

9. Do you think having CSP gradually replace commodity program payments (linking income payments to environmental farming practices) would be: a good thing; a bad thing; no opinion?

Good	16
Somewhat good	6
Bad	7
No opinion	6

Specific individual telephone interview comments of interest

Note that the number represents the number of farmers responding with a specific statement. Some similar statements have been grouped/generalized to represent multiple individuals.

1. Linking environmental practices to payments is acceptable, BUT:
 - Don't shift to enforcement: 3
 - Don't eliminate commodity payments: 5
 - Base it on "sensible" standards: 4
 - If payments stay the same: 1
 - Landlords are an issue: 5
 - OK if payments are permanent: 1
 - OK if World Trade Organization will require it anyway: 1
2. Green payments are good because they appeal to non-farmers: 2
3. Records and paperwork are too much/overkill: 9
4. Goals of program are excellent: 3
5. Wrong time of year/program was rushed 8
6. Feel program standards changed mid-stream 1
7. Thinks most farmers are good stewards already: 3
8. 3 tier approach is an incentive to get in, then improve: 4
9. Hope NRCS recognizes farmer software and records: 3
10. Non-farm pollutants need to be addressed: 3
11. Planned management won't reflect actual (day to day) management: 4
12. Benefits big farms too much: 2
13. Working with landowners is no problem: 1

14. My farm was too small to make it worthwhile to apply:

5

Case Studies

A total of eight case studies were developed, using farms that had applied to CSP within the two participating Maryland watersheds. One full case study is included in this section as an example. The other seven are attached as Appendices 3-9. All case studies provide an understanding of how CSP works for a farmer.

Summary of CSP Case Study Payments

<u>No. of Cases</u>	<u>Type of farm</u>	<u>Acreage Enrolled</u>	<u>Tier level</u>	<u>Total \$</u>	<u>Contract Length</u>
4	cash grain	939	III	\$140K	10 years
2	cash grain	650	III	\$113K	10 years
7	cash grain	181	III	\$53K	10 years
3	dairy	168	I	\$18K	5 years
8	dairy	748	II	\$106K	10 years
5	dairy grazing	53	III	\$14K	10 years
1	beef grazing	88	III	\$27K	10 years
6	beef grazing	306	III	\$63K	10 years
Averages		392 acres		\$58,875	Over 9.4 years

Maryland released the results of the CSP sign-up for the two Maryland participating watersheds on July 26, 2005. Of 410 submitted applications, 377 will receive contracts. While the precise official figures were not available, the average contract was estimated to be between \$6,000 and \$8,000 per year. This estimate is consistent with the rough average of the case studies, which is about \$6,300 per year.

Example of a Case Study

**Case Study #2 Mid-Sized Cash Grain Operation
Conservation Security Program Plan**

I. Introduction

This farming operation is a family partnership and has been in existence for 11 years. The total operation is 650 acres and all land is rented from a total of 20 landlords. All but four of these acres were enrolled in CSP. The farm’s primary crops are corn, soybeans, and hay. Tillage operations are entirely no-till except for those fields receiving manure.

In the late 1980’s the operators began producing no-till corn which improved management on those fields having rather thin, red shale soils. Conventional tillage was especially difficult when soils were wet. The operation also includes a small beef operation.

II. Farm Overview

Land

- Soils information – Pe-Penn Loam; Pn-Penn Silt Loam; Ph-Penn Shale Silt Loam.
- Typical rotations are corn-soybeans-corn and corn-soybeans-wheat-soybeans-corn.
- One stream passes through part of farm; hedgerows have largely been retained; livestock have limited access to stream.
- There are two pasture lots with a sacrifice area.
- 30 acres are enrolled in CRP and are therefore ineligible for enrollment in CSP.

Operations

- Cash grain operation
- Average yields are corn = 110 bu/ac, wheat = 50 bu/ac, beans = 35bu/ac
- Farm includes small beef operation, typically between 20 and 35 head, made up of Hereford cull calves obtained from a neighboring operation.

III. Highlights of CSP plan

- Tier III, Category A
- Soil Conditioning Index = .4 for Group #1 fields, .6 for Group #2 fields, and .8 for Group #3 fields
- Soil Tillage Intensity Rating (STIR) = less than 15
- Enhancements include:

Breakdown of first year payment:

Estimated Benchmark Stewardship payment	\$3058
Estimated Existing Practice payment	\$764
Estimated Enhancements payment	\$28,126 (= \$18,751 x 150%)

IV. Conservation Security Program Qualifications

- Farm qualified for Tier III because the entire farm met all applicable resource concerns, had a wildlife index score >.5, protected riparian areas and had no readily observable erosion or point contamination at signup.
- Farm qualified for Category A based on conservation activities in the areas of soil quality, water quality and wildlife.

- Benchmark Enhancements (Field Group #1=183.5 acres, #2=424.4 acres, #3=39.2 acres; AG=All or 647 ac.)
 - Energy – Recycle motor oil: \$200/year
 - Energy – STIR value less than 15: AG x \$.90/ac = \$582
 - Energy – uses perennial legumes for nitrogen: 10 ac of Group 2 x \$.70/ac = \$7
 - Energy – uses annual legumes for nitrogen: AG x .10/ac = \$65
 - Habitat – Habitat Index score between .7 and .8: AG x \$8/ac = \$5176
 - Nutrient Management – Split N applications: AG x \$2/ac = \$1294
 - Nutrient Management – Incorporate manure < 24 hours: 15 ac of Group 2 x \$2/ac=\$30
 - Pest Mgmt – weather-based forecasting: AG x \$1/ac = \$647
 - Soil Mgmt – SCI score of .4: Group 1 x \$1.16/ac x 4 = \$851
 - Soil Mgmt – SCI score of .6: Group 2 x \$1.16/ac x 6 = \$2954
 - Soil Mgmt – SCI score of .8: Group 3 x \$1.16/ac x 8 = \$364
 - Soil Mgmt – STIR value less than 15: AG x \$2/ac = \$1294
 - Air – carbon sequestration through continuous no-till: AG x \$10/ac = \$6470
 - Air – incorporate animal manure w/in 24 hrs to reduce NH4 volatilization: 15 ac of Group 2 x \$5/ac = \$30

V. Estimated Payment Schedule for Farm #1 under CSP

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
%	150%	90%	70%	50%	30%	10%	0%	0%	0%	0%
Enhancement	28125	16875.84	13125.66	9375.469	5625.281	1875.094	0	0	0	0
Stewardship	3058	3058	3058	3058	3058	3058	3058	3058	3058	3058
Existing Practice	764	764	764	764	764	764	764	764	764	764
Additional Practices		0	0	0	0	0	0	0	0	0
Total	\$31947.00	20697.84	16947.66	13197.47	9447.281	5697.094	3822	3822	3822	3822

Total Estimated Payment for CSP Contract = \$113,223.8

Total estimated annual Enhancement payment = \$18,751 (x 150% for first year, declining thereafter)

Total estimated annual Stewardship payment = \$3,058

Total estimated annual Existing practice payment = \$764.00 (=25% of Stewardship payment)

Note: CSP limits total annual payments as follows: Tier I = \$20,000, Tier II = \$35,000 and Tier III = \$45,000

Annual enhancement payments are limited to: Tier I = \$13,750, Tier II = \$21,875 and Tier III = \$28,125

VI. Conclusion

If funding levels allow, the Conservation Security Program will provide increased income to this operation of an estimated \$113,223 over ten years. This increase translates to \$175/acre over the contract period or roughly \$17.50/acre/year. Future conservation work may include construction of a semi-solid manure storage structure and installation of new grass waterways and maintenance of existing waterways. The operators feel generally positive about the

program, including the tiered structure that allows for additional enhancements to be added in subsequent years. They also support the approach of rewarding good managers.

Soil Conditioning Index

Three hundred thirty-five data sets were analyzed (each data set represents a farm field) from the NRCS data bank of farms applying for CSP. A comparison of the Soil Conditioning Indexes (SCI) across production systems was made for the following: production type, tillage, cover crop use, manure use, and types and lengths of rotations. The tables below present the results.

#1 Production & Average SCI

Production	Average SCI
Vineyard	0.90
Beef	0.73
Cash Grain	0.46
Cash Grain/Vegetable	0.43
Dairy	0.42
Vegetable	0.20
Grand Total	0.46

#2 Tillage & Average SCI

Tillage	Average SCI
Conventional	0.24
No-Till	0.52
Grand Total	0.46

#3 Fertilizer & Average SCI

Fertilizer	Average SCI
Commercial	0.49
Manure	0.32
Grand Total	0.46

#4 Cover Crop & Average SCI

Cover crop	Average SCI
Yes	0.49
No	0.34
Grand Total	0.46

The SCI is heavily weighted in CSP as it is used to determine:

1. program eligibility,
2. program category (The category is used to rank all the eligible farms; the higher the category the more likely a farmer is to be given a contract and program)

payments. The categories are used because there are not enough funds available for all the farms that are eligible.),

3. a portion of the program enhancement payments.

Below are the SCI values for Categories (which determine the likelihood of a farm receiving funding):

Category Soil Conditioning Index

- A. SCI > or equal to 0.30, or STIR rating < or equal to 15
- B. SCI > or equal to 0.20, or STIR rating < or equal to 30
- C. SCI > or equal to 0.10, or STIR rating < or equal to 60
- D. SCI > or equal to 0.10, or STIR rating < or equal to 100
- E. Must meet program eligibility requirements.

The table below shows the CSP enhancement payment the farmer receives for each acre of land based on the farm's SCI value. As can be seen, the price the farmer receives goes up with each increase in SCI. (For CSP a value is rounded up if it is 0.05 or more; for example, an SCI of 0.45 is considered 0.5.)

Below are the SCI values for enhancement payments:

SCI	Payment per acre
0.1	\$1.16
0.2	\$2.32
0.3	\$3.48
0.4	\$4.46
0.5	\$5.80
0.6	\$6.96
0.7	\$8.12
0.8	\$9.28
0.9	\$10.44
1.0	\$11.60
1.1	\$12.76
1.2	\$13.92
1.3	\$15.08
1.4	\$16.24
1.5	\$17.40
1.6	\$18.56
1.7	\$19.72
1.8	\$20.88
1.9	\$22.04
2.0	\$23.20
2.1	\$24.36
2.2	\$25.52
2.3	\$26.58
2.4	\$27.84

The SCI analysis was performed to determine if there were specific inequities or inherent disparities across types of farms embedded in its calculations. This analysis was preliminary to determining whether further analysis by NRCS is warranted to ensure that the CSP is equitable regionally and across types of farms.

The analysis suggests that certain types of farms such as beef operations (grazing) or vineyards will do better in their category ratings and in the payments that they receive per acre than a cash grain farm or a dairy. Vegetable farms may fair the worst. There were few vegetable farms applying to CSP (and no data sets that were predominantly vegetable farms for our comparison). It is believed that this disparity is because of the generally low SCI values that would have put them in low categories less likely to be funded. A fundamental question that must be answered is whether we want the best farms overall to be encouraged and rewarded by CSP, or whether we want to encourage and reward the best farms within a production system, i.e. the best of beef farms and the best of vegetable farms.

Tillage was understandably a major factor in SCI values, and no-till operations scored more than twice as high as other tillage systems. This scoring has positives without question. However, because no-till also receives an enhancement payment a no-till operation is rewarded twice or more – once in the higher SCI rating which gives it a higher category rank and a higher SCI enhancement payment and again for the no-till enhancement payment.

Interestingly, using manure in the farm system led to a lower SCI value than using just commercial fertilizer. If all other farm practices are held constant the use of manure will increase an SCI value. Thus, the lower values that were found are likely due to increased tillage in the incorporation of the manure, a practice that the University of Maryland highly recommends for water quality reasons.

The use of cover crops led to an increased value for SCI, which means that use of cover crops is receiving some credit in CSP through the SCI.

The above results of the project's research and analyses were used by a second team of investigators to develop the set of recommendations contained in next section – "Policy Recommendations and Education Initiatives."

SECTION II

Policy Recommendations

During the course of this project, the Conservation Security Program (CSP) was implemented in 2004 (no Maryland watersheds) and 2005 (two Maryland watersheds – the Chester-Sassafras and the Monocacy) under the terms of an interim final rule and an amended interim final rule. The Maryland Green Payments project team has met regularly during this early implementation period and has followed program developments closely nationally as well as closely in the state. The team has incorporated results from the farmer surveys about the program and from the detailed case studies of particular farms representing the variety and diversity of Maryland agriculture. A subset of the project team used the results of the project and its collective thinking to develop recommendations for future program development of CSP. The policy development team included the following:

Michael Heller, Project Coordinator
Chesapeake Bay Foundation

Kim Kroll, USDA- SARE

Ferd Hoefner, Washington Representative
Sustainable Agriculture Coalition

Bryan Butler, Cooperative Extension
University of Maryland

Jim Lewis, Cooperative Extension
University of Maryland

Tom Simpson, University of
Maryland

2005 INTERIM FINAL RULE CONTAINS SOME IMPROVEMENTS OVER 2004 RULE.

USDA has taken positive steps in making changes to CSP. The rules for the program have undergone a few different revisions and are about to undergo yet another set of revisions after the comment period for the rule changes is over on September 9, 2005. The most recent changes to the program have addressed some of the problems that existed, but many problems still remain. Below are some of the rule changes that exemplify the positive steps taken:

1. Removing the regulatory contract payment cap.

The contract limitation in place for the 2004 sign-up discriminated against smaller farms relative to larger ones, and discriminated against areas of the country with relatively low rental rates. Its removal in the amended interim final rule is a real step forward for Maryland's participation in the program.

2. Paying base (“stewardship”) and existing practice payments on pastureland at cropland rental rates.

This change will facilitate the participation of grass-based production systems in the program. Relatively lower rental rates on pasture otherwise could leave important acreages out of the program and prejudice the program toward maximizing cropping, irrespective of environmental benefits. The project's beef operation case studies illustrate the benefits to Maryland farmers of this change, as the payments to these farms are large enough to encourage farmer participation.

3. Increasing program flexibility.

By allowing transitions from 5 year contracts to 10 year contracts for producers who choose to move up from Tier I to Tier II or III during the contract period, and by not forcing producers to wait for a year to receive the higher tier payments, the program has been made more farmer-friendly and encouraged participants to consider moving up to higher levels of stewardship.

4. Providing beginning farmers and limited resource farmers with a 15% higher cost-share level, as provided for in the CSP statute.

5. Allowing CSP payments for practices that have been adopted by a producer as part of a conservation compliance plan if they exceed the minimum practices required by law and regulation.

This change ensures that farmers will not be penalized for their previous decisions and efforts to exceed minimum requirements.

RECOMMENDATION 1. The above rules should be maintained.

The above changes improve the program and will benefit Maryland's farmers. These changes should be retained in the development of the final rules or additional amended interim final rules.

CSP REGULATIONS CONTINUE TO HAVE SIGNIFICANT PROBLEMS.

There continue to be significant problems with CSP regulations, and the following recommendations are being made to strengthen the program, particularly as CSP relates to Maryland: (Note: the recommendations are organized by CSP program elements and issues.)

ISSUE – CSP needs increased emphasis on water quality.

CSP has been designed to require participating farmers to meet minimum soil and water quality criteria. This is a good concept, but the soil quality is more heavily weighted because of the strong emphasis on the use of the Soil Conditioning Index (SCI). SCI is used to determine program eligibility and is also used as one key determinant of payments a farmer receives. (See SCI in Section I). In Maryland, there is tremendous interest in improving water quality in the Chesapeake Bay. Farmers are being urged to implement a substantial number of water quality improvements in their farm operations. Farmers should be rewarded for doing a good job under CSP. Furthermore, these rewards will encourage them, as well as others, to increase their conservation efforts.

RECOMMENDATION 2 – NRCS, as the agency responsible for CSP, should develop a Nutrient Index to help assess water quality benefits.

This index should take into account the delivery of nutrients to ground and surface waters from the farm production system. In Maryland and the Bay watershed the index should estimate land use loads by using the Best Management Practice (BMP) efficiency ratings of the Chesapeake Bay Tributary Strategies. These ratings give reasonable "relative" rankings for practices and the payments should reflect these relative efficiency rankings.

RECOMMENDATION 3 – Eligibility to enter Tier III should include higher water quality scoring than for Tiers I or II using a measure such as a Nutrient Index (to be developed).

Currently requirements to enter Tier III are minimally higher than for Tier II, and require only that a farmer address additional resources of concern such as wildlife, air quality, and energy. The requirements for these are very modest and yet the increased payments that a farmer receives for being in Tier III are substantial. More water quality emphasis should be required to get into Tier III.

ISSUE – The Soil Conditioning Index (SCI) needs to be carefully analyzed to determine whether it is achieving the desired program goals in a fair and equitable manner.

An analysis of more than 300 SCI values was performed from Maryland farms interested in CSP. This analysis indicates that SCI may favor certain types of production over others. For example, beef operations do very well with SCI values and vegetable farms appear to do poorly (See Appendix 11 – SCI Analysis). CSP should be designed carefully to reward the above-average producers within a type of production (dairy, beef, etc.), not favor one type of farm over others. This weighted use of the SCI is very important as it is used for eligibility determination and category ranking, and it is also used for determining a significant portion of the payments to farmers.

RECOMMENDATION 4 – NRCS should carefully evaluate SCI values over the program’s two-year history, comparing those that have been accepted into the CSP program with those not accepted to assess the fairness of the program and the usefulness of SCI to meet program objectives. Any inequities that result from the use of the Index should be addressed.

ISSUE – Make CSP a nationwide program with continuous sign-up.

CSP will not achieve major benefits for Maryland’s farmers and the environment until it is available to farmers statewide, with sign-up available throughout the year. USDA continues to limit CSP eligibility for each sign-up to farmers and ranchers within a small number of watersheds. Moreover, within those watersheds, USDA establishes certain "enrollment categories and subcategories" of eligible farmers and ranchers and uses these categories to rank farmers in order to decide who gets to participate. USDA intends to allow each watershed to participate in the program just once every eight years, using what it calls a “watershed rotation” approach. Rather than allowing farmers to sign-up for the program during times of the year when they have more time to develop conservation plans and contracts, USDA is limiting sign-up to a short period.

The restrictions limiting enrollment to selected watersheds and to instituting a continuous sign-up process should be removed. The CSP should be a nationwide and statewide program available to all types of producers in all regions, as provided for in the 2002 Farm Bill. Moving to a continuous sign-up would make the program far more farmer-friendly.

RECOMMENDATION 5 – The CSP should be run as a nationwide program without geographic restrictions and should be implemented through a continuous sign-up process.

However, if USDA does maintain these restrictions, the entire Chesapeake Bay watershed should be designated as a pilot program for CSP, as a national priority enrollment area open to enrollment continuously for the next ten years.

RECOMMENDATION 6 – If a continuous sign-up is not instituted, then it is imperative that a longer sign-up period be provided to overlap with the winter months.

This past CSP signup was over a relatively short period of time and during the height of the farmers' workload. This made it very hard for farmers and caused a very difficult period for the NRCS field staff that had to work with the farm community to implement CSP during a shortened, busy period. In the telephone interviews (Section I Results) eight farmers commented that the signup was at the wrong time of year or that the program was too rushed.

ISSUE – Provide farmers a second enrollment chance.

A new sign-up category should be created for any farmer who applies to enroll in CSP in the year his or her watershed is eligible, but fails to get in either due to lack of available funding, or because he or she cannot meet each and every eligibility criterion at that particular time. These farmers should be allowed a second chance to enroll in the year immediately following the single year in which their watershed is eligible. If USDA does not make at least this small, practical change, it will create extreme frustration among farmers with the way the program is administered and deny the public the conservation and environmental benefits that could otherwise be provided. For example, in the project survey half of the farmers, who thought that their farms would not qualify, responded that it was because of the lack of adequate records. Record keeping is important, and is something that a farmer could address if given a second opportunity to apply to the program.

RECOMMENDATION 7 – Provide those farmers who have applied and been turned away once a second chance to enroll in CSP in the year immediately following their watershed's participation in CSP.

ISSUE – Clarify Contract Renewals.

The statute stipulates that CSP participants who are fulfilling the terms of their conservation plans have the right to renew their contracts at the end of the contract term. This will encourage continued strong environmental practices on participating farms, and provide farmers assurance of continued incentive payments.

RECOMMENDATION 8 – It should be clearly stated that contracts can be renewed by farmers in good standing.

ISSUE – CSP Eligibility Requirements. Allow farmers to satisfy the resource management system or non-degradation level of resource protection within the first three years of the CSP contract rather than making it a condition of eligibility.

The amended interim final rule and the sign-up notice require Tier I and II participants to have satisfied the non-degradation standard or quality criteria for soil quality and water quality and Tier III participants to satisfy the complete resource management system level for all resource concerns as a condition of being allowed to enroll in the CSP. A farmer should be given a reasonable time limit (such as a two- or three-year period) to reach the standards required for the CSP. This will encourage increased environmental practices by those farmers wishing to be accepted into CSP and to receive program incentive payments.

RECOMMENDATION 9 – Allow farmers to be eligible for a CSP contract if they commit to achieving the minimum soil and water quality criteria within the first 3 years of the contract. Consideration could be given to delaying payment until the criteria were achieved.

ISSUE – CSP Eligibility Requirements. Base (“Stewardship”) Payments should be made more equitable. For a state like Maryland with a smaller than average farm size and lower than average rental rates, CSP is not fairly rewarding farmers who are providing good environmental stewardship. Establish base payment floors/minimums to ensure adequate participation by smaller acreage farms.

Because Maryland has a high proportion of small farms, its farmers fare poorly under the current CSP base payment arrangement. The average size farm in Maryland is 169 acres much smaller than the national average of 432 acres (Agriculture in Maryland, 1999). Currently, CSP provides very meager base or stewardship payments for small farms. In our farmer survey, several respondents/interviewees said that their farms were too small to make CSP worthwhile for them (See Farmer Surveys in Section I). Considerations of fairness and of the need to gain program participation rates substantial enough to help solve major environmental problems and resource concerns dictate that the basic incentive needs to be greater to ensure widespread interest. The heavy weighting of acreage size and rental rates in determining base payments also causes disparities among different types of production.

For example, a 160-acre pasture-based farm participating at the Tier II level in the Monocacy watershed would receive \$208 a year in stewardship payments and a Tier I farm with 400 acres of cropland in the Chester-Sassafras Watershed would receive \$240. In order to reach the maximum allowed enhancement payment, a Tier III livestock farm in the Monocacy watershed would need to have over 4,600 acres, while a Tier III crop farm would need 2,500 acres in the Chester-Sassafras watershed.

Perhaps elimination of the stewardship payment regulatory reduction factor currently in the CSP rule could be considered. And there should be a floor on stewardship payments so that smaller farms, including those that are small in acreage but are high value in production, are encouraged to participate. Nutrient and water quality concerns in Maryland cannot be solved without the participation of these farms.

RECOMMENDATION 10 – Establish a stewardship payment floor (minimum) of \$500 for farms up to 50 acres and a floor of \$1,000 for farms greater than 50 acres. These floors could be across all tiers or could be graduated slightly by tier.

Such a floor would help smaller operations. (Refer to case study # 5, a grazing dairy farm of 53 program acres.) In this case study CSP sign-up, the base payment for this operation is 53 acres x \$5.40 = \$287/year. Under this recommendation of minimum base payment floors, the base payment would be a \$1,000 minimum/year. This would increase the overall farm payment from \$1,400/year to \$2,113/ year. Over the life of the contract, the payment would increase from \$14,000 to \$21,000.

ISSUE – Reconsider the use of rental rates to determine base payments.

Basing the base or stewardship payments on a percentage of rental rates raises very significant regional equity issues. It is very positive that NRCS now pays for pasture at the cropland rental rate, but there is concern as to whether rental rates were the right choice from the beginning. In addition to producing regional inequities, using rental rates as the basis also favors areas with heavy commodity program participation. The statute gives USDA the choice of basing these payments on rental rates or “another appropriate rate...that ensures regional equity.” It could benefit Maryland farmers if USDA would reconsider this choice and investigate the appropriateness of using a percentage of agricultural use land valuation for the base payments.

RECOMMENDATION 11 – Consider using agricultural use land valuation rather than rental rates as the basis for stewardship payments.

ISSUE – Enhancement Payments

Enhancement payments are a central feature of the CSP and ought to be a very significant part of the total payment for producers prepared to take advantage of them. The interim final rule’s basic approach to allow State Conservationists, with advice from State Technical Committees, to develop the enhancement activities and enhancement payment amounts is positive as it allows for regional flexibility. Enhanced payments should reward the most environmentally beneficial systems and, to the maximum extent possible, should pay for performance and results without regard to whether the practices and systems are put in place prior to or during the CSP contract period.

However, there are several key aspects of the rules concerning enhancement payments that should be modified to strengthen the water quality and farmer benefits of CSP.

RECOMMENDATION 12 – New and enhancement payment practices should be more heavily weighted toward water quality and nutrients.

Maryland should have the flexibility to ensure that:

1. These practices support the tributary strategies, as these strategies focus on water quality and include practices that farmers know and have helped to suggest.
2. Enhancement payments are weighted based on the relative water quality benefits they provide (the tributary strategies include estimates of practice benefits which can be a guideline for the relative weighting of practices.).

RECOMMENDATION 13 – Allow more nutrient management practices and activities to qualify for enhancement payments and make advanced cover cropping practices an enhancement activity, not just a new practice cost-share activity.

In the two Maryland watersheds in which CSP is being offered in 2005, the list of nutrient management enhancements includes:

- utilizing on site nitrogen test (PSNT, Chlorophyll, etc.) to indicate more specifically what amount of nitrogen is needed, if any.
- splitting nitrogen applications according to crop specific nitrogen uptake requirements.
- using precision agriculture (GPS/record keeping/Yield Monitoring) to better target plant nutrient needs.
- using precision agriculture-variable rate application to more efficiently apply plant nutrients.
- utilizing filter strips along water courses and sensitive areas to capture nutrient runoff (payment on entire field).
- using slow controlled, released formulation nitrogen fertilizer.
- using urease inhibitor or stabilized nitrogen.
- incorporating manure within 24 hours.
- applying manure based on P crop uptake for fields with FIV>75 to more effectively manage soil phosphorus levels.
- applying manure to all fields with FIV<75 first to more effectively manage soil phosphorus levels.

In addition, newly adopted cool and warm season conservation covers are cost-shared, but no cover cropping practices, whether grass, legume, small grains, or mixtures, are included among the enhancement payment eligible practices.

RECOMMENDATION 14 – Incorporate the “Management Intensity” concept into enhancements.

The use of graduated, enhancement payment ‘management intensity’ factors for all practices, systems, and activities should be incorporated into CSP where appropriate. The farmers who were interviewed, as well as extension people, have said that this is a concept that farmers fully appreciate and one that will encourage farmers to move toward higher intensities of management. Locally-adapted management intensity factors can serve the same purpose, be implemented immediately, and be easier for farmers and field staff to understand and apply.

As an example, we have previously proposed to Maryland NRCS the following management intensity (MI) ideas:

Nutrient Management

MI 1 - Apply nutrients at recommended rates and timing

MI 2 - Recommended rates with split application and use of PSNT, tissue test, sap test, etc., to enhance efficiency

MI 3 - Variable rate application using yield monitor data and/or “on the go” chlorophyll measurements to vary rate or apply N at 15% below recommended rate

Field Residues

MI 1 - 30% conservation tillage

MI 2 - 60% conservation tillage with heavy residue

MI 3 - 90% no-till

(these are average %s over life of contract)

Cover Crop

MI 1 - Cover crop planted no later than two weeks after the average date of the first frost

MI 2 - Cover crop planted more than one week before the average date of the first frost

MI 3 - Cover crop planted 2 weeks before first frost date

Commodity small grain

Grown with no fertilizer application until after March 1
(no management intensities for this one)

Grass Buffers

MI 1 - 35 feet

MI 2 - 70 feet

MI 3 - 100 feet

Forest Buffers

MI 1 - 35 feet

MI 2 - 70 feet

MI 3 - 100 feet

Rotations

MI 1 - no-till with winter cover crop

MI 2 - 1 year green manure or 2 years of hay

MI 3 - 3 years of hay in rotation

Erosion control

MI 1 - Soil loss of "T" or less

MI 2 - Soil loss of 0.5 "T" or less

MI 3 - Soil loss of 0.25 "T" or less

Drainage Water Management

MI 1 - water control structures

MI 2 - water control structures and 5' grass buffers

MI 3 - water control structures and no temporary field drainage in fields with a history of temporary drainage

Managed Grazing

MI 1 - meets NRCS standard for improved pasture

MI 2 - Management Intensive Grazing (MIG) (min. 2-day rotations)

MI 3 - MIG with water per paddock and managed trails

Program rules and procedures should be adopted to allow State offices, in close consultation with State Technical Committees, to develop management intensity levels and to incorporate them in the enhancement payment offerings.

RECOMMENDATION 15 – Eliminate the enhancement payment limit.

The CSP statute is very clear on payment limitations. Total payments per farm are capped in a graduated fashion according to the tier level of participation chosen by the farmer. A sub-cap also applies to the base payment and is also graduated by tier. All payments are directly attributed to real persons to eliminate the loophole problems that have so plagued USDA commodity production subsidy programs.

Unfortunately, the interim final rule and the 2005 sign-up notice add several additional payment limitations, including a cap on enhancement payments, which reduce the effectiveness of the program to deliver natural resource and environmental results and which unnecessarily increase the complexity of the program. While there has been some movement in the right direction on the enhancement payment cap between the first interim final rule/2004 sign-up notice and the revised interim final rule/2005 sign-up notice, this extraneous cap should be removed altogether.

If enhancement payments are for rewarding and fostering advanced, performance-based conservation activities as the agency proposes, then there is no justification for capping those payments as a percentage of the total CSP payment flow. These caps are particularly harmful for smaller acreage farming operations. With much of total CSP payments determined on the basis of farm size, enhancements can and should be the one area where farms with less acreage can nonetheless maintain and adopt conservation measures that can be rewarded on the basis of their conservation importance. Smaller acreage farms can be very high value production units and can be critically important for resource protection. This is particularly important in a state like Maryland, and the CSP should be made to work for all regions of the country and all types of production. The enhancement payment caps are counter-productive and should be removed.

RECOMMENDATION 16 – Ensure that adoption and maintenance of resource-conserving crop rotations qualify for major enhancement payments.

The CSP statute defines “resource-conserving crop rotations” and assigns such rotations high priority enhancement payments. The interim final rule, on the other hand, substitutes a much weaker definition, provides farmers with priority status for enrollment in CSP partly on the basis of yet another and even weaker definition, and provides no direct enhancement payments for resource-conserving crop rotations. This process and procedure appears to be contrary to the statute, thereby missing the opportunity CSP presents to encourage conservation systems based on long, diversified rotations to improve soil and water quality, reduce or eliminate chemical use, conserve water, reduce energy inputs, and enhance wildlife benefits.

The regulatory definition of resource-conservation crop rotation should be brought into conformance with the law, which clearly requires rotations that produce multiple environmental benefits. The statute requires resource-conserving crop rotations to include at least one resource-conserving crop for at least one year in the rotation and requires that the rotation as a whole act to reduce soil erosion, improve soil fertility and tilth, interrupt pest cycles, and where applicable reduce depletion of soil moisture. The regulation, on the other hand, allows a rotation to qualify as long as it includes a resource-conserving crop and meets just one of the other criteria. The regulation should adopt the statutory language.

The provision in the rule defining a “resource-conserving crop” as including “a perennial grass, a legume grown for use as forage, seed for planting, or green manure--a

legume-grass mixture, i.e. a small grain sown in combination with a grass or legume, whether inter-seeded or planted in rotation” is an excellent one. Furthermore it would be a good idea to revise the conservation practice standard for “conservation crop rotation” to incorporate the resource-conserving crop rotation and the resource-conserving crop definitions and considerations.

Beyond that simple, but critical step, USDA should establish a CSP cropping system rotational diversity index with which to rank proposals for enrollment. The regulatory imposition of a ranking system undermines the spirit and the legislative history of the statute. As long as NRCS continues to use enrollment categories and ranking to limit participation in the CSP, diversified operations should be afforded credit for their very significant environmental contributions through the addition of a rotational diversity index.

USDA should make enhancement payments for resource-conserving crop rotations a prominent feature of the CSP. There should be a direct and explicit enhancement payment, one that is substantial enough to begin to cover the opportunity cost for adoption and maintenance of resource-conserving crops that are not generally favored by the market and are generally penalized by USDA commodity production subsidy programs. A ‘green payments’ program that fails to address income loss and opportunity costs for sound, high level, multiple resource benefit systems is not a ‘green payments’ program at all.

A suggested proposal for rotations in Maryland (see the section below on management intensity) consists of the following:

Rotations

- MI 1- no-till with winter cover crop
- MI 2 - 1 year green manure or 2 years of hay
- MI 3 - 3 years of hay in rotation

RECOMMENDATION 17 – Encourage riparian buffers and all other buffer practices through enhancement payments (and through new practice cost-share where applicable), but do not make previous adoption of riparian buffers an eligibility requirement to enroll in the program.

The CSP statute calls on USDA to provide strong enhancement payments for conservation buffer practices. Buffers are a very important conservation practice, and a benefit of addressing them as part of the CSP is that they will be dealt with in the context of whole farm plans that address the full range of resource concerns and in-field practices and systems. Treating buffers as part of a whole farm system has a great advantage over treating them in isolation from the farming systems that surround them. Drainage, nutrient management, pesticide drift and other issues affect the relative effectiveness or ineffectiveness of buffers for water quality and wildlife.

Rather than provide enhancement payments for buffers as called for by the statute, the amended interim final rule includes a brand new provision, not previously included in the proposed rule or the first interim final rule. It requires that farmers already have NRCS-approved buffers on 100 percent of all riparian areas as a condition of eligibility for CSP Tier III enrollment. Instead of encouraging buffers through CSP, USDA is demanding prior installation without CSP support.

This requirement discourages farmers from enrolling in Tier III, hindering them from adopting whole farm, total resource management systems. The requirement reduces the environmental benefits to be gained from CSP implementation in general and from riparian buffers in particular. The requirement is also a misapplication of both the NRCS resource management system and the CSP focus on a system-based and performance-based approach rather than a practice-based approach. Even if the entirety of a farmer's existing conservation plan is already meeting all NRCS standards for water quality, runoff, and habitat (without the use of buffers or without 100 percent coverage) the amended interim final rule nonetheless requires 100 percent prior coverage.

Requiring a specific practice is antithetical to the CSP conservation system performance-based approach and will unfairly exclude some farmers and will defeat the purpose of the CSP. Eligibility for Tier III participation should be based as the law specifies: on successful adoption of a resource management system for soil, water, wildlife, and other resources, rather than on an absolute mandate for riparian buffers regardless of circumstance. Furthermore the installation of conservation buffers of all types with strong enhancement payments should be as required by the statute.

RECOMMENDATION 18 – Eliminate the declining variable enhancement payment rate provision.

This provision was not in the proposed rule or the first interim final rule, but has been added as a new provision in the revised interim rule and the 2005 sign-up notice. This provision effectively limits CSP enhancement payments for **existing** conservation systems to four years worth of payments spread out over seven years on a declining percentage basis. In contrast, **new** conservation practices and activities added during the 5-10 year CSP contract period are rewarded with ongoing, unlimited enhancement payments.

This provision unfairly penalizes farmers with a long-term investment in sustainable agricultural systems. If, for instance, a CSP participant is already at Tier III and already exceeds the resource management system standards on all resource concerns on his or her entire farm, the participant's payments will be cut short. In essence, for the very best stewards participation in CSP at any substantial payment level comes to an end rapidly. The neighboring farm that is only able to enroll at the Tier I level and just barely meets or exceeds the water and soil quality eligibility criteria is then able to draw enhancement payments without limit and for as long as the farm remains in the program. The declining variable enhancement payment rate provision encourages farmers to delay adoption of conservation measures until after they are able to enroll in the CSP. In fact, it actively encourages postponement of adoption of conservation measures. This is exactly the wrong signal to send. New conservation and environmental enhancements should be strongly encouraged and should be rewarded if added during the CSP contract term, but not at the expense of enhancement payments for existing excellent conservation systems. The CSP should reward farmers and ranchers for adopting and sustaining superior conservation systems by paying for environmental enhancements on a long-term, ongoing basis. In short, the "declining variable enhancement payments" provision is contrary to the letter and spirit of the law, runs directly against the essence of a "green payments" program, and is contrary to USDA's very own CSP motto of "rewarding the best and motivating the rest." The declining variable enhancement payment provision should be dropped.

RECOMMENDATION 19 – Offer enhancement payments for participation in on-farm research and demonstration of innovative conservation systems and approaches.

The CSP statute expressly authorizes USDA to approve conservation security plans that include on-farm conservation research and demonstration activities. In addition, on-farm conservation research, demonstration, or pilot projects, as well as assessment and evaluation activities relating to practices, are expressly eligible for enhanced payments.

The CSP on-farm research and demonstration mandate will promote creative sustainable agricultural solutions and help promote farmer-to-farmer interest and promotion of advanced conservation systems through the CSP. Nothing will promote conservation better and faster than proof of its effectiveness, and the ability to see it in action on a real farm in one's area. By the same token, by investing in conservation research producers have a greater stake in the actual outcomes and will be empowered to assist in the evolution of technical guides and conservation choices.

Unfortunately, the current CSP implementation regime fails to provide payments for on-farm research and demonstration of innovative conservation measures. Ignoring this provision of law for the first two years of implementation has reduced the potential of the program to showcase the best conservation efforts, test new approaches, and encourage adoption through farmer-driven outreach to other farmers.

USDA should implement enhancement payments for on-farm research and demonstration of innovative conservation systems without further delay. Enhancements for on-farm research and demonstration activities should be included in 2006 and all subsequent years. USDA should undertake such CSP on-farm projects in coordination with non-governmental organizations with experience in running on-farm research programs and in cooperation with other USDA, land grant, or cooperative extension on-farm research initiatives.

RECOMMENDATION 20 – Adopt enhancement payments for on-farm monitoring and evaluation.

The CSP statute contains express authorization of enhancement payments for on-farm assessment and evaluation activities. From the standpoint of Maryland's nutrient management law and the major investment in monitoring and evaluation projects related to the Chesapeake Bay, this aspect of the CSP enhancement system could be well-utilized, especially if linked on a coordinated basis within a CSP watershed.

Unfortunately the current CSP implementation regime is failing to utilize this important enhancement factor. Enhancement payments should be adopted for on-farm monitoring and evaluation as soon as possible. The size of the payment should reflect degree of effort and sophistication of the monitoring and evaluation plan and whether the individual farm is linked into a broader network. The payment should reflect both the cost and the time and effort involved in the activities.

Linked enhancement activities combining on-farm research and demonstration with monitoring and evaluation would be a terrific way of working on key emerging resource concerns or conservation practices that are not yet part of the Field Office Technical Guides.

ISSUE – New Practice Cost-Share Payments

RECOMMENDATION 21 – Eliminate the new practice cost-share payment cap.

The 2005 sign-up notice caps cost-share payments for new practices at \$10,000 cumulative total for the life of the 5 or 10 year contract. This cap is not in the statute or in the interim final rule. The interim final rule, however, does include a provision in which the agency grants itself the authority to place any limits it cares to on new practice payments, base payments, or enhancement payments and to change them from year to year. The \$10,000 cumulative cap currently in effect essentially sends a strong and unmistakable message that the CSP is not at all about fostering conservation improvements on the landscape or encouraging farmers to take additional steps toward resource protection. This practice appears to be in opposition to the purposes for which the CSP was created. This low cap should be removed from all future sign-up notices. If USDA maintains the cap on the amount of total CSP payments represented by cost-share payments for new practices, USDA should increase the rate to \$10,000 per year, rather than cumulative for the life of the contract. This cap would be consistent with the annual cap on Environmental Quality Incentive Program cost-share payments from 1996-2002.

RECOMMENDATION 22 – Make cost-share rates consistent with the Environmental Quality Incentives Program.

The amended interim final rule caps the CSP cost-share rate for all practices at 50 percent, with the exception of a rate of up to 65 percent for beginning and limited-resource farmers. This is another example of discouraging CSP participants from adopting new practices. It also creates a situation in which different NRCS working lands conservation programs are offering different cost-share rates. The CSP cost-share rate should be matched to the rates determined each year at the state and local level for USDA's Environmental Quality Incentives Program (EQIP). In the many instances in which EQIP is paying cost-share rates of 75 percent or between 50 and 75 percent, CSP should have identical rates. USDA should consider reducing discrepancies between CSP and EQIP programs and encourage the adoption of new conservation practices by adopting EQIP cost-share rates for the CSP.

Education Initiatives

Education initiatives ranged from developing panels for conferences through educating Extension personnel to submitting recommendations based on this report. The core team interactions provided some of the most valuable education and outreach as we each carried ideas away from meetings and shared them with the different organizations and communities in which we worked closely. Several members of the core team also met with David McKay of the CSP national NRCS program to express our interests, learn about program progress and promote certain key program changes that we have identified.

Mid-Atlantic Water Quality Program

One core team member initiated a number of strong projects to educate Extension personnel about CSP. He held an educational telephone-conference for all the interested Extension agents in CSP-participating watersheds, developed educational brochures on CSP and considered a SCI education project to advance understanding of it. He is working to establish a dairy feed management education program focused on animal nutrients, veterinarians, and feed mills, and will work to encourage Mid-Atlantic region states to adopt dairy feed management as a CSP-approved practice.

Conference Presentations

We have been asked to develop a panel for the Future Harvest Conference in Hagerstown, MD to promote education about CSP.

American Farmland Trust is holding a national workshop on the Conservation Security Program in Washington in early December of 2005. Michael Heller, the Project Coordinator, has been asked to participate as one of fourteen experts from around the country to formulate needed changes to the CSP.

In addition, a national sustainable agriculture conference has asked to be able to present results of our study as they consider recommending changes to CSP.

Public Comments for federal rules

Various members of the Core Team submitted recommendations based on this report as individuals or through our organizations before the public comment period deadline for the amended interim final rule for the Conservation Security Program closed on Friday, September 9, 2005.

Conservation Security Program

Workshop Survey

1. Describe your farm operation:

Grain crop acres _____ Livestock # _____
 Hay acres _____ Type _____ (dairy, cattle, sheep, etc)
 Pasture acres _____ Other (please specify):
 Vegetable acres _____

2. Have you participated in other agricultural conservation programs: (check below)

- Soil and Water Cons. Plan CRP/CREP
 EQIP Other (please specify):
 WHP

3. How did you learn about this meeting?

4. What was your purpose in attending this meeting?

- Seek information Curiosity
 Learn how to signup Other (please describe):

5. Were the presentations at this meeting helpful for you to understand CSP?

- Very Helpful
 Moderately Helpful
 Not Really Helpful

6. Based on these presentations, would you guess that your farm or a part of your farm would qualify for the program?

- Yes
 No
 Unsure

7. If you should desire to signup for CSP, do you anticipate any barriers for your farm operation?

- Lack of farm records Other (please describe):
 Soil conditioning index value too low (use too much tillage to qualify)

8. Do you need additional information to decide whether to participate? Yes No
 If so, how would you characterize that information?

9. What do you plan to do now?

- Proceed with the sign-up procedure
 I am not interested – do nothing
 Other (please specify):

10. May we call you in about one month for a follow-up survey (5 minutes max.)? Yes No

If yes:

Name: _____ Phone number: () _____ Best time to call: _____

Draft Telephone Survey Questions

1. did you do the 'csp self-assessment' for your farm? ___yes ___no
 - a. was the self-assessment understandable? ___yes ___no
 - b. was the self-assessment of reasonable length and effort? ___yes ___no
2. did you apply for a csp contract? ___yes ___no
why not?
3. did your farm qualify? ___yes ___no
 - a. if not, why? ___SCI (soil conditioning Index) number too low ___lacking adequate records ___other
4. did you use the payment calculator to assess payments for your farm? ___yes ___no
 - a. was the ballpark payment estimate higher or lower than you expected? ___higher ___lower
 - b. do you understand the front loading of payments? ___yes ___no

bigger picture questions:

5. do you feel you understand the basics of the CSP? ___yes ___no
6. do you like or dislike or have no opinion of the following aspects:
 - a. do you like having all farmers eligible for income payments which are linked environmental farming practices to? ___like ___dislike ___no opinion
 - b. the 3-tiered approach? ___like ___dislike ___n/op
 - c. management intensity approach?
 1. do you understand this concept? ___yes ___no
 2. ___like ___dislike ___n/op
7. for the acreage use to determine payment \$s is this ___too much emphasis ___too little emphasis ___just right
8. the use of the SCI (Soil Conditioning Index) to determine eligibility for the program is ___too much emphasis ___too little emphasis ___just right
9. the use of the SCI to help determine payment rates is ___too much emphasis ___too little emphasis ___just right
10. do you or have you received commodity program payments? ___yes ___no
11. having CSP gradually replace commodity program payments (linking income payments to environmental farming practices) would be: ___a good thing ___a bad thing ___no opinion
Basic farm characteristics: (stuff to know but may not need to ask)
____ acres crops (corn, beans, wheat, barley,)
____ pasture
____ hay
____ numbers of livestock (dairy, cattle, hogs, sheep)

Case Study #1 Rotational Grazing Beef Operation Conservation Security Program Plan

I. Introduction

This steeply sloped, one hundred acre farm has seventy seven acres devoted to rotationally grazed pastures, some of which have hay harvested. 11 acres are used for hay production and the remaining acres are mostly wooded. When the farm was purchased nearly 40 years ago, most fields were in crop production, resulting in serious erosion problems. Now all pastures are in permanent grass which currently supports 53 cows, 2 bulls and 42 calves. Cattle breed is Maine-Anjou/Angus cross.

The farmer became interested in intensive grazing in mid-seventies through reading and input from Extension and NRCS. He took advantage of several federal programs to subsidize cost of fencing and water supply. He was initially skeptical of CSP - why should farmers get paid for something they're already doing? After a closer look at the program he felt the extra funds could be invested back into the farming operation and that CSP planning could identify additional improvements for the future. He appreciated the fact that this program recognizes the many environmental and community benefits provided by his farming operation.

II. Farm Overview

Land

- o 77.8 acres pasture and 10.5 acres hay acres enrolled in CSP. Soils are predominantly Mt. Airy channery loam.
- o 8-15% slopes. Average slope length 200 ft. Ave. slope steepness = 8%
- o The T value for the farm is 3 tons/ac/yr but estimated soil loss for the farm is .68 tons/ac/yr.
- o Natural features include permanent grass cover, small parcels of woodland, stream
- o Farm includes historic building dating to 1790

Operations

- o Cow-calf operation, rotationally grazed; cattle are sold at auction and as 4-H project animals
- o Pastures are primarily comprised of a mix of fescue, bluegrass, orchard grass and clover. In the entire history, pastures have been fertilized only three times, and only one field was sprayed with herbicide just one time.
- o There is no land enrolled in CRP, CREP or other government programs.

III. Highlights of CSP plan

- Farm qualifies as Tier III, Category A
- Soil Conditioning Index = .9 for cropland and .4 for pasture (maximum allowable score for pasture)
- STIR = 10.81 (Soil Tillage Intensity Rating)
- Enhancements include use of legumes to supply nitrogen, minimal tillage and carbon sequestration, high pasture index score, organic methods in pasture production, good SCI and STIR scores and others.
- If fully funded, first year estimated payment would be \$8906. Total estimated payment over life of the contract would be \$27,197.
- Breakdown of first year payment:
 - Estimated Stewardship payment = \$376
 - Estimated Existing Practice payment = \$94
 - Estimated Enhancements payment = \$8906

IV. Conservation Security Program Qualifications

- Farm qualified for Tier 3 because the entire farm met all applicable resource concerns, had a wildlife index score >.5, protected riparian areas and had no readily observable erosion or point contamination at signup.
- Farm qualified for Category A based on conservation activities in the areas of soil quality, water quality and wildlife.
- Existing Enhancement Component (AC is All Cropland = 10.5 acres, AP is All Pasture = 77.8 acres)

Energy - use of perennial legumes in rotation to reduce energy need for production of nitrogen = AC x \$.70/ac

Energy - STIR value less than 15 = AC x \$.90/ac

Energy - uses manure for 90% of nutrient needs = AC/AP x \$1.10/ac

Grazing – pasture index score of 45-49 = AP x \$20/ac

Grazing – exclude livestock from woodland = 6.9 ac x \$3/ac

Grazing – limit supplemental feeds to <10 lbs/animal/day = AP x \$2/ac

Grazing – use organic methods for pasture establish/mgmt = AP x \$25/ac

Habitat – Habitat Index score between .5 and .6 = AC/AP x \$4/ac

Pest Mgmt – non-chemical control to reduce risks to beneficial insects and ground/surface water = AC /AP x \$10/ac

Soil Mgmt – cropland SCI score of .9 = AC x \$1.16/ac x 9

Soil Mgmt – pasture SCI score of .4 = AP x \$1.16/ac x 4

Soil Mgmt – STIR < 15 = AC x \$2/ac

Air – carbon sequestration through continuous no-till = AC x \$10/ac

V. Estimated Payment Schedule for Farm #1 under CSP

Year funding rate	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
	150%	90%	70%	50%	30%	10%	0%	0%	0%	0%
Enhancement	\$8,436	\$5,062	\$3,937	\$2,812	\$1,687	\$562	\$0	\$0	\$0	\$0
Stewardship	\$376	\$376	\$376	\$376	\$376	\$376	\$376	\$376	\$376	\$376
Existing Practice	\$94	\$94	\$94	\$94	\$94	\$94	\$94	\$94	\$94	\$94
Total Payments	\$8,906	5532	4407	3282	2157	1032	470	470	470	470

Total Estimated Payment for CSP

Contract = **\$27,196**

Total estimated annual Enhancement payment = \$5,624 (x 150% for first year, declining thereafter)

Total estimated annual Stewardship payment = \$376.00

Total estimated annual Existing practice payment = \$94.00 (= 25% of Stewardship payment)

Note: CSP limits total annual payments as follows: Tier 1 = \$20,000, Tier 2 = \$35,000 and Tier 3 = \$45,000

Annual enhancement payments are limited to: Tier 1 = \$13,750, Tier 2 = \$21,875 and Tier 3 = \$28,125

VI. Conclusion

If funding levels allow, the Conservation Security Program will provide increased income to this operation of an estimated level of \$27,196 over ten years. This translates into \$309/acre over the contract or roughly \$31/acre/year. Compared with other farmers enrolled, his record requirements were minimal based on size of operation and on the modest amounts of cultivation and fertilizer and pesticide inputs. CSP payment may enable owner to invest in additional conservation enhancements on the farm. However, the level of soil and water conservation is already very high on this operation. Future plans include construction of dry stack manure storage structure. The producer supported the objectives of the program.

**Case Study #2:
Mid-Sized Cash Grain Operation
Conservation Security Program Plan**

I. Introduction

This farming operation is a family partnership and has been in existence for 11 years. The total operation is 650 acres and all land is rented from a total of 20 landlords. All but four of these acres were enrolled in CSP. The farm's primary crops are corn, soybeans and hay. Tillage operations are entirely no-till except for those fields receiving manure.

The operators began producing no-till corn in the late 1980's, which improved management on those fields having rather thin, red shale soils. Conventional tillage was especially difficult when soils were wet. Some of the nutrient application recommendations from their nutrient management plan are higher than what the operators actually apply based on the productivity of the soils. The operation also includes a small beef operation.

II. Farm Overview**Land**

- o Soils Information: Pe – Penn Loam; Pn – Penn Silt Loam and Ph – Penn Shaly Silt Loam
- o Typical rotations are corn-soybeans and corn-soybeans-wheat/DC soybeans
- o One stream passes through part of farm; hedgerows have largely been retained; livestock have limited access to stream
- o There are two pasture lots with a sacrifice area
- o 30 acres are enrolled in CRP, which is therefore ineligible for enrollment in CSP.
- o About 25 acres of the farm are in woods and there are some grass and tree plantings under CREP.

Operations

- o Average yields are from FSA records: Corn = 110, Wheat = 50, Soybeans = 35. Operator states that corn sometimes averages 120, wheat 55 and soybeans 40 in better years.
- o Farm includes small beef operation, typically between 45-50 head, made up of Hereford cull calves obtained from neighboring operation.
- o Farm had a nutrient management plan for several years before plans became mandatory.

III. Highlights of CSP plan

- Tier III, Category A
- Soil Conditioning Index = .4 for Group #1 fields, .6 for Group #2 fields and .8 for Group #3 fields
- Soil Tillage Intensity Rating (STIR) = less than 15
- Enhancements include
 - Breakdown of first year payment:
 - Estimated Benchmark Stewardship payment = \$3058
 - Estimated Existing Practice payment = \$764
 - Estimated Enhancements payment = \$28,126 (= \$18,751 x 150%)

IV. Conservation Security Program Qualifications

- Farm qualified for Tier 3 because the entire farm met all applicable resource concerns, had a wildlife index score >.5, protected riparian areas and had no readily observable erosion or point contamination at signup.
- Farm qualified for Category A based on conservation activities in the areas of soil quality, water quality and wildlife.

■ Benchmark Enhancements (Field Group #1=183.5 acres, #2=424.4 acres, #3=39.2 acres; AG=All or 647 ac.)

Energy – Recycle motor oil = \$200/year

Energy - STIR value less than 15 = AG x \$.90/ac = \$582

Energy - uses perennial legumes for nitrogen = 10 ac of Group 2 x \$.70/ac = \$7

Energy – uses annual legumes for nitrogen = AG x .10/ac = \$65

Habitat – Habitat Index score between .7 and .8 = AG x \$8/ac = \$5176

Nutrient Management – Split N applications = AG x \$2/ac = \$1294

Nutrient Management – Incorporate manure < 24 hours = 15 ac of Group 2 x \$2/ac = \$30

Pest Mgmt – weather-based forecasting = AG x \$1/ac = \$647

Soil Mgmt – SCI score of .4 = Group 1 x \$1.16/ac x 4 = \$851

Soil Mgmt – SCI score of .6 = Group 2 x \$1.16/ac x 6 = \$2954

Soil Mgmt – SCI score of .8 = Group 3 x \$1.16/ac x 8 = \$364

Soil Mgmt – STIR value less than 15 = AG x \$2/ac = \$1294

Air – carbon sequestration through continuous no-till = AG x \$10/ac = \$6470

Air – incorporate animal manure w/in 24 hrs to reduce NH4 volatilization = 15 ac of Group 2 x \$5/ac = \$30

V. Estimated Payment Schedule for Farm #1 under CSP

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
%	150%	90%	70%	50%	30%	10%	0%	0%	0%	0%
Enhancement	28125	16875.84	13125.66	9375.469	5625.281	1875.094	0	0	0	0
Stewardship	3058	3058	3058	3058	3058	3058	3058	3058	3058	3058
Existing Practice	764	764	764	764	764	764	764	764	764	764
Additional Practices		0	0	0	0	0	0	0	0	0
Total	31947.00	20697.84	16947.66	13197.47	9447.281	5697.094	3822	3822	3822	3822

Total Estimated Payment for CSP Contract = 113223.8

Total estimated annual Enhancement payment = \$18,751 (x 150% for first year, declining thereafter)

Total estimated annual Stewardship payment = \$3,058

Total estimated annual Existing practice payment = \$764.00 (=25% of Stewardship payment)

Note: CSP limits total annual payments as follows: Tier 1 = \$20,000, Tier 2 = \$35,000 and Tier 3 = \$45,000

Annual enhancement payments are limited to: Tier 1 = \$13,750, Tier 2 = \$21,875 and Tier 3 = \$28,125

VI. Conclusion

If funding levels allow, the Conservation Security Program will provide increased income to this operation of an estimated \$113,223 over ten years. This translates to \$175/acre over the contract period or roughly \$17.50/acre/year. Future conservation work may include construction of a semi-solid manure storage structure and installation of new grass waterways and maintenance of existing waterways. The operators feel generally positive about the program, including the tiered structure which allows for additional enhancements to be added in subsequent years. They also support the approach of rewarding good managers.

Case Study # 3: Dairy Operation Conservation Security Program Plan

I. Introduction

This operation enrolled two separate farms in CSP, one a dairy and the other a cash grain operation on rented ground. Total rented ground is about 4200 acres. There is no operational connection between the two operations. The original dairy farm was established in 1942 and has expanded into a family partnership represented by four brothers and their families. The father is still involved in the operation and the mother enjoys working with the cows. The sons all take different responsibilities on the farm. They currently milk 45 cows which are a mixture of Holstein and Shorthorn, although they typically are milking 55-60 head. Average milk production is 54 lbs.

Starting no-till in 1983 they now farm as much no-till as possible. They installed waterways on their own and as well as a wetland pond to which barn roof water drains. They use rye cover crops (not all ground qualifies for the state cover crop program) and maintain buffer strips along creeks. The buffer strips are primarily tall fescue mowed twice a year. Their SWCP calls for at least 2 years of no-till to every one year of conventional. Their biggest pest challenge with no-till is slugs, and deer pressure is high. The farm has had a nutrient management plan for years, before it was mandatory.

II. Farm Overview

Land

- o Dominant soils are Mattapex-Matapeake-Butlertown silt loams; 2-5% slope; soil loss = 3.7 t/a/y for corn grain
- o 168.9 acres were enrolled in CSP; there are 185 total acres on this farm.
- o There are 19 acres of pasture which was not enrolled.
- o Land is currently planted in the following crops: 88 acres corn silage; 20 acres orchard grass hay; 37 acres barley

Operations

- o Typical rotation is corn(s)-harvested rye-barley-no-till soybeans-not-till rye. Corn ground is chisel plowed, followed by field cultivator, then Landsman before the planter. Rye ground is disked twice, then drilled.
- o Packed manure is used in the rotation on some fields, roughly 10 t/a in winter and 18 t/a in summer.
- o Average yields per acre are corn(s) = 18T; corn (g) = 120 bu; rye(s) = 4T; sb = 33 bu; barley = 60-80bu
- o Precision ag: most field equipment (sprayers) operated with GPS.

III. Highlights of CSP plan

- Contract is for 5 years only. Tier I, Category C
- Soil Conditioning Index = .1 for corn grain; .1 for corn silage
- STIR = 59 (Soil Tillage Intensity Rating)
- Enhancements include precision ag, use of legumes for nitrogen, crop rotations and manure incorporation.
- If fully funded, first year estimated payment would be \$7066. Total estimated payment over life of the contract would be \$18,684.
- Breakdown of first year payment:
 - Estimated Stewardship payment = \$102
 - Estimated Existing Practice payment = \$26
 - Estimated Enhancements payment = \$6938

IV. Conservation Security Program Qualifications

- Farm qualified at Tier 1 because only part of the operation was enrolled.
- Farm qualified for Category C based on the STIR rating of 59.
- Existing Enhancement Component: Enrolled cropland = 168.9 acres
 - Energy – Annual legumes in rotation to reduce energy need for N = $\$.10 \times 168.9 = \17
 - Energy – STIR value is less than 60 = $.50/\text{ac} = \$85$
 - Energy – Use manure to supply at least 90% of nutrient needs of crops = $\$1.10 \times 168.9 = \186
 - Nutrient Management – Use on-site N test to determine N needs = $\$2 \times 168.9 = \338
 - Nutrient Management – Use precision ag to better target nutrient needs = $\$8 \times 168.9 = \$1,352$
 - Nutrient Management – Incorporate manure within 24 hours = $\$2 \times 168.9 = \338
 - Nutrient Management – Apply manure based on P where $\text{FIV} > 75 = \$3 \times 168.9 = \507
 - Nutrient Management – Apply manure to all fields where $\text{FIV} < 75$ first = $\$3 \times 168.9 = \507
 - Pest Mgmt – Rotate at least two crops in three years to break cycles = $\$2 \times 168.9 = \338
 - Pest Mgmt – Use weather-based forecasting for pests = $\$1 \times 168.9 = \169
 - Pest Mgmt – Use geo referenced mapping = $\$3 \times 168.9 = \507
 - Soil Mgmt – SCI of at least .1 = $\$1.16 \times 168.9 = \196
 - Soil Mgmt – STIR between 31 and 60 = $.5 \times 168.9 = \$85$

V. Estimated Payment Schedule for Farm #3 under CSP

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
funding rate	150%	90%	70%	50%	30%	10%	0%	0%	0%	0%
Enhancement	6938	4163	3238	2313	1388					
Stewardship	102	102	102	102	102					
Existing Practice	26	26	26	26	26					
Total Payments	7066	4291	3366	2441	1518					

Total Estimated Payment for CSP Contract =
\$18,684 (5 year contract)

Total estimated annual Enhancement payment = \$4625 (x 150% first year, declining thereafter; contract ends '09)

Total estimated annual Stewardship payment = \$102

Total estimated annual Existing practice payment = \$26 (= 25% of Stewardship payment)

Note: CSP limits total annual payments as follows: Tier 1 = \$20,000, Tier 2 = \$35,000 and Tier 3 = \$45,000

Annual enhancement payments are limited to: Tier 1 = \$13,750, Tier 2 = \$21,875 and Tier 3 = \$28,125

VI. Conclusion

If funding levels allow, the Conservation Security Program will provide increased income to this operation of an estimated level of \$18,684 over five years. This translates into \$111/acre over the contract or roughly \$22/acre/year. This producer was initially concerned that there was too much paperwork involved, but later felt that the funding offered would make it worth it if it came through. Future enhancements planned are wildlife strips and woodlot planting.

Case Study #4: Large Cash Grain Operation Conservation Security Program Plan

I. Introduction

This farmer was once a waterman but now rents 1,100 tillable acres on various farms on the Eastern Shore. He plants all tillable fields in cash grain rotations. He started farming in 1972 in Delaware, adopted no-till in 1976 and is committed to soil conservation and enjoys working with his landowners to provide wildlife habitat wherever possible. Because of his need to move equipment on many roads, he's very concerned about the increase in traffic in the area and the fast pace of residential development that is consuming and fragmenting farmland. He has noticed less patience on the part of some drivers for farm equipment on roads. He takes great interest and pride in the wildlife that inhabits the farms he rents. For example, he and one of the landowners preserved an old abandoned barn that was home to a group of turkey vultures and their young. Note that a detailed schedule of current field operations is included at the conclusion of this case study.

II. Farm Overview

Land

- o 1,100 acres tillable; 939 acres enrolled in CSP; soils are predominantly Barclay silt loam (0-2% slopes) and Matapeake silt loam (2-5% slopes); erosion rates are .78 t/a/y (Barclay) and 1.7 t/a/y (Matapeake)
- o Many hedgerows and grass strips are maintained; most acreage that's not farmed has been enrolled in CRP (funds go to the landowners; streams have riparian forest buffers.
- o Wildlife plots planted in fescue, sunflower and Cave Rock grass which must be burned off in February

Operations

- o Average rotation is corn (g)-soybeans-wheat-corn (g); yields typically corn = 125 bu/ac, sb = 45 bu/ac, wheat = 50 bu/ac
- o Follows a nutrient management plan closely, which includes dribbling and split application for N
- o He manages all field operations but does not do any custom work

III. Highlights of CSP plan

- Tier III, Category A
- Soil Conditioning Index = .52 on Barclay soils and .44 on the Matapeake soils
- STIR = 18 (Soil Tillage Intensity Rating)
- Enhancements include filter strips, crop rotation, wildlife habitat, use of renewable fuels and GPS to reduce soil compaction.
- If fully funded, first year estimated payment would be \$34,464. Total estimated payment over life of the contract would be \$140,256
- Breakdown of first year payment:
 - Estimated Stewardship payment = \$5,071
 - Estimated Existing Practice payment = \$1,268
 - Estimated Enhancements payment = \$28,125 (total enhancement payments = \$19,493.

This figure multiplied by 150% for first year = \$29,240. However, CSP's annual contract limit for Tier III = \$28,125.

IV. Conservation Security Program Qualifications

- Existing Enhancement Component Cropland enrolled = 939 Acres
- Energy – Use annual legumes to reduce energy used for N = .10 x 939 ac = \$94

Energy – Recycle motor oil = \$200
 Energy – STIR value < 30 = .70 x 939 ac = \$1878
 Nutrient Management – Use on-site N test = \$2 x 939 ac = \$1878
 Nutrient Management – Split N application = \$2 x 939 ac = \$1878
 Nutrient Management – Filter strips along water courses = \$3 x 700 ac = \$2100
 Pest Mgmt – Rotate at least 2 crops to break pest cycles = \$2 x 939 ac = \$1878
 Pest Mgmt – Filter strips along water courses = \$5 x 700 ac = \$3500
 Pest Mgmt – Weather based forecasting = \$1 x 939 = \$939
 Soil Mgmt – SCI of at least .4 = \$4.64 x 863 ac = \$4005
 Soil Mgmt – SCI of at least .5 = \$5.80 x 76 ac = \$441
 Soil Mgmt – GPS to reduce compaction (STIR between 16 and 30) = \$2 x 939 ac = \$1878

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
funding rate	150%	90%	70%	50%	30%	10%	0%	0%	0%	0%
Enhancement	28125	17546	13647	9747	5850	1951				
Stewardship	5071	5071	5071	5071	5071	5071	5071	5071	5071	5071
Existing Practice	1268	1268	1268	1268	1268	1268	1268	1268	1268	1268
Total Payments	34464	23885	19986	16086	12189	8290	6339	6339	6339	6339

Total Estimated Payment for CSP Contract = \$140,256

V. Estimated Payment Schedule for Farm #1 under CSP

Total estimated annual Enhancement payment = \$19,493 (reduced in first year due to contract limit)

Total estimated annual Stewardship payment = \$5071; Existing practices payment = \$1268

VI. Conclusion

If funding levels allow, the Conservation Security Program will provide increased income to this operation of an estimated level of \$140,256 over ten years. This translates into \$149/acre (of enrolled acres) over the contract or roughly \$15/acre/year. This producer is very supportive of the Conservation Security Program and feels that federal programs need to favor producers who meet high standards of environmental protection and habitat enhancement. When asked about the enrollment requirements of the program, he stated that CSP forced him to “sharpen my pencil up” and to be more efficient with his record-keeping. He also feels the nutrient management plan is irreplaceable and is absolutely paying for it in fertilizer savings and for guiding field operations. **Following is a typical schedule of field operations:**

5/5/2 Spread poultry litter @ 2600 lbs/ac	10/8/3 Harvest, killing crop, 50% stubble (yield 45 bu/ac)
5/5/2 Cultivator, row – hi residue	10/13/3 Cultivator, row - hi residue
5/6/2 Drill-double disk w fluted coulters corn(g)	10/13/3 Drill, single disk opener, winter wheat
10/1/2 Harvest, killing crop, 50% stubble (yield 120 bu/ac)	5/14/4 Harvest, killing crop (yield 60 bu/ac)
10/2/2 Row cultivator, hi residue	5/14/4 Bale straw
10/3/2 Drill single disk opener, winter wheat	5/15/4 Plant soybeans
5/14/3 Harvest, killing crop (yield 40 bu/ac)	10/14/4 Harvest, killing crop (yield 35 bu/ac)
5/15/3 Drill single disk opener soybeans	10/14/4 Cultivator, then plant wheat

Case Study #5: Grass-Based Dairy Conservation Security Program Plan

I. Introduction

The operators took over this 55 acre farm in 1997 and now manage it as an intensive grazing, seasonal dairy operation. No cows were here when they bought the farm but it had been a dairy. Most fields were in wheat at that time and were established in permanent grass. The target milking population is 64 cows which equals 2.1 animal units per acre on an annual basis. Adult cows are given access to a new paddock every 12 hours. Residual is used for pasturing yearlings.

After a 48 hour grazing period there is a three week rest prior to the next grazing. Pastures are grazed ten times a year.

Both individuals are very environmentally conscious and believe the small land base needs careful attention. Cows are kept from all sensitive areas on the farm including streams, woods, the pond and ditches. They value the nutrient management plan for the farm but say a good planner is critical. They believe the plan needs to accept higher levels of nitrogen application based on their levels of grass production. Another challenge is if the manure tank fills up prematurely. EQIP provided funding for their manure storage system. This operation participated in a Sustainable Agriculture Research and Education grant and documented that they could have a neutral or decreasing P balance over time if they exported manure, but in doing so would incur costs for manure export and fertilizer purchase.

II. Farm Overview

Land

- o Pastures are mostly in white clover, perennial ryegrass, orchard grass, phytate-free fescue and reed canary grass for wetter areas. A no-till pasture seeder was purchased in 2004.
- o One grassed waterway is in CRP; all ditch erosion problems have been addressed.
- o All roof runoff is diverted to a swale; all barnyard and milk house waste drains into storage.
- o There is a small stream which is fenced, has a grass buffer and several crossings.

Operations

- o They export stored manure to a neighbor to keep P levels in check and to improve grass palatability.
- o Fertility program includes ammonium sulfate and liquid nitrogen; no pesticides applied except spot spraying.
- o All 55 acres are grazed; about 30 tons of hay is harvested each year. Additional feed purchased is 600 t silage; 40 t hay

III. Highlights of CSP plan

- Tier III, Category A
- Soil Conditioning Index = .4 (prescribed for all pasture in CSP)
- Enhancements include controlled grazing, protected sensitive areas, roof, and waste runoff management.
- If fully funded, first year estimated payment would be \$4,324. Total estimated payment over life of the contract would be \$14,175.
- Breakdown of first year payment:
 - Estimated Stewardship payment = 53 acres x \$5.40/acre = \$287
 - Estimated Existing Practice payment = \$72 (.25 of stewardship payment)
 - Estimated Enhancements payment = \$2643

IV. Conservation Security Program Qualifications

- Existing Enhancement Component = All 53 acres enrolled in the program
 - Energy – Use of perennial legumes to reduce energy need for N = $.70 \times 53 = \$38$
 - Grazing – Pasture index score of 45-50 = $\$20 \times 53 = \$1,060$
 - Grazing – Exclude livestock from riparian areas = $\$50 \times 3 \text{ acres} = \150
 - Grazing – Exclude livestock from woodland = $\$3 \times 2 \text{ acres} = \6
 - Grazing – Utilize winter stockpiled forages = $\$2 \times 25 \text{ acres} = \50
 - Nutrient Management – Use on site N test = $\$2 \times 53 = \106
 - Nutrient Management – Split N applications to enhance crop uptake = $\$2 \times 53 = \106
 - Nutrient Management – Use filter strips along water and sensitive areas = $\$3 \times 49 \text{ ac} = \147
 - Nutrient Management – Apply manure based on P uptake (where FIV>75) = $\$3 \times 4 \text{ ac} = \12
 - Habitat – Habitat Index score = $.6 > \text{ to } < .7 = \$8 \times 53 = \$424$
 - Pest Mgmt – Use filter strips along water and bottom of slopes = $\$5 \times 49 \text{ acres} = \245
 - Pest Mgmt – Use weather-based forecasting = $\$1 \times 53 = \53
 - Soil Mgmt – SCI of at least $.4 = \$4.64 \times 53 = \246

V. Estimated Payment Schedule for Farm #5 under CSP

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
funding rate	150%	90%	70%	50%	30%	10%	0%	0%	0%	0%
Enhancement	3965	2378	1701	1321	793	264	0	0	0	0
Stewardship	287	287	287	287	287	287	287	287	287	287
Existing Practice	72	72	72	72	72	72	72	72	72	72
Total Payments	4324	2741	2212	1681	1155	626	359	359	359	359

Total Estimated Payment for CSP Contract = \$14,175

Total estimated annual Enhancement payment = \$2643 (x 150% for first year, declining thereafter)

Total estimated annual Stewardship payment = \$287

Total estimated annual Existing practice payment = \$72 (= 25% of Stewardship payment)

Note: CSP limits total annual payments as follows: Tier 1 = \$20,000, Tier 2 = \$35,000 and Tier 3 = \$45,000

Annual enhancement payments are limited to: Tier 1 = \$13,750, Tier 2 = \$21,875 and Tier 3 = \$28,125

VI. Conclusion

If funding levels allow, the Conservation Security Program will provide increased income to this operation of an estimated \$14,175 over ten years. This translates into \$267/acre over the contract or roughly \$27/acre/year. The operators certainly support the objectives of the program and appreciate the financial support that may be possible. But they do have concerns that funding offered won't be enough to convince other farmers to make additional and needed conservation changes in order to qualify. They also suggested allowing the NRCS planners to override certain standards if equal or greater conservation benefit is provided. The CSP assessment process did uncover at least one management change they could implement immediately: the NRCS planner suggested they not spot spray 2, 4, D to control weeds (mainly broad-leaf plantain and curly dock) and instead mow or cut.

Case Study #6: Rotational Grazing Beef Operation Conservation Security Program Plan

I. Introduction

This 450 acre farm has been in the family for over 100 years and all land is owned. After years of conventional tillage (about 2/3 of the fields were in corn-beans-wheat-oats rotation), the family has transitioned into a cow-calf operation based on rotationally-grazed pastures with permanent grass. A few acres have been left in crops but are slowly being phased out. Soil erosion, once a significant problem, has been largely eliminated. Acknowledging the importance of managing for optimum grass production, the farmer believes that “mowing is *the* conservation practice on this farm.” The operation is not currently certified organic but may pursue this in the future as few sprays are used.

Producing quality shorthorn cattle and lush pasture are priorities on the farm. However, wildlife cover and water resources are also part of the farm plan. A picture from the late 1800’s shows the farm completely devoid of trees. Now there are mature trees in several woodlots and riparian buffers. He fenced and planted wet areas with trees and enrolled them in CREP. All rain from the buildings is conveyed to the CREP ground and all rain over barnyard areas goes to the storage.

II. Farm Overview

Land

- o Total acreage for the farm is 450 acres, 306 pasture acres enrolled in CSP
- o Farm covered by SWCP by 2000 which includes waterways, stream fencing, two wildfowl ponds, no-till on the remaining cropland
- o A minimum of trees are left in each field for shade and one parcel used as sacrifice lot.

Operations

- o Registered Shorthorn cows, young stock and one bull total 135 head; housing and manure storage scraped daily
- o Cows sold as breeding stock, very little meat sales. Breeding is primarily A.I.
- o Yield on hay fields is between 4-7 tons/acre/year; haylage usually reaches 20% protein if harvested at right time.
- o Pastures are comprised of orchard grass, timothy, clovers, fescue and rye; mowing used for weed control

III. Highlights of CSP plan

- Farm qualifies as Tier III, Category A
- Soil Conditioning Index = .4 (prescribed for pasture)
- Enhancements include use of permanent pastures, perennial legumes, and exclusion of livestock from riparian areas.
- If fully funded, first year estimated payment would be \$19,285. Total estimated payment over life of the contract would be \$62,912.
- Breakdown of first year payment:
 - Estimated Stewardship payment = \$1446
 - Estimated Existing Practice payment = \$362
 - Estimated Enhancements payment = \$11,651

IV. Conservation Security Program Qualifications

- Existing Enhancement Component – All acreage enrolled in program = 306 acres

Energy – Use of perennial legumes to reduce energy need for N = $.70 \times 306 = \$215$
 Grazing – Pasture index score = $45-50 = \$20 \times 306 = \$6,120$
 Grazing – Excluding livestock from riparian areas = $\$50 \times 10 \text{ ac.} = \500
 Grazing – Excluding livestock from woodland = $\$3 \times 10 \text{ ac.} = \30
 Grazing – Establishing/utilizing winter stockpile forages = $\$2 \times 306 = \612
 Nutrient Management – Split N applications according to crop uptake = $\$2 \times 306 = \612
 Nutrient Management – Apply manure to fields with $FIV < 75$ to control P = $\$3 \times 297 = \891
 Nutrient Management – Apply manure based on P uptake where $FIV > 75 = \$3 \times 9 \text{ ac} = \27
 Habitat – Habitat index = $.5 \text{ and } .6 = \$4 \times 306 = \1224
 Soil – Soil Conditioning Index of at least $.4 = \$4.64 \times 306 = \$1,420$

V. Estimated Payment Schedule for Farm #6 under CSP

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
funding rate	150%	90%	70%	50%	30%	10%	0%	0%	0%	0%
Enhancement	17477	10486	8156	5826	3495	1165	0	0	0	0
Stewardship	1446	1446	1446	1446	1446	1446	1446	1446	1446	1446
Existing Practice	362	362	362	362	362	362	362	362	362	362
Total Est. Payments	19285	12294	9964	6334	5303	2973	1808	1808	1808	1808

Total Estimated Payment for CSP Contract =
63385

Total estimated annual Enhancement payment = \$11,651 (x 150% for first year, declining thereafter)

Total estimated annual Stewardship payment = \$1446

Total estimated annual Existing practice payment = \$362 (= 25% of Stewardship payment)

Note: CSP limits total annual payments as follows: Tier 1 = \$20,000, Tier 2 = \$35,000 and Tier 3 = \$45,000

Annual enhancement payments are limited to: Tier 1 = \$13,750, Tier 2 = \$21,875 and Tier 3 = \$28,125

VI. Conclusion

If funding levels allow, the Conservation Security Program will provide increased income to this operation of an estimated level of \$63,385 over ten years. This translates into \$207/acre over the contract or roughly \$20.70/acre/year. While “not initially crazy” about the program, this producer came to appreciate the goals of the CSP. In his words it’s “putting a spotlight on the very best stewards.” He hopes the program will keep high enough standards so this is achieved.

He has many future production and conservation objectives for the operation. While he feels the land could support more cattle, he doesn’t want to push the land excessively. CSP is a motivation to do some additional work he knows is needed. For example, he plans to apply for funds to develop a heavy use area including a main travel lane. He also hopes to put in a new hay feeding area behind the building to get animals off the field when feeding. He already had a nutrient management plan but CSP increased the number of elements in his plan. He concluded with the observation that the key conservation strategy early on for this farm was to recognize that some parts of the farm – particularly the wet fields – needed to be taken out of production.

Case Study #7: Small Grain Operation Conservation Security Program Plan

I. Introduction

This CSP contract was submitted by a farm that submitted another contract for their dairy operation in a different county (see case study #3). This cash grain operation qualified as Tier III. All ground is rented and is planted in cash grains using no-till. To qualify as Category A, the operator had to drop one of the two farms in the initial application. He requested that the contract be limited to eight years instead of ten.

II. Farm Overview

Land

- o 181 acres enrolled in CSP
- o Soil is Butlertown silt loam, moderately eroded with 2-5% slopes; average soil loss is .43 t/a/y with T = 4.0
- o Streambanks are stable and have riparian forested buffer; buffers are predominantly native vegetation

Operations

- o Typical 3 year rotation is corn (g) – soybeans – winter wheat – soybeans; yields are c-150 b/a sb-45 b/a wheat-60 b/a
- o Tillage system leaves at least 50% over-winter residue
- o Ten percent of acreage unharvested for wildlife food plots
- o Herbicides used include atrazine, Liberty and Touchdown

III. Highlights of CSP plan

- Tier III, Category A
- Soil Conditioning Index = .68
- STIR = 3.5 (Soil Tillage Intensity Rating)
- Enhancements include use of legumes in rotation, enhanced N management and use of filter strips.
- If fully funded, first year estimated payment would be \$17,511. Total estimated payment over life of the contract would be \$53,228, ending in year 8 due to abbreviated contract.
- Breakdown of first year payment:
 - Estimated Stewardship payment = \$978
 - Estimated Existing Practice payment = \$245
 - Estimated Enhancements payment = \$10,859

IV. Conservation Security Program Qualifications

- Existing Enhancement Component for 181 acres
 - Energy – Recycling of used motor oil = \$200
 - Energy – Use of annual legumes to reduce energy need for N = .10 x 181 ac. = \$19
 - Energy – Use of renewable energy fuel = \$300
 - Nutrient Management – Split N application = \$2 x 181 ac. = \$362
 - Nutrient Management – Use urease inhibitor or stabilized N = \$2 x 181 ac. = \$362
 - Nutrient Management – Use slow controlled release N = \$4 x 181 ac = \$724

Nutrient Management – Use precision ag – variable rate application = \$8 x 181 ac. = \$1448
 Nutrient Management – Use filter strips along water courses = \$3 x 181 ac. = \$543
 Nutrient Management – Use precision ag to target plant nutrients = \$8 x 181 ac. = \$1448
 Habitat – Habitat index score between .7 and .8 = \$12 x 181 ac. = \$2172
 Pest Mgmt – Rotate at least 2 crops to break pest cycles = \$2 x 181 ac. = \$362
 Pest Mgmt – Use weather based forecasting = \$1 x 181 ac. = \$181
 Pest Mgmt – Use filter strips = \$5 x 181 ac. = \$905
 Soil Mgmt – SCI = .7 = \$8.12 x 181 ac. = \$1470
 Soil Mgmt – Control traffic areas for STIR of < 15 = \$2 x 181 ac. = \$362

V. Estimated Payment Schedule for Farm #1 under CSP

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
funding rate	150%	90%	70%	50%	30%	10%	0%	0%	0%	0%
Enhancement	16288	9773	7603	5430	3260	1088	0	0		
Stewardship	978	978	978	978	978	978	978	978		
Existing Practice	245	245	245	245	245	245	245	245		
Total Payments	17511	10998	8826	6653	4483	2311	1223	1223	0	0

Total Estimated Payment for CSP Contract = \$53,228

Total estimated annual Enhancement payment = \$10,858 (x 150% for first year, declining thereafter)

Total estimated annual Stewardship payment = \$978

Total estimated annual Existing practice payment = \$245 (= 25% of Stewardship payment)

Note: CSP limits total annual payments as follows: Tier 1 = \$20,000, Tier 2 = \$35,000 and Tier 3 = \$45,000

Annual enhancement payments are limited to: Tier 1 = \$13,750, Tier 2 = \$21,875 and Tier 3 = \$28,125

VI. Conclusion

If funding levels allow, the Conservation Security Program will provide increased income to this operation of an estimated level of \$53,228 over ten years. This translates into \$294/acre over the contract or roughly \$29/acre/year. Future work at this farm should include reconstruction of the waterways.

Case Study #8: Mid-size Dairy Operation Conservation Security Program Plan

I. Introduction

This fifth generation, preserved farm is operated by a family that owns all the cows and equipment, but not the land and buildings. They bought the operation in 2001. The land on the home farm is owned by the other members of the husband's family. They hope to buy the rest of the entire farm as they are able and add a dry cow facility which is greatly needed. The operation milks 200 cows which are Holstein, Guernsey and crossbreeds. Most of the young stock is on the rented acreage. There is a total of 775 tillable acres plus pastures.

The urban-rural interface is very evident here, with a housing development within close view of the farmhouse. Development pressure is high. Much consideration is given to neighbors when planning field activities, especially manure spreading. In addition to the impact on day to day farming operations, this was a concern related to the CSP contract. There was some question regarding the status of enrolled rented acres if some of this land was developed. Indeed it was a challenge for the farmer to get some landowners to sign up for ten years.

II. Farm Overview

Land

- o 775 tillable acres are rented which is predominantly (90-95%) no-tilled. 748 acres were enrolled in CSP.
- o Soils are predominantly Chester silt loam, Glenelg silt loam and Chrome silt loam. Slopes mostly 3-8% but farm averaged 8-15% slopes. All moderately eroded.
- o As with other dairy farms, pastures on this farm limited the qualification level for this farm, which qualified at Tier 2.

Operations

- o Land on the home farm is conventionally tilled and receives the manure from the dairy operation
- o On home farm, every field is managed differently. Most fields are rotated between 4-5 years alfalfa possibly followed by 3-4 years corn silage, then cover crop, and finally soybeans.
- o On rented ground, fields that can be no-tilled usually have corn-soybeans-hay/small grain rotations.
- o In conventionally tilled ground, typical rotations are 2 years corn and 1 year soybeans.

III. Highlights of CSP plan

- Tier II Category A
- Soil Conditioning Index = range of .3 to 1.2
- Enhancements include use of perennial and annual legumes, filter strips, crop rotations and cover crops.
- If fully funded, first year estimated payment would be \$21,875. Total estimated payment over life of the contract would be \$106,034.
- Breakdown of first year payment:
 - Estimated Stewardship payment = \$1796
 - Estimated Existing Practice payment = \$449
 - Estimated Enhancements payment = \$21,875 (1st/2nd year enhancements capped by Tier II contract limits)

IV. Conservation Security Program Qualifications

- Farm qualified for Tier II
- Farm qualified for Category A
- Existing Enhancement Component on a total of 748 acres.
 - Energy – Recycle oil = \$200
 - Energy – Use of perennial legumes = $.70 \times 748 = \$524$
 - Energy – Use of annual legumes to reduce energy needs for N = $.10 \times 748 = \$75$
 - Nutrient Management – On site N test = $\$2 \times 748 = \1497
 - Nutrient Management – Split N applications = $\$2 \times 748 = \1497
 - Nutrient Management – Filter strips = $\$3 \times 748 = \2245
 - Nutrient Management – Urease inhibitors = $\$2 \times 748$
 - Habitat – Habitat index score = $.6 < \text{to} < .7 = \$8 \times 748 = \5985
 - Pest Mgmt – Rotate at least 2 crops in three year period = $\$2 \times 748 = \1497
 - Pest Mgmt – Filter strips - $\$5 \times 748 = \3741
 - Pest Mgmt – Weather based forecasting = $\$1 \times 748 = \748
 - Soil Mgmt – SCI of at least .6 = $363.7 \text{ acres} \times \$6.96 = \$2352$
 - Soil Mgmt - SCI of at least .3 = $289 \text{ acres} \times \$3.48 = \$1006$
 - Soil Mgmt - SCI of at least .7 = $23.7 \text{ acres} \times \$8.12 = \$193$

Existing Enhancement Component continued:

- Soil Mgmt - SCI of at least 1.2 = $24.4 \text{ acres} \times \$13.92 = \$340$
- Soil Mgmt - SCI of at least 1.1 = $47.3 \text{ acres} \times \$12.76 = \$604$
- Soil Mgmt - STIR value between 31-60 = $525.5 \text{ acres} \times .50 = \263
- Soil Mgmt - STIR value < 15 = $222.6 \text{ ac} \times \$2 = \$446$

V. Estimated Payment Schedule for Farm #8 under CSP

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
funding rate	150%	90%	70%	50%	30%	10%	0%	0%	0%	0%
Enhancement	21875	21875	17426	12447	7470	2491	0	0	0	0
Stewardship	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Existing Practice	449	449	449	449	449	449	449	449	449	449
Total Payments	24120	24120	19671	14692	9715	4736	2245	2245	2245	2245

Total Estimated Payment for CSP Contract = \$106,034

Total estimated annual Enhancement payment = \$21,875 (calculation: total enhancements = \$24,711. This figure multiplied by 150% for first year would be \$37,067. However, CSP's annual contract limit for Tier II = \$21,875, so enhancement payments are capped at that level for 2005 and 2006.)

Total estimated annual Stewardship payment = \$1,796

Total estimated annual Existing practice payment = \$449 (= 25% of Stewardship payment)

Note: CSP limits total annual payments as follows: Tier 1 = \$20,000, Tier 2 = \$35,000 and Tier 3 = \$45,000

Annual enhancement payments are limited to: Tier 1 = \$13,750, Tier 2 = \$21,875 and Tier 3 = \$28,125

VI. Conclusion

If funding levels allow, the Conservation Security Program will provide increased income to this operation of an estimated level of \$106,034 over ten years. This translates into \$142/acre over the contract or roughly \$14/acre/year. The couple operating this farm expressed support for the CSP, but questioned whether the general public would appreciate it as an environmental or "green payment"

program. They also questioned whether funding levels would be high enough to support all the farmers who had enrolled. The lower Tier rating for this farm reflects the challenge conventional dairy farms face in qualifying for payments under CSP given current program criteria.

Results of Soil Conditioning Index Analysis

Production, Tillage, Fertilizer.

Comm. = Commercial fertilizer

				Averages By the Waters Shed with Totals		
Production	Tillage	Fertilizer	Data	Monocacy	Sass/Ches	Grand Total
Beef	No-Till	Comm	Average of SCI	0.73		0.73
			Count of SCI	3		3
	No-Till Average of SCI			0.73		0.73
	No-Till Count of SCI			3		3
Beef Average of SCI				0.73		0.73
Beef Count of SCI				3		3
Cash Grain	Conventional	Comm	Average of SCI	0.10	0.24	0.24
			Count of SCI	1	41	42
		Manure	Average of SCI	-0.23	0.21	0.12
			Count of SCI	3	11	14
	Conventional Average of SCI			-0.15	0.23	0.21
	Conventional Count of SCI			4	52	56
	No-Till	Comm	Average of SCI	0.64	0.50	0.53
			Count of SCI	52	143	195
Manure	Average of SCI	0.31	0.56	0.47		
	Count of SCI	7	12	19		
No-Till Average of SCI			0.60	0.50	0.53	
No-Till Count of SCI			59	155	214	
Cash Grain Average of SCI				0.55	0.43	0.46
Cash Grain Count of SCI				63	207	270
Cash Grain/Vegetable	Conventional	Comm	Average of SCI		0.47	0.47
			Count of SCI		5	5
	Manure	Average of SCI	-0.30		-0.30	
		Count of SCI	1		1	
	Conventional Average of SCI			-0.30	0.47	0.34
Conventional Count of SCI			1	5	6	
No-Till	Comm	Average of SCI	0.69	0.52	0.62	
		Count of SCI	3	2	5	

		Manure	Average of SCI Count of SCI	0.07 1	0.07 1
	No-Till Average of SCI			0.53	0.52
	No-Till Count of SCI			4	2
Cash Grain/Vegetable Average of SCI				0.37	0.48
Cash Grain/Vegetable Count of SCI				5	7
Dairy	Conventional	Comm	Average of SCI Count of SCI	0.53 3	0.53 3
		Manure	Average of SCI Count of SCI	0.28 5	0.28 5
	Conventional Average of SCI			0.37	0.37
	Conventional Count of SCI			8	8
	No-Till	N	Average of SCI Count of SCI	0.74 1	0.74 1
		Comm	Average of SCI Count of SCI	0.44 10	0.62 5
		Manure	Average of SCI Count of SCI	0.32 12	0.43 11
	No-Till Average of SCI			0.38	0.50
	No-Till Count of SCI			22	17
	Dairy Average of SCI				0.38
Dairy Count of SCI				22	25
Vegetable	Conventional	Manure	Average of SCI Count of SCI	0.20 1	0.20 1
		Conventional Average of SCI			0.20
	Conventional Count of SCI			1	1
Vegetable Average of SCI				0.20	0.20
Vegetable Count of SCI				1	1
Vineyard	No-Till	Comm	Average of SCI Count of SCI	0.90 2	0.90 2
		No-Till Average of SCI			0.90
	No-Till Count of SCI			2	2
Vineyard Average of SCI				0.90	0.90
Vineyard Count of SCI				2	2
Total Average of SCI				0.51	0.44
Total Count of SCI				95	240
				335	

Production, Perennial Crop Length

		Averages By the Waters Shed with Totals			
		H2O Shed			
Production	perennial crop	Data	Monocacy	Sass/Ches	Grand Total
Beef	6	Average of SCI	0.80		0.80
		Count of SCI	1		1
	11	Average of SCI	0.70		0.70
		Count of SCI	2		2
Beef Average of SCI			0.73		0.73
Beef Count of SCI			3		3
Cash Grain	0	Average of SCI	0.36	0.41	0.40
		Count of SCI	26	192	218
	1	Average of SCI		1.09	1.09
		Count of SCI		2	2
	2	Average of SCI	0.80		0.80
		Count of SCI	2		2
	3	Average of SCI	0.55	0.78	0.69
		Count of SCI	4	7	11
	4	Average of SCI	0.50	0.60	0.51
		Count of SCI	6	1	7
	5	Average of SCI	0.43	0.44	0.44
		Count of SCI	3	1	4
	6	Average of SCI	0.71	0.59	0.66
Count of SCI		6	4	10	
7	Average of SCI	0.80		0.80	
	Count of SCI	1		1	
8	Average of SCI	0.82		0.82	
	Count of SCI	1		1	
9	Average of SCI	0.61		0.61	
	Count of SCI	2		2	
10	Average of SCI	0.84		0.84	
	Count of SCI	10		10	
11	Average of SCI	0.90		0.90	
	Count of SCI	2		2	
Cash Grain Average of SCI			0.55	0.43	0.46

Cash Grain Count of SCI			63	207	270
Cash Grain/Vegetable	0	Average of SCI	0.37	0.48	0.43
		Count of SCI	5	7	12
Cash Grain/Vegetable Average of SCI			0.37	0.48	0.43
Cash Grain/Vegetable Count of SCI			5	7	12
Dairy	0	Average of SCI	0.20	0.45	0.35
		Count of SCI	7	10	17
	3	Average of SCI	0.35	0.41	0.40
		Count of SCI	2	9	11
	4	Average of SCI	0.38	0.55	0.43
		Count of SCI	3	1	4
	5	Average of SCI	0.34	0.48	0.39
		Count of SCI	5	3	8
6	Average of SCI	0.70		0.70	
	Count of SCI	3		3	
7	Average of SCI	0.40	0.65	0.56	
	Count of SCI	1	2	3	
10	Average of SCI	0.84		0.84	
	Count of SCI	1		1	
Dairy Average of SCI			0.38	0.46	0.42
Dairy Count of SCI			22	25	47
Vegetable	0	Average of SCI		0.20	0.20
		Count of SCI		1	1
Vegetable Average of SCI				0.20	0.20
Vegetable Count of SCI				1	1
Vineyard	1	Average of SCI	1.00		1.00
		Count of SCI	1		1
	12	Average of SCI	0.80		0.80
		Count of SCI	1		1
Vineyard Average of SCI			0.90		0.90
Vineyard Count of SCI			2		2
Total Average of SCI			0.51	0.44	0.46
Total Count of SCI			95	240	335

			Averages By the Watershed with Totals		
			Watershed		
Length of rotation	Perennial crop	Data	Monocacy	Sass/Ches	Grand Total
1	0	Average of SCI	-0.04	0.18	0.16
		Count of SCI	2	15	17
	1	Average of SCI	1.00	1.09	1.06
		Count of SCI	1	2	3
1 Average of SCI			0.31	0.29	0.29
1 Count of SCI			3	17	20
2	0	Average of SCI	0.29	0.47	0.46
		Count of SCI	13	118	131
2 Average of SCI			0.29	0.47	0.46
2 Count of SCI			13	118	131
3	0	Average of SCI	0.33	0.43	0.40
		Count of SCI	12	39	51
	3	Average of SCI	0.60	1.06	0.99
		Count of SCI	1	5	6
3 Average of SCI			0.35	0.50	0.46
3 Count of SCI			13	44	57
4	0	Average of SCI	0.46	0.30	0.33
		Count of SCI	9	29	38
	2	Average of SCI	0.80		0.80
		Count of SCI	2		2
	4	Average of SCI	0.66		0.66
		Count of SCI	1		1
4 Average of SCI			0.53	0.30	0.37
4 Count of SCI			12	29	41
5	0	Average of SCI	0.42		0.42
		Count of SCI	2		2
	3	Average of SCI	0.30	0.23	0.25
		Count of SCI	1	3	4
	5	Average of SCI	0.50		0.50
		Count of SCI	1		1
5 Average of SCI			0.41	0.23	0.33
5 Count of SCI			4	3	7

6	0	Average of SCI Count of SCI		0.27 6	0.27 6
	3	Average of SCI Count of SCI	0.50 2	0.46 6	0.47 8
	4	Average of SCI Count of SCI	0.75 1	0.60 1	0.68 2
	6	Average of SCI Count of SCI	0.80 5	0.94 1	0.83 6
6 Average of SCI			0.72	0.42	0.53
6 Count of SCI			8	14	22
7	3	Average of SCI Count of SCI	0.50 2		0.50 2
	4	Average of SCI Count of SCI	0.36 4		0.36 4
	5	Average of SCI Count of SCI	0.36 1		0.36 1
	6	Average of SCI Count of SCI	0.68 1		0.68 1
	7	Average of SCI Count of SCI	0.80 1		0.80 1
7 Average of SCI			0.47		0.47
7 Count of SCI			9		9
8	0	Average of SCI Count of SCI		0.47 3	0.47 3
	4	Average of SCI Count of SCI	0.55 2	0.55 1	0.55 3
	5	Average of SCI Count of SCI	0.73 2		0.73 2
	6	Average of SCI Count of SCI	0.66 2		0.66 2
8 Average of SCI			0.65	0.49	0.58
8 Count of SCI			6	4	10
9	3	Average of SCI Count of SCI		0.19 2	0.19 2
	4	Average of SCI Count of SCI	0.19 1		0.19 1
	5	Average of SCI	0.17	0.30	0.20

		Count of SCI	4	1	5
	6	Average of SCI		0.62	0.62
		Count of SCI		1	1
	8	Average of SCI	0.82		0.82
		Count of SCI	1		1
	9	Average of SCI	0.61		0.61
		Count of SCI	2		2
9 Average of SCI			0.36	0.32	0.35
9 Count of SCI			8	4	12
10	5	Average of SCI		0.53	0.53
		Count of SCI		3	3
	6	Average of SCI	0.55	0.45	0.50
		Count of SCI	1	1	2
7	Average of SCI		0.65	0.65	
	Count of SCI		2	2	
10	Average of SCI	0.84		0.84	
	Count of SCI	11		11	
10 Average of SCI			0.81	0.56	0.73
10 Count of SCI			12	6	18
11	11	Average of SCI	0.80		0.80
		Count of SCI	4		4
11 Average of SCI			0.80		0.80
11 Count of SCI			4		4
12	6	Average of SCI	0.60	0.35	0.48
		Count of SCI	1	1	2
	12	Average of SCI	0.80		0.80
		Count of SCI	1		1
12 Average of SCI			0.70	0.35	0.58
12 Count of SCI			2	1	3
13	7	Average of SCI	0.40		0.40
		Count of SCI	1		1
13 Average of SCI			0.40		0.40
13 Count of SCI			1		1
Total Average of SCI			0.51	0.44	0.46
Total Count of SCI			95	240	335

**Production, Tillage,
Cover**

Averages By the Watershed with Totals

			Averages By the Watershed with Totals			
			H2O Shed			
Production	Tillage	Cover crop	Data	Monocacy	Sass/ Ches	Grand Total
Beef	No-Till	Yes	Average of SCI	0.73		0.73
			# of data points	3		3
	No-Till Average of SCI			0.73		0.73
	No-Till # of data points			3		3
Beef Average of SCI				0.73		0.73
Beef # of data points				3		3
Cash Grain	Conventional	Yes	Average of SCI	-0.04	0.31	0.29
			# of data points	3	43	46
	Conventional	No	Average of SCI	-0.47	-0.15	-0.18
			# of data points	1	9	10
	Conventional Average of SCI			-0.15	0.23	0.21
	Conventional # of data points			4	52	56
	No-Till	Yes	Average of SCI	0.62	0.51	0.55
			# of data points	55	112	167
No-Till	No	Average of SCI	0.33	0.48	0.47	
		# of data points	4	43	47	
No-Till Average of SCI			0.60	0.50	0.53	
No-Till # of data points			59	155	214	
Cash Grain Average of SCI				0.55	0.43	0.46
Cash Grain # of data points				63	207	270
Cash Grain/Vegetable	Conventional	Yes	Average of SCI		0.47	0.47
			# of data points		5	5
	Conventional	No	Average of SCI	-0.30		-0.30
			# of data points	1		1
	Conventional Average of SCI			-0.30	0.47	0.34
Conventional # of data points			1	5	6	
No-Till	Yes	Average of SCI	0.53	0.52	0.53	
		# of data points	4	2	6	

Production, Tillage,
Fertilizer

Comm. = Commercial Fertilizer

Averages By the Watershed with Totals

Tillage	Fertilizer	Data	Monocacy	Sass/Ches	Grand Total
No-Till	Comm	Average of SCI	0.73		0.73
		Count of SCI	3		3
No-Till Average of SCI			0.73		0.73
No-Till Count of SCI			3		3
			0.73		0.73
			3		3
Conventional	Comm	Average of SCI	0.10	0.24	0.24
		Count of SCI	1	41	42
	Manure	Average of SCI	-0.23	0.21	0.12
		Count of SCI	3	11	14
Conventional Average of SCI			-0.15	0.23	0.21
Conventional Count of SCI			4	52	56
No-Till	Comm	Average of SCI	0.64	0.50	0.53
		Count of SCI	52	143	195
	Manure	Average of SCI	0.31	0.56	0.47
		Count of SCI	7	12	19
No-Till Average of SCI			0.60	0.50	0.53
No-Till Count of SCI			59	155	214
			0.55	0.43	0.46
			63	207	270
Conventional	Comm	Average of SCI		0.47	0.47
		Count of SCI		5	5
	Manure	Average of SCI	-0.30		-0.30
		Count of SCI	1		1
Conventional Average of SCI			-0.30	0.47	0.34
Conventional Count of SCI			1	5	6
No-Till	Comm	Average of SCI	0.69	0.52	0.62
		Count of SCI	3	2	5
	Manure	Average of SCI	0.07		0.07
		Count of SCI	1		1

No-Till Average of SCI			0.53	0.52	0.53
No-Till Count of SCI			4	2	6
			0.37	0.48	0.43
			5	7	12
Conventional	Comm	Average of SCI		0.53	0.53
		Count of SCI		3	3
	Manure	Average of SCI		0.28	0.28
		Count of SCI		5	5
Conventional Average of SCI				0.37	0.37
Conventional Count of SCI				8	8
No-Till	N	Average of SCI		0.74	0.74
		Count of SCI		1	1
	Comm	Average of SCI	0.44	0.62	0.50
		Count of SCI	10	5	15
	Manure	Average of SCI	0.32	0.43	0.37
		Count of SCI	12	11	23
No-Till Average of SCI			0.38	0.50	0.43
No-Till Count of SCI			22	17	39
			0.38	0.46	0.42
			22	25	47
Conventional	Manure	Average of SCI		0.20	0.20
		Count of SCI		1	1
Conventional Average of SCI				0.20	0.20
Conventional Count of SCI				1	1
				0.20	0.20
				1	1
No-Till	Comm	Average of SCI	0.90		0.90
		Count of SCI	2		2
No-Till Average of SCI			0.90		0.90
No-Till Count of SCI			2		2
			0.90		0.90
			2		2
			0.51	0.44	0.46
			95	240	335

Production, Perennial Crop Length

		Averages By the Waters Shed with Totals			
		H2O Shed			
Production	perennial crop	Data	Monocacy	Sass/Ches	Grand Total
Beef	6	Average of SCI	0.80		0.80
		Count of SCI	1		1
	11	Average of SCI	0.70		0.70
		Count of SCI	2		2
Beef Average of SCI			0.73		0.73
Beef Count of SCI			3		3
Cash Grain	0	Average of SCI	0.36	0.41	0.40
		Count of SCI	26	192	218
	1	Average of SCI		1.09	1.09
		Count of SCI		2	2
	2	Average of SCI	0.80		0.80
		Count of SCI	2		2
	3	Average of SCI	0.55	0.78	0.69
		Count of SCI	4	7	11
	4	Average of SCI	0.50	0.60	0.51
		Count of SCI	6	1	7
	5	Average of SCI	0.43	0.44	0.44
		Count of SCI	3	1	4
	6	Average of SCI	0.71	0.59	0.66
		Count of SCI	6	4	10
7	Average of SCI	0.80		0.80	
	Count of SCI	1		1	
8	Average of SCI	0.82		0.82	
	Count of SCI	1		1	
9	Average of SCI	0.61		0.61	
	Count of SCI	2		2	
10	Average of SCI	0.84		0.84	
	Count of SCI	10		10	
11	Average of SCI	0.90		0.90	
	Count of SCI	2		2	
Cash Grain Average of SCI			0.55	0.43	0.46

Cash Grain Count of SCI			63	207	270
Cash Grain/Vegetable	0	Average of SCI	0.37	0.48	0.43
		Count of SCI	5	7	12
Cash Grain/Vegetable Average of SCI			0.37	0.48	0.43
Cash Grain/Vegetable Count of SCI			5	7	12
Dairy	0	Average of SCI	0.20	0.45	0.35
		Count of SCI	7	10	17
	3	Average of SCI	0.35	0.41	0.40
		Count of SCI	2	9	11
	4	Average of SCI	0.38	0.55	0.43
		Count of SCI	3	1	4
	5	Average of SCI	0.34	0.48	0.39
		Count of SCI	5	3	8
6	Average of SCI	0.70		0.70	
	Count of SCI	3		3	
7	Average of SCI	0.40	0.65	0.56	
	Count of SCI	1	2	3	
10	Average of SCI	0.84		0.84	
	Count of SCI	1		1	
Dairy Average of SCI			0.38	0.46	0.42
Dairy Count of SCI			22	25	47
Vegetable	0	Average of SCI		0.20	0.20
		Count of SCI		1	1
Vegetable Average of SCI				0.20	0.20
Vegetable Count of SCI				1	1
Vineyard	1	Average of SCI	1.00		1.00
		Count of SCI	1		1
	12	Average of SCI	0.80		0.80
		Count of SCI	1		1
Vineyard Average of SCI			0.90		0.90
Vineyard Count of SCI			2		2
Total Average of SCI			0.51	0.44	0.46
Total Count of SCI			95	240	335

			Averages By the Waters Shed with Totals		
			H2O Shed		
Length of rotation	Perennial crop	Data	Monocacy	Sass/Ches	Grand Total
1	0	Average of SCI	-0.04	0.18	0.16
		Count of SCI	2	15	17
	1	Average of SCI	1.00	1.09	1.06
		Count of SCI	1	2	3
1 Average of SCI			0.31	0.29	0.29
1 Count of SCI			3	17	20
2	0	Average of SCI	0.29	0.47	0.46
		Count of SCI	13	118	131
2 Average of SCI			0.29	0.47	0.46
2 Count of SCI			13	118	131
3	0	Average of SCI	0.33	0.43	0.40
		Count of SCI	12	39	51
	3	Average of SCI	0.60	1.06	0.99
		Count of SCI	1	5	6
3 Average of SCI			0.35	0.50	0.46
3 Count of SCI			13	44	57
4	0	Average of SCI	0.46	0.30	0.33
		Count of SCI	9	29	38
	2	Average of SCI	0.80		0.80
		Count of SCI	2		2
	4	Average of SCI	0.66		0.66
		Count of SCI	1		1
4 Average of SCI			0.53	0.30	0.37
4 Count of SCI			12	29	41
5	0	Average of SCI	0.42		0.42
		Count of SCI	2		2
	3	Average of SCI	0.30	0.23	0.25
		Count of SCI	1	3	4
	5	Average of SCI	0.50		0.50
		Count of SCI	1		1
5 Average of SCI			0.41	0.23	0.33
5 Count of SCI			4	3	7

6	0	Average of SCI Count of SCI		0.27 6	0.27 6
	3	Average of SCI Count of SCI	0.50 2	0.46 6	0.47 8
	4	Average of SCI Count of SCI	0.75 1	0.60 1	0.68 2
	6	Average of SCI Count of SCI	0.80 5	0.94 1	0.83 6
6 Average of SCI			0.72	0.42	0.53
6 Count of SCI			8	14	22
7	3	Average of SCI Count of SCI	0.50 2		0.50 2
	4	Average of SCI Count of SCI	0.36 4		0.36 4
	5	Average of SCI Count of SCI	0.36 1		0.36 1
	6	Average of SCI Count of SCI	0.68 1		0.68 1
	7	Average of SCI Count of SCI	0.80 1		0.80 1
7 Average of SCI			0.47		0.47
7 Count of SCI			9		9
8	0	Average of SCI Count of SCI		0.47 3	0.47 3
	4	Average of SCI Count of SCI	0.55 2	0.55 1	0.55 3
	5	Average of SCI Count of SCI	0.73 2		0.73 2
	6	Average of SCI Count of SCI	0.66 2		0.66 2
8 Average of SCI			0.65	0.49	0.58
8 Count of SCI			6	4	10
9	3	Average of SCI Count of SCI		0.19 2	0.19 2
	4	Average of SCI Count of SCI	0.19 1		0.19 1
	5	Average of SCI	0.17	0.30	0.20

		Count of SCI	4	1	5
	6	Average of SCI		0.62	0.62
		Count of SCI		1	1
	8	Average of SCI	0.82		0.82
		Count of SCI	1		1
	9	Average of SCI	0.61		0.61
		Count of SCI	2		2
9 Average of SCI			0.36	0.32	0.35
9 Count of SCI			8	4	12
10	5	Average of SCI		0.53	0.53
		Count of SCI		3	3
	6	Average of SCI	0.55	0.45	0.50
		Count of SCI	1	1	2
7	Average of SCI		0.65	0.65	
	Count of SCI		2	2	
10	Average of SCI	0.84		0.84	
	Count of SCI	11		11	
10 Average of SCI			0.81	0.56	0.73
10 Count of SCI			12	6	18
11	11	Average of SCI	0.80		0.80
		Count of SCI	4		4
11 Average of SCI			0.80		0.80
11 Count of SCI			4		4
12	6	Average of SCI	0.60	0.35	0.48
		Count of SCI	1	1	2
	12	Average of SCI	0.80		0.80
		Count of SCI	1		1
12 Average of SCI			0.70	0.35	0.58
12 Count of SCI			2	1	3
13	7	Average of SCI	0.40		0.40
		Count of SCI	1		1
13 Average of SCI			0.40		0.40
13 Count of SCI			1		1
Total Average of SCI			0.51	0.44	0.46
Total Count of SCI			95	240	335