Berks County Conservation District
Chesapeake Bay Program
County Implementation Plan
(2007-2008)

I. COUNTY DESCRIPTION

Berks County is located in the southeast section of Pennsylvania. In 1752, Berks County was incorporated from parts of Lancaster, Chester, and Philadelphia Counties, and named for Berkshire, England, home of William Penn's family. In 1772, Berks gave up territory for the formation of Northumberland County, and again in 1811, for the formation of Schuylkill County.

Berks is close to both the Philadelphia and Harrisburg Metropolitan areas, but is also considered part of Pennsylvania Dutch Country. Through numerous federal and state highways and turnpikes, the county is also linked to other major cities such as New York (125 miles) and Baltimore (97 miles). The county is a diamond-shaped area of approximately 864 square miles. The county's physical geography, combined with a moderate climate, is favorable for an agricultural industry, especially for dairy and poultry products. The county has over 1,900 farms, which account for 243,260 acres. Annual receipts from field crops, fruit, livestock, and livestock products is close to $168 million, making Berks the third leading county in PA in agricultural production (The History And Government of Berks County, Pennsylvania, 4th edition 1993).

Because of its proximity to other large cities, the population of Berks County has been increasing over the last 15 years. The Berks County website lists the1990 census with 336,523 persons, the 2000 census with 373,638 persons, and the 2010 census reports 411,442 persons: a 19% increase in residency since 1990. Because of the increasing residential population, Berks County has been pursuing agricultural easements since the early 1990's. As of January 2005, Berks has 37,250 acres and 316 farms permanently preserved for agricultural production. This makes Berks County the number one county in Pennsylvania with preserved acres (Beef Roundup, January 3, 2005).

While the county is predominantly in the Schuylkill River watershed, the Chesapeake Bay drainage area is approximately 56,000 acres, or about 10% of the county. This drainage area consists of two separate lobes: one area located in the northwest section of the county, and the other located in the southwest area. The population in the northwest section is approximately 5,850 and the population in the southwest part of the county is approximately 9,050. The economy in the two areas is primarily agriculture and small businesses based (food stores, gas stations, restaurants, trucking companies, farm implement dealers, lawn and garden stores, welding shops, etc). The land use in the two areas is primarily agriculture, small businesses, woodland, and housing. The culture in the area is predominately influenced by the descendants of German/Swiss immigrants. Nearly the entire farming community in this area is made up of these German/Swiss descendants. A large portion of the farms located in the Chesapeake Bay watershed are owned and operated by the plain sects (Mennonites and Amish). The types of agriculture in the areas are very diverse. There are numerous types of farms that include dairy, beef, poultry (broilers, pullets, layers), hogs, and cash grain. Dairy is the most popular farming operation. Dairy is also the dominant type of operation for the plain sect farmer.

The following table outlines production values for several Berks County operations, as reported in the 2007 Pennsylvania Agricultural Statistics:

Berks County Agricultural Statistics 2007	
Commodity	Value of Production
Milk	$86,013,000
Livestock, Poultry and their products	$202,330,000
Cattle and Calves	$24,122,000
Total Value of Crops	$165,511,000

II. COUNTY WATER RESOURCES AND QUALITY

There are two major watersheds located in the Chesapeake Bay region of Berks County.
These two major watersheds are the Little Swatara Creek Watershed and the Conestoga Creek Watershed. The Little Swatara Creek Watershed is located in the northwest area of the county. There are several named streams in Bethel Township that flow into the Little Swatara Creek and include: *Meck Creek, Crosskill Creek, Mill Creek, and Stone Creek*. All the named creeks and unnamed tributaries make up the Little Swatara Creek Watershed. The Conestoga River Watershed is located in the southwest area of the county. The actual Conestoga River itself originates in the southern most section of the county. There are two sub-watersheds located in the Conestoga River Watershed. These two sub-watersheds are located north of the Conestoga River and flow into the Conestoga River in Lancaster County.

The following is a listing of the two major watersheds and the municipalities in which they are located.

- ***Little Swatara Creek Watershed*** (HUC #: 2050305070) consists of four municipalities: Bethel Township (in its entirety), Marion Township, Tulpehocken Township, and Upper Tulpehocken Township. This watershed contains 37,000 acres within the county.
- ***Conestoga River Watershed*** (HUC #: 2050306110) itself contains two municipalities: Caernarvon Township & New Morgan Borough. This watershed contains 19,000 acres within the county – this acreage includes the two sub-watersheds.
  The two Conestoga River sub-watersheds and their municipalities:
  - ***Little Muddy Creek Watershed*** (HUC #: 2050306110) consists of two municipalities: Brecknock Township, and Spring Township
  - ***Little Cocalico Creek Watershed*** (HUC #: 2050306090) consists of one municipality: South Heidelberg Township.

The Little Swatara Creek is a Cold Water Fishery from the source to the Berks/Lebanon County line. The Conestoga River and its tributaries is a Warm Water Fishery. The Little Muddy Creek is a Warm Water Fishery from the source to the Berks/Lancaster County line. The Little Cocalico Creek basin is a Trout Stocked Fishery. Moreover, all of the designated streams in the Chesapeake Bay Watershed in Berks County are impaired by agriculture in the form of excess nutrients and/or siltation. The Little Swatara Creek, the Conestoga River, the Little Muddy Creek and the Little Cocalico Creek are listed on the Pennsylvania Integrated Water Quality Monitoring and Assessment Report as class 5 waterbodies impaired by agriculture and in need of a TMDL. In addition, all of these are considered high priority watersheds by the EPA.

III. SIGNIFICANT TRENDS IN THE COUNTY

The population in all the municipalities located in the Chesapeake Bay drainage area is increasing. According to the Berks County web page, *Demographics and Statistics*, the population estimates are as follows:

Chesapeake Bay area Municipal Populations			
	Year		
Municipality	**1990**	**2000**	**2003**
Bethel Township	3,676	4,166	4,311
Brecknock Township	3,770	4,459	4,649
Caernarvon Township	1,933	2,312	3,045
Marion Township	1,415	1,573	1,581
South Heidelberg Township	4,382	5,491	6,099
Spring Township	18,899	21,805	22,934
Tulpehocken Township	2,843	3,290	3,414
Upper Tulpehocken Township	1,289	1,495	1,579

The main land use in the Chesapeake Bay region of the county is agriculture. Agriculture is by far the main land use in the Little Swatara Creek Watershed. Numerous conservation plans and nutrient management plans (NMPs) have been written, and best management practices (BMPs) have been installed through the years in the Little Swatara Creek Watershed. The following chart is a profile of the economic characteristics of the municipalities in the four watersheds. This chart demonstrates that the Little Swatara Creek Watershed is the most active watershed in agriculture out of the four Chesapeake Bay watersheds.

Industry Type -vs- Number of Jobs in Each Industry

Industry Type	WS1	WS2	WS3	WS4
Agriculture, forestry, fishing and hunting, and mining	433	31	53	40
Construction	482	149	725	89
Manufacturing	1,215	592	2,707	286
Wholesale trade	231	69	500	48
Retail trade	614	282	1,690	158
Transportation and warehousing, and utilities	134	180	771	60
Finance, insurance, real estate, and rental and leasing	139	360	1,048	56
Professional, scientific, management, administrative, and waste management services	233	165	1,231	100
Education, health and social services	805	498	3,060	206
Arts, entertainment, recreational, accomodation and food	355	169	748	75

Legend

WS1 are the Little Swatara Creek Watershed Municipalities: Bethel Township, Marion Township, Tulpehocken Township, Upper Tulpehocken Township

WS2 is the Little Cocalico Creek Municipality: South Heidelberg Township

WS3 are the Little Muddy Creek Municipalities: Brecknock Township, Spring Township

WS4 is the Conestoga Creek Municipality: Caernarvon Township

Source: U.S. Bureau of the Census, Census 2000

The following table represents agricultural trends for the Number and Value of several different livestock types in Berks County as a whole:

Livestock on Farms and Value in Berks County

	Livestock type, number and value		
Year of Statistical Summary	Hogs and Pigs	Cattle and Calves	Sheep and Lambs
1990-1991	52,000 $4,386,000	75,000 $55,875,000	4,700 $413,600
1995-1996	64,000 $4,544,000	69,000 $49,355,000	2,600 $260,000

2003-2004	55,700 $3,843,300	63,300 $61,401,000	1,550 $220,100

Source: Pennsyvania Agricultural Statistics

The following table represents agricultural trends for crop production and its value in Berks County as a whole:

Crop Production and Value in Berks County			
	Crop type, production and value		
Year of Statistical Summary	Corn Grain	Corn Silage	All Hay
1990-1991	6,636,000 Bu $16,258,200	240,500 Tons $5,627,700	194,900 Tons $19,879,800
1995-1996	5,123,000 Bu $18,955,100	202,500 Tons $4,758,700	151,300 Tons $14,193,200
2003-2004	4,092,700 Bu $11,868,800	381,100 Tons $10,022,900	106,700 Tons $14,617,900

Source: Pennsylvania Agricultural Statistics

According to the above two tables, the number of livestock and crop production in Berks County is generally decreasing with time. This trend is applicable in three of the four Chesapeake Bay watersheds. The trend has occurred through the removal of numerous farms out of agricultural production and into housing and industrial developments. The watershed that has not been hard hit by development and is continuing to thrive with agriculture is the Little Swatara Creek Watershed. As stated earlier, many of the farms in this watershed are preserved through the Ag Land Preservation Program and many more landowners want to get into the program. This program will be responsible for the areas agricultural stability for many years to come.

IV. SEDIMENT AND NUTRIENT SOURCE REDUCTIONS

Some strategies for sediment and nutrient reductions have already been implemented in the Chesapeake Bay portion of the county. Numerous cost share programs have been partly responsible for attaining these reductions. Currently, project implementation cost sharing has been offered through local, state, and federal agencies and non-profit organizations. The following chart lists the funding source, types of BMPs installed by the funding source, and the total monies spent by the funding source.

Tally of Cost Share Monies Spent In Berks County In The Chesapeake Bay Region from January 1, 1990 to June 30, 2005		
Funding Source	BMP	Money Spent
PA-DEP Chesapeake Bay Program	manure storages, grassed waterways, soil samples, etc.	$1,202,825.55
PA-DEP Streambank Fencing Program	streambank fencing and crossings	$17,239.15
Berks County Conservation District	streambank fencing and crossing	$6,311.65
Ducks Unlimited, Inc.	streambank fencing, streambank and shoreline protection, crossings	$18,419.30
Chesapeake Bay Foundation	streambank fencing	$2,986.00
Trout Unlimited, Inc.	streambank fencing	$274.10

National Fish and Wildlife Foundation	streambank fencing and crossings	$9,995.86
PA-PDA Nutrient Management Grant Program (Act 6 funding)	manure storage, barnyard runoff controls	$45,852.00
USDA-NRCS Environmental Quality Incentive Program	liquid manure storage, two manure stacking pads, no-till	$74,284.00
USDA-NRCS Conservation Reserve Enhancment Program	streambank fencing, stream crossings, grassed waterways	$97,961.08
USDA-NRCS Long Term Agreement	multiple field practices	$43,700.00
USDA-NRCS Rural Clean Water Program (RCWP)	manure storage, field practices	$102,995.00

Two of the above funding source options no longer exist in Berks County. These two funding sources consist of: LTA, and RCWP.

There are at least seven farms in the Little Swatara Creek Watershed that had streambank fencing and crossings installed through one or a combination of streambank fencing funding sources. RCWP, Act 6 Program, EQIP, and the Chesapeake Bay Program are responsible for installing numerous types of BMPs on farms in all the Chesapeake Bay Watersheds. In the early 1990's RCWP had installed a manure structure (dairy) in the Conestoga Creek Watershed (this federal program is no longer in existence). In the mid-1990's, EQIP had installed one manure storage (hogs) and two concrete manure stacking pads (pullets) in the Little Swatara Creek Watershed. In the late 1990's the Act 6 Program had installed a manure storage, manure transfer line and concrete barnyard (dairy) in the Little Cocalico Creek Watershed. Also in the late 1990's, CREP installed numerous grassed waterways in both the Little Swatara Creek Watershed, and the Little Cocalico Creek Watershed. In all four watersheds, the Chesapeake Bay Program had installed numerous other BMPs, including but not limited to: grassed waterways, diversions, cropland terraces, field stripcropping, concrete barnyards, and manure storages.

Through the numerous funding sources there have been numerous installed conservation practices credited to the Berks County Chesapeake Bay area from 1985 through 2002:

Cumulative total of Chesapeake Bay Program Credited Practices Reported From 1985 Through 2002		
Practice	**Unit**	**Amount**
Abandoned Mine Reclamation	Acres	2
Animal Waste Management – AEUs	AEUs	3,572
Conservation Plans	Acres	8,470
Conservation Tillage	Acres	2,141
Erosion and Sediment Control	Acres	69
Forest Buffers	Acres	22
Grass Buffers	Acres	1
Land Retirement	Acres	338
Nutrient Management	Acres	8,725
Off-stream Watering With Stream Fencing	Acres	62
Off-stream Watering Without Fencing	Acres	12
Rotational Grazing	Acres	43
Septic Connections	EDUs	12
Tree Planting	Acres	80
Wetland Restoration	Acres	4

V. Chesapeake Bay Technician Responsibilities

The Chesapeake Bay Technician will write conservation plans as part of the priorities in the Technician Contract. The conservation plan level will either be RMS or Progressive to address the resource concerns on a farming operation. A conservation plan will be considered applied when all of the conservation practices that make up the system have been installed according to Conservation Practice Standards in Section IV of the USDA-NRCS PA Technical Guide. The NMPs will all be written to PA Act 38 standards. The complexity of both the conservation plans and NMPs vary on the size and type of the operations. Many BMPs have already been installed in which some of the BMPs include: grassed waterways, diversions, streambank fencing and crossings, cropland terraces, field stripcropping, concrete barnyards, and manure storages.

Experienced Conservation District staff have strived to become familiar with the land and the farmers in the designated Chesapeake Bay watersheds. There are numerous farmers that have cooperated with the conservation district but yet there are many farmers that have not cooperated. Many of these non-cooperating farmers are of the plain sect and have stayed away from government assistance. Of the farmers that have cooperated with the Conservation District in the past there are still many BMPs to be installed. With the limited amount of funds offered by the numerous programs in the past there were many farms in which several of the needed BMPs were installed on any certain farm. The lack of cost share funds prevented the installation of all the necessary BMPs that needed to be installed on any certain farm. On many of the plain sect farms there is little if any BMP installation. If enough money can be obtained for cost sharing there are many BMPs that can and will be installed. With every farm that BMPs are installed, conservation plans and P-based nutrient management plans will be written to document the BMPs that already exist on the operation, plan the BMPs that yet need to be installed on the operation, and balance the nutrients that are spread on the operation. In fact, to qualify for SPFP funding an operation must have a valid nutrient management plans and Ag E&S/Conservation Plan. The traditional BMPs that need yet be installed on the farming operations include but are not limited to: grassed waterways, cover crops, streambank fencing and crossings, concrete barnyards, and manure storage structures. There is also a need and appears to be a desire to install numerous agricultural BMPs described on the list of Chesapeake Bay Program Best Management Practices dated 7/26/04. These BMPs include but are not limited to: rotational grazing systems, no-till farming, and cover crops.

The most effective way to approach and address the conservation needs for the farms in the two major watersheds and the two sub-watersheds is a complex matter. This is based on numerous items:

1) Overall lack of cost share money available to be allocated and/or divided out to the farming operations interested in obtaining cost share funding,
2) having existing farmers interested in installing BMPs to obtain the RMS or Progressive level conservation plans and P-based NMPs written and followed,
3) convincing reluctant plain sect farmers to install BMPs, having conservation plans and P-based NMPs written and followed,
4) the amount of time it takes to faithfully and accurately follow the USDA-NRCS Planning Process in generating a RMS or Progressive level conservation plan, and to assist in writing manure management plans,
5) the amount of time it takes to design and construction check the numerous BMPs to be installed by the standards and specifications set forth in the USDA-NRCS PA - Technical Guide,
6) ensure that all structural BMPs installed function as intended for its 10 year minimum lifespan.

There are numerous possible solutions to address the above items. The Chesapeake Bay Programs cap of $30,000 per farm has recently been removed however the lack of Special Project Funding that can be obtained is minimal. Thus additional funding sources must be used to install BMPs. One funding source that appears to have a good supply of funding is the Nutrient Management Act 38 program. The limiting factor on this program is the farmer meeting the minimum financial need requirements. Several farming operations in the Chesapeake Bay watersheds did not meet the minimum financial need criteria and thus could not install the desired BMPs. Overall it is very important to have a cost share program and/or programs that have a dependable supply of easily accessible funds that are able to cost share all the BMPs that need to be installed. Of the farmers that are already willing to enter into the Chesapeake Bay Program to have a RMS or Progressive level conservation plans and Act 38 equivalent P-based NMPs created and BMPs installed, funding and time devotion will be a priority. Over the next 2-5 years several farms in which the BMPs have been installed will be used to exhibit as many of the installed BMPs listed in the Chesapeake Bay Program Best Management Practices dated 7/26/04 (this list is included in section V). These cooperating farms must be willing to allow the Chesapeake Bay Technician to show the farms during numerous times throughout any given year.

V. COUNTY BAY IMPLEMENTATION PLAN

There are numerous activities the Chesapeake Bay Technician will accomplish. The first and foremost thing is the need for the Chesapeake Bay Technician to be educated on the new BMPs that exist on the Chesapeake Bay Program Best Management Practices list dated 7/26/04. The list and the value of importance to implement the BMPs in the immediate future (i.e. next two years) is listed on the following table. The value of importance was determined by using the information obtained from the results of the farmers meeting and conversations with DEP and NRCS personnel:

Berks County Best Management Practices Value of Importance - The BMPs are assigned a value from 1 through 10 (10 is highest value)		
Best Management Practice	Value	Comments/Obstacles and Constraints
Abandoned Mine Land Reclamation	1	Not Applicable
Alternative Use Of Manure/Manure Transport	3	there is a need for better understanding; education opportunity
Animal Waste Management Systems	10	continue to implement as funding permits
Carbon Sequestration	2	there is a need for better understanding; education opportunity
Conservation Plan/Plan Implementation	10	continue to implement as funding permits
Conservation Tillage (no-till)	10	will be a great opportunity to implement
Conservation Tillage (other than no-till)	7	will focus on no-till system
Cover Crops (cereal)	2	most farmers will take for feed
Cover Crops (commodity)	10	will be implemented with no-till system
Dirt and Gravel Road Practices	10	no documented improvements although E&S staff will do when opportunity arises
Erosion and Sediment Controls	10	will continue with E&S Staff
Forest Buffers	2	will encourage to install where applicable
Forest Harvesting Practices	2	will encourage to practice where applicable
Grass Buffers	2	will encourage to install where applicable
Horse Pasture Management	4	will encourage where applicable
Land Retirement	2	will encourage where applicable
Managed Precision Agriculture	3	need a better understanding
Mortality Composters/Manure Composters	10	continue to implement as funding permits
Non-Urban Stream Restoration	3	Done with streambank fencing BMP
Nutrient Management Plan Implementation	10	will encourage on all operations
Off Stream Watering With Stream Fencing	2	35 foot wide buffers not practicle for local farming community
Off Stream Watering W/out Stream Fencing	10	implement where funding and desire exist
Rotational Grazing	10	implement where funding and desire exist
Precision (Intensive) Rotational Grazing	10	implement where funding and desire exist
Septic Dentrification (family units)	1	municipality responsibility
Street Sweeping	1	municipality responsibility
Tree Planting	2	Done with streambank fencing BMP
Urban Growth Reduction	10	AgLand Preservation Program
Urban Nutrient Management	1	municipality responsibility
Wetland Restoration	1	low priority to farm community
Yield Reserve	3	there is a need for better understanding;

		education opportunity
Precision Feeding – Dairy	1	opportunity for feed companies
Phytase Feed Additive - Swine, Poultry	1	opportunity for feed companies
Ammonia Emission Controls - Dairy, Swine, Poultry	2	there is a need for better understanding; education opportunity

Over the next 3-5 years Conservation District personnel realize the ranking of importance of the numerous BMPs on the list may fluctuate.

The farms in the two major watersheds and the two sub-watersheds have the same identified agricultural needs. This County Implementation Plan will focus on trying to obtain Special Project Funding for BMPs, in these watersheds, which have identified importance in the above chart and where Special Project Funding can be obtained Also, recommendations from PA-DEP Chesapeake Bay Program personnel will also help determine the BMPs to be focused on.

Existing farmers that are interested in implementing the high priority BMPs will be focused on first. Due to the shortage of funding in the Chesapeake Bay Program, farmers may have to use programs such as the Nutrient Management Act 38 Grant Program and EQIP to install the following BMPs in the immediate future: Animal Waste Management Systems, Rotational Grazing Systems, Precision (Intensive) Rotational Grazing Systems. There are numerous technical personnel that can assist in both technical assistance and engineering on the above government funding programs and BMPs. These personnel consist of: 1) Gary A. Ballina who is an engineering technician that is employed by USDA-NRCS, 2) Daniel P. Ludwig who is a grazing specialist that is employed by the USDA-NRCS, 3) Clyde A. B. Myers who is a Penn State Extension Agent who is also a grazing specialist.

In the immediate future Chesapeake Bay Program funding will focus on funding several of the BMPs that are on the list dated 7/26/04. These BMPs are as follows: No-Till Farming, Cover Crops - early (commodity), Precision Agriculture, and Conservation Plan – Implementation of Erosion Control BMPs (such as grassed waterways, grassed diversions and subsurface drainage). All BMPs installed under the Conservation Plan – Implementation of Erosion Control BMPs will be installed according to the standards and specifications set forth in the USDA-NRCS PA Technical Guide. The Chesapeake Bay Technician will write conservation plans as part of the technical assistance contract. All farms that have Chesapeake Bay Program Special Project Funding contracts will have both Conservation Plans (either RMS or Progressive) and P-based NMPs created. An important part of making conservation plans and P-based NMPs are to implement all listed BMPs in a timely fashion. As time progresses (i.e. 3-5 years from now) it will become a higher priority to promote and implement the other new BMPs on the 7/26/04 list. This can only be accomplished by first having the conservation district personnel proficiently trained in the new BMPs. The proposed accomplishments over the next 5 years will gain momentum by having additional farmers wanting to install the targeted BMPs. The need of cost share funds will ultimately remain a high priority.

Educating the farmers in all the watersheds will be a priority. The farmers will be educated on the condition of the Chesapeake Bay and what BMPs they can install and actions they can do to reduce sediment and nutrient loads. As stated in section IV, of the farms in which the targeted BMPs are installed, field visits will be arranged on some of these farms for the new BMP promotion. This will be an important step in the process to thoroughly explain and show the effectiveness of the targeted BMPs. This is why that as much cost sharing that can be obtained will be obtained for the installation of BMPs. As part of this education and BMP promotion, the Chesapeake Bay Technician and farmers will on occasion make farm visits to neighboring counties to view the success and discuss the targeted BMPs. Farmer meetings will continue to occur on either an annual or bi-annual basis. These meetings will be used to rank the importance of BMPs to be installed and to discuss strategies on how to most efficiently implement the BMPs.

Over time an inventory and evaluation will be made of all the farms in the Chesapeake Bay region of the county. Four steps will be done to accomplish this:

1) Look at the tax parcel maps to find out how many landowners are in the Bay – vs - how many district cooperators – vs – who needs help
2) Make a list of conservation plans that are currently in place and determine what level each conservation plan is written to: ACS, BCS, RMS
3) Determine the % RMS level of conservation plans – vs – landowners that have some level of conservation plans (ACS, BCS)

4) Rank the farms using the above three items to determine who is in greater need of help.

As stated earlier in this section, there are four BMPs in which Chesapeake Bay special Project Funds will be used: 1) No-Till farming as a Systems Approach, 2) Cover Crops – early (commodity), 3) Precision Agriculture BMP, 4) Conservation Plan – Implementation of Erosion Control BMPs (such as grassed waterways, field strips and subsurface drainage). Tracking of the BMPs installed using Chesapeake Bay and non-Chesapeake Bay funds will be done with quarterly reports using the CBP-23 as instructed in the PA-DEP Administrative Manual for the Chesapeake Bay Program, dated January 2000. The following explains how the four BMPs will be implemented, payments set and/or cost shared.

No-Till Farming BMP:

Goal:

To Implement the No-Till Farming BMP as a Systems Approach. This No-Till BMP will be administered using both the No-Till Systems Approach as taught at the No-Till Workshops which have been sponsored by the South Central DEP Region and the PA-DEP Technical Guidance For the implementation of No-Till and Cover Crop Agricultural Best Management Practices, dated August 2005.

A total of ten farmers with 484.2 total acres are currently contracted with this BMP. The following is a listing of the farmers in which contract exists.

- Jesse R. Alspaugh, 50 acres, Bethel Township
- Glenn Z. Brubacher, 50 acres, Caernarvon Township
- Elvin Z. Brubaker, 50 acres, Bethel Township
- Leroy E. Daub, 32.3 acres, Bethel Township
- W. Ray Hershey, 50 acres, Bethel Township
- Todd J. Kurtz, 49.4 acres, Caernarvon Township
- Glenn Z. Musser, 50 acres, Bethel Township
- Eugene W. Sensenig, 50 acres, Tulpehocken Township
- Steven J. Wenger, 50 acres, Bethel Township
- Dalton R. Zimmerman, 50 acres, Tulpehocken Township

Steps or Procedure:

The key components of a sustainable no-till farming system are: not tilling, crop rotation, cover crops and compaction management. There are numerous items that were explained at the No-Till Workshops that will be incorporated into the Berks County No-Till Systems Approach. Some of these items consist of:

1) The soil needs to be tested and the pH stabilized before the No-Till System actually starts – if lime is required it needs to be incorporated throughout the entire plow layer,
2) Deep Tillage (subsoiling) may need be done before the system is started (if the farmer stays in the No-Till Farming System, Deep Tillage may be needed at least one time throughout the crop rotation cycle). On the Special Project contracted acres a penetrometer will be used at the spring of the year to determine the compaction level of the soil. Agronomy Facts 63 “Diagnosing Soil Compaction Using A Penetrometer (Soil Compaction Tester)” will be followed on how to properly use the instrument. According to the fact sheet if Penetration Resistance is 50 PSI or greater, deep tillage (subsoiling) will be recommended.
3) When converting a farmer into the No-Till Systems Approach – the farmer should only start on a portion of the fields as an experiment because if it fails there will not be a total crop loss,
4) The manure can be injected with special no-till implements,
5) The field structural BMPs will still need be installed – such as grassed waterways. The time period of when the field structural BMPs will be installed will be according to the farmers Conservation Plan BMP implementation schedule.

Soil Samples will be taken in the spring or fall of every year to determine the nutrient, acidity and organic matter levels of the soil. The season on which the soil samples are taken will be noted and repeated for each operation to maintain consistency. If the soil pH is low, a recommendation of adding Lime will be made to neutralize the pH in order to neutralize the acidity. A Cornell pH Test Kit will be used on all cropped contracted acreage in order to determine the existence of an “Acid Roof”. The addition of lime will be recommended on all operations that have an “Acid Roof”. A Chlorophyll Meter will be purchased with Special Project Funding and used on all acreage contracted with this No-Till BMP in which corn has been planted. Agronomy Facts 53 “The Early-Season Chlorophyll Meter Test for Corn” will be

followed to provide best results. The Cover Crop BMP will be done with this No-Till Farming BMP. A maximum of 50 acres can be enrolled per participant.

The following is a list of set payments associated with its No-Till practice:
(a maximum of $50.00 per acre will be allowed to be paid per participant during any given year for any combination of the following No-Till practices)

Crop Scouting: $7.50 per acre
Deep Tillage (Subsoiling): $18.00 per acre
Cover Crop – early (commodity): $20.00 per acre
No-Till Planting: $20.00 per acre
Manure Injection: $10.00 per acre

Soil Samples must be taken for all contracted acres:
(soil samples will not be part of the $50.00 per acre maximum payment)

Soil Samples (with organic matter test): $14.00 per sample

The farmer will decide the combination of No-Till Farming practices that will be paid with the Special Project Funding. Special Project Funding will be used to subsidize Soil Samples (with organic matter test) at $14.00 per sample. Soil samples will be mandatory for all acreage contracted in the No-Till System BMP. Before any special project funds are paid to the farmer for the completion of a BMP, it must first either meet the NRCS practice standard and/or meet the guidance taught at No-Till Meetings/Trainings.

There will be an understanding between the Conservation District and the farmers participating that the No-Till Farming System BMP will be implemented over a three-year term for the farmers that signed contracts dated no later than February 28, 2006. All other contracts that will be signed as of March 1, 2006 need be five-year contracts. The contracts have addressed the possibility of Chesapeake Bay Program funding for this BMP could be reduced or unavailable. When the revision of the Chesapeake Bay Program Manual is completed, the revised manual will be used for all new Chesapeake Bay Program contracts that use Special Project Funding. Payments will be made in full in both the spring and fall of every year when the components of the No-Till Farming System have been implemented. In the first Chesapeake Bay Program Special Project contract year (July 1, 2005 – June 30, 2006) the acreage of six farmers were contracted in the No-Till Farming System. The number of farms converted will be determined by the number of acres each participating farmer is willing to enroll and the amount of cost share funds available for use.

Possible Resources:

- other government personnel such as USDA-NRCS, PA-DEP.
- Berks County Cooperative Extension personnel.

Obstacles or Problems Anticipated:

- Chesapeake Bay Program Funding may not be available for the entire three year contract. Other funding may be limited.
- compaction
- availability of deep tillage equipment (subsoiler)
- availability of a manure hauler with special No-Till injectors
- manure odor or potential runoff if manure is not injected
- if manure is injected to get a uniform distribution of nutrients throughout the entire root zone
- slugs
- poorly drained soils or soils with springs
- getiing the cover crops out in time to qualify for early sowing

Measurable Results:

- The amount of acres to be able to convert with the contracted dollars into the No-Till Systems Approach.
- The additional amount of acres to be able to convert to the No-Till Systems Approach above and beyond the contracted acres. This will be able to be accomplished if the contracted No-Till Systems Approach is successful.
- Improved soil organic matter.
- Improved water infiltration and retention.
- Decreased surface water runoff.
- Decreased erosion.
- Improved biodiversity.
- Weed suppression.

Cover Crops – early (commodity) BMP:

Goal:

To continue promoting the use of cover crops of farms with Special Project Funding already contracted with the PA-DEP from past funding allocations.

Steps or Procedures:

This BMP will be implemented using the USDA-NRCS PA-Technical Guide Section IV, Cover Crop conservation practice standard, component # 340. Payments will be paid at $20.00 per acre and they will be made after all farmers participating have completed the installation.

Possible Resources:

- other government personnel such as USDA-NRCS, PA-DEP
- Penn State Cooperative Extension personnel

Obstacles and Problems Anticipated:

- timing issues – vs - crop harvest

Measurable Results:

- reduced erosion from wind and water
- increased soil organic matter
- increased biodiversity
- weed suppression
- improved soil structure

Precision Agriculture BMP:

Goal:

This BMP is for the purchase of a Chlorophyll Meter. Once purchased the Chlorophyll Meter will be used on all the existing contracted No-Till System BMP corn fields to do the Early Season Nitrogen Test for Corn. One of the fears that farmers have about No-Till farming is the lack of incorporation of manure that will lead to Nitrogen volatilization . Using this meter on the contracted No-Till fields will give the farmer a better sense of security that Nitrogen levels will be known thus enabling the farmer to apply additional Nitrogen to meet the corn needs. This meter will also decrease the chances of over application of Nitrogen.

Steps or Proceedure:

The Agronomy Facts 53 “The Early-Season Chlorophyll Meter Test for Corn” will be used to ensure proper timing and use of the Chlorophyll Meter.

- fields contracted in the No-Till System BMP that are planted in corn will receive this test.
- nitrogen fertilizer will need to be purchased to calibrate the Chlorophyll Meter for each corn variety tested.

Possible Resources:

- other government personnel such as USDA-NRCS, PA-DEP
- Penn State Cooperative Extension personnel

Obstacles and Problems Anticipated:

- initial expense of meter is high
- will take time to calibrate the meter from one corn variety to the next

Measurable Results:

- improved No-Till System by application of Nitrogen to test results
- will prove to farmers that manure volatilization from surface application will not cause a decrease in crop production

Conservation Plan – Implementaion of Erosion Control BMPs:

Goal:

This BMP is for 80% cost sharing of Erosion Control BMPs that are needed to implement practices in a Conservation Plan. Erosion Control BMPs in which special project cost sharing will be used consist of BMPs such as grassed waterways and subsurface drainage.

Steps or Procedure:

Farms that obtain Erosion Control BMP funding are those that are or become cooperators with the Conservation District. A RMS or Progressive conservation plan will need to be created for the farm in which Special Project Funding will be paid. If the farmer is an existing cooperator and a conservation plan has already been created it can be used however the plan will need to be updated if it is outdated. Special Project funding will be used for but not limited to the Implementation of Erosion Control BMPs such as:

- installing Grassed Waterway BMP and Subsurface Drainage BMP to address gully erosion issues.
- installing Subsurface Drainage to dry up field springs before the No-Till Farming BMP is implemented.
- Grassed Diversion BMP
- Structure For Water Control BMP

All accompanying BMPs, such as Obstruction Removal BMP, needed to install the desired BMPs will be 80% cost shared. All BMPs installed under this BMP will be designed and constructed according to the standards and specifications set forth in the USDA-NRCS PA Technical Guide.

Possible Resources:

- other government personnel such as USDA-NRCS, PA-DEP.
- Berks County Cooperative Extension personnel.

Obstacles and Problems Anticipated:

- shortage of Chesapeake Bay Program funding; other funding may be limited.

Measurable Results:

- decreased erosion
- increased nutrient buffer potential

Accomplishments Using Special Project Funding (July 1, 2005 – March 31, 2007)		
Contractee	**Municipality**	**Acres or Units Contracted**
No-Till System BMP		
Jesse R. Alspaugh	Bethel Township	50 Acres
Glenn Z. Brubacher	Caernarvon Township	50 Acres
Elvin Z. Brubaker	Bethel Township	50 Acres
Leroy E. Daub	Bethel Township	34.8 Acres
W. Ray Hershey	Bethel Township	50 Acres
Todd J. Kurtz	Caernarvon Township	49.4 Acres
Glenn Z. Musser	Bethel Township	50 Acres
Eugene W. Sensenig	Tulpehocken Township	50 Acres
Steven J. Wenger	Bethel Township	50 Acres
Dalton R. Zimmerman	Tulpehocken Township	50 Acres
To date a total of 484.2 acres are contracted in this BMP. A total of $9,674.00 has been paid to farmers in the implementation of this BMP.		
Cover Crop – early (commodity) BMP		
Jesse R. Alspaugh	Bethel Township	50 Acres
Glenn Z. Brubacher	Caernarvon Township	50 Acres
Elvin Z. Brubaker	Bethel Township	50 Acres
Leroy E. Daub	Bethel Township	34.8 Acres
W. Ray Hershey	Bethel Township	50 Acres
Todd J. Kurtz	Caernarvon Township	49.4 Acres
Glenn Z. Musser	Bethel Township	50 Acres
Eugene W. Sensenig	Tulpehocken Township	50 Acres
Steven J. Wenger	Bethel Township	50 Acres
Dalton R. Zimmerman	Tulpehocken Township	50 Acres
To date a total of 484.2 acres are contracted in this BMP. A total of $4,148.00 has been paid to farmers in the implementation of this BMP.		
Conservation Plan – Implementation of Erosion Control BMPs		
Eugene W. Sensenig	Tulpehocken Township	Subsurface Drainage – 598’
Jay A. Felty	Bethel Township	Obstruction Removal & Grassed Waterway – 600’
Dalton R. Zimmerman	Tulpehocken Township	Grassed Waterway – 365’
Harold L. Miller	Tulpehocken Township	Heavy Use Area Protection – 1,560 square feet
Glenn Z. Brubacher	Caernarvon Township	Grassed Waterway – 1,835’ & (2) Heavy Use Area Protection – 4,000 square feet (combined)
To date a total of $27,223.85 has been paid in the implementation of this BMP.		

VI. Acre Application

VII. Long Term Strategy

The long term strategy of the Berks County Conservation District Chesapeake Bay County Implementation Plan is to follow the guidelines of the Pennsylvania Chesapeake Watershed Implementation Plan (WIP) in order to achieve the mandatory nutrient and sediment reductions required by the TMDL set forth by the Environmental Protection Agency in 2010. In order to achieve the watershed targeting recommended in the Pennsylvania WIP, Berks County has purchased

and is in the process of implementing a software program that will aid in tracking the location of Conservation Plans, Nutrient Management Plans, and best management practices. Additionally, this program will assist in identifying locations where BMP implementation, i.e. agriculturally-impaired streams and watersheds, can have the larger impact on nutrient and sediment reduction in Berks County.

VIII. Conclusion

The goal of the Berks County Conservation District's County Implementation Plan is to do its part to "Save The Bay" with the limited funding it can obtain. Many new BMPs have been introduced to the Chesapeake Bay Programs list of BMPs. This list of BMPs has made some of the older BMPs a less of a priority to implement. Not all of the new BMPs are understood by many of the government personnel participating in the Chesapeake Bay Programs tributary strategy approach. As time progresses these government personnel will get a better understanding of these new BMPs. This better understanding will ultimately lead to the inclusion of these new BMPs into future revisions of the Berks County Conservation District's County Implementation Plan.

Addendum
(March 2007)

Other Agricultural BMPs:
(Manure Composting BMP)

Goal:

To promote the use of Innovative Agricultural BMPs on farms within the Chesapeake Bay area of Berks County. In this case, the Innovative Agricultural BMP is manure composting.

Steps or Procedures:

Special Project Funding will be sought to cost share the installation of a 50' wide X 100' long concrete pad on a chicken farm (broiler farm). The cost share rate for the concrete pad is 50% of the cost estimate for the project. The farmer is responsible for 50% of the cost of the concrete pad and the full cost of the plastic cover that will be installed over the concrete pad. This plastic cover will be installed to prevent the manure from getting saturated with water. When this BMP comes fully operational, the farmer has agreed to allow Conservation District and PA-DEP personnel onto the operation to showcase this BMP to other farmers in the area. This in turn will help to promote Innovative Agricultural BMPs in the watershed. Thus funding for additional manure composters will be sought to offset the installation costs for the interested farmers. Farmers will begin to understand that adding manure compost (otherwise know as "organic composted manure") to their soils on a regular basis will make their soils "drought proof".

Possible Resources:

- other government personnel such as USDA-NRCS, PA-DEP.
- Penn State Cooperative Extension personnel.

Obstacles and Problems Anticipated:

- shortage of Chesapeake Bay Program funding; other funding may be limited.

Measurable Results:

- Less odor and fly issues when spreading the "organic composted manure".
- Improved soil organic matter.
- Nitrogen becomes part of the compost organic matter and does not readily percolate through the soil profile. The nitrogen will stay where it is needed for crop production.

- Improved soil structure.
- Improved water infiltration and retention.
- Decreased surface water runoff.
- Decreased erosion.

Berks County Chesapeake Bay County Implementation Plan

(Update 6/2014)

Chesapeake Bay Technician Responsibilities

The following list of Chesapeake Bay Technician responsibilities represents what is currently identified on the scope of work for the 2014 Chesapeake Bay Technician contract between the Berks County Conservation District (BCCD) and the Pennsylvania Chesapeake Bay Program. Several responsibilities have been added since 2011 and will be discussed at a later point.

1. To provide technical assistance to the Berks County Conservation District to facilitate the implementation of conservation planning, nutrient management planning and the installation of BMPs and related technical needs under the Chesapeake Bay Special Projects Program to reduce nurient and sediment pollution with available funding and resources.

2. To conduct outreach/ education visits as necessary. The purpose of these outreach / educational site visits will be to inform agricultural operations of their obligations toward Chapter 102 (agricultural erosion and sediment control) and Chapter 91.36 (manure management planning). We are confident that Berks County has contacted nearly all operators in the Chesapeake Bay Watershed, however if we encounter an operator who has not been contacted we will provide the necessary information and record that as a contact.

3. To collect and compile data regarding non-point source best management practices (BMP's) that were implemented without state or federal funding, often described as "voluntary" BMPs. Exact methodology and composition for collection of these BMP data will follow DEP directives once they are developed.

4. To collect information on the Chesapeake Bay Financial Assistance Funding Program request Form (CBP-SP1) to assist District in determining priority and ranking of landowners applying for a Chesapeake Bay Special Projects Funding Program Agreement (CBP-SP3).

5. To work with the NRCS or private engineering firms in the development and implementation of the Chesapeake Bay Special Projects Program including the planning, design, installation, and maintenance of best management practices (BMPs) and to conduct construction inspections on behalf of the project engineer as designed in the Project Quality Assurance Plan.

6. To assist landowners with the development, interpretation and necessary revisions of Manure Management Plans or Act 38 Nutrient Management Plans annually or as required.

7. Conducts applicable follow-ups with landowners at least annually to review the agreement to assure that scheduled BMPs are installed on time, that necessary revisions are made to the Nutrient Management Program, that the Manure Management Plan or Certified Nutrient Management Plan is current and being followed, and that previously installed BMPs are properly operated and maintained.

8. Arranges and coordinates with landowner, DEP Program Staff, and applicable agencies - compliance field inspections of completed projects to assess required operation and maintenance of BMPs at a minimum of once during the lifespan of the contract.

9. Assists CBP-SP3 landowner and other cooperators with collection of manure and soil samples for analysis, and with manure spreader calibration.

10. Maintains daily record of time spent in all work activities, and submits written quarterly report of activities in a complete, correct and timely manner to the DEP Program.

11. Assists in maintaining a computerized record-keeping system for Chesapeake Bay Program.

12. Assists in maintaining all required record-keeping relating to Bay contracts so that the District may make accurate and timely reports to appropriate agencies or officials.

13. Coordinates with NRCS and other funding agencies regarding cost-sharing actions on the same farm.

14. Attends and participates, and may represent District Manager, at all Chesapeake Bay Program coordination meetings sponsored in part by the Bureau of Watershed Management (BWM) and the PA-DEP Regional Office.

15. Coordinates with BWM, the DEP Regional Office, and NRCS representatives on fact-gathering investigations (Office Reviews, Compliance Inspections, and Failed Practice Investigations).

16. Attends technical training sessions to become proficient in duties required of a Nutrient Management Specialist or other appropriate training pertaining to position responsibilities including related Certifications. As appropriate, seeks and maintains Engineering Job Approvals for conservation practice installations.

17. Corrections to concerns noted during Administrative File Reviews and Compliance Inspections should be addressed completely in a very timely manner. Notification of these corrections shall be given to DEP Program Staff for further review.

The education/outreach visits discussed in paragraph 2 are now a requirement as part of the Scope of Work contained within the Chesapeake Bay Technician Assistance contract and the Pennsylvania Chesapeake Bay Watershed Implementation Plan. DEP, in cooperation with the State Conservation Commission and the county conservation districts agreed to the changes in the Scope of Work that will require conservation district personnel to spend a portion of their time contacting all farms in their respective Chesapeake Bay Watersheds to ensure that all farm operators are aware of their responsibilities under Pennsylvania's Erosion and Sediment Control regulations (Chapter 102) and the Manure Management Manual (Chapter 91.36). Moreover, DEP published the "Land Application of Manure, Manure Management Plan Guidance", a supplement to the Manure Management Manual, to assist operators in developing their required manure management plans. This supplement is intended to be distributed to all operators contacted through the education/outreach visits. According the Scope of Work, each Chesapeake Bay Watershed County must perform 100 of the education/outreach visits per year.

With the assistance of the Berks County Agricultural Land Preservation program, the NRCS and all other available data (aerial photographs, GIS, etc.), Berks County began contacting operators in late 2011. All visits and data gathered during the visits were entered into the Farm Visit database provided by DEP. In addition, the BCCD paid 2 college interns to conduct visits during the summer of 2013. Also, education/outreach visits were performed at farm visits during routine BCCD business. We are confident that BCCD has contacted nearly all operators in the Chesapeake Bay Watershed, however if we encounter an operator who has not been contacted we will provide the necessary information and record that as a contact. Many operators are Mennonite and as such are not involved with any state or government business, therefore no data exists concerning these operators which makes it extremely difficult to determine whether we have contacted all operators in the County. No list or database was ever created to identify all operators in Berks County; therefore we cannot know for certain that we have contacted all operators.

In addition, as outlined in paragraph 3, the PA DEP Chesapeake Bay Program is requiring Chesapeake Bay Technicians to gather and compile data regarding BMP's that were installed by the operator without any form of government financial assistance, so-called "voluntary BMP's". DEP considers BMP's such as no-till farming and cover crop use to be underreported to the CBP Model and therefore should be given credit in the model. Originally, DEP wanted to gather this data during the Chesapeake Bay education/outreach visits; however DEP decided not to gather those data during these visits. Moreover, as of the current Chesapeake Bay Technician Contract (2014), DEP is still developing a mechanism to track and account for those data. Therefore, information concerning "voluntary BMP's" is not yet being collected by BCCD.

<u>Tracking Conservation Planning, Nutrient Management Planning and BMP Installation</u>

During the educational/outreach visits conducted as part of the technician contract, it became apparent that BCCD needed a more sophisticated way to keep track of operators who have had conservation plans, agricultural erosion and sedimentation plans, and nutrient management plans written and best management practices installed on their operations. Presently, we have no method of determining whether an operator has the basics elements required by Pennsylvania Law: an agricultural erosion and sedimentation plan and a manure management plan.

In response to this lack of information, BCCD is in the process of implementing the World View Practice Keeper® software system. Practice Keeper® is a software tool designed specifically for Conservation Districts.

Practice Keeper® is capable of tracking all of a Conservation District's data related to conservation plans, nutrient management plans and best management practices. This will allow for easier identification of operations with the required plans and practices. In addition, Practice Keeper® can generate reports which make quarterly reporting much more efficient and accurate; thereby streamlining the process of tracking and reporting BMP's funded through the Chesapeake Bay Special Projects Funding Program. Moreover, all data will be linked together, i.e. an installed BMP can be tracked to a conservation or nutrient management plan, etc.

Prioritizing BMP Installation and SPFP Funding

The Chesapeake Bay Special Projects Funding Program (SPFP) allocated approximately $750,000 for FY 2014 to Chesapeake Bay County Conservation Districts for installation of best management practices (BMP's) in the Chesapeake Bay Watershed, which is less than the amount of funding in previous years. SPFP funding is now limited to EPA-designated priority watersheds, which include both the Little Swatara and Conestoga River watersheds located in Berks County. In fact, all of the designated streams in the Chesapeake Bay Watershed in Berks County are impaired by agriculture in the form of excess nutrients and/or siltation. The Little Swatara Creek, the Conestoga River, the Little Muddy Creek and the Little Cocalico Creek are listed on the Pennsylvania Integrated Water Quality Monitoring and Assessment Report as class 5 waterbodies impaired by agriculture and in need of a TMDL. In addition, all of these are considered high priority watersheds by the EPA.

However, in addition to prioritizing funding requests to EPA-designated high priority watersheds, the SPFP is also prioritizing funding approval to specific BMP's. The FY 2014 funding announcement states the following:

Priority will be given to projects that focus on:

- Non-structural BMPs that provide cost-effective solutions for the reduction of nutrient and sediment loads to the Bay. These include no-till/conservation tillage, cover crops, and ag E&S and manure management planning activities. **NOTE: Cover Crops will be the highest priority for projects in this 2014-15 application period.**
- Riparian corridor protection/restoration improvements that provide cost-effective solutions for the reduction of nutrient and sediment loads to the Bay. These include streamside practices, streamside animal fencing, and riparian buffers.
- Manure storages that fit within the CIP and are matched with other funding sources.

In addition, according the Phase 1 Pennsylvania Chesapeake Bay Watershed Implementation Plan, the EPA Region 3 identifies five key BMP's as their most critical for Bay model loadings and are as follows:

1. Riparian Buffers
2. Animal Fencing
3. Manure Storage
4. Cover Crops
5. Nutrient Management Plans

From FY 2007 through FY 2011 the BCCD Chesapeake Bay County Implementation Plan prioritized SPFP funding to a no-till farming and commodity cover crops incentive program. The program was successful in broadening the implementation of both of these practices in the Berks County portion of the Chesapeake Bay Watershed. As such, No-till farming and commodity cover crops have become readily accepted practices in the Chesapeake Bay Watershed. Originally, the no-till farming and cover crop incentive program was to be funded for the FY 2007-2009, with an additional year if funding became available. However, the incentive program was continued through FY 2012, whereupon the program was ended due to lack of participation by the farming community and the need to direct funds to Conservation Plan Implementation for other much-needed BMP's such as grassed waterways, animal heavy-use areas, and barnyard runoff controls. Operators with approved conservation plans requesting cost-share assistance for cover crops are encouraged to apply for EQIP funding.

Starting in FY 2012, the BCCD decided to use available funds to partner with the NRCS to implement much-needed

BMP's for cooperating operators with approved conservation plans. As such, BMP's were prioritized based upon not only the nutrient and sediment reduction capabilities but financial need as well. This cooperation with the NRCS has allowed the BCCD to leverage funds available through the NRCS/EQIP funding program. In addition, funding for nutrient management plans required for EQIP funding has been requested and received for FY 2012, 2013 and 2014. These monies have been used to pay technical service providers to write NRCS 590 nutrient management plans to be included with the approved conservation plans. These nutrient management plans have served two purposes: to qualify operators for EQIP funding and to provide them with a nutrient management plan required by PA Section Code 91.36 of the manure management regulations. In addition, the Chesapeake Bay Technician is available to assist operators with the development of manure management plans utilizing the Manure Management Plan Guidance supplement. Although it is relatively simple to create a manure management plan from this guidance document, many operators still require assistance from trained personnel. For instance, many Mennonite operators do not have internet access to PA One-Stop, therefore the Chesapeake Bay Technician will produce maps for these operators.

Riparian corridor protection/restoration is also a high priority in the Berks County portion of the Chesapeake Bay Watershed. These BMP's include streambank fencing for livestock exclusion, appropriately sized and maintained riparian buffers, cattle/equipment crossings, and off-site watering. In fact, riparian corridor restoration/cattle stream exclusion has been shown to be one of the most simple and cost effective BMP's to implement in an agricultural watershed. The effectiveness of riparian corridor protection is also supported by several published case studies. Several case studies in Maryland, Virginia and Pennsylvania demonstrated that within 5 years after excluding cattle from streams followed by replanting of the stream banks lead to increases in water quality, stream bank stabilization, in-stream habitat, and populations of fish and macroinvertebrates. Taken together, the results of these studies indicate the relatively simple nature and cost effectiveness of this practice (Lyerly, et. al., 2014).

Unfortunately, convincing operators to allow cattle to be excluded from streams with subsequent stream bank restoration has proven to be an overwhelmingly difficult task. In Pennsylvania, cattle are allowed access to streams. BCCD has had some limited success in convincing farm operators to implement stream bank fencing that involves total cattle exclusion. Allowing farmers to "flash graze" the stream buffer inside the stream bank fencing has succeeded in convincing some operators to adopt riparian corridor protection such as stream bank fencing. "Flash grazing" is a subjective term which generally consists of allowing cattle to graze inside the riparian buffer for a short period of time, i.e. one day at the most. However, in practice it is generally recognized that farmers allow cattle to graze the buffer area for much longer periods of time, thereby negating the water quality benefits of riparian corridor protection. Subsequently, the NRCS will no longer allow "flash grazing" for EQIP contract participants and the DEP stream bank fencing program doesn't allow animals or machines inside the buffer area under any circumstance. Therefore, stream bank protection BMP's are rarely accepted by Berks County farm operators.

A new source of funding BMP's has been offered by the Stroud Water Resource Center entitled "Stroud Farm Stewardship Program" which is intended to encourage farm operators to plant stream buffers. For each acre of stream buffer planted with trees, the Stroud Center will provide a participating farmer with up to $3000 as a "BMP voucher". However, these vouchers must be used to plan and install conservation work necessary on the farm. The vouchers can be combined with other programs like REAP and CREP or they can be used alone. In order to qualify for the program, the cooperator must sign a 15-year CREP contract or establish and maintain a forested buffer that meets or exceeds the same standards as CREP. In addition, the cooperator must have a current conservation plan meeting PA Chapter 102 requirements and nutrient management plan appropriate for the type of operation. So far, the farming community in the Berks County Chesapeake Bay Watershed has shown very limited interest in the program.

Manure storages are also a priority for the BCCD, however funding manure storages can be difficult. As stated above, SPFP will fund manure storage only when they are matched with other funding sources. Manure storage is becoming more of a priority for BCCD as winter spreading is coming under increased scrutiny and will almost certainly be more tightly regulated as the cleanup of the Chesapeake Bay continues. Many operations in Berks County do not have enough storage to get through winter without spreading manure. The BCCD will continue to utilize funding sources such as Growing Greener and PennVest to provide matching funds for manure storages. In fact, BCCD has obtained PennVest funding to construct an automated dairy which separates dairy manure into liquid and solid fractions. The solid fraction is then composted to make bed pack and the liquid fraction is spread on crop fields. BCCD also obtained funding from PennVest to replace a leaking earthen manure pit upslope from Rock Creek with a circular storage, reception pit and concrete

barnyard.

In addition, in 2011 BCCD applied for and received a Growing Greener Grant to obtain 35 conservation plans in the Chesapeake Bay Watershed of Berks County. BCCD contracted the writing of the conservation plans to several technical service providers who are also certified conservation planners. In June of 2014 all 35 conservation plans had been received, reviewed for completeness, and approved by the BCCD Board of Directors. These additional conservation plans will assist operators in gaining compliance under Chapter 102 Agricultural Erosion and Sediment Control Regulations, as well as providing a conservation plan that meets the requirements for the REAP grant program.

Conclusion

The BCCD will continue to focus its efforts and available funding in the Chesapeake Bay Watershed on the most cost-effective and scientifically-based BMP's such as those listed above. BCCD will continue to utilize SPFP funding to work with the NRCS to leverage available funds through the EQIP cost-share program for the implementation of BMP's for operators with approved conservation plans and nutrient management plans. In addition, BCCD is currently assisting operators with REAP grant applications and will continue to apply for funding through PENNVEST and Growing Greener. In the Berks County Chesapeake Bay Watershed, for many operators manure storage is the primary concern because lack of adequate storage requires that manure be spread in the winter. Also, the Berks County portion of the Chesapeake Bay Watershed still contains many outdated and leaking earthen manure storages that need to be replaced through either EQIP or PENNVEST funding.

References

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