



# CHESAPEAKE BAY FOUNDATION

*Environmental Protection and Restoration  
Environmental Education*

## **House Bill 687**

Agriculture - Cost-Sharing Program - Fixed Natural Filter Practices

**DATE: FEBRUARY 25, 2020**

**POSITION: SUPPORT**

**The Chesapeake Bay Foundation SUPPORTS House Bill 687.** This legislation would tune the existing Maryland Agricultural Water Quality Cost-Share program to better support farmers interested in implementing fixed natural filter conservation practices as part of their farming businesses.

### **Right-size Cost Share Rates for Farmers**

Regenerative agriculture practices are growing in popularity among farmers in Maryland. These practices are proven to improve soil health and productivity while protecting water quality and combating the effects of climate change. This legislation supports the use of regenerative agriculture practices by aligning the State's cost share for those practices with actual implementation costs for farmers and federal rates.

HB 687 identifies regenerative practices such as tree plantings along streams and livestock grazing as "fixed natural filters" fully eligible for funding in the Maryland Agricultural Water Quality Cost-Share (MACS) program and puts them on equal financial footing with other practices in the program. This means that the rates the State pays on these practices will no longer be reduced by embedded formulas, and, where appropriate, will be based on the regional rates paid out to farmers under federal programs.

The MACS eligibility criteria and cost-share formulas fall short for farmers who want regenerative natural filters as part of their operations. For example, a farmer interested in planting trees on portions of his property may be eligible for cost-share for trees planted in a swath at least 35 feet wide and within 100 feet of an existing stream. A farmer seeking to plant trees 100-250 feet from the stream may only be eligible for cost-share under certain circumstances, depending on whether the land is deemed 'highly erodible or floodplain,' and if eligible may receive a payment reduced through a soil loss calculation. The same farmer may not be eligible for any funding for trees planted as a windbreak or hedgerow on other portions of his property.

Tree plantings on agricultural land benefit water-quality, sequester carbon, and support other conservation practices including livestock grazing. This legislation provides common-sense reforms for eligibility and cost-share practices for MACS, to support, rather than frustrate farmers interested in tree plantings.

As pasture-raised meats and grass-fed dairy gains in popularity at the supermarket, farmers are becoming more interested in regenerative agriculture that allows them to tap into emerging business opportunities. While the MACS program provides some funding for pasture management, eligible costs and cost-share rates are out of alignment with actual costs and comparable programs. For example, MACS will provide cost-share for fencing to prevent livestock from streams but not perimeter fencing. This limitation makes little sense for a farmer starting a grazing operation – that farmer needs fencing to confine his livestock on all sides – not just streamside.

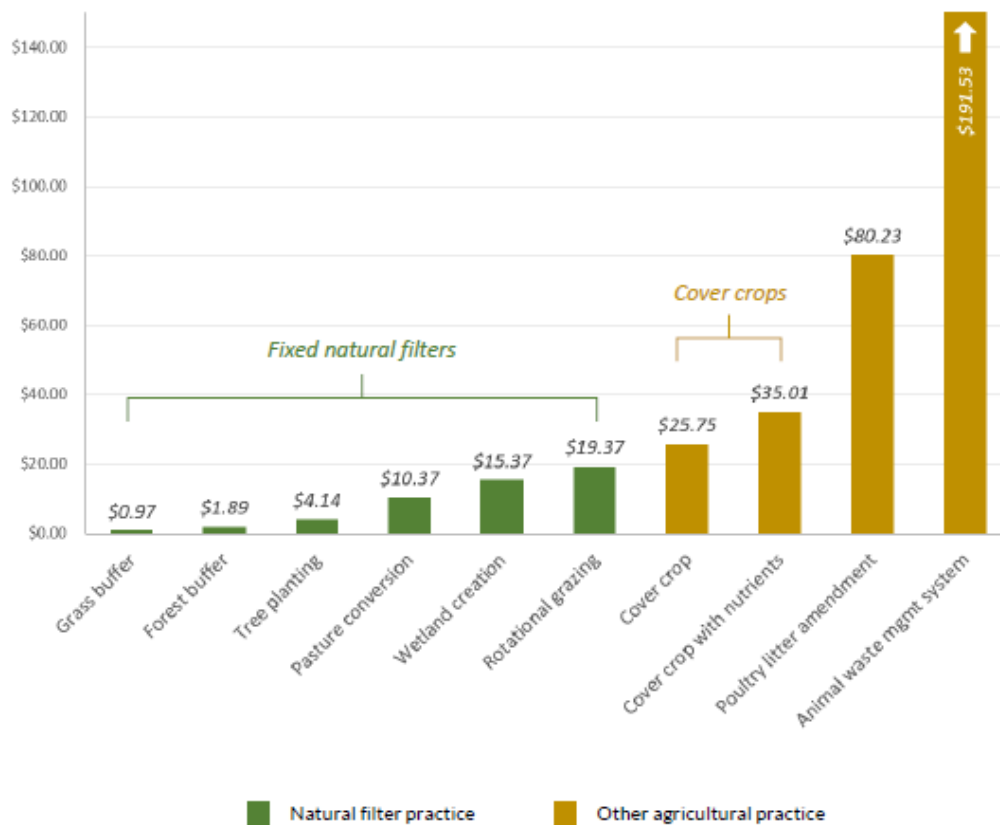
MACS has also historically reduced cost share payments for pasture management by the same soil loss calculation applied to tree plantings. Ultimately, the programmatic differences set off MACS cost share rates by hundreds of dollars per acre from comparable programs such as the US Department of Agriculture's Environmental Quality Incentives Program. The lack of

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meaningful cost-share for grazing systems may discourage farmers from conversion to grazing – a missed business opportunity for farmers and a missed environmental opportunity for the State.

### **Stretch the State’s Dollar to Save the Bay**

The State’s robust investment in Bay-saving practices can be credited for the significant progress Maryland has made on the Chesapeake’s clean-up. To finish the job the State will have to make the most of funding streams and spend wisely.



Source: Chesapeake Bay Program - Chesapeake Bay Watershed Data Dashboard (<https://gis.chesapeakebay.net/wip/dashboard/>)  
Chart averages BMP cost efficiency values for Frederick, Dorchester and St. Mary's counties.

### ***Fixed Natural Filters Deliver Savings***

Maryland’s Phase III Watershed Implementation Plan (WIP) for agriculture calls for an increase in the amount of fixed natural filters over current implementation. Fixed natural filters are a wise investment. Data from the Chesapeake Bay Program show that these long-lasting natural filters are some of the most cost-effective best management practices available.

The chart above shows the cost of fixed natural filters per pound of nitrogen reduced as compared with other best management practices that may receive funding through MACS. Fixed natural filters are, on an annual basis, effective and inexpensive.

Once a fixed natural filter practice is in place, it continues to reduce pollution with minimal additional investment. This legislation will help the State reach its WIP III goals for fixed natural filters and pollution reduction by creating greater incentives for farmers to employ those practices.

### ***Funding for Existing Pollution Concerns Carries More Credit***

Making the most of existing funding streams will allow the State to support farmers and make progress on pollution-reduction goals without additional investment. Currently, the Department of Agriculture may, and has, used limited resources to provide grants to farming operations to new or expanding Confined Animal Feeding Operations (CAFOs).

This legislation would ensure that taxpayer dollars are spent on improving water quality outputs for existing farming operations and make overall progress with a narrowly tailored funding limitation. The funding restriction language in this bill mirrors and creates consistency with the US Department of Agriculture's Environmental Quality Incentives Program.

Federal policy is also in line with other Maryland environmental program funding restrictions. Mitigating the impact of new construction, whether it is from additional wastewater, stormwater, or another source, is generally considered the cost of doing business and is not typically eligible for state taxpayer assistance. For example, the Bay Restoration Fund does not pay for new wastewater treatment plant capacity; these funds are limited to upgrades that reduce pollution from existing flows. Focusing funding on reducing existing pollution sources will stretch the MACS dollar and bring MACS funding policies into alignment with other federal and state programs.

### ***Don't Leave Dollars on the Table***

Likewise, ensuring that all available agricultural cost-share funding is used from year-to-year will accelerate progress. In years past, millions of dollars of this funding have gone unused. Variability in farming conditions means that flexibility is needed to provide cost-share for practices that farmers can successfully install in a given year. While this legislation proposes to provide flexibility by enabling use of Bay Restoration Fund for fixed natural filter practices, the problem could also be addressed through fiscal management of the various funding streams by the Department of Agriculture.

The agricultural cost-share program receives funding from three sources: Bay Restoration Fund, the Chesapeake and Atlantic Coastal Bays 2010 Trust Fund, and General Obligation Bonds. While the Bay Restoration account may by statute only be used for cover crop cost-share, the 2010 Trust Fund can be used to fund cover crops or other regenerative agricultural practices.

Currently, the Department of Agriculture expends the 2010 Trust Fund account for cover crops first because if not spent, that funding may not be used in future years. However, this process has resulted in excess Bay Restoration Funds, especially when rainy planting seasons prevent farmers from meeting cover crop goals. Through fiscal management, however, the Department of Agriculture might ensure that both funds are fully used each year.

**For these reasons, the Chesapeake Bay Foundation recommends a FAVORABLE report on HB 687 from the Environment and Transportation Committee.** Please contact Rob Schnabel, Restoration Scientist at [rschnabel@cbf.org](mailto:rschnabel@cbf.org) or 443.482.2175 or Erik Fisher, AICP, Maryland Assistant Director and Land Use Planner, [efisher@cbf.org](mailto:efisher@cbf.org) or 443.482.2096 with any questions.



# PROJECT SUMMARY

## Promoting Rotational Grazing in the Chesapeake Bay Watershed and Quantifying the Environmental and Economic Benefits





# Project overview

Between 2015 and 2019, the Chesapeake Bay Foundation worked with several partners to promote the adoption of rotational grazing in the Chesapeake Bay watershed portions of Maryland, Virginia, and Pennsylvania and quantified some of the environmental (water quality, greenhouse gas, and soil health) and economic benefits. This project was funded through a Natural Resources Conservation Service (NRCS) Conservation Innovation Grant (CIG).

## Partners





MICHAEL HELLER/CBF STAFF

# Why adopt rotational grazing?

There are many reasons why farmers convert to grazing. Graziers can save money on labor, feed costs, and vet bills. Often, they get higher prices for their products. Many producers also say it improves their quality of life. There are even more

ways that the rest of us benefit from this decision. Planting grass instead of corn for feed or moving from continuous grazing to rotational grazing can substantially reduce farm nutrient and sediment runoff. Because of these water quality benefits, Chesapeake Bay jurisdictions have committed to implement rotational grazing on over 1.2 million acres within the Bay watershed. Since 2009, the jurisdictions are only 19 percent of the way toward accomplishing that goal by 2025.

This transition also helps reduce greenhouse gases by sequestering carbon in soil through increases in soil organic matter. In addition, fertilizer use is often reduced or eliminated, leading to lower emissions of nitrous oxide, a very potent greenhouse gas. Rotational grazing improves soil health and fertility. It makes farms more resilient to weather extremes, like drought and heavy rainfall, because healthy soils have higher water holding capacity. Yet despite these benefits, adoption of this practice is relatively low among producers.

## Greenhouse gases and agriculture

Gases that trap heat in the atmosphere are called greenhouse gases. We list the most common ones and some agricultural sources and sinks.

“CO<sub>2</sub> equivalents” is a standard unit for measuring carbon footprints. It allows us to account for the different potencies of greenhouse gases and express them in common units. For example, 1 ton of methane would be 28 tonnes of CO<sub>2</sub> equivalents, since methane is 28 times as potent as carbon dioxide.

<p><b>CARBON DIOXIDE (CO<sub>2</sub>)</b> is the most abundant greenhouse gas, but the least potent in terms of its ability to trap heat. CO<sub>2</sub> enters the atmosphere primarily through the burning of fossil fuels. It is removed from the atmosphere (or “sequestered”) when it is absorbed by plants and soils.</p>	<p>Converting to rotational grazing increases soil organic matter and functioning. Organic matter is directly related to soil organic carbon, so higher values indicate higher amounts of soil carbon sequestration. There is national and global interest in building “healthy soils” because of the huge capacity of soils to sequester carbon. Fossil fuel use can also be lower in grazing systems due to reduced use of farm equipment for planting and harvesting.</p>
<p><b>NITROUS OXIDE (N<sub>2</sub>O)</b> is 265 times as potent as carbon dioxide. N<sub>2</sub>O is predominately produced in the soil by microbial processes and is heavily influenced by nitrogen fertilizer and manure application. The storage and handling of livestock manure is another source of on-farm emissions.</p>	<p>Converting fields from grain crops to pasture usually means less use of nitrogen fertilizer. As a result, on-farm emissions of N<sub>2</sub>O can decrease substantially.</p>
<p><b>METHANE (CH<sub>4</sub>)</b> is 28 times as potent as CO<sub>2</sub> in terms of its ability to trap heat.<sup>1</sup> “Enteric” emissions of methane from livestock are a by-product of the fermentation process cows use to extract nutrition from the food they eat. Methane is also emitted from manure management systems.</p>	<p>Enteric emissions of methane typically increase when cows are converted to a grass-based diet. Fortunately, these increases are often offset by increases in carbon sequestration and decreases in N<sub>2</sub>O emissions.</p>

1 [ghgprotocol.org/sites/default/files/ghgp/Global-Warming-Potential-Values %28Feb 16 2016%29\\_1.pdf](https://ghgprotocol.org/sites/default/files/ghgp/Global-Warming-Potential-Values%28Feb%2016%29_1.pdf)





## Building the case

One objective of our project was to estimate the environmental benefits of converting to rotational grazing on actual farms in the Chesapeake Bay region. To that end, we used farm scale models, COMET-Farm for greenhouse gas emissions and the Chesapeake Bay Nutrient Trading Tool ([CBNTT](https://cbntt.org)) for nutrient and sediment loads, to quantify benefits for six “case study” farms (see map).

Both models are available online ([cometfarm.nrel.colostate.edu](https://cometfarm.nrel.colostate.edu) and [cbntt.org](https://cbntt.org)) and are free to use, but users need to establish an account and password to protect the confidentiality of the data.

For each farm, Chesapeake Bay Foundation (CBF) staff worked with the producers to obtain the necessary information to run two scenarios: the “baseline scenario” that reflected on-farm conditions and practices before the conversion to rotational grazing, and the “current scenario” that reflects conditions after the conversion. We also collected “before and after” samples to assess changes in soil health and worked with



an agricultural economist to conduct a financial analysis on two farms—both dairies. Results of the financial analysis are available upon request.

## Case Study Farm Results Highlights



### GREENHOUSE GASES

- Five of six farms showed decreases in whole farm emissions of greenhouse gases when transitioning to rotational grazing due to a combination of increased carbon sequestration in the soil and lower emissions of nitrous oxide from reductions in fertilizer/manure use. The average reduction across all farms was 42 percent.
- We expressed greenhouse gas emissions per hundred weight (cwt) of milk for two dairy farms in our pilot since graziers typically experience a reduction in annual milk production. Results indicate that even accounting for this reduction there was a 50 percent and 43 percent reduction in greenhouse gas emissions when expressed on a cwt production basis.



### NUTRIENT AND SEDIMENT LOADS

- Modeling results indicate substantial reductions in annual loads of nitrogen, phosphorus, and sediment from all six farms. Average reductions were 63 percent, 67 percent, and 47 percent for nitrogen, phosphorus, and sediment, respectively.



### SOIL HEALTH

- Three of four farms where we collected “before and after” soil samples experienced statistically significant increases in key soil health indicators—aggregate stability and organic matter—after converting to rotational grazing. We cannot rule out, however, the influence of climatic conditions on these results.

For more details, read our Rotational Grazing Pilot Farm Study Report ([m2balliance.org/benefits.html#case-study](https://m2balliance.org/benefits.html#case-study)). The report includes farm details and results, a comparison of the results of COMET-FARM with another greenhouse gas tool, A-Microscale, and recommendations and conclusions.



BOB NICHOLS/NRCS

## Leveraging resources for implementation

Collectively, we converted more than 1300 acres to rotational grazing over the life of the project.

One innovative funding source was the use of the CBF-managed Carbon Reduction Fund (CRF) to pay costs for grazing infrastructure not covered by federal or state programs. The CRF was established via a CBF partnership with WGL Energy and Sterling Planet. CBF receives donations related to the sale of voluntary carbon offsets to WGL Energy natural gas customers and uses them to fund projects that benefit water quality and reduce greenhouse gases ([wges.com/cmp/cleanstepsoffsets/partners.php](https://wges.com/cmp/cleanstepsoffsets/partners.php)).

CBF also leveraged this grant to secure a three-year, \$1 million 2017 Regional Conservation Partnership Program award focused on providing



financial and technical assistance to graziers in Maryland. These dollars were expended within two years.

## Building awareness

Project partners decided to create an umbrella name for the multi-state grazing partnership—the Mountains-to-Bay Grazing Alliance (M2B). M2B partners hosted a variety of outreach events in Maryland, Virginia, and Pennsylvania. These included intensive two-day Grazing Schools that reached more than 100 producers and over a dozen pasture walks and field days attended by more than 300 producers. We also hosted two successful regional grazing conferences that featured a farmer panel and nationally and internationally known experts on soil health and grazing. The conferences averaged over 100 attendees.



Direct distribution of our quarterly electronic Mountains-to-Bay Grazing Alliance newsletter has increased to over 250 and is forwarded to members of our partner organizations. Want to be on our emailing list? Please email our newsletter editor at [eronston@cbf.org](mailto:eronston@cbf.org). Access all newsletter issues at [m2balliance.org/resources.html#newsletters](http://m2balliance.org/resources.html#newsletters).



## Tools for producers

An annual planning calendar for graziers in Pennsylvania, Virginia, and Maryland is another key way to disseminate important grazing information and keep the network engaged and informed.



## Direct marketing to consumers

As part of this project, the *Amazing Grazing Directory* was updated to include grass-based producers in Virginia, West Virginia, Delaware, and Maryland. This directory is a tool for graziers to market their “value-added” products—such as grass-fed beef, lamb, and pastured poultry—directly to consumers, making these farming systems more profitable and making it easier for consumers to locate and support local sustainable farms. The online version is regularly updated ([futureharvestcasa.org/resources/amazing-grazing-directory-0](http://futureharvestcasa.org/resources/amazing-grazing-directory-0)).



## Assessing obstacles to adoption

CBF held three workshops (one each in Maryland, Virginia, and Pennsylvania) to run ADOPT (Adoption and Diffusion Outcome Prediction Tool). ADOPT is a tool developed by social scientists in Australia to provide insights about the importance of various factors influencing the adoption of a particular practice—in our case, rotational grazing.<sup>1</sup> Workshop participants were local experts, e.g. staff from local soil conservation districts, extension, and/or NRCS that work with producers on grazing.

Application of ADOPT provided the forum for an informed and engaged discussion about potential barriers to adoption of rotational grazing. More importantly, the workshops led to tangible recommendations that, if implemented, could lead to greater adoption. These include:

- Continue to provide opportunities for farmer-to-farmer sharing and technical assistance via field days and pasture walks.

<sup>1</sup> Kuehne, G, Llewellyn, R, Pannell, DJ, Wilkinson, R, Dolling, P, Ouzmana, J, Ewing, M. 2017. Predicting farmer uptake of new agricultural practices: A tool for research, extension and policy. *Agricultural Systems* 156: 115-125.

- Organize local grazing groups or roundtables that provide informal opportunities for new and established graziers to connect.
- Allow flexibility to “try out” the practice before committing to full-farm adoption.
- Continue and expand efforts to connect producers with markets and generate consumer demand for grass-fed products.
- Leverage the finding that many farmers have a desire to invest in the future of their farm by developing outreach materials that highlight the long-term benefits of grazing to soil health, increased resiliency to climatic extremes, and long-term farm productivity.

For more details on these workshops, visit [m2balliance.org/resources.html](https://m2balliance.org/resources.html).



TIM MCCABE/NRCS

## What's next?

Building on the partnerships and lessons learned from this grant, CBF recently received a three-year, \$750,000 grant from the National Fish and Wildlife Foundation (NFWF) entitled: *Mountains-to-Bay Grazing Alliance: A Collaborative to Increase Rotational Grazing*.

The grant objectives are:

- To build on and strengthen the structure and information-sharing of the Mountains-to-Bay (M2B) partnership and to create a strong core of collaborating partners.
- To expand and enhance outreach efforts focused on promoting rotational grazing and soil health. A key component of outreach efforts will continue to be on-farm demonstrations, field days, and peer-to-peer dialogue, including lessons learned from the ADOPT workshops.
- To work with roughly 30 producers to convert 1,700 acres to rotational grazing, as well as implement related practices such as livestock stream exclusion and forested buffers, by leveraging private, state, and federal funds.

For more information go to [m2balliance.org](https://m2balliance.org).

In addition, one of our grant partners, Future Harvest–Chesapeake Alliance for Sustainable Agriculture, recently received a U.S. Department of Agriculture (USDA) grant from the Farmers Market and Local Food Promotion Program, entitled *Amazing Grazing: Stepping up supply and demand for grass-fed meat, dairy, and other local, pasture-based products in the Chesapeake region*. This grant also builds upon the partnerships formed during this project and is complementary to the NFWF grant.

The project has three objectives:

- To increase the number of graziers trained in direct-to-consumer marketing.
- To increase the number of consumers informed about how and where to buy local grass-fed products and why it's important.
- To increase pasture-based product sales for area graziers.

## Acknowledgments

The project partners are excited about building upon the CIG via these new initiatives and are very grateful for the support of the USDA Natural Resources Conservation Service under agreement number 69-3A75-16-038.

Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the authors and do not necessarily reflect the views of the U.S. Department of Agriculture.