

Maryland Agriculture and Carbon Sequestration

Maryland farms offer an untapped opportunity to sequester carbon and help private industry meet air quality standards. This is an opportunity for a private-public partnership to provide a market based incentive for environmental improvements. Many farming and conservation practices do an excellent job of removing carbon dioxide from the air and holding it for extended periods. This source of carbon sequestration has been largely untapped to date by industry.

The US Department of Energy has proposed a procedure to report Greenhouse Gas Emissions, better known as 1605(B), to be implemented in 2007. This proposal will also benefit farmers by helping them with the reporting requirements.

There are opportunities to improve carbon sequestration by encouraging farmers to adopt many of the farming practices that both conserve soil, energy and carbon on a long term basis. The following figures are taken from USDA, ERS TB 1909:

Production practices that sequester carbon on cropland include:

- Conservation tillage and residue management (0.09 -0.18 Metric tons/acre)
- Improved crop rotations and winter cover crops (0.04 -0.12 Metric tons/acre)
- Improved fertilizer management (0.02-0.06 Metric tons/acre)
- Use of organic manure and byproducts (0.02-0.50 Metric tons/acre)
- Improved irrigation management (0.04 Metric tons/acre)
- Reduced fuel use associated with no-till (4.0 Metric tons/acre savings)

Production practices that sequester carbon on pastureland include:

- Improved use of fertilizers (0.10-0.20 Metric tons/acre)
- Use of organic manure (0.20-0.50 Metric tons/acre)
- Planting of improved species (0.10-0.30 Metric tons/acre)
- Grazing Management (0.30-1.30 Metric tons/acre)

Land use changes that sequester carbon include:

- Conservation buffers (0.13-0.25 Metric tons/acre)
- Restoration of wetlands (0.10 Metric tons/acre)
- Croplands shifted to perennial grasses (0.25-0.51 Metric tons/acre)
- Afforestation of cropland (0.79-1.72 Metric tons/acre)
- Afforestation of pastureland (0.73-2.09 Metric tons/acre)

Key point: 1 ton of carbon equals 3.62 tons of CO₂.

Focusing on the production practices commonly used in Maryland there is an opportunity to encourage adoption of the practices, provide an incentive or land rental type payment to the farmers for maintaining the practices for an extended period and achieving several objectives: carbon sequestration, soil health improvement, energy savings and improved water quality in the Chesapeake Bay.

Problem: There is no central organization capable of promoting, tracking and managing the potential carbon credits. Industry may be interested in purchasing carbon credits and investing money into the agricultural sector but there is no framework or infrastructure to facilitate and manage the activity.

Proposed Solution: The Maryland Department of Agriculture and the USDA, Natural Resources Conservation Service need to partner to establish an agricultural carbon trading bank. Both agencies offer various programs that would encourage and maximize carbon sequestration. The Maryland Department of Agriculture would establish the mechanism to obtain and manage funds from private industry, establish contracts with local farmers and manage the program on the ground. USDA, NRCS would provide the technical expertise and carbon sequestration payment funds for farmers through the Conservation Security Program (more details in the Opportunities section). This bank and the technical experts associated with it could also assist farmers with the 1605(B) reporting requirements and verify the accuracy of the reporting.

Program Stacking

Current programs offered by both the State of Maryland, Department of Agriculture, and the USDA, Natural Resources Conservation Service (NRCS) could be combined with assessments or payments from private industry seeking interim carbon credits. The programs and opportunities follow:

- **NRCS Conservation Security Program:** Offers a long term rental payment for various tiers of conservation and management practices utilized on the farm. An additional payment could be added by the State of Maryland for the top tier when the practices that sequester carbon are utilized. Funds could come from industry payments or assessments to the state carbon sequestration fund. This assures a long term commitment to maintaining the farming methods most beneficial to the environment.
- **State of Maryland and NRCS: Nutrient Management plans in place and followed.** The State requires all farm operators to have a current Nutrient Management Plan in place. NRCS provides assistance in developing plans for CAFOs. NRCS and MDA provide cost sharing assistance on nutrient management plan development. This assures proper fertilizer management and manure use with minimal environmental damage while maintaining maximum crop yields and sequestering carbon.
- **NRCS and State of Maryland: provide cost sharing assistance on implementing conservation practices through the Environmental Quality Incentives Program (EQIP) and Maryland Agricultural Water Quality Cost Share Program (MACS) respectively.** This includes land use conversions of pasture or trees. This provides the establishment costs of conservation practices such as buffers, wetland conversions, grassed waterways, animal waste management facilities, etc. Once established the farmer is obligated to maintain the practices for the lifespan of the practice, usually 10 to 20 years depending on the practice.

- State of Maryland and NRCS provide funds for easement purchases through the Maryland Agland Preservation Foundation (MALPF) and the Farm and Ranchland Protection Program (FRPP) respectively. This assures that the farmland will remain as open space farmland in perpetuity.
- State of Maryland offers the Low Interest Loans for Agricultural Conservation Program (LILAC) which offers an interest subsidy for agricultural practices and equipment which improve water quality and sequester carbon as an additional benefit.

Combined cost sharing assistance and incentive payments are utilized to implement continuous no-till on all cropland acres, winter cover crops are used each year with incentive payments provided, fertilizer and manures are applied according to an approved nutrient management plan, the irrigation system is improved and managed according to the latest technology, streams are all buffered and wetlands are restored. This will qualify the farmer for the top level of payment in the Conservation Security Program and also qualify them for a Carbon Sequestration Payment for the life of the contract.

Given this scenario approximately 5 metric tons of carbon per acre would be sequestered annually in the cropland (using the highest figures for carbon sequestration). If all cropland (1.2M ac) on Maryland farms would meet the criteria then approximately **6M tons of carbon could be sequestered on cropland or the equivalent of 21.7 million tons of CO₂**. An additional 2.3 tons per acre of carbon sequestration or **345,000 tons of carbon (1.25M tons CO₂ equivalent) per year across the state** could be sequestered by properly managing and maintaining the pastureland in Maryland (150,000 acres). This doesn't count any stream buffers or wetlands that are restored.

Key Point: The coal fired power plants currently operating in Maryland are emitting about 23 million tons of CO₂ each year. This could be completely mitigated by investing in carbon sequestration on farmland across the state.

This is a small but noble incentive for the farmers to remain in farming in Maryland and for industry to continue to grow and thrive in the state.

Opportunities for MDA and NRCS:

An agricultural carbon trading bank is needed to serve as a brokering and contracting service between industries that need to mitigate their carbon emissions and farmers who hold the key to sequestering the carbon. The bank would receive mitigation payments from industry and contract with farmers for long term farm maintenance.

The bank would verify that the farmers have optimized their farm management regarding conservation practices and operational management strategies in place. This is to assure maximum environmental improvement while farming and managing the land. A certification would be documented. This bank and the technical experts associated with it

could also assist farmers with the 1605(B) reporting requirements and verify the accuracy of the reporting.

The farm owner has the opportunity to install all necessary conservation practices to reach the optimized level of conservation on the property. All applicable federal and state programs could be utilized (EQIP, CREP, MACS, MALPF, LILAC)

Once the farm operation has been certified by the technical experts then the bank would consummate a contract with the farm owner for long term maintenance and management of the property. This could include, at the landowner's discretion, all applicable long term program payments such as all Aghand Preservation Program Payments, all CSP payments, all Carbon Sequestration payments, all CREP, WRP and other agricultural easement program payments.

Annual reviews would be conducted on the farm with the farm owner to assure that required practices and management strategies are in place and properly maintained. These reviews would be conducted by private Technical Service Providers funded by administrative costs from the various programs managed through the bank.

Initially this could be a joint venture between the NRCS, MDA, and the Maryland Association of Conservation Districts (MASCD) with the goal of bank establishment within 12 months.

Actions needed:

- NRCS, MDA and MASCD need to agree on the concept.
- MDA needs to engage all appropriate elected officials, state agencies and affected industries in the development and implementation of a business and marketing plan.
- MDA needs to plan for and provide staffing, office space and related business operation necessities.
- NRCS needs to accelerate the CSP watersheds in Maryland to a 3 year implementation schedule and continue to provide funding for the various CSP Tiers.
- NRCS needs to provide training to TSP's that will be engaged in the planning and certification of the farms.
- NRCS and MDA need to review payments, cost share incentives to assure adequate assistance to farmers to achieve the project goals.