Maine Earth Smart
“FARMING FOR THE FUTURE”
An agricultural GHG emissions reduction certification program.
### Maine & New England Statistics

<table>
<thead>
<tr>
<th></th>
<th>New England</th>
<th>Maine</th>
<th>Vermont</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Farms 2011</td>
<td>33070</td>
<td>8100</td>
<td>7000</td>
</tr>
<tr>
<td>Average Size</td>
<td>122 acres</td>
<td>167 acres</td>
<td>174</td>
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- Over 5000 Maine farms are under 100 acres
- Diversified agriculture
- New England is significantly higher than the national average in direct sales, both in market value and percentage of farms (2007). Maine ranked 6th nationally in 2007 in percentage of farms with direct sales. Vermont ranked 5th.
- Percentage of organic farms is higher than the national average.
- Percentage of on-farm electricity or energy generation is higher than the national average.
- More practice rotational or management intensive grazing than the national average.
- Community Supported Agriculture is practiced more in New England than nationally.

*Trends in New England Agriculture, Gary Keough, State Director USDA National Agricultural Statistics Service  New England Field Office-available as Power Point presentation.*
Background

2007-No infrastructure to facilitate farmer participation in GHG emissions reduction activities or in any voluntary offset market.

2007-Collaborators provided farm energy audits, alternative energy assessments, and on-site training and education for professionals and farmers to promote energy conservation and reduction in fossil fuel use. Started modeling soil carbon and management practice change in selected counties. Started outreach to farmers about GHG emissions, climate change, carbon sequestration and ecosystems markets

2009-Conducted needs assessment and outreach. The survey addressed energy efficiency and conservation, energy production from farm products, renewable energy production (including solar, wind, geothermal and hydroelectric), alternatives to nitrogen fertilizer, biomass, carbon sequestration, carbon trading and more. Respondents indicated that they needed help in assessing their farm for potential project adoption and for calculating financial paybacks and that they wanted unbiased information. Farmers and forest landowners indicated an interest in participation in an ecosystem market if practical and economically viable.
2009-2010 – Focus Group convened to develop program and/or adapt practical guidelines for management practices that reduce agricultural GHG emissions.

Big question-How do we provide the assessment, services and guidelines for best management practices that farmers want and need?

Big question-How do we provide the means to facilitate GHG emissions reductions in Maine and New England, lacking a viable offset market than encompasses small farms?
Initial Project Approach–Whole Farm–Tiered

- Must be practical for farm implementation.
- Must be farmer driven, they need to choose what is best for their operation.
- Provide additional farm income and/or reduce expenses.
- Must have flexibility within the infrastructure.
- Must adapt currently accepted protocols and/or practices.
- Quantification of individual projects, combined for total reductions.
- Development of guidelines.
- Development of a “whole farm” assessment/survey to provide the means to assess activities that produce emissions.
Initial Approach

- Education incorporated into the program to ensure farmers receive up-to-date information needed to make beneficial decisions.

- Provide training for professionals.

- Development of local/regional ecosystems market.
The “whole farm” approach ultimately will yield more GHG emissions reductions and other benefits than any one single activity could alone, especially for small farms.

The ultimate goal: improve the quality of the environment while providing recognition and economic benefit to the producers who implement management practices that achieve that goal.
The End Product-Maine Earth Smart

• Provides recognition for implementation of best management practices that reduce agricultural emissions and that have multiple co-benefits.
• Promotes management practices that benefit the environment, increase sustainability and reduce costly inputs such as electricity, fertilizers and fuels.
• Includes practices that will enhance productivity, soil health and farm profitability.
• Can help farmers distinguish their farm and their products using the Maine Earth Smart label and demonstrate to their customers that they care about the environment.
• May help position farmers to comply with potential future market requirements and may help them take advantage of possible future regional opportunities.
• Is compatible with existing NRCS incentives and other resources, thus some compensation may be available for practice implementation.
• Does not include development of a local or regional ecosystems market.
The whole farm assessment is a comprehensive survey used to gather needed information to prepare recommendations that prioritize practices. The intent is to prioritize the practices with emphasis on those that deliver the “biggest bang for the buck”. In other words, what will work for the farm, reduce emissions, deliver co-benefits and be affordable for the farmer.

The assessment can be done by the farmer alone or with the help of a trained professional. It utilizes all pertinent available records and typically will also include an on-site visit for a complete practice evaluation.

The assessment may help position farmers to take advantage of markets if they choose.
The program includes six modules. Within the modules are management practices that have been selected by agricultural and forest scientists that will reduce agricultural emissions and provide other co-benefits. They are:

- Energy Management
- Crop Management
- Fertilizer Management
- Manure Management
- Pasture Management
- Forest Management

Each module has specific requirements and performance standards and several selected practices. The practices chosen are backed by most relevant scientific research and program developers have confidence that they will be effective in Maine. The program is fluid, practices can be added or eliminated as research continues and documentation is provided.
The farmer can choose practices that will work best for their farm, within the framework of the recommendations and modular system. They are not required to utilize the recommendations if they think another module practice is better for them. It is assumed that all practices will reduce emissions and as most modules do not have a specific reduction requirement, it is acceptable to utilize any of the practices, unless there is a reason they should not.

Certification is based on a point system with 70 out of 100 points required. One module must be completed (total points designated for that module) with individual practices selected from any of the other modules as recommended or chosen by the farmer to total 70 points. 10 points are given just for doing the assessment. Points were assigned to practices based on weighted values taking into account the emissions reductions, co-benefits, cost and risk of reversal.
There is no designated quantification method, nor is there an emphasis on quantification for the certification program as there are no minimum reduction requirements associated with most modules. Professionals can choose whatever tool or method best fits the practices, such as Comet Farm, Cool Farm Tool or tables, to help them prioritize practices. The assessment data gathered can also be used for Century or DNDC modeling to establish baselines and projected reductions, if the farmer is considering participation in a voluntary offset market.

Verification and tracking varies by module. Most require annual on-farm visits. Soil tests (which include organic matter) are required for fertilizer management and manure management and can be used to track changes in soil carbon. We have not designated a method, but may do so in the future.

Energy audits include quantification of emissions reductions and tracking can be done annually fairly easily utilizing required records.
Requirements

• Whole Farm GHG Assessment and Management Plan.

• Landscape Energy Audit, if available and Homestead Energy Audit within four years prior to the assessment or one after.

• Two years of annual records of fossil fuel use. One year prior to practice implementation to establish a baseline and one year after implementation of management practices to provide proof of reduction of fossil fuel prior to certification. Annual records must be maintained for the life of the certification.

• Two years of records of electricity use—same as above.

• Provide summary of reductions and access to records annually.

• Allow regular on-site verification of practices to maintain certification.
Performance Standards - All Practices

• Annual reduction of energy use is based on unit production. Reductions must be real and actual, representing decreased energy use and decreased expenses related to crop and milk production, on an annual unit basis (yield).

• Reductions must total a projected 10% of baseline energy use over the certification period.

• Historical average annual crop yields or milk production maintained or increased (no net decrease in yield resulting from change in energy management).

• All changes must reduce emissions while not increasing the possibility of any other environmental impact compared to normal practice.
Fuel Switching

- Fuel switching must include documentation that the new fuel used has less environmental impact and reduces GHG emissions when compared to an equivalent fossil fuel unit. There must be no possibility of engine damage attributed to the fuel switch. See requirements for fossil fuel use.

Energy Reduction (includes fossil fuel), Conservation and Energy Efficiency

- Energy reduction, conservation and energy efficiency projects must be implemented and proof of reduction submitted prior to certification and annually thereafter. See requirements. Appropriate certification points can be awarded if acceptable practices have been implemented, as recommended by energy and/or landscape audits, within five years prior to the assessment and annual records documenting energy reduction are available.
Renewable Energy

- If opting for a renewable energy source, installation must be based on an appropriate assessment by a qualified consultant and documentation provided proving that the switch will result in overall conventional energy reductions. Reporting requirements are the same as fossil fuel and electricity.

- Reasonable energy conservation and energy efficiency practices, as outlined in the energy audit must be implemented before renewable energy practices can qualify for certification.

Points required for Energy Management Certification: 25

- Energy conservation measures can be used for certification points if they were implemented within five years prior to the assessment and they have documentation to prove energy savings on measures taken after an audit recommendation.

- Certification Period Five years; Verification Period Five years; Opt Out: None
Energy Management Module

Practices

Fossil Fuel Reduction 15 points

Fuel Switching (exp. Fossil fuel to biofuel, diesel to propane) 5 points

Electricity reduction via conservation and efficiency 15 points

Renewable energy sources-solar, wind, biofuel etc. 25 points
Fertilizer Management Module

Requirements

• Whole Farm GHG Assessment and Management Plan

• Landscape Energy Audit, if available

• Site-specific Fertilizer Management Plan (FMP) (can be part of a Nutrient Management Plan) for all crops and fields. Soil tests, prescription blends, fertilizer and soil amendment analyses, crop nutrient requirements and soil maps are included in FMP.

• Current soil tests (done within the last 3 years prior to the assessment). Standard soil tests must include organic matter.

• Current manure tests if applicable, done annually.

• Pre-plant tests for residual nitrogen (Solvita test as part of the traditional soil sample instead of a separate sample and test).
Requirements Cont.

• Pre-side dress tests for nitrogen (PSNT). Split application for nitrogen required. Option: Use Adapt N modeling (can determine N loss and predict side dress N needed).

• Crop nutrient requirements (part of FMP)

• Field soil maps

• Allow regular on-site verification of practices to maintain certification.

• Keep annual records of type of fertilizer, timing and dates of application, weather at time of application, rate and placement, crops and yield.

• Keep annual crop irrigation records, if irrigation is used, including irrigation type, amount and dates of irrigation.
Fertilizer Management Module

Performance Standards - All Practices
- All crop acreage included in FMP enrolled.
- All fertilizer management practices must meet established management criteria.
- Historical average annual crop yields maintained or increased (no net decrease in yield resulting from change in fertilizer management).

Synchronize application with crop growth
- Split application of nitrogen based on PSNT tests, land utilization (pasture or harvested forage) and forage species present.

Banding or injecting into sod, split applications
- Include banded or injected split applications with rates based on yield potential and species utilization.
Fertilizer Management Module

Points required for Fertilization Management Certification: 15

• If a qualifying practice has been implemented on a farm within ten years prior to the assessment, it may be used for certification points if the practice is uncommon for the county in which the farm site is located. An "uncommon practice" is defined as one that is implemented on less than 25% of the same type of farm in the county. If a qualifying practice is classified as "common", in use by more than 25% of same type farm within the county, certification points can be awarded only if additional greenhouse gas reductions are made, such as extended rotations, change in crop, etc.

• Certification Period: 5 years, renewable
• Verification Period: Annually
• Opt out: None
Fertilizer Management Module

Practices

Application rate reduction to optimal crop needs to maintain yield 5 points

Band placement near, below and to side of seed row 5 points

Injection into root zone 10 points

Synchronize application with crop growth (crop uptake) (spring application, split application tied to N tests) 5 points

Switch to enhanced efficiency fertilizer 5 points

Cover Crops (No-Till) (scavenging potential) 5 points

Banding or injecting into sod, split applications 10 points
Challenges & Beliefs

• Funding is an issue—we don’t know how we will fund it to deliver it to farms for the duration of the pilot. Our goal is to test it on a minimum of 15 farms. After testing, we will hold another workshop with participants to assess the program, make changes if needed and work out the details.

• Funding beyond the pilot has yet to be worked out.

• We don’t know where it will ultimately be housed.

• We don’t know who will be verifying beyond the pilot.

• Proving the value of the program to farmers and to their markets is absolutely necessary, but how do we get there?

• We believe it will be an effective method for emissions reductions on Maine and New England farms, perhaps small farms across the country, but it will take a substantial amount of time and work to implement fully.

• We believe a certification program can co-exist with and complement offset markets, providing a GHG reductions beyond what an offset market will provide.
All Maine Earth Smart materials can be found at:

www.androscogginswcd.org

Also available for viewing at ?:  

2 excellent videos of farms that were used as training tools for professionals. Both videos give an overview of current farming practices by the farmer and cover all aspects of the farm. Both are typical Maine farms, though the dairy has more land than the average. Both had outlines of what we wanted them to cover but both were unrehearsed and from the heart. The only edits made to the videos were to shorten them up, for instance deleting portions that were duplicates. You will find them enlightening.
A SPECIAL THANK YOU TO THE CONTRIBUTING PARTNERS THAT MADE THIS PROJECT POSSIBLE

[Logos of various organizations]