

Earth Smart *“Farming for the Future”*

Crop and Land Management

Implementation of certain crop and land management practices has significant potential to reduce GHG emissions by increasing carbon sequestration and to a lesser extent decreasing nitrous oxide emissions. In all cases, attention must be paid to effects of implementation on productivity and yield, co-benefits and cost. Increased carbon sequestration depends on climate, soils, topography, crops grown, tillage nutrient management, etc. The practices selected have the best chance of reducing emissions in Maine, however, that said, they still will require careful consideration on an individual farm basis prior to including in a GHG Management Plan.

Practices eligible for certification include: long-term rotation of annual and perennial crops (alfalfa or grass hay), cover crops, switching from conventional to zone tillage combined with cover crops (at least 30% residue cover on the surface after planting), no-till combined with cover crops, irrigation improvements, change from annual to perennial crops and conservation set-aside. While any one of these practices generally can be expected to yield some decrease in emissions, depending on climate and soils etc., greater benefit may be gained by the combination of multiple practices, such as long-term rotation combined with cover crops and/ or no-till. No-till alone in Maine may not be the best solution to sequester additional carbon in all areas or on all soils, however it can yield enough other benefits, such as decreased use of fossil fuel (accompanied by a decrease in emissions), to warrant inclusion into the certification program.

Crop and Land Management Certification Goals

- Decrease greenhouse gas emissions
- Maintain or increase crop productivity
- Decrease production expense

Requirements

- Whole Farm GHG Assessment
- Whole Farm GHG Management Plan
- Nutrient Management Plan (Includes Fertilizer and Manure Management)
- Soil Tests
- Landscape Energy Audit, if available
- Allow regular on-site verification of practices to maintain certification
- Keep annual records of manure, fertilizer and soil amendment use, as outlined in fertilizer and manure management modules.

Performance Standards

All Practices

- All fertilizer management practices must meet established management criteria.
- Historical average annual crop yields maintained or increased (no net decrease in yield resulting from changes) or maintain acceptable new management goals that may be somewhat lower than historical average. Reduced inputs may result in acceptable lower yields if the cost per unit of the item produced is lower.

Crop Rotation

75% of all eligible crop acreage included in long-term rotation. The minimum rotation length is five years (3:2) with at least three years of a perennial crop (such as alfalfa or grass hay) included. Longer rotations are acceptable, such as five years of alfalfa, one year of grain, two

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years of corn. When using longer rotations, perennial crops must be grown for a proportionally longer period of time, a minimum of 50% of cropping seasons.

Cover Crop

75% of all eligible acreage included four out of five years (to allow for weather/extenuating circumstances), must use no-till planting. Both summer and winter cover crops must be planted as soon as possible, inter-seeded in the main crop or immediately after harvest, by the date appropriate for area of the state, to be determined by planner and farmer.

Change from Annual to Perennial Crops

Maintain for a minimum of five years on at least 50% of total eligible acreage.
New acreage on or off the farm must not be planted to annual crops during that time.
Short-term woody products are allowed.

Switch from Conventional to Zone Tillage with Cover Crop

At least 30% residue must be left on the ground after planting. Must be used on 75% of eligible acreage. Residue must be measured and/or compared to picture guidelines.

No-till combined with Cover Crop

Used on 50% of eligible land, maintained for a minimum of five years.

Conservation set-aside

Any previously cropped land eligible for NRCS CRP program can be set aside.

Irrigation Improvements

All irrigated acres enrolled. Eligible activity: switch to drip irrigation or from a gun or reel to center pivot.

Points required for Crop and Land Management Certification: 15

Existing practices - 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: Five years, renewable for two additional terms.

Verification Period: Annually for certification period.

Opt out: To be determined on an individual basis for a catastrophic event.

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Accepted Management Practices

Practice	GHG Benefit	Co-Benefit	Co-Benefit	Certification Period	Verification	Points
Crop Rotation	Increase carbon sequestration	Increased organic matter and increased carbon sequestration. Increased soil health, decreased nitrogen application and related emissions, less erosion, increased wildlife, decreased denitrification	Immediate payback as long as yield is not reduced.	5 years	Annually	5
Cover Crops	Increase carbon sequestration	Increased organic matter and increased carbon sequestration. Increased soil health, decreased nitrogen application and related emissions, less erosion, increased wildlife, decreased denitrification	Immediate payback as long as yield is not reduced and increased fossil fuel use is minimal.	5 years	Annually	10
Change from Annual to Perennial Crops	Increase carbon sequestration	Increased organic matter and increased carbon sequestration. Increased soil health, decreased nitrogen application and related emissions, less erosion, increased wildlife	Payback related to equipment cost and overall reduction of fossil fuel, if any.	5 years	Annually	15
Switch from Conventional to Zone Tillage with Cover Crop	Increase carbon sequestration	Increased organic matter and increased carbon sequestration. Increased soil health and decreased erosion	Payback depends on equipment needed versus increased productivity.	5 years	Annually	15
No-till with Cover Crop	Possible increase in carbon sequestration depending on area, reduced fossil fuel use	Reduced fossil fuel use, reduced potential for water quality degradation, better soil quality, less soil erosion, increased wildlife, increased organic matter	Payback depends on equipment needed versus decreased fuel use and labor.	5 years	Annually	15
Conservation Set-aside-all CRP eligible crop land as defined by NRCS.	Increased carbon sequestration, reduced nitrous oxide if not fertilized	Reduced fossil fuel use, reduced potential for water quality degradation, better soil quality, less soil erosion, increased wildlife habitat	Payback depends on production loss versus CRP payments and reduced cropping expenses.	Length of contract	5 years	5
Irrigation Improvement-Drip Irrigation, Center Pivot	Decreased nitrous oxide emissions, may be decreased NH3 if fertigating	Decreased leaching, improved water management, reduced erosion, reduced water withdrawal, reduced odors, less pumping and less engine emissions, improved crop uptake	Payback depends on equipment cost versus yield and water use.	5 years	Annually	5
Total Points						