

The following information is a thought experiment, not an actual program proposal endorsed or supported by VAAFM

Draft Approach 2: Soil Carbon Testing via Soil Bulk Density Tests

Farmer fields are measured for soil carbon content in the first year of the program and then again 5 years later. Once the tests after 5 years come back from the lab, farmers are paid for “improvements” at a set rate per every ton of carbon sequestered over that time period. Program may additionally pay for sampling/testing costs, and/or enrollment bonus in year 1.

Pros:

- Explicit link to ecosystem services
- Additionality – payment for improvements
- Required tests are relatively easily accessible and low-cost – Soil Organic Matter may be taken by farms already, but not to the same depth of a SBD test.

Cons:

- Sampling is labor-intensive and requires training/specialized technique (esp bulk density)
- Metrics may be influenced by external variables (e.g. weather at time of sampling) – how to control for that?
- Long lag time to see results – delayed payment, financial risk to the farmer

Possible Program Details/Considerations:

Ecosystem Service Valued: Soil Health – Soil Carbon Accumulation

Output: Performance – measured Soil Carbon Accumulation as direct proxy for sequestration of CO₂

Quantification: Measurement

1. Soil Bulk Density and Organic Matter Test [SBD-OM] Test
 - a. 1 organic matter test and 3 soil bulk density tests per field (assume 20 acres)
 - b. Unanswered considerations:
 - i. *Lab capacity*
 - ii. *Timing of sampling should be somewhat consistent year 1 to year 5*
 - iii. *Need to document field management? [crop type / soil type]*
 1. *Shapefiles for field boundary and gps point for sample locations*

‘Whole Farm’ Consideration:

- a. Farmer- chooses fields to be submitted for program testing and tracking
- b. Unanswered considerations:
 2. *Land use limitations for enrollment?*
 3. *All fields – cost prohibitive*
 4. *Could look at whole farm if collect samples from “representative fields” – would require further TA to review farmer land base and select representative fields based on soil type, crop management, etc.*
 5. *Land tenure requirements (rented vs. owned)*

SBD-OM Test Sample Costs:

- a. Total cost (labor, shipping, lab costs): \$156.20 / field tested (includes 3 bulk density tests, 1 SOM tests)
 - iv. See attached spreadsheet for complete cost itemization

Who Pays?

- a. PES Program Pays for:
 - v. SBD-OM sampling costs – labor & lab costs [Farmer or TA Provider]

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1. 'Verification'

- vi. Tons of carbon sequestered over the 5 years of the program
 - 1. *What if some fields go up and others go down? Should consider all together? Or only look at improvements?*

Who Samples?

- a. TA Provider or Farmer
- vii. Unanswered considerations:
 - 1. QA/QC
 - 2. Verification

How often Sample?

- a. SBD-OM Sampling Program: Year 1 and Year 5
- b. SBD-OM Payment Program: Year 5

Payment

- a. Will be based on Social Cost of Carbon at time of program grant execution
 - a. USEPA calculates \$51. Higher SCC in Vermont.
- b. Payment per ton of carbon stored in soil
- c. Payment rate flat rate at time of grant execution
- d. Individual fields submitted for sampling and payment
- e. Payment in Year 1 for sampling, Payment in Year 5 for sampling and carbon storage
- f. Payment will be direct financial remuneration
- g. Funding source: \$1,000,000 PES GF appropriation

Baseline

- a. No baseline – is a performance program proposal.
- b. Eligible for payment in 5 years, even if score goes from optimal to excellent.

Threshold

- a. Threshold will be an improvement in soil carbon on a test-by-test basis.

Farm Eligibility

- a. All Vermont farm & crop types which are grown in the soil
- b. All RAP farm sizes
- c. Farm must be in good standing with VAAFM

Farm Ranking

- a. First come first served based on application deadlines set by program

Pilot Specifics

- a. 1 year of sampling in 2023, 1 year of sampling in 2027. Payments in 2027.

Payment Scenarios:

Two payment scenarios are considered for this pilot thought experiment. These payment rates are based off of data reported in the PES WG Task 5: Valuation of Ecosystem Services report. A fixed cost of 15% is considered for administration costs between program payment rates– this will need to be revisited as complexity is introduced into a program and cost to administer is truly considered. Payment rate of \$18.84 / ac and \$9.42 / ac are utilized by the report to provide a possible range of achievement a farmer could hope to meet in five years of soil health management and soil carbon testing. These payment rates reflect the SCC adjusted to address permanence and are scenarios that could be achieved with good agronomic management.

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Scenario Results less admin costs or TA costs:

\$18.84 / acre payment rate cost per acre @ 20-acre SBD-OM Sample @ 100% success per sample: \$34.46

\$9.42 / acre payment rate cost per acre @ 20-acre SBD-OM Sample @ 100% success per sample: \$25.04

