Carbon Credits - Marketing a New Crop from Your Farm or Ranch

Dale Enerson, Director
NFU Carbon Credit Program
August 14, 2007
Carbon Credits - Why Now?

- Climate change and our nation’s reaction is in the news
- Renewable Energy issues and higher priced fossil fuels are related
- Carbon prices doubled in 2006 on the CCX, have remained steady recently
- Iowa Farm Bureau and North Dakota/National Farmers Union are major aggregators for the CCX
- 2007 Farm bill debate includes discussions of climate issues and conservation payments
Agriculture’s Role…

• It is estimated that U.S. agriculture could sequester 275 -900 million tons of carbon dioxide annually.

• Dr. Richard Sandor (CCX Founder) estimated future value of agricultural offsets at up to $20 Billion annually

• Agriculture could be the “bridge” to climate stabilization in the coming years at a much cheaper cost than some of the big technology ideas like underground or ocean storage.
Carbon Dioxide and Temperature

Temperature and CO₂ concentration in the atmosphere over the past 400,000 years (from the Vostok ice core)

CO₂ concentration, ppmv

Temperature change from present, °C

Year before present (present = 1950)

Maryland sunbathers enjoy the warmth Saturday.

2006 warmest on record

Last year was the warmest on record for the United States, with temperatures pushing higher than normal during the last half of December. Preliminary data from the National Climatic Data Center listed the average temperature for the 48 contiguous states in 2006 as 55 degrees Fahrenheit. That's 2.2 degrees warmer than average.
Arctic Sea Ice Loss: Greater than Land Area of Texas, California, and Maryland Combined

2003 vs. 1979 Comparison
1871-2000 Mean Annual Temperature Time Series
Station: DICKINSON, ND
(from the United States Historical Climatology Network dataset)
Carbon Sequestration

• Carbon sequestration can be defined as the capture and secure storage of carbon that would otherwise be emitted to or remain in the atmosphere.

• What are Carbon Credits?
  – Carbon credits encompass two ideas:
    (1) Prevention/reduction of carbon emissions produced by human activities from reaching the atmosphere by capturing and diverting them to secure storage.
    (2) Removal of carbon from the atmosphere by various means and securely storing it.
Strategies to Reduce Atmospheric CO$_2$

- Strategies
  - Reduce fossil fuel consumption
    - Improve efficiency
    - Renewable energy sources
  - Identify sinks and sequestration rate
    - Terrestrial
      - Soils
    - Aquatic
    - Geologic
    - Plants
Value of Increasing SOM (Soil Organic Matter)

- Improves soil structure
- Decreases erosivity
- Increases infiltration
- Increases soil water holding capacity
- Increases cation exchange capacity
- Decreases the energy requirement for cultural operations
An acre of land could produce:

- Income from the sale of a grain crop
- Income from a government crop subsidy
- Income from the lease or sale of minerals under the surface
- Income from recreational uses
- Income from the wind development rights
- Income from the storage of carbon
NFU Carbon Credit Program

- **No-till cropping** (.2-.6 metric tons per acre annually) (No beginning date) (Includes alfalfa planted in rotation)
- **Seeding long term grasses** 1.0 metric tons per acre) (Other seeded grasses, CRP) (Has to be planted after 1-1-1999)
- **Enhanced range management with increased vegetative index** (.12-.52 metric tons per acre?) (Cell grazing, rotational, intensive grazing practices)
- **Forestry offsets** (1.5-7 tons per acre annually) (Available in all states) (Have to be planted after 1990)
- **Methane Capture** (anaerobic digesters from livestock wastes - [1 ton methane =18 tons carbon credits])
- **Restoring wetlands** (not approved yet and maybe won’t be anytime soon) (up to 4.5 tons) (concerns over other emissions, notably methane and nitrous oxide)
What’s It All Worth?

• Total about $3,000,000 to 1230 farmers in the first NDFU/NFU pool

• That will average about $2400 per farm and will range from about $60 to about $24,000.

• 2007 enrollments (Sept 15 deadline for no-till and grass offsets) will add substantially to total acres, and increased rangeland and forestry could generate millions of additional dollars to be paid in 2008.
What’s It Worth to Me?

• No-till, Strip-till, and alfalfa in central and northwestern Minnesota at .4 tons is about $1.25/acre
• Seeded grasses (CRP) at 1 ton is just over $3.00 per acre
• Forestry offsets (planted trees or regenerated trees) can be up to $8-12 per acre
• All carbon contracts specify only tons, and the price is determined at the time of each year’s sale of the pooled credits.
Expanded No-till Eligible Areas

- Central and eastern US has several zones ranging from 0.2 tons to 0.6 ton per acre annually. Minnesota eligible area was expanded in April to all of the state.
- Similar restrictions as previously with limits on low-residue crops in rotation (soybeans)
- Ridge Till is not permitted, even though some aggregators allowed this earlier. Strip till is permitted with less than third of surface area disturbed.
- Has to be continuous no-till or strip-till in the same field, not rotations to different parts of the farm.
New Eligible Areas

• NFU/NDFU website has new map area and new contract for enrollment.
• Only one contract for all areas and only one contract covering 2006-2010 period
• Now offering choice of entering land descriptions by text version in all states, and trial of new Internet mapping entry system in North Dakota
“No-till’ Definitions

• General rule of thumb: direct seeding with no more than 30% surface area disturbance (3” wide openers on a 10” shank spacing)

• Strip till is allowed with no more than 30% soil disturbance (10” wide tilled strips on a 30” row spacing, no in-crop row cultivation, but separate knife fertilizer applications are allowed

• Disc type openers in most any row spacing are least disturbance, but are not required.

• Guidelines reference NRCS STIR ratings of 20 or less
Forestry Offsets

- Trees have to be planted (not native stands) after January 1, 1990
- Series of “lookup” tables from CCX using age, species, locale, density, and etc.
- In initial applications, we estimate the rate using CCX tables, then farmer decides whether to enroll
- Sample contract and worksheets on nfu.org
Methane Capture

• Carbon credits are earned for the capture of methane from livestock waste systems, either just covered lagoons or anaerobic digesters.
• Each ton of methane captured earns 18 tons of carbon dioxide credits which can be sold on CCX.
• Estimate at today’s carbon price about $30 per dairy cow, additional revenue if methane can be used to produce electricity.
• Projects can be anywhere in US.
How Do I Get Into This?
Soils Offsets (No Till and Grass)

• Enter farm information and enter land descriptions into the on-line database.
• Download, print contract from the web.
• Send signed contract, copies of maps, and CCC-578 forms to NFU.
• Send annual certification form to NFU
• Cash the first check next year !!!
Welcome to the Farmers Union Carbon Credit Program

This site provides the information that you need about earning income from various conservation practices on your farm or ranch. Some of these practices you may be already doing, or you may be thinking of making some cropping or land use changes. In either case, the annual sale of carbon credits may bring additional dollars to your operation, and also help our environment.

Check out the questions and answers, the general information, a short video on the left side of this page. For the no-till and tame grass practices, the enrollment is done on-line by following the directions and following up with mailing in the downloaded contract, maps, and FSA forms. For the other practices, download the contract, complete the worksheets for rangeland, forestry, or the methane capture project, and mail the documents to PO Box 2136, Jamestown, ND, 58402-2136, and we'll take it from there.

Carbon credits can be earned in a number of ways, including no-till cropping, seeding tame grasses or alfalfa, native rangeland enhancement, forestry, and methane digesters. All contracts run through December 31, 2010.

**No-Till:** Carbon credits will be issued at the rate of .2 to .6 metric tons of carbon per acre annually to participants who commit to continuous conservation tillage on enrolled land from 2002 through 2010. In most cases, credit can be earned for the 2006 year. Enrolled acres may be planted in pulse crops (i.e. beans, peas, lentils) no more than three of the contract years. Alfalfa or other planted forage crops will be considered as no-till.

**Seeded Grass Stands:** Carbon credits will be earned at a rate of 1 metric ton per acre annually, even if enrolled in CRP. Grass stands seeded prior to January 1, 1999, will not be eligible for enrollment in the program.

**Native Rangeland:** Grassland with a grazing plan, may earn from .12 to .52 tons/acre annually.

**Forestry:** Forested acres, planted or regenerated after 1990, can earn up to several tons of carbon credits annually, if the trees are managed in a sustainable manner.

**Methane Offsets:** Methane captured and/or destroyed, can earn tons of carbon credit. Animal waste systems, including anaerobic digesters and covered lagoons, can be enrolled. Each ton of methane captured earns 18 tons of carbon credits.

While the carbon credit program is available through National Farmers Union, North Dakota Farmers Union acts as the fiscal agent actually contracting and selling the carbon offsets on the Chicago Climate Exchange. That is why links from NFU and other state Farmers Union organizations all connect to the ndfu.org website, and the contract language refers to the ND Farmers Union. Income earned from aggregating acres in all other states will result in revenue paid to individual state Farmers Union groups and National Farmers Union.
How Do I Get Into This? (Range, Forestry, Methane)

- Go to nfu.org or ndfu.org to download sample contracts and worksheets
- Enter data on the worksheets as accurately as possible
- Send worksheets and other required materials to NFU
- We will estimate the rate and proposed contract and then will contact producers
- Depending on number of contracts, may have several payment periods
- Forestry offsets can be paid back to 2003 if eligible.
Verification of CCX contracts

- CCX randomly selects at least 10% of our contracts for verification.
- This is crucial to our program. We have to have the reputation of having high quality, true offsets.
- Without this step, buyers will question the purchase of agricultural offsets, and the whole system of “cap and trade” fails.
Verification of Contracts…

- Chicago Climate Exchange contracted with ND Association of Soil Conservation Districts for verification of 104,000 acres in our carbon program. (10% of contracts, not acres)
- North Dakota in-field contract verifications were conducted and completed by Christmas - Less than 800 acres out of 800,000 had any eligibility problems!
- Other states have completed verifications by various private companies and soil conservation districts. (Overall results good, but some problems with grass/forage seeding date)
 CHUNK OF CHANGE: Mark Liebig, a soil scientist at the Northern Plains Research Center at Mandan, N.D., tests for carbon emissions from grasslands, one of the types of land that farmers and ranchers will be able collect money from for its ability to store carbon. "It's an excellent opportunity for North Dakota farmers and ranchers to acquire extra income just by doing what they already do," says Liebig, who has worked on carbon sequestration for several years. "The first payment in 2007 could be substantial, especially for large acreages. It's a nice chunk of change to start out the year with."
NO-TILL REWARDS: No-till could be worth $1 to $2 per acre as part of a carbon-credit program that the North Dakota Farmers Union is organizing. The farm organization is signing up carbon credits to sell on the Chicago Climate Exchange.

Carbon contracts

Key Points

- Current carbon-credit prices are low but still significant.
- Prices are set every year; market could go up or down.
- Agreement is a binding contract that could affect land sales.

By LON TONNESON

binding to the effect that the practices have to be completed for the life of the contract. If a landowner sells land that is covered by a contract, the next landowner would have to accept the arrangement and continue the practices, or the first landowner would face penalties for breaking the contract.

- How are carbon credits priced, and when is income received? During each production year covered in the carbon-credit contract, a fixed price is
Future Potential?

- Relatively low prices for stored carbon up until recent months caused many producers to feel it was not worth the effort to enroll, but the $3-5 price caused some interest.
- US political climate and concern for environmental issues will determine success of this project.
- There are millions of acres of cropland, rangeland, forests and wetlands in the US, and relatively few are managed for carbon sequestration objectives as of now. Farm bill and other considerations will determine how many acres will fit carbon credits programs.
- Manure digesters, renewable energy projects will also offer opportunities.
- Realistically, even if we could achieve enough income to pay real estate taxes, that would be a huge impact to rural economies. ($3-10 per acre)
CCX CFI Market Data Charting Tool

Start Date
12 December 2003

End Date
30 July 2007

Vintage
2001

Chart Type
Line

CCX Carbon Financial Instrument (CFI) Contracts Daily Report

Price

Volume

Price and volume reported in metric tons CO₂
Downside?

- Other farm groups will see this as another threat to property rights (no easements, no recordings)
- While general public has been shown to support reducing greenhouse gas emissions, many individuals see this as a threat to business
- Coal fired energy industry and to some extent rural electric cooperatives see greenhouse gas discussions as a threat, but are planning to adapt to coming cap and trade plans.
- Fear of selling credits now when they may be worth more later (credits are priced in the future)
- Producers not fulfilling contracts if prices drop.
- May complicate landlord-tenant negotiations.
Welcome to CCX: We are a financial institution whose objectives are to apply financial innovation and incentives to advance social, environmental and economic goals through the following platforms.

Chicago Climate Exchange (CCX) is North America’s only and the world’s first global marketplace for integrating voluntary legally binding emissions reductions with emissions trading and offsets for all six greenhouse gases. (learn more)

Chicago Climate Futures Exchange (CCFE) is a landmark derivatives exchange that currently offers standardized and cleared futures and options contracts on emission allowances and other environmental products. CCFE is a wholly owned subsidiary of CCX. (Visit CCFE’s website)
A bipartisan trio of Congressman has proposed an amendment to the House of Representatives’ energy bill that would require utilities to produce 20 per cent of electricity from renewable energy by 2020. Democratic Cong Republican Todd Platts announced the amendment late last week to be added to the comprehensive energy package unveiled by House Speaker Nancy Pelosi at the end of June. The draft is debated this week ahead of

ECX Dec07 EU$0.11 -.01; Dec08 20.85 +.20; Dec09 21.24 +.66, Dec10 21.63 +.44

### 07/30/2007 IN CCX:

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<th>Product</th>
<th>Vintage</th>
<th>High</th>
<th>Low</th>
<th>Close</th>
<th>Today's Volume (metric tons)</th>
<th>MTD Volume (metric tons)</th>
<th>YTD Volume (metric tons)</th>
<th>Historic Volume (metric tons)</th>
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<td>$3.70</td>
<td>$3.70</td>
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<td>15,130,000</td>
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CCX volume represents all transferred metric tons of CO2e including block trades, cash transactions, super reductions, and auctioned CFI's.

Rob McAndrew  
Vice President  
Chicago Climate Exchange  
(312) 229-5124 (direct)  
(312) 229-1208 (fax)  
rmcandrew@chicagoclimatexchange.com
Future NFU Carbon Website…

• As we add more eligible territory for soils offsets, range management, and forestry, we plan to make the on-line enrollment easier.

• We are working with our programmer to have an on-line internet mapping system to avoid typing in land descriptions. Instead, producers will simply click on the land tract (Common land units {CLU}) and the acreage will automatically add to the database. The initial trial version on this is up and running for North Dakota.
(Leaps tall stubble in a single bound! Sequesters carbon with his bare hands! Carbon bullets bounce off his impenetrable skin. When he passes gas it of course contains no methane!!! He's Carbon Man!!! Raised by a farm family from western North Dakota, most of his days are spent as the meek and mild mannered Farm Economist Dale Enerson. But when the need arises, he ducks into a nearby VW Beetle and emerges that hero of heroes Carbon Man!!! )
It’s Now Time to STOP!