

Soil Carbon Sequestration Contracts

Agriculture has become a player in world greenhouse gas markets by providing carbon credits in the form of soil sequestration (crop and rangeland), methane capture and forest sequestration. In order to provide these carbon credits, agricultural producers enter into a contractual arrangement with the market. Within the framework of the carbon credit market, soil sequestered carbon credits are referred to as exchange soil offsets.

The parties involved in soil carbon sequestration contracts are the farmer, the aggregator and the market. This guide uses the term “farmer” to refer to the person actually providing the carbon offset to the market. A nonfarming landowner can also enter into a contract to supply carbon offsets as long as he ensures that the one farming his land complies with the specifications of the contract. Aggregators are businesses that assemble many small providers of soil carbon offsets, then register and sell those offsets on the market. Currently the major, but not sole, market in the United States is the Chicago Climate Exchange. MU Extension publication G311, *An Introduction to Greenhouse Gas Market and Cap-and-Trade*, summarizes the markets that exist for carbon trading in 2009.

This guide also assumes that farmers will use an aggregator to market their carbon credits. While it is possible for individual farmers to market their own credits, aggregators provide an important service. First, the market requires a minimum trade of 12,500 metric tons of CO₂ equivalent (CO₂ Eq.) per year. (See MU Extension publication G310, *Agriculture and Greenhouse Gas Emissions*, for a more complete description of CO₂ Eq.) Given that conservation tilled land earns 0.2 to 1 metric ton CO₂ Eq./acre/year in Missouri, this minimum trade would require from 12,500 to 62,500 acres enrolled. The 2007 Census of Agriculture reports

that there are less than 1,000 farms larger than 2,000 acres, the largest size reported. Very few, if any, Missouri farmers could participate in the carbon market without aggregators pooling the credits of multiple farms. Second, aggregators are also able to achieve economies of scale associated with verifying and marketing carbon credits.

The contracts offered by aggregators to farmers must follow the rules of the Chicago Climate Exchange (CCX) for *exchange soil offsets* (XSOs). Soil carbon sequestration contracts offered by AgraGate (created by the Iowa Farm Bureau Federation), the North Dakota Farmers Union, the National Carbon Offset Coalition, Delta P2E2, and Kentucky Corn Growers' Association were consulted to provide information for this guide. Web sites that contain their contracts are listed at the end of this guide. Other aggregators may also offer soil carbon sequestration guides. If soil carbon sequestration becomes more widespread, other aggregators will undoubtedly enter the market.

This guide provides economic and legal insight into the contracts used to market soil carbon sequestered for the purpose of providing carbon credits. The guide is organized around the following key specifications of carbon sequestration contracts:

- Eligible practices
- Rights to the exchange soil offsets
- Carbon Reserve Pool
- Marketing and fees
- Land tenure changes

For each of these topics, this guide evaluates the allocation of responsibility, reward and risk among the parties involved in the contract. For a more detailed explanation of contracts and the responsibility, reward and risk analysis, see MU Extension publication G312, *Contracts in Agriculture*.

Introduction to XSO contracts

Competent legal counsel performs a valuable service of protecting an individual's interest as they consider entering into a contractual agreement. Some of the clauses of a contract deal with legal concerns

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not specific to the major intent of the contract. These clauses are critical to the efficient functioning of a contract but are not the emphasis of this guide. This guide will concentrate on contract clauses that deal with the rights and responsibilities of farmers thinking of sequestering soil carbon for the purpose of marketing carbon credits.

Three different entities share the decision rights associated with carbon sequestration contracts. The market (CCX in this case) sets the guidelines for registering and trading carbon credits. The aggregators are responsible for communicating with farmers the specific rules for carbon sequestration contracts, for registering the carbon offsets with the CCX, for verifying that the practices that earn credits are actually being performed, for selling the credits on the CCX market, and for financially settling up with the farmers who provided the credits. Farmers manage their land in such a way as to earn carbon credits that can be delivered to the market.

All contracts for carbon credits traded on the Chicago Climate Exchange (CCX) must follow the CCX Rulebook. (The Web site that contains the CCX Rulebook is listed at the end of this guide.) The contracts offered by aggregators to farmers reference and summarize the CCX Rulebook but do not present all the rules in full detail. While the aggregator is responsible for making sure that all participating farmers comply with the CCX rules, understanding the underlying rules of the CCX is helpful in understanding the rights, risks and rewards associated with the contracts.

Both the farmer and the aggregator bear price and financial risk. Price and financial risk occurs for aggregators because they are uncertain of the price at which they will sell exchange offsets. With aggregators charging 8 to 10 percent of the sales for their services, they make less money when exchange credits are sold for \$3 per ton than when they are sold for \$7 per ton. In addition, the aggregator is ultimately responsible for verification expenses, which continue during the life of the contract, because a certain percentage of acres must be verified to comply with the CCX protocol. While the farmer is responsible for paying these fees, until sales occur to compensate for these fees, the aggregator manages the finances.

Contracts that enroll farmland where soil carbon is sequestered officially sell exchange soil offsets, so called because a landowner is being paid to sequester carbon in the soil, which is then used to *offset* an emission of carbon by some business or person seeking to reduce their carbon emissions.

When farmers sign contracts to provide XSOs, they agree to transfer to the aggregator the legal rights associated with XSOs for the period of the contract (usually five years). The contracts offered by aggregators specify that enrolled projects are subject to the application eligibility rules of the Chicago Climate Exchange.

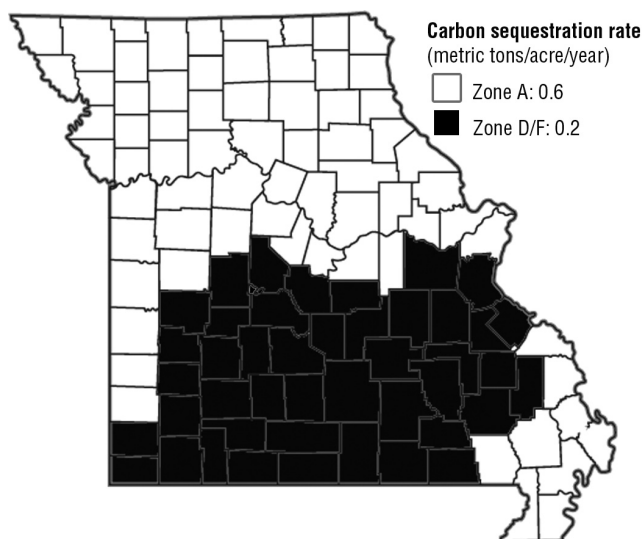


Figure 1. Missouri's two conservation tillage regions have different carbon sequestration rates.

Farmers can better evaluate the pros and cons of enrolling their land in XSO contracts by understanding the allocation of responsibility, reward and risk associated with the following contract specifications.

Eligible practices

An XSO contract has what is called high task programmability. The contracts specify several production requirements for accruing XSOs. Basing payment on observable input activities is an efficient allocation of risk and value because trying to measure output in the form of actual sequestered carbon on all acres would be prohibitive.

The major contract specification is that the land be farmed using "continuous conservation tillage." The CCX Rulebook defines conservation tillage in the same way that the USDA Handbook of Conservation Practices does. Specific field activities, such as burning and harvesting residue, are prohibited. Likewise, the use of specific implements, such as plows and disks, are prohibited. Restrictions vary depending on the region of the country enrolled. This guide does not give a complete list of restrictions. Farmers considering a contract should read and understand all of the eligible practices for their particular region and soil types before signing.

The farmer is not required to prove, through soil testing, that the carbon was sequestered. Specific farming practices are assumed to sequester different amounts of carbon in different regions. There are two conservation tillage regions in Missouri (Figure 1). Conservation tillage in the Ozarks region is assumed to sequester 0.2 ton CO₂ Eq. per year, while the remainder of the state is assumed to sequester 0.6 ton CO₂ Eq. per year. Continuous grass cover established on or after January 1, 1999, can also earn XSOs at the rate

of 1 ton CO₂ Eq. per year, regardless of the county in Missouri.

The contract specifies that “continuous cotton, soybeans and pulse crops (e.g., beans, peas, lintels) are eligible only if there is a cover crop.” This is particularly important for Missouri because many farmers plant soybeans or cotton in consecutive years. One aggregator’s contract specifies that “enrolled acres may be planted in soybeans no more than 50 percent of the enrolled years.”

The CCX rules specify that “no XSOs will be issued in years in which residue removal and/or burning occurs.” Alfalfa and grass hay harvest are permitted residue removal activities. Silage removal or Baling straw and removing silage are considered unauthorized residue removal activities. Residue removal does not incur penalties and interest. The consequence of residue removal is only that no credit is earned in the year that the residue is removed.

Allocation of responsibility

While the contract gives general requirements (e.g., conservation tillage) and prohibits specific practices (e.g., plowing), the farmer has the right to choose how to meet the requirements. Several different types of planting, fertilizer and pest control equipment can be used to meet the conservation tillage requirement. A variety of cropping systems are also permitted.

It is the responsibility of the farmer to periodically submit a project report that confirms compliance with the contract. Each year the aggregator sends participating farmers a form on which they indicate that all the contracted land is still compliant with the contract or that all or part of the land is out of compliance for some reason.

It is the responsibility of aggregators to conduct a verification process on 10 percent of all acres they register with the CCX. The contract specifies that the verification agency hired by the aggregator has the right to access enrolled acres to perform verification work. It is the responsibility of the owner to permit the verifier access to land and necessary documentation to complete their job.

Allocation of risk

The attribution of a certain amount of carbon sequestration by following the performance requirements, rather than by actually measuring changes in soil carbon, reduces the risk to the farmer. The amount of XSO from each acre is known with certainty at the time the contract is signed.

For a farmer, two major risks arise from the contracts: (1) failure to comply and the resulting assessment of penalties and fees and (2) inability to manage your farm to maximize profits because of production limitations.

For noncompliance, the contracts specify that the owner of the noncompliant project shall replace the quantity of XSOs that are out of compliance. For example, if 50 acres of a 400-acre contract are out of compliance, the farmer is responsible for replacing all of the XSOs already earned, including those in the Carbon Reserve Pool (to be discussed later), on the 50 acres out of compliance. In addition, the farmer may be charged a 20 percent penalty, interest accruing on the XSO value, and costs incurred by the aggregator in enforcing the contract. An example of contract incompleteness in XSO contracts can be seen by the fact that none of the contracts consulted for this guide specify what rate of interest will be charged. This ambiguity could create problems if a farmer ceases to be in compliance.

The risk associated with noncompliance varies with the market price for carbon credits. If the market for carbon credits was lower when the farmer went out of compliance than previous sales made by the farmer, then replacing the credits would be rather easy. The farmer would simply purchase from the CCX the needed quantity of offsets. This purchase could, theoretically, cost less than the amount previously received for selling credits. However, if the market price increases, the cost of replacing the credits will be greater than the price that was previously received. In addition, the penalties and interest are still a potential cost of noncompliance.

Another risk is the potential loss of income from not being able to till the soil and from cropping system limitations. The major production risk occurs when continuing conservation tillage reduces yield potential. This would most likely occur when compaction exists and the contract specifications prohibit the farmer from using an implement that would break up the compaction. While many farmers have voluntarily used conservation tillage for years, they have always had the option of resorting to tillage to manage problems. A carbon sequestration contract removes some of the options for solving field problems.

Tilling to remedy compaction would make the land out of compliance. The farmer is faced with the decision of whether to take a continuing yield loss or repay contract payments with penalty and interest. When XSOs are priced low, it would take very few bushels of yield from tilling to justify breaking the contract.

Specific cropping systems could be another source of risk for farmers in carbon contracts. The prohibition of continuous soybeans or cotton could reduce the options for crops produced given current and expected market conditions. Should a farmer decide to produce continuous cotton or soybeans, an additional cost of planting a cover crop would be incurred. At historical carbon credit prices, the cost of planting and subsequently destroying a cover crop will be less than the income achieved from the carbon contract. However, assistance in paying for a cover crop may be available

from the USDA Environmental Quality Incentive Program and could make compliance more profitable.

While probably foreseeable within a five-year contract term, there is a risk of wanting to grow a new crop that does not conform to the contract rules. Whether or not that cropping system is compliant with the carbon sequestration contract is uncertain, thereby constituting a risk. For example, if a cellulosic ethanol market developed so that removing corn stover from the field was profitable, farmers with a carbon sequestration contract would find themselves losing earned carbon credits if they removed the stover.

Unauthorized removal of residue by burning or harvest results in no credits being issued on otherwise eligible cropland. The CCX Rulebook specifies that generally, two-thirds of the crop residue should remain on the field surface. While residue removal results in no credits being issued for the year the residue was removed, it does not require the repayment of previously earned credits, as tillage would.

Rights to the exchange soil offsets

Farmers signing XSO contracts agree to “sell and deliver to the purchaser (aggregator) free from liens and encumbrances ... the rights to the XSOs created during this contract.” Farmers who enter into soil carbon sequestration contracts agree to sell and deliver XSOs for an, as yet, unspecified price.

Allocation of responsibility

Once a contract is initiated, the management of the XSOs becomes the exclusive responsibility of the aggregator. The supplying farmer has no responsibility for managing or marketing the earned XSOs. All rights have been transferred, free from liens and encumbrances, to the aggregator. The CCX Rulebook indicates that the XSOs placed in the Carbon Reserve Pool (to be discussed later) remain the property of the farmer delivering the XSOs.

Contractually, the CCX is not scheduled to accept XSOs for registration beyond 2010. If XSOs that would be registered in 2011 and beyond cannot be registered, the contract just ceases. The CCX does not have to recognize them as credits; the aggregator would not be responsible to manage them; the farmers would not have to comply with conservation tillage requirements.

Allocation of reward

Fixing the amount of the XSO to compliance with a certain set of prescribed activities allows the farmer to provide the XSO with some degree of certainty and receive the reward of supplying them. The CCX, in determining the amount of XSOs to fix to different counties for different production practices, indicates that they were conservative in their estimate. Some farmers might consider this conservative estimate

of the amount of carbon sequestered to reduce their reward for sequestering carbon.

Two things make the fixing of XSOs an efficient reward for farmers. First, if the XSOs were determined by actually measuring sequestered carbon, the cost of this measurement would reduce the net return from the transaction. Second, the simplification of the process has allowed farmers to experiment with carbon sequestration. Were this simplification not present, they may not have the one market currently available. If the per-acre amount of XSO is too low, subsequent markets may develop to compete for the actual carbon sequestered.

Allocation of risk

Financial risk to the farmer can occur in several ways. First, the farmer delivers the XSOs to the aggregator for an unspecified price. The farmer is uncertain what price will be received for the XSOs at the time that he is modifying his management to create the XSOs.

The second risk, which has not occurred in the short history of marketing XSO, is that the aggregator would declare bankruptcy or cease to operate. The CCX Rulebook states that the XSOs in the Carbon Reserve Pool remain the property of the farmer supplying the credits, indicating that the farmer could continue to receive payments. The credits delivered to the aggregator but not yet sold and not in the Carbon Reserve Pool may be considered an asset of the aggregator and subject to claims by other creditors. No bonding of stored credits exists for the trading of carbon credits as is seen in grain trading. Assuming that the farmer did have ownership rights to the XSOs he supplied, the verification and other services offered by the aggregator can probably not be performed in an economically viable manner without the services of the aggregator. Furthermore, marketing on the CCX requires registration so the farmer would likely have to find another registered aggregator to market his existing credits. Should the aggregator cease to manage the pool of XSO, the confusion relating to continuing the contract could be exhausting.

Carbon Reserve Pool

Twenty percent of the offsets earned are put into the CCX Carbon Reserve Pool until the end of the contract.

Allocation of responsibility

This reserve pool is mandated by the CCX. All XSO contracts sold on the CCX have the 20 percent reserve pool withheld from annual sales of carbon offsets. Contractually, the CCX is scheduled to release Carbon Reserve Pool XSOs in time to allow owners to trade before the end of 2010. If the CCX continues to accept XSOs for registration beyond 2010, the Carbon Reserve Pool XSOs not yet at the end of their five-year contract

are likely to be kept in the Carbon Reserve Pool until the contract ends.

When Carbon Reserve Pool XSOs are released, the aggregator determines when and for what price these credits will be sold.

Allocation of reward

While the credits have been in the reserve pool, their value has not been earning money. No reward has been realized by the farmer, the aggregator or the exchange. On a theoretical level, there has been a loss of opportunity value. Depending on the price of carbon in the year that it is sold, this loss may be compensated by a higher price than would have been recognized if sold earlier.

Allocation of risk

Farmers started enrolling acreage into carbon contracts around 2005. Since that time, 20 percent of the credits have been earned but not marketed. This has effectively reduced the supply of offsets by 20 percent each year — exerting upward pressure on the price of carbon credits. Beginning in 2010, these Carbon Reserve Pool credits will begin to be marketed. In essence, the temporary limit on supply will end and a new supply of stored XSO will enter the market, both exerting downward pressure on prices. Because offsets constitute a small percentage of carbon contracts traded, this pressure should be minor.

Should CCX actually stop trading carbon in 2010, the market price would probably be very low because the market is ceasing and the quantity of credits released into the market would be high.

In line with the economics of high asset specificity, if in fact, there is no market for XSOs after 2010, the value of the Carbon Reserve Pool would approach zero. The XSOs have no value other than in the GHG market. Much uncertainty revolves around the use of early action credits should a mandatory greenhouse cap-and-trade system develop. An early action credit is the right to provide offsets from carbon-reducing activity (e.g., soil carbon sequestration) that occurs before the cap-and-trade rule actually takes effect. If agricultural early action credits are permitted, then the Carbon Reserve Pool will have increased value. A mandatory cap-and-trade system will increase the value of credits and the pool will have a supply to sell. If the market refuses to recognize agriculture's early action credits, the value of XSOs in the pool would be diminished.

Marketing and fees

All XSOs delivered to and sold by the aggregator are assessed an 8 to 10 percent service fee by the aggregator. In addition, the following costs are borne by the farmers: (1) the cost of registering the offsets on the CCX (15 cents per ton in 2009); (2) carbon credit

trading fees assessed by the CCX when XSOs are sold (5 cents per ton in 2009); and (3) the cost of project verification (varies by year and by aggregator). These costs are deducted from the payment made to the farmer by the aggregator.

Allocation of responsibility

The sale of XSOs is the sole responsibility of the aggregator. They are able to sell or not sell XSOs depending on their analysis of the market. The contracts usually do specify that they will sell the offsets within a certain time after the contract ends. Payments are scheduled to be made on an annual or semiannual basis.

Allocation of reward

The farmer receives the value of all XSOs sold, less the aggregator service fee and costs. Carbon market data can be found at the Chicago Climate Exchange Web site.

Allocation of risk

Both farmer and aggregator face price risk in the carbon market — neither knows the price of carbon at the time the contract is initiated. They will receive different prices throughout the life of the contract. As of June 4, 2009, prices for XSOs have ranged from \$.55/metric ton of CO₂ Eq. (July 2009) to \$7.40/metric ton of CO₂ Eq. (May 2008).

The sales price, less fees, is allocated to the farmer. It is assumed that the sales price will always be greater than the fees. However, this is not necessarily the case. In some periods it may be that the price is insufficient to meet all of the costs of participating in the market. In late 2008, the price of carbon was so low that aggregators made few or no sales, yet continued to incur verification expenses. While the farmer is responsible for the verification expense, the aggregator in 2008 did not charge that fee. But eventually the verification expenses do need to be paid from whatever price can be obtained on the market.

Land tenure changes

The carbon credit contract is tied to the land for five years, regardless of who controls the land. If the original farmer ceases to control the contracted acreage (either by sale of land or change of farming tenants) during the contracted period, a subcontract may be created. All of the terms and conditions of the original contract apply to the subcontract.

Allocation of responsibility

Upon transferring control of the registered land, the original farmer is responsible for securing a subcontract and registering it with the aggregator.

Allocation of reward

Given that the carbon contract is expected to yield financial benefits to the farmer, the transfer of the land could have increased value associated with the contract. However, because there currently is no barrier to the subsequent farmer entering into a contract on his own, it is doubtful that the new tenant will be willing to pay the previous tenant anything for the existing contract. The constraints placed on the subsequent farmer could be considered a negative value and lower the price of the transfer.

Allocation of risk

If the control of the land does change, the original owner is responsible for getting a subcontract. If the original farmer fails to get the subsequent farmer to

subcontract, or if the new farmer fails to meet the contract specifications, the original farmer is responsible for the broken contract. A tenant signing a five-year carbon contract might want to secure control of the land by obtaining a five-year lease from the landowners.

The contract can be written where the landowner gets the carbon payments. When this occurs, the landowner has incentive to keep the contract compliant should the tenant change.

Tax rules

The payments received from selling carbon credits are similar to those received when selling grain. No Internal Revenue Service Form 1099 will be sent to the farmer from the aggregator. The farmer is responsible for reporting the income to the IRS.

Further information on the Web

Chicago Climate Exchange

Home - chicagoclimateexchange.com

List of aggregators - chicagoclimateexchange.com/content.jsf?id=64

Rulebook for soil carbon offsets - http://chicagoclimateexchange.com/docs/offsets/CCX_Conservation_Tillage_and_Grassland_Conversion_Protocol_Final.pdf

Market data - chicagoclimateexchange.com/market/data/summary.jsf

USDA Natural Resources Conservation Service technical standards

www.nrcs.usda.gov/technical/standards/nhcp.html

Aggregators (contracts referenced in this publication)

AgraGate Climate Credits Corp. - agragate.com

North Dakota Farmers Union - carboncredit.ndfu.org

National Carbon Offset Coalition - ncoc.us

Kentucky Corn Growers' Association - kycorn.org/ccx

Delta P2E2 Center - chicagoclimateexchange.com/offsets/projectReport.jsf