



Cornhusker Economics

Ag Carbon Credits

There is a lot of discussion in the ag community about ag carbon credits as part of a larger U.S. strategy to reduce carbon emissions and avoid the very worst impacts of global warming. This newsletter takes us through some of the basics regarding what ag credits are and why they are a current topic of discussion.

What are carbon credits? Carbon credits are sometimes purchased by businesses that are being required to reduce their greenhouse gas (GHG) emissions. A carbon credit typically represents one metric ton of carbon dioxide (CO₂), the most prevalent GHG, and can be created by activities reducing GHG emissions, like reforestation.

The carbon credit concept is based on the 1990 EPA acid rain program, where coal-fired power plants were required to lower their sulfur emissions by reducing the destruction of Canadian and U.S. forests by acidic precipitation (“acid rain”). All regulated coal-fired power plants were issued sulfur emission allowances that would over time require them to reduce annual sulfur emissions. (One sulfur emission allowance would authorize the emission of one ton of sulfur by the holder.) In response, some power plants lowered their emissions by replacing high-sulfur Appalachian coal with low-sulfur Wyoming Powder River Basin coal. Other power plants installed scrubbers to clean their emissions. These cleaner-burning power plants often had unused sulfur emission allocations, which the cleaner plants could sell to the dirty plants that had not yet started reducing their emissions.

In the global warming context, some states (California, and several New England and mid-Atlantic states in the Regional Greenhouse Gas Initiative or RGGI) and some countries (most of Europe) are regulating carbon emissions from coal-fired power plants and large coal-burning industrial facilities (like cement factories). Often these carbon regulation programs allow regulated power and industrial plants to offset part of their emissions with carbon credits.

Carbon credits are generated when businesses and entrepreneurs engage in activities that reduce the release of GHGs, such as converting from coal-generated electricity to zero GHG electricity such as wind, solar, hydroelectric or nuclear power. Carbon credits may also be generated when a building or facility’s energy efficiency is improved. These potential carbon credits must be documented or certified as truly representing a stated quantity of reduced or avoided carbon emissions before they can be approved to offset regulated carbon emissions from the power or industrial plant. Purchasing carbon credits can be less expensive than making the GHG emission reductions, although they are not a long-term substitute for making those GHG reductions.

What are agricultural carbon credits? Foresters, ranchers and farmers can increase the storage of carbon from the air into the soil through improved forest, grassland and cropland practices. A

recent study estimates that improved agricultural land management (including forests) could increase annual carbon storage in soil by up to 21% of annual U.S. GHG emissions (Massey & Willett, p. 18). With President Biden's goal of making the U.S. **net carbon neutral** by 2050, ag carbon credits from additional carbon sequestration in forests, grasslands and cropland would be an important component of achieving that goal. (**Net carbon neutral** means that the U.S.' net GHG emissions would be zero, which would require a sharp reduction in fossil fuel combustion.)

What activities might generate ag carbon credits?

Most tons of potential soil carbon storage come from forest management activities, avoided grassland conversion to cropland and planting cover crops (Massey & Willett, p. 19). Other agricultural activities potentially generating carbon credits include reduced tillage, reduced fertilizer applications, and capturing methane from livestock operations and converting it to electricity. In the U.S., the most ag carbon credits that have been certified for use in California and RGGI GHG regulatory programs are from forestry and methane capture from dairies.

What are the different types of carbon markets? The two main categories are voluntary markets and compliance markets.

Voluntary carbon markets serve businesses and individuals who wish to offset some or all of their GHG emissions to accomplish business or personal sustainability goals but who are not legally required to do so. For example, when Al Gore travels to Europe to give a climate talk, he might purchase some carbon offsets to offset his share of the GHG emissions generated in his cross-Atlantic flight. Some families or businesses may purchase carbon credits to reduce the size of their collective carbon footprint.

Compliance carbon markets serve regulated entities who are legally required to reduce their GHG emissions, such as the California, RGGI and EU programs previously mentioned.

The primary difference between the two markets is the level of scrutiny activities are subject to before they qualify as certified carbon credits. The certification process for carbon credits in compliance markets is stricter than for the voluntary carbon markets. It is difficult to say how much of a difference there really is -- some voluntary certification programs are probably

just as strict as the compliance certification programs. But there is no overall regulation of the voluntary carbon markets to assure that all carbon credits represent a metric ton of carbon reduction.

What does the U.S. voluntary carbon market look like today? In 2019, renewable energy represented 42% of the carbon credits generated in the U.S. for the global voluntary carbon market (calculated from Donofrio et al., p. 1). Forestry and land use (including forestry offsets) represented 37%. Other U.S. carbon credit generating activities include waste disposal, chemical processes and industrial manufacturing, energy efficiency/fuel switching, and transportation (Donofrio et al., p. 1). There is no central marketplace where these carbon credit purchases occur, virtually all of the trades are directly between buyer and seller with no intermediary (Donofrio et al., pp. 8, 9).

What does the ag carbon credit market look like today? It is the wild, wild west. No rules or regulations exist, so let the buyers and sellers all beware. From where I sit, the two largest players appear to be speculators and pilot project developers.

The speculators – in my opinion – are attempting to contract as many acres as they can with the expectation that carbon markets will explode in the next few years and they will sell their carbon credits at a large profit. One source estimates that the U.S. voluntary carbon market will grow 1500% by 2030 (Donofrio et al., p. 6). Speculators are placing their bets now and are willing to pay a premium to sign acres up early.

The pilot projects (my characterization) are being developed by several different groups, many with agribusiness partners or connections. The basic idea is to sign up some acres and use them as a test to develop the soil carbon storage information to credibly document that the improved management practices have sequestered more carbon in the farm or ranch land. These firms or groups want to be the intermediary between ag producers and carbon markets or carbon credit buyers over the long haul. If you want to learn about these “pilot projects” google “agricultural carbon credits” or “carbon farming” and get comfortable because you will find many articles on this topic.

What was the Obama carbon farming market like?

The Kyoto climate treaty and President Obama's proposed GHG regulatory program led to the development of the Chicago Climate Exchange (CCX) from 2003-2010. The CCX was organized to sell GHG emission allowances for GHG emission reduction and offset projects in North America and Brazil. The CCX went out of business in 2010 due to the failure of Congress to enact President Obama's GHG regulatory program, which led to a lack of interest in trading carbon credits (Wikipedia).

While the CCX was in existence, some groups attempted to aggregate farmer contracts to increase soil storage (Leonard pp. 335-37). An interesting example is AgriGate Climate Credits Corp., a subsidiary of the Iowa Farm Bureau. The AgriGate farmer contracts were for a minimum of 5 years, and 20% of the carbon offsets generated were held back in a reserve pool to cover any carbon storage shortages (if some farmers did not complete their contracts, for example). Any offsets remaining in the reserve pool at the end of the contract period were sold. The farmer application process relied heavily on FSA information, which simplified the process. AgriGate sold carbon credits, deducted its costs and a 10% selling commission, and distributed the remainder to participating farmers (Leonard pp. 337-40). I would estimate that farmers probably received around half of the carbon credit sale proceeds. During this time the Nebraska Farmers Union was also very active in generating farmer carbon contracts.

I will note here that the only reason we are discussing ag carbon credits today and back in the 2003-2010 period is that there were then (and are today) widespread expectations that the U.S. would then (and will soon) regulate carbon emissions from the power sector and industry. If there are no U.S. carbon regulations that would encourage U.S. electricity producers and industries to purchase carbon credits, there is only a very small U.S. market for ag carbon credits. If President Biden's clean energy programs fail to achieve Congressional approval, any momentum towards developing a market in U.S. agricultural carbon credits will likely die.

Are there issues with generating carbon credits on leased land? Yes, and they are significant.

One drawback of agricultural carbon credits in cropland is that after the carbon contract expires the land can be plowed up and the stored carbon released

back into the atmosphere. This possibility makes cropland carbon credits somewhat problematic, as the carbon sequestration is not necessarily permanent. This has led to long-term ag carbon contracts, 10-20 years or more. This is not as large a problem for forests that are managed on a longer time frame than cropland. Grasslands may fall somewhere in between cropland and forests.

The longer contract term to ensure longer soil carbon storage is somewhat at odds with typical farm leasing patterns in Nebraska and probably much of the Corn Belt. Most Nebraska farm leases are handshake agreements for one year with no written lease. I suspect that most written leases are for one year also with specified renewal procedures. This pattern has led at least one commentator to suggest banning leased land from carbon markets (Duffy, p. 315). Certainly, if ag carbon markets become a significant source of farm income, more farm leases will be written for a longer term to qualify for carbon market participation. That would be a dramatic change but it will happen if the carbon market financial incentives justify making the change.

Over time, if the nations of the world remain committed to achieving their net-zero emissions by 2050 pledges, it likely will become necessary to adapt carbon contracts to facilitate carbon storage on leased farmland. But we are a long way from that point now, and it may be years before we reach that point.

Should the USDA develop a carbon bank? Yes. The proposed USDA carbon bank would treat soil carbon storage like another conservation objective, similar to reducing soil erosion and preventing water pollution from agricultural production. The carbon bank could be operated similarly to the conservation reserve program, where farmers bid their land into the CRP and USDA takes the lowest qualifying bids. USDA conservation programs already deal with leased land issues, and the carbon bank could pay farmers to continue existing soil carbon storage rather than only paying for new practices. According to media accounts, USDA Secretary Vilsack and President Biden favor developing a USDA carbon bank. Mr. Vilsack has indicated that USDA might pursue a pilot project which, if successful, could be the basis for proposing a much larger program to be

approved by Congress. Major advantages of a USDA soil bank include much less farmer paperwork than carbon markets would likely require and an expanded opportunity for landlords and tenants to jointly participate than carbon markets would likely provide, at least in the short and medium term.

What about international carbon markets? There are no organized international carbon markets at present. Several nations have established national carbon markets, including China, and there may be an EU carbon market. For carbon markets to become more robust, more countries must commit to net-zero GHG emissions by 2050 or some similar goal and back that commitment with action, including programs to regulate and substantially reduce GHG emissions within their borders. If that happens, carbon markets will sprout like dandelions, and market operators will see the value of coordination and cooperation. But the commitments and meaningful follow-up actions have not yet occurred, so we will need to see what happens in the coming months and years.

What should producers watch for? I would watch for government actions around the world but especially in the U.S., China and India to reduce carbon emissions. Without these carbon reduction requirements, there is no increased need or market for ag carbon credits. So don't think that carbon reduction commitments make this all a done deal – they don't. They would be a good first step but without follow-up regulatory programs, the commitments won't mean much. The U.S. will be the best barometer of future progress on carbon reductions: if the Biden administration can get its soon-to-be-announced (we hope) Clean Energy Standard program approved by Congress, we will be on our way and most other countries will likely follow our lead. If the Biden climate proposals don't make it through Congress, then it will be a much more difficult row to hoe.

Will carbon markets make farmers rich? No, unless you become a successful carbon credit speculator (and if you do, you are wasting your time as a farmer). Perhaps carbon credits will evolve into a meaningful component of farm or ranch income but it won't happen overnight and a lot of things that have never happened will need to happen soon (like the U.S. agreeing to limit its carbon emissions).

Resources

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