

GREEN MATTERS

A newsletter from the Alberta Environmentally Sustainable Agriculture Council

Carbon Credits & Agriculture

From AESA Council's Chair

By John Kolk,
Poultry Industry Council



John Zylstra /AAFRD

The issue of trading carbon credits from agriculture has generated a tangle of views, from soaring hopes for the value of the credits, to debates about whether humans are influencing the global climate. As Canada edges closer to establishing a national emissions trading system, we have to pull what we need out of the tangle so we can focus on making our farms and our industry more economically and environmentally sustainable.

To sort through the tangle, we first need to educate ourselves. For me, attending the recent Carbon Connections conference was one way to do that (see “Gearing up for Greenhouse Gas Offset Trading” in this issue). The conference wasn’t about debating emission policies or the reality of climate change. It was aimed at helping us learn about the practical aspects of commercial trading of carbon credits from agriculture – like how do we build relationships and create deals, how would we cover off risk, how might we amalgamate at the production level, and how do we set value on different credits.

Canada’s emissions trading system still has many unknowns, including what the monetary value of carbon credits might be. However, we do know who the players are going to be: the industries that will be buying credits to reduce their emissions; the aggregators; the people in agriculture who could have credits to sell. The conference brought us all together, and helped us to get to know one another and make some contacts.

One thing I’ve learned in the last few years, and which was reinforced at the conference, is that the returns from carbon credit trading will likely not provide enough of a benefit to put expensive agricultural changes into place. The driver for

adoption of new practices will be because they make sense for a farm’s sustainability and viability.

Most “beneficial management practices” have benefits on the greenhouse gas side and they are also practical, cost-effective and good for the natural resources that agriculture relies on. Some examples that come to my mind are: changes to livestock rations to more closely meet nutritional requirements; managing manure so more nitrogen gets to the crop and less is lost to the air; and minimizing tillage to increase soil moisture and reduce fuel costs. Yes, these practices reduce agriculture’s net greenhouse gas emissions, but they offer producers much more than that.

On my own family’s farm, we’re going to continue making changes that make good economic and environmental sense. We are installing low-pressure irrigation packages because they save water and energy and help us get more water to the crop, not because of the carbon credits. We may change a feeding ration because it will reduce our costs. But as we do those things, we’ll be recording how we are reducing our greenhouse gas emissions so we’ll be ready when a viable carbon market develops.

I think it’s time to set aside the fruitless debate in the farm community over whether climate change is real and influenced by human action. Instead, we need to consider how we can adapt to some climate change, because that’s a risk management tool, and how we can implement practices that enhance the sustainability of our farms. Any carbon credits we earn along the way will be a bonus.

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Greenhouse Gas Offset System: Some Basics

The main elements of Canada's emissions trading system are now known, although final approval of the rules was put on hold by the January 2006 federal election. For producers who are interested in participating, here's a brief outline of the system.

Large final emitters (LFEs), which include such industries as oil and gas, and manufacturing, must meet mandatory targets to reduce their greenhouse gas emissions. LFEs have various options to meet their targets, one of which is to buy **offset credits** from sectors, like agriculture, that don't have mandatory reductions.

To create offset credits, a producer undertakes a project involving a **practice change** that reduces his or her operation's emissions or that removes emissions from the air and sequesters (stores) them in a sink, such as in the soil as organic carbon.

"Offset credits are a value-added aspect of doing a project, not the core financial reason for doing it," explains Dr. Carol-Ann Brown of Climate Change Central. "For a producer, the first step would be to look at what you have that could be a project. Perhaps it is changing from low-till to no-till or changing your livestock feed. Then you would assess your own costs and benefits for the project, as well as the risks and the steps in bringing it through the offset process and getting credits."

Under the proposed rules, the steps in offset credit process are:

1. The project proponent develops a proposal and applies to Environment Canada's **Offset Program Authority** (OPA) to register the proposed activity as an **offset project**.
2. The OPA determines if the proposal meets various criteria (e.g. the reductions/removals must be quantifiable, verifiable, etc.). If it does, then the OPA registers the project for an eight-year period.
3. The proponent implements the project and keeps records to quantify the reductions/removals.
4. A third-party assessor verifies the project's results periodically.
5. The proponent applies to the OPA for credits for the verified results.



Rick Tailleu/Reduced Tillage LINKAGES

A one-pass no-till system uses less fuel and stores more carbon in the soil than a conventional tillage system.

6. The OPA issues the credits.
7. The proponent sells the credits directly or through a broker or other agency to LFEs.

Brown notes, "Canada's obligation [under the Kyoto Protocol] begins in 2008. However, if you apply in 2006, you can start generating credits as of 2006. The eligibility date for entrance into the program is January 1, 2000. If a producer started no-tilling in 2001, their farm would be eligible to apply but wouldn't start earning credits until 2006, provided the project was approved." The system will also allow people who have been no-tilling prior to 2000 to participate. They will be eligible to earn carbon credits but they will be given a lower calculation coefficient with which to calculate how many credits they've generated in 2006 and beyond.

Some companies and producer groups are already acting or are considering acting as **aggregators**, bringing together many farms with similar offset projects to reduce transaction costs and increase selling power.

To reduce some of the uncertainties and costs in the system, you may use a standardized **quantification protocol** to calculate a project's reductions/removals. Working groups from the federal, provincial and territorial governments are one venue developing protocols. So far there are five agriculture-related working groups: pork, beef, manure processing, soil management,

and afforestation. The pork protocol will be completed in March, and the other four are expected in mid-2006. Dairy and biofuel groups will likely start soon.

Karen Haugen-Kozyra of Alberta Agriculture, Food and Rural Development chairs the beef and pork groups. She says, "To develop these protocols, we review the scientific literature, then consult with experts, and then do a farm-based confirmation. When we started to develop the pork protocol, we had all these practices that we thought were potentials. But as we started to go through our three-step process, it became very clear that some were not viable. Either they were net-negative from a greenhouse gas standpoint or the technology isn't there yet." For the pork protocol, the group narrowed the practices down to three areas: feeding, manure storage, and manure application.

Haugen-Kozyra says using the protocols will streamline the approval/registration and verification processes. She adds, "The quantification protocols are really the key to the market. They will provide a level of assurance to a producer, an aggregator and even a buyer."

For more information, visit the federal website at <http://www.climatechange.gc.ca/>. Also, Alberta Agriculture will publish an offset trading manual for producers this spring.

Gearing up for Greenhouse Gas Offset Trading

Now that the rules for Canada's emission trading system are getting finalized, we realized that there was a need to bring agricultural producers up to speed and give them some tools to start getting engaged in it," says Dr. Carol-Ann Brown of Climate Change Central.

So Climate Change Central hosted *Carbon Connections: Climate Change Opportunities in Agriculture*, on November 21 and 22, 2005, in Calgary. Other conference sponsors included a variety of government agencies, private companies and other organizations from across Canada, including the AESA program.

Producers, aggregators, buyers, brokers and others attended the conference, providing the opportunity for people from the different parts of the trading system to meet and make connections. The first day, attended by 150 people, included overviews of policy and the various components in the system, as well as examples of projects that producers are undertaking that would likely be eligible for offset credits.

On the second day, 115 people participated in Canada's first Mock Contract Negotiation Workshop for selling offset credits from agriculture. Brown says, "We structured the workshop around real-life rules as much as possible, but we couldn't apply all of the process because it's just not possible in three hours."

To help minimize the risks related to selling credits, various mechanisms are available, such as working through an aggregator. At the workshop, producers chose to form a selling block. Brown says, "At the mock negotiations, we had 10 groups of producers, each with their own producer profiles, giving them the kinds of options they had and the costs per tonne of greenhouse gas emissions of the different projects. They didn't know what the other groups had. We had six different buyers with different numbers [of credits] that they had to buy, and we had aggregators and brokers. Trading started out really slowly ... Then about halfway through, someone stood up and said 'I want all of the producer groups to come join us here.' And they formed a consortium to increase

their selling power. They sold a big block of the tonnes available at \$45/tonne to the industry buyer."

Climate Change Central plans to make the conference's workbook available to the public, after it is updated with any final changes in the trading rules. For more information, visit www.climatechangecentral.com.

Barriers & incentives

Sten Lundberg, a forage producer and chair of the Foothills Forage Association (FFA), was a speaker at one of the sessions at the conference. He says, "When I started down this trail four years ago, I said, 'I've seeded all my place down to forages. That ought to be good for some carbon credits.' And I went trudging down the road to find out about that. Since then, it's all been a learning curve for me, learning about why [the Kyoto Protocol] was created, and more importantly, the potential significance to our whole society ... for how we manage energy and other resources."

Lundberg says, "Foothill Forage Association is skeptical about receiving much dollar value reward from [offset credits]. We don't see that there's going to be a lot leftover for producers by the time they get through all the brokerage and aggregating and verifying and validating in the trading process."

Instead, FFA's main interest is in the benefits and costs for producers of the practices that reduce net emissions. Lundberg explains, "When we reduce emissions, we are more efficient on our farms. And if we put the carbon back into our soils, it should increase productivity." Also practices that store soil carbon provide other benefits, like protecting water quality.

Lundberg says, "Growing perennial forages and managing them well could be one of the most advantageous ways to reduce emissions and sequester carbon, but much of it needs scientific verification." So FFA is planning to conduct studies to more clearly determine the relationships between growing forages, storing soil carbon and reducing emissions.

Despite the long-term benefits, the initial costs of converting to agricultural practices that reduce net emissions can be a significant barrier to adoption, notes Lundberg.

Lundberg's own interest in this issue goes beyond economics. "Once you learn about [the global impacts of rising greenhouse gas levels], you have a responsibility to respond. ... No one player can affect climate change unless the whole world does it. Does that mean we just sweep it under the rug and ignore it? ... Let's clean up our own backyard and demonstrate the value of [reducing net emissions]."



During the mock negotiations, a consortium of sellers of offset credits came together for greater selling power.

Water-efficient drinkers for pigs: a win-win-win-win-win situation

“The difference in water usage was just astounding.”

Improved water efficiency, reduced costs for water pumping and manure spreading, lower greenhouse gas emissions, and improved barn management – Dennis McKerracher has achieved all this by simply changing the drinkers for his pigs.

“I wanted to see if converting [from regular nipple drinkers] to ball-bite nipple drinkers would equate to economic and environmental benefits,” explains McKerracher, who is an Alberta Pork delegate and a member of AESA Council.

With a ball-bite drinker, the pig has to close its mouth right around the drinker to get water, resulting in much less water spillage in comparison to a regular nipple drinker. Part of McKerracher’s motivation for the project was to conserve water because it is such an important resource for ensuring healthy pigs. In addition, he knows that wasted water costs money. There’s the extra cost of pumping that water to the drinkers. And, since the spilled water drips through the slatted barn floor into the manure pit below, there’s the extra cost to pump the increased volume of manure diluted by the spilled water. And there’s the extra cost to transport and apply the increased manure volume. As well, there’s the cost to the environment of the greenhouse gas emissions related to the energy for pumping, transporting and spreading.

So McKerracher worked with Climate Change Central, the Canadian Pork Council (with funding from the national Greenhouse Gas Mitigation Program for Canadian Agriculture), and Alberta Pork to set up a year-long comparison trial of the two drinkers at his hog operation near High River. They installed two pulse meters, one for each test group, to very accurately measure water flow. They also installed a control monitor for recording water consumption per head every day.

Every eight weeks they brought in a new batch of 500 grower pigs, with a total of six batches from August 2004 to September 2005. Each pair

of test groups had the same number of male and female pigs, and the same group weights going in. None of the pigs had been on either type of drinker before the trial. The two groups were housed in separate rooms with separate manure storage.

Both groups of pigs performed equally well in terms of weight gain, but “the difference in water usage was just astounding,” says McKerracher.

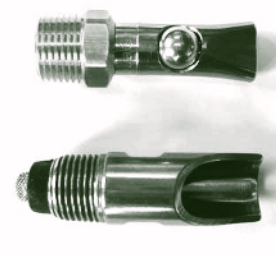
He explains, “One drinker serves 15 pigs. One ball-bite drinker reduces water use per pig by at least 2 litres per day [this amount is the minimum in the winter months]. Each drinker is used for 344 days per year, allowing for barn clean-out times between batches. That would equate to 10,320 litres saved per drinker per year. And that 10,320 litres of water is about how much the manure in the pit below the nipple drinker group is diluted by.” Even though the manure from the ball-bite pens is less diluted, McKerracher has had no problems in pumping out the pits.

Recording the daily water use produced an unexpected benefit. “We became familiar with the normal water use curve for each group, so if there was any difference in that curve, we could investigate and see if anything was awry. For example, if there was something different with the feed or if a nipple was leaking a bit, we knew immediately,” notes McKerracher. “Now the first thing we do when we check on the pigs is to check the water use.” He adds, “If a producer were using a water medication to address a specific concern, the amount would be calculated with greater accuracy.”

McKerracher says currently a regular nipple costs \$6.90, while a ball-bite nipple costs \$12.60. But those extra costs are soon recovered. “The savings on electricity for pumping the water will pay for the conversion to ball-bite drinkers in a couple of years. If you factored in the savings on manure spreading, you could pay for the conversion even sooner. That’s not even including the value of the carbon credit offset.”



McKerracher in his barn



Ball-bite nipple drinker (top) and regular nipple drinker

He plans to work with Climate Change Central to analyze how much less energy is required for the ball-bite drinker system and the implications for reducing greenhouse gas emissions from hog operations.

McKerracher is now converting his whole barn to ball-bite drinkers. He says, “This project is more than affordable, it’s profitable. And it’s a simple little thing, so it’s really easy to have uptake from grass-roots producers.”

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COUNCIL PROFILES

Roger Bryan/AEFRD



Graham Caskey

The Caskeys' farm near Oyen lies within a semiarid region of southeastern

Alberta. This region presents a variety of farming challenges and has recently come through a trying period of successive droughts.

Graham Caskey employs various strategies to meet these challenges. For example, he practices a combination of reduced tillage and no-till in a continuous cropping system, he has a fresh water hauling service to provide non-farm income, and he takes part in diverse organizations that are relevant to his farming business.

Caskey says, "In this area we have a lot of soil erosion from wind, so no-till has been

a great thing for us. It keeps the soil on the ground and builds organic matter." He adds, "We're still in the process of trying to make continuous cropping work because of our moisture limitations." Although no-till conserves soil moisture, successive years of drought have made continuous cropping a tough option, so he is considering altering the proportions of chemfallow and minimum-till in his crop rotations.

Caskey is involved in many associations related to agriculture. For example, he's a member of the Alberta Canola Producers Commission, and through that he sits on the Canadian Canola Growers Association and the Canadian Farm Safety Net Committee.

"...no-till has been a great thing for us."

He's been a member of the Alberta Conservation Tillage Society for about 15 years and is currently a director on its voluntary board. This society, now 27 years old, recently changed its name to the Alberta Conservation Tillage Society II, to reflect its updated role. Its mission is to promote the development and adaptation of conservation

in agronomy (the science and economics of crop production and farm land management).

"ACTS II is a grass-roots producer organization. We like to be actively involved with anything to do with our business and to give input from the grass-roots," notes Caskey. ACTS II members sit on a wide range of boards and committees such as the Red Deer River Watershed Alliance, Soil Conservation Council of Canada, Alberta Environmental Farm Plan Company and Alberta Surface Rights Federation.

Caskey also serves on the Reduced Tillage LiNKAGES steering committee. As a member of the AESA Council, he sits on the Council's Greenhouse Gas Team. Reduced tillage systems sequester carbon in the soil, which lowers greenhouse gas levels in the air. So ACTS II is interested in understanding "the linkage with carbon credits and how it would be beneficial for our producers."

At more and more of the meetings that Caskey attends, he finds that the biggest issue for farmers is maintaining profitability in the face of low market prices and rising input costs. He says, "Without profitability, you can't be sustainable."

Alberta Irrigation Projects Association

I've been an irrigation farmer all my life and my father before me, and my grandfather before that. I'm in my 19th year of being involved in the Alberta Irrigation Projects Association. And those of us who have worked with irrigation and have seen how great its impact is, we are really enthusiastic about it. We feel that what we are doing is extremely important for the province and for the economy, not just of Alberta, but of Canada," says Jim Csabay.

Energized by such enthusiasm, Alberta Irrigation promotes water conservation practices and increases awareness of the value of irrigation. It does this through education and outreach, research, innovation, partnerships, and policy and regulation review.

"...we are very conscious of the value of water and our effect on the environment."

The association's primary members are the 13 irrigation districts in the province. It also has associate members from agencies involved in the irrigation industry.

Csabay, who farms near Coaldale, has just completed his three-year term as chair of Alberta Irrigation. One of its major initiatives during his tenure has been to increase public outreach. For example, partnering with such agencies as Inside Education, teachers and school boards, the association has created a unique information package for youth outreach. He explains, "We have just finished filming the last of a series of four educational videos that will be in classrooms for Grade 8 Science students this coming spring. The teaching resources focus on fresh water resources in Alberta and interpret the curriculum on the Alberta landscape. The final video uses irrigated agriculture as the case study for the unit."

Irrigation's wide-ranging benefits include tourism and recreation, water supplies for communities and individual residences, habitat, stock water supplies, and, of course, water for growing diverse crops, including high-value crops like potatoes, sugar beets

and corn. Csabay says, "While irrigated land comprises only about 5% of Alberta's arable land, it contributes almost 20% of the province's primary agricultural production." It also provides the foundation for industries that process and transport products from irrigation farming, as well as irrigation service industries.

Conserving water is fundamental to Alberta Irrigation. "While irrigation is the largest user of water in Alberta, we are very conscious of the value of water and our effect on the environment," says Csabay. Through innovations in practices and equipment, Alberta's irrigation districts and irrigation farmers have increased the water efficiency of irrigation and are using about a third less water per acre than just 10 years ago.

On AESA Council, Alberta Irrigation is represented by its executive director, David Hill. For more information, visit www.aipa.org.



Accelerating the transition to lower energy costs

Lower costs and a healthier environment – that’s what the new On-Farm Energy Efficiency pilot program will be offering to Alberta producers.

The program will provide a much-needed leg-up to producers who want to improve their farm’s energy efficiency. “Apart from Alberta Agriculture’s energy audit manual [called *First Steps to Energy Management*], there is currently very little information targeted to energy efficiency on farms. Our two-year pilot program will provide information on the potential, the implementation, and the savings, costs and financing associated with on-farm energy efficiency activities,” explains Paul Hunt of Climate Change Central.

Climate Change Central is a public-private partnership that promotes the development of innovative responses to climate change and its impacts. This agency created the original idea for the energy efficiency initiative, and it is partnering with Alberta Agriculture, Food and Rural Development to develop the pilot.

In November 2005, the Innovation Program of Alberta Innovation and Science awarded almost \$500,000 toward the pilot.

“The benefits ... are to reduce producers’ energy costs by helping them to use energy more efficiently.”

The pilot will operate in a selected region of Alberta, as a first step to building a province-wide initiative. Hunt notes, “By focusing on a specific region, we hope to facilitate creation of the required knowledge infrastructure – such as financing, installation and maintenance – so we could form a cluster of knowledge and service providers that would support the on-farm energy efficiency technologies and practices.” When the pilot begins in early 2006, one of the initial tasks will be to choose the region where the program will first take place.

The deliverables for the pilot include:

- a reference guide of the energy demand for various farm types;
- a checklist of energy efficient technologies and practices for various types of farms and activities;
- some on-farm demonstration projects to show new technologies and practices in action, so producers can see whether these options might be worthwhile for their own farms; and
- other tools and guides, such as a “calculator” for self-assessment of energy use.

The pilot will also assess methods to help producers afford the initial costs of converting to energy-saving technologies. “Clearly, new or improved technologies, like more efficient lights, insulation, windows or electric motors, are going to cost more. So we are looking at ways to incent or facilitate the uptake of the new technologies,” says Hunt. He adds, “After a while, if many individuals are buying the new technologies, the price will come down as the economies of scale are achieved.”

Hunt is excited about the program’s potential. He says, “The benefits I see coming out of the initiative are to reduce producers’ energy costs by helping them to use energy more efficiently. In addition, if you use less fossil fuels and less energy derived from fossil fuels, which is almost all our energy in this province, then there will be a reduction in greenhouse gas emissions, as well as in many other emissions, which can’t help but improve and maintain good air quality.”

For information on this pilot program, contact Climate Change Central (1-866-609-2700). For information on ways to improve farm energy efficiency, see Alberta Agriculture’s *First Steps to Energy Management: Save Energy & Money* (Agdex 818-2) available from the Publications Office (1-800-292-5697) or the Internet ([http://www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/eng8268](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/eng8268)).



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Green Matters is the newsletter of the Alberta Environmentally Sustainable Agriculture (AESAs) Council. AESAs Council consists of representatives from Alberta’s agriculture and food processing industry, environmental organizations and municipal, provincial and federal governments.

AESAs Council’s vision is that Alberta has a thriving agriculture and food industry that is operating in an environmentally responsible manner. Its mission is to lead the agriculture and food industry in addressing environmental challenges. And its goal is to develop and deliver collaborative environmental stewardship initiatives that result in sustainable growth of Alberta’s farm, ranch and agri-food processing industry.

The purpose of *Green Matters* is to provide a forum for discussion of environmental issues in Alberta’s agriculture and food processing industry.

To subscribe to *Green Matters*, call 780-422-4385. *Green Matters* is also available online at <<http://www1.agric.gov.ab.ca>>.

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AESAs
Alberta Environmentally Sustainable
Agriculture Program

The Agricultural Policy Framework (APF) – A Federal-Provincial-Territorial Initiative