Climate Friendly Farming™ Research and Demonstration Project

Center for Sustaining Agriculture & Natural Resources
Washington State University

Quarterly Update for Vulcan, Inc.

June – August 2005

Milestones:

- *Recognition:* Governing Christine Gregoire visited both Shulin Chen's anaerobic digestion labs and the Vander Haak Dairy Digester Project during this quarter. She had pointed questions about the performance and reliability of anaerobic digestion as a tool for treating manure (particularly from the environmental management perspective). After her visit to Chen's labs, she encouraged the legislature to provide funding ($560,000) to the Mason Conservation District to investigate the use of AD to help solve the Skokomish River Valley's contributions (animal and fish waste) to the Hood Canal's dissolved oxygen problem.
- *Dairy System (Whatcom County):* The Vander Haak Dairy has been under stable operation for more than 6 months now. One of the most intriguing experiences that they have had this year is success using the liquid effluent as a fertilizer. The participating dairies have been extremely pleased by the performance of the fertilizer, and they are all in concurrence that they want more than their allocation. We are planning to submit a small farmer / researcher grant to USDA SARE to document the performance of the fertilizer. Governor Gregoire visited the project in late May and was very encouraged by what she learned. She has referenced the project in other presentations since her visit, and her staff confirmed that she was extremely pleased and encouraged with our progress. The Climate Friendly Farming Project and our partnership with the Vander Haak Dairy will be part of the Farming for Life! Exhibit sponsored by the Whatcom Farm Friends at the Northwest Washington Fair in August – thousands of people view the exhibit annually.
- *Dairy System (Tech R&D):* The first 25-cow prototype of Shulin Chen's novel anaerobic digester is under construction at the WSU Knott Dairy (construction has been slightly delayed due to an electrical infrastructure need for the dairy that was not previously expected to affect the pilot). Construction should be completed and the system will begin operating in September. A discussion with several of the largest dairy farmers in the state (representing approximately 20,000 cows near Sunnyside) confirmed that Chen's research direction (both in AD technology R & D as well as whole-farm nutrient management planning) is highly desirable for the dairies.
- *Dryland Cropping System:* Precision Agriculture technologies for improved nitrogen management (reduced N2O emissions and reduced nitrate pollution)

was the key topic at the dryland farming systems field day at the Cunningham Agronomy Farm in Pullman on June 23rd. Farmers were keenly interested in the potential of the technology to solve long standing concerns about nitrogen management. Approximately 125 people participated

- *Irrigated Cropping System:* Nitrogen management, reduced tillage, and the biofuel variety trials were presented at the Irrigated Cropping Systems Field Day in Paterson on July 15th. There was a significant showing of "non-farm" participants who were interested in learning about the production issues related to biofuel feedstock crops.
- *Modeling:* Discussions have begun with modeling experts outside of the CFF project team to determine what types of modeling tools should be targeted in the development of outputs from the CFF modeling effort. The goal is to have greenhouse gas contributions to the CropSyst database completed by the end of year 2 and continue validating and refining the models in year 3. Production of key outputs and interfaces for the software will begin in year 4.
- *Socio-economic*: Survey work on adoption continues and has been expanded from the original dryland conservation practices to irrigated and dairy. Initial economic data from the Vander Haak digester (now that it is stabilized) is being analyzed.
- *Outreach*: The USDA ARS posted a press release about their scientist's participation in the Climate Friendly Farming Project in June (http://www.ars.usda.gov/is/pr/2005/050616.htm). The brief release received significant circulation and spurred a number of inquiries about the project.

Developing Issues

- The primary concern for the project at this point in time is to continue collecting and analyzing quality data for the baseline greenhouse gas emissions report.
- CSANR, in partnership with other units at WSU, has begun developing a major initiative that has been coined *Triple BIO: BIOAgriculture, BIOEnergy, and BIOProducts.* The purpose of this initiative is to explore opportunities for research and development, education, and public policy supportive of developing Pacific Northwest specific agricultural and industrial technologies, practices and products which reduce the use of and reliance on fossil fuels, improve energy efficiency, take full advantage of biological and ecosystem services for agriculture and industry, provide rural economic development opportunities, and mitigate environmental problems in the region. A white-paper overviewing the concept is under development and several presentations are already scheduled for this fall.
- WSU Spokane, in coordination with the Thomas Foley Institute for Public Policy at WSU, is hosting a workshop on Peak Oil on October 4 & 5 in Spokane. Information on the workshop can be found at: http://www.capps.wsu.edu/globaloil/.

- Several small farmers in the state have continued requesting information and research on small-scale applications of AD for mixed-animal agriculture. We have initiated a scoping project with these small farmers to look at existing small-scale technology which could be adopted and improved. We are investigating funding options for initiating a small, pilot evaluation of improved small-scale AD with these farms. We will also be presenting on small-scale AD at the Alternative Energy Research Symposium held at the Washington Tilth Producers' (organic producer organization) Annual Meeting in November.

Response to the EPA Air Quality Consent Agreement for CAFO's

Quality feedback on the effectiveness of the EPA Air Quality Consent Agreement for CAFO's (ie. dairy farms) proved very difficult to find. The agreement can be found at:
http://www.epa.gov/compliance/resources/agreements/caa/cafo-agr-0501.html
http://www.epa.gov/compliance/resources/agreements/caa/cafo-agr-050121.pdf

The key pollutants to be monitored are ammonia, VOC's (volatile organic compounds), NOx, H2S, and Particulate Matter. Anaerobic digestion DOES reduce VOC's, but actually increases ammonia (organic forms of N are converted to ammonia – and are thus more readily available for uptake by plants). The reason EPA is suggesting that it needs new monitoring of these emissions is that they are currently using very old emissions data (circa 1938). Their was a great deal of skepticism early on about whether a voluntary reporting program would be effective – the belief being that no dairy would voluntarily admit to being a "polluter". However, recent discussions with dairies have indicated that many of our dairies DO INTEND to file their voluntary report – though they cite extreme concerns about the "uncertain consequences" at the end of the monitoring period. More than one dairy suggested that filing would be a "good faith" effort to demonstrate to EPA that the dairies want to do the right thing – in hopes of an incentive based program to reduce emissions rather than a penalty based program. Other dairy associations around the country have also suggested that producers should file reports.

Our large dairies in Sunnyside expressed that this new agreement is now an obstacle to their decisions to move forward with adoption of anaerobic digesters (only 1 Sunnyside dairy submitted a USDA energy title grant to cost-share a digester during this cycle). They cited concerns that EPA may not consider the benefits of AD in future decisions to regulate (ie. fine) CAFO's for these emissions. They have asked us to provide detailed analysis of the impact of AD on all of the pollutants noted above to help them continue investigating AD. Many of them are now taking a "wait and see" approach to AD based on further clarification of the Air Quality Agreement. However, of note in this process, a number of the dairies who were considering purchasing existing AD technology are now particularly intrigued by Dr. Chen's novel system. They share his belief that his system more closely addresses the concerns (nutrient management, flush dairy systems,

economics, etc.) that they have than current technology. We are scheduling a visit for these dairies to the labs and pilot digester in Pullman for late September.