C-AGG Meeting
Wednesday-Thursday, July 11-12, 2012
Hotel Allegro - Chicago, IL

All speaker presentations will be made available on the C-AGG website:
http://www.c-agg.org

C-AGG Background, Meeting Overview
Debbie Reed, C-AGG Executive Director

Debbie opened the meeting by providing an overview and background information on C-AGG, its inception, leadership, and Steering Committee members, as well as the group's focus, objectives, and make-up. She reviewed C-AGG products and reports, and products in development. As a refresher for the group, she reiterated the 5 policy recommendations that guide C-AGG's work. Before reviewing the meeting agenda in brief, Reed shared plans with the group to develop a new, more resource-based website for C-AGG, working through Ag Innovations Network, C-AGG's new partner and support group. Finally, she reminded the group that the next C-AGG meeting is being held Wednesday and Thursday, November 7-8, 2012 in Washington, DC, at the Dupont Circle Hotel, and will be followed by the November 9 EPRI GHG Emissions Offset Workshop, being held at the Hotel Monaco.

Assessing the Landscape: A Discussion of Critical Issues and Trends in Agriculture and Climate Change

Participants were invited to identify current issues and trends at the intersection of agriculture and climate change that each participant is paying attention to, that C-AGG should be aware of, and that may affect our work. The following issues, trends and opportunities were identified in the process:

- The abundance of cheap natural gas is thwarting renewable energy funding, research and development of projects for manure and bio-gas energy projects
- Two trends to track is the uptake in smart tablets by Canadian producers at a higher rate than among the general population; and producers are using more social media to communicate.
- Beginning farmers that are keyed into, and conscious of, the climate change story and want to be engaged, responsible players in creating solutions. Most of them don't know how to help, or how to engage constructively.
- During the Indian Creek Field Day, it was clear that crops were struggling. A conversation and strategy needs to be discussed to link crop insurance to climate mitigation and adaptation
- High commodity prices and the effect on all producers, especially livestock (for feed)

- The Farm Bill: there seems to be agreement coalescing to retain conservation programs, (e.g. the House did not cut conservation programs more than the Senate) and will hopefully remain stable, but will need to watch as this unfolds.
- Growing global demand for animal protein: extensification v. intensification
- Pressure on brands to connect with the farm, they are being held accountable for something they are not responsible for, and is not their role (vis a vis sustainable supply chain initiatives). Some corporations are seeking genuine connections and opportunities with growers/supplies, for some it is just a matter of corporate social responsibility and image.
- Plethora of sustainable supply chain initiative programs and metrics, certifications, but producers are not entirely keyed into this yet. There are connections occurring between retailers and processors, and there is an expectation that there is a connection between the processor and the producer, but this is largely not happening yet.
- There is a disconnect between the technical aspects of GHG protocols and methodologies with robust practices and technologies for growers – i.e., what is needed v. what farmers are able to do.
- There has been an amazing amount of effort to consolidate GHG data and data sets in the past couple of years, but a comparison of models, an increase in data exchange(s), and more efforts to share raw data still needs to occur in order to have a greater impact.
- There is a trend towards GHG policies that are regional, rather than national or global in scope.
- Bio-fuels: ongoing high oil prices slowing process of creating cellulosic conversion process for biofuels
- Conflict between growing demand for protein and an inability to source grain for the production of protein, especially in light of the drought
- We need to look closely at and do an inventory of barriers to adoption of new practices in order to better understand them, since it is not just money that motivates or creates barriers.
- Shrinking cattle sector in U.S. and Canada
- A lot of concern exists about the environmental impact of ag, but different aspects of this, e.g., water quality and quantity, seem to carry more weight with agricultural sector than do GHG issues
- Lack of understanding of what needs to happen at the farm gate- the development of vocabulary and policies needs to be relevant to farmers and their reality. That is where backlash will grow: conversations need to include economics, environmental impacts, and science, and include an understanding of where that intersection is
    - There is a real or perceived growing gap between environmentalists and the ag community. The argument is that GHGS have become less relevant to ag producers in all 3 areas (economics, environmental impacts, scientific evidence), and that the two communities are farther apart than we were three years ago
    - A counterpoint to that argument is that the beef industry is getting hammered daily by the conversation about the high-GHG emissions from beef, and the

dairy industry is in the midst of a great effort to look at GHG emission reduction activities. Both beef and dairy are constructively engaged in the GHG conversation

- There is strong consumer demand for food that is healthy and sustainably produced, and policy concern about public health, obesity etc.
- Need to look at environmental/ecosystem markets being used as a leverage point to get practices on the ground, and the potential co-benefits of environmental practices

Update from USDA on Relevant GHG Activities

Bill Hohenstein of USDA Climate Change Program Office, provided an update on USDA efforts on a GHG monitoring tool TRACCR (Tree & Ag Carbon Calculator). Hohenstein noted that the science behind climate change is becoming more solid, for example NOAA can specifically tie changes in the probability of extreme events to climate change, (e.g., 2011 drought in Texas), and the evidence continues to grow. USDA recently released a climate change adaptation plan, which assessed commodity programs, rural development, foreign ag services, and other key USDA services. The report and plan determined that many USDA programs and services are vulnerable to the impacts of climate change. Additional USDA reports on climate change's impact on agriculture look at the effect and prevalence of pests, the need for drought resistant crops, and what the overall effect of climate change is on certain crops and stakeholders, which will vary widely. USDA will soon release a report looking specifically at the effect of climate change on corn and soy beans and various specialty crops.

A key resource and partner for these initiatives is the Global Research Alliance (http://www.globalresearchalliance.org/), which is working in 30 countries. Three GRA working groups are focused on GHG mitigation opportunities from croplands, livestock and rice. Internationally, there is still a lack of progress in climate change negotiations, and significant disagreements among member countries has stalled progress.

USDA GHG Report

USDA will release a report this summer that is a comprehensive look at the costs and benefits of GHG mitigation technologies and practices in the agricultural sector. The report will provide descriptions of each of the technologies and practices, and includes representative cost-curves for each, by region. Ideally, USDA will be able to create fact sheets on individual technologies that can be incorporated into NRCS handbooks and extension materials. The following are some of the technologies covered:

- Fuel management and tillage operations;
- Nutrient management mitigation options;
- Manure management;
- Enteric fermentation;

- Feed additives;
- Breeding

Update on USDA GHG Methodology Project

USDA continues to work on methods development for GHG mitigation, and tool development as a resource for landowners. Using science-based methods, the goal is to create a standard set of GHG quantification methods and tools for landowners, USDA, and other stakeholders. USDA will seek public comments on the methods development work, likely in the March/April 2013 timeframe. The tool development process should be completed by December, 2012. The current draft name of the tools is TRACCR (Tree and Agriculture Carbon CalculatoR). It is a meta-model which incorporates or runs many other models within it (offline), including DayCENT, CENTURY, DNDC, COMET-VR, Holos, DairyGEM, FVS iTREE, FOFEM. USDA will issue a request for expert and peer review of the TRACCR tool, and will circulate that request through C-AGG.

Questions/Comments

1. *Will anybody in the market use the TRACCR tool? The market seems to be going towards unique, single-source models with very specific purposes. Is there a reason to believe that any of the markets will accept this government model?*
   There are multiple intended uses of the TRACCR tool, including for conservation planning, and it is intended as a tool for farmers, many of whom are interested in improving their environmental impacts. USDA hopes to make it available to registries to perhaps adapt and modify for use, but that needs to be decided by the registries. USDA cannot dictate how others, including registries, might use it.
2. *The market/industry does not appear to be embracing or following USDA on this, which can be very problematic at the farm level.*
3. *Organic soils are very carbon intensive and restoring them can have a huge impact on GHG mitigation*
4. *CAR would love to know more about the development of TRACCR and to take advantage of this work*
   Practices are described, but the cost of crediting is not included, nor is the cost of implementation of practices
5. *How is USDA dealing with issues of tracking practices v. performance with the TRACCR tool? How will you or can you address this concern?*
   The intended end-use for TRACCR is performance monitoring, and embedded within it will be as much site specific data and models that are available for incorporation. There is an explicit need to balance precision and performance; for the most part USDA is not talking about conducting field measurements, except for existing forests. There is a need for greater geographic specificity. In some cases the data will be county specific. These are issues that will hopefully be addressed through the peer review process.

6. *There will be an issue of transparency for farmers/producers, and since the costs of various practice changes can vary widely, it will be important to make sure this has on-the-ground utility for agricultural producers.*
7. *Will there be a link between TRACCR and the Nutrient Tracking Tool (NTT)?*
   Yes, USDA OCE is working closely with NRCS on NTT, specifically with the user interface, moving in the direction of a desktop tool.
8. *Since there are significant gaps in data relative to GHG and specialty crops, will they be included in TRACCR, and are there any other major gaps that exist?*
   The tool is largely based on practice change at this point, and is crop agnostic, but as pointed out, there is very little information or data on specialty crops at this point, and more data is needed even for the major commodities.
9. *Will there be an attempt or is there intent to use this tool to identify research and data gaps and needs?*
   Yes, researchers know the gaps nationally and internationally, and the tool can help to identify them.

Status Update on COMET-Farm (http://cometfarm.nrel.colostate.edu/dev)

Keith Paustian of Colorado State University presented an update on the COMET-Farm tool. The context for the creation of the COMET-Farm tool stems from the fact that it is a fundamental challenge to quantify net GHG emissions from across the agricultural sector. GHG emission estimations take a lot of time to measure, can be costly, and must account for potential fine scale variation across topographies. The confidence in our ability to quantify, verify, and administer agricultural GHG mitigation activities is a key issue.

COMET-Farm provides full-farm, net GHG quantification that can be aggregated to encompass agriculture at the national scale, and to track interactions between management practices and net GHG emissions impacts. Uncertainty in the quantification of practices should be minimal, e.g. 5-10%. COMET-Farm is process-based, and is a tool that non-specialists can use, while incorporating state of the art methods and models for capturing full-farm scale net GHG accounting. The tool is a web-based application, user-friendly, and creates a method that is based on the unique information that only growers have, which is the best data available. It also automatically downloads soil maps and information (e.g., NRCS Web Soil Survey, SSURGO) based on the field that the farmer defines as a management unit. It also has a remote sensing capacity built in, (but is not yet being used), though it will be used for field delineations and productivity estimates. The tool will also implement an uncertainty calculator, based on empirical models and using monte-carlo simulations with the DayCENT model.

The request for data from farmers can be great, but COMET-Farm captures the information in a manner that is only available to the farmer, thus avoiding the need to re-enter data later.

Overall, the tool is designed to bridge the gap between the farmer's knowledge of what is happening on farm (which may not be related at all to GHG impacts), and net GHG impacts.

Status Report

- A soft beta release of the tool is planned in the near future. It is currently being beta-tested in Pottawattamie County, Iowa, and there are plans for beta testing in other counties, as well.
- There is now a special interface for specific soil and land locations, which can delineate specific soil types in various fields
- A pasture/rangeland full energy model will be operational in November, 2012
- Uncertainty for soil C and N_2O will be available in December, 2012
- Perennial crops and agroforestry model will be available in 2013
- Field testing with GHG CIG projects is proposed for the fall (note that a participant suggested it would be great to do overlays to compare COMET-Farm results with other measured and modeled results)
- There has been interest from USDA, NRSC personnel, Delta Institute, Climate CHECK and others to field test the tool within the GHG CIG projects, and that will likely begin in the fall

Questions /Comments

1. *Developing videos to share the tool with farmers would be helpful, but would take a lot of resources.*
   There is a lot of on-line help embedded within the tool.
2. *There is a need for the livestock sector engage with the tool and to test it out*
3. *What is the current adoption or utilization rate among producers?*
   There is relatively little use by growers currently, but NRCS has had several conservation participants use it. They are not sure exactly who is using it, although Google analytics, shows that there have been over 2,000 hits from all over the world. It is understood that there is a need to market and promote the tool.
4. *Have you considered other applications: i.e. sustainable supply chain certifications?*
   Yes, it would be helpful to integrate into other systems that farmers and stakeholders are using.
5. *How do the USDA TRACCR calculator and COMET-Farm interact or relate?*
   The architecture is similar, though COMET-Farm preceded the development of the USDA TRACCR tool, and TRACCR will incorporate some of the novel capabilities developed by COMET-Farm. TRACCR working groups convened and created recommendations for each individual GHG source, which is a bit different from how COMET-Farm was developed. TRACCR will also include forestry. The COMET-Farm team is part of the TRACCR development team. Some substantive differences include: scope and process (scope is GHG, and process is designed to be transparent and comprehensive).

6. *What is the plan or vision for getting the tool out to farmers?*
   There is a lot dialogue within academia about the tool, and students will likely use it. NRCS is a prime stakeholder and their network of personnel will be introduced to the tool, but the plan for ag outreach remains unclear. Suggestions from C-AGG participants are welcome and would be very helpful.
7. *Does the tool allow users to track GHG emissions and emission changes over time, perhaps over years, and to share with or compare with other growers?*
   No.
8. *Regarding marketing, it was suggested that you reach out to producer member groups, such as farmers unions and other membership organizations*
9. *Have you considered a tablet-based data-entry platform? Much easier for farmers, a tablet would lend itself very well to the site, and the creation of an app would be ideal.*
   There is an effort underway to get NRCS staff and users back into the field, and to integrate the tool into the NRCS conservation desktop so that it can be utilized in the field, and help identify resource concerns.

Agricultural Protocol Development: Updates from Voluntary GHG Registries
Presenters Teresa Lang of Climate Action Reserve (CAR) and Nick Martin of American Carbon Registry (ACR) presented updates on their respective Nitrogen protocols.

Teresa Lang provided an overview of all CAR ag protocols and their status:

- Nitrogen management protocol has been adopted
- Rice cultivation protocol was adopted last December
- CAR initiated work on a soil carbon protocol, specifically on land use change opportunities, including avoided grassland conversion and preservation of grasslands and/or conversion of marginal croplands to grasslands. Working on an issue paper now; will later decide whether to develop into a protocol.

Nick Martin announced that ACR will approve the MSU methodology for fertilizer rate reduction. The two methodologies ACR has approved for fertilizer are very different: the MSU approach is simpler to apply, but can only be used for reduced fertilizer applications in corn, and only in the north central US. The DNDC ACR approach is more flexible for other crops and activities. The ACR rice protocol has 2 parts: one is for use in California, and one is for use in the MidSouth. It uses DNDC for soil emission calculations. Calibration and validation is completed up front, to build in the uncertainty deductions. The protocol requires a minimum of 5 fields/1000 acres. The issue of early adopters is addressed by deeming the activities as additional based on low adoption rates, but the baseline is set and based on the last 5 years on a producer's own fields, so there are not credits for early adopters. This 'early adaptor policy' is currently just for the rice protocol, but ACR may potentially apply it to other methodologies.

Questions/Comments

1. *Comparing protocols, the ACR and CAR nitrogen management protocols are different and slightly overlapping.*
   ARB is not sure when they will approve a fertilizer or nutrient management protocol, but are looking at the various protocols that exist. CDFA and ARB are conducting research looking at ways to calibrate DNDC, and are looking at developing a rice protocol. Some cross-crop protocols have been compared, and ACR is developing a paper to discuss this.
2. *When registries are reviewing protocols, do you consider rate of adoption and likelihood of adoption?*
   ACR does, and N-rate reductions were included because data around other practices that would ideally be included was not there, or was not comprehensive enough.

Uncertainty in Models and Agricultural Offset Protocols

Steven De Gryze of Terra Global Capital, LLC presented the final draft of the C-AGG white paper: *Uncertainty in Models and Agricultural Offset Protocols* to the group for review and described the timeline of development of the White Paper, the Executive Summary, and a separate peer-reviewed publication that is in development. The first version of the white paper was deemed to be too complicated and technical for a policymaker audience, and the paper was revised to correct for this. After reviewing the current version of the white paper, Steven asked C-AGG participants for suggestions or concerns before moving the paper forward. Participants were asked to write down concerns or recommendations within small groups, to then report back to plenary.

Feedback from the small groups included:

- Concern that it is *still* too technical for people not steeped in the specifics of modeling and agricultural GHG emissions; it also runs the risk of inappropriately emphasizing technical uncertainty, which could erode the policy process in opening the carbon market. There is a need for technical specificity, but the paper itself needs to support forward movement within the markets.
- Suggestion was made that specific recommendations are made in areas where there is a need for more research. Straightforward statements and recommendations would be ideal, e.g. language from Steven in the introduction of the paper is good, regarding the status of science behind modeling, etc.
- Statements need to be applicable to policymakers, this current document seems more appropriate for project implementers.
  - Need a one page policy brief
  - The current white paper seems to be targeted at an audience that lies somewhere between T-AGG and C-AGG
- Suggestion made to better address the issue of bias in the paper, and include examples of bias
- Ag is not the only system with uncertainty- that point needs to be made in the document

- Terms of reference should be included

Panel Discussion: GHG Metrics in Agricultural Projects
Measurement Tools and Methodologies, and Applications

The focus of this panel was to share information on how the various tools that are being used in the field are faring, how the data is being collected and used, and how each addresses key issues such as scalability, cost, data burdens, and user-friendliness.

*Cool Farm Tool -- Daniella Malin of Sustainable Food Lab (*http://www.coolfarmtool.org/)
Daniella shared that the food industry and the farm fare differently with respect to the application of the tool. The food industry likes the tool, it takes only about 10 minutes to go through once you know how to use it. There is a critical mass of private sector entities, certifiers and development organizations that are looking at Cool Farm as a food industry standard. It is a high profile tool that is rather easy to use. It is faring less well with farmers, who don't really like it until they get to know it and know how to use it. The interactive component is very helpful for farmers and it can quickly become an interesting tool for them to use.

DNDC -- Steven De Gryze (http://www.dndc.sr.unh.edu/)
Steven shared his excitement that the science is coming together, and that the DNDC model is being used in multiple relevant applications. As far as the burden on farmers who are using the tool in the GHG CIG Project, even though the protocols can be quite complicated, farmers using the rice protocol are spending no more than 6 hours inputting data on an annual basis, which is quite low.

COMET-Farm -- Keith Paustian, Colorado State University http://cometfarm.nrel.colostate.edu/dev
Keith re-iterated that the tool is still under development, but unique and relevant aspects of COMET-Farm are the level of rigor and the low investment costs required by farmers to use the tool. The tool is based on self-reporting of data, and since individual farmers have the most accurate data on how they are managing their operations, their very detailed data can be invaluable. The concept of COMET-Farm is to "crowd-source" GHG information at the farm scale, and give farmers the tools to do so. There is an overall optimism that COMET-Farm could be a win-win situation for both scientists and farmers. Next steps include making the tool applicable across regions.

Field to Market: The Keystone Alliance for Sustainable Agriculture
Terry Stone, Syngenta http://www.fieldtomarket.org/
Syngenta is an ag company that sells seed, pesticides, and other agronomic services. As a company, Syngenta uses the tool to make decisions to improve their profitability. In order to be successful, the tool has to be broad and inclusive, and very simple for growers to use, as well as consistent and scalable. Terry emphasized that there has to be inherent value for the farmers to use the tool, and has to be outcome-based, and within the grower's control to change or improve practices.

He expressed that farmers are some of the most innovative members of our society, and they need to be engaged in the development of the tools. If they can measure and establish a baseline, it will then be up to them to focus on changes and modifications to their operations. Additionally, Terry urged projects to consider, during the development of measurement tools and methodologies, what the goals are for the tool- it is program compliance, decision-making, or ensuring climate change mitigation or bio-diversity? These goals and outcomes are very different, and necessarily have very different implications for how a tool is developed.

In implementing the tool Syngenta worked with farmers post-harvest, and knew at the offset of the project that farmers needed to feel confident with the result. The trade-off for growers needs to be clear, and needs to make financial sense to them, as well. Data is a very valuable currency for growers, and determines their decision-making, qualifies them for insurance, etc. and this needs to be taken into consideration for tool developers. Field to Market is not currently paying growers to use the tool or to change practices, but what the initiative is observing is that food businesses and retailers are working to incentivize growers to participate so that they (the retailers and corporations) can "claim" that their products are sustainably produced. The value needs to go to the retailers and corporations, but also to the growers to incentivize them.

Questions/Comments

- *These various tools can be looked at as one of the ways to incentivize farmers and create value for the farmer. What does C-AGG want to say to policymakers to create incentives for farmers? What does C-AGG want to say to the supply chain, etc. as far as creating incentives for farmers?*
    - Within sustainable supply chain initiatives, there are many conversations about opportunities for the agricultural sector, but we just are not seeing any incentives for producers – financial or otherwise – and what producers see is just a pathway to mandates.
    - Producer participation in sustainable supply chain initiatives can increase their security with buyers who participate in these programs
- *What is similar about these tools?*
  There is a process that includes measurement and data collection, a monitoring program, and in every instance you have begun to measure GHG impacts, which translates into measuring efficiencies on your farm. There is value in that for producers.
- *N-rate reduction protocols are a nonstarter in the field; there has to be better semantics/language used if you are going to try to convince farmers to adopt these protocols.*
- *The ACR fertilizer protocol, which incorporates the 4 Rs, is able to account for changes in multiple practices*
- *Farmers understand carbon sequestration, which enhances soil health and productivity; how do we sell that back to policy-makers?*
- *There is a role/need for stacking with other eco-system services, look at holistic incentives for multiple environmental impacts.*

- *Some of the most successful examples of changes in on-farm practices are based on empowering growers to take on issues on their own by creating the necessary signals based on outcomes, and allowing farmers to come up with the specific activities, e.g. water quality in the Midwest. The connection was made between their activities and the impact of these activities. Water quality is much more tangible than GHG emissions, but if the appropriate tools and incentives are provided to farmers they will address the issues and make the necessary changes in ways that allow them to continue to produce food, feed, etc.*
    - Stand-alone tools are not enough; you must train the trainers; producers learn from one another
    - Innovation and entrepreneurialism are hallmarks of agricultural producers – it is how they naturally operate and succeed
    - Must link the level of risk to the level of reward for farmers, so that those taking the greatest risks can also reap the greatest rewards, e.g. early-adopters
- *Change needs to be driven by stakeholders who demand the change, since they will or should pay for such changes. For example, in sustainable supply chain initiatives, if the customer or the retailer is demanding a practice change from a farmer, they need to provide the incentives for the practice change to happen.*
    - Many agricultural practices have multiple benefits, but these multiple benefits or impacts need to be measured to be rewarded
    - One potential incentive to cite or add to the list is that by adopting certain practice changes the ag producer (or the sector) can reduce the risk of future regulation
    - Since producers are afraid that voluntary change may lead to further regulation, why not specify that the practice changes in supply chain initiatives should remain voluntary?
- *Suggest that demonstration or pilot projects that measure net environmental benefits – including multiple benefits – be used to convince regulators of the value of these agricultural practices in mitigating GHGs*

CA Compliance Market: Making the Case for Agricultural Offsets
Panel Discussion and Breakouts Sessions: Strategic Approaches to Tapping the CA Offset Market

Panelists Candice Chow of EDF, Cynthia Cory of CA Farm Bureau Federation, Steven De Gryze of Terra Global Capital and Karen Haugen-Kozyra of The Prasino Group, shared their learnings, observations, and a status report of the development of the CA offset market, as well as opportunities and challenges for the development of agricultural protocols and the inclusion of agricultural offsets in future policy.

Overall, the panelists observed that California Air Resources Board (ARB) staff are eager to engage and learn more about agricultural protocol issues and to continue the dialogue and interactions with key stakeholders. Panelists mentioned that ARB is starting a public process to

develop a rice protocol. There is no set timeline for the development of a fertilizer protocol, which is very complex in the California context. EDF has been working with the California Rice Commission (CRC) to develop a rice protocol methodology for the GHG CIG grant, focusing on California and the MidSouth region. During discussions about the protocol with ARB, staff raised some specific concerns, including the following: concerns about additionality and the role of early adopters. Candice Chow noted that EDF submitted a letter to ARB promoting the use of some allowance auction proceeds to be used to allow early adopters to participate in offset projects (the idea being that the non-additional tons be paid for with auction proceeds). ARB also indicated a desire to see a focus on development of protocols for practice changes with the greatest potential GHG mitigation impact (in terms of potential tons of emissions reductions to be achieved). They expressed concerns about uncertainty related to modeled emissions reductions, but EDF and Terra Global Capital and others have attempted to reassure them that there are tools to deal with and manage uncertainty. The C-AGG white paper and Executive Summary on Uncertainty can play a valuable role in this respect.

Concerns were also raised by ARB staff about potential low enrollment or adoption rates among the agricultural sector even if protocols are developed; a need to understand the costs of participation for producers (EDF is running some numbers based on their experiences to date, and will share them with ARB when they are ready); and how much of a time commitment will be required for producers to participate in offsets projects.

ARB staff are also interested in cost-effective and transparent methods of verification; they seem very interested in the possibility of remote sensing or other remote verification methodologies, and panelists urged creative thought be given to this issue. In response, a participant suggested that perhaps verification costs might be paid for (or supplemented by) allowance allocation proceeds.

One participant reminded the group about the political realities that ARB is facing, having survived one major lawsuit and now responding to a second. There is a need for ARB to be transparent in its work, since they are under a lot of scrutiny. There is an Ag Offset Working Group in California comprised of CDFA, ARB, and the CA Farm Bureau Federation and others, where constructive and informative discussions about the role of agriculture in the offset market can take place. From the industry perspective, there is concern from the over 300 capped entities that the linkage or role of offsets has not been clear. Participants encouraged a strategic approach of focusing on individual meetings with ARB and entities already at the table, and a focus on the rice protocol, (since it is moving), as well as on nutrient management, for which there seems to be great potential within California.

Karen Haugen-Kozyra summarized Alberta's offset market in Canada, where there is a focus on sectoral standards. There is little flexibility allowed for the coal sector under the Alberta program, which means the coal sector is the biggest consumer/buyer of offsets in order to meet their emission reduction obligations. Karen argued that a potential linkage between Canada and

the CA market could be huge, due to the greater carbon intensity of the Canadian market. Regarding aggregation, ARB has mentioned to some stakeholders the instance of an audit in Alberta that discovered some fraudulent data had been used with regard to offsets, and they were concerned about that possibility and how to avoid it. Karen explained to the group what had happened there, and indicated it was a case that could easily be avoided by following the protocols, which were not followed in that case in Alberta. She will develop a written summary as a case study, to help everyone understand what happened, and how it can be prevented.

Questions/Comments

- *Have there been conversations about avoiding crop-loss while achieving GHG goals?*
  Yes, and as a matter of fact, this falls into ARB's concern that protocols need to be economically viable for producers. The protocols being developed by the GHG CIG participants do take this into consideration.
- *It seems like there are 3-4 consistent concerns: offset supply; the benefits to CA; off-set critics; and litigation. There seems to be general agreement that offsets are in short supply, but uncertainty regarding how many tons ag can provide.*
- *Realistically, a lot of the early ag offsets that will come from CA will come via the rice protocol.*
- *The concerns voiced by the agricultural sector about regulations are real: ARB is comfortable with regulations, which is a valid concern from the producer community.*
- *ARB was asked at the Feb/March C-AGG meeting in Sacramento whether they will entertain the adoption of protocols that will take place outside of CA, and it was voiced that CA needed to be "taken care of" first, meaning they have to be sensitive to the role of CA agriculture before bringing in "outside" agricultural offsets.*
- *Have regulated entities been part of the dialogue regarding where offsets will come from*?
  Yes, some CA groups (CAR, etc.) have attempted to educate regulated entities and help them understand the rationale and the need for offsets, particularly over time.
- *Is the National Farm Bureau paying attention to the CA market?*
  The challenge is that these markets are not being created at national levels, currently, and there are various political issues to navigate regarding climate change. The National Farm Bureau will not engage in discussing regulatory approaches to climate change, and have been neutral on sustainable supply chain efforts, as they are voluntary.
- *Protocols are regularly developed and released without being vetted by the producer community, regarding economics, perceived impacts, whether practice changes are consistent with management, etc., which can create a political problem in that, if protocols are created and then not used, critics will charge that agricultural offset efforts "don't work"*
- *Are there lines in the sand that environmental and market stakeholders won't cross, i.e. regarding early adapters, additionality, etc.? CA may become a precedent in that regard.*
  The current lawsuit facing ARB will determine a lot if offsets are upheld/protected. The only line in the sand is whether protocols that producers can use are developed and approved
- *Is there a dialogue happening between agricultural groups and environmental groups?*

There are, and there was more of a dialogue happening in the past (when federal legislation was possible), but the positions of groups have changed since the national dialogue ended. In some instances, e.g., the Chesapeake Bay and water quality issues, extremism on both sides of the dialogue has hampered efforts.

Next Steps for C-AGG

1. Support the development of strong viable agricultural offset protocols
2. Demonstrate that agricultural offsets are real, verifiable, quantifiable; this is C-AGG's opportunity to show that agricultural offset credits are legitimate
3. Focus on the rice protocol in CA, (since it is moving forward) which could establish a precedent
4. Look at ways to work through barriers to adoption, frustration with burdensome data requirements, etc., and use the strength of the Coalition to build the capacity of growers to participate in carbon markets, through education and engagement. Additionally, have grower and ag support entities analyze and report what happens if we do not go down this road, for example, are we looking at a carbon tax rather than a carbon market, and if so, what does that mean for the impending costs on agriculture, e.g., fuel taxes. Look at the difference between Alberta and BC, in the terms of case studies. What will be gained by continually blocking progress on climate change regulations?
5. Use GHG CIG projects as demonstrations to justify simplifying agricultural offset protocols to make them more farmer-friendly and the various ways to package protocols to ease the burden on growers.
6. Would recommend ARB looks at the experiences of the GHG CIGs (e.g., provide cost analysis and case studies) and at the CCX experience, to examine why it was successful
7. C-AGG is steering toward more engagement with ARB, which is positive.

Thursday, July 12, 2012

The morning began with a high-level overview of the previous day. Participants shared the following reflections before moving forward with the agenda:

- Issues of funding in this space: grant monies continue to be more important than public monies
- Thinking about frustrations around leakage, additionality, and other protocol-related issues that are problematic, would it be possible for C-AGG to explore uncertainty at a project level to determine how it applies to these other areas
- A suggestion was made to develop a project in which a business-to-business carbon transaction occurs, as a form of contingency planning, rather than awaiting transactions through a carbon registry
- Need to find footing between "unwarranted optimism and unnecessary pessimism"

USDA GHG CIG Project Panel Discussion

GHG CIG Project Plans: Targeting GHG Registries/Markets, Selling/Trading of Offset Credits, Challenges to Market Entry

Several GHG CIG project representatives participated on this panel, in which they were asked a series of questions aimed a learning about GHG CIG project barriers and opportunities encountered, and other observations about the projects as they proceed from planning to implementation.

How is your project working to make the connection between offset credit creation and market trades or sales for these credits?

Ry Thompson with the Soil Carbon Project in the Palouse Region, (AEP), GHG CIG is working on primarily a soil carbon sequestration project. Project partners are working to engage farmers through quite a bit of personal engagement by discussing their farm practices, opportunities for changing practices, understanding their history of investments, and looking for opportunities to capitalize on changes that will reduce inputs. The project is focused on a 30-40 million acre region, and has been breaking it down into sub-regions that can be worked with. There is a foundation to work with, particularly existing science. They have already packaged a 300,000 ton sale of credits (based on pre-sampling), with funds that were put up as matching funds for the GHG CIG grant. The project is trying to further evaluate the additional possibility for carbon accrual with new management practices (such as new cover cropping strategies in lieu of fallowing), and with new groups of farmers and new potential buyers of credits. They believe that additional investments will leverage the engagement of more farmers, and are hoping to offer more tons to new buyers within the next 6 months.

Cynthia Cory with Demonstrating Ag Offsets for the California Compliance Market (Tomatoes), a non-GHG CIG project in collaboration with UCCE, Sure Harvest, and with the support of The Packard Foundation and Winrock International. The project is focused on processing tomatoes, with one of the largest processors in California. The processor is a capped entity, and is seeking to create their own offsets from the production side of their operation. The processor is very efficient with extensive records and is a pioneer in many ways. Tomatoes are grown now in 80" beds (previously 60") with drip irrigation, and production has doubled in ten years. They will be looking at the difference in bed longevity, as increasing the bed longevity is important. The project is investigating the use of Agrotain Plus, a nitrification and urea inhibitor, on 39.5 acres as a control. If reductions do occur it could be an incentive for Agrotain to just create a nitrification inhibitor (without the urea inhibitor), which would be more efficient and could drop the price. The project will have 2 years of data from UC Davis for calibration and validation using the DNDC model. Measurements will continue through the end of the year (June to December). One risk is that there is no approved protocol for this project. They are seeking compliance grade credits, but need an ARB protocol for fertilizer management to achieve this.

Matt Sutton-Vemeulen with the Bovine Innovative Greenhouse Gas Solutions (BIGGS-Unison), a GHG CIG project looking at reductions in carbon intensity on feedlots and dairies. They began with four offset protocols developed in Alberta, Canada, and are working to adapt them into one protocol to fit U.S. conditions. They are looking at days on feed and age at harvest. They are working to develop a standard baseline in order to avoid a project-by-project baseline. COMET-Farm will be used, and the project partners feel they can find a national baseline due to the lack of variance in key parameters. The records of feedlots and dairies will be looked at to identify possible areas of efficiencies/reductions. Feedlots are apprehensive; the willing and interested parties are those seeking connectivity with processors and processor customers, and the discussion is based on building a pipeline of information from the processor to the customer, and to send a carbon signal through the supply chain. Another element is that producers are finding data collection needs from multiple points burdensome, and would like to see a system created that will allow data to be collected just once, and be compatible for multiple uses. Over time, the partners would like to expand the pipeline of communications to beyond just carbon. The project will preliminarily be working with operators to give them an idea of what the practices/transaction might look like.

Peter Wiesberg with Avoided Grassland Conversion Carbon Project (DU), GHG CIG project is looking to develop methods for landowners of grasslands to avoid conversion by being credited for grassland maintenance and management. Ducks Unlimited (DU) had a pilot project operational before the GHG CIG grant was awarded, so they acted as an aggregator and secured permanent easements with producers under the National Fish and Wildlife Service (NFWS). DU arranged to sell $40 million in offsets for 100,000 tons of CO2 via a contract with a large buyer. (The buyer declined to put in matching funds for the GHG CIG match.) The contract was rather straightforward, as the aggregator (DU) was in place and had already addressed additionality and uncertainty. The big lesson is that an experienced aggregator assumed the risk and carried it; they managed the complexities of the transaction for the landowners. Also, the transaction was achieved without a protocol, but based on a robust methodology, with milestones that must be met. The partners are developing a protocol now, and are confident that the transaction will occur.

Theo Gunther with Smart Nitrogen Application Program (SNAP), GHG CIG project, has been looking at N_2O emissions reductions from cropland in Iowa and Illinois, and examining the differences between various protocols (EPRI/MSU, ACR, CAR and Alberta NERP). The project will seek both voluntary and compliance market credits, although no saleable credits are on the immediate horizon. They are working with innovators to identify novel and innovative practices. Challenges identified: outreach is difficult, but they are relying on project partners operating in the two states; producer data is valuable, but they are unable to tell producers how much they will get paid for their data, (and it likely will not be enough to pay for the value of the data over multiple years); and finally, the variability in soil types, farm size, management practices, and on-farm data storage is great. Accessing data continues to be a challenge and without data, the project partners cannot provide producers with a potential value of emissions

reductions. Given the uncertainties, the project is finding it difficult to develop a message that resonates with farmers. Many retailers and service providers in the region own and claim the data, and do not want to share it with competitors, and producers are often bound by contract not to share. There are also tenancy/lease agreements that complicate the issue further. The market for the credits it also unknown, as there are no buyers of N_2O credits in Iowa and Illinois.

One of the project partners (International Plant Nutrition Institute) hopes to provide a meta-analysis of the data in the area (working with Johann Six, UC Davis and others). Producers are interested in yield increases, but this is potentially an issue with additionality.

Ryan Anderson with the *Nutrient Management for Nitrous Oxide Reductions Project, (Delta and NWF), GHG CIG* project is similar to the SNAP project, is focusing on crop production in Illinois, Michigan and Oklahoma. When dealing with producers, Ryan emphasized that they do not mention the price floor because it is too low, but try to assure growers of the potential. He continues to be impressed by the fact that growers know their data, but do not know what they are doing as a far as GHGs are concerned. The project is not seeking to create or adapt a protocol, but rather to implement one that has already been adopted. They noted that the ACR protocol that uses DNDC is open-ended and not prescriptive, but doesn't provide enough guidance to buyers about practices that might be credited. They have also found that producers are more willing to provide data if it will be translated into environmental impacts and benefits; however, given the nebulous nature of potential outcomes (in tons reduced, or potential income) or of potential practice change required, it has been difficult to attract buyers, and without buyers it is difficult to attract producers. Ultimately, the project partners are trying to create/collect similar sets of data that can be bundled and used for credit stacking, perhaps to generate water quality and carbon credits.

Comments & Questions

- *Has compensation been offered to growers during the interim, before prices are set?*
  For market-ready projects, the issue has been the costs of verification, so for example, the rice project developers wanted to sell credits after the first year of the project, but high verification costs forced them to wait two years. (The rule of thumb for verification is at or after 10,000 credits have been created). Because of the CCX experience, verification needs to be as close to the project as possible. The SNAP project is looking forward to using EQIP funds to provide financing to farmers early on. DU project, landowners were paid up front, which speaks to its success. Some have long-term contracts with producers, and sequenced payments are based on a price point for carbon, with no money up front. For the BIGGS-Unison project, verification will be figured out as a next step, and thus far there has not been a need for incentives.
- *Suggestions for producer outreach- reach out to family trusts that may be more accessible and likely to take on some risk.*

- *Could credits be aggregated across states?*
  Yes, if it's the same protocol, since unit costs go down for verifiers if the work is spread out across projects. For DU, the entire project was based on co-benefits and private groups looking to promote the same sets of practices with new partners. Because DU developed a rigorous methodology the credits were fit for the voluntary market. Credit stacking seems to be an obvious next step, but there is a need to streamline the approach. In the Midwest there are no buyers for these ecosystem services, and while there are buyers in CA, they need to buy from within the same watershed, e.g., where the water treatment plants are located.
- *Tile drained regions- leakage of nitrogen loss is significant, and stacking could work to prevent this loss if N_2O emission reductions were bundled with water quality credits. If only direct leakage is examined or accounted for, we are not looking at the whole puzzle. Working with other entities to bundle credits is necessary, and while we shouldn't lose sight of soil nitrogen issues, there is a need for systems-based approaches, not just those focused on nitrogen.*

T-AGG Report Review: "***Near term options for reducing greenhouse gas emissions from livestock systems in the United States: Beef, dairy and swine production systems***"

Presenters Karen-Haugen-Kozyra of the Prasino Group and Lydia Olander of the Nicholas Institute at Duke University presented a detailed overview of the T-AGG report, which is available on the C-AGG website with the presentation. The report focused on the livestock population, which has virtually plateaued, and was conducted by advisors from across the U.S.

Questions/Comments

- *When shifting livestock from one system to another, for example, from CAFO to free range or open land, what is the potential for emission reductions?*
  Producers want to stagger calf/yearling entry to feedlots and there are pilots underway to reduce the amount of time spent in CAFOs to see what the impact may be.
- Karen and Lydia solicited feedback on the reference guide from C-AGG participants

USDA GHG CIG Project Panel Discussion
EQIP Funding for Projects: A Discussion of Priorities, Needs

Adam Chambers, NRCS-USDA, provided an overview for participants on the next phase of implementing the GHG CIG projects, which will make available EQIP funds of up to $10M. Key points from his presentation:

- NRCS is working to identify the best means of dispersing the funds in a way that impacts/supports the CIGs. He mentioned that additional funds may be available if the demand/need exists.
- Funds left from 2013 will carry over to 2014
- Not all nine projects will need or require EQIP funds, e.g. DU project will not

- NRCS has the challenge of coordinating the entire EQIP team, from a county level up to a national level
- He stressed the importance of CIG grantees maintaining contact with their state technical advisors
- If a list of targeted areas and priority funding criteria could be developed, it could help to direct the funds

Key comments and input from GHG CIG project representatives

Bovine Innovative Greenhouse Gas Solutions (BIGGS-Unison) Project: The project is struggling with the income cap limit for EQIP since there are very few small feedlot cattlemen-adjusted gross income (AGI) is in the millions for many livestock and dairy producers as they are vertically integrated. Most of the project cooperators are likely to not quality as a result. It was pointed out that the AGI cap/number is determined by the Farm Bill, and thus cannot be changed by NRCS. ***NRCS (since the meeting) clarified that the $1M AGI cap only applies to producers with greater than 1/3 of their income from non-farm revenue streams, which should help with eligibility.*

Estimating N2O Reductions from Nutrient Management in the Chesapeake Watershed (CBF): Three states in the Chesapeake Bay watershed (VA, PA, and MD) are working on a nutrient management project, using the DNDC protocol. A benefit of the project is a ready buyer in the region, who has put up some matching project funds. Data access has been a project hurdle; one of the county NRCS offices they are working with has included as a screening criteria for EQIP funds that data must be made available for the project, and the project representatives are hoping to replicate this in other counties. Some producers are worried about going over their EQIP funding caps. Additionality is also an issue, particularly for producers receiving EQIP funds, which makes them ineligible under the ACR protocol. The Chesapeake GHG CIG project could benefit from NRCS establishing county-specific eligibility requirements, and will not refuse project participants from counties that have producers inside and outside the Chesapeake Bay watershed.

Demonstrating GHG Emissions Reductions in California and MidSouth Rice Production (EDF): The project is targeting CA and the MidSouth region of the US. In CA practice standards are not yet available because research is still underway with regards to the potential trade-off between mid-season draining of rice fields and the impact on wildlife. This will have to be investigated in Arkansas as well. When the research is completed, the project partners will make technical recommendations to NRCS. The practice of rice straw bailing is being investigated to determine the potential for uptake among rice growers. A survey is being conducted this summer to try to identify the thresholds or tipping points for practice change.

Soil Carbon in the Palouse Region (AEP): The geographic focus has been established and there is interest from farmers in experimenting with cover cropping, nutrient management, and rotation diversification. Some producers have used EQIP (livestock integration has been brought up by certain producers). Helpful issues that can be addressed with EQIP funds: stacking of credits, a way to overcome the additionality issue (e.g. since they are working largely with established no-till growers, they are excluded from participation in offset protocols due to additionality), innovation in eligible practices and eligibility of new innovative practices would be helpful. Issue of national standards v. local needs is also a problem. The project hopes to be eligible to receive EQIP funds, but timing is important, and they may not have identified EQIP-eligible practices by the end of the year.

Nutrient Management for Nitrous Oxide Reductions (Delta and NWF): The project is looking at Section 590 (National NRCS 590 Nutrient Management Standard) and other potential practices, i.e. cover cropping, as well as looking at updating of 590. Many producers are familiar with it, and many have applied and not received funds. There are many potential practices included. Screening criteria: a requirement that producers will share data, are farms 500+ acres, and perhaps use an existing model (i.e. COMET-Farm). Ownership and leasing will be an issue. The pitch to producers will be these are good practices that will help increase yield/production in the long run, that there are buyers for the carbon credits, and that EQIP funds can be used for the transition.

Comments/Questions

- *Can other CIGs groups apply, or non-CIG projects apply?*
  NRCS believes to the sole determinant is producer eligibility, but will confirm
- *Can funding be used for practices that are not directly involved with GHG mitigation, such as record-keeping and data collection?*
  Yes, as long as they are not already established practices, but are necessary for the GHG mitigation project.
- *Need to get a handle on terms of use of data, this has to be addressed before producers will provide data or access to data.*
  - *Pooling it and using it in the aggregate provides anonymity, but for verification the data must be tied to the land/locale/coordinates*
  - *Terms of use could be incorporated into the criteria process- who will have access, etc. the NRI database is a possible model for this: the public access includes no geographic references, and only certain federal official have access to locale-based data.*
  - *Refer also to other examples of data sharing, i.e. in Canada*
  - *C-AGG should look at the need for a central GHG data repository, and discuss in more depth*

Reactive Nitrogen in the Environment: Perspectives on Integrated Management Approaches

Dr. Thomas L. Theis, Vice-Chair (2008-2009) of the Integrated Nitrogen Committee
USEPA Science Advisory Board *and* Director, Institute for Environmental Science and Policy
University of Illinois at Chicago presented an overview of the report:

Summary of a Report‡ of the EPA Science Advisory Board
‡Reactive Nitrogen (Nr) in the United States: An Analysis of Inputs, Flows, Consequences, and Management Options – A Report of the EPA Science Advisory Board (*August 2011****)***
(http://yosemite.epa.gov/sab/sabproduct.nsf/67057225CC780623852578F10059533D/$File/EPA-SAB-11-013-unsigned.pdf).

The aim of the report is to raise awareness about reactive nitrogen in the environment, and to provide detailed analysis, and monitoring and management recommendations. Reactive nitrogen is not on the publics' minds as something that needs to be addressed.

Questions/Comments

- *Why is nitrogen cascading so important?*
  Chesapeake Bay watershed is a good example: all nitrogen, once emitted, changes chemical forms and enters different systems: air, water, and land.
- *How has the Chesapeake Bay community responded- by focusing on the atmosphere?*
  All forms need to be focused on, decreasing one form could increase another, and the exact ratio changes depending on location.
- *Does reactive nitrogen accumulate somewhere?*
  A lot of it accumulates in forests and vegetation, as well as in ground water.
- *It is entirely possible that the missing 21 tg of reactive nitrogen is in soil organic matter*

Developing Integrated Management Approaches to Reactive Nitrogen in Air, Water and Land -- Implications for Agriculture, Agricultural Technologies

Larry Elworth, Agricultural Advisor to the Administrator, USEPA, moderated a discussion about various approaches now in use or being developed to increase nitrogen use efficiency within the agricultural sector. He began by presenting some key problems at the policy level regarding how to address reactive nitrogen in the environment, which include overlap in regulatory jurisdictions, intra-agency issues, and existing fractured approaches to addressing nitrogen loading in air, land, and water. There are oversight legal/litigation challenges, as well.

The response to the EPA Advisory Board report from the agricultural sector has been strong and the industry has requested a transparent dialogue with EPA and USDA regarding a federal response. He referred to the complexities around nutrient management, and emphasized that when it comes to complex, scientific issues like this one, the agricultural sector needs to be

engaged early and often. Responses and proposed solutions need to be fully deliberated and transparent, need to support innovation among all institutions, and needs to retain ample political space for the dialogue to continue.

Panelists comments

Dr. Josette Lewis- Director, Agricultural Development, Arcadia Sciences

- Arcadia Sciences is introducing a nitrogen use efficiency (NUE) genetic trait intro crops; the trait was licensed from the University of Alberta, and it improves the uptake and utilization of nitrogen by crop plants
- The NUE trait has been introduced into canola varieties, and field testing has shown 65% reduction in N_2O emissions
- Arcadia is working to develop the trait for most large commodities; sugar beet is furthest along, with an expected release in 2017
- Working with UC Davis to measure changes in GHG emissions rates, to shows that the trait allows reduced applications of N fertilizers, while retaining yield; or, increased yield when current N fertilizer rates are retained.
- An offset protocol for the Clean Development Mechanism (CDM) of the Kyoto Protocol has been completed; there are no plans to complete a protocol for the US or voluntary markets, since existing protocols for nitrogen management (e.g., CAR) would already apply to the use of this trait.
- There is a clear economic benefit for the use of this trait in crops; producers will have incentives to use these seeds.

Questions/Comments

- *If a producer applies the same amount of nitrogen with this product, how would it apply to the CDM protocol?*
  CDM criteria that was submitted in the protocol states that you cannot decrease yield, so producer would have to reduce N applications and N_20 emissions while retaining or increasing yields, which is possible with this technology.
- *Are there, or when are there diminishing returns observed with the use of this trait?*
  Have not taken the trials out far enough yet. In the commercial trials on sugar beets, we have not yet looked at GHG emissions. In analyses with canola there is more biomass with crops with this trait inserted, and there is more nitrogen sequestered in the plants. Analysis has also shown that the sugar composition is acceptable; and in wheat, protein levels did not decrease.
- *Questions about the market for genetically modified crops, and their viability in the marketplace?*
  GMO crops and products are already being utilized around the world, and there is already an existing market, especially with these crops under development- canola, corn, and sugar beets. Wheat is a risk, but the demand will rise so Arcadia believes there are still opportunities. Arcadia's license is global. Growth in rice demand in Asia might open the market up for the use of this trait there.

Michael Formica, National Pork Producers Council

- Emphasized that farmers will reject a new technology, practice, seed, etc. that reduces yield.
- Demand for grain for protein production is high and continues to grow
- There is going to be tremendous disruption in the market when it comes to grain if the drought continues
- Herd size of livestock has remained consistent despite the loss of producers, since production has become more efficient
- Increase in the size of animals has environmental benefits, including that the volume of manure (per animal) is down 25% in the past 20 years. Also, manure is not providing the nutrients that it did in the past, because of more efficient animals.
- Manure nutrient issues vary regionally; in some locales more N is being taken up than is produced, in other areas there is some overproduction of N.

Ray Knighton, National Program Leader, USDA NIFA

- With this issue, as well as with others, there is a need to take a systems approach, and to figure out how to incentivize producers to adopt these systems approaches
- Discussed a case study regarding nitrogen management with the sugar sector in which a practice change resulted in reduced sugar yield, but amount of recoverable sugar went up, and nitrogen use efficiency went up, so producers adopted the change, but they had to understand the full system dynamics
- Farm policy needs to better integrate research results with applications and the end users
- NIFA has research, extension, and education in its mandate, but the three communities do not interact very much, and this needs to improve.
- For research applications that emerge to be fully utilized and integrated into producer practices via adaptive management, there needs to be a social sciences component that translates the science into action on the ground, and enhances adoption.

Theo Gunther, Smart Nitrogen Application Program (SNAP-TFI)

- Good to hear support for a systems approach, but this can be a challenge. Agree that there is a need to integrate the social sciences into research, but understanding the *why* is often a bigger challenge (i.e., why producers adopt certain practices, or change practices). A lot of the "evidence" that motivates producers is in people's heads, and needs to be quantified and better understood.
- Looking at ways to incentivize growers is a strong goal of the project. Producers are familiar and comfortable with receiving payment for practices such as soil conservation, improvement in water quality, etc. GHGs are the next step, and even though their practices have always impacted GHGs, this has not been part of the dialogue. Producers understand issues related to impacts on soil and water, but need to be educated about how these relate also to GHG emissions. There is an opportunity to partner and expand on the successes of addressing soil and water concerns, and to tag GHGs onto them by

using good metrics, and by looking at stacking and other incentives to maximize beneficial impacts.

Questions/Comments

- *Do you need a protocol for GHG emissions reductions activities to get started?*
  No, get started and the industry will adopt beneficial practices, and there will be no additionality. The driver is economics: fertilizer costs are at $150 an acre.
- *An inter-agency task force needs to be formed to look at the regulatory barrier to adoption of new GHG technologies, and to prioritize technology adoption.*
- *If I could demonstrate a practice that reduces nitrogen input more than a GMO, would you adopt?*
  Not if it reduces yield.
- *GHG credit barriers don't diminish the need to develop the tools to measure changes in GHG emissions, since they can still benefit policymakers, supply chain, producers, etc.*
- *There are socio-economic dimensions to taking up new crop management practices, but human behavior means it is often/just "easier" to adopt and use new seed technologies. It is a matter of perception as much as anything else.*

Designing C-AGG Work Products in Core Areas: A Strategic Exercise

Meeting participants reviewed the focus areas of C-AGG: carbon markets, sustainable supply chain initiatives, farm and conservation programs, and eco-system services and market opportunities have all been discussed in the past. The question was posed, is C-AGG focused in the right area, are there new areas for the Coalition to focus on, what should the priorities be, and what work products should be produced?

Sustainable Supply Chain Initiatives

- There needs to be a conversation about cost-sharing fairly between consumers, farmers and the corporations. There was a reference to the conversation between WWF and McDonalds Corp that took place at the C-AGG Chicago Meeting in 2011, in which Bob Langert of McDonalds indicated that carbon is not a loss-leader for his company or any other, as suggested by WWF, but that McDonalds would consider providing financial incentives for practice changes required of their growers or producers, where those changes helped to meet consumer demands, such as reduced environmental impacts of McDonalds products. However, he indicated it would not be a permanent payment, but rather a time-limited incentive to help cover the risks and increased costs associated with a practice change.
- C-AGG needs to map the supply chain to identify the targets that can have the most impact, specifically with regard to agricultural GHGs. Need to look at the policy implications, create a strategy for outreach, and look for overlapping interests and potential partners.

- C-AGG should dig into the methodologies that supply chains are using, and into other carbon market methodologies, such as market standards for organic. There is a risk of the marketplace developing methods that are off base.
- C-AGG should bring in supply chain stakeholder sand major players, such as Field to Market, to focus on financial incentives for agricultural producers. Alos, begin a dialogue with Walmart and discuss their strategy, to help them understand they can't just pass something down the chain and expect real value without costs (to them).

Engagement with CA Policymakers

- Should use C-AGG to strategically engage and share information, documents, products, experiences with ARB and other policymakers. Should also engage USDA, and provide relevant updates at the federal level. C-AGG has a breadth of sectoral and technical participation and experience and can help ensure that others are up to date.
- What does ARB need?
    - Uncertainty Paper
    - Regional supply analysis of offsets for various crops, fertilizers, etc. to show them that the agricultural sector has a lot to contribute.
    - The 9 GHG CIGs, T-AGG, and USDA/COMET- Farm, other USDA tool and products need to be shared with ARB. *This was a key takeaway from the meeting*
- In terms of C-AGG work products, further thinking on aggregation rules, ARB may or may not have thought about this.
    - We can use the GHG CIGs as models or case studies
- Need for a piece on verification methods, options, barriers (e.g., cost), etc. Could be integrated with the aggregation piece.
- Need to bring verifiers to the table, as well, to join the discussions.
- AB32 is not just about market compliance, but there is also CEQA pressure in 58 counties, and this potentially offers a place to help ARB get on track, in terms of developing voluntary CEQA protocols
- Need to add to C-AGGs statements about uncertainty
- A recommendation that there be a central repository for research data sets to be shared

General Feedback and Focus of C-AGG

- Should focus on mitigation and adaptation
- Further probe the linkage between nitrogen and GHGs and water quality
    - With all the water quality research going on how can we further drive or support the development of ecosystem service markets, e.g., wetland banking, etc., to provide additional incentives for farmers
    - There is a strong effort underway to stack water quality benefits and other environmental benefits
    - Can we include non-additional tons (innovators) at the start of the process, at least?
- Relationship with farm bill programs- based on past successes with CIGS

    - Farm bill programs could possibility effect ag GHGs, but could get large and the focus was brought back to core competencies- CIGs, and continued guidance on tools- how to get more conservation out of your dollar
- Continue working with USDA to interpret language/law, and synchronizing- i.e. COMET farm populated with CIG data. Give the right guidance so that there can be implementation by local staff.