August 19, 2009

Mary D. Nichols, Chair
California Air Resources Board
Headquarters Building
1001 I Street, P.O. Box 2815
Sacramento, CA 95812

Re: Request for Comments on Modified Text to the Proposed California Low Carbon Fuel Standard and Resolution 09-31

Dear Ms. Nichols:

We welcome the opportunity to comment on staff modifications to the first draft and additional documents (Resolution 09-31 and its associated recommendations: Proposal for an Expert Workgroup and Establishing New Fuel Pathways) provided to the docket regarding the adoption of a regulation to implement a Low Carbon Fuel Standard (LCFS). We offer these comments in light of additional developments, nationally and internationally, in the understanding and regulation of indirect land use that have occurred since the closure of the initial California LCFS public comment period and subsequent hearing on April 3, 2009.

We provide recommendations in each of the following areas:

1. **Harmonization with Other Studies to Establish Effects of Indirect Land Use Change**. As referenced in the approval by the board of the LCFS, the Board directed the Executive Officer to "convene an Expert Workgroup to assist the Board in improving its land use and indirect effect analysis" and further directed the Executive Officer "to coordinate this effort with similar efforts by the U.S. EPA, European Union and other agencies pursuing a low carbon fuel standard".
2. **CARB Direction on the Establishment of an Expert Workgroup**. Resolution 09-31 requires the Executive Officer to establish an Expert Workgroup to assist the Board in refining and improving the land use and indirect effect analysis of transportation fuels.
3. **CARB Direction on Procedures and Guidelines for Establishing New Fuel Pathways**. Resolution 09-31 requires the Executive Officer to outline a means for the establishment of new fuel pathways.

We have intentionally worked collaboratively on these recommendations to minimize the number and volume of independent comments that CARB receives such that CARB is in the best position to most effectively and efficiently utilize their resources. This collaborative effort was done, in part, to address our concerns that previously identified inaccuracies were not incorporated as a result of limited time and resourcing for staff to adequately perform their responsibilities. We additionally offer to staff our willingness to meet and review our comments and data.

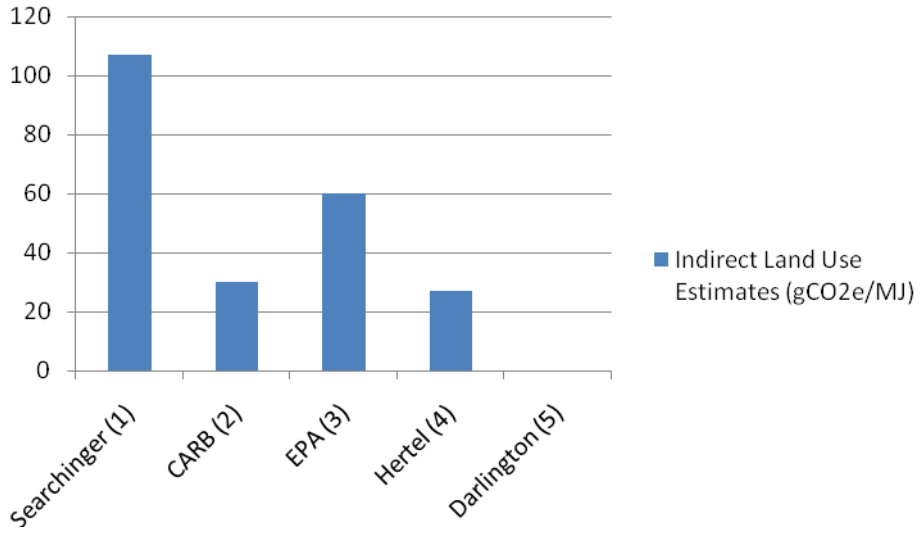
California Should Harmonize with Other LCFS Efforts on Indirect Land Use

The uncertainty around CARB's indirect land use determinations and their impact on overall carbon intensity (CI) values for fuels suggests that California may not comply with its own Executive Order S-01-07 to reduce the CI of transportation fuels with its current pathway determinations. We reiterate recommendations from numerous experts (submitted as comments prior to the April 14, 2009 public hearing) that CARB delay its implementation of an indirect land use change component until such time as a scientifically accepted method to estimate indirect land use change is developed.

We concur with the recommendation outlined in CARB Resolution 09-31 and reflected in the "Preliminary Draft Proposal for an Expert Workgroup" to "coordinate efforts, to the extent feasible, with the U.S. EPA, the European Union and other regional, national and international agencies considering the adoption and implementation of an LCFS regulation or similar program".

California is to be applauded for its early work in attempting to address the question of impact of indirect land use on the CI values of fuels. However, it is now clear that there is a significant disparity in the values being obtained for indirect land use for the production of corn based ethanol depending on the assumptions utilized in the ILUC determination. The graph below illustrates the variability of indirect land use determinations assigned to corn based ethanol from a dry grind plant utilizing natural gas and drying 100% of their animal feed co-product based on the use of different assumptions. The values range from 107 gCO2e/MJ in the case of Searchinger, to a negligible value in the case of Darlington where, consistent with many agricultural forecasts, exports are assumed constant to increasing.

Disparity in Carbon Intensity Values (gCO2e/MJ)



1. **Indirect land use factors are especially sensitive to the assumptions used in their determinations:**

   The Center for Agricultural and Rural Development (CARD) applied modest corrections to the assumptions utilized by Searchinger in his indirect land use determinations and demonstrated a dramatic reduction in the CI values obtained (21 vs 118 gCO2e/MJ). (6) As illustrated in the following table, CARB first demonstrated an ability to recreate Searchinger's numbers (obtaining a value of 118 vs 107 gCO2e/MJ), and then corrected model assumptions in the areas of ethanol processing productivity, US deforestation, and yield increases. This analysis demonstrates that the payback period of corn ethanol's carbon debt is extremely sensitive to modest changes in the assumptions regarding land conversion and yield growth. While Searchinger's indirect land use determination has already been determined to be extreme, the illustration of the sensitivity has similar bearing on the assumptions CARB is using.

Variability in Searchinger Indirect Land Use Carbon Intensity Values (6)

Description	Searchinger et al (gCO2e/MJ)	CARD (gCO2e/MJ)
Base Searchinger assumptions	107	118
No US Deforestation	NA	91
1% Increase in Crop Yields	NA	21

2. **There is broad recognition of the fact that indirect land use is a complex and uncertain topic that requires a broadly agreed upon and scientifically accepted methodology:**

   - Direction from CARB itself to the Executive Officer to convene an expert workgroup to assist the Board in refining and improving the land use and indirect effect analysis of transportation fuels; coordinating this effort with similar efforts by the U.S. EPA, European Union, and other agencies pursuing a low carbon fuel standard . (7)

   - The assessment from multiple *CARB staff selected LCFS peer reviewers* citing the lack of an agreed upon framework, quality of data, and lack of scientific validation of the indirect land use components of the model. These same concerns were reinforced by comments submitted by numerous technical experts prior to the LCFS public hearing. (8)

   - Determination by 2009/28/EC of the European Parliament and of the Council on the promotion of the use of energy from renewable fuel sources, to delay the incorporation of an indirect land use change determination value for any renewable fuels until a methodology and the best available scientific evidence can be brought to bear. (9)

   - Amendment to U.S. House Bill 2454, June 25, 2009. "International Indirect Land Use Changes require the establishment of an independent scientific review and report on the

determination of whether models and methodologies exist that can predict indirect land use implications with reliability, predictability and confidence and if so to establish a methodology for their determination." (10)

CARB Direction on the Establishment of an Expert Workgroup

We remain hopeful that the direction from CARB to establish an Expert Workgroup is, in part, to review and incorporate into the LCFS model the numerous data corrections that were provided to CARB during the initial public comment period ending April 22, 2009 and the subsequent public hearings ending April 23-24, 2009. With inaccuracies in the current proposed rule, it is imperative that the Expert Workgroup, in concert with harmonization with federal efforts, be allowed to complete its work to allow for the determination of science based ILUC values before the ILUC component of the CI value determination is implemented. Well referenced comments and data were submitted by numerous individuals and organizations with years of direct experience and knowledge in both domestic and global agricultural and livestock production to correct inaccuracies in the proposed standard. CARB documentation specifically states that, "The response to comments in the final statement of reasons must demonstrate that each relevant, timely comment has been considered." (12)

We are aware of the following inaccuracies that were identified in the draft standard for which documentation was provided in the initial comment period and yet the inaccuracies remain in the approved standard:

1. **The treatment of crop yield growth rates**
2. **The treatment of yield on new cropland**
3. **The treatment of U.S. versus rest of world (ROW) yield**
4. **The treatment of US versus ROW crop yield growth rates**
5. **The insufficient accuracies associated with land use change assessments**
6. **The inaccurate treatment of distillers dried grains with solubles (DDGS)**

Further substantiation of these inaccuracies is provided below:

1. **The treatment of crop yield growth rates – domestic**

   Until the Expert Panel work is complete, CARB should, at a minimum, utilize USDA projected yields. Alternatively, they should treat yield as a time-dependent variable, similar to the way emissions due to indirect land use are treated as Edgerton suggested in his previous comments to CARB.(13)

   Numerous experts have commented on the flawed reasoning in CARB's treatment of crop yields as largely a fixed value. CARBs approach initially utilized a 2000/2001 corn yield owing to their interest in having a base year when data was available on the relationship between US and ROW crop yields. CARB later adjusted this yield to the 2006-2008 average, noting that "US corn yields rose by about 10% over the 2001 -2007 period" and that "this direct adjustment to land use is essential and it will reduce the initial land use change impulse". (14) Additional yield increases from this base number occur in the model based on the assumption that corn yields increase only in response to price. This results in a 2015/2016 assumed US corn yield of 151.3 bu/A. These yield numbers are used despite the fact that 2008/2009 US corn yields were 153.9 bu/A and USDA conservatively estimates 2015/2016 crop yields at 169 bu/A. (15)

A sampling of the expert comments that were provided to CARB are provided below:

- In their comments to CARB, Good and Irwin suggest that "any analysis must correctly identify the direct implications of the amount of US corn acreage that will be needed to meet the mandated level of renewable biofuels production by 2015". (16)

- In their GTAP analysis, Hertel and Keeny, disputing the standard assumption of trend yield growth as unduly restrictive, determined that with plausible distribution on the yield elasticity reflective of past work and current agricultural economic conditions, that nearly thirty percent of the five year output response to a marginal ethanol demand shock is expected to be due to yield gains. (17)

- In their recent analysis on the sensitivity of carbon emission estimates from Indirect Land-Use Change, Dumortier et al indicate that a 1% higher yield scenario changes the payback period by a greater amount than any other scenario, reducing the payback period by a factor of four. (6)

Ultimately, individuals with the appropriate agronomic technical expertise and experience need to be included in the Expert Panel to review and recommend appropriate treatment of crop yield growth rates.

2. The treatment of yield on new cropland

Until the Expert Work Group completes its analysis, CARB should increase their "new" crop land elasticity assumptions to reflect actual data on yields in areas where this land use change is expected to occur.

In their draft LCFS rule, CARB utilized an elasticity factor of 0.5 for area expansion suggesting that "little empirical evidence exists to guide the modelers in selecting the most appropriate value". A number of experts commented on numerous sources of readily available data to guide the modelers to a data based decision. Examples of this data are provided below:

- Tyner, in comments at the CARB workshop in February 2009, suggested that the largest land use changes would occur in South America, the European Union (EU), and Sub-Saharan Africa.

- UNICA, in their comments to CARB indicated, "empirical data in Brazil shows that the crop yield elasticity with respect to area expansion should be around 0.9-0.95". (18)

- Informa Economics, LLC indicated that in their assessment of Brazil and Argentina that yields on new area or area previously planted to crops were not meaningfully different than existing yields (an elasticity o f 1.0). (19)

- Edgerton highlighted in his comments to CARB that soybean yields in Brazil and Argentina at least match those seen in the United States, justifying a value of 1.0 for the

elasticity of crop yield in South America, if not greater than 1.0 when double cropping is considered. (13)

- Similarly Edgerton outlined in his comments to CARB that solid data exists for the EU owing to its mandatory "set-aside" program. Tyner et al suggest that land use change for the EU will require a 1-2% increase in crop area for these countries. A European Commission funded study on the set-aside found that yields on the set-acres varied from 50-95%. Assuming the most productive acres would be brought back into production, Elasticity values for this region could be justified at values of at least 0.75. (13)

It is critical that individuals with the appropriate global agronomic knowledge and experience be included in the Expert Panel to review and recommend appropriate treatment of crop yields on new or restored cropland.

3. The treatment of US versus ROW crop yield growth rates

CARB's assumption that US and ROW crop yield growth rates are the same is not an accurate assumption as demonstrated by looking at available historic data for the period of time since CARB's selected base year of 2001. This implies that CARB's exogenous yield adjustment has overestimated land use change emissions.

CARB indicates that they have selected 2001 as the base year for their crop yield assumptions as this year is the latest year for which a global data base on harvest area and yields is available. They compare these yields with FAPRI for the time period, but indicate a more comprehensive comparison along these lines would be helpful. CARB indicates that their assumption of equal rates of growth in US and ROW corn yields is critical to their assumption noting:

> *If US corn yield grows slower than ROW yield, then we will overestimate the net change in cropland due to increase in ethanol production.*

Using a trend line methodology to predict US corn yields (1985 to present; consistent with the timeframe being utilized by the EPA), U.S. yields have increased 8.4%, from 2001 to 2007. Using the data for the time frame indicated directly, U.S. corn yields increased 9.1%. During this same timeframe, corn yields in the ROW increased by 9.4%.

For soybeans, using trendline yields, U.S. yields have increased by 6.7% from 2001 to 2007. Using the data for the time frame indicated directly, U.S. soy yield increased by 5.4%. During this same time period, the yield improvement for the ROW was 9.2%.

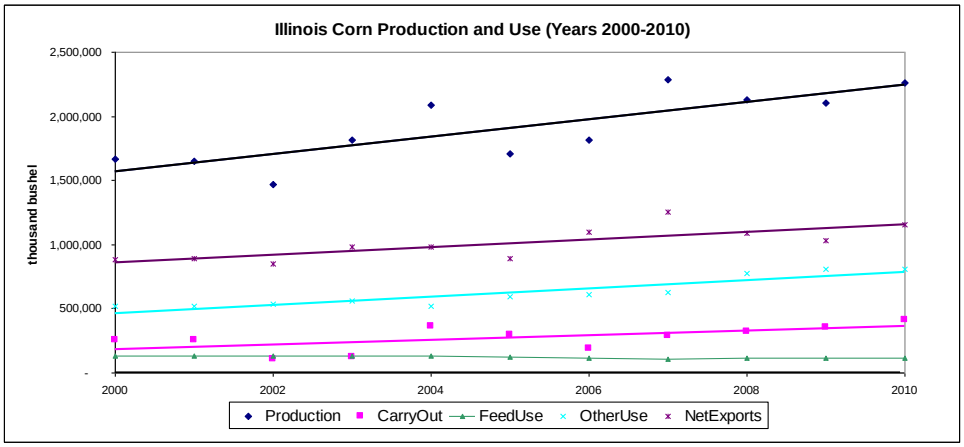
This analysis was conducted utilizing the FAOSTAT database and does not account for any double cropping.

4. The insufficient accuracies associated with land use change assessments

In a recent study, the University of Illinois at Chicago Energy Resources Center determined the accuracy of using remote sensing for land use change assessments. (20) The study finds that direct land use change in the vicinity of ethanol plants can be determined with higher resolution

imagery from sensors such as Landsat Thematic Mapper and AWiFS after thorough vetting of the data. However, consistent, high resolution global land cover products do not yet exist to permit land use change assessments from biofuels production and a coordinated effort is needed to compile these data sets.

Furthermore, we do not yet fully understand how direct and indirect land use changes vary by region. Mueller and Copenhaver with additional data provided by Ross Korves are currently finalizing an assessment that shows that the start up of several new ethanol plants in the Midwest a) did not prompt conversion of non-agricultural land to agricultural land, and b) did not affect the region's corn export balance, c) in an environment of increasing US soybean exports. (21)



5. The inaccurate treatment of distillers dried grains with solubles (DDGS)

Many animal nutritionists and animal feed experts commented on the inaccuracy and flawed assessment of DDGS by CARB. These include: Stein, Gaines, Parsons, Klopfenstein, Waldrup, Kerley, and Shurson who have expertise in applied nutrition of dairy, beef cattle, pigs, and poultry . (22) From the comments provided by these experts it is clear that the statements made by CARB about the utilization of DDGS in animal feeding are incorrect and without any background in the scientific literature. In particular, CARB is making incorrect statements about the nutrient composition of DDGS, about the utilization and digestibility of protein and amino acids in DDGS, about the value of phosphorus in DDGS, about the consequences of the Maillard reaction, and about the nutritional effects of the particle size in DDGS. As has been pointed out by these feeding and nutrition experts, there is strong scientific evidence to support the use of DDGS in diets fed to beef cattle, dairy cows, swine, and poultry and there is a plethora of information available about the use of DDGS in diets fed to livestock and poultry. The nutrition experts also point out that it is incorrect when CARB postulates that "it is evident that significant barriers to the widespread adoption of DDGS as livestock feed exist" – in contrast all the nutritionists point out that livestock and poultry producers have been very receptive to the use of DDGS because it contributes to a reduction of diet costs.

From the statements provided by the experts, it is also evident that based on the peer reviewed scientific literature, 1 kg of DDGS can replace between 0.50 and 0.70 kg of corn and between 0.40 and 0.60 kg of soybean meal. Small differences among species exist:

- Linn: 1 kg DDGS displaces 0.531 kg corn and 0.514 kg of soybean meal (23)
- Birkelo: 1 kg DDGS displaces 0.68 kg corn, 0.60 kg soybean meal, 0.07 kg hay (24)
- Shurson: 1 kg DDGS displaces 1.244 kg of corn and soybean meal (22)
- Argonne: 1 kg DDGS displaces 1.27 kg of corn and soybean meal (25)
- IEA: 1 kg DDGS displaces 1.28 kg of soybean meal and corn (26)

Additionally, we are providing expert opinion to CARB from the U.S .Grains Council responding to the comments by CARB staff on the lack of DDGS demand:

> CARB Staff comments provided in Appendix C of the proposed rule: "Significant barriers to the widespread adoption of DDGS as a livestock feed exist. International marketing efforts currently underway by the U.S. Grains Council is boosting exports, but it remains to be seen if this can be enhanced given the large quantities of distiller's grains being produced by the rapid expansion of corn ethanol production. High prices render DDGS less cost-effective as a replacement feed." – (27)

Knowledgeable independent analysis and forecasting compiled by U.S. Grains Council and provided in Appendix I suggest otherwise:

- Informa Economics, LLC: anticipated US DDGS production with 15 BGY of corn based ethanol is 38 mmt
- Informa Economics, LLC: Growth in export demand of DDGS: 2010/11 represents 477% of 1999/2000 demand
- Informa Economics, LLC: "Potential export demands exceed projected DDGS export volumes required to keep DDGS price competitive with other feed ingredients in the US domestic markets."
- CARD MATRIC: Forecasted world export demand is 80.6 mmt
- Informa Economics, LLC 2007 study: Asia demand potential for DDGS is 29 mmt

CARB Direction on Procedures and Guidelines for Establishing New Fuel Pathways.

The continued advancement of technologies that can reduce the CI values of current pathways as well as to provide new pathways is critical to the success of the LCFS program. CARB has assumed the advancement of technologies in its identification and quantification of pathways for technologies that do not yet exist at commercially or economically viable scale today (i.e. cellulosic fuels and renewable electricity.) However, CARB has not provided a ready means for broadly updating existing pathways for current and future efficiencies. CARB has also not provided pathways for technologies that are available to the corn based ethanol industry today, but are not broadly adopted, that significantly reduce the CI of corn based ethanol. A process by which annual updates of the current pathway CI values can occur is critical to encourage the further reduction in CI values of renewable fuels. Proactive definition of potential new pathways is also critical or adoption of these new technologies is unlikely in the future. Additionally, proactive identification of and approval of new pathways, will dramatically simplify the resource burden on CARB. We are prepared to work collaboratively to bring forward these pathways to CARB.

Key examples of areas requiring annual updates are as follows:

- **Corn based ethanol plant production metrics: ethanol yield, natural gas and electricity use**

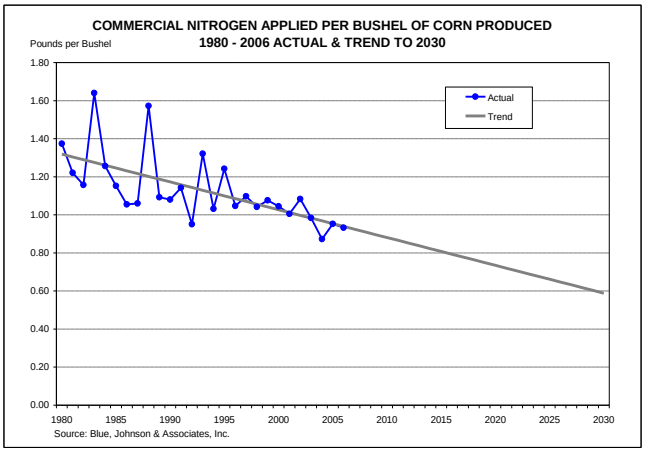
  Since the last available data on the efficiency of the ethanol industry was obtained by the 2002 USDA Survey, it is clear that ethanol plant production values utilized within GREET and the California LCFS model, do not reflect current day efficiencies. The IEA report notes that between 1983 and 2005, the energy requirements for producing ethanol in a dry mill plant decreased by 63%. (26)

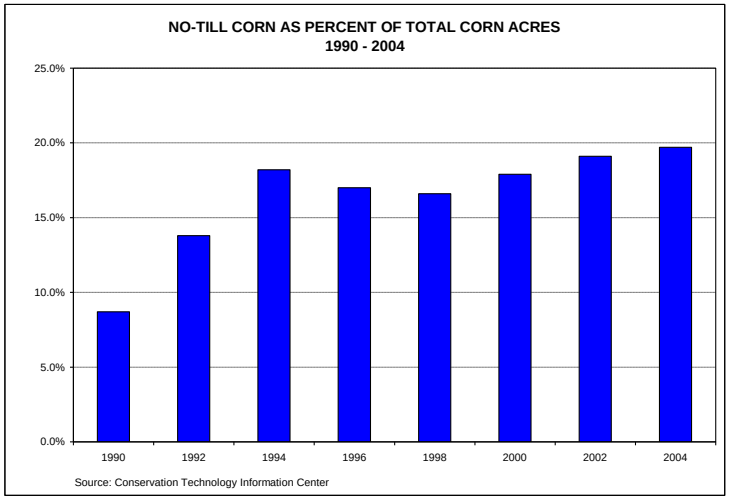
  Modest corrections to the GREET model to reflect the state of the dry grind ethanol industry today have a significant impact and reinforce the importance of using current quality data. Updating the current dry grind industry production figures (e.g. ethanol and DDGS outputs and energy inputs), in the CA-GREET model), results in an 8.8 gCO2e/MJ CI reduction; a 13.3% reduction in direct emissions.

  The University of Illinois at Chicago, under the direction of Dr. Steffen Mueller, is currently conducting a rigorous survey of the ethanol industry to provided current production values to Argonne National Laboratories to allow for an update of the GREET model. This study has an anticipated completion of year end. **CARB should immediately update its ethanol production numbers when presented with this new information.**

- **Crop production metrics: on farm fuel use, fertilizer use, tillage practices, pesticide use**

  On farm fuel use, fertilizer use and pesticide use have all continued to decline since the last available federally compiled data (2005 for fertilizer and 2004 for no-till cultivation). As illustrated, fertilizer use alone has declined 8% from 2000-2005 (ProExporter from Blue, Johnson & Associates), and no -till as a percent of total corn acres increased two-fold from 1990 to 2004 (Conservation Technology Information Center). The IEA Bioenergy Task Force highlights that nitrogen requirements have decreased at the rate of 0.10 kg N/tonne/year based on a 50-year trend with no evidence that these trends are slowing. They further demonstrate that the improvements in nitrogen efficiency are happening globally. Similar trends are provided for a reduction in both phosphorous fertilizer and potassium at declining rates of 0.18 kg/P/tonne/year and 0.13 kg/tone/year, respectfully. (26)





The advent of biotechnology has provided many benefits, most often recognized as a moderating effect of stress on yield. The National Center for Food and Agricultural Policy, however, illustrates that with this adoption, pesticide use has also decreased more than two-fold from 2001 to 2006. (28)

Overall Impact on U.S. Agriculture of Biotechnology Derived Crops			
	National Center for Food and Agricultural Policy (2008)		
Year	**Planted Acres**	**Yield Increase**	**Reduction in Pesticide Use**
	MA	B lbs	M lbs
2006	156	7.78	110.1
2005	123	8.34	69.7
2004	118	6.61	62
2003	106	5.34	46.4
2001	80	3.79	45.7

To address the lack of data available in the public domain, we are working with academic and industry experts to gather comprehensive and current data to provide to CARB by year end**. We would again expect CARB to immediately update its models so that all pathways can benefit from this continued technical advancement.**

Key examples of technologies that are available to the corn based ethanol industry today that could significantly reduce the carbon footprint of a corn based ethanol plant:

- Fractionation; front or back end, generating corn oil for food or fuel use , higher value animal feed products, lower utility usage
- Combined heat and power to reduce electricity requirements
- Biomass combustion or gasification to reduce or eliminate natural gas usage
- Anaerobic digestion to reduce or eliminate natural gas usage]
- Bioplastics (zein) and solvents (ethyl lactate), expand co-product displacement for life cycle analysis

Many of these are highlighted in a recent paper by Mueller, discussing anticipated adoption rates and reduced global warming impacts of these adoptions.(29)

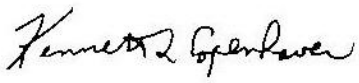
It is critical that industry be allowed to proactively provide generic pathways to CARB that reflect the CI improvements of technology adoption as a means for achieving California's desired results and for catalyzing the adoption of GHG reducing technologies. If these pathways are not predefined, financing and thus realization of these important CI improvements will impede further development and adoption.

We appreciate the willingness of CARB staff to constructively engage with us to improve the overall quality of the model. As we are so collectively aware, in an area of such global importance, it takes good science to make good decisions. We welcome the opportunity to continue to work with CARB to address current errors and inadequacies in the model and to proactively provide improvements to the working model.

Sincerely,

Rob Elliot, President, Illinois Corn Growers Association

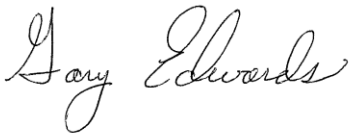
John Holzfaster, Chairman, Nebraska Corn Board



Kenneth Copenhaver, Ph.D., University of Illinois-Chicago

Steffan Mueller, Ph.D., University of Illinois-Chicago

Rita Mumm, Director, Illinois Plant Breeding Center, University of Illinois Urbana Champaign



Gary Edwards, President, Iowa Corn Growers Association

Raymond E. Defenbaugh, President, Illinois Renewable Fuels Association

Mike Edgarton, Technical Lead, Monsanto

Hans Stein, Ph.D., University of Illinois Urbana Champaign

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Ms. Sandra Berg
Mr. Ron Roberts
Dr. John G. Telles, M.D.
Dr. Ronald O. Loveridge

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Appendix 1: **U.S. Grains Council Report on DDGS Export Demand and Potential**

August 14, 2009

Table 1: Summary of DDGS Production & Export Potential (Metric Tons)

Information Source /Date	**DDGS Exports Crop yr & Calendar Year.**	**DDGS Exports as a % of US Production**	**DDGS Exports Forecasted (Date below)**	**DDGS Export Demand Potential**	**2008 Calendar Exports as a % of Potential Demand**
1.Informa Asian DDGS Transport Study Nov-2007	2006/07 (est.) 1,600,000	15,810,000 (10.1%)	2011/12 Production- 40,000,000 Exports 5,000,000	2007 *Asia Demand potential* 32,000,000	4,532,352 (14% of *Asian Demand)*
2.CARD MATRIC	2007/08 4,140,296 2008 CY 4,532,352	See chart	2014/15 DDGS export projections (FAPRI-08) 6-7,000,000 mt	*World potential demand* 80,600,000	4,532,352 (5%) of world export potential
3. Informa USGC Program Evaluation	2007/08 4,140,296	20,566,000 (20% of production)	(2014/15) 7,200,000	*Select countries Potential* 2006/07 32,109,848	4,532,352 (14% of markets in table 19.)
4. FAPRI/MU Report	(08/09) 4,827,000	(08/09) 27,688,000 (17%)	(2014/15) 39,877,000 6,317,000	n/a	n/a

Summary observations:

- ✓ There is a wide range of potential export demand estimates among these reports from the low end of 12 mmt (CARD MATRIC), to the higher end (over 80.6 mmt) also CARD MATRIC.
- ✓ The past predictions of DDGS export growth have proven to be below the actual exports later reported by FAS.
- ✓ The range of DDGS export estimates looking out into the future are from the low end of about 10% of total DDGS production, to the high end of about 25% of total production. However there seems to be a growing consensus among the analysts which suggests that if U.S. DDGS production exceeds 45 mmt then exports will have to increase at a more rapid pace and a gain greater share of total production due to the likely saturation of U.S. domestic demand for DDGS.
- ✓ DDGS is a quality substitute feed ingredient for corn, soybean meal, wheat, fiber and other "energy or protein feeds such as fat, canola meal, tapioca, corn gluten etc.." displacement rates depend on the animal species and relative prices of the substitute feeds.
- ✓ The past rapid growth in DDGS exports is attributable to the educational marketing efforts of the U.S. Grains Council, and that future export growth will also require additional educational marketing efforts by the Council.

1. **"DDGS Transportation Study"; November 2007 (Informa Economics Inc). Table**
   - At the time of the issuance of this report the most current estimated exports for DDGS were crop year 2006/07 which Informa estimated to be at 1,600,000 mt. The actual FAS exports for Oct-September 06/07 were 1,874,454 mt.
   - The 2006/07 Informa estimated DDGS production was at 15,810,000 mt, therefore the 1.6 mmt of estimated exports were equal to 10.1% of their total estimated total production.
   - The Forecasted Production for 2011/12 – at the time of this report was 40,000,000 mt) with their forecasted exports for 2011/12 at 5,000,000 mt or about 12.5% of total production. (Note 2008 calendar year exports already have reached 4.5 mmt)
     The total estimated demand potential for the targeted countries in this report for Asia was 32 million metric tons. The most current calendar year FAS exports of 4.532 mmt are equal to 14% of this reports estimated potential Asian demand.

2. **CARD/MATRIC REPORT:**

- At the time of this report CARD MATRIC estimated exports for 07/08 to be at 4,140,296 mt while the actual exports for calendar year 08 equaled 4.532 mmt.
- Figure 1.1 page two of Chapter 1, there is a chart that indicates projected exports to be between 6-7 million metric tons (mmt). If we use the projected production for the year 2-14/15 of 40 mmt of DDGS then this export projection would be equal to 15-17% of total U.S. Production.
- The estimated total potential demand by this report is in the range of 80.6 mmt, which would make the current exports for calendar year 2008 of 4.5 mmt equal to only 5% of the potential.

3. **Informa USGC Program Evaluation (September 30, 2007):**

- Informas' projected DDGS exports at the time of this report for 2007/08 was 4,140,296 mt
- Informas' projected DDGS production at the time of this report for 07/08 was 20.566 mmt which meant exports equaled about 20% of total production.
- The reports projected DDGS exports by 2014/15 was 7.2 mmt with an export potential at the time of this report for selected countries estimated at 32.109 mmt.

- Dividing 2008 calendar year actual exports of 4.5 mmt by the potential of 32.109 equals 14% of potential demand. If we reach the projected 7.2 mmt exports that would equal 22% of potential demand in the selected countries evaluated in this report (not all countries potential demand which would be larger.

4 FAPRI/MU Report

- This report is the most recent of the reports on estimated DDGS production, and exports, it states in their table below that 2008/09 DDGS exports would equal 4.827 mmt.
- DDGS U.S. Domestic production for 08/09 would equal 27.688 mmt total making exports equal to 17% of the total production for this year.
- Projected DDGS production for 2014/15 is reported to be 39.877 mmt and exports at 6.317 mmt or about 15% of total production.