“GRAIN SORGHUM IN ETHANOL”

For: US SORGHUM CHECKOFF PROGRAM

Prepared: October 22, 2009

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1.0 Executive Summary:

The Board of Directors for the US Sorghum Checkoff Program (USCP) charged the staff, in their initial strategic plan to find ways to increase the inclusion rate of grain sorghum in ethanol by 50% before the end of 2011. In order to do that, USCP needed to understand the current conditions and any deterrents affecting the use of grain sorghum in the United States to produce ethanol. Agri-Energy Solutions, Inc (AES) was engaged to conduct this study within the ethanol industry on behalf of USCP.

In order to gather accurate marketing information, AES developed a confidential survey with a set of questions that were designed to determine the current inclusion rate of grain sorghum to produce ethanol, establish basis values per plant and to find out how far grain buyers at these ethanol plants will go to secure grain sorghum. AES was also asked to determine the primary factors influencing sorghum's usage and gather and report any other anecdotal information that remains relevant.

While preparing to gather information, AES understood ethanol plant starch consumption generally follows grain production, so we sent surveys, via US Mail, to every producing facility in Nebraska, Kansas, Texas, Colorado, Missouri and Arizona. After canvassing several plants by follow-up telephone call, AES determined the primary target area for grain sorghum inclusion is Kansas and Texas ethanol plants, therefore we designated these plants as Tier I targets. Colorado, Missouri and Arizona plants were designated as Target II plants and Tier III targets included all other producing facilities in the United States.

While preparing the initial questions for the survey AES discovered a need to keep certain information regarding these target ethanol plants confidential, so unless otherwise directed, AES agreed to withhold the identities of participating ethanol plants from this study. Each of the surveyed ethanol production biorefineries was assigned a number strictly based on the order in which they responded to our survey or interview. The key to this report is being held in confidence at the AES office in Lubbock, Texas.

There are 14 producing Tier I ethanol plants and 34 producing Tier II plants. AES followed-up on each mailed survey to the Tier I plants with telephone interviews. Most calls lasted from 35 to 40 minutes and several lasted as much as two hours. Some consisted of several calls back and forth. Of the surveys sent to Tier II ethanol plants none were returned completed and only three plants responded to our request for telephone interviews. Tier III plants were not contacted.

The 14 plants in Tier I reported using 247,648,571 bushels of grain, including 119,375,000 bushels of corn and 128,303,571 bushels of grain sorghum to produce 643,500,000 gallons of ethanol. They also produced 12,134,779 tons of dry distiller's grain, 1,114,418 tons of wet distiller's grain (50/50 dry to wet ratio) and 2,123,550 tons of CO-2.

Tier I ethanol plant demand for corn represents slightly less than 1% of the total 2008 U.S. production; 119,375,000 bushels out of 12,101,238,000 bushels. Demand for grain sorghum in this primary target area was 128,303,571 bushels out of 472,342,000 bushels or 27%. If we interpolate total US grain sorghum consumption in all Tiers, to produce ethanol the percentage will rise to approximately 29% of the total US production.

AES uncovered a number of critical issues that need to be addressed by USCP. The most mentioned comment from the ethanol producers was for USCP, or some other entity to develop and deliver educational seminars to producers of grain sorghum about ethanol and to ethanol producers about grain sorghum. The misinformation residing within these two groups alone boggles the mind. Additionally, all plants want to see more assistance from USCP regarding advantages of using grain sorghum and cellulosic forms of sweet sorghum or energy cane, policy initiatives, buying group opportunities, better ways to buy farmer grain and less negative impact to the ethanol industry from grain merchants regarding export programs.

Competition for export programs seems to be another serious concern expressed by the ethanol producers. Their concern surrounds merchants purchasing grain sorghum for storage and eventual sale into an export program. Ethanol producers are not against this practice, as a matter of fact, they see it as healthy for grain sorghum. What they want to see however is for all participants in the market for grain sorghum to have an equal chance for a fair price. They believe, leaving market control in the hands of one group, ethanol producers, merchants or who ever, does not serve any market well and it creates a disincentive for farmers to add more acreage or switch crops especially if they see no benefit to doing so! All parties agree; we need more grain sorghum produced in the United States but it must be more profitable for the producers.

In the last two years, several new ethanol biorefineries were built in the middle of the highest concentration of grain sorghum production in the United States. They were built in these areas because adding an additional market, like an ethanol plant, should have added value to the marketing chain thereby enhancing the farmer's potential for profit. Initially, this did not happen, because these ethanol plants either came online after last years harvest or they went dormant for a period of time during this past year due to high grain prices forcing ethanol plants below their break even point. So farmers in many cases sold their grain to a merchant and never saw any benefit to adding the ethanol plant's demand. As of October 1, 2009, this situation seems to be correcting itself. In Texas and SW Kansas during this year's harvest, farmers are discovering new opportunities to sell their grain in these now producing ethanol plants. Several cases are now being reported of significantly narrowing basis in ethanol production areas.

USCP has the opportunity to put the results of this study to work immediately. By understanding grain trading patterns in the primary target areas for grain sorghum consumption, we can better manage ethanol producer's needs, and secure better prices for USCP's grain sorghum producers. Additionally, ethanol plants can increase their inclusion rate of grain sorghum and USCP can rebuild the incentive to produce more grain sorghum in the future. This in turn will meet USCP's requirement of increasing grain sorghum inclusion by 50% before the end of 2011.

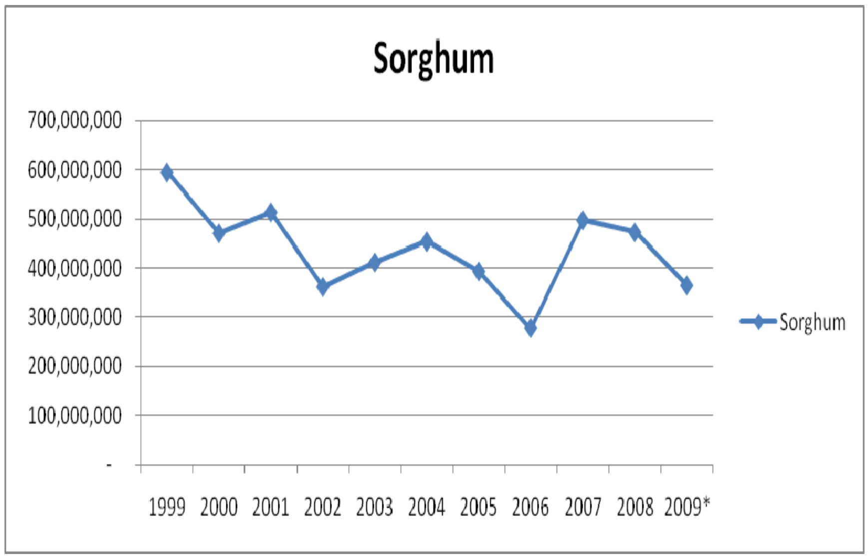
2.0 Situation Analysis

2.1 Market Summary

According to the National Agriculture Statistics Service (NASS), production of grain sorghum in the United States has remained statistically negative over the last ten (10) years while showing years where production increased, the trend was overall downward. Corn production however has risen during the same time period and that has been attributed to the growth of the ethanol industry. Grain sorghum is not currently benefitting in production growth due to ethanol's growing demand.

2.1.1 United States Grain Sorghum Production Statistics:

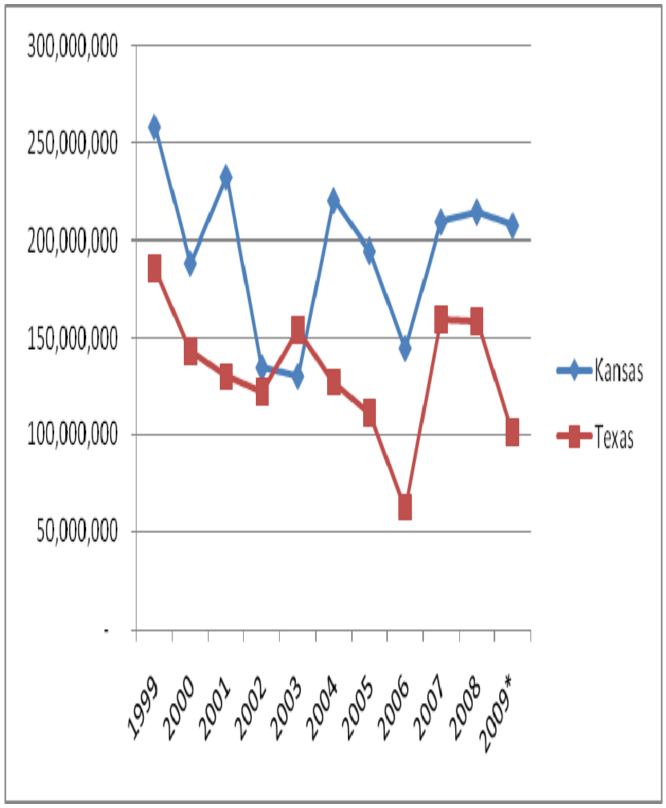
US	Sorghum
1999	595,166,000
2000	470,526,000
2001	514,040,000
2002	360,713,000
2003	411,219,000
2004	453,606,000
2005	392,739,000
2006	276,824,000
2007	497,445,000
2008	472,342,000
2009*	363,728,000



Grain sorghum has not benefitted nationally in the growth in demand for starch in the ethanol industry. Ethanol is still perceived as a corn derivative product and this has not crossed over to grain sorghum in any way, though as evidenced below Tier I demand is growing.

Kansas and Texas Grain Sorghum Production Statistics:

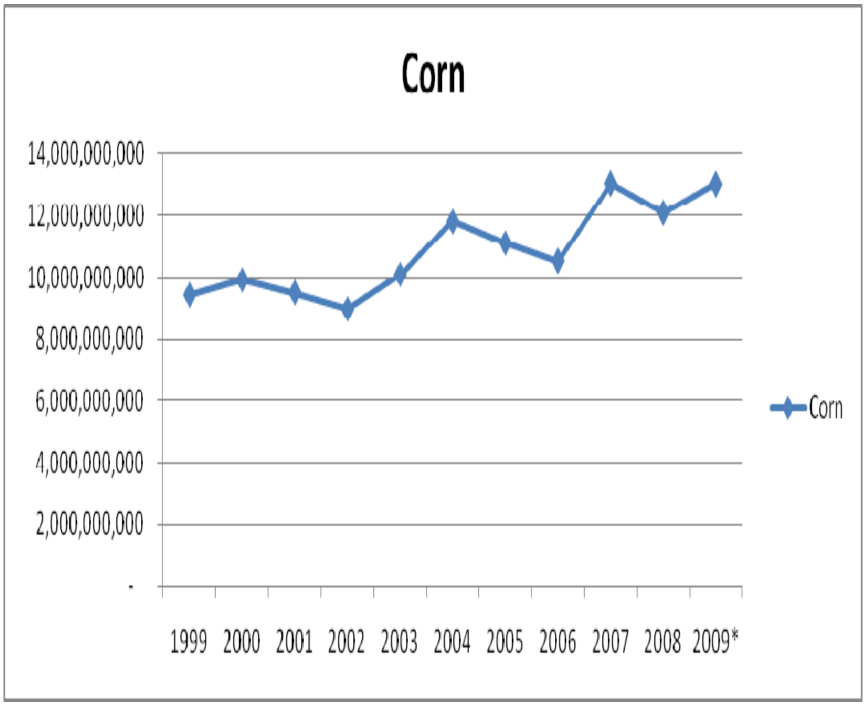
Grain Sorghum	Kansas	Texas
1999	258,400,000	185,850,000
2000	188,800,000	143,350,000
2001	232,500,000	130,000,000
2002	135,000,000	122,400,000
2003	130,500,000	153,900,000
2004	220,400,000	127,100,000
2005	195,000,000	111,000,000
2006	145,000,000	62,400,000
2007	209,350,000	159,250,000
2008	214,500,000	158,600,000
2009*	207,500,000	101,200,000



As evidenced in this graph showing the last 11 years of production in both Texas and Kansas, Kansas ethanol demand has caused production to level out somewhat and is not losing ground as it was through 2006. Texas demand has done nothing to support grain sorghum production growth as of the date of this report. Adverse alternative cropping weather and higher prices helped increase production during 2007 and 2008, but the lack of a comprehensive support and growth plan for grain sorghum in ethanol has kept Texas from keeping pace.

2.1.2 United States Corn Statistics:

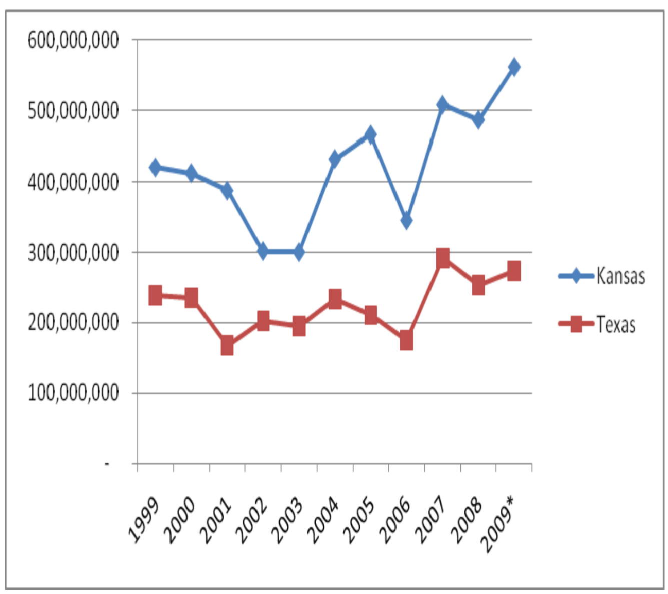
US	Corn
1999	9,430,612,000
2000	9,915,051,000
2001	9,502,580,000
2002	8,966,787,000
2003	10,087,292,000
2004	11,805,581,000
2005	11,112,187,000
2006	10,531,123,000
2007	13,037,875,000
2008	12,101,238,000
2009*	13,018,058,000



As referenced above, corn production is growing dramatically in response to additional ethanol production. The above graph indicates growing interest that should continue weather permitting.

Kansas and Texas Corn Production Statistics:

Corn	Kansas	Texas
1999	420,180,000	238,330,000
2000	412,100,000	235,600,000
2001	387,350,000	167,560,000
2002	301,600,000	202,270,000
2003	300,000,000	194,700,000
2004	432,000,000	233,520,000
2005	465,750,000	210,900,000
2006	345,000,000	175,450,000
2007	507,840,000	291,560,000
2008	486,420,000	253,750,000
2009*	561,150,000	273,000,000



Once again corn production acreage in Kansas is outpacing production acreage in Texas. Ethanol demand in existing and new ethanol biorefineries is helping to grow demand for corn in Kansas while rail rates and the increased cost of fuel for rail transportation helps to grow Texas corn acreage.

There are again three (3) producing ethanol plants in Texas and this should help build demand as well.

2.1.3 Ethanol Plants

According to the Renewable Fuels Association (RFA) website, as of August 2009 in the United States, there were 197 completed ethanol biorefineries and only 177 of those plants were on line producing ethanol. These 177 producing ethanol biorefineries generated 728,000 barrels of ethanol per day; that translates to an annual production rate of approximately 11.1 billion gallons per year. Today RFA reports 202 ethanol biorefineries with 191 operating facilities producing 11.9 billion gallons of ethanol per year.

Of the 202 plants on the RFA website, four (4) plants reported using a corn/milo blend, ten (10) of the plants used some other starch source including cheese way, brewery waste and others and the remaining 183 biorefineries used corn only to produce ethanol. Due to extensive experience within the ethanol industry, AES was aware that these numbers needed to be updated.

In an effort to accurately reflect demand and potential market opportunities, AES divided the US ethanol industry into three tiers. They are:
Tier I Plants: Those plants that pose the highest probability of consuming grain sorghum to produce ethanol because a significant amount of the crop is produced within 100 miles of the production facility.
Tier II Plants: Those plants that pose a lower probability of consuming grain sorghum to produce ethanol but reside in states where grain sorghum is producer or shipped.
Tier III Plants: Those plants that pose the lowest probability to consume grain sorghum because they reside in areas where corn or other crops can be consumed more readily to produce ethanol.

2.1.3.1 Tier I Ethanol Plants

There exist fourteen (14) producing ethanol plants in this primary target area and AES interviewed each of them. None of these plants reported using corn only to produce ethanol. As a matter of record all of the surveyed plants expect to continue using grain sorghum in some blend during this next production year.

For the purpose of supplying ethanol's needs plants in Tier I target areas will consume 247,678,571 bushels of corn and sorghum. Below is a chart showing the mix as reported by each plant in Tier I:

Tier I Ethanol Plant Statistics

2008		MMGPY*
Number of Kansas Ethanol Plants	14	443,500,000
Number of Texas Ethanol Plants	3	250,000,000

	Bushels Needed
Kansas Ethanol Grain Bushels Required	158,392,857
Kansas Corn Needed	66,875,000
Kansas Milo Needed	91,517,857
Percent of Kansas Corn Needed	14%
Percent of Kansas Milo Needed	43%
Texas Ethanol Grain Bushels Required	89,285,714
Texas Corn Needed	52,500,000
Texas Milo Needed	36,785,714
Percent of Texas Corn Needed	21%
Percent of Texas Milo Needed	23%
Total Kansas & Texas Tier 1 Bushels Required	**247,678,571**

(* million gallons per year)

These figures give an adequate picture of the market dynamics that unfolded during the most recent production year.

Tier I Target Plants:
2009-2010

Name	City	State
Abengoa BioEnergy	Colwich	KS
Arkalon Energy Conestoga, LLC	Liberal	KS
Bonanza Energy Conestoga , LLC	Garden City	KS
East Kansas Agri-Energy, LLC	Garnett	KS
ESE Alcohol	Leoti	KS
Kansas Ethanol, LLC	Lyons	KS
Levelland Hockley County Ethanol, LLC	Levelland	TX
Nesika Energy, LLC	Scandia	KS
Prairie Horizon Agri-Energy, LLC	Phillipsburg	KS
Reeve Agri-Energy	Garden City	KS
Western Plains Energy, LLC	Campus	KS
White Energy (HE)	Hereford	TX
White Energy (PL)	Plainview	TX
White Energy (RU)	Russell	KS

Below is the Tier I target ethanol plant spreadsheet, reporting current blends of corn/grain sorghum and the corresponding grain demand for the upcoming year. Please note the names of the plants below have been removed for confidentiality purposes and do not correspond to the list above reported in alphabetic order.

TIER I Targets
2009-2010

Name	Name Plate	Actual	Corn	Milo	Bu Corn	Bu Milo	Total
Plant 1		35	90%	10%	11,250,000	1,250,000	12,500,000
Plant 2		40	60%	40%	8,571,429	5,714,286	14,285,714
Plant 3		12	10%	90%	428,571	3,857,143	4,285,714
Plant 4		25	0%	100%	-	8,928,571	8,928,571
Plant 5		55	20%	70%	3,928,571	15,714,286	19,642,857
Plant 6		1.5	70%	30%	375,000	160,714	535,714
Plant 7		110	50%	50%	19,642,857	19,642,857	39,285,714
Plant 8		40	0%	100%	-	14,285,714	14,285,714
Plant 9		60	70%	30%	27,500,000	11,785,714	39,285,714
Plant 10		10	70%	30%	2,500,000	1,071,429	3,571,429
Plant 11		55	20%	80%	3,928,571	15,714,286	19,642,857
Plant 12		100	70%	30%	25,000,000	10,714,286	35,714,286
Plant 13		55	50%	50%	9,821,429	9,821,429	19,642,857
Plant 14		45	40%	60%	6,428,571	9,642,857	16,071,429
Total	**693.5**	643.5					247,678,571
Average Corn Inclusion Rate			48%		119,375,000		
Average Milo Inclusion Rate				52%		128,303,571	

While conducting interviews with Tier I targets, AES discovered there is a tremendous amount of misinformation in ethanol about grain sorghum. In a number of cases, plant managers told AES, their local farmers do not see the connection between higher prices to the producer for grain marketed directly to the plant versus grain marketed directly to the elevator. By not understanding the market dynamics, a disincentive exists to produce additional grain sorghum. According to one plant manager, “They just don’t see any added value coming directly to the plant first.” This caused producers to consider alternatives to grain sorghum for their cropping needs for the next production year.

2.1.3.2 TIER II Ethanol Plants

There are 34 ethanol plants in the designated Tier II area and eight (8) of those plants are owned by large corporate entities or grain companies. These plants reside in Nebraska, Missouri, Colorado and Arizona.

Tier II ethanol plants, as a rule, responded only to our telephone interviews. Excluding the eight (8) large corporate plants there are 26 plants that fit into this category as prime two targets. Of these 26 remaining plants, only six (6) plants told AES they used grain sorghum this past year and they all agreed they would switch to a blend again if prices got as out of line as they have been during the past two years; corn however is the preferred starch source in all of these plants. These six plants did not agree to complete the survey and would not give price or logistical data.

Tier II Target Plants

Name	City	State
Abengoa Bioenergy	Ravenna	NE
Abengoa Bioenergy	York	NE
Advanced Bioenergy	Fairmont	NE
AGP	Hastings	NE
ADM	Columbus	NE
Aventine	Aurora	NE
Biofuel Energy - Pioneer Trail Energy, LLC *Cargil*	Wood River	NE
Bridgeport Ethanol	Bridgeport	NE
Cargil, Inc	Blair	NE
Chief Ethanol	Hastings	NE
Cornhusker Energy Lexington, LLC	Lexington	NE
E Energy Adams, LLC	Adams	NE
Front Range Energy, LLC	Windsor	CO
Golden Traingle Energy, LLC	Craig	MO
Green Plains Renewable Energy	Central City	NE
Green Plains Renewable Energy	Ord	NE
Husker Ag, LLC	Plainview	NE
Kappa Energy	Minden	NE
Lifeline Foods	St Joseph	MO
Louis Dreyfus	Norfolk	NE
Merrick & Company	Aurura	CO
Mid America Agri Products/Wheatland	Madrid	NE
Mid-Missouri Energy, LLC	Malta Bend	MO
Midwest Renewable Energy, LLC	Sutherland	NE
NEDAK Ethanol	Atkinson	NE
Pinal Energy, LLC	Maricopa	AZ
Poet Biorefining	Laddonia	MO
Poet Biorefining	Macon	MO

Show Me Ethanol	Carrollton	MO
Siouxland Ethanol, LLC	Jackson	NE
Sterling Ethanol, LLC	Sterling	CO
Trenton Agri-Products, LLC	Trenton	NE
Valero	Albion	NE
Yuma Ethanol	Yuma	CO

2.2 The Survey

Based upon the deliverables requested in the study outline from USCP, AES developed a set of survey questions that would help define certain variables that were identified as necessary to determine who uses grain sorghum, how much is used and so on. In early August, AES canvassed a small number of facilities and USCP staff to seek input on appropriate questions.

Below are the questions from the survey that was mailed to each of the Tier I and Tier II facilities. It was also used as the base document for telephone interviews. Below are the questions asked in the survey:

1. What is your position at the plant?
2. When did your plant first come on line?
3. Who was your design builder?
4. What is your nameplate production level?
5. What is your most recent monthly production level?
6. Does your plant co-generate power or steam?
7. Is there anything unique to your plant?
8. What starch source do you primarily use?
9. If corn is your primary starch source, do you ever use grain sorghum (milo)?
10. If you use milo, what is the primary consideration for using milo? (Price, Protein, Availability)
11. When you use milo, how often does price become a consideration?
12. Has anyone explained the added protein value to your distiller's grain with milo?
13. If you use milo, do you buy it locally and have it delivered by truck?
14. If you buy it locally, how far do you go to make a purchase? (50, 75, 100 miles)
15. Have you ever had milo delivered by train?
16. If you use milo, is there a clear and traceable basis with which to set your price?
17. What is your local sorghum basis?
18. How do you buy your sorghum? (Farmer direct, Grain Brokers, Co-op's, etc)
19. If you buy from farmers do you offer production contracts or some other form of contract?
20. Are you willing to serve on an advisory panel with USCP for ethanol and distiller's grains?
21. Have you ever considered buying group purchases or a pool?
22. Would you like to have a member of the United Sorghum Checkoff Program (USCP) contact you regarding the benefits of using grain sorghum to produce ethanol?
23. Would you like to have a member of USCP contact you regarding information on cellulosic sorghums?
24. Is there an issue you would like USCP to look into for you?

Additionally, AES discovered it was necessary to offer some anonymity to the survey process, so certain confidential information is not advanced to competitors. In an effort to secure agreement to answer our surveys, AES sent a cover letter to each of the plants defining our purpose. It is included under Attachments.

While conducting interviews, it became obvious from many of the respondents, there is significant misunderstanding regarding grain sorghum in ethanol. The anecdotal comments below will show just how much misunderstanding there really is. Below is a compilation of all comments gathered from survey participants.

Comments:

1. There is no value to using sorghum instead of corn. We spend $30,000 to $40,000 extra per month on different enzymes when we use sorghum so there is no economic advantage as a matter of fact, it cost us more money.
2. Sorghum is too hard on our plant. Sorghum is supposed to cut life in half on our hammer mill.
3. Red or dark distillers grain is burned and not as good a feed product.
4. Corn promotes ethanol sorghum does not.
5. Sorghum varies too much in starch and protein.
6. Sorghum only yields 1/3 what corn does.
7. All sorghums have tannins
8. Sorghum needs hybrids like corn
9. Sorghum has no story
10. USCP needs to promote sorghum for ethanol, if there really were advantages, I feel quite sure they would be promoting them
11. We prefer sorghum to corn, even if it is better for the distillers
12. There is not a consistent supply
13. Too much competition for export
14. Rail rates from Central Kansas to the Panhandle of Texas are the same as to the Gulf.
15. Sorghum needs to tell a story
16. No educational effort to the farmers about ethanol and to the ethanol plants about sorghum
17. Why do nutritionists dislike sorghum vs corn distillers
18. Sorghum needs a story
19. Very inconsistent supply.
20. Grain Merchants use sorghum as a trading tool and farmers don’t benefit when this happens
21. We battle the milo problems alone
22. Supply is an issue for such a small crop
23. More research on the benefits to grain sorghum distiller’s grain
24. We must discount our DDG and WDG more with cattle feeders than we do with dairies
25. Price is not the only advantage, protein is as well
26. Dairy’s like the sorghum distillers better than corn because of protein
27. Feed yards discount our distillers when we use milo
28. Dairies see value in WDG from our plant more than corn or our DDG
29. Cattle feeders like the DDG’s better than the WDG as they blend the feed

2.3 Economic Impact

Those farmers who either contracted directly or planned their harvest to hit the scales in early fall at the ethanol plant, saw the highest prices of the year for their grain sorghum and received prices that caused the local basis to narrow significantly.

During my interview with the general manager of an ethanol plant, AES was told the plant was offering "Option Premium" pricing for any milo brought in until the 16th of October. Normal practice would have offered December basis pricing at $4.65 cwt for new crop delivered, but this plant was able to offer $6.00 cwt and received a significant amount of new crop grain sorghum. There were ten (10) transactions that received this price; they received the highest price for their grain sorghum of this season and narrowed the basis significantly.

One of the farmers who participated in this early marketing program said he practices crop rotation with his cotton and his grain sorghum. The past two years have proven very successful for this practice as his cotton benefits from the crop residue left from the grain sorghum and his grain sorghum benefits from being planted on better land and the carefully planned water he applies. This year the producer decided to plant his grain sorghum earlier than normal; soil temps were right so he planted in April to take advantage of spring rains and more predictable heat units in the middle of the summer. His grain sorghum was ready to harvest right after Labor Day and the $1.35/cwt ($.76/Bu) extra he received, due to well timed marketing for his grain, went straight to his bottom line.

This "market timing" worked well for the ethanol plant and the farmer. By planting early and harvesting early the farmer gained a greater price and captured a greater share of the basis. The ethanol plant won as well, for in a time when supply was nearly non-existent, the farmer was able to bridge the gap before harvest started in earnest.

Below is a spreadsheet demonstrating volumes and price received during this "Market Timing" program:

Farmer	Volume/BU	Futures Price	Market Price	Price Received	Difference	Value Added
1	106,500	$3.00	$2.60	$3.36	$0.76	$80,940.00
2	52,000	$3.00	$2.60	$3.36	$0.76	$39,520.00
3	71,000	$3.00	$2.60	$3.36	$0.76	$53,960.00
4	77,500	$3.00	$2.60	$3.36	$0.76	$58,900.00
5	26,200	$3.00	$2.60	$3.36	$0.76	$19,912.00
6	24,330	$3.00	$2.60	$3.36	$0.76	$18,490.80
7	312,120	$3.00	$2.60	$3.36	$0.76	$237,211.20
8	202,125	$3.00	$2.60	$3.36	$0.76	$153,615.00
9	334,560	$3.00	$2.60	$3.36	$0.76	$254,265.60
10	123,895	$3.00	$2.60	$3.36	$0.76	$94,160.20
	1,330,230					$1,010,974.80

Grain sorghum traditionally trades up to 90 cents discount to than corn on a bushel basis in this market. Because the ethanol plant had a significant immediate need for grain and because there was not sufficient supply to satisfy their need at the end of the crop year, this ethanol plant offered a special price to producers as an incentive for timing their harvest when the plant would experience their most critical supply need. The ethanol plant narrowed the sorghum discount from 90 to 76 cents and gave it all back to the farmer. This incentive brought over $1 million back to the ten farmers who were able to deliver their new crop grain. An interesting side note is this production would bridge the gap from old crop to new crop and last only one (1) month.

Using market timing as a blueprint for developing farmer direct contracts or promotions will definitely narrow local basis opportunities for grain sorghum producers and provide the incentive producers need to add back acreage to this important crop.

2.3.1 Price & Basis

AES gathered basis data from each of the 14 plants in Tier I. Basis range for corn was from + 15 cents to -41 cents to the board. Grain sorghum ranged from -35 cents to – 83 cents. Grain sorghum discount to local corn ranged from – 30 cents to – 57 cents. The average grain sorghum discount to corn was -43 cents. This is in line with expectations. Below is the chart of responses and local cash prices with basis:

Plant	Reported Basis	Basis Range	Cash Corn to the Board	Cash Milo to the Board	Basis Discount to corn
1	No Idea	?	$ (0.30)	$ (0.60)	$ (0.30)
2	$ (0.60)	-60	$ (0.41)	$ (0.83)	$ (0.42)
3	$ (0.55)	-40 to -70	$ 0.08	$ (0.45)	$ (0.53)
4	$ (0.20)	0 to -40	$ 0.05	$ (0.35)	$ (0.40)
5	$ (0.15)	0 to -30	$ 0.05	$ (0.35)	$ (0.40)
6	No Idea	?	$ 0.05	$ (0.35)	$ (0.40)
7	$ (0.40)	-40	$ 0.08	$ (0.45)	$ (0.53)
8	$ (0.45)	0 to - 90	$ 0.08	$ (0.40)	$ (0.48)
9	$ (0.65)	-40 to -90	$ 0.15	$ (0.42)	$ (0.57)
10	$ (0.50)	-50	$ (0.30)	$ (0.60)	$ (0.30)
11	$ (0.30)	-10 to -50	$ 0.05	$ (0.35)	$ (0.40)
12	$ (0.55)	-40 to -70	$ 0.15	$ (0.40)	$ (0.55)
13	$ (0.40)	-40	$ (0.30)	$ (0.60)	$ (0.30)
14	$ (0.35)	-35	$ (0.41)	$ (0.83)	$ (0.42)
	$ (5.10)		$ (0.98)	$ (6.98)	$ (6.00)
Average Basis	$ (0.43)		$ (0.07)	$ (0.50)	$ (0.43)

It is interesting to see that each of the plants in Tier I reported an average price to the plant equal to the price reported in the cash markets. The basis relationships show an interesting trend as well. With the key applied to these numbers, it appears that the ethanol plants that reside in close proximity to large cattle feeding areas saw the deepest discounted prices for grain sorghum. Of those plants in areas away from cattle feeding, the basis tends to narrow significantly.

Applying anecdotal comments to price for distillers grain as well, those plants closest to C.A.F.O. cattle feeding areas also had to discount their DDG and WDG more than those that were situated away from cattle feeding. According to one respondent, dairies helped build back some of the feedlot discounts for DDG and WDG forced on ethanol marketers.

The following spreadsheet represents added revenues to the 10 farmers who were able to market their new crop grain early to the ethanol plant. We converted the CWT price to BU price. $4.65 = $2.60 and $6.00 = $3.36 for ease of comparison. Notice the production volumes and the value added to each transaction.

2.4 Transportation and Logistics

After canvassing each ethanol plant in Tier I and several of those in Tier II, AES discovered nearly every bushel currently being delivered is by truck. Only one facility reported receiving grain by train however only 10% of their grain needs have come on the rail.

There are several facilities that are considering their rail options, but for current needs 13 of 14 ethanol plants in Tier I receive their grain by truck only.

The ethanol plants in Tier I reported going an average of 75 miles from the plant to procure their grain. The range of miles was from 15 miles to 120 miles. As these plants continue to mature in the market, their rail options will develop rather dramatically given the shortline railroad’s desire to build new business, according to Bruce Carswell, General Manager of Permian Basin Railways, and a division of Iowa Pacific; especially if grain sorghum’s production in Texas keeps its current trend.

2.5 How Grain Sorghum Purchased

According to the AES survey, only four of fourteen Tier I ethanol plants reported price being their primary consideration when purchasing the starch source to produce ethanol. Four plants reported availability of grain sorghum was their primary consideration and six reported price and availability together were their primary consideration. This is significantly different than the responses we expected to hear. All of the Tier II ethanol plants interviewed reported price and price alone as their primary consideration if and when they used grain sorghum.

The methods of procuring grain sorghum in Tier I ethanol plants were much more in line with expectations. Two (2) plants reported broker grain only, one (1) reported cooperative only grain and the remaining eleven (11) reported through the survey they purchased farmer direct grain, cooperative supplied grain and merchant direct grain for their starch requirement.

Two (2) of the plants in Tier I reported using a producer direct contract, though they all were interested in finding a more workable contract and none had considered a pool option. Most were more cautious of the pool option than any other option. Most reported buying producer grain at harvest primarily and this theme followed through the tier.

2.6 Grain Sorghum Effects on Ethanol & Distiller's Grain

All fourteen Tier I ethanol plants and three of the Tier II plants that reported using grain sorghum as a starch source said grain sorghum's additional extrinsic costs were minimal, many see no difference at all between corn and grain sorghum. Extrinsic costs included additional screens, small increases for enzyme adjustments and all reported grain sorghum is definitely harder on their hammer mills. This was expected within Tier I where as Tier II plants saw this as more of a problem.

One plant reported spending as much as $30,000 to $40,000 more per month for enzymes with grain sorghum vs corn. Upon follow-up with the other Tier I plants, none saw much of a change with grain sorghum at all. Concerned about this response from the one (1) plant, AES followed-up with ICM to see if there was anything to this response and they were as baffled as AES. Other ethanol plant managers were baffled as well. Consider this discounted as incorrect, however this plant manager needs to be educated as well about grain sorghum and the costs involved quickly.

The plant managers and the marketers selling distiller's grain were unanimous in their concern over, both the color of the distiller's grain and the value of the product. They mentioned this response came primarily from feedlot buyers and some dairy's. All plants reported receiving discounted bids to purchase their distiller's grain if it included grain sorghum. Some because grain sorghum reports a lesser feeding value for the grain itself and some because they were aware grain sorghum cost the plant less than corn and they wanted to participate in the savings; once again, not understanding the intrinsic value of grain sorghum in this essential animal feed.

Each of the plants requested in the survey, USCP or some other entity needs to create an educational program and some tools to assist nutritionists and feed buyers about the misunderstandings surrounding grain sorghum in distiller's grain. This way we can categorize potential negatives to misunderstandings & replace many of these as positives.

Distiller's grain prices for both wet and dry have been on a roller coaster lately. According to each of the respondents in Tier I, prices have ranged from $100 to $130 per ton for Dry Distiller's grain while the prices for Wet Distiller's grain pricing ranged from $27 to $60 per ton.

According to the respondents to our survey, prices have dropped rather dramatically for the wet product. Revenue restrictions in the dairy industry have forced prices down lately to the low $30 range. Each of the plants responding requested we not report prices for their distiller's product, so we have only reported price ranges.

2.7 S.W.O.T Analysis

2.7.1 Strengths

Certain strengths must be identified. They are:

1. Grain Sorghum offers a lower cost alternative to high priced corn for manufacturing ethanol, similar output rates of production
2. Distillers Grains from grain sorghum offer higher protein rates than corn
3. Input costs for producing grain sorghum are much lower than corn
4. Grain sorghum takes less water to produce than does corn and can be produced on more marginal lands
5. There is no yield drag when placed in a rotation program with cotton, using existing irrigation systems. Grain sorghum can yield equal to corn on the same acreage.
6. Sweet sorghum can be used to produce ethanol from a cellulosic source
7. Market timing allows the producers of grain sorghum to find pockets of profit, not previously available
8. Protein values for distillers grain primarily in dairy markets

2.7.2 Weaknesses

Recognizing the weaknesses of sorghum will allow USCP to avoid pitfalls and help direct efforts to properly educate producers of ethanol and grain sorghum about this product.

1. Grain sorghum has a limited consumer awareness and no marketing image
2. Grain sorghum is little recognized for it's benefits other than low cost
3. Grain sorghum production in the US does not meet with its demand potential
4. Sorghum is one of the most misunderstood major crops in the US.
5. Ethanol producers do not understand why grain sorghum is mot marketed properly to this industry

2.7.3 Opportunities

Opportunities for all types of sorghum exist today and are developing rapidly. Herein lays the focus for existing market expansion and new market development.

1. Grain based ethanol plants in areas where grain sorghum is being or can be grown need this crop because of its price differential and availability
2. Opportunities for non-corn based biofuels fits current US policy to reduce our dependence on foreign oil and gasoline with no impact on food supplies
3. New markets for sorghum traits need to be evaluated and resources brought forth to facilitate infrastructure development
4. There is a great need for a comprehensive education program for grain sorghum producers who market into ethanol markets and for ethanol marketers who purchase grain sorghum

2.7.4 Threats

Threats posed to sorghum can cause irreparable damage to marketing efforts. We have seen the damage "no market presence" has caused and how slotting grain sorghum as an inferior grain for animal feeding or ethanol production has caused the efforts to increase production.

1. Limited market identity associated with the crop

2. Grain sorghum's anonymity can bring down non-grain based potential for sorghum
3. Incorrect knowledge threatens to limit production due to misunderstandings about the crop
4. Limited grain sorghum supply and production in Texas
5. No focus on grain sorghum's benefits in ethanol turns USCP away from its task
6. Not addressing color, production issues and nutritional value of grain sorghum into ethanol.

3.0 Conclusion

The primary motivation for this study was the desire of the USCP to increase consumption of grain sorghum in the ethanol industry of 50% by 2011. In order to meet this goal, AES divided the 202 producing ethanol production biorefineries into three (3) separate tiers according to the state where they produce. Tier I covers those plants in Kansas and Texas, Tier II covers those plants in Nebraska, Colorado, Arizona and Missouri and Tier III covers all other states. AES also identified eight (8) key market variables that were not previously understood by either the grain sorghum industry or the ethanol industry. They are:

1. Grain sorghum has limited identity in the ethanol industry other than in the Tier I primary markets of Kansas and Texas and a couple of outliers in Nebraska and Arizona.
2. Tier I ethanol plants actually consume more bushels of grain sorghum than is reported.
3. Grain sorghum production has not been positively effected by growth of the ethanol industry whereas corn continues to feed off its growth.
4. Export competition has had a negative effect on the ethanol plants purchasing grain sorghum, primarily due to far more limited supplies of grain sorghum produced in the United States and merchant pricing activities.
5. Basis levels are predictable, even though consumption of grain sorghum by ethanol was far greater than was reported by most sources including NASS and the agriculture news media, basis numbers were exactly in line with expectations, though ranges varied far more.
6. Transportation variables in rail transportation pose a barrier to trade in the Panhandle of Texas and SW Kansas.
7. There are value-added opportunities for producers of grain sorghum when they work directly with a local ethanol plant resulting in increased local production and increased profit per bushel as well.
8. Grain sorghum has little market identity carrying value back to the producer of grain sorghum or the manufacturer of ethanol. This resulted in a need to develop an education program to build bigger markets for grain sorghum.

There is simply very little market identity for grain sorghum. The value of this great crop is not recognized by the ethanol industry nor is by the public as a whole. Issues misunderstood with grain sorghum remain color, inclusion of tannins, inferior distillers grain and inaccurate production figures. These and more, build barriers to the market and hinder grain sorghum's success, even though this information is incorrect.

Tier I ethanol plants represent a consistent market place with room to consume far more bushels of grain sorghum than are currently being produced. When compared with the data reported to the Renewable Fuels Association, (RFA) AES discovered a significantly higher number of ethanol plants use grain sorghum in conjunction with corn to produce ethanol than is reported on their website. According to www.ethanolrfa.org only four (4) ethanol biorefineries use some percentage of grain sorghum to produce ethanol in the entire United States. AES discovered in Teir I alone, none of the 14 producing ethanol plants in Kansas and Texas use corn only. Every one of these plants uses some percentage of grain sorghum as a starch source; as a matter of fact two (2) of the plants in this area reported consuming grain sorghum only. This is a concern.

Grain sorghum has not kept up with the demand for bushels for ethanol, like corn has on a national basis. Grain sorghum production is declining and has not been connected to the growth of the ethanol industry. Serious efforts need to be made to publically connect grain sorghum back into this growth market.

Export competition was mentioned numerous times in the survey responses. Upon late follow-up with survey participants, AES believes now this perceived negative impact to the ethanol industry is correcting its self somewhat. Merchant activities now fall more in line with larger volume markets like corn and soybeans, as the demand for grain sorghum grows under the radar screen. Merchants in several cases were pitting the ethanol markets against the export markets and neither the farmer nor the ethanol plants were benefitting; especially in the restrictively high margin markets we just experienced in ethanol these past 18 months. AES believes the best way to keep this from happening again is to develop the educational plan discussed previously, create a new market identity for grain sorghum and increase US and state production of grain sorghum.

Basis levels for grain sorghum remain predictable as competition and the feed value of the raw grain still play a disproportionately negative role in keeping prices down. Education will alleviate this, though strong nutritionist support will need to be gained. The average sorghum discount to corn is -43 cents in the Tier I markets and AES believes there is room here due to the extreme range in basis values reported.

Transportation variables remain predictable in trucking and terribly inconsistent in rail markets for delivering grain. AES discovered market anomalies exist in transporting grain sorghum from Central Kansas to the South Plains of Texas. The rail fee for this short haul is the same as the fee from Central Kansas to the Gulf of Mexico. This creates an artificial barrier to trade where supply is more consistent. Demand has had no impact on this transportation variable. AES believes this has become a volume issue for the railroads.

AES discovered price is not the only market variable driving grain sorghum in the ethanol market. Availability plays an equally important role in driving success for grain sorghum in ethanol. Of the plants responding in the survey AES encouraged that there are several pockets of success that can be copied throughout the ethanol market place. AES reported above in section "2.3.1 Price and Basis", several producers of grain sorghum participated in a program that not only gathered large production for the ethanol plant, the producers received prices significantly higher than the current market and this was due to “market timed” demand for this crop.

There is a strong need for education programs to be developed by USCP to address the inaccuracies and remove any artificial barriers that exist for grain sorghum. Education about grain sorghum for the ethanol plant merchandisers and education about ethanol for the grain sorghum producers is desperately needed. By creating these education programs, marketers of distiller’s grains as well can build stronger more reliable markets feeding dairy cattle and feedlot cattle. This is the most important issue facing USCP today.

AES suggests a two (2) pronged approach to reidentifying grain sorghum as a major contributor in the ethanol market. One, hire an ethanol marketing specialist and two, develop a marketing plan and education program for the industry and USCP producers.

USCP must hire an ethanol specialist to represent grain sorghum in the ethanol industry within all three (3) tier markets. Too many comments regarding market identity and sorghum’s absence make this a priority. The ethanol marketing specialist should develop a “Territory Operating Plan (TOP) that allows at least quarterly face-to-face contact with each of the Tier I ethanol plants and establish at lease monthly verbal contact as well. This allows the ethanol plant to benefit from having on site a specialist who can work with nutritionists, ethanol marketers and grain marketers.

Secondly USCP must develop a new educational program that helps develop a new comprehensive market identity for grain sorghum in ethanol. Leave behind marketing pieces including visual aids and market research should be included. Lack of education regarding grain sorghum in ethanol was the number one concern expressed by the respondents of the survey. USCP can correct any misunderstandings and develop a productive new model for including grain sorghum in ethanol. AES believes it can fulfill this need for USCP immediately, as it already has relationships with the entire Tier I ethanol group in USCP’s primary market and most of Tier II group as well.

ATTACHMENTS:

Survey Questions on Starch Sources for Ethanol Production

Plant

Your Plant Name Here

1. What is your position at the plant?
2. When did your plant first come on line?
3. Who was your design builder?
4. What is your nameplate production level?
5. What is your most recent monthly production level?
6. Does your plant co-generate power or steam?
7. Is there anything unique to your plant?

Starch Source

8. What starch source do you primarily use?
9. If corn is your primary starch source, do you ever use grain sorghum (milo)?
   (If you don not use milo, skip to question #18)

Grain Sorghum / Milo

10. If you use milo, what is the primary consideration for using milo? (Price, Protein, Availability)
11. When you use milo, how often does price become a consideration?
12. Has anyone explained the added protein value to your distiller's grain with milo?
13. If you use milo, do you buy it locally and have it delivered by truck?
14. If you buy it locally, how far do you go to make a purchase? (50, 75, 100 miles)
15. Have you ever had milo delivered by train?
16. If you use milo, is there a clear and traceable basis with which to set your price?
17. What is your local sorghum basis?
18. How do you buy your sorghum? (Farmer direct, Grain Brokers, Co-op's, etc)
19. If you buy from farmers do you offer production contracts or some other form of contract?

General information

20. Are you willing to serve on an advisory panel with USCP for ethanol and distiller's grains?
21. Have you ever considered buying group purchases or a pool?
22. Would you like to have a member of the United Sorghum Checkoff Program (USCP) contact you regarding the benefits of using grain sorghum to produce ethanol?
23. Would you like to have a member of USCP contact you regarding information on cellulosic sorghums?
24. Is there an issue you would like USCP to look into for you?

August 25, 2009

Dear Sir:

On behalf of the United Sorghum Checkoff Program (USCP), I am sending you the enclosed survey on grain sorghum usage in ethanol. The purpose of this survey will be to assist USCP in their understanding of the volume of grain sorghum used, logistics in locating and transporting supply and other factors that contribute to including grain sorghum as a starch source to produce ethanol in the United States.

If you agree to answer the attached survey, we will keep your information confidential and will not share your specific answers to our questions. Each ethanol plant will be assigned a number that does not correspond to any specific geographic region, thereby insuring confidentiality. Your information will be complied with other plants and reported as a whole. No specific information will be made available to USCP, its members, or any other group at any time. The key for the plant numbers and the individual responses will be kept at the office of Agri-Energy Solutions, Inc, in a secure file.

Once each ethanol plant is contacted, we will have a better idea of the contributing factors you find important to use grain sorghum in ethanol production. We intend to determine the level of knowledge about grain sorghum benefits in ethanol production and hope to find pockets of grain sorghum production that can be directed to ethanol plants that will use it.

In advance Tim, we want to thank you for your participation in our survey and hope this exercise brings value back to your plant.

If you have any questions, please feel free to call me at my office or my cell (806) 441-7721.

Sincerely,

Tim Snyder, President
5101 80th Street, Suite #4
Lubbock, Texas 79424
(806) 794-7800 office
(806) 794-7804) fax
tim@agri-energysolutions.com

BIOREFINERY LOCATIONS

Currently Operational

Under Construction

U.S. FUEL ETHANOL INDUSTRY BIOREFINERIES AND CAPACITY

Company	Location	Feedstock	Nameplate Capacity (mgy)	Operating Production (mgy)	Under Construction / Expansion Capacity (mgy)
Abengoa Bioenergy Corp. (Total)			198.0	168.0	176.0
Abengoa Bioenergy Corp.	Madison, IL	corn			
Abengoa Bioenergy Corp.	Mt. Vernon, IN	corn			
Abengoa Bioenergy Corp.	Colwich, KS	corn/milo			
Abengoa Bioenergy Corp.	Ravenna, NE	Corn			
Abengoa Bioenergy Corp.	York, NE	Corn			
Abengoa Bioenergy Corp.	Portales, NM	corn			
Absolute Energy, LLC*	St. Ansgar, IA	Corn	100.0	100.0	
ACE Ethanol, LLC	Stanley, WI	Corn	41.0	41.0	
Adkins Energy, LLC*	Lena, IL	Corn	40.0	40.0	
Advanced Bioenergy, LLC	Fairmont, NE	Corn	100.0	100.0	
Ag Energy Resources, Inc.	Benton, IL	corn			5.0
AGP*	Hastings, NE	Corn	52.0	52.0	
Agri-Energy, LLC*	Luverne, MN	Corn	21.0	21.0	
Al-Corn Clean Fuel*	Claremont, MN	Corn	42.0	42.0	
Alchem Ltd. LLP	Grafton, ND	Corn	10.0		
AltraBiofuels Coshocton Ethanol, LLC	Coshocton, OH	corn	60.0		
AltraBiofuels Indiana, LLC	Cloverdale, IN	corn	92.0		
AltraBiofuels Phoenix Bio Industries, LLC	Goshen, CA	Corn	31.5	31.5	
Amaizing Energy, LLC*	Atlantic, IA	Corn	110.0	110.0	
Amaizing Energy, LLC*	Denison, IA	Corn	48.0	48.0	
Appomattox Bio Energy	Hopewell, VA	corn			65.0
Archer Daniels Midland			1,070.0	1,070.0	550.0

(Total)					
Archer Daniels Midland	Cedar Rapids, IA	Corn			
Archer Daniels Midland	Clinton, IA	Corn			
Archer Daniels Midland	Decatur, IL	Corn			
Archer Daniels Midland	Peoria, IL	Corn			
Archer Daniels Midland	Marshall, MN	Corn			
Archer Daniels Midland	Wallhalla, ND	Corn/barley			
Archer Daniels Midland	Columbus, NE	Corn			
Arkalon Energy, LLC	Liberal, KS	Corn	110.0	110.0	
Aventine Renewable Energy, LLC (Total)			207.0	207.0	
Aventine Renewable Energy, LLC	Pekin, IL	Corn			
Aventine Renewable Energy, LLC	Aurora, NE	Corn			
Badger State Ethanol, LLC*	Monroe, WI	Corn	48.0	48.0	
Big River Resources Galva, LLC	Galva, IL	corn	100.0	100.0	
Big River Resources, LLC*	West Burlington, IA	Corn	92.0	92.0	
Big River United Energy	Dyersville, IA	corn	110.0		
BioFuel Energy - Buffalo Lake Energy, LLC	Fairmont, MN	Corn	115.0	115.0	
BioFuel Energy - Pioneer Trail Energy, LLC	Wood River, NE	Corn	115.0	115.0	
Bional Clearfield	Clearfield, PA	Corn			110.0
Blue Flint Ethanol	Underwood, ND	Corn	50.0	50.0	
Bonanza Energy, LLC	Garden City, KS	Corn/milo	55.0	55.0	
Bridgeport Ethanol	Bridgeport, NE	corn	54.0	54.0	
Bunge-Ergon Vicksburg	Vicksburg, MS	corn	54.0	54.0	
Bushmills Ethanol, Inc.*	Atwater, MN	Corn	50.0	50.0	
Calgren Renewable Fuels, LLC	Pixley, CA	Corn	55.0		
Carbon Green Bioenergy	Lake Odessa, MI	Corn	50.0		
Cardinal Ethanol	Union City, IN	Corn	100.0	100.0	
Cargill, Inc.	Eddyville, IA	Corn	35.0	35.0	
Cargill, Inc.	Blair, NE	Corn	85.0	85.0	
Cascade Grain	Clatskanie, OR	Corn	108.0		
Castle Rock Renewable Fuels, LLC	Necedah, WI	Corn	50.0	50.0	
Center Ethanol Company	Sauget, IL	Corn	54.0	54.0	

Central Indiana Ethanol, LLC	Marion, IN	Corn	40.0	40.0	
Central MN Ethanol Coop*	Little Falls, MN	Corn	21.5	21.5	
Chief Ethanol	Hastings, NE	Corn	62.0	62.0	
Chippewa Valley Ethanol Co.*	Benson, MN	Corn	45.0	45.0	
Cilion Ethanol	Keyes, CA	Corn			50.0
Clean Burn Fuels, LLC	Raeford, NC	Corn			60.0
Commonwealth Agri-Energy, LLC*	Hopkinsville, KY	Corn	33.0	33.0	
Corn Plus, LLP*	Winnebago, MN	Corn	44.0	44.0	
Corn, LP*	Goldfield, IA	Corn	55.0	55.0	
Cornhusker Energy Lexington, LLC	Lexington, NE	Corn	40.0	40.0	
Dakota Ethanol, LLC*	Wentworth, SD	Corn	50.0	50.0	
DENCO, LLC	Morris, MN	Corn	24.0		
Didion Ethanol	Cambria, WI	Corn	40.0	40.0	
E Caruso (Goodland Energy Center)	Goodland, KS	Corn			20.0
E Energy Adams, LLC	Adams, NE	Corn	50.0	50.0	
E3 Biofuels	Mead, NE	corn	25.0		
East Kansas Agri-Energy, LLC*	Garnett, KS	Corn	35.0	35.0	
ESE Alcohol Inc.	Leoti, KS	Seed corn	1.5	1.5	
Front Range Energy, LLC	Windsor, CO	Corn	40.0	40.0	
Gateway Ethanol	Pratt, KS	Corn	55.0		
Glacial Lakes Energy, LLC - Mina	Mina, SD	corn	107.0	107.0	
Glacial Lakes Energy, LLC*	Watertown, SD	Corn	100.0	100.0	
Global Ethanol/Midwest Grain Processors	Lakota, IA	Corn	97.0	97.0	
Global Ethanol/Midwest Grain Processors	Riga, MI	Corn	57.0	57.0	
Golden Cheese Company of California*	Corona, CA	Cheese whey	5.0	5.0	
Golden Grain Energy, LLC*	Mason City, IA	Corn	115.0	115.0	
Golden Triangle Energy, LLC*	Craig, MO	Corn	20.0	20.0	
Grain Processing Corp.	Muscatine, IA	Corn	20.0	20.0	
Granite Falls Energy, LLC*	Granite Falls, MN	Corn	52.0	52.0	
Greater Ohio Ethanol, LLC	Lima, OH	Corn	54.0		
Green Plains Renewable Energy	Shenandoah, IA	Corn	55.0	55.0	

Green Plains Renewable Energy	Superior, IA	Corn	55.0	55.0	
Green Plains Renewable Energy	Bluffton, IN	Corn	110.0	110.0	
Green Plains Renewable Energy	Central City, NE	corn	100.0	100.0	
Green Plains Renewable Energy	Ord, NE	Corn	50.0	50.0	
Green Plains Renewable Energy	Obion, TN	Corn	110.0	110.0	
Guardian Energy	Janesville, MN	corn	110.0	110.0	
Hankinson Renewable Energy, LLC	Hankinson, ND	corn	110.0	110.0	
Hawkeye Renewables, LLC	Fairbank, IA	Corn	120.0	120.0	
Hawkeye Renewables, LLC	Iowa Falls, IA	Corn	105.0	105.0	
Hawkeye Renewables, LLC	Menlo, IA	Corn	110.0	110.0	
Hawkeye Renewables, LLC	Shell Rock, IA	Corn	110.0	110.0	
Heartland Corn Products*	Winthrop, MN	Corn	100.0	100.0	
Heartland Grain Fuels, LP	Aberdeen, SD	Corn	50.0	50.0	
Heartland Grain Fuels, LP	Huron, SD	Corn	32.0	32.0	33.0
Heron Lake BioEnergy, LLC	Heron Lake, MN	Corn	50.0	50.0	
Highwater Ethanol LLC	Lamberton, MN	Corn	55.0	55.0	
Homeland Energy	New Hampton, IA	Corn	100.0	100.0	
Husker Ag, LLC*	Plainview, NE	Corn	75.0	75.0	
Idaho Ethanol Processing	Caldwell, ID	Potato Waste	4.0	4.0	
Illinois River Energy, LLC	Rochelle, IL	Corn	100.0	100.0	
Iroquois Bio-Energy Company, LLC	Rensselaer, IN	corn	40.0	40.0	
KAAPA Ethanol, LLC*	Minden, NE	Corn	40.0	40.0	
Kansas Ethanol, LLC	Lyons, KS	Corn	55.0	55.0	
KL Process Design Group	Upton, WY	Wood waste	1.5	1.5	
Land O' Lakes*	Melrose, MN	Cheese whey	2.6	2.6	
Levelland/Hockley County Ethanol, LLC	Levelland, TX	Corn	40.0	40.0	
Lifeline Foods, LLC	St. Joseph, MO	Corn	40.0	40.0	
Lincolnland Agri-Energy, LLC*	Palestine, IL	Corn	48.0	48.0	
Lincolnway Energy, LLC*	Nevada, IA	Corn	50.0	50.0	
Little Sioux Corn Processors, LP*	Marcus, IA	Corn	92.0	92.0	
Louis Dreyfus Commodities	Grand Junction,	corn	100.0	100.0	

	IA				
Louis Dreyfus Commodities	Norfolk, NE	Corn	45.0	45.0	
Marquis Energy, LLC	Hennepin, IL	Corn	100.0	100.0	
Marysville Ethanol, LLC	Marysville, MI	Corn	50.0	50.0	
Merrick & Company	Aurora, CO	Waste beer	3.0	3.0	
Mid America Agri Products/Horizon	Cambridge, NE	Corn	44.0		
Mid America Agri Products/Wheatland	Madrid, NE	Corn	44.0	44.0	
Mid-Missouri Energy, Inc.*	Malta Bend, MO	Corn	50.0	50.0	
Midwest Renewable Energy, LLC	Sutherland, NE	Corn	25.0	25.0	
Minnesota Energy*	Buffalo Lake, MN	Corn	18.0	18.0	
NEDAK Ethanol	Atkinson, NE	corn	44.0	44.0	
Nesika Energy, LLC	Scandia, KS	corn	10.0	10.0	
New Energy Corp.	South Bend, IN	Corn	102.0	102.0	
North Country Ethanol, LLC*	Rosholt, SD	Corn	20.0	20.0	
NuGen Energy	Marion, SD	corn	110.0	110.0	
One Earth Energy	Gibson City, IL	corn	100.0	100.0	
Otter Tail Ag Enterprises	Fergus Falls, MN	Corn	57.5	57.5	
Pacific Ethanol	Madera, CA	Corn	40.0		
Pacific Ethanol	Stockton, CA	Corn	60.0		
Pacific Ethanol	Burley, ID	Corn	50.0		
Pacific Ethanol	Boardman, OR	Corn	40.0	40.0	
Panda Ethanol	Hereford, TX	Corn/milo			115.0
Parallel Products	Rancho Cucamonga, CA				
Parallel Products	Louisville, KY	Beverage waste	5.4	5.4	
Patriot Renewable Fuels, LLC	Annawan, IL	Corn	100.0	100.0	
Penford Products	Cedar Rapids, IA	Corn	45.0	45.0	
Pinal Energy, LLC	Maricopa, AZ	Corn	55.0	55.0	
Pine Lake Corn Processors, LLC	Steamboat Rock, IA	corn	30.0	30.0	
Platinum Ethanol, LLC*	Arthur, IA	Corn	110.0	110.0	
Plymouth Ethanol, LLC*	Merrill, IA	Corn	50.0	50.0	
POET Biorefining - Alexandria	Alexandria, IN	Corn	68.0	68.0	
POET Biorefining - Ashton	Ashton, IA	Corn	56.0	56.0	

POET Biorefining - Big Stone	Big Stone City, SD	Corn	79.0	79.0	
POET Biorefining - Bingham Lake	Bingham Lake, MN		35.0	35.0	
POET Biorefining - Caro	Caro, MI	Corn	53.0	53.0	5.0
POET Biorefining - Chancellor	Chancellor, SD	Corn	110.0	110.0	
POET Biorefining - Coon Rapids	Coon Rapids, IA	Corn	54.0	54.0	
POET Biorefining - Corning	Corning, IA	Corn	65.0	65.0	
POET Biorefining - Emmetsburg	Emmetsburg, IA	Corn	55.0	55.0	
POET Biorefining - Fostoria	Fostoria, OH	Corn	68.0	68.0	
POET Biorefining - Glenville	Albert Lea, MN	Corn	42.0	42.0	
POET Biorefining - Gowrie	Gowrie, IA	Corn	69.0	69.0	
POET Biorefining - Hanlontown	Hanlontown, IA	Corn	56.0	56.0	
POET Biorefining - Hudson	Hudson, SD	Corn	56.0	56.0	
POET Biorefining - Jewell	Jewell, IA	Corn	69.0	69.0	
POET Biorefining - Laddonia	Laddonia, MO	Corn	50.0	50.0	
POET Biorefining - Lake Crystal	Lake Crystal, MN	Corn	56.0	56.0	
POET Biorefining - Leipsic	Leipsic, OH	Corn	68.0	68.0	
POET Biorefining - Macon	Macon, MO	Corn	46.0	46.0	
POET Biorefining - Marion	Marion, OH	Corn	68.0	68.0	
POET Biorefining - Mitchell	Mitchell, SD	Corn	68.0	68.0	
POET Biorefining - North Manchester	North Manchester, IN	Corn	68.0	68.0	
POET Biorefining - Portland	Portland, IN	Corn	68.0	68.0	
POET Biorefining - Preston	Preston, MN	Corn	46.0	46.0	
POET Biorefining - Scotland	Scotland, SD	Corn	11.0	11.0	
POET Biorefining- Groton	Groton, SD	Corn	53.0	53.0	
Prairie Horizon Agri-Energy, LLC	Phillipsburg, KS	Corn	40.0	40.0	
Quad-County Corn Processors*	Galva, IA	Corn	30.0	30.0	
Range Fuels	Soperton, GA	wood and wood waste			100.0
Red Trail Energy, LLC	Richardton, ND	Corn	50.0	50.0	
Redfield Energy, LLC *	Redfield, SD	Corn	50.0	50.0	
Reeve Agri-Energy	Garden City, KS	Corn/milo	12.0	12.0	

Renew Energy	Jefferson Junction, WI	Corn	130.0	130.0	
Renova Energy	Torrington, WY	Corn	5.0	5.0	
Riverland Biofuels	Canton, IL	corn	37.0	37.0	
Show Me Ethanol	Carrollton, MO	Corn	55.0	55.0	
Siouxland Energy & Livestock Coop*	Sioux Center, IA	Corn	60.0	60.0	
Siouxland Ethanol, LLC	Jackson, NE	Corn	50.0	50.0	
Southwest Georgia Ethanol, LLC	Camilla, GA	Corn	100.0	100.0	
Southwest Iowa Renewable Energy, LLC *	Council Bluffs, IA	Corn	110.0	110.0	
Sterling Ethanol, LLC	Sterling, CO	Corn	42.0	42.0	
Sunoco	Volney, NY	Corn	114.0		
Tate & Lyle	Ft. Dodge, IA	Corn			105.0
Tate & Lyle	Loudon, TN	Corn	67.0	67.0	38.0
Tharaldson Ethanol	Casselton, ND	Corn	110.0	110.0	
The Andersons Albion Ethanol LLC	Albion, MI	Corn	55.0	55.0	
The Andersons Clymers Ethanol, LLC	Clymers, IN	Corn	110.0	110.0	
The Andersons Marathon Ethanol, LLC	Greenville, OH	Corn	110.0	110.0	
Trenton Agri Products, LLC	Trenton, NE	Corn	40.0	40.0	
United Ethanol	Milton, WI	Corn	52.0	52.0	
United WI Grain Producers, LLC*	Friesland, WI	Corn	49.0	49.0	
Utica Energy, LLC	Oshkosh, WI	Corn	48.0	48.0	
Valero Renewable Fuels	Albert City, IA	Corn	110.0	110.0	
Valero Renewable Fuels	Charles City, IA	Corn	110.0	110.0	
Valero Renewable Fuels	Ft. Dodge, IA	Corn	110.0	110.0	
Valero Renewable Fuels	Hartley, IA	Corn	110.0	110.0	
Valero Renewable Fuels	Welcome, MN	Corn	110.0	110.0	
Valero Renewable Fuels	Albion, NE	corn	110.0	110.0	
Valero Renewable Fuels	Aurora, SD	Corn	120.0	120.0	
VeraSun Energy Corp. (Total)			220.0		
VeraSun Energy Corp.	Linden, IN	Corn			
VeraSun Energy Corp.	Bloomingburg, OH	corn			
Verenium	Jennings, LA	Sugar Cane bagasse	1.5	1.5	

Western New York Energy LLC	Shelby, NY		50.0	50.0	
Western Plains Energy, LLC*	Campus, KS	Corn	45.0	45.0	
Western Wisconsin Renewable Energy, LLC*	Boyceville, WI	Corn	40.0	40.0	
White Energy	Russell, KS	Milo/wheat starch	48.0	48.0	
White Energy	Hereford, TX	Corn/Milo	100.0	100.0	
White Energy	Plainview, TX	Corn	110.0	110.0	
Wind Gap Farms	Baconton, GA	Brewery waste	0.4	0.4	
Xethanol BioFuels, LLC	Blairstown, IA	Corn	5.0	5.0	
Yuma Ethanol	Yuma, CO	Corn	40.0	40.0	
TOTALS			**13,131.4** mgy for **202** nameplate refineries	**11,930.4** mgy for operating refineries	**1,432.0** mgy for under construction/ expanding refineries

* locally owned
mgy = million gallons per year

Proforma Break Even Model

A/O 9-15-09

Assumptions		***Cost / Units***
Gallons of ethanol Produced		40,000,000
Total Gallons of Denatured ETOH		40,800,000
Daily Gallons of Undenatured ETOH		113,314
Daily gallons of Denatured ETOH		115,581
Gallons of Ethanol per Bu of Grain(Un-denatured)		2.8
Gallons of Denatured ETOH per Bu of Grain		2.856
Total bushels of Grain		14,285,714
Bushels of grain per day		40,469
Cost of Grain per bu	$	3.25
Total cost of Grain		$ 46,428,571.43
Grain Cost per Gallon of Denatured ETOH Produced	$	1.14
Gallons of water per gallon of ethanol		2.54
Gallons of Water Total (1000)		101,600
Cost of City Water (1000 gal)	$	1.80
Gallons of Return water (day)		144,000
Cost to return to city (1000 gal)	$	0.01
Gallons of Denaturant		800,000
Denaturant		$0.048
Chemicals, Yiest & Enzymes	$	0.068
Hard Cost Chemicals		$ 2,100,000.00
Natural Gas	$	4.65
MMBTU/day		3200
Gas cost per day		$ 14,880.00
Electricity	$	0.045
KWT /day		85,000
Total Annual usage		30,600,000
Production days per year		353
Ethanol	$	1.58
WDG Lbs per bu of grain		49
DDG lbs per bu of grain		18
Wet Distillers Grains Px per Ton	$	44.00
Dry Distillers grain Price per ton	$	160.00
Percentage of WDG		75%
Percentage of DDG		25%

Lbs per day of DDG		728,450
Lbs per day of WDG		1,983,003
Daily tons of DDG		331
Daily tons of WDG		901
Price per ton of C0-2	$	-
Lbs of CO 2 per gallon of Undenatured ETOH		6.6
Tons per day of C0-2		340
Current Mkt for CO2	$	40.00
Tons of Syrup		?
Price for Syrup		?
Development costs		$ 1,400,000.00
Fees (accounting, legal, consulting)		$ 500,000.00
Number of Employees full time	$	34.00
Plant average wage (all-in)	$	21.00

Expenses

Input Commodities	**Cost per gallon**	**Total Costs**
Grain	1.138	$ 46,428,571.43
Denaturant	0.001	$ 38,400.00
Chemicals, Yiest & Enzymes	0.053	$ 2,100,000.00
Natural Gas	0.129	$ 5,252,640.00
Electricity	0.034	$ 1,377,000.00
Water	0.002	$ 64,556.64
Input Commodity Cost per Gallon	***$ 1.36***	*$ 55,261,168.07*

Non-Commodity Costs		
Salaries & Benefits	$ 0.036	$ 1,485,120.00
Maintenance	$ 0.012	$ 500,000.00
License Fees	$ 0.013	$ 500,000.00
Real Estate & Property Tax	$ 0.038	$ 1,500,000.00
Insurance (inclusive)	$ 0.010	$ 388,000.00
Capital Expenditures	$ 0.009	$ 350,000.00
Other G & A	$ 0.025	$ 1,000,000.00
Non-Commodity Cost per Gallon	*$ 0.141*	*$ 5,723,120.00*

Development Costs

Discovery	0.005	$ 200,000.00
Travel	0.000625	$ 25,000.00
Document prep	0.0001875	$ 7,500.00
Phase 1 & 2 Development	0.105	$ 4,200,000.00
Fees	0.0125	$ 500,000.00
Development Cost per gallon	*$ 0.123*	*$ 4,932,500.00*

Revenues		Value	Total Revenue
Ethanol	$	1.580	$ 64,464,000.00
Wet Distillers Grains	$	0.257	$ 10,500,000.00
Dry Distillers Grains	$	0.115	$ 4,675,324.68
Syrup	$	-	$ -
C0-2	$	-	$ -
Revenues per gallon	***$***	***1.952***	***$ 79,639,324.68***

Break Even			
Expenses	$	1.621	$ 65,916,788.07
Revenues	$	1.952	$ 79,639,324.68
Net Return per Gallon	***$***	***0.331***	**$ 13,722,536.61**

Plant Cost			
Plant	$ 52,000,000.00		$ 52,000,000.00
Equipment	$ 8,000,000.00		$ 60,000,000.00
Office	$ 750,000.00		$ 60,750,000.00
Property cost	$ 2,000,000.00		$ 62,750,000.00
Total Fixed cost for PPE	$ 62,750,000.00		*$ 62,750,000.00*
Interest cost (8.25% Simple)	$ 5,176,875.00		$ 5,176,875.00
Total PPE Cost			*$ 67,926,875.00*
Annual payment 10 years	$	0.166	$ 6,792,687.50
PPE Cost per gallon	$	1.665	
Depreciation	$	0.074	$ 3,037,500.00
Total Cost per gallon	*$*	*1.906*	

Line of Credit Payment ($2,000,000)			$ 2,000,000.00
Estimated P/L	*$*	*0.046*	***$ 4,929,849.11***