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Ag Decision Maker

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Tracking ethanol profitability

by Don Hofstrand, value-added agriculture specialist, co-director AgMRC, Iowa State University Extension, 641-423-0844, dhof@iastate.edu

The profitability of ethanol production is extremely variable. Due to the volatile price nature of ethanol and corn, its major feedstock, ethanol profitability can change rapidly from month to month. In addition, price variations of its co-product (distillers grains with solubles, DDGS) and its energy source (natural gas) add to the variability of ethanol profits.

To track the profitability of corn ethanol production, an economic model of a typical northern Iowa[1] corn ethanol plant was created. This is a 100 million gallon facility with construction costs similar to plants built in 2007. The costs and efficiencies are believed to be typical of northern Iowa ethanol plants.

Major assumptions and characteristics of the ethanol plant model

1) Turnkey ethanol production facility
2) Facility built in 2007
3) Nameplate capacity of 100 million gallons
4) Facility construction cost (including working capital) of $1.97 per gallon of ethanol nameplate capacity
5) Lender finances 50 percent of the project
6) Equity financing of 50 percent of the project.
7) Plant operates at 120 percent of nameplate capacity
8) Conversion factor of 2.8 gallons of ethanol per bushel of corn
9) A bushel of corn produces 18 pounds of distillers grains
10) Carbon dioxide is vented (no local market)
11) Natural gas requirement of 34 cubic feet per gallon of ethanol
12) Typical input costs for an Iowa corn ethanol facility

Input coefficient adjustment. Although we believe the coefficients in this model are a good representation of a corn ethanol plant, the user has the ability to change any of the input coefficients in the model to fit a special situation. A change in an input coefficient will be reflected in the analysis tables and graphs.

The monthly profitability of this hypothetical plant is computed by using the monthly market prices for

continued on page 2

Handbook updates

For those of you subscribing to the handbook, the following updates are included.

Estimated Costs of Crop Production in Iowa - 2008 – A1-20 (12 pages)

Estimating a Value for Corn Stover – A1-70 (4 pages)

Fieldwork Days in Iowa – A3-25 (2 pages)

Suggested Closing Inventory Prices – C1-40 (2 pages)

2007 Farmland Value Survey – C2-70 (5 pages)

Please add these files to your handbook and remove the out-of-date material.

continued on page 6

Inside . . .

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University Extension

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Tracking ethanol profitability, continued from page 1

ethanol, corn, DDGS and natural gas. Each month the analysis is updated with the previous month's prices. All other variables are held constant throughout the analysis.

Monthly price variables

1) **Ethanol Price** [2] – Ethanol daily price F.O.B. (Free on Board) the plant (converted into monthly average prices) at selected ethanol plants in northern Iowa as reported by USDA Ag Market News in the Iowa Ethanol Plant Report (http://www.ams.usda.gov/mnreports/NW_GR111.TXT).

2) **Corn Price** (No. 2 yellow) [2] – Spot bid daily corn price (converted into monthly average prices) at selected ethanol plants in northern Iowa (north of Interstate 80) as reported by USDA Ag Market News in the Iowa Ethanol Plant Report (http://www.ams.usda.gov/mnreports/NW_GR111.TXT).

3) **DDGS Price** [2] – DDGS daily price F.O.B. the plant (converted into monthly average prices) at selected ethanol plants in northern Iowa as reported by USDA Ag Market News in the Iowa Ethanol Plant Report (http://www.ams.usda.gov/mnreports/NW_GR111.TXT).

4) **Natural Gas Price** – Monthly Iowa natural gas price for industrial users as reported by the Energy Information Administration (official energy statistics of the U.S. government) (http://tonto.eia.doe.gov/dnav/ng/hist/n3035ia3m.htm).

Price adjustment. Although these prices are representative of northern Iowa ethanol plants, they may not be representative of plants in other regions or states. In the economic model the user can increase or decrease any of the price series by a fixed amount to represent a special situation. An adjustment in a price series will be reflected in the analysis tables and graphs.

To show how this facility would have performed in the past, the monthly profitability time-series is started in January, 2005. Although this facility would not have been in production at this time (built in 2007), it provides a perspective on how this facility would have performed historically.

Revenue, costs and net returns (profitability) are shown monthly per gallon of ethanol and per bushel of corn. Also, ethanol and corn price breakeven levels are computed.

Analysis outputs

Graphs

Monthly Prices

Output prices – ethanol and DDGS
Input prices – corn and natural gas

Monthly Returns

Revenue
Costs
Net returns (profits)
Return on equity

Monthly Breakeven Prices

Net cost per gallon versus ethanol price [3]
Net revenue per bushel versus corn price [4]

Tables

Monthly revenue, cost, breakeven and profit per gallon
Monthly revenue, cost, breakeven and profit per bushel

Ethanol model

Assumptions (inputs) and Outputs

Many ethanol businesses use risk mitigation strategies such as forward pricing to minimize their financial risk exposure rather than relying on spot market prices. So the financial results of an individual plant may be quite different than the results shown in this analysis. However, spot price analysis provides an indication of the over-all health of the industry.

[1] Northern Iowa is defined as Iowa north of Interstate 80.

[2] The USDA Ethanol report for Iowa began in October of 2006. Price data prior to Oct 2006 was created for ethanol, corn, and dried distillers grains. The Omaha rack ethanol price, the USDA Interior Iowa Grain (corn) prices, and the Lawrenceburg, Indiana distillers grains price from the USDA Feed Grains Database were used to create this series. The pre-Oct. 2006 series was created by comparing the post-Oct. 2006 Iowa Ethanol price series to these databases prices and adjusting the pre-Oct. 2006 Iowa Ethanol series by these differences.

[3] Net cost per gallon includes all costs and subtracts the value of the distillers grains, so it represents the ethanol price needed to break even.

[4] Net revenue per bushel includes all revenue (DDGS & ethanol) and subtracts all costs except corn, so it represents the corn price needed to break even.

Average value of Iowa farmland tops $3,900 an acre in 2007 survey

By Mike Duffy, extension economist, 515-294-6160, mduffy@iastate.edu

The average value of an acre of farmland in Iowa increased by just over $700 during the past year, to an all-time high of $3,908, according to an annual survey conducted by Iowa State University (ISU) Extension. The land boom is being driven by the developing biofuel economy.

The 22 percent increase recorded this year is the greatest one-year increase since 1976, and marks a new record for the fifth year in a row. Since the year 2000, Iowa land values have increased an average of $2,051 per acre, more than a 100 percent increase over the 2000 average value of $1,857.

The increases in values were reported statewide, with the survey recording averages above $5,000 an acre in five counties, and between $4,000 and $5,000 an acre in 51 counties. Nineteen counties reported increases of more than 25 percent, and 59 counties had increases between 20 and 25 percent.

Some of the smaller percentage increases occurred in the counties and crop reporting districts along Iowa's eastern and western borders. This reflects the impact of local demand for corn from ethanol plants. Counties along the border rivers previously received the best prices for crops due to low transportation costs to gulf port markets, but now those crops are being used locally by the ethanol plants, which is driving up prices in interior counties.

I am frequently asked whether the land market will crash, and how high it might go before it tops out. I am also questioned about the impact of the weakening dollar, the new farm bill, and the current subprime mortgage crisis. My general feeling is that the land market will remain strong for at least the next five years. We have seen a fundamental shift in demand for corn due to ethanol production. I don't think this demand will diminish in the near future.

The world of agriculture as we know it here in Iowa has changed. Where the changes will settle out and when is not known.

Of the nine crop reporting districts in the state, northwest Iowa reported the highest average value at $4,699 per acre. The lowest average in the state was in south central Iowa at $2,325 per acre. north central Iowa was the leader in percentage increase at 25.3 percent, while east central Iowa had the lowest percentage increase at 14.7 percent.

The highest county average in the state was Scott County at $5,699 per acre, while Decatur County was lowest at $1,828 per acre. Sioux County led the state with the largest dollar increase at $1,142 per acre, while Floyd County had the largest percentage increase at 30.3 percent.

Low grade land in the state averaged $2,655 per acre, an increase of $460 or 21 percent over the 2006 survey. Medium grade land averaged $3,666 per acre, a $655 increase or 21.8 percent. High grade land averaged $4,686 per acre, an increase of $851 or 22.2 percent.

Survey participants were asked to indicate positive and negative factors that affected land prices during 2007. Good grain prices was by far the most frequently mentioned positive factor, listed by 35 percent of the respondents. Another 10 percent mentioned low interest rates as a major factor.

Three negative factors impacting land values were listed by more than 10 percent of the respondents. They included high costs for the inputs needed to grow crops, listed by 25 percent; high land prices in general, listed by 12 percent; and a concern over how long the market would remain at high levels, listed by 11 percent.

Thirty-seven percent of the respondents to this year's survey reported more land sales in 2007 than in the previous year. That was the highest percentage since 1988. Buyers were existing farmers in 60 percent of the sales, and investors in 34 percent of the sales, essentially unchanged from the previous year, but down considerably from a decade ago when existing farmers represented nearly 75 percent of the buyers.

Data on farmland sales has been collected by Iowa State University annually since 1941. About 1,100 copies of the survey are mailed each year to licensed real estate brokers, ag lenders, and others knowledgeable of Iowa land values. Respondents are asked to report values as of Nov. 1. Average response is 500 to 600 completed surveys, with 499 usable surveys returned this year. Respondents provided 668 individual county estimates, including land values in nearby counties if they had knowledge of values in those counties.

continued on page 4

Average value of Iowa farmland tops $3,900 an acre in 2007 survey, continued from page 3

Additional detail on the 2007 survey is available on the ISU Extension web site at www.extension.iastate.edu/landvalue/

The following chart indicates 2007 values by crop reporting district and county, 2006 values, dollar change from 2006 to 2007, and percentage change from 2006 to 2007.

By Crop Reporting District:

District	2007 $/acre	2006 $/acre	2006-2007 Change $	2006-2007 Change %
Northwest	4,699	3,783	916	24.2%
North Central	4,356	3,478	879	25.3%
Northeast	4,055	3,187	868	27.2%
West Central	4,033	3,410	623	18.3%
Central	4,529	3,716	812	21.9%
East Central	4,272	3,725	547	14.7%
Southwest	3,209	2,580	629	24.4%
South Central	2,325	1,927	399	20.7%
Southeast	3,463	2,849	614	21.6%
State Average	3,908	3,204	704	22.0%

By County:

County Name	2007 $/acre	2006 $/acre	2006–2007 $ Change	2006–2007 % Change
Adair	$2,742	$2,198	$544	24.7%
Adams	2,688	2,203	485	22.0%
Allamakee	2,640	2,126	514	24.2%
Appanoose	1,908	1,564	344	22.0%
Audubon	3,991	3,311	680	20.5%
Benton	4,485	3,619	866	23.9%
Black Hawk	5,083	3,952	1,131	28.6%
Boone	4,680	3,917	763	19.5%
Bremer	4,603	3,621	983	27.1%
Buchanan	4,518	3,562	956	26.8%
Buena Vista	4,846	3,914	932	23.8%
Butler	4,398	3,458	940	27.2%
Calhoun	4,878	3,958	920	23.2%
Carroll	4,434	3,581	854	23.8%
Cass	3,598	2,950	648	22.0%
Cedar	4,429	4,012	417	10.4%
Cerro Gordo	4,439	3,567	872	24.5%
Cherokee	4,466	3,581	885	24.7%
Chickasaw	3,767	2,909	858	29.5%
Clarke	2,213	1,811	402	22.2%
Clay	4,506	3,612	894	24.7%
Clayton	3,610	2,919	691	23.7%
Clinton	3,798	3,285	513	15.6%
Crawford	4,013	3,254	759	23.3%
Dallas	4,327	3,385	942	27.8%
Davis	2,406	1,956	450	23.0%
Decatur	1,828	1,465	364	24.8%
Delaware	4,628	3,866	762	19.7%
Des Moines	3,899	3,179	720	22.7%
Dickinson	4,210	3,404	805	23.7%
Dubuque	4,239	3,513	726	20.7%
Emmet	4,515	3,721	794	21.3%
Fayette	4,144	3,337	807	24.2%
Floyd	4,325	3,320	1,005	30.3%
Franklin	4,329	3,518	811	23.1%
Fremont	3,478	2,832	646	22.8%
Greene	4,235	3,470	765	22.0%
Grundy	4,985	3,996	988	24.7%
Guthrie	3,675	2,963	711	24.0%
Hamilton	4,934	4,097	836	20.4%
Hancock	4,381	3,592	789	22.0%
Hardin	4,482	3,667	816	22.2%
Harrison	3,773	3,093	680	22.0%
Henry	3,668	3,073	596	19.4%
Howard	3,400	2,621	780	29.7%
Humboldt	4,689	3,873	816	21.1%
Ida	4,426	3,668	757	20.6%
Iowa	3,785	3,131	654	20.9%
Jackson	3,501	2,931	569	19.4%
Jasper	3,929	3,301	629	19.1%
Jefferson	2,811	2,375	436	18.3%
Johnson	4,579	3,911	668	17.1%
Jones	3,719	3,147	572	18.2%
Keokuk	3,262	2,836	427	15.0%
Kossuth	4,537	3,707	830	22.4%
Lee	3,602	2,893	709	24.5%
Linn	4,638	3,983	656	16.5%
Louisa	3,997	3,413	584	17.1%
Lucas	2,098	1,672	426	25.5%
Lyon	4,458	3,447	1,011	29.3%
Madison	3,316	2,644	672	25.4%
Mahaska	3,547	2,963	584	19.7%
Marion	3,555	2,925	629	21.5%
Marshall	4,103	3,433	670	19.5%
Mills	3,827	3,095	732	23.6%
Mitchell	4,235	3,252	983	30.2%
Monona	3,452	2,838	613	21.6%
Monroe	2,454	1,981	473	23.9%
Montgomery	3,167	2,630	536	20.4%
Muscatine	4,183	3,647	536	14.7%
O'Brien	5,306	4,255	1,051	24.7%
Osceola	4,687	3,640	1,046	28.7%
Page	2,823	2,372	451	19.0%
Palo Alto	4,392	3,525	867	24.6%
Plymouth	4,802	3,830	972	25.4%
Pocahontas	4,663	3,830	832	21.7%
Polk	4,234	3,487	747	21.4%
Pottawattamie	4,072	3,294	778	23.6%
Poweshiek	3,776	3,124	651	20.8%
Ringgold	2,126	1,726	400	23.2%
Sac	4,745	3,824	921	24.1%
Scott	5,699	5,073	626	12.3%
Shelby	4,057	3,287	770	23.4%
Sioux	5,204	4,063	1,142	28.1%
Story	4,852	4,021	831	20.7%
Tama	4,123	3,320	802	24.2%
Taylor	2,435	1,948	487	25.0%
Union	2,622	2,085	537	25.8%
Van Buren	2,642	2,159	484	22.4%
Wapello	2,719	2,237	482	21.5%
Warren	3,588	2,935	653	22.2%
Washington	4,289	3,624	665	18.4%
Wayne	1,947	1,596	351	22.0%
Webster	4,779	4,040	739	18.3%
Winnebago	4,054	3,238	816	25.2%
Winneshiek	3,413	2,720	693	25.5%
Woodbury	3,570	3,014	557	18.5%
Worth	4,162	3,268	895	27.4%
Wright	4,807	3,988	819	20.5%

Value-added business success factors -- the role of financial structure and performance

by Don Senechal, Founding Principal, The Windmill Group, F. Larry Leistritz, Professor, Department of Agribusiness and Applied Economics, North Dakota State University, Nancy Hodur, Research Scientist, Department of Agribusiness and Applied Economics, North Dakota State University

(second in a series of six)

There has been a surge of interest in farmer-owned business ventures that seek to capture additional value from commodities past the farm gate. Some of these ventures have been very successful, some marginally successful, and some have failed. Supported by funding from the Ag Marketing Resource Center at Iowa State University, we conducted in-depth interviews with farmer-owned businesses to determine the key factors that influenced the relative success or failure of these ventures. A better understanding of why some ventures succeeded while others failed provides valuable insight for the success of future farmer-owned businesses. This article focuses on the role of financial structure and performance on business success.

Research method

To identify factors having the greatest impact on the success or failure of farmer-owned business ventures, a cross-section of seven farmer-owned commodity processing businesses formed since 1990 in North Dakota, South Dakota and Minnesota were selected. Extensive interviews were conducted with individuals who played, or continue to play, an important role in the formation and operation of the business. This included leaders in the formation of the business, key members of the management team, selected board members, lenders, local leaders and others.

Research results

While the necessity of sufficiently capitalizing the business would seem to be obvious, its importance cannot be overstated. The business must be sufficiently capitalized to withstand cash flow risks during the first few years of operation. Market down-turns, crop failure and production issues can all challenge a new organization. So the business plan must allow for adequate reserves. Once the firm begins to show a profit, it is important to retain a sufficient portion of the earnings to build the business' reserves to enable it to survive future challenges. Market down-turns, crop failures and production issues can challenge even a well established business, making an appropriate business reserve critical for new start-ups. Members' desires for pay-outs must be weighed against the needs of the business for reserve funds.

Financial reserves

The business plan must provide for sufficient operating capital to carry the organization through the start-up period. Enterprises that were not successful often cited the lack of operating capital as a significant contributing factor.

Further, plant start-ups often require some fine-tuning before reaching planned capacity. Also, markets typically take time to develop. Without sufficient working capital, a glitch in production, marketing, or an industry wide disruption could prove fatal.

If the business does not build sufficient financial reserves, its only recourse when confronted by a downturn is another equity drive to raise more money from its members. Several of the unsuccessful businesses we interviewed reported having undertaken such fund raising efforts. But the efforts met with limited success given the business's recent history of substantial losses. On the other hand, some of the successful businesses conducted subsequent equity drives to finance expansions. These business's histories of making substantial payments to grower-members were credited with contributing to the success of subsequent capitalization efforts.

Lender issues

The financial partner (lender) must be sufficiently invested in the business to have an incentive to stay the course over the long term. Without that incentive, they may want out at the first sign of trouble. Two businesses were financed by a consortium of rural banks, with a USDA loan guarantee. Thus, the risk to any individual lender was relatively small. Under these circumstances, it appeared that the lenders may not have critically evaluated the project and were quick to get out when problems occurred. If the financial institution is not sufficiently vested in the business, it may withdraw if a downturn leads to the need for additional funding.

Organizational structure

Organizational structure may have an impact on some lenders' decisions to finance cooperatives. Some characteristics of the closed cooperative model may be perceived as weaknesses of the organizational form. Because of expanded access to capital through non-farmer investors, fewer restrictions on membership delivery and commodity purchases, and simplified structures for distribution of earnings, some lenders saw the limited liability company (LLC) or corporation (subchapter C) as a preferred organizational structure. In fact, all of the enterprises examined

continued on page 6

Value-added business success factors -- the role of financial structure and performance, continued from page 5

were either a LLC or a corporation. Some were organized as LLCs, while others had started as a closed cooperative and had since converted to a LLC or corporation. One chief executive officer we interviewed cited the need for a stream-lined decision making process as critical in the decision to convert from a closed cooperative to a corporation.

Several lenders questioning the wisdom of siting processing facilities in remote rural areas. They expressed concern that the facility's potential for resale may be less than if it were located in or near a regional trade and service center.

(Next article – Strategic Planning and Implementation)

Major funding for this research provided by the Agricultural Marketing Resource Center. Additional funding provided by Farmers Union Marketing and Processing Association Foundation, Co-Bank and Ag Ventures Alliance.

What's new with crop insurance in 2008

by William Edwards, extension economist, 515-294-6161, wedwards@iastate.edu

Both traditional yield insurance (APH) and several varieties of revenue insurance will again be offered to crop producers in 2008. Last year 89 percent of Iowa's corn and soybean acres were covered by some form of crop insurance. Revenue insurance has become the dominant type of coverage, accounting for over 85 percent of the insured acres.

Last year's high indemnity prices of $4.06 per bushel for corn and $8.09 per bushel for soybeans allowed many producers to lock in very attractive guarantees. Indemnity prices for 2008 may go even higher, especially for soybeans. The down side, of course, is that higher prices mean higher premiums. And, despite the high value guarantees that were purchased in 2008, payouts for losses were equal to only about 4 percent of the premiums that farmers paid in.

The newest innovation in crop insurance is a premium discount for planting certain biotech corn hybrids. The Biotech Yield Endorsement (BYE) is available to corn growers in Iowa, Illinois, Indiana and Minnesota. To be eligible for a discount, farmers must plant at least 75 percent of the corn acres in an insurance unit to hybrids that contain the YieldGuard VT Triple or YieldGuard Plus with Roundup Ready Corn 2 technologies. These hybrids can be purchased from more than 250 companies that license the technology. Discounts are expected to average about 14 percent on revenue insurance policies.

Updates, continued from page 1

Internet Updates

The following updates have been added to www.extension.iastate.edu/agdm.

Motor Vehicle Cost – A3-40

Livestock Production – Specializing While Retaining Income Diversification – B1-76

Farmer-owned Processing Business Business Success Factors – C5-225

Decision Tools

The following decision tools have been added to www.extension.iastate.edu/agdm.

Corn Stover Pricer – Use this *decision tool* to estimate a price for corn stover standing in the field or harvested and stored.

Motor Vehicle Cost Analyzer – Use this *decision tool* to calculate ownership and operating costs for a vehicle per mile and per year.