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Global warming – are bio-fuels good or bad?

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(Fourth in a Series)

The emergence of bio-fuels such as ethanol has been touted as the answer to our energy problems and a boon for the agriculture sector. By defining the energy problem as the danger of relying on foreign sources of oil, domestically produced renewable fuels provide a logical solution. So, the question facing domestically produced renewable fuels is not “if it provides a solution” but “how much of a solution does it provide”.

Handbook updates

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

Table of Contents – A1-00
(1 page)

Table of Contents – A2-00
(1 page)

Do You Need a Market Advisory Service? – A2-70 (6 pages)

Table of Contents – A3-00
(1 page)

Please add these files to your handbook and remove the out-of-date material.

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Net greenhouse gas emissions

Another dimension of the energy problem has emerged. Scientific investigation has confirmed the dangers of global warming from greenhouse gas (GHG) emissions. Our reliance on energy from fossil fuels contributes to GHG emissions. Early analysis determined that bio-fuels, while not exempt from carbon emissions, emit less (GHG) emissions than gasoline. As shown in Table 1, corn ethanol results in a 20 percent reduction in emissions versus gasoline. Biomass ethanol shows a 70 percent reduction. Other studies provide similar results.

Although growing corn and biomass and refining them into ethanol produces as much or more emissions than pumping, transporting and refining crude oil into gasoline, the source and amount of carbon contained in the feedstock is the most important component. The carbon in crude oil has been sequestered from the atmosphere and now is being released into the atmosphere during consumption. So, it adds to the amount of atmospheric carbon. Conversely, the carbon contained in corn and biomass that

is released during consumption was recently pulled out of the atmosphere during photosynthesis. So this carbon is part of the natural carbon cycle and does not increase the level of atmospheric carbon.

Carbon in the soil

A carbon sink is a place where carbon is stored or sequestered. We are aware that crude oil and coal are natural sinks where carbon was removed from the atmosphere millions of years ago. As we consume oil and coal, this carbon is released back into the atmosphere. We are also aware that forests, especially tropical rain forests, are natural carbon sinks where large amounts of carbon

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Table 1. Gasoline and ethanol greenhouse gas (GHG) emissions (not considering land use changes) (grams of GHGs CO₂ eq. per MJ of energy in fuel)

Fuel Source	Making Feedstock	Refining Fuel	Vehicle Operation	Feedstock Uptake	Land Use Change	Total GHGs	Percent Change
Gasoline	+4	+15	+72	0	--	+92	--
Corn Ethanol	+24	+40	+71	-62	--	+74	-20%
Biomass Ethanol	+10	+9	+71	-62	--	+27	-70%

Source: Use of U.S. Cropland for Biofuels Increases Greenhouse Gases through Emissions from Land Use Change, *www.sciencexpress.org*, Feb. 2008

are stored in the wood. When forests are burned or otherwise destroyed through deforestation, the carbon is released into the atmosphere.

A less well-known but important carbon sink is soil. Large amounts of carbon are stored in the soil in the form of undecayed plant and organic matter. When virgin soils are disturbed by plowing or other tillage, large amounts of carbon stored as organic matter are released into the atmosphere. This causes a reduction in soil organic matter as shown hypothetically in Figure 1. However, over time the balance of emissions and sequestration is restored, but at a lower level of soil organic matter. Part of the organic matter loss from tillage is replaced by the organic matter increase from the decomposition of crop residue. Crop residue includes the stalks, stems, leaves, chaff, cobs, etc. left in the field after the grain is harvested.

Crop residue has been touted as a major biomass source for the production of cellulosic ethanol. However, removing residue for ethanol production will change the organic carbon balance in the soil. By removing the crop residue, it is not available for decay and sequestration as carbon in the soil. The soil will once again become a net emitter of carbon into the atmosphere.

Is there a limited amount of residue that can be removed for ethanol production without reducing soil organic matter levels further? This is a topic of current discussion and

future research. Regardless of the answer, it appears that the potential of crop residues as a major ethanol feedstock is not as great as previously believed.

High levels of organic matter are also important for maintaining soil productivity and retaining soil moisture. In addition, crop residue contains important crop nutrients that are returned to the soil during decomposition. Crop residue left on the soil surface also helps reduce soil erosion.

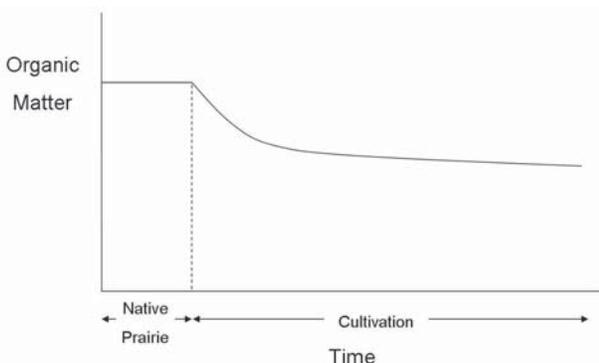
This article has focused on the “direct” GHG emissions from both corn and cellulosic ethanol production. More controversial are the “indirect” emissions from “land use” changes that may be attributed to corn, biomass and ethanol production. In the next article we will explore these indirect effects and endeavor to shed light on the issues involved in this debate.

References:

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Searchinger, T., R. Heimlich, R.A. Houghton, F. Dong, A. Elobeid, J. Fabiosa, S. Tokgoz, D. Hayes, and T.H. Yu, 2008, “Use of U.S. Croplands for Biofuels Increases Greenhouse Gases through Emissions from Land Use Change,” *Sciencexpress*. Accessed April 21, 2008: <http://www.sciencemag.org/cgi/content/abstract/319/5867/1238>.

Figure 1. Depletion of organic matter and carbon from midwest soils.





A panel study of Iowa farm financial conditions: 2000-2007

by Robert W. Jolly, professor, 515-294-6267, rjolly@iastate.edu and Darnell Smith, extension program specialist

This article highlights the financial performance of a panel – or group of farm businesses over several years. The data used in our analysis are obtained from the Iowa Farm Business Association (IFBA). The IFBA is an independent farm accounting association managed and controlled by its members. The full version of this report is available from ISU Extension Publications as FM 1883.

The IFBA data consists of larger farms particularly those operating more than 500 acres. The data does not represent the entire farm population but does represent the commercial farm population in Iowa. According to the most recent census, farms larger than 180 acres – those more typified by the IFBA data – made up approximately 50 percent of all farms in Iowa and produced 83 percent of the total value of farm output.

History

Figure 1 presents nominal aggregate net farm income and farm program payment information for Iowa since 1980. Note that farm payments are included in farm income and consequently the figure shows how much of net farm income came from government farm payments of all types. Our focus in Figure 1 is 2000-2006, the period covered by this study. From 2000-2003 farm incomes were close to historical average levels. However during 2000 and 2001 most net farm income came directly from farm payments. Income declined slightly the next two years. The decline can be attributed in part to reduced government payments resulting from improving corn and soybean prices as well as declining pork prices. In 2004 income increased sharply and then fell over the next two years. In general, farm income at the end of the period significantly exceeded income at the beginning.

Aggregate farm income improvement was driven, in part, by strong corn and soybean prices in 2004, significant farm program payments in 2000, 2001 and 2005, strong growth in corn yields and continuing profitability in livestock production. The impact of the current ethanol boom is not reflected in the aggregate income data however. The 2006 average prices received for corn and soybeans in Iowa were \$2.13 and \$5.55 respectively. The sharp ethanol-driven increase in prices began in October, 2006.

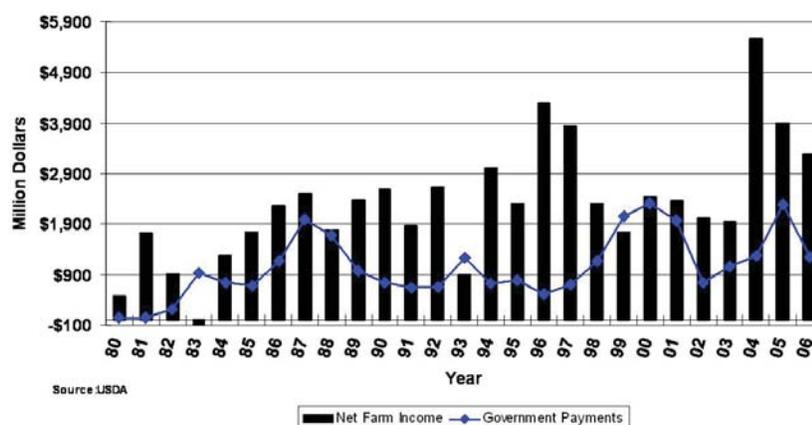
The story that emerges from the aggregate farm income data over the past seven years is one of above average earnings, considerable income volatility and reliance on farm program payments to provide some degree of stability during low price years. Examining farm income at the state level, however, provides little insight into the income situation for individual farm families. How income is distributed among farmers or groups of farmers is important in addressing the issues stated earlier in this paper.

Comments

In the full report, we examine the financial performance of a panel of Iowa commercial farm businesses from 2000-2007. As in previous studies, we demonstrate the wide variability in financial performance across firms facing similar economic conditions.

Within the IAFBA data set, the top 20 percent have improved their financial standing significantly over the period. The lowest 20 percent have made little financial progress. Between these extremes we see farm businesses, at varying degrees, meeting outside cash obligations and strengthening their equity position.

Figure 1. Iowa Net Farm Income and Government Payments: 1980-2006



This study provides a snapshot of Iowa commercial farmers' financial strengths at the beginning of the ethanol-fueled price boom and a new Farm Bill. We expect, for a few years at least, that commodity prices will continue to be strong. The grain price increases may result in cutbacks in livestock profitability depending on the growth in meat demand. Ultimately strong farm profits will be bid into land, rents and other asset values, resulting in tighter more volatile margins.

A panel study of Iowa farm financial conditions: 2000-2007, continued from page 3

If commodity prices do remain strong, one of the unresolved questions is how the farms represented by the panel will fare. Will a rising tide lift all boats or will the range in adjusted cash income become wider? The lower 20 percent group has higher debt-to-asset ratios and is more dependent upon government payments as a source of cash income. This group may be more vulnerable to changes in the cost structure of agricultural assets. And, it is unclear how the new farm bill will influence farm income and equity growth across this rather broad spectrum of farm structures. Farm size, enterprise mix, financial condition and human capital will all contribute to the ability of farmers to adapt to changing conditions. The full version of this report is available at: <http://www.extension.iastate.edu/Publications/FM1883.pdf>

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Congressional research service report to Congress on CRP is incomplete and misleading

by Neil E. Harl, Charles F. Curtiss Distinguished Professor in Agriculture and Emeritus Professor of Economics, Iowa State University, Ames, Iowa. Member of the Iowa Bar, 515-294-6354, harl@iastate.edu

On April 10, 2008, the Congressional Research Service released a report to Congress on the Conservation Reserve Program (CRP) which does not recognize the key issues in the controversy and which is both incomplete and misleading. Inasmuch as the Congressional Research Service was set up as the research arm of Congress, the contents of the report, coming at a crucial time when the 2008 farm bill, H.R. 2419, is in conference committee, are particularly important.

The key shortcomings of the CRS report

On the self-employment tax issue, which is of central importance, the CRS report commences the analysis by leading the reader to assume that the issue of exclusion of CRP payments from self-employment tax has arisen only in recent years and that the argument is all about the breadth of the exclusion from self-employment tax liability. The report dismisses the fact that CRP payments were historically not subject to SE tax for those who fell short of carrying on a trade or business (those who were retired, those who were disabled and those who were mere investors) from the time of the first sign-up under the CRP program in 1986 until IRS announced a change in position in 2003. Thus, it is misleading to omit any mention of the longstanding tax treatment of CRP payments. It is also misleading to treat the issue as involving a loss of revenue when the former exemptions are restored as the Congressional Committees have repeatedly done in their calculations. Allowing IRS to change the law as evidenced

by Section 1402(a) of the Internal Revenue Code and resist challenges on the ground that any relaxation of the revisionist rule would constitute a cut in tax revenue is not only disingenuous; it goes well beyond the proper role of IRS as was extensively discussed in 1998.

What is at issue here is an attempt by the Internal Revenue Service to redraw the line between income from a trade or business (which triggers self-employment tax) and income from an entity falling short of the trade or business test and, therefore, is not subject to SE tax. Nowhere in the CRS report is that test even mentioned and nowhere is Section 1402(a) of the Internal Revenue Code cited. With the IRS position taken in the 2003 ruling and the 2006 Notice, plus the revenue ruling threatened in the 2006 Notice, there would be no investment activity, even those held by those in retirement or disabled, that would not be subject to SE tax. The attempt by the Service to redraw the line of what constitutes a trade or business goes well beyond the CRP issue. If the IRS position prevails, it will pose a serious threat to the meaning of "trade or business" in all sectors of the economy.

No challenge to IRS authorities cited in support of the service position

The CRS report makes no mention of the lack of authority in support of the IRS position on imposition of SE tax on CRP payments falling well short of the trade or business test. As

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Congressional research service report to congress on CRP is incomplete and misleading , continued from page 4

discussed in more details elsewhere, the Service agrees that the term "trade or business" has the same meaning as when used in Section 162 of the Internal Revenue Code. Of the many cases which have addressed the issue of "trade or business" in the context of Section 162, in Notice 2006-108 the IRS singled out one of those cases, Groetzinger v. Commissioner in support of the Service position that merely signing up for CRP constitutes a trade or business. The Supreme Court in Groetzinger stated that the "... resolution of this issue [meaning of 'trade or business'] requires an examination of the facts of each case." The Groetzinger case involved a gambler who devoted 60 to 80 hours per week to pari-mutuel wagering on dog races with a view to earning a living from such activity. The taxpayer went to the track six days per week for 48 weeks in the year in question. The betting activity was more than a full-time job.

It is an unbelievable reach to assert that a case involving a taxpayer putting in up to twice the number of hours in a

normal work week could stand as authority for a situation where merely signing up for a conservation program constitutes a trade or business.

In conclusion

The CRS report totally ignored the core issue involved in the debate over whether all CRP payments or only those from an activity constituting a "trade or business" should be subject to self-employment tax. That core issue is where the line for what amounts to a trade or business should be drawn. There is no discernible support in tax law for the notion that the line should be drawn to include all profit making ventures as has been suggested by the Internal Revenue Service. That is what the Congress needs to understand in considering H.R. 2419.

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Value-added business success factors -- the role of management and operations

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

(fifth 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 management and operations for 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

Competent professional management is essential to a business venture's success. The right Chief Executive Officer (CEO) and management team can mean the difference between success and failure. Management needs to be involved very early in the business project. One successful venture we interviewed hired its CEO prior to the equity drive. The CEO was then able to lead the equity drive and provide input on plant design and oversee construction. The plant was up and running on schedule.

While this example is more often the exception than the rule (the CEO often comes on board after a successful equity drive), all of the businesses we interviewed agreed the sooner the CEO is hired, the better the start-up process unfolds. Although board members are usually successful producers and community leaders, there is no substitute for good professional management.

It was also particularly helpful when the CEO had been involved in similar start-up operations.

Management recruitment -- The board should plan for a significant investment in the recruitment and retention of a CEO. Recruitment strategies varied among the businesses we interviewed, with several using executive placement (a.k.a. headhunter) firms. One CEO responded to an ad in a trade magazine. Another CEO of a successful venture was re-

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Value-added business success factors -- the role of management and operations, continued from page 5

cruited because he was personally acquainted with one of the founding directors. While there appears to be no patented formula for successful recruitment, the board should make an appropriate investment in time, money, and networking to find, recruit, and hire an industry savvy CEO.

The CEO is the only member of the management team that the board hires. So, once the CEO is hired, the board should leave the remaining hiring decisions to the CEO. The CEO is responsible for building the management team.

As was articulated in a previous article, the board of directors and the CEO must have a shared vision of the organization including its future growth and operations. This shared vision will enable the CEO to manage and build an appropriate management team and will help alleviate micro-managing by the board, which can be very detrimental to board/CEO relations. One CEO we interviewed reported that the board of directors must be committed to reinvestment and growth in order to attract top quality management.

CEO compensation -- Providing adequate compensation and incentives is absolutely necessary for attracting top management professionals. While often challenging for a fledgling organization, an appropriate compensation package will insure that the CEO has as much incentive for business success as the board and the owners. Two successful organizations we interviewed reported offering performance-based incentives described as 'phantom stock' to top management.

Industry knowledge -- The entire management team needs to develop and maintain market and industry savvy and awareness. Market and industry awareness is often a prime selection criterion for key positions. For the venture to suc-

ceed, it must remain competitive in its industry in terms of operating efficiency and cost of operations. It is the management team's responsibility to be aware of industry standards and recommend investments and upgrades over time to insure that the venture remains competitive.

Operating margins and investor returns must also be competitive with industry standards and the management and the board must be aware of the margins and returns of other industry participants. This too will likely require ongoing reinvestment of some of the earnings to expand or upgrade facilities. In the absence of such industry awareness, the board and farmer-members may develop unrealistic expectations regarding the returns from their venture. Many farmer-owned processing activities are fundamentally commodity businesses characterized by thin margins.

Employee training -- Finally, the new organization should plan and prepare for significant investments in employee training. This is particularly relevant if the facility is located in a rural area where manufacturing and processing industries are rare. New employees will likely need substantial training in areas such as safety, sanitation, and quality control.

Another measure to enhance competitiveness is to maintain a lean management team.

(next article – the role of local infrastructure and support)

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.

Updates, continued from page 1

Internet Updates

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

Managerial Costs – C5-209

Opportunity Costs – C5-210

Current Profitability

The following profitability tools have been updated on www.extension.iastate.edu/agdm to reflect current price data.

Corn Profitability – A1-85

Soybean Profitability – A1-86

Ethanol Profitability – D1-10

... and justice for all

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