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Supply chain options for biobased businesses

Abstract: This research paper investigates and evaluates the supply chain structures currently being used in biobased businesses, as well as presenting corollary examples of supply chains in businesses of all types (in the United States and abroad).

Question & Answer

Q: How can supply chains help producers?

A: Supply chain partners are connected through the business relationships between partners in the chain. There are many forms that these relationships can take, i.e., spot market sales, contracts, etc. New biobased business partners, including farmers, should evaluate the various relationship models available to them before signing a new contract or forming a relationship. This research defines the various types of relationships and the advantages and disadvantages to each. Strategic alliances may provide the best advantage for farmers as they begin to acquire a marketing perspective of the supply chain rather than a production view, and look for long-term commercial success.

Background

In order to succeed, biobased businesses may require different types of supply chain business relationships than other businesses. A framework is required to identify the business structures available to producers that will allow them to profit from producing these products.

This research paper describes potential benefits from biobased businesses, background on the development of supply chain practices, and information on best practices in supply chain management and in buyer/seller relation-

ships. The investigator considers non-biobased agricultural business supply chain practices and discusses their current use. A complete description of each business structure is developed and the writer then evaluates their effectiveness for farmers and others in the value chain. (Copies of this paper are available from the Leopold Center or at the Center's web site, www.leopold.iastate.edu.)

The paper's text includes:

- A description of the specific business model,
- A description of supply chain partners,
- An analysis of benefits (for all links in the supply chain and for the community where the business resides), and
- An analysis of disadvantages (for all links of the supply chain and for the community).

Discussion

While there is much interest and support for biobased businesses, the development of these businesses requires advances in science and technology, evaluation of agricultural practices, and resolution of supply chain issues. The issue of supply chain development for biorefineries is discussed in both the national and Iowa vision and roadmap documents for biobased products and bioenergy. The national vision and roadmap document highlights the need for research and development for "addressing the facilities, location, handling and delivery issues for a plant-based feedstock supply chain, including mechanisms to enhance the economy of the rural regions," according to the U.S. Department of Energy.

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The manner in which biorefineries are developed will have tremendous implications for the future wealth of Iowa's farmers, communities, and the economic conditions of the state. The role of the midsize farmer is not so easy to determine. Should these farms try to succeed by moving up the value-added chain and gaining some of the profits from further processing their raw materials into semi-finished products? Many in the industry believe this is the model to follow. In recent years a number of farmer-owned manufacturing facilities have been established, particularly in the bioenergy area.

Another view that has gained favor is that of developing "biocenters" close to the source of biomass supply in rural areas. The biocenters would process particular inputs into semi-finished products, which would then move to a nearby location for further processing. These biocenters would result in the creation of jobs, income, and an improved tax base for rural communities. While these new businesses would most likely be an asset to the state, no one is quite sure of the impact on farmer income and wealth creation. Some writers note that other agricultural products such as corn have seen greatly improved production without generating increased revenue to farmers. In the new bioeconomy it is imperative that farmers be appropriately rewarded for their output.

New biobased businesses would be well-advised to establish strategic alliances with their supply chain partners. Within such alliances, both parties share the risks and benefits and both make decisions. These relationships are often flexible and trust-based, and both parties work toward a mutual goal. Both groups use their complementary assets to gain long-term competitive advantage for the supply chain. These relationships often are very broad based, difficult to define by contract, and generally need to be built over time. Strategic alliances also allow for product differentiation and improve traceability and quality specifications. Since these relationships are trust-based, both the farmer and the processor must be committed to making them work. There is generally no penalty for one or the other reneging on the agreement. The relationships

generally require systems for sharing information; and some of the information required, such as product or processing costs, may be difficult for the either side to disclose. Also, there must be a group of committed growers to make an alliance feasible, and they must be willing to give up some independence.

The table on the next page shows the benefits and disadvantages to using a strategic alliance.

Conclusions

Clearly, the **manner** in which biobased businesses are developed will have tremendous implications for the future wealth of Iowa's farmers and communities, as well as for the economic condition of the state. While there may be great opportunities for large-scale farms that use best practice management standards to succeed in the new bioeconomy, it is more difficult to envision the role of the midsize farmer. These midsize farmers must consider carefully how to improve their profitability as they begin providing products to biobased processing companies.

This paper offered information about possible business structures along with analysis of benefits and disadvantages for all links in the supply chain. While none of the models provides the perfect solution for farmers, the benefits of strategic alliances that are long term and based on trust among partners appear to have the most potential for biobased businesses.

There were difficulties in doing a literature search for this paper because there were so many resources both in academic and popular journals, books, and on web sites. Persons who are interested in the topic may look for information on supply chain literature in general or for information segregated by commodity type or location.

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Table 9: Strategic Alliance Transactions for Growers

Business Model		Benefits	Disadvantages
Strategic alliance			
	Grower	<ul style="list-style-type: none"> * Secure and stable market * Agreed-to price or price structure plan * Share risk * May differentiate product * Improves traceability * Quality specified * Reduced financial risk * Multi-year possible * Access to a committed customer 	<ul style="list-style-type: none"> * Relationship is based on trust * No penalty for processor defecting * Requires sharing detailed information including costs * Increased relationship costs * No guarantee of return * Information system required to capture and exchange information * Must have a group of committed growers to make feasible * Give up some independence
	Processor	<ul style="list-style-type: none"> * Reliable source of product * Agreed-to price or price structure plan * Share risk * May differentiate product * Improves traceability * Quality specified * Reduced financial risk * Multi-year possible 	<ul style="list-style-type: none"> * Relationship is based on trust * Growers can defect and product supply disintegrate * Requires sharing detailed information * Increased relationship costs * Information system required to capture and exchange information * Must have a group of committed growers to make feasible
	Further Processor	<ul style="list-style-type: none"> * May differentiate product * Improves traceability * Quality specified 	<ul style="list-style-type: none"> * Possible higher prices
	Retailer	<ul style="list-style-type: none"> * May differentiate product * Improves traceability * Quality specified * Can promote product feature 	<ul style="list-style-type: none"> * Possible higher prices
	Consumer	<ul style="list-style-type: none"> * Traceability * Product differentiation possible 	<ul style="list-style-type: none"> * Possible higher prices
	Community	<ul style="list-style-type: none"> * Can identify sustainable growers/processors * Potential for sustainable practices 	<ul style="list-style-type: none"> * Supply chains must be competitive for all partners to be sustained