Economics

Biodiesel may be derived from oilseed feedstock, known as virgin oil, or recycled vegetable oil. When feedstock is used, you should understand the economic factors that affect oilseed processing and how they relate to the overall economics of biodiesel production.

Oilseed processing economics

The economics of an oilseed processing operation are substantially influenced by oilseed prices, vegetable oil revenues, oilseed meal revenues and labor costs.

Costs

Costs for an oilseed processing facility can be grouped into three general areas:

- Seed costs — 80 to 90 percent of total operating costs.
- Labor costs — 5 to 10 percent of total operating costs.
- Other costs (equipment, maintenance and operation) — Less than 5 percent of total operating costs.

Seed costs

Oilseed processors have little control over commodity prices. In some cases, oilseed processors can use futures and options contracts to help manage the price risk associated with oilseed markets. Processors can also contract directly with growers to ensure a local supply and a fixed price. These contracts typically last one growing season. The short duration makes it difficult to ensure a local supply over longer periods of time.

Processors may also choose to be a buyer in the cash market, which allows — but does not require — them to purchase seed when it is profitable. However, the cash market does not guarantee an available supply of oilseed feedstock. Most oilseed processors employ a combination of these tools to secure oilseed feedstock for processing. Obtain historical oilseed prices from the USDA National Agricultural Statistics Service. For prices specific to Missouri, see *http://www.nass.usda.gov/Statistics_by_State/Missouri/Publications/Press_Releases/20130628-Grain_Stocks.pdf*.

Labor costs

Labor costs for small- to medium-scale oilseed processors involve two main issues. The first is that one employee can operate a one-ton press or a 15-ton press. Increasing the size of the press doesn't change operational labor requirements by a substantial amount, which is key to understanding the role that labor costs play in oilseed processing. One hour of a worker's time on a five-ton-per-day press will result in about 0.21 tons of processed seed. The same time spent on a 10-ton-per-day press results in 0.42 tons of processed seed. The larger press offsets the labor cost by improving production levels. Purchasing a press that is sized appropriately for capacity and available workforce can help ensure the best overall value.

The second key issue is the cost of labor. Nearly all commercial oilseed operations have employees. The company can easily determine the cost per hour of hiring an employee and use this cost to determine the appropriate press size. Spending more money on a larger press will offset labor costs. However, many smaller oilseed processors opt not to employ labor and provide the labor themselves. It is more difficult to assign value to labor in these situations. The value of the proprietor's time is the opportunity cost of their time. If you hired an employee to help run the farm so you could operate the oilseed press, the value of your time is the cost of paying that employee.

Some proprietors view their enterprise as a hobby or something they do in their spare time. In these cases, proprietors often place a low opportunity cost on their time. As the value of labor increases, larger capacity oilseed presses will become more financially attractive.

Equipment and operation costs

Equipment and operating costs do not comprise a large portion of total costs but still need to be managed. Capital equipment purchases are commonly a large upfront expense for new oilseed processors. It can be tempting to purchase the least expensive equipment available. However, you should consider the labor costs associated with operating a press and the oil recovery efficiency of the press. These factors can have a significant effect on the financial viability of the press over its lifetime. Other costs, such as maintenance and electricity, typically account for a minor part of the total.

Revenue

Oilseed processing produces oil and meal, which are both important revenue streams for an oilseed processor.

Approximately 70 to 75 pounds of meal and 20 to 25 pounds of oil are produced for every 100 pounds of oilseed feed stock with an oil content of 35 percent. About five pounds are lost in processing to moisture reduction. Oilseed meal prices vary depending on the type of oilseed processed.

Oil prices also vary depending on the feedstock. Peanut oil is the most valuable, and soybean oil tends to be the least expensive. Recent prices have ranged from $3.75 to $6.00 per gallon. Meal prices also vary depending on the feedstock. Current prices for both can be found at: *www.ers.usda.gov/Briefing/SoybeansOilcrops/data.htm*. Market prices will dictate which product will contribute more revenue to the operation.

Biodiesel economics

Potential biodiesel producers should have a basic understanding of biodiesel economics. The economics of biodiesel are dominated by two factors: the cost of vegetable oil and biodiesel revenue.

Input and operations costs

The cost of purchasing vegetable oil typically accounts for 65 to 90 percent of the total costs of producing biodiesel. Labor costs may account for 3 to 10 percent of total costs. Methanol costs can account for 12 to 18 percent of total costs, though larger operations might use methanol recovery systems, lowering this to 7 to 12 percent. Equipment costs vary for small-scale producers but rarely exceed 15 percent of total costs and may be much lower. Labor costs decline as the size of the operation increases, but even small operations rarely have labor expenses over 5 percent of total costs. Other costs, such as catalyst, electricity and maintenance, are commonly less than 5 to 8 percent of total costs.

Revenue

Sales of biodiesel are the main revenue stream for biodiesel producers. In April 2014, the U.S. Department of Energy reported that the national retail price per gallon premium for biodiesel over premium diesel was $0.26. Biodiesel producers will typically generate 95 percent or more of their revenue from biodiesel sales. In cases where the biodiesel is not sold but instead used by the producer, its value is realized by reduced diesel fuel purchases.

In cases where biodiesel is being sold, additional revenue may come from the sale of glycerin. Unrefined glycerin is a byproduct of the biodiesel production process. It can be refined for use in the production of cosmetics, soaps or other products or sold as an unrefined product for use as a boiler fuel. In either case, the revenue generated by this is low. Some producers compost their glycerin, which can be an effective means of disposal but involves significant volume to be composted — about 10 to 20 gallons per 100 gallons of biodiesel produced. Small-scale biodiesel producers may have difficulty finding a buyer for this product, so account for this when planning a biodiesel operation.

Subsidies have been periodically available for biodiesel production, including grants for equipment purchases, tax credits and per-gallon payments.

Business plan software

Potential oilseed processor or biodiesel producers should develop a business plan and projections on the financial viability of the proposed operation. This is a great option for many businesses but may be impractical for small operations. Potential small-scale biodiesel producers can take advantage of software developed at Montana State University to help create individualized financial projections. This free software is also suitable for Missouri consumers and is available at *http://www.ampc.montana.edu/energyinformation.html*. It allows users to account for equipment, labor, oilseed, oil, methanol and other costs specific to their operation, as well as revenues from vegetable oil, oilseed meal, biodiesel and glycerin. Based on the user-provided information, the software generates basic cash-flow and financial information. You can alter variables to get a feel for the implications of changing market conditions.

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