

15. Assume near-automation on distillery, so it doesn't need babysitting. Labor is to load and heat, add yeast, and later distill for three hours. Marketing delivery of products takes three hours @ \$10 per hour.
16. This averages \$.60 per gallon across the three examples.
17. Figured as Btu wood-equivalent cost. Assume recovery of 70% as 150°F hot water. Can be used for byproduct industries or for next alcohol run.
18. Dewatered fruit pulp price on a dry-weight basis.
19. The thin stillage could be converted to single-cell protein, two lbs. per gallon or \$.22, but not included here.
20. \$80.00 per ton equivalent to dry weight.
21. \$.10 per lb., sold to local greenhouse growers or welders, although it would be worth much more in the growing of high-value vegetables on-site. Cost of compressing equipment is not included here, since it would be less than one cent per gallon of alcohol produced.
22. These totals would be for sale off-farm. If secondary materials are produced, then the primary co-products would not be sold but would instead be used in making secondary products.
23. Gross income only. No tertiary byproducts by using waste of secondary products, except as noted. Value per gallon of alcohol produced.
24. Wet distiller's grains.
25. Eight lbs. of dry pulp with eight lbs. of additional straw soaked in DS, making 16 pounds of mushrooms, at \$2.50 per lb.
26. Eight lbs. of straw soaked in DS, yielding ten lbs. of mushrooms.
27. Seven pounds of DDG plus eight lbs. of straw soaked in DS, making 17 lbs. of mushrooms.
28. \$1 per lb. wholesale castings, at 50% moisture.
29. Fruit pulp and 50% straw produce 16 lbs. of worm castings, sold at 50% moisture content @ \$1 per lb.
30. DDG plus straw yields 16 lbs. castings @ \$1.
31. Simplified figure of \$10/lb. of fish as combination of male fish live retail and balance as fish emulsion. Fish is an alternative to worm castings.
32. Assumes pulp mixed with an equal weight of straw to make mushrooms first. Byproduct of mushroom production feed to fish. Five lbs. of fish biomass @ conversion rate of 1.6:1.
33. Estimated 6 pounds of fish from using 10 gallons DS liquid and carbon dioxide to produce spirulina to feed fish.
34. WDG converted to fish at 1.6 lbs. per lb. of fish.

Fig. 26-3
Expenses and
credits for three
feedstocks.

farmer, you ought to be able to work out a deal where you get corn at the end of the season and he gets thousands of gallons of your fish water. If he has to borrow less money for inputs (fertilizer), his risk of failure goes way down when he can pay you in corn at the end of the season.

Tax Incentives

Tax incentives consist of tax credits or tax deductions. Tax credits are subtracted from your total amount of tax due. Tax deductions are subtracted from total gross income before you calculate your taxes.

For many years, the U.S. tax credit for alcohol fuel was a complicated affair that was actually a credit against the federal excise tax on all fuel sold for public highway use. If the alcohol was used for any other purpose, such as for powering machinery or off-road equipment like tractors, you didn't get the credit. This did not provide much incentive for farmers to run their tractors on ethanol. Over time, the tax credit evolved to become even more difficult to claim, and only oil companies buying alcohol to blend with gasoline were able to get the credit.

But, in 2005, a law created the Volumetric Ethanol Excise Tax Credit (VEETC), which can be claimed by anyone in the sales chain of the fuel right down to the retailer. As long as you have a

resale terminal, you can also be a distributor, jobber, refiner, or even producer. This is so much better than the former law, since the fuel can be sold without regard for the tax status of the buyer, or what the buyer uses the fuel for. Now you can get the credit for using the fuel to power your generator or off-road equipment, or for heating and lighting your home.

The catch: In order to be eligible for VEETC for alcohol production or use, you need to be a business. (In the final chapter, we talk about a pretty painless way that consumers can get the credit without having to become a stand-alone business.) Happily, being a business is almost always to your advantage. If you're not a business now, you should become one. Hop on down to your county courthouse and fill out the registration form. You'll probably have to go through logbooks of business names to make sure the name you've chosen hasn't already been taken ("Microsoft," for example). In most cases, after you've checked the logbooks, you turn in the application with a check to the city and/or county, then publish the new name of your business in a local paper a certain number of times. Voilà! You're a business.

One of the questions on the application asks for the "purpose" of your business. "Research and development of fuel alcohol processes" is a good



Fig. 26-4

answer. For tax purposes, you are doing business as (dba) a sole proprietor.

You can have a job and still be a business. Any income you earn (in a job, for instance) or loss you sustain (from your new sideline business, for instance) is considered part of your total income or loss as far as the IRS is concerned. Lots of things you aren't able to write off as a citizen, you can write off or deduct from your business income, such as all of your health costs and some or all of your trip to Mexico (since you toured the Corona beer plant "to study fermentation methods"). Of course, I'm not giving you tax advice; that is for your CPA to do.

Federal Tax Benefits

For small-scale producers, defined as under 60 million gallons per year, there is a federal ten-cent-per-gallon producer's tax credit. The producer can choose to keep it or pass it on to retailers or buyers of the fuel. Between the VEETC and the small producer credit, you are looking at a total tax credit of 61 cents per gallon off your federal taxes. So your business can submit a bill for 61 cents per gallon for tax credits, which is refundable as cash!

If you form a fuel co-op as a limited liability corporation (LLC), the tax credits are passed down to

the co-op owners/members to write off on their personal taxes (for a simple way to do that, see Chapter 29).

If your business sells alcohol to co-op members, but their intended use is for off-road consumption, you still get the 61 cents per gallon refund, but you don't pay the road tax! (For off-road use, the alcohol is dyed a different color, like farm diesel.) If the user decides to put the alcohol in a cogenerator instead of a tractor, it is still exempt from the road tax, but still qualifies for the tax credit.

In the 2005 energy bill, a couple of new things came into existence. The costs of putting in fuel-dispensing equipment or stations for renewable fuels now qualify for a tax credit. The current credit is for 30% of the cost of establishing the refueling site, up to a maximum of \$30,000. If you are a corporation or even a sole proprietorship, you can include most or all of the costs to calculate the credit. That doesn't include any permit fees, staff costs to obtain use permits or building permits, etc. This credit doesn't apply just to big public stations; it also applies to your home (business) fuel dispensing equipment.

Also buried in the bill is a system of renewable energy "credits" that are not tax credits. These credits accrue if you make your alcohol from cellulosic

material or if your plant is powered more than 90% by renewable energy. You can earn 2.5 credits for each, for a total of five credits. So what do they mean? Since the federal government has established a Renewable Fuel Standard (RFS) for auto fuel, oil companies must buy a certain amount of renewables to mix with gasoline. But instead of actually buying the fuel, they can buy credits to meet their obligations under RFS. However, the amount of alcohol being produced by all the big plants coming on-line will surpass the RFS. So the credits may end up being worthless.

The bigger issue is that as long as the oil companies have a near-monopoly on distribution of auto fuel, they will manipulate the market. Let's take the summer of 2006 as an example and then discuss how the credits might be used by a savvy producer as a hedge against market manipulation.

Oil companies first bid the price of alcohol up, claiming that the elimination of MTBE from auto fuel was to blame. The American Petroleum Institute portrayed the increase in alcohol's price as a free-market problem, demand outstripping supply. In reality, since oil companies are the only customer for 99% of the alcohol produced (only 1% is sold as E-85) what oil companies will pay for alcohol is totally under their control.

Running up the price had two effects. The oil companies could avoid the embarrassment of having E-85 at the pump for a dollar less per gallon than gasoline (which was \$3 per gallon in summer 2006); and the higher price provided fodder for a massive PR campaign casting alcohol as too expensive for the consumer.

Immediately following a devastating article in *Consumer Reports* that dutifully related the oil company position that E-85 was a bad deal for the consumer, the oil companies, with their disinformation campaign in place, boycotted purchasing alcohol in excess of what was required by the RFS, crashing the alcohol futures market by 40% nearly overnight. So, once the disinformation went as far as they could make it go, they dropped their purchases and crashed the market.

Producing your fuel renewably or from cellulose provides a hedge against manipulation, since oil companies would prefer to buy your credits rather than buy alcohol fuel when they are in a "crush the competition" cycle. They have historically boycotted buying alcohol to disrupt the alcohol business and create a lack of confidence, which makes

"The world is a dangerous place to live; not because of the people who are evil, but because of the people who don't do anything about it."

—ALBERT EINSTEIN

getting capital difficult. So, at those times, they would rather buy credits than fuel—and if you have credits to sell, that will help protect you from losses when the price drops through the floor as a result of their boycott. In such a case, all the producers, desperate to sell fuel, drop their prices. Producers using renewable energy will be less subject to the artificial volatility of manipulated pricing.

State Tax Benefits

At last count, 36 states have ethanol-related tax incentives: 22 states have incentives to support ethanol production, 32 states have incentives to support use of ethanol, and 18 states have both production-side and application-side incentives. There are also a small but growing number of states that are providing tax credits for establishing E-85 stations, in addition to the federal credits.

Some states give relief from property or other taxes on the cost of building plants, but the primary measures used by states to support expansion of ethanol production are given to producers. Production-based tax credits, currently ranging from 7.5 to 30 cents per gallon of ethanol, either reduce liability for state income tax or transfer a reduced tax liability to the marketer on the ultimate sales of motor fuel. These credits are independent of the federal benefits. You will have to check with your state to see if there are tax credits for production. Check <www.permaculture.com> for periodic updates on state tax credits.

Some states still have deductions, such as no income or sales taxes on the first so many millions of gallons produced. These tax incentives are designed to help attract alcohol distilleries to be built in the state, and should apply to your small plant, as well.

Most state ethanol production incentive programs have legislative and/or administrative regulations defining eligibility, maximum amounts claimable (per facility and/or in total), effective time period, and other terms and conditions. For instance, Minnesota's ethanol producer payment program, enacted in 1986, offered a direct producer payment of 20 cents per gallon for up