

## Introduction: Why Alcohol?

The fact that you're reading this reveals that you have at least a passing interest in alcohol as a fuel. For some, that interest may be one of curiosity — about alternatives to petroleum in general or about the practicability of fuel alcohol in particular. Others may be considering using alcohol fuel — better known as ethanol — to supplement or even replace petroleum in their vehicles, tractors, generators, or to power equipment at home or on the farm.

The majority of people who read this book from start to finish will likely learn a lot more about alcohol than they ever suspected there was to know. Alcohol has a long and diverse history, certainly as a beverage, but equally so as a fuel, which only came into sharp focus toward the middle of the 19<sup>th</sup> century when it was used for lighting. Alcohol's journey from an illuminant to a motor fuel to a clean-air gasoline additive and most recently to a bridge technology slated to help us transition to a petroleum-free age is an absorbing one. The tale is fraught with political chicanery, the

impact of wars, industrial espionage, and the sheer energy of a grass-roots movement. Yet the more important story is the fact that an entire litany of common carbohydrates — not just food crops, but agricultural cull, food industry waste, and plants normally considered a nuisance — can actually be turned into a viable fuel, effectively free from the constraints of the marketplace, suppliers, middlemen and tariffs if you so choose.

Depending upon how you approach alcohol fuel production, it is entirely possible to maintain a completely self-sufficient, self-sustaining, environmentally responsible operation able to produce not only fuel, but also valuable co-products that can be sold, bartered or recycled back into your own venture. In this way, alcohol has some real advantages over other renewable fuels in that it doesn't need much, if any, "mainstream" input unless you decide to include it. Having freedom from the unpredictable swings of traditional commodities markets can be a real benefit to long-term planning and peace of mind.

I have intentionally approached the subject of fuel alcohol with small-scale production in mind. Chapters 3, 4 and 8 address this in more detail, but I will summarize it by saying that in steering clear of the conventional industrial-level mindset, a fuel producer can shed him or herself of what's become a stigma associated with relying on corn as a feedstock — that of using food for fuel. You'll see more on that later, but the point is, appropriate-scale production means opening your mind to the vast possibilities that exist, embracing experimentation, and adjusting your approach to manufacturing accordingly. When I first became involved with fuel alcohol at *The Mother Earth News* in 1978, the price of corn and its impact on the global market was nowhere near the issue that it is today. Yet we still didn't simply accept corn and grains as the status quo — potatoes, apple waste, and other atypical feedstocks were fair game for the sheer flexibility of supply.

Now, the question often arises at seminars and presentations as to how small is small? That, again, is up to you. In the chapter on distillation equipment, I discuss a plain-vanilla batch still capable of making a few gallons of fuel-grade ethanol per hour. Something like that will barely serve the needs of a typical motorist, but there are some good arguments for considering such a piece of equipment in the experience it can provide, devoid of a hefty investment. People in exurban or rural areas can easily contemplate a larger still, fully capable of output in the range of 12 to 35 gallons per hour or more, without breaking the bank with an automated, continuous-distillation design. And if you consider the options opened

with a cooperative venture — be it in an urban or rural environment — you can achieve an economy of scale that makes a larger investment in equipment much more appealing.

I have tried diligently throughout the book to avoid overselling the concept of fuel alcohol as a matter of principle. I have been through that before, and it only taints the waters. As I represent my publishing business or address workshop attendees at various renewable energy and sustainability events across the country, it has become clear to me that there is opportunity in the air and, regrettably, no shortage of opportunists ready to make a quick buck. Particularly in the past few years, interest in fuel alcohol has flourished and along with it the carneys, wrapped in the flag and preaching a grass-roots message from the convenient soap-box of sustainability. This may sell books, products and videos but it does little to legitimize the practical production of alcohol fuel.

Make no mistake: alcohol fuel requires an investment in time and equipment and a commitment to study and effort. The rewards can be great, but the promises of a universal magic potion cure-all can also be very beguiling. What is unfortunate is that eager newcomers to renewable energy and a sustainable lifestyle are the ones who will get taken; often enough, they can move forward and carry on unscathed. Yet there will always be those who depart, embittered, blaming the message and not the false messenger. It is my hope that this book will honestly guide those willing to work toward some degree of self-sufficiency and sustainability in the right direction.