Living Energy Farm

March-April 2013 Newsletter

Let LEF Help You Plan your Summer Garden

Rosa is on the tractor and ready for spring!

Spring is here! After sloshing our way though an unseasonably cold and wet March- complete with three significant snowstorms!- we were all very happy to welcome some warm weather in April. As the fruit trees flower and leaf out, we're celebrating the season by getting our spring crops planted, and getting the seeds fields ready for summer plantings.

And if you're still not sure what to plant in your summer garden, this year Living Energy Farm can help you out! We've partnered with Southern Exposure Seed Exchange to create a collection of seed packets ideal for summer planting in the mid-Atlantic. LEF growers Edmund, Debbie, Emily and Sean put their heads together to choose 10 varieties that we wholeheartedly recommend for productivity, flavor, disease and insect resistance, heat tolerance, and keeping quality. Some of the seeds, like Super Shepard pepper, are ones we grew ourselves. And 30% of the proceeds from this collection will be donated to Living Energy Farm. The collection is available online at http://www.southernexposure.com/virginia-growers-choice-summer-collection-p-1705.html

Biogas: Making Fuel from Trash

Carrie shows the two plastic barrels and PVC plumbing to be used in our biogas digester.

In early April LEF was happy to welcome Carrie, our first intern for the 2013 growing season. After about a week of settling in, Carrie got right down to business with her big project for the summer: building us a biogas digester for cooking fuel. Small scale biogas (or methane) digesters are popular in China and other parts of Asia, where folks typically use animal manure and plant residues to create gas for lighting, cooking, and other domestic uses. In the USA, large methane digestors are often connected to landfills or CAFOs (confined animal feeding operations), but home scale production and use is not very common.

Methane is the main component of both natural gas and biogas. It is created when organic matter is broken down by anaerobic bacteria. Sounds simple, but creating high quality (as in, usable) gas can be tricky, and depends on many factors including the carbon/nitrogen ratio, pH, bacterial culture, and temperature. Although many different kinds of organic matter can theoretically be used to feed a digester, it is useful to have a regular supply of feedstock with a high nitrogen component- usually animal manure. At LEF, we will be using food scraps, a small amount of animal manure, and possibly human manure. We'd like to find a way to use cheap, commonly available sources of organic matter like leaves, hay, or sawdust; but making gas from such high

carbon materials can be difficult. The trick, as Carrie puts it, is to find what makes the digestor happy under our particular conditions and available feed stocks.

It's an ambitious undertaking, but Carrie isn't working on this project alone- she's getting help from a student group from UVA called Engineering Students Without Borders. Four engineering students came out to the farm last weekend to put together a prototype digester made from two 50 gallon plastic barrels. The plan is to seed the digester with cow manure for the bacterial culture- cattle, it turns out, have a methane digester of sorts in their stomach, so the manure has a good mix of bacteria for anaerobic decomposition. To continue the supply of gas, the digester will be fed with food scraps. And by this summer, if all goes well, we'll be cooking with biogas!

Quick and Easy (sort of) Solar Hot Water

After a long winter of washing our hands in cold water, we've finally set up a batch collector style solar water heater at our greenhouse. Batch collectors are a simple but effective method to heat water with the sun. They consist of a tank, painted black and set in an insulated box with a plate of glass set on top. The box is then set vertically at an angle of 45-60 degrees facing south. A long and narrow tank is ideal because the water will thermally stratify more effectively, meaning the hottest water will collect at the top.

Our collector consists of two stainless steel tanks and is insulated with two inch foam on the bottom and sides. Cold water is plumbed to the bottom of each tank, and hot water is collected from the top. Having two tanks increases the surface area exposed to the sun and thus the temperature; also, stainless steel is corrosion resistant so the collector should last practically forever. The water source for our collector is a tank that catches rain water from the roof of the greenhouse. It is pumped through the system with a hand pump.

Batch collector systems are easier to build because they combine heating and hot water storage into one component. Flat plate collectors, which we will probably use on our house, have a greater capacity for storage and can achieve higher sustained temperatures, but they are more complicated and expensive. In a flat plate system, water is pumped through a series of black pipes under glass, then pumped into an insulated storage tank indoors. Flat plate collectors are prone to freezing out, so precautions must be taken- either a drain back mechanism, or using antifreeze in the pipes and a heat exchanger at the storage tank. In a batch collector, the thermal mass of the water in the tanks will be enough prevent freezing in everything but very extreme cold.

So far our batch collector has been performing well. On sunny days we have plentiful warm wash water, and on cloudy days we have enough for minimal use. We plan to build insulated shutters to cover the collector so the water will stay warm on cold nights.

Living Energy Farm is a project to build a demonstration farm, community, and education center in Louisa county that uses no fossil fuels. For more information see our website www.livingenergyfarm.org, or contact us at livingenergyfarm@gmail.com. Donations are tax deductible.