

Modeling Sustainable Food Production at Living Energy Farm

Living Energy Farm is a community, a farm, and a technology development center in Louisa Virginia. We currently earn most of our living growing **Open-Pollinated Seeds**. We are also largely food self-sufficient. Our goal is build a model of what a truly sustainable regional food system can look like. Our buildings are entirely off-grid, and built with modestly priced technologies that can be widely employed. We have a **Farm-Grown Fuels** program to figure out how to operate our farm without fossil fuel. Our hope is that we can test the scalability of our solutions. How much land does it take to grow fuel to support small machines that can support a small community of people? These are the questions we are trying to answer.

We are very excited to be researching **Organic No-Till** methods as well. As with our mechanical technologies programs, we are not trying to “re-invent the wheel.” We are trying to figure out what works for us, and what might work for others. Rodale Institute and other organizations are doing great research and development on organic no-till. Those methods rely mostly on rye as cover crop. We were pleased to discover Susana Lein at Salamander Springs Farm in Kentucky more recently. She uses a more diverse mix of cover-crops for a year-round no-till regimen. (Her farm is very small.) We are hoping to bring together these ideas with on our energy and food self-sufficient farm to create a model that can be applied to other locales. Following find a summary of our agricultural philosophy and methods. We will be posting more material for our website and newsletters as our projects evolve.

Methods, Visions, and Goals

The corporate food system is under the control of an increasingly small number of people using increasingly toxic and destructive methods. We envision a future where communities both rural and urban are able to use regenerative methods to produce for themselves, and can buy from or trade with other communities in the region to provide for all their basic needs. Rural farmers using sustainable methods must be able to not only feed themselves, but produce an excess of staple crops to sell to urban centers. Unfortunately, most rural intentional communities and permaculture demonstration projects we know of are actually net importers of food.



Growing seeds and food at LEF. These crops are grown organically, and irrigated with solar pumped water. Can organic farming feed humanity? Yes it can!

The ethics of permaculture are summarized as “earth care, people care, fair share.” There are many ways these ethics can be interpreted. We focus on the following tangible goals:

* **Earth care:** We aim to manage our productive land in a way that builds topsoil and organic matter over time. We use no non-organic inputs, and seek to minimize off-site organic inputs like manure and mulch.

* **People care:** We aim to grow a full, balanced, tasty diet for ourselves and our domestic animals. We aim to produce an excess to sell or trade. We want to use methods that are labor efficient- we love our work, but love it even more if we have space in our lives for more than just work.

* **Fair share:** We aim to leave space for wild nature by using only as much land as we really need. And while sustainable agriculture solutions are always local, we aim to use methods that communities of very meager means can also afford.

The strategies we use to work towards our goals are inspired by several agricultural philosophies, including permaculture, bio-intensive mini-farming, and large-scale (mechanized) organic farming. We aim to balance the strengths and weaknesses of each approach. **Permaculture** design is strong on earth care, but often does not focus on productivity or land use efficiency. **Bio-Intensive Methods** are strong on land efficiency and productivity, but are very labor intensive. Large scale, mechanized **Organic Farming** is labor efficient, but often does not meet our earth care goals. But all these philosophies, as well as what we know about indigenous farming methods, have a lot to offer a balanced approach.

The Strategies We Use to Meet our Goals

Plant based diet. While we appreciate the nutritional and culinary benefits of modest amount of animal foods (no traditional culture has been 100% vegan), eating mostly plants is the simplest way to practice the ethic of “fair share.” It's obviously much more land efficient to feed plants directly to humans than to run them through animals first. Even with optimal grazing management, seven billion people cannot eat meat and dairy based diets -- there's just not enough land, and it certainly leaves no room for wild nature. As we aim to demonstrate a way of life everyone can afford, we have made a conscious decision to not include ruminants in our food system. We do fine without them.



“Drought-stressed” organic corn at LEF. We often grow heirloom varieties that are resistant to drought and insects.

Food from trees. Tree crops build topsoil, are labor-efficient and need little or no irrigation. We are guided by what grows wild on our land, and grow cultivated varieties of persimmons, filberts (hazelnuts), pecans, jujubes, muscadines, blight-resistant pears, berries, and a number of other naturally disease resistant fruits and nuts.

Organic no-till when practical. The negative impact of tillage on topsoil is well known. That said, we are not 100% no-till. Most organic no-till vegetable production relies heavily on imported mulch. Another technique consists of growing a lush cover crop which can be mowed down and left in place to serve as mulch for the cash crop. This method works only with crops where the timing of planting coincides with the time when a cover crop can be successfully killed by mowing or frost. We have struggled to use this method in the past, and have learned that it does not work well to rotate no-till management with cultivation. We are in the process of establishing permanent no-till sites for crops which grow well with this method, which include wheat, beans, sweet potatoes, tomatoes and corn.

Cover crops and fallowing to build topsoil. Crops managed with cultivation are rotated with fallow periods of growing only cover crops to control weeds and add organic matter. We also use relay cropping- sowing a cover crop into an established cash crop at last cultivation- to ensure that our fields are well covered through the winter. Cover crops are such aggressive biomass producers that they can compensate for organic matter lost through cultivation.

We eat what grows easily in our climate. This seems obvious, but for most people, it is a big adjustment. Organic growers take for granted that they must battle disease and insect pressure when they take crops from New England and grow them in the south. Our diet is based on annuals and perennials that, in healthy soil with good organic matter, can grow without sprays, integrated pest management, trap crops, compost teas, or labor intensive interplanting. (We do use row cover sometimes, but hope to wean ourselves off of it eventually. Also, we are lucky enough that our fields are surrounded by wild lands which provide habitat for all manner of beneficial insects -- other growers may need to provide this habitat themselves.)



Growing winter squash for food and seeds at LEF makes for happy farmers, young and old.

Choosing seed stocks selected for organic, no-spray production in our bioregion. As seed growers, we have come to appreciate what a difference it makes to start with seeds selected for performance under our conditions. Just a few generations of selection can greatly increase disease resistance in cucurbits, for example. We are lucky to be connected to a network of seed growers in the region who are selecting every year for high-quality genetic material. This is indispensable work.

Food and Food Processing

Our plant-based, homegrown diet is focused on a few staple crops, which store easily and provide the bulk of our calories. These crops are corn, wheat, beans, peanuts, spring potatoes, and sweet potatoes/winter squash. Corn and wheat also provide the bulk of the calories for our ducks, which provide us with eggs.

We also grow all of our vegetables. Some of these we get as a by-product of growing vegetables for seed. But we also grow lots of veggies to eat fresh, or preserve for the winter.

We ensure a supply of vegetables year-round we use several methods of food preservation, including season extension, fermenting, canning, and drying. Season extension is the easiest method of “food processing.” We extend the fresh picking season by doing multiple plantings, using row cover, and choosing cold-hardy and disease resistant varieties.



Canned and dried food at LEF.

Fermenting is kind of like season extension, it doesn't put the food in suspended animation to be stored indefinitely like canning does. But it is easy and so very tasty. If you have a root cellar or extra refrigerator space, it can store for several months. Our favorite foods to ferment are cucumbers, green beans, winter radishes, and carrots. Cabbage of course is excellent fermented, but it's a lot of work to grow so we mostly don't grow it.

Canning: We do boiling water bath canning for high acid foods, and pressure canning for low acid foods. The foods we pressure can are sweet corn and meat (usually venison). For boiling water bath canning, we do a whole lot of tomatoes and fruit (pear sauce and peaches mostly). We don't do much with vinegar based pickles because we don't like the flavor.

Drying: We have a lot of capacity to dry food as a side benefit of our solar hot air-based heating system. The first year we had our dryer I tried drying everything we grow. I learned that a lot of vegetables don't retain much flavor when dried. Now I am more discerning. My favorite vegetables to dry are peppers, eggplant, okra, and green beans. Tomatoes of course are very tasty but also difficult to dry with a solar dryer, as they mold easily overnight. Almost all fruits dry easily and are delicious, especially persimmons and pears. Berries can be made into fruit leather and dried. Paw paws are an exception, they don't dry well.

Resources

We are very fortunate to have three local gurus of sustainable food production, who have decades of experience growing food in central Virginia, and have all written books on the topic. These women are Ira Wallace ([Vegetable Growing in the Southeast](#)), Cindy Conner ([Growing a Sustainable Diet](#)), and Pam Dawling ([Sustainable Market Growing](#)). Pam's book is an especially useful reference because it contains details down to planting dates and varieties best suited for our region.



Mid-winter breakfast fruit platter, all homegrown. Persimmons, kiwis, peaches and pear sauce. Oh the hardship of off-grid living!

In the world of perennials, an excellent local resource is Michael McConkey and his nursery Edible Landscaping (www.ediblelandscaping.com), which specializes in low-care perennials for the mid-Atlantic. Alexis' booklet, Perennial Food, is super useful as well and available at <http://covev.org/fruitbook9.pdf>.

For sourcing seeds, we recommend Common Wealth Seed Growers (<https://www.seedwise.com/farmers/18/common-wealth-seed-growers>) and Southern Exposure Seed Exchange (www.southernexposure.com). SESE also has organic planting stock like alliums, white potatoes, and sweet potato slips. If you're not certified organic, you can get planting stock from a local farmer's cooperative like Southern States, and it is much cheaper.

Of course there are piles of other books about organic food production out there. My favorite books by non-regional growers are The Resilient Gardener by Carol Deppe and The New Organic Grower by Elliot Coleman. I especially like section in Coleman's book on farm-grown fertility. Carol Deppe's book is focused on the northwest, but I find it especially useful on the topics of seed selection and breeding. Her book is also excellent for understanding all the different kinds of dry corn (flour, flint and dent) and the best ways to cook them.