

How to Plant a Subsistence Garden



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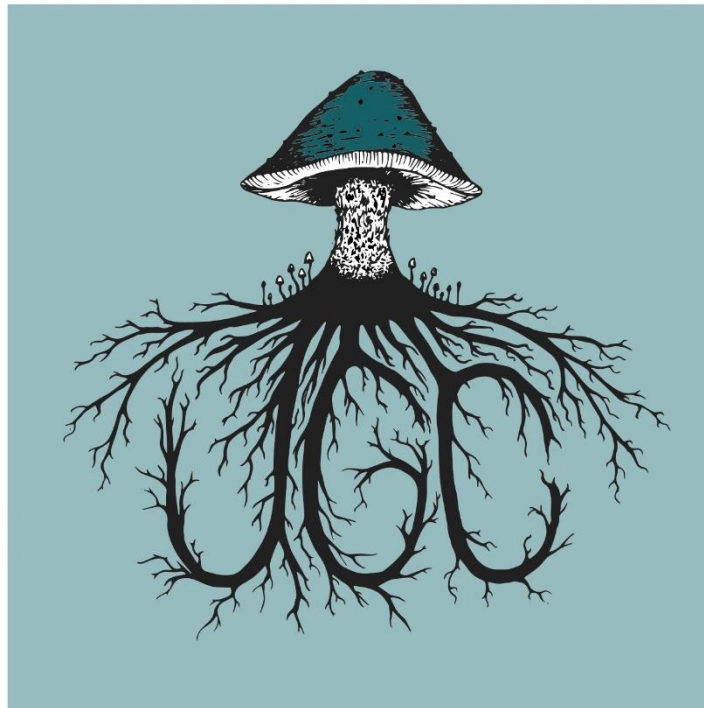
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Index

Subsistence farming overview	3
Subsistence farming techniques	7
Staple crops	14
Root crops	23
Kitchen crops	24
Other food sources	29
Resources and references	30



Subsistence farming overview

In previous texts, we discussed the importance of transforming private and public land into food infrastructure. In this document, we will focus on what to grow in those spaces. What we suggest planting are crops that you can live on - a garden to meet all your calorie needs. We are advocating for a system where we grow, process, store, cook, and compost where we live. The food never needs to travel more than walking distance. We believe that *if most of the people in our community adopted these strategies, in combination with a widespread transformation of land use and reallocation of labor, we would be able to grow all the food necessary for everyone without any need for money transactions or trading.* This cultural and economic change would allow us to feed everyone in our community without exploiting land, fossil fuels or vulnerable workers in the process. We also believe this can happen without the need for top down government intervention or coercion by profit driven corporations.

What we offer in this text

The goal of this text is to share the fundamental techniques we use to grow food, what crops to include in a subsistence garden, and a general overview of how to plant, harvest, process, and save seed for these crops.

At The Underground Center, we don't live completely off the food we grow. If we kept all the food that we planted and harvested in a year across the multiple gardens we manage we absolutely could. We are primarily educators, so we share the food we grow to motivate others to do the same. We demonstrate, assist and advocate for community food production and a local economy based on mutual aid. As others start to take on more of the work growing food, mentoring young people, and sharing useful information for free, we can prioritize satisfying our own food needs from the land. Hopefully, that day will come soon.



Acknowledging that we are not completely “food self-sufficient”, we are still able to grow large amounts of crops in small gardens. We can do this in the types of growing space widely available to most of the folks reading this text. If you are interested in doing the same, we would love to share what we know!

The vegetables we plant are created with the idea of growing everything we need for a complete diet. Our subsistence crops are meant to fully sustain us. In an optimal situation, every ingredient can be sourced from a garden right by our homes (or short walking distance) and prepared into healthy, filling, delicious meals.

Admittedly, growing all our own food means changing up our diet, but this does not mean giving up quality, taste, or pleasure in our culinary lives. When we invite friends to visit our “primitive” farm they are shocked by the quality of meals we cook from ingredients harvested 100% from the garden.

Subsistence farming vs Market farming

Subsistence farming is growing food with the goal of feeding your family or hyper-local¹ community. The type of subsistence farming we propose requires little to no money or fossil fuel inputs. This is a strong base to build from because the crop has inherent value - we can eat it! This contrasts with market farming where there is overhead. This includes money inputs, insurance, rent, distribution, labor and marketing costs. If you fail to bring in money in a market farm you lose your way of living. Subsistence farming, especially on a community scale, is something we can control and design to meet our needs in uncertain times; it is flexible. Market farming, which inherently depends on large scale economic forces, is something we can only react to and is subject to unpredictable price shocks on business failures. A current example of this is farmers in the U.S. slaughtering thousands of animals, dumping milk in the ground, and letting huge piles of vegetables rot in the field all because their usual markets have shut down during the pandemic. Meanwhile, food pantries are struggling to feed the many hungry people who have lost their jobs. Both producer and consumer lose.

Subsistence farming as security

Economists and academics who take poverty reduction seriously point out how supporting subsistence farmers is an effective way to avoid famine and hardship from the frequent price shocks of our tumultuous global market. They argue that in poorer countries, it is much easier to help “small holder” farmers increase the fertility of their soil and support their time tested agricultural practices than it is to control food prices, subsidize corporations, or provide social security nets. These require strong (and well meaning) centralized governments, something that is hard to find in “developing” nations. When supply chains fail and investors lose their interest in markets, the poor are hit hardest. Having food growing in their backyards is the best security against hunger there is.

Some might contend that a strategy to support subsistence farming does not apply to “developed” countries because we do not have subsistence farmers to support. Our point is that we should start creating subsistence farms. Let’s transition any land we are privileged enough to have access to away from land speculation markets or high-priced rentals and create food infrastructure instead. Let’s gradually and consistently replace our labor hours spent creating profits for capitalists on a market economy with labor spent creating and maintaining subsistence farms and the infrastructure to support them. We are arguing that this is a powerful tool to secure our communities from events that will undermine the stability of market economies like economic downturns, climate catastrophes, pandemics, and government neglect. We are currently experiencing all four of these things. What other signs do we need to challenge our complacency and faith in this system to provide for us?²

¹ We use the term hyper-local to mean your neighbors and immediate community, primarily in walking distance. This is in contrast with the “local food movement” which is a market farming enterprise that relies on fossil fuels for production and distribution, increased food prices to compensate for higher local labor rates, and a definition of local that is within 100 miles and sometimes more.

² Researchers highlight three aspects that make “developing nations” ineffective at administering aid to the poor during food crises. Limited policies to contain the rise in cost of living, weak fiscal resources to transfer money directly to citizens, and limited institutional capacity or willingness to manage social assistance programs. Sound familiar?

Subsistence farming as Justice

The goal we are aiming for is food self-sufficiency, or more accurately food “co-sufficiency.” A system where we collaborate with the people in our community to meet everyone’s food needs. Survival is not just about stockpiling and protecting your food supply, it is about prioritizing work based on need and collaborating to meet those needs. Survival depends on social skills. For these reasons, we aren’t advocating a “support your local farmer” movement, we are advocating a “feed your neighbor” movement. Food sovereignty means reviving the cultural practices of food growing that exist in all our veins, some in more recent history than others. We are talking about mutual aid: people doing work that benefits them, their community and the systems that sustain us simultaneously.

If you follow this growing technique, you will be able to reduce or eliminate your food expense, which means less time you need to sell your labor. You will be building a base that a resistance movement against exploitation capitalism and environmental destruction can be supported on. Right now, we have no choice but to support the exploitive, wasteful, industrial food system because we need to eat! Becoming a subsistence farmer and collaborating with other local farmers is a great way to stop “feeding the fire” and create a viable alternative for the future.

How viable is subsistence farming?

Now that we’ve made a case for an alternative vision, let’s explore the possibility of realizing it. The amount of space to *actually* grow all your own food depends on what you are growing, quality of the soil, planting method, care of the crops and other factors.

The mythical number of how much square footage you need to reach “food self-sufficiency” is different according to different authors. Some urban farming practitioners like Will Allen in Milwaukee grew over 2 million pounds of food a year on a 2 acre city farm. John Jeavons, creator of the bio-intensive method that we draw heavily from, says as little as 1000 sq. feet per person can provide all your food needs with healthy soil and proper watering. When he factors in the space for mulch and cover crops to maintain fertility, he says 4,000 sq. ft per person is a good number to aim for.



From our experience, by utilizing leaves and efficient compost for soil fertility and supplementing your diet with foraged food and hunted meat, you could survive on less than 4,000 square feet of cultivated land. As more people collaborate and experiment locally with subsistence farming, we can have more precise answers to these questions.

Can it scale up? It's hard to wrap our minds around feeding our whole community with our own labor. We are so used to massive amounts of food on the grocery shelves and images of endless fields and giant tractors. A piddly little garden seems like it could never replace that. Based on our experience growing food intensively over the last 10 years, we strongly believe it can.

A little research into the history of Saugerties (where we farm) shows that 150 years ago, this community grew most of its own food and exported even more to New York City. Saugerties wasn't some backwoods town either. In the late 1800s around 10,000 people lived here, there were multiple ferries, overnight steamboats to the city, a train line on the river, two big hotels, massive bluestone quarries supplying all the cities on the east coast with sidewalks, paper, mushroom, gunpowder, brick and lead factories. One part of the town, Barclay Heights, was a massive fruit orchard. Even people living in the foothills of the Catskills were able to harvest hundreds of pounds of huckleberries to bring to the market. All this before fossil fuels. The point here is that the land is available to grow all the food we need. The question is: how to organize land for this purpose?



Huckleberry pickers from West Saugerties with a massive haul of food foraged from the mountains.

Some crops can be grown in abundance within very small garden beds, others need more space. How far could we go if a majority of people turned their backyards into mini farms? It's possible that would be enough to feed everyone if we really focused on composting, soil building and efficient methods of farming and seed saving. It might make sense to grow some things close to home and grow other crops on a bigger scale like large lawns, empty lots, or the endless fields at the Saugerties High School (sunflowers for oil, corn for flour and flax for linen come to mind) .

Imagine if we transformed every nook and cranny of our landscape into edible plots. The strip of land between the sidewalk and the street could be lined with fruit and nut trees and medicinal plants. Empty lots could be transformed into mini-farms for corn, beans, amaranth, and other crops that require more square footage. Do we create organized community seed banks, or rely on the free exchange of individually saved seeds? Do we create uniform crop rotations or let families create a diversity of options? Do we organize "gangs" of young folks to create farms for families, or let people organize on their own? Do we process flour and oil and weave clothes in the home (like it was done locally in the 18th century) or do we create centralized infrastructure? These seasonal processing events could become a huge community celebration on the same scale as the Garlic Festival.

These are things that need to be figured out. There are many possible solutions, but one thing is for sure, we don't need to rely on exploiting the land or people to make this happen. Before any of this vision can become reality, we need more collaborators in our mission to create a viable non-exploitive way of meeting our food needs. We hope the following information can help you join us in our effort to develop an alternative.

Techniques to plant a subsistence garden

The most important “technique” for growing food to feed yourself from your garden is having healthy soil. To accomplish this requires a lifestyle of feeding your soil organic matter and compost throughout the year (See our E-book *Creating and Maintaining Garden Beds and Compost: Foundation of a Nourishing Food System* for more info). Aside from that fundamental requirement, we follow these practices when planting our garden beds to maximize yield and promote plant and soil health.

Mulching

We rely heavily on mulch in our gardening. This is to prevent water from evaporating from the bed, protect the soil biota from harmful sun rays (plants like the sun, the soil does not) and suppress weed growth. We plant seedlings or seeds right through the mulch by making a small “nest” to give us access to the soil. Some delicate seeds like beets or carrots, we plant on bare soil or very light mulch until they come up then delicately mulch around the plants once they germinate.



A bed covered with newspaper and then hay. The newspaper effectively blocks weeds, creates a habitat for worms, keeps in moisture, and breaks down into soil. The hay weighs down the newspaper and stops water from evaporating out of the bed while allowing rain to fall through. This combination protects the soil from hard rain drops that can wash away topsoil and leech out soluble nutrients that the plants need to grow. When it’s time to plant we make a nest in the hay, poke through the newspaper and plant the seed or seedling directly in the soil.

Mulch that we use in the garden: Hay, shredded leaves, grass clippings, dried weeds, dead cover crops, mushroom straw, heavily rotted woodchips (sparingly, hardwoods, and mostly around perennials), “living mulch” that includes a mix of “brown” and “green” organic matter (see our eBook *Creating and Maintaining Garden Beds* for more info).

Cover crops (green manures)

Cover crops are planted in the garden to help the soil, not to be eaten. We utilize cover crops for soil fertility, weed suppression and to create “homemade” mulch for our garden beds. Plant the cover crop when you don’t have a food crop growing in the bed and chop it down onto the bed when you are ready to plant. This can be done in the fall or spring depending on the cover crop and food crop that you have planned for the garden.

Cover crops are usually “nitrogen fixing” plants that take nitrogen in gas form from the air and convert it to a form the plants can utilize. The nitrogen benefit of the plant is in the roots, so make sure not to pull them out of the ground. Pick a section or a separate bed to let some cover crops go to seed, so you can have some to plant for next year. Letting 3-5% of the crop go to seed is usually enough to replenish the amount of seed you planted that year. Planting a cover crop protects the nutrients from leaching out of the soil during the wet fall and winters by absorbing them and then being returned to the soil by “chopping and dropping” on the bed or tilling in to the soil when you are ready to plant.



Field peas, a spring cover crop (as a bonus, you can eat the shoots)

Cover crops that we use: field peas, hairy vetch, bell beans, winter rye, clover, sun hemp and oats.

Direct seed vs seedlings

We plant our beds two different ways. One way is planting seeds right in the soil (direct seed) and the other is starting the plant in a small container either indoors or in a greenhouse (seedlings). Which method you choose depends on the individual plant, soil conditions and available infrastructure of your garden site.

Direct seed: The advantage of this method is its simplicity. When you put the seed directly in the soil, it adapts to the conditions of the garden bed without the shock of transplanting. If a seed does not come up, you can fill in bare spots in the garden bed by adding more seeds.

When you direct seed, it is important to keep the young plant watered and protected from pests, which can be challenging. Also, some crops can only be planted as seedlings because of the length of our growing season.

Beans, root vegetables, cucumbers, corn, squash, lettuce, and sunflowers are some crops that we direct seed.

Seedlings: Growing seedlings indoors has many advantages. First, growing seedlings allows us to start frost sensitive plants earlier. Where we grow food, in south east New York state, the last frost usually comes sometime in early May. If we waited to direct seed until this time, we would not be able to harvest some vegetables until very late summer or early fall, if at all. By starting seeds 4-8 weeks early, the plants will be that much farther along when they can go in the ground in May.

Another advantage of seedlings is that you can keep them protected in their early stages of life. When a small seedling is outdoors it is vulnerable to slugs, rodents, hail, strong winds or temperature swings. Indoors you can keep it protected until it is strong enough to withstand these threats.

A third advantage of growing seedlings indoors is saving resources. It is much easier to keep a small seedling tray watered than a whole garden bed. Also, you can grow hundreds of plants in a few seed trays which would require lots of square footage of garden space if grown outdoors.



Lastly, the growing space that is freed up by starting seeds indoors can be planted with another crop early in the growing season. By the time the seedlings are mature enough to be planted outdoors, you can have a root vegetable, early greens, or cover crop grown in the same garden bed.

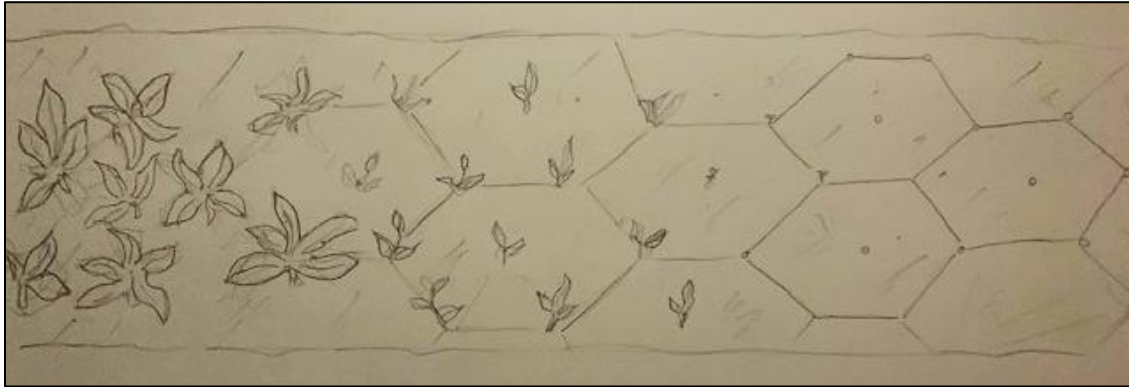
The downside to growing seedlings indoors is that you need equipment like trays and seedling soil and a space to grow. A south facing window or grow light can work. Greenhouses can be simple to make, but still require materials, skills and space that not everyone has.

Tomatoes, peppers, melons, amaranth, onions and leafy greens are plants we plant as seedlings.

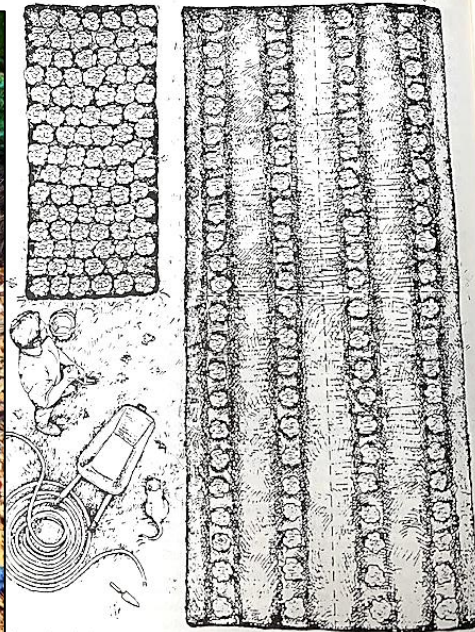
Note: Almost any plant can be started as a seedling and then transplanted into the soil, even root vegetables.

Intensive planting

An important part of subsistence farming is using space efficiently. For this reason, we do not plant in rows. Instead we design beds in shapes that are easy to reach (usually 2.5-4 feet wide) and plant all the space within that bed. Our garden beds are like “pods” of food instead of long rows. To accomplish this, we ignore the “between row” spacing on seed packets and instead look at spacing between plants. We plant the entire bed with each vegetable spaced equally apart. The result is staggered lines throughout the whole growing space. Another way to think of this is a hexagonal pattern with plants on each point of the hexagon as well as in the middle.



Because we continually add organic matter and compost to our gardens, we can plant intensively year after year without depleting the soil. This is a great way to get high yields in minimal square footage like a backyard or marginal space in the community. An experienced gardener might point out that planting vegetables close together will cause them to compete resulting in less yield. As long as crops are given the space suggested on the “between plant” spacing on seed packets, intensively planted beds will produce more *per square footage*. Although the individual plant may produce less, the amount of food coming out of the soil is more. (see image below) In cases where the plants are companions (see below), the individual plants will actually yield more in this scenario.



Left: An intensively planted bed with brassicas.

Right: The same amount of food grown in $\frac{1}{4}$ the space when planted intensively

Intensive planting also has the benefit of making a “micro-climate” in each bed with varying plant heights and differences of moisture and airflow. Planting in this way imitates how plants grow in the forest. The closely spaced leaves shade and protect the soil from direct rainfall which can wash away topsoil and precious nutrients. It also prevents the soil from drying out from direct sunlight and discourages weed growth.

Interplanting

Another technique to utilize space, resist pests and create “micro-climates” is interplanting. This is combining plants that can grow well together within a bed. Plants that grow well together are known as “companions,” plants that don’t are “antagonists.” Plants can be companions because they require similar soil conditions, because they complement each other in plant structure (shallow vs deep rooted) or can provide growing conditions that benefit each other.

Some examples of how interplanting benefits plants:

Sunflowers blocking the sun providing partial shade that **cucumbers** appreciate.

Beans add nitrogen to the soil that **corn** needs in abundance to grow.

Garlic repels pests in the soil that chew on the roots of **fruit trees**.

An example of an antagonistic relationship would be an acid loving plant like potatoes growing next to an alkaline loving plant like tomatoes.

Some companion plants that we plant together in beds:

Corn, beans, squash

Beets, kale, swiss chard

Potatoes, cabbage, onions

Carrots, tomatoes, lettuce, basil

Sunflowers and cucumber

Peppers and soybeans

We always plant flowers like nasturtium that will attract pollinators or deter pests on edges of beds.



Succession planting

A good way to maximize yield is planting multiple crops throughout the season in the same beds. Roots in the soil help the soil by protecting it from erosion and adding carbon to the garden bed which feeds important soil organisms. By continually growing in the same beds, we can get two or even three plantings out of a bed in one year without needing more growing space. Starting seedlings in a greenhouse is a good way to keep beds unoccupied for succession planting. Even if we are not growing a food crop in the bed, we always try to take advantage of empty bed space by planting cover crops.

Here are some of the successions we use in our gardens:

Spring: plant potatoes → **Summer:** harvest potatoes, plant a cover crop → **late fall:** plant garlic

Late Fall: Plant garlic → **Summer:** harvest garlic, plant soup beans³

Early spring: Radish → **early summer:** plant anything (radish grows very quickly)

Spring: plant early potatoes → **Summer:** harvest potatoes plant carrots or beets

Spring: Lettuce, carrots, radish → **Summer:** (early June) harvest roots and plant squash

Early spring: field pea, oats, bell bean or other spring cover crops → **Summer:** any summer food crop

Late Spring: any food crop → **Late summer:** bell beans, vetch, winter wheat or other winter cover crop

Plant rotation

An effective way to keep soil and plants healthy is to rotate what type of crops you grow in a specific garden bed year after year. Here are the things we consider when designing crop rotations.

Heavy feeders, nitrogen fixers, light feeders

Some crops like corn and tomatoes are “heavy feeders” which means they pull a lot of nutrients from the soil while they are growing. If you plant them over and over in the same bed they will quickly deplete the soil unless heavily fertilized.

Nitrogen fixing crops or “heavy givers” like beans, peas, peanuts and any cover crop add nitrogen to the soil that heavy givers take.

Other crops like carrots and onions are “light feeders” which means they don’t totally deplete the soil.

It’s good to follow heavy feeders with nitrogen fixers and then light feeders. This isn’t always easy (or possible). If you follow our suggestions of soil building which includes continual adding of compost and the use of cover crops, you have flexibility with these rules. The most important thing is to remember that after planting heavy feeders, you need to replenish the soil somehow.

Types of plants

It’s good to avoid planting a crop from the same family twice in a row in a garden bed. For example, peppers and tomatoes are both in the nightshade family and cucumbers and zucchini are both in the squash family. The main reasons to avoid this is that plants in the same family generally carry the same diseases. By rotating by family type, you disrupt the lifecycle of the pathogens.

³ Some sources say that beans are an “antagonist” to garlic. Our experience conflicts with this claim and we haven’t found credible research to back it up either. This is not the first instance of commonly repeated, but false information about gardening or plants. If there are not reliable scientific studies to back up a claim, try it for yourself!

Rotation across gardens

Another important factor for rotating crops is pests or diseases that can travel anywhere in your garden. An example of this is the Colorado potato beetle, blight, and squash borers (see more in the section about staple crops below). At a certain point, a pest will become established in your garden and get stronger every year. Even spraying chemicals is ineffective in the long term⁴. The only way to stop this is to stop planting that crop in your garden for a period of time (3 years for potato beetles). Because we want our staple crops each year, we need friends who can grow these crops in another garden. Rotating across gardens takes cooperation and coordination, but it is the only sustainable way to deal with pests that can lead to total crop failure.



Is it necessary?

Some proponents of no-till gardening argue that crop rotation is not that important. Because they are always adding compost to the top of the bed, the nutrients are not really being depleted by the crops. Also, they argue that because they are not tilling, the soil is healthy and so are the plants. The thriving and diverse soil biota make it hard for plant pathogens to establish in the garden bed and the resulting healthy plants have natural resistance to disease. They claim that unless you get some sort of infestation, there is no reason to rotate. There is truth to this concept, and we've observed it in action. Regardless, we still practice rotations in our garden. Because we focus heavily on soil health, we are not worried if we have to plant a crop in the same bed two years in a row. This often happens with self-seeding plants and biennials⁵ anyway.

This concept of diversity in your soil biota can be generalized to the entire growing process. A diversity of ingredients in your compost, a diversity of flowers in the garden, a diversity of insect and other wildlife, a diversity of crops within individual beds and garden are all ways to disrupt and confuse pests, give your plants access to different nutrients and minerals, make a competitive environment for harmful pathogens and provide a mix of nutrients in our bodies after we consume the vegetables. Diversity is resiliency.

⁴ During the growing season, a commercial potato grower has to spray with a new pesticide every few weeks to keep up with the adaptation of the Colorado potato beetle. If you visit an industrial potato farm before it rains you can see up to an inch of white powder accumulated on top of the soil. Every year, chemical companies have to come up with new pesticides to keep pace with the resistance of these beetles. This is the definition of an unsustainable food system!

⁵ Plants that produce seeds after its second year in the ground.

What to Plant in a Subsistence Garden:

As we noted earlier, the crops we plant in our gardens are chosen to make up a diet we can live on. For this reason, we plant staple crops in most of our growing space and set aside a portion (10%-30%) of the beds for “kitchen gardens.” The kitchen gardens consist of vegetables that we harvest throughout the summer and fall to add to our meals, but don’t make up the majority of our calorie intake. The result is a seasonal diet. What we eat changes throughout the year.

With some of the crops on this list it’s easy to grow as much as you need with under 100 square feet (Kale, Squash). Some crops can give you a satisfying amount with 100 square feet (potatoes, garlic) and the rest need more than 100 square feet to give you an abundance to enjoy the crop throughout the year (corn, beans). Planting any amount of these crops can supplement your need to go to the grocery store, give you practice in raising these foods if (more like when) the need arises, and give you the opportunity to taste these vegetables the way they are meant to!⁶

Staples:

We consider staples the crops that make up the bulk of our diet. This is what gives us a majority of our calories. A benefit of the crops on this list is that they need minimal preservation and don’t need to be refrigerated. Also, it is easy to save seeds from these crops so we can plant them year after year. We try to dedicate most of the growing space in the garden (2/3rds or more) to these crops. In the following list, we will give you information on how to plant, maintain, process, store and propagate these plants.

Potatoes- Possibly the most nutrient and calorie rich food you can grow per square foot. Like most of the staples we grow, indigenous farmers in South America developed this incredible food. This was a staple in the Andes mountains for millennia. After Spanish colonists brought potatoes from modern day Peru to Europe, its population soared. Historians believe this is because less people died from disease and malnutrition since potatoes have so much more nutrition and are more resilient than wheat. If wheat gets hit by bad weather or a ravaging army, the grain is lost. This doesn’t apply to potatoes. Even if the plant is destroyed the potato will be safe below ground. Potatoes fill you up, store easily and are versatile in the kitchen. Growing potatoes successfully really makes you feel like you can live off the land!



⁶ People often scoff at the idea of growing crops like potatoes because they are cheap at the grocery store. If you have never eaten a freshly grown potato, you don’t know what potatoes taste like. Whenever we share potatoes with friends, they can’t stop ranting and raving about how they are the best potatoes they ever ate. We hear this enough that we are convinced it’s not hyperbole!

How they grow: Potatoes are easy to grow. You just dig a hole in the ground and plant a potato with “eyes” growing on it. Make sure to plant them with the eye facing up (“eye to the sky” is what we tell the kids). If a potato has multiple eyes growing, you can cut the potato in pieces. As long as each piece has an eye on it, it will grow into a whole new plant.

As the potato grows, you can “hill up” the plant. When you cover the stem of the plant, it puts out new tubers, which is the edible potato. Just make sure you leave a few leaves exposed at the top. If you don’t have soil, you can add leaves, woodchips, straw, manure or weeds from the rest of the garden to make a thick “living mulch” (See our E-book *Creating and Maintaining Garden Beds* for more info).

Some people grow potatoes in boxes or tires. As the plants grow, they add another box or tire on top and fill it with dirt. The plant will keep getting taller and putting out more potatoes, taking advantage of vertical space. When it’s time to harvest, you remove the structure one layer at a time and potatoes tumble out. We have had mixed results with this technique and find that planting in the ground has higher yields. Don’t let us discourage you from trying this method though!

Potatoes can grow in all different types of growing medium including dirt, woodchips, hay, manure, compost or ideally a combination of all these things. We like growing potatoes in a new lasagna bed since most other things will not grow in it. Potatoes are ready to harvest when the plants die back to the ground. They can stay there underground until you are ready to harvest them.

Processing: Potatoes don’t need much processing, just let them cure for a week or two at room temperatures before you store them long term. Make sure to keep potatoes out of the sun or they will turn green. The solanine that turns them green is carcinogenic if consumed in large quantities. This does not hurt the potato if you are saving it for seed. Also, you can just cut off the green portion when you are cooking the potato.

Storage: They are relatively easy to store. Ideally, they are kept in a high humidity root cellar kept at temperatures below 40 degrees but above freezing (they turn to mush if they freeze). Even though those are the ideal conditions, we always have a bucket of potatoes for eating kept at room temperature. Although they grow eyes and some get soft, most make it to the next season without rotting and end up in the ground as seed potatoes (6 months!). Potatoes can even be left in the ground through the winter and harvested when you want them. We always miss a few potatoes during harvest and new plants emerge the next spring.



Seed: The potato is the seed⁷. When they are warm for a while, they sprout eyes and that becomes the new plant.

Biomass⁸: The stem and leaves of the potato provide a good amount of organic matter to include in a lasagna bed or compost. Make sure it does not have blight (see below).

Pests and disease: This is the bad part about potatoes. The pests can be a real problem. The Colorado potato beetle was a bug that lived off a wild relative of potatoes, but after it encountered endless fields of mono-cropped potatoes, it eventually mutated and became a destroyer of potato crops across the world. When we plant potatoes year after year, they show up. Since we do not spray our plants, we crush their orange larvae by hand. If it is a small infestation this can handle the problem. If it's a large infestation they will eat the entire plant to the ground. Potato beetles over-winter in the mulch below the potato plant and walk to their next host, so rotating where you plant across gardens is the best way to control for this problem.

The other main problem with potatoes is blight. This is the famous spore that cause the Irish potato famine. This also infects tomatoes and to a lesser extent peppers. Blight spores travel on air currents from miles away. It turns the plant into a sickly brown color and makes it rot. If you get hit with blight, cut the plants, and burn them or place in a plastic bag and bring it to the dump. Make sure you act as quickly as possible, so you don't spread the disease to your neighbor's garden. If the potatoes are developed enough below ground, and you catch it early enough they are still fine to eat. Blight will last in the soil for 3 years, so if you get hit with it, you must grow somewhere else during that time.



⁷ Technically it's not the seed. Potato plants are clones from the tuber. Potatoes do produce fruit sometimes that looks like a little green tomato. If you start it from the seed inside, there is no telling what variety of potato you will get.

⁸ Biomass is any biodegradable material that can be used for soil building or mulch. This is a critical component of maintaining fertility for subsistence farming.

Cabbage- A brassica⁹ that is different from other members of its family in that it cannot be harvested continually throughout the year. Cabbage is beautiful in the garden and can be a great meal, especially when combined with starchy potatoes or stir fried with cayenne peppers and garlic. Cabbage takes a long time to develop, but it does not rot for a long time in the garden bed, although it might start to split after a big rainstorm.

How they grow: We usually start cabbage in the greenhouse, but they can be planted from seed. They are an early vegetable and can go in the ground in April, but do not start to really grow until the soil warms in May. Cabbage is harvested when it is solid to the squeeze. Harvest it before it splits and cracks.

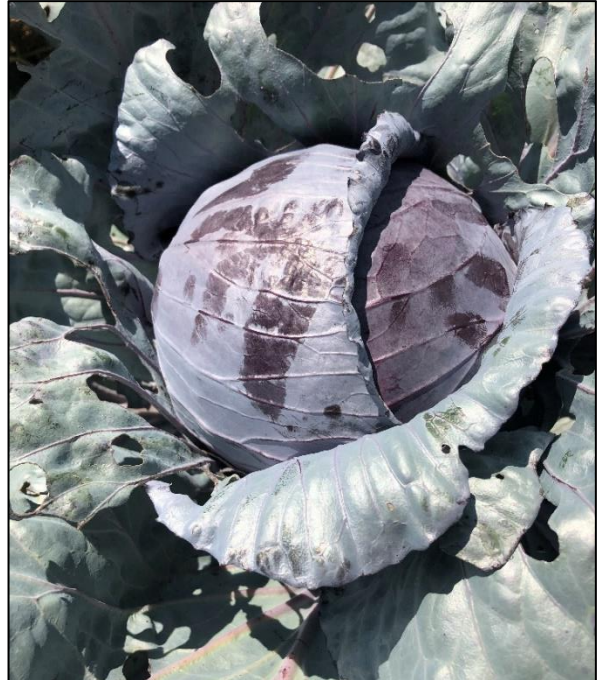
Processing: Cabbage does not need to be processed. Just cut it up and cook it. It can be fermented to make sauerkraut or other lacto-fermented products.

Storage: Cabbage can last a long time in the garden and be picked directly before you cook it. It can survive temperatures down to 20 degrees. If you want to store it, it will last in a root cellar wrapped in newspaper all winter.

Seed: Cabbage is a biennial. You need to plant a separate patch of cabbage to overwinter. They need to be covered to survive cold winters. In spring, shoots come out of the cabbage head and produce flowers and seeds.

Biomass: Not a particularly abundant biomass plant.

Pests and disease: The Cabbage gets attacked by a cabbage moth. It lays eggs on the cabbage and little green worms eat the leaves. You can protect it by covering it with fabric in the beginning of the season when the moths fly around. The worms take a while to devastate the plant. You can pick them off. Cabbage also gets eaten by slugs during wet times. They put holes in the leaves but usually don't destroy it.



⁹ Brassicas are a family of vegetables that originate from the wild mustard plant. Each Brassica originates from a different part of the plant. Cabbage from the terminal buds, Kale from the leaves, Kohlrabi from the stem, Broccoli from the flowers, Brussel sprouts from the lateral buds, Cauliflower from the flower clusters!

Popcorn and Flint corn – There is a reason Maize is found repeatedly in Indigenous art, religion, and ritual. Scientists have theories about how the wild grass ancestors of maize were domesticated, but the quickness and radical transformation of the crop in Mexico leave them puzzled. How humans “engineered” such a perfect crop in such a short time is hazy to science at best. There is no reason not to believe the indigenous stories across the Americas that corn is a gift of godly origins. Corn travelled North and South from Meso-America and was then introduced to every continent by colonial Europeans where it is now a world staple. Corn has been grown in New York for around 1000 years. Although sweet corn is the most popular type folks eat, we focus on growing popcorn and flint (flour) corn. These varieties store easily, and corn flour has lots of uses. Some of our favorite varieties are Calico popcorn, Floriana red and Abenaki flint corn. If we have space in a garden, we plant sweet corn for kids to harvest or for barbecues, but we don’t consider it a staple in a subsistence diet.



How its grown: We plant corn from seed when “the oak leaves are the size of mouse ear” (shortly after the last frost). Corn grows easily, but once it gets large it requires care. The roots start to grow above to soil and the stalks can blow down. Sometimes we hill up dirt around the roots to help this or even tie and stake some of the stalks that keep falling over. It is important to plant corn in large blocks, not rows to help with pollination. Corn takes a lot of nitrogen from the soil. This is not a problem if you rotate crops and interplant with beans (a nitrogen fixer). Corn is harvested in late summer when the silk turns brown and the husk is still green.

Processing and storage: After corn is harvested, we pull back the husk, tie it and hang it to dry. The stalks can stay like this indefinitely (they make good decorations). After a few weeks, you can shuck the corn by hand and store the dried kernels in paper bags. We like to shuck popcorn with the kids we work with and immediately cook a batch. Most kids don’t realize popcorn comes from corn!

For flint corn, we grind the dry kernels in small batches with a Corona mill to make corn flower. We store the flour in mason jars. We grind it as we need it since the flour does not last as long as the kernels. An alternative is working with a group of people to grind large quantities for everyone to take home. Economy of scale by cooperation not exploitation of fossil fuels and poor workers!

The hairs (silk) that comes off the tops of the corn make a tasty tea by boiling it.

Seeds: The dry kernels of the corn are the seed. They last a long time if kept dry. Corn easily hybridizes across variety so it’s best to plant one type per garden (another reason to share with fellow gardeners).

Biomass: Cornstalks and cobs are a great biomass. The stalks contain lots of lignin which is important for soil building and carbon sequestration. The biomass of corn takes a while to break down since they are so hearty. We usually cut them into little pieces with loppers and include them in a “living mulch” on the bed. An alternative is to place them on the bottom of a new compost pile and let time and bacteria do the work. Be careful, the leaves can cut you.

Pests and disease: We have not had too many problems with corn. There is a corn earworm that digs little channels in the kernels, but it is not devastating to the crop. If we wait too long to harvest the corn, we have gotten some surface mold that forms, but it can be rubbed off. The biggest pest has been squirrels. One year we waited too long to harvest popcorn in one of our community gardens because it looked so pretty. When we brought the kids to harvest. There was nothing but cobs on the plant and lots of fat squirrels.



Beans- Beans are in incredible crop that have been eaten by people all over the world for thousands of years. The varieties that we use for food crops were domesticated in Mesoamerica. Beans are a great companion to corn because they add the nitrogen to the soil that corn craves. Beans are easy to grow and store, high in protein, and delicious. We grow “string beans” to eat fresh during the summer but focus most of our growing space on “soup beans.” These are beans that we let dry and eat like most people eat canned beans. Our favorite varieties are Jacob’s cattle, Vermont cranberry and black turtle beans.



How they grow: We plant beans from seed. They can be planted from any time after the last frost to mid-July. You can eat soup beans like a string bean, fresh off the plant, but if you want dry beans, you let the pods dry on the plant. After the pods turn brown, you can harvest them. If you wait too long, the beans can get moldy if it is a wet fall, or if its dry they can “shatter” and the beans will fall out of the pods onto the ground. To get a decent harvest of dry beans, you need a lot of plants. A hundred square feet or more. We always interplant them with corn.

Processing and storage: To process beans, you have to wait until the pods are totally dry. This can be done on the vine, or if it starts to get rainy during fall, you can bring it inside to dry by a woodstove or heater. It is easy, but time consuming, to shell the beans. We like to do this work over the course of the winter. Once the beautiful beans are shelled, they can go in a paper bag, or a mason jar if they are totally dry. Soak them over night before you cook them. Another option is to can them in a pressure cooker. This can be done with other vegetables and meats to create a ready to heat up meal!

Seeds: the dry bean is the seed. Whatever you do not eat, you can plant the following year. Beans self-pollinate, so you can plant multiple types of beans in one garden without them crossing.

Biomass: The bean plant and dry pods add up to a good amount of biomass to return to the bed or add to compost. It is important that when you remove the bean plant from the bed you do not pull it up from the root. Cut it at the soil line because the roots contain nitrogen rich nodules that decompose and enrich the soil. If you pull up the plant from the root, you do not take advantage of the bean’s nitrogen enriching properties.

Pests and disease: We have had no problem with pests or diseases with beans.

Winter Squash: Yet another creation of the agricultural revolution of Mesoamerica and the Andes mountains. This plant likely predates the domestication of beans and corn. The many varieties of squash plants create unbelievable amounts of food from one little seed. Some of our favorite varieties to plant are Butternut and Tromboncino (Moschata family) Acorn (Pepo family), buttercup and Hubbard (Maxima family)



How they grow: Squash is another plant we direct seed even though it does transplant well. Squash grows well on small hills 3 or 4 wide, 8 -12 inches tall. It also can be grown in a mounded bed or even a lasagna bed. The most productive squash harvest we ever had was grown in ripped up sod, turned upside down and covered with compost and mulch. The bed was shaped like a curvy snake. Squash needs lots of room because they spread out 10-20 feet! If you don't give them room to spread, it's hard to maneuver around the garden. If this isn't a problem for you, the plant won't mind, and fortunately winter squash only needs to be harvested once.

As the fruits form and transition from green to whatever color they will end up (depends on variety) it's good to place a rock or piece of wood under them so they don't rot from contact with the ground. Once the squash becomes its ripe color and your fingernail can't easily penetrate the skin if you poke it, it is ready for harvest. From our experience, they can stay on the vine for a week or two, but if left too long, they will start to rot.

Processing and storage: The best part about winter squash is how easy it is to store. As long as its kept at room temperature it will last a loooooong time. We once had a butternut squash for 2 years that we forgot about. When we cut it open, it was totally fine inside and tasted great. The only problem with storing squash is that they take up so much room because of high yields!

Seed: The seed is in the middle of the fleshy center of the squash. Most people are familiar with pumpkin seeds. Harvesting the seeds of all winter squash is similar. After you take scoop out the seeds, put them in a cup of room temperature water and remove the flesh by hand.¹⁰ Change the water periodically until you see bubbles. Then take the seeds out and let them dry on glass or ceramic. It will stick to a paper towel. Once you are sure it's dry, store it in a paper packet or jar for next year's planting.

There are different species of winter squash, most notably Maxima, Moschata, and Pepo. If you plant two plants from the same group, they will hybridize. If you plan on saving seed, its best to plant one variety of each specie in your garden. Note: Zucchini, and yellow summer squash are in the Pepo family, so they can hybridize with pumpkin or acorn squash.

Biomass: The long vines and leaves of winter squash produce a good amount of organic matter by the end of the season. This is great in the compost bin or sheet mulching project. The rinds and stems of the fruit also are good "greens" in the compost.

Pests and disease: Squash vine borer has been a problem for us in the past. This bug lays an egg in the stem of the plant and the little worms start killing the vines. The fruit will start rotting on the plant. It is very depressing. You can try to perform surgery on the stem by cutting out the worms and tying a wet cloth around the wound to let it heal. This rarely works though. The best solution we have found is to plant a second round later in the season and it avoids the pest.

Another prolific pest are aphids. They lay orange eggs in pretty patterns under the leaves and then hatch into robotic looking bugs that devastate the leaves. If you examine the leaves regularly and manually remove the eggs you can avoid problems later in the season. Another option is to spray a combination of biodegradable soap and water on the leaves or a combination of water, cayenne pepper and garlic. These remedies work for a lot of plant pests and do not hurt the plant or soil.

Other crops that are viable as staples

The above list are crops that we have tested year after year in various conditions. There are more possibilities for crops we can grow in our area as staples. The following are crops we have experimented with or plan to in the future.

Sweet potatoes: These roots are delicious and grow surprisingly well in our climate. Sweet potatoes are grown from "slips" which are leaves that grow off the tuber. Stab a piece of sweet potato with tooth pics and suspend in a glass of water and the leaves (slips) will grow. Cut that off and plant it. We plan on planting a significant amount in our garden this year. We'll let you know how it goes

Peanuts: Another crop from the Andes mountains. Peanut butter, peanut oil and boiled peanuts all sound like something that would be great to add to our diet! Peanuts, like other legumes, are a nitrogen fixer which makes them appealing for their role in keeping the soil fertile. We did a test plot for cold tolerant peanuts. We planted them during a very dry summer, but still managed to get a small crop. We are going to expand our crop this year

¹⁰ To ensure optimal germination, you can ferment the seeds by leaving them in room temperature water for a few days and then dry them. From our experience, this isn't necessary.

Soybeans: A staple crop historically important in Asia both as a raw vegetable, a dried bean and a fermented one. Soybeans are a good companion to every crop. Like other beans they are a nitrogen fixer. This year we will be doing tests to see the viability of soy in our growing system.

Amaranth: Another plant important in Mesoamerica, Amaranth can be eaten as a grain (grinding the seeds) or a leafy vegetable. At one of the gardens we managed, the previous farmers planted lots of Amaranth a few years before we got there. The seeds dropped and the crop ended up popping up like an edible (and beautiful) weed in the garden. At Shagbark Garden, we are trying to replicate this scenario.

Rice: The family farm called Ever Growing Family Farm grows rice in the town of Esopus. They utilize traditional farming techniques learned in Gambia to get substantial yields of rice. This is an impressive feat that demonstrates that rice is viable in the Hudson Valley given the right water conditions.

Roots

Root vegetables are great to interplant or in succession with staples. They store well and usually have high calories for the space they take. Try to sneak them in everywhere you can in the garden! Root vegetables do best in loose soil. Generally, they don't take a lot of nutrients from the soil.

Garlic: Garlic has almost daily use in our meals at the UGC. Garlic is great because it is easy to grow. It does not need to be inside a fence because deer and other pests don't eat it. It can be planted around fruit trees, which helps protect its roots. The individual cloves are planted in the fall and are harvested in July. In the summer they put out seed pods called scapes. These are edible and delicious and can be cooked just like garlic. When the scapes loop around, we cut them, the plant puts more energy into the bulb resulting in bigger garlic.

Garlic is also medicinal. It has antibacterial, antiviral and antifungal properties. Stir frying garlic and its' cousin onion is a great way to make bitter or bland vegetables into a delicious meal. The stems of garlic produce a lot of biomass.



Onions: Not as easy to grow as garlic. Start from seed early indoors. We've had the most success starting seeds under a grow light starting in late January. Another way is to use a to-go container with a clear lid filled with soil. Plant it in late fall and let it sit outside through the winter. Transplant the onions when they are as thick as a pencil. Without using black plastic (which we hate with a passion) they don't get big like they are in the store. We see no problem with this. We cook the entire onion including the tops. We never have half cut onion stinking up the fridge. Pull it right out of the ground and if you need more grab another. Again, this highlights different priorities between subsistence farming and market farming. For the market, you want that fat onion to attract customers!



Carrots – delicious! Harder to grow than you would think since it's the most cliché garden crop. These can be planted in April or late summer for a fall crop. With decent loose soil and careful planting and weeding you can get an abundant crop. We usually plant carrots without mulch and then delicately mulch around the plant after the seedling emerges. Since the seeds are so small, it's hard to get one seed in each hole. You always have to thin out the seedlings after they emerge. Make sure soil is loose and does not have lots of rocks or else you will have stunted and crooked carrots.

Interplant with tomatoes and lettuce. When interplanting, make sure to start the carrot early so it has a head start growing before the other crops shade it out. Carrots supposedly store well in a root cellar, but we would not know because the kids we work with always eat them right out of the garden!

Beets – A bit easier to grow than carrots, but also take a delicate hand in the beginning. They also can be planted in spring or late summer. We interplant them with brassicas and onions. They store well in the root cellar.

Turnips- Another Brassica. These root vegetables can be planted early in spring and can get MASSIVE. In the past we've grown 8-inch-wide turnips. Not the most popular tasting vegetable but can certainly provide calories in a subsistence diet and can be tasty if cooked correctly.

Rutabaga: Another Brassica, the leaves can be eaten as well as the large root. Kind of tastes like a slightly bitter Potato.

Radish- This root vegetable is great to include in your garden. Radishes grow extremely fast. Some varieties will grow in as quickly as 3 weeks. They also can be planted as soon as you can work the soil. This is a perfect crop to include in succession planting because it will be done before your next crop starts to grow.

Kitchen Garden crops

What we call a "kitchen garden" are the crops you eat seasonally to mix with your staples. During the summer we rely more on these fresh vegetables since the garden is abundant. This is not an all-encompassing list, but this is what we've had the most success with. A kitchen garden is where you plant based on taste. Crops in a kitchen garden aren't less important than staples per se, they just don't provide as many calories or can store as well. For example, Kale is a really important garden crop. We always have an abundance of it because it's reliable. In a pinch you might be able to survive a famine because of a crop like kale.

Rugged Brassicas (Kale, Collards, Pak Choi)- The whole plant family of brassicas are beautifully rugged plants, but the ones on this list are especially resilient. No one should ever buy these greens in the store; they are easy to grow in abundance. Brassicas deal well with cold temperatures and even come back through mild winters. They taste better after a light frost. Brassicas are a great confidence booster as a gardener. They keep feeding you throughout the year, are nutritious, tasty (especially stir fried with garlic) and are very hard to kill.

Brassicas can be planted from seed, but we usually start them in the greenhouse. The little round seeds always come up! They can go in the ground in early April and you can be eating from them in June. If you have Brassicas that survive the winter, you can be eating the leaves in March!



Broccoli: Yet another brassica on the list, Broccoli produces food until the coldest months if you get the non-heading varieties. After you harvest the first large head of broccoli, lots of little delicious mini broccolis keep coming back. Make sure to keep picking it or it will put out yellow flowers. These are also edible. The greens of broccoli are delicious and taste somewhat like sweeter kale. It's nice to have a lot of non-heading broccoli growing so you can have a continual supply of little broccoli to add to your meals.

Kohlrabi: has leaves like Kale that can be continually harvested but has the benefit of a massive stem that has the flavor of broccoli, but less intense.

Peas: This is an early crop that you can plant as soon as you can work the soil usually March (we planted in February this year!). Peas are climbers so we usually plant them along a fence, otherwise you need a trellis. This is a great snack and is also a nitrogen fixing plant.



Sweet and hot Peppers: Peppers need to be planted as seedling to grow in our climate. 6 pepper plants or so can produce a good amount of crops for continual harvest. Our best harvest was in a raised bed, but they grow well in the ground. Make sure they get plenty of sun. We grow Cayenne peppers and let them dry to add to our meals throughout the whole year. Hot peppers are great to make hot sauce with all you need is vinegar, garlic and whatever spices you like.

Tomatoes: Tomatoes are a great treat. During the summer we make fresh sauces and add tomatoes in lots of dishes. If you like canning, you can produce all the tomato sauce and salsa you need for the year. We like growing heirloom varieties.

From our perspective, tomatoes get overplanted in gardens. They are a heavy feeder. They don't provide a lot of calories (mostly water) they need care (trellising and pruning suckers) and are prone to disease (blight). Don't plant them too close or they will be hard to manage. Tomatoes do provide lycopene, an important nutrient absent in other foods.



Cucumbers: Cucumbers are one of the plants that can provide you with more fruits than you can consume. They are a bit picky in how they grow. They like shade *and* heat. They need water, but don't like waterlogged soil. It's good to plant them among something that will give them partial shade like sunflowers. We like to grow cucumbers on trellises or fences, but they can grow along the ground. They can add vertical beauty to your garden landscape. Great to make pickles either canned or lacto-fermented.

Summer squash: Zucchini and crookneck yellow squash are some of our favorite varieties. If the plants are healthy you can easily end up with more summer squash than you can handle! This is a great crop to give out to friends. There are only so many zucchini fritters you can eat! Unfortunately, summer squash does not store through the winter.



String beans: String beans are a great to eat raw, stir fried, or blanched. We always have at least a dozen plants to supply us with continual beans. These can be planted in succession to guarantee you have beans throughout the whole season. Climbing varieties should be planted all along your garden fence to take advantage of unused vertical space. Lots of folks freeze beans to have them all year



Lettuce: We plant a patch of lettuce "mesclun" style in every garden we manage. This is where you sprinkle seeds densely in a patch. It grows up like a lawn of lettuce. You can cut it with scissors, and it grows back quickly. We like this approach better than individual lettuce heads.

Greens: Yokatta-Na, Swiss Chard and Spinach are some hardy greens we always like to have dispersed throughout the garden. A few plants can go a long way to provide flavor. Greens are packed with nutrients that can supplement starchy staples.

Cooking oils

Cooking oil is something that we take for granted but is an important part of cooking. If you are interested in making your own soap post fall of industrial capitalism, it also will help to have fatty oil to mix with ash for this purpose. Butter from animals or Lard from a pig works great. Some folks don't want to engage in animal husbandry because of the commitment, lack of space or simply for moral or religious reasons. Bear fat makes a good oil as well but might not be a reliable source. If you are interested in created oils from vegetables here are what we have been exploring.

Sunflower oils: Sunflowers come in two varieties, the type to be eaten (confectionary) and the type for oil (oilseed). The oilseed varieties don't need to be hulled and produce twice as much oil as confectionary ones. We use a hand cranked oil press for this task. We are going to do an experiment to find out the ratio between number of plants and amount of cooking oil. Sunflowers are beautiful, so we could plant them all over. The leftover from the press can also be used to feed animals or fertilize the soil. The stems of the sunflower also create a lot of biomass similar to corn stalks.



Hickory and Acorn: These are not technically grown in the garden, but at some of our sites they fall in huge quantities. You can also make oils with these foraged nuts with the same hand press we use for sunflowers.

Perennial crops

Adding perennial plants to your garden is a very smart way to keep roots in the soil and cut back on the work of replanting annual vegetables every year. The staples we listed earlier in this document are all annual crops and they are highly productive, but they do require labor year after year. Perennial crops require much less maintenance and once they are established can produce food for many years. As we build soil in our gardens and finalize the design and shape of the space, we try to "perennialize" as much of the growing space as possible while still leaving significant square footage for staples.

Perennial greens: Nine star perennial broccoli, "sea kale," and Turkish Rocket are examples of perennial greens that save you on time in planting each year. These crops will come up earlier than annuals since they are already established.

Sunchokes: Also known as Jerusalem artichoke, this plant is a perennial in the sunflower family native to North America. It has a tuber that tastes like a more nutty, sweet potato. This grows easily and comes back year after year and has a pretty flower.

Walking onions: This is a perennial onion that falls over in the fall and self-seeds. As it spreads it seems to "walk" across the garden. Once established its easier to grow than onions.

Asparagus: It takes 2 years before you get a crop. It's awesome to see this vegetable come back year after year.

Berries: Strawberries, Blueberries, blackberries, raspberries, juneberries, honeyberries, wineberries, currants and thimbleberries are just some of the sweet berries that can thrive in or around your garden.

Fruit and nut trees: We plant all different kinds of dwarf fruit and nut trees in our gardens. People complain that it takes too long to get fruit, so they don't want to waste their time planting fruit trees. This is the kind of selfish thinking that got us into this mess to begin with! If our parents planted trees, we would have an abundance of fruit now. Luckily, there are lots of apple trees around the community that people are generally willing to part with since they produce so abundantly. One year, members of the Long Spoon Collective biked around asking people if they could pick apples from trees they spotted on the road. This image shows some of the haul from that effort.



The box is 4 feet high by 4 feet wide! Everyone got apples and cider that year! At one of their community gardens there is also a peach tree that yields a tremendous amount of delicious peaches!

At our gardens over the past years we planted plums, Asian pears, Bartlett pears, hazelnuts, paw paws, apples, peaches, and American chestnuts. We will be rich with fruit in no time!

Sweets

Aside from fruits and berries which are sweet on their own, here are some other options for those with a sweet tooth who want to grow all their own food.

Maple syrup: Maple trees aren't something you grow in the garden but it is a dominant tree in our area. Tapping a maple tree is an easy way to get some delicious sugar. Maple water, maple tea, maple syrup and maple sugar are all different stages of sap in the process of evaporation. This is something that can be done on a small scale on a woodstove or open fire or in larger quantities with a sap house.

Stevia: This plant is easy to grow. It's a different sweetness than what we are used to from sugar but can definitely sweeten up some dishes. Also helpful for those with diabetes as it's not a sugar.

Butternut squash water: One way to sweeten things up is to save water you cook butternut squash in and add it to other dishes.

Apple cider: Given the abundance of apple trees in peoples yards, apple cider is a nice treat. It can also be fermented into hard cider for a different kind of treat and then vinegar which is useful for cleaning, canning, making hot sauce, dressing and lots of other things.

Melons: Although not the most productive crop in our environment, a nice harvest of cantaloupe or watermelon can satisfy a sweet tooth.



Other foods:

Growing vegetables intensively in the garden and integrating perennial crops can get you a long way (or all the way) toward food self-sufficiency. The garden is a great foundation for feeding ourselves but there are other ways of acquiring food that should be considered if we want to feed ourselves without exploiting people or the land. There is an incredible amount of food that exists outside the garden. The woods provide lots of meat (deer, turkey, rabbit, squirrel, trout), mushrooms, berries and nuts that are viable additions to our diets. Although it is a sensitive topic to people who are not raised with the practice, insects provide a great source of protein and vitamins. Scientists (and even capitalists) are exploring the viability of insects as a sustainable source of meat. Ants, grasshoppers, and grubs are especially viable (and tasty when cooked right). There is a reason black bears are a few hundred pounds, they eat some meat, but a surprisingly large portion of their diet is insects and berries.

While the industrial food system that is destroying our planet still exists there is a massive amount of food available from the waste stream. Between 30 to 60 percent of food produced world wide ends up in a landfill. "Dumpster diving" is an inglorious, but effective way of acquiring excellent and healthy food from ending up in a landfill. Lots of retail grocery stores and restaurants will share food that is in good shape but destined for the dump like day old baked goods. At the very least, we should be reclaiming this food for animal feed or compost!

Animal husbandry can contribute meat, eggs, dairy and manure, which is a great addition to the garden. There is a debate about the sustainability of growing feed for animals and providing them with the water and space they need to have a good life. There is no question that this is using animals as slaves, but farming is the enslavement of plants and even the most sustainable agriculture requires disrupting ecosystems. We believe it's possible to integrate animals into this system morally and sustainably. Most of the criticisms of raising animals for food should be aimed at the cruelty of industrial capitalism and not animal husbandry, but how this can be done and the debate around it is for another text!

For more information, clarification, or assistance in planting a subsistence garden contact us at:
Info@theundergroundcenter.org

Resources and References

Most of the information in this text is from a decade of firsthand experience gardening with various methods and scales. Trial and error have taught us a lot of what works and what doesn't. As for the science, statistics, and history in this text, we referenced the following books, articles and websites.

Books:

How to Grow More Vegetables than you ever thought possible on less land with less water than you can imagine by John Jeavons.

*This book is an awesome resource for growing food in in the Bio-intensive method. The book includes charts that have plant spacing, companion suggestions, rotation guidelines, and projected yield per square footage. Provides step by step walk through of subsistence farming.

Five acres and independence by M. G Kains

*An in-depth manual of small-scale farming written during the great depression. Although some information is outdated, most is not. Kains was an authority of faming at his time with many years of experience working the land. He also includes studies and cool drawings from the USDA.

1493: Uncovering the New World Columbus Created by Charles C. Mann

*A fascinating history of early and pre-colonial north and south America. Especially useful for our purposes are in depth histories of staple crops and other plants like potatoes, corn, sweet potatoes, and rubber. Mann does a great job of showing how historical trends live on into the present.

Farming While Black: Soul Fire Farm's Practical Guide to Liberation on the Land by Leah Penniman

*A complete resource for getting up and running growing food. Includes practical as well as historical information about farming. The book is written through Soul Fire Farm's social justice oriented lens and promotes racial justice through land based practices. Great resource!

Images of America: Saugerties by Edward Poll and Karlyn Knaust Elia

*a photographic history of Saugerties. Contains images of Saugerties' early farming history.

Eating the Landscape: American Indian Stories of Food, Identity, and Resilience by Enrique Salmon

*Written by an indigenous ethnobotanist that explores stories of American Indian farmers in the southwest United States and northern Mexico. Discusses traditional indigenous ways of cultivating crops and preparing meals. Aside from being a good read from an anthropological perspective there are some great examples of relevant environmental stewardship and ways of making garden beds in harsh terrain and utilizing staple crops that we plant in our own garden.

Cows Save the Planet: And Other Improbable Ways of Restoring Soil to Heal the Earth by Judith D. Schwartz.

*This is a well-researched book about the science of soil biota, carbon sequestration, and the role animal husbandry can play in creating soil and addressing climate change. The author includes up to date scientific research about compost and aerobic decomposition.

The World in 2050: Four Forces Shaping Civilization's Northern Future by Laurence C. Smith

*A conservative prediction of where the world will be in 30 years based on forces of globalization, climate change, demographic shifts, and natural resource demand. Although the projections don't consider cataclysmic scenarios, it is still a sobering prediction!

Freedom Farmers: Agricultural Resistance and The Black Freedom Movement by Monica M. White

*The Author lays out her theory of social change through community food movements. The book goes through examples over the last 200 years of US history where African American farmers used gardening as a way to model more just alternatives for society, create economic autonomy, and develop theoretical unity among oppressed people.

Articles:

Subsistence farming as a safety net for food-price shocks by Alain de Janvry and Elisabeth Sadoulet

*article advocating for assisting subsistence farmers by helping them increase yields instead of conventional poverty safety nets like subsidies to corporations or price controls.

https://gspp.berkeley.edu/assets/uploads/research/pdf/Subsistence_farming.pdf

Lignin: Characterization of a Multifaceted Crop Component by Michael Frei

*This science text explores the benefit of lignin in the soil building and carbon sequestration. Highlights corn stalks as an excellent source of returning lignin to the soil.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3848262/>

Web resources:

http://journeytoforever.org/biofuel_library/oilpress.html

Detailed article documenting firsthand experiment successfully growing and processing sunflowers for oil.