Eye of newt, blood of bat
please remind me
where I planted at

Caveat Lector
This article started going the way of the last one in becoming way too long. I decided to break it up into sections. Some of the information may not make complete sense until you put together the info from all the sections. The sections will be –
– General propagation information (this article)
– Inbreeding Depression
– Collecting and storing seeds
– Cuttings, suckering, layering and grafting
– Specific practices for specific plant species
– Infrastructure considerations (planning and how to avoid the mistakes I’ve made over the years)

Also, in an effort to do my best avoiding getting overly technical in them, I’m going to knowingly cut some corners. What that means is while some of the following is not completely technically accurate, it will suffice for our discussion purposes.

And, all these articles are predicated on the growing of plants commonly used as a food source. So while, according to Euell Gibbons, “many parts of a pine tree are edible” and there are a lot of plants that grow in water, this information is directed at plants normally grown as garden foods in soil.

Finally, while I strive to provide you with sound information it is beyond my ability to completely explore every topic I touch on. Ideally it is my hope that exposing an idea or concept will provide you a launch point in your own exploration and research. Considering as the intent of these articles is to get you thinking about growing food AFTER TEOTWAWKI, you should be looking at the plants you intend to grow and researching them now, rather than when you have limited resources to perform your research.

Just to remove the question of what my corner cutting might look like, an example would be -

expressing a flower may have both a stamen and pistil when in actuality it would have a stamen and carpels which when partially or totally joined (the carpels) form the pistil. A stamen produces pollen grains, each of which contains a male gametophyte and the carpel at maturity houses the ovule which contains a female gametophyte. This female gametophyte, when fertilized with a male gametophyte becomes a seed. Pollination may occur as a result of self pollination or cross pollination. The preceding ignores completely the discussion of double fertilization, which is what actually happens during the fertilization process.

Contrast the above with the following.

Many, perhaps even most, flowers have both a stamen and pistil. The stamen fertilizes the pistil. Many plants can either self pollinate or cross pollinate.

Though not technically accurate the second example is more than sufficient for most of our needs. Just remember though, that when we generalize, we run the risk of overlooking the exceptions to the rule and I am certainly vulnerable to falling into that trap.

Enough of that and on with this article.

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Preamble
In order to successfully grow food year after year we have to understand plants reproductive processes, whether they are an annual or perennial, how to maintain genetic purity and variability of our stock and what we need to do to manage this process to our advantage.

Summarizing the above we have two broad topics of exploration. On the one hand we need to understand our plants and their reproductive cycle and on the other we need to understand the mechanics of the act of propagating plants.

Propagation
It is beyond our scope here to cover every plant that is grown for food. You will need to do your homework and research the specific varieties you grow.

Most naturally occurring plant propagation resolves down to two basic types, sexual and asexual.

Sexual reproduction consists of the fertilization of a blossom by pollen (pollination). Examples are just about every plant you can purchase seeds for. Don’t overlook the non obvious ones like onions (included because most people don’t start their onions from seeds, but from sets or transplants.). Many plants have both male and female reproductive organs, whether male and female flowers or both gender parts being contained in the same blossom. Some plants, like kiwi, actually have gender based plants so if you plant three kiwi and they’re all male or all female plants you just have an ornamental. Again, you need to do your research on the plants you intend to grow.

Asexual reproduction (also referred to as vegetative reproduction) takes several forms which include tubers, bulbing, rhizomes, runners, sporlation, buds, layering and suckering. Some examples of these are potatoes (tubers), raspberries (suckering) strawberries (runners) and marionberries (layering).

Artificial propagation consists of methods such as grafting, cuttings and tissue cultures among others. A common grafting example is fruit trees (apple, peach, pear). Rhubarb, potatoes and blueberries are examples of cuttings. Tissue culturing is going to be beyond the means of most individuals post collapse and unless there is a huge demand for more info this is probably the last time I will mention it. The biggest benefits to tissue culturing is the ability to obtain a genetic clone of the parent (completely sidestepping concerns of inbreeding depression) and providing initially disease free plant stocks.

Ok, now that we know some means of plant propagation our next step is to understand plant reproductive cycles. This is another one of those areas where I’m going to generalize.

Most annuals are plants that have a complete life cycle from seed to seed in one year. Examples are corn, tomatoes, peppers, lettuce and pole beans. Some of these break the rules. In the case of lettuce, it grows so fast and goes to seed so quickly you could probably grow a few generations over the course of one growing season. Peppers are actually a perennial but they usually don’t survive the winter season where most of us grow them so we treat them as annuals. I have begun overwintering super hot chili pepper plants to get a jump on a growing season that is usually too short to see them reach maturity, even when starting seed as early as the first of February.

Biennials are plants that grow one season and seed the next season. Carrots, beets and common onions are an example. They grow one year, produce a bulb, go dormant and then the next year grow again producing flowers and seed. Actually onions are kind of an exception to a lot of rules because it’s not really years they go by but cold cycles. This is why if you put out your onion transplants early and then after awhile have a cold snap you may have some of your first year onions go to seed. The cold snap tricks the onion into thinking it has gone through a winter and fools its biological clock.

Perennials are plants that live and produce for more than one year, often for several or more years. Rhubarb, asparagus, garlic, horseradish and collard greens are some examples, so are many herbs. Some other perennials are many soft fruits, strawberries, raspberries and marionberries to name a few. Raspberries and marionberries break the rules too, because while they are a perennial, their fruiting cycle is biennial (well most raspberries are, there are some exceptions here as well).

Ok, now that we have a small grasp of plant propagation and reproductive cycles we need to go back up several paragraphs to where I mentioned pollination. Pollination either occurs abiotically, without insect involvement, or biotically utilizing insects (actually there are other pollinators than insects). A common abiotic pollination method is wind and a common example is corn. Biotic pollination examples are most flowering plants. Biotic pollination accounts for nearly ninety percent of all pollination.

Both of these methods of pollination are very susceptible to cross pollination. Though I’ve dealt with cross pollination to a degree in a previous article we’re going to examine it again here. Cross pollination can be a great boon to your efforts in maintaining genetic variability in your plants and seed stocks. It can also be the cross you bear when similar plant species cross pollinate leading to an undesirable result. Most of the time, especially right now today when we can purchase all the seed we want, cross pollination for the most part is not an issue. It does become an issue when you begin to collect your own seed. Corn, onions, sweet and chili peppers and tomatoes all easily cross pollinate with others of their species. Did you know your zucchini and pumpkins can cross pollinate? How about this one, your carrots and a non crop plant, Queen Anne’s lace? Those will be some nasty carrots let me tell you. If you are counting on that great sweet pepper remaining sweet over the years you don’t want it cross pollinating with a chili pepper.

To maintain the integrity of your seed stocks you need to practice methodologies that ensures the genetic pureness of your plants. As far as I am concerned from a practical standpoint you have two means of insuring the integrity of your seed, monoculture planting or isolation (either distance or physical).

Monoculture, though effective, suffers from the severe problem of greatly limiting what you are going to grow. I can not envision only growing one variety of anything in my garden.

Distance isolation is just that, planting easily cross pollinated varieties far enough apart they can’t cross pollinate. This methods limitation is spelled out in its name, distance or more appropriately minimum distance. Here’s something that will bend your mind a little. The minimum planting distance for isolation of heirloom tomatoes is greater than that of hybrid tomatoes. Why? Answer, because the flower structure of heirloom varieties is different in a way that encourages cross pollination. Humpf, who woulda thought it.

It can be very difficult to come up with the safe minimum planting distance to avoid undesirable cross pollination. The USDA tells us for OP (open pollinated) corn the safe distance is one mile. Tomatoes is thirty feet, peppers is thirty feet, honeydew melon is a quarter mile. Did you know honey bees can fly up three to five miles to forage? Guess distance isn’t going to work so well for most of us if we want to be sure our seed plants don’t cross pollinate. Don’t overlook the impact your neighbors gardening efforts can have on your efforts, especially if you decide to monoculture and then find out he is growing a different variety of the same species.

That leaves physical isolation. You can make physical isolation as simple or complex as you like and it can vary from an isolation bag over one blossom to positive pressure structures utilizing air filtration and air locks on the entry ways and having their own group of biotic pollinators.

I like simple and cheap so lets look as using isolation bags. These are open weave bags allowing light, air and water to pass through but blocking insects and drifting pollen from doing their job. With some plants like chili peppers you can put an isolation bag over a blossom and forget about it. It will self pollinate as the blossom opens. That is not to say that chili peppers don’t cross pollinate they do, very easily I might add.

With other plants you will need to help the process along by capturing some pollen from some of your plants and transferring it to your other plant blossoms. For smaller blossoms we use small natural bristle paint brushes. Each species of plant has its own brush kept in a zip lock bag. In some cases even an individual plant will have its own brush. It all depends on the degree of control you want in maintaining isolation. We also wear latex gloves that are changed for each plant or species group, again depending on the degree of isolation we want. We will lightly twirl the paint brush in several blossoms (source plants) and then move over to the blossoms we want to pollinate (destination plant). Another light twirl in the blossom and we’ve just knocked mother nature out of the process.

On larger plants (think corn) we employ a shaker bag to collect the pollen and then move this bag over to the plant we want to pollinate and close the bag around the ear and silk and shake it like mad to get the job done.

We make our own isolation bags out of summer weight floating row cover material. Basically they are shaped like pillow cases with a tie loop on the open end. They are sized from an individual blossom all the way up to a whole plant. Once we pollinate we leave the isolation bags in place for awhile then we remove them. We do flag the individual blossom, stem or plant that we have pollinated so we know what we are going to collect for seed.

There is a procedure we follow when doing the above process. We place isolation and shaker bags before the blossoms begin to open or pollen forms. This is done on both our source and destination plants. Once we have blossoms and pollen we will perform the pollination. The isolation bags are left in place until fruit begins to form. After that we’ll pull the bags. We tag the bags so if we reuse them in the future we know which plants pollen was previously in the bag. We attempted to clean and sterilize the bags but it was more effort than just making new bags each year.

Yes the above is a lot of extra work but if it ever goes to hell in a hand basket, several years down the road, if you are still alive, you’ll thank me for this info.

So to wrap up this weeks installment, you need to know what you are going to grow, its reproductive cycle, how it reproduces, how you are going to isolate your future seed stock plants and the methodologies you are going to employ to maintain the integrity of your seed stock plants.

Links to previous articles

A food growing primer https://bustednuckles.net/a-special-treat-food-grower-articles-resurrected/

The foundation of it all -this thing called dirt <https://bustednuckles.net/food-grower-article-2/>

Starting Seeds https://bustednuckles.net/the-food-grower-series-continues-seed-starting/