Build Your Sustainable Garden Ecosystem

In partnership with:

JEFFERSON CONSERVATION DISTRICT

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WHEAT RIDGE PARKS & RECREATION

Every garden or agricultural landscape is an adaptable, location specific ecosystem of interacting living organisms (plants, animals) and their nonliving physical environment (water, air). Gardens contribute to sustainability when they regenerate ecological diversity, and each yard has unique challenges that require specialized solutions.

https://www.motherearthnews.com/organic-gardening/gardening-techniques/sustainable-gardening-zm0z11zsto

Sustainable Garden Ecosystems

- Require minimal energy inputs
- Use less water
- Maximize biodiversity at all levels
- Minimize pollution and run-off
- Utilize closed loop cycles

Planning Your Sustainable Garden Ecosystem

Vision

Write a list of everything you would like in your garden, include what is existing along with future items, such as vegetable beds, pollinator area, compost, chicken coop, etc.

Site

Observe your backyard through all seasons and times of day to understand its unique characteristics– soil, sun, shade, wind, water–and get to know what might work where.

Map

Whether a simple sketch or a cartographic masterpiece, a map helps to conceptualize a cohesive plan for your garden. Things to consider: growing, sitting, storing, materials, water, connectivity, movement, sun and use patterns.

Zones

Like rooms in a house, zones are fluid and adaptable according to each site's particular features and occupant needs; not all sites include all five zones.

1. Intensively used space (vegetables, paths)
2. Part of daily life, not as intensive (small livestock, edible perennials, compost)
3. Areas that don't require as much attention (fruit trees, cover crop)
4. Borders, managed passively or as needed seasonally
5. Wilderness, requires no human intervention

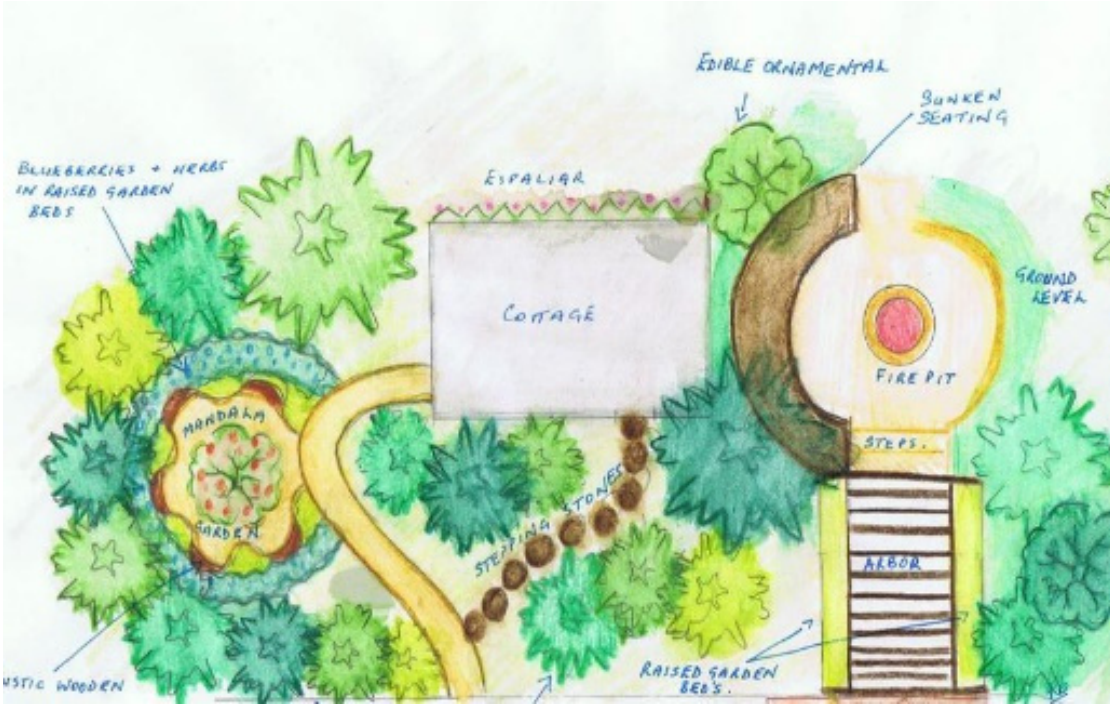

Image by Fiona Blackham, Gaia Permaculture; used with permission

Some Ideas for Your Sustainable Garden Ecosystem Continued

Soil "As above, so below."

Biodiversity above ground becomes diversity below, supporting a thriving garden ecology. Soil organisms are the key to a sustainable garden! Soil is supported by composting, mulching with organic materials, and minimal- or no- tillage

- Resource: https://whatsupwheatridge.com/sustainable-wheat-ridge/news_feed/dig-deeper-into-soil-health

Microhabitats

Small-scale ecosystems in a larger habitat that meets the physical needs of a particular organism or community of organisms. These can include bird, bat, and insect houses; decomposing logs; compost area; vermicompost; pollinator habitat.

Native Multispecies Planting

Polyculture plantings of native species are adapted to the local climate, requiring less maintenance and care to grow, and provide vital habitat for birds and pollinators.

Guild

Grouping of plants in which each plays a certain role in support of a central element—such as a fruit tree—for maximum harvest and use of space.

Hugelkulture

A mound that uses branches and logs to benefit soil fertility by adding nutrients, improving water-holding capacity, and providing a home for soil organisms. Other soil building methods include lasagna gardening and sheet mulching.

Chickens

In a sustainable backyard garden, chickens can help turn the garden in Spring and Fall. They snack on a variety of insects and weed seeds, eat kitchen scraps, provide eggs, and their manure makes great fertilizer. Eggshells also make a great addition to compost!

Bees

In addition to honey, bees provide a range of ecosystem services that promote biodiversity by supporting the growth of trees, flowers, and other plants.

Part II – Seed Saving

DRY SEEDS – The easiest seeds to save

Peppers

The seeds are mature after the peppers have changed color. Indicating final ripeness. cut the peppers open. scrape out the seeds onto a glass or ceramic plate and let dry.

Beans and Peas

Allow pods to fully dry on the plant before harvesting. for peas about 4 weeks after harvesting to eat, for beans about 6 weeks after harvesting to eat. Pods can be opened by hand. winnow off remaining chaff.

WET SEEDS – Requires washing seeds

Watermelons

Cut the watermelon open, scoop seeds into a strainer. rinse with a bit of dishwashing soap to remove sugar. Rinse seeds and spread to dry.

Winter squashes

Cut winter squash open, pull the seeds from the fibers, rinse seeds and spread to dry.

To be successful, do not harvest the following plants until they are past ripe:

Eggplants (when they are far past ripe, dull. off-colored. hard or shriveled)

Cut the ripe eggplants in half and pull the flesh away from the seeded areas. Wash through mason jar. letting viable seeds settle, and pouring off water and debris. until water is clean and only clean seeds remain. Rinse one last time and pour all contents through cheesecloth to catch tiny seeds. Capture seeds with a coffee filter or dump onto a plate to dry.

Cucumbers (when they change color and become soft)

Cut the ripe cucumber in half and scrape the seeds into a bowl. To remove the seeds' coating. rub them gently around the inside of a sieve while washing them or soak them in water for two days. Rinse and dry.

Summer Squash (when you can no longer dent skin with fingernail)

Cut the squash open. scrape the seeds Into a bowl, rinse thoroughly and dry.

ADVANCED

Tomatillo

Collect seeds from ripe tomatillos. when the fruit has filled out the paper husk wrapper and it has begun to split/dry at the base. Remove the wrappers. Cut up the fruit into wedges and gently blend them in a blender. The seeds are small and won't be damaged by the blade. Pour the slurry into a tall clear glass or mason jar and cover with water. Stir mixture and good. viable seed will sink down to the bottom.

Pour off the floaters (pulp and bad seeds) but be sure none of the good seeds fall out. Repeat rinsing and stirring until the water Is clear and the good seeds are at the bottom. Repeat as many times as necessary. With the final rinse. pour the seeds and clean water through a sieve to retrieve the tiny seeds. Smack the wad of seeds onto a labeled coffee filter. fold up the filter and dry thoroughly.

Tomatoes

Cut each across the middle and gently squeeze the juice and seeds into a mason jar. You can do multiple tomatoes at a time as long as they are from the same plant and harvested at the same time. Cover with enough water to last three to four days. Jar can stay uncovered. If you are concerned about fruit flies, cover with a cheesecloth or a coffee filter secured with a rubber band. Set jars out of direct sunlight and let seeds sit for three to four days, giving the jars a stir or a slosh each day.

A layer of white mold will form on top of the water, this is the result of the seeds fermenting. Good, viable seeds will rest at the bottom while bad seeds and mold will stay at the top. Around day four, fill the jar with clean water and stir to break up the contents. Let the good seeds settle back to the bottom of the jar and slowly pour off the floaters (mold and bad seeds) but be sure none of the good seeds fall out. Repeat rinsing and stirring as many times as necessary until the water is clean and the good seeds are at the bottom. With the final rinse, pour the seeds and clean water through a sieve to retrieve seeds. Smack the wad of seeds onto a labeled coffee filter, fold up the filter and dry thoroughly.

DRY TEST

When completely dry. round or oval seeds should shatter when hit with a hammer and flat seeds should break and not bend.

OTHER THINGS TO KNOW:

•Seeds dried on paper towels or paper plates might stick. A plate or wax paper works well. Coffee filters are good but be sure to break up clumps when transferring to seed packets.
•While drying, turn seeds so they dry completely.
•Choose the seeds wisely. the earliest tomato. the brightest pepper. Make sure to choose disease free fruits to save seeds.
•In humid environment. put seed envelopes in an airtight glass container. you might add a drying agent such as Silica Gel or Rice.
•Tag your seeds at various steps through the process. ball point pen writes well on paper towels. sharpie markers wash off glass.
•Coin envelopes are a great size for saving and swapping seeds.
•Rinse seeds over a bucket to collect water for the garden or compost pile.

Be sure to record the following on seed packets:

•Date of harvest
•Varietal
•Location of plant
•Special feature
•If for a swap, # of seeds

REFERENCES

- http://www.pennandcordsgarden.com/
- https://rockymountainseeds.org/
- https://www.motherearthnews.com/organic-gardening/save-vegetable-seeds-backyard-zmaz77zsch
- https:// www.nativeseeds.org/
- https://www.seedstrust.com/basic-seed-saving

Vegetable Families and Method of Cleaning Seed

Family	Vegetables	Method
Apiaceae	Carrots, Fennel, Celery, Dill, Parsnip, Coriander, Parsley, etc.	Allow plant to bolt, form umbels of flowers. Allow umbels to dry (achieved best by leaving on the plant). Once dry, cul from plant. Screen the umbels to remove chaff. Some plants are biennials and will not form flowers until the second year.
Asteraceae	Lettuce, Sunflower	Allow plant to bolt. Collect dried seed stalks. Store in bags for a few weeks. Will probably require a bit of threshing and winnowing.
Brassicaceae	Broccoli, Cabbage, Brussel Sprouls, Radish, Collards, Cauliflower, Rutabaga, etc.	Mature seed pods must mature on the plant. Once the seedpods begin to turn brown, remove from plant. The pods are often brittle and will shatter. Removing the seeds from pod can be done by hand or by threshing and winnowing.
Chenopodiaceae	Spinach, beets, swiss chard	Mature seeds can be stripped from stalks before or after plant is removed from ground. Seeds are prickly, gloves advised. Will probably need threshing and winnowing. Most plants are biennials.
Cucurbitaceae	Cucumbers, Squash (Winter and Summer), Melons	Seeds are removed from mature fruits. Clean off by rinsing in a strainer. Set aside to dry (not above 9SF). ••c ucumbershave higher germination rates if they are cleaned using fermentation.
Fabaceae	Peanuts, Beans (snap and shell), Lentils, Peas	Mature seed pods are left on plant urtl the pods begin to turn brown. Remove pods (or entire lan!). Pods split vertically to release seeds. Allow to dry.
Lamiaceae	Basil. Mint, Sage, etc.	Allow plant to boll, forming flower stalks. Allow flowers to dry; when inflorescence begins to brown and drop, cut flower stalks. Will need threshing and winnowing.
Malvaceae	Okra	Still green, but firm and mature, pods are collected and allowed to further dry out. Once dried, crack open pod and release seeds.
Poaceae	Corn	Allow mature ears to dry out on the plant if there is no danger of pest damage. If you are concerned, you can pick mature ears and allow them to dry indoors. Once dry, shuck the ears and rub two together to remove seed.
Solanaceae	Tomatoes, Peppers, tatoes, Eggplant, Tomatillos	Seeds are collected from mature, ripe fruit. Insides of fruit are mixed with water and processed in a blender. Seeds are then strained and set aside to dry. *_*Tomato seed germination will increase if a fermentation process is used. .. Potatoes are generally propagated from root cuttings, not from seed.

Primary Source: Ashworth. Suzanne: (1991). Seed to Seed. Decorah. Iowa: Seed Saver Publications.

How to Save Tomato Seed

One can start collecting viable seeds for saving once the fruit reaches the "breaker" stage. This is when a small amount of color (usually red) shows up at the blossom end of the fruit. Still it is probably best to wait till one a fruit is fully colored. Selecting over-ripe fruit can result in reduced seed vigor and germination even though this is part of nature's method of removing the seed's gelatinous coat which contains germination inhibiting compounds. Over ripe fruits can also result in precious seed germination in some cultivars (means the seed germinations in the fruit). Trying to speed up the ripening process up by utilizing ethylene(the gas which speeds ripening) can also result in reduced vigor and germination.

Fermenting the seeds will help to remove the gelatinous coat which contain germination inhibitors and helps reduce or destroy any pathogens present. Though messy/smelly, it is recommended.

Extract the seeds and put them in a marked container. Squeeze juice and seeds into 8oz- 16oz plastic containers with lids (which will help too keep out insects, prevent spills and hold moisture) for about 2 days (it is also wise to label the container rather than the lid to prevent any mix ups). If one does use coverings, the container should not be set in direct sunlight.

The warmer the temps, the quicker they ferment. 3 days or more may be needed in cool conditions. Rely on the fruit juices for moisture but add a small amount of water if needed to prevent drying. Too much water and the may start sprouting.

A mold should start forming on the surface but if it does not and its been 2 days that's ok. Just rinse the seeds well in a strainer and them tamp then out to dry. One can do so on paper towel, a plate, a screen or various other methods. It is important to dry seeds slowly, since rapid drying out shrinks the seed coat around the embryo and reduces seed quality (in terms of vigor). Good seed should be a light tan color. If you get dark brown seeds they may have set too long and germination will likely be reduced. If this happens do not worry too much, usually some will germinate the next year.

How to Save Tomato Seed Continued

Store the seeds in the refrigerator and they should keep well for about 4 years. One can still get viable seeds 7-12 years later but usually the germination percentage is lower. If one plans to save seed this long be sure to save plenty of seed. If one reduces the humidity this will increase seed life. This is done by adding a desiccant like silica to a container which will hold the packets of seeds. One can get desiccants from the packets of silica that come packed in electronics.

*If one suspects diseases treat seed in a 10% Clorox solution for 10-20 minutes, then rinse, just PRIOR to sowing (NOT storage). This can reduce germination somewhat but can help to eliminate disease problems that may be associated with the seed. It cannot do anything for virus diseases however.

*If cleaning seed of different varieties do so one at a time so you don't mix up seed lots. A simple mistake like this can ruin a lot of hard work.

Source: http://vrww.kdcomm.net/~tomato/Tomato/seedsav.html

Tomato Seed Saving Steps

Steps completed during workshop:

1. Harvest ripe tomatoes, cut and squeeze seeds into clean jar.
2. Label your jar with the variety, date and any notes.
3. Cover seeds with water.
4. Cover with cheesecloth to prevent fruit flies.

Next steps:

1. Allow jars to rest for 4 days to a week. Swirl contents occasionally. White mold will form at the top to show that the seeds are fermenting.
2. Pour off mold layer and any floating residue. Viable seeds will rest at the bottom.
3. Rinse the good seeds with fresh cool water, swirl and pour off residue. Repeat until water is clean and good seeds are at the bottom of the jar.
4. Add water one last time, swirl and pour water and seeds through a sieve or cheesecloth to capture all seeds.
5. Smack the seeds onto a labeled coffee filter. Fold up to keep seeds safe and allow to dry thoroughly.
6. Once dry, gently peel seeds off filter and put in labeled envelope to store.