

The Heirloom Gardener's Seed-Saving Primer

Seed saving is fun and interesting. It tells the story of human survival, creativity, and community life. Once you learn the basics of saving seeds you can even breed your own variety of crop! Share your interesting seeds and stories with other gardeners and farmers while helping to prevent heirloom varieties from going extinct forever. Contact The Foodshed Project to find out about local seed saving events!

1.	Food "as a system".....	5
2.	Why are heirloom seeds important?.....	6
3.	How are plants grouped and named?.....	8
4.	Why is pollination important?... ..	11
5.	What is a monoecious or a dioecious plant?.....	12
6.	How do you know if a plant will cross-breed?.....	14
7.	What types of seeds are easiest to save?.....	18
8.	What about harvesting and storing seeds?.....	20
9.	What do I need to know about gardening in a warming climate?.....	21
10.	More links and references.....	22





Anderson Farm Community Garden
Anderson Farm Museum, Lively, Ontario

Thank you to all the gardeners, farmers, organizations and individuals who are dedicated to protecting global seed diversity.

The document is a self-learning guide and is general knowledge for beginner seed savers.

Click your way through the document and online to learn more about the movement to save endangered heirloom seeds.

This self-learning guide is for **educational purposes only**.

For the best results, research each plant that you plan on saving seeds from.

Click on the images for more online information.

To be able to open the online video links, you may have to download this

Interactive PDF document to your hard drive and reopen it in either

Adobe Reader or Adobe Acrobat.

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For more information: info@foodshedproject.ca



FOOD

→ or famine?



CLIMATE CHANGE

loss of
**SEED
DIVERSITY**

LOCAL SEED EXCHANGES
SEED EXCHANGES
GLOBAL

FARMERS +
GARDENERS
FOOD SECURITY

This document is dedicated to our ancestors who saved seeds, and to our descendants that we hope will carry on the tradition.

SUSTAINABILITY

1. Food "as a system".

Food "as a system" - what does that mean? It means that if one part of the system changes, it impacts the rest of the system. If you change the seeds, and you change the whole system!

It all starts with seeds, but from the soil to processing, distribution, and disposal - it all impacts the natural environment along the way.

Our agricultural food system has taken centuries to evolve. Our agrarian ancestors began the science of agriculture by domesticating plants from wild stock. The seeds from the healthiest and strongest plants were selected over the years until they became stable varieties.

Seeds represented life for the community. Seed saving was integral to local customs, traditions, and spiritual rituals. Saving seeds prevented famine, and the culture of seed saving produced thousands of regionally adapted, and genetically resilient, seed varieties.

Many of the staple foods we eat today were developed by Indigenous communities who saved seeds and passed them down through the

generations. The seeds of hundreds of heirloom varieties of maize, potatoes, wild rice and other field crops were used for trade. These seeds were dispersed all over the globe and eventually they evolved into new regionally-adapted varieties.

Commercial seed companies emerged early in the 20th century, and with that most farmers and gardeners stopped the practice of saving seeds for next years crop. Then came the hybrid crops, which were valued for their high yields. They produced sterile seeds.

Today, food is grown on larger and larger commercial mono-culture farms - and fewer and fewer varieties of crops are grown. Most seed for the basics such as wheat, rice, corn and soya, is patented seed - or is grown from hybrid seeds. And today, most people do not backyard garden or save seeds from one generation to the next.

The net result has been the loss of locally adapted open-pollinated heirloom seed varieties - on a the global scale it has meant the extinction of 75-90% of all crop diversity.

Heirloom vegetables are open-pollinated, which means that a plant receives pollen from many other nearby plants. This produces genetic variability, and the more genetic variability, the more adaptable and resilient a seed can be. This is why it is important to save our current stock of heirloom vegetables from extinction - many of their valuable genetic traits may be needed for future farmers and gardeners.

Heirloom seeds are being saved in seed banks, seed vaults, and seed libraries - but growing them out every 10 or so years will ensure that they continue to evolve as the climate warms and growing conditions change.

Select rare or endangered heirloom varieties that suit your growing conditions. Grow them out over many generations so that they become adapted to your local region.

Many vegetable seeds - such as peas, beans, lettuce, squash, carrots, spinach and tomatoes - are easy to save once you learn the basics!

2. Why are Heirloom seeds important?

Heirloom plants gather a wide range of genetic material because they are “open-pollinated” by insects, wind and, animals, for many generations.

Heirloom (or heritage) plants have been selected and bred for up to 50 years for specific genetic traits such as cold emergence or disease resistance.

In general, heirloom plants will produce “a true-to-type seed” of the same variety - even though they can have a wide range of genetic traits and variability within a variety.

Be sure to note any interesting traits (such as disease or drought tolerance) on your seed storing labels.

Common Vegetable Families

1. Solanaceae - Nightshade
2. Brassicaceae - Mustard
3. Fabaceae - Legume
4. Curcubitaceae - Squash
5. Alliaceae - Onion
6. Apiaceae - Parsley
7. Amarantaceae - Spinach
8. Asteraceae - Lettuce
9. Lamiaceae - Basil



What happened?

- Seeds became a mass-marketed product.
- People grew the same varieties everywhere.
- People stopped saving community heritage varieties.
- Locally adapted varieties vanished.
- 3/4 of food biodiversity died out during the 20th century.

EXTINCT

Courtesy of Aabir Dey

 **Seeds of Diversity** People Protecting the People's Seeds
www.seeds.ca

Between the year 1900 and 2000, 3/4 of the world's food crop diversity has become extinct as a result of changes to our food system.

Blue Podded Capucijner

...some rare heirloom varieties

Our ancestors selected plants for traits such as cold and heat tolerance, disease resistance, nutrition, texture, and taste. These traits are stored in the genetic code, and that information is passed along to the seeds. Selecting plants for these traits will help save this genetic history!

Climate change means a longer growing season, and summers will be hotter. Look for traits such as drought and heat tolerance, to help your vegetables be tastier and thrive in a warmer climate.

In Northern Ontario save seeds from varieties that have a short growing season, around a 90 DTM (days to maturity from direct seeding or transplanting into the garden). A 90 DTM plant will have sufficient time to mature the fruits and produce seeds to harvest.

Early Cluster Russian Cucumber
1850's



Long Island Cheese Pumpkin
1880's



Reines des Glaces Lettuce - 1800's



Chioggia, Candy Stripe Beet - 1840



Kaho Watermelon - Rare - 1912



Monstreus de Viroflay- 1885



Marina di Chioggia - 1600's



Matin Organic Red Peppers -1887



3. How are plants grouped and named?

The chart on the right is how a botanist would organize the world of plants. All flowering plants are Angiosperms and they have a scientific name based on the type of flower, stem, roots, first leaves, and mature leaves that emerge.

Angiosperms are also categorized by the type of seed they have. Angiosperms are either monocots or dicots.

We know plants by their common names, but some common names are similar or misleading. For seed saving you have to know the Genus and species. This is called the **binomial name**, and it can get confusing!

Species names can sound similar, or even be the same name. For instance, Arugula (Rocket) salad greens are *Eruca sativa* (*E. sativa*). *Cucumis sativus* (*C. sativus*) has a similar species name, but it is a cucumber.

The **Genus and species** information should be written on the seed package. You can also check Seeds of Diversity for more information (www.seeds.ca).



Order	Cucurbitales
Class	Magnoliopsida
Family	Cucurbitaceae
Genus	<i>Cucumis</i>
Species	<i>melo sativus anguria</i>

For seed saving it is important to know the **Genus** and **species** of your plant.

The **Genus** is always capitalized, and both **Genus and species** are italicized.

If the Genus is already mentioned in a document, the name is usually shorted to the first letter. For instance, *Cucumis sativus* can be shorted to *C. sativus* once the Genus has been identified.

Family	Fabaceae - peas and beans
Genus	<i>Brassica</i>
Species	<i>oleracea</i>
Variety	Kale
Cultivar (var.)	Red Russian, Lacinato

...understanding the scientific names

Botanical Classification of the Order Cucurbitales

Order Cucurbitales
 Class Magnoliopsida
 Family Cucurbitaceae - squash and gourd family

Genus *Cucumis*
Species *C. melo* - honey dew, cantaloupes, and melons
C. sativas - slicing and pickling cucumber
C. anguria - gherkins



Genus *Cucubita*
Species *C. moschata* - butternut squashes, some pumpkins
C. maxima - turban and Hubbard squash, some pumpkins
C. pepo - summer squashes, common pumpkins, crook neck, patty pan, vegetable marrow, cocozelle, zucchini, and ornamental gourds
C. mixta - cushaw pumpkins and winter squash, and silver seeded gourds

Genus *Citrullus*
Species *C. lanatus* - watermelons and citrons including varieties of seedless, picnic, icebox, yellow-orange watermelons, and acidic and non-acidic pulp citrons.

- ...the Family name ends with "aceae".
- ...the Genus is capitalized
- ...and both *Genus* and *species* are italicized.

Cucumis melo - If these varieties (cultivars) cross-breed they will produce hybrid seeds. They are the same species.



Petite Gris de Renee



Armenian Cucumber



Mother Mary's Pie Melon

Cucumis sativus - If these varieties (cultivars) cross-breed they will produce hybrid seeds. They are the same species.



Bushy Cucumbers



Pickling Cucumbers



White Wonder Cucumbers

Cucumis anguria - If these varieties (cultivars) cross-breed they will produce hybrid seeds. They are the same species.



Gherkin Cucumbers



West Indies Gherkin



L. Beneficios

Monocots or Dicots? The seed tells it all!

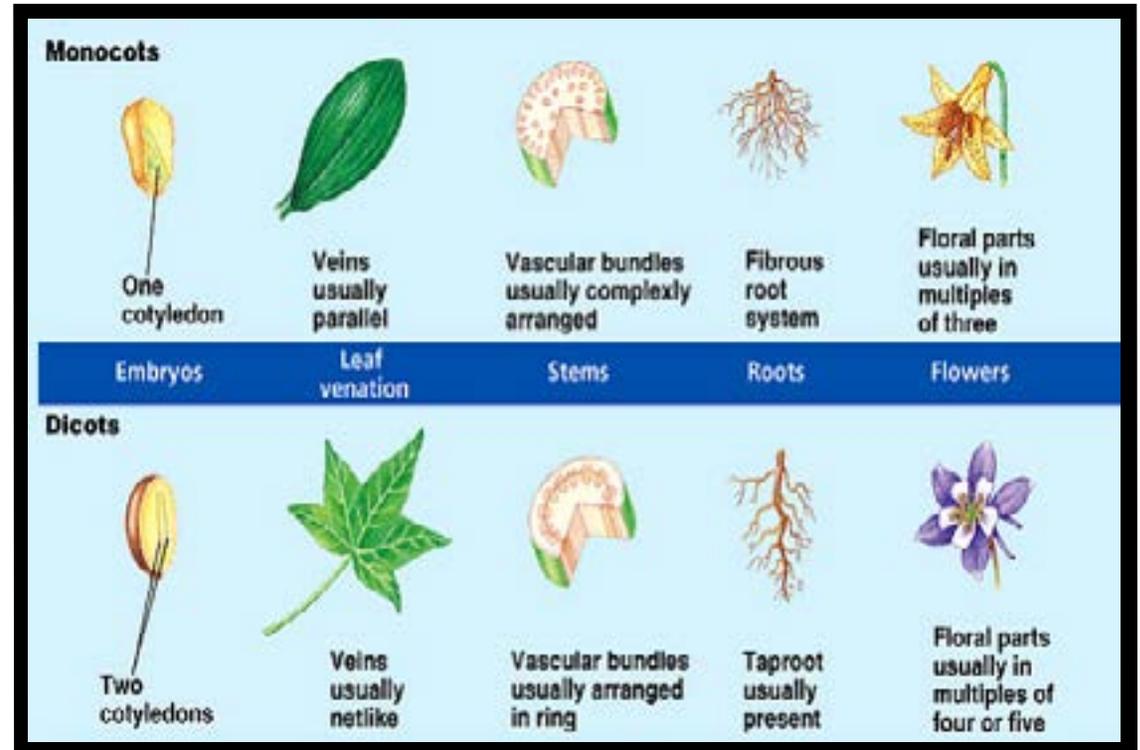
An important aspect of seed saving is understanding how your plant grows, pollinates, and matures the seeds.

If a seed has one cotyledon, or embryonic leaf, it is called a monocot. Grains, onions, and grasses are examples.

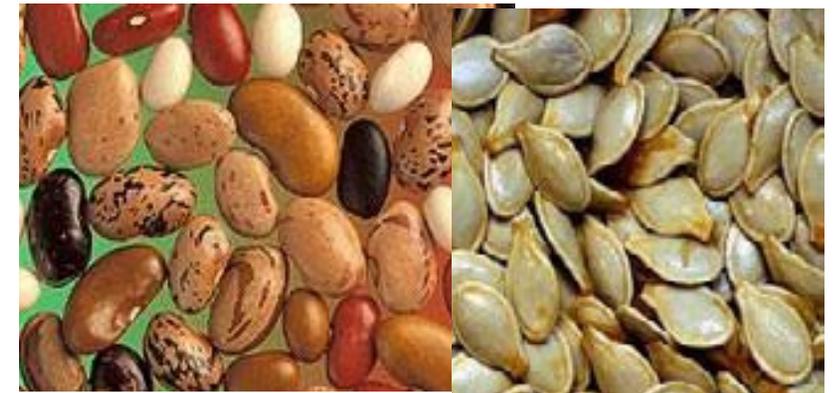
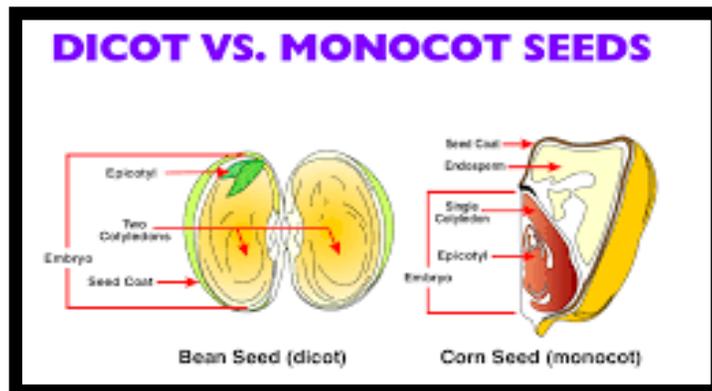
If a seed has two cotyledons in each seed it is a dicot. Peas, beans, lettuce and tomatoes are examples.

As you can see in the diagram, monocots and dicots are very different types of plants, from the roots to the flowers.

For instance, knowing what kind of roots your plant will grow can help you adapt your garden for climate change. Water deeply once a week to encourage roots to grow deep. Mulch the base of your plants to keep the soil cool and reduce water evaporation.



...these are all dicot seeds, carrots, beans and pumpkin



4. Why is pollination important ?

Pollination is essential to the development of seeds and the fruits of the plants we like to eat. Even if what you are eating is a vegetable, botanically it is a “fruit”, or a ripened ovary.

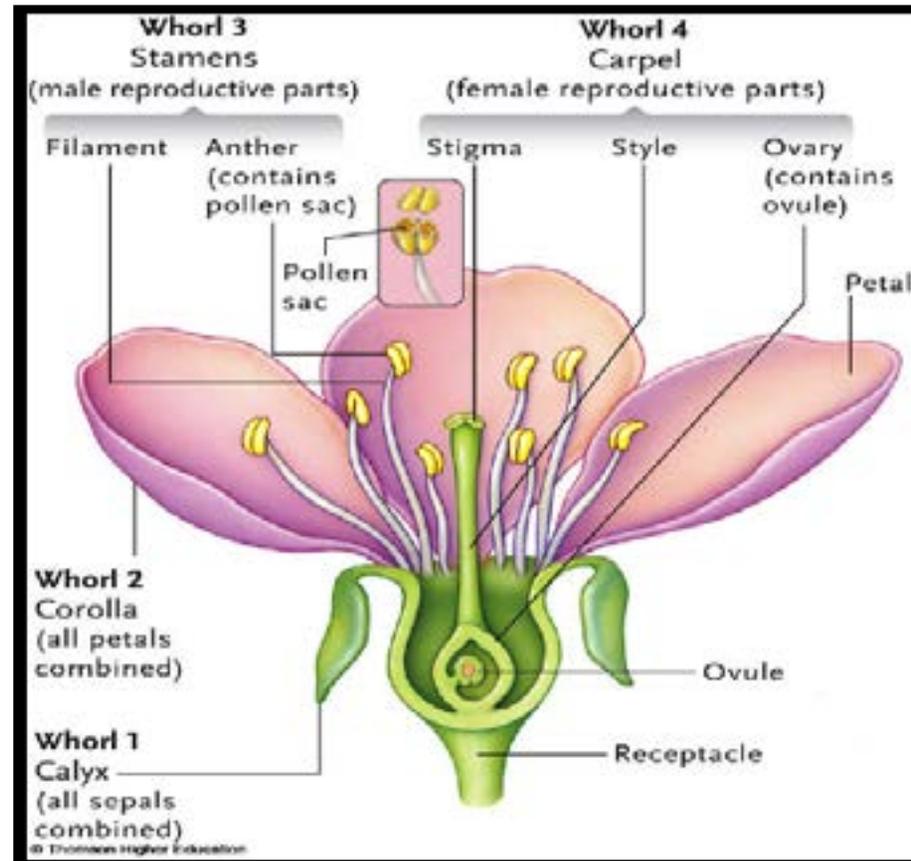
Pollination takes place when the male pollen is transferred to the ovaries of a flower. Ovaries are the female part of the flower, and contain ovules, or immature egg cells. After fertilization these egg cells develop into the seeds of the plant. The ovary wall then thickens to protect the new seeds - producing the fruits and vegetables we like to consume on our dinner plate.

If the pollen of another variety (of the same species) lands on the stigma of the female flower part, it will cross-pollinate and cross-breed.

Grow colourful flowers in your garden to help attract pollinators, such as insects and birds. You can also hand-pollinate squash and gourds.

Fruit tree pollination can be either self-pollination, or a tree can require pollen from a different variety of fruit tree - don't confuse this with heirloom vegetable pollination!

Parts of a Perfect Flower - note the male and female parts.



Open-Pollination

Open-pollination refers to the transfer of pollen from birds and other animals such as bats, insects, or from the wind or even rain.

Open-pollinated plants have a greater amount of genetic variety, and are more adaptable to changing growing conditions.

Always choose certified organic open-pollinated seeds for seed saving.

5. What is a monoecious or dioecious plant ?

All flowering plants are either **monoecious or dioecious**. Know what your plant is and it will help you understand how your plant pollinates, and where to find the seeds!

Monoecious plants have both male and female reproductive parts on one plant (remember MONO means one). That could mean that they have flowers with both male and female parts (a perfect flower), or they have imperfect male and female flowers on one plant.

Tomatoes and lettuce are monoecious plants. They have perfect flowers- one type of flower that has male and female parts. They are in-breeders and can self-pollinate.

Members of the Cucurbitaceae family, including squash, pumpkin, melons and cucumbers, are monoecious. They have separate male and female flowers (imperfect flowers) on the same plant. The fruit grows from the base of the female flower.



Corn is monoecious. The male corn tassel (male flower) produces a fluffy type of pollen.

When the pollen lands on sticky corn silk (female flower), it travels down to fertilize the ovules - producing a kernel of corn seed!



The top flower in the above image is the female squash flower blossom. Once pollinated the embryonic fruit at the base will grow to produce a new squash plant and new seeds!

Dioecious plants have separate male and female plants. The female plant has imperfect female flowers which contain the ovaries, and is called the pistil. The male plant has male parts (anther) in an imperfect flower which produces the pollen.

Examples of dioecious plants are spinach and asparagus. To save the seeds from these plants you have to make sure you have a sufficient number of male plants growing nearby to pollinate the female plant.



Female spinach plant above produces the seed.

The male plant above is in full flowering mode.

Cucurbitaceae Family - hand pollination is possible!

The **Cucurbitaceae Family** of plants includes cucumbers, cantaloupes, gherkins, melons, watermelons, gourds, pumpkins, vegetable marrow, zucchini and squash.

Though many fruits in this family are similar, there are at least four genera and eight species in the Cucurbitaceae squash and gourd family. They cannot cross-pollinate with each other unless they are the same species.



All squash and gourd are monoecious and have both male and female flowers on every plant.

Cucurbitaceae produce the male flowers first to attract bees. The female flower develops, and then pollination occurs. It is an excellent example of how plants have co-evolved with the environment to attract pollinators.

Did you know that you can step in to



The top image shows the flowers that are typical of the Cucurbitaceae Family - squash and gourds. The female flower has the baby squash at the base. The bottom flower is the male, which produces the pollen. Squash are pollinated by a specialized squash bee, on the right.

help nature along by hand pollinating your squash and pumpkins? You can fertilize the female flower by transferring the pollen from the anthers of the male flower.

For larger squash and giant pumpkins, this method can help you get a jump on the growing season! Remove the rest of the female flowers so the plant can concentrate their energy on growing fewer, and larger, fruits.



Q. How do you know if a plant will cross-breed ?

Seed savers strive to maintain varietal purity, and produce "true-to-type" seeds. Only seeds produced from pollen of the exact same variety or cultivar will produce seeds that are "true to type" - true to the variety of the mother plant. If the plant was cross-bred, the mother plant will still bear fruit that season true to its' variety. The seeds produced during that growing season however will not be "true-to-type", or may even be a sterile hybrid.

Here is an example of cross-breeding of two *Cucurbita moschata*...



Long Island Cheese Pumpkin

The Long Island Cheese Pumpkin on the left is a variety of *Cucurbita moschata*. It can cross-pollinate with other Long Island Cheese Pumpkins, or other members of the *C. moschata* species.

Chirimán Squash

The Chirimán Squash is also a species of *C. moschata*. These two varieties can cross-pollinate - even though one is called pumpkin and one is called squash. They are the same genus and species!

If these plants cross-breed, they will produce hybrid seeds. Those seeds in this example will grow the hypothetical Long Island Chirimán Squash.



The Long Island Chirimán Squash would be a hybrid plant. It would grow from the cross-bred seeds of the two varieties of *Cucurbita moschata* (on the left).

Because these two squash are the same species, *Cucurbita moschata*, they can cross-pollinate. The seeds produced will be hybrid seeds, and will not be "true to type". Grow open-pollinated certified organic heirloom varieties to help you achieve good growing and seed saving results.

... genus, species, and varieties of the Cucurbitaceae Family

Order	Cucurbitales
Class	Magnoliopsida
Family	Cucurbitaceae
Genus	<i>Cucumis</i>
Species	<i>melo</i> <i>sativus</i> <i>anguria</i>

Will cucumbers and melons cross-breed? Even though cucumbers and melons share the same Family (Cucurbitaceae) and Genus (*Cucumis*), a cucumber is a different species, *sativus*, and cannot cross-breed with a melon which is a species of the *melo* group.

The Armenian Cucumber is an example where the common name is misleading. It is not a cucumber (*Cucumis sativus*), it is a *Cucumis melo*, which includes honeydew, cantaloupes and melons.

These plants can cross-breed - they are the same **Genus** and **species** - *Cucurbita moschata*.



Seminole Pumpkin Squash
Cucurbita moschata



Pennsylvania Dutch Crookneck Squash
Cucurbita moschata

These plants cannot cross-breed - they are the same **Genus** but different **species**.



Armenian Cucumber
Cucumis melo



Pickling Cucumber
Cucumis sativus

... more of the Cucurbitaceae Family

These plants can cross-breed - they are the same genus and species - *Cucurbita moschato*.



Musque de provence Pumpkin
Cucurbita mochato



CUSHAW of
Martinique Squash
Cucurbita moschato

These plants cannot cross-breed - they are the same genus, but are different species - *C. melo* and *C. satavis*.



Tiger Melon
Cucumis melo

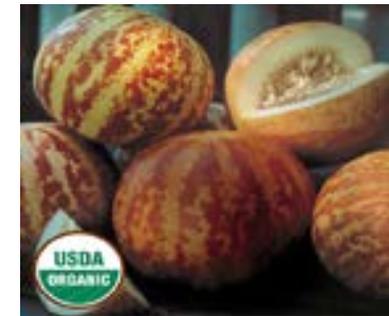


White Wonder Cucumber
Cucumis satavis

These plants cannot cross. They are a completely different genus - *Citrullus* and *Cucumis*



Golden Midget Watermelon
Citrullus lanatus



Tigger Melon
Cucumis melo

...have enough plants and isolate varieties!

Inbreeding depression is when there is insufficient genetic material available to carry on the traits typical of the plant. Each plant type will require a minimum number of plants nearby to open-pollinate with. Refer to the chart on the right for recommended number of plants you will need to reduce inbreeding and maintain high genetic variability.

Mating Systems on a Spectrum

Inbreeders - self-pollinators

Outbreeders

Recommended Isolation Distances

3 m 6 m 150 m 500 m 1.5-3.2 km
5-10 ft. 20 ft. 500 ft. 1600 ft 3200 ft 1-2 miles



Peas Lettuce Tomato Pepper Squash Brassicas Umbels Amaranths Corn

3-5 plants
acceptable

12 plants
minimum

60 plants
minimum

200 plants
minimum

Recommended Population Size

suggested number of plants needed to prevent inbreeding depression.

Courtesy of Michelle Smith

Isolation Distances

To preserve the varietal purity of “true to type seed” make sure that you isolate varieties of the same species from each other. The chart above indicates the isolation distance required when you plant similar varieties in your garden. Note the increase in isolation distances needed between plants that are insect pollinated (squash) and those plants that are wind pollinated (corn). The more diverse your garden-scape, the more insects you will have available to pollinate, and so you may have to increase your isolation distances. Barriers such as fences, hedges, and trees, can reduce the distances needed.

7. What seeds are easiest to save? Self-pollinators!

Peas and beans self-pollinate. You should still have an isolation distance of 4 meters between varieties to increase your success in producing a “true-to-type” seed.

Peas like a cooler season, and beans are adapted for warmer weather. Select, and then mark, at least 6 of the healthiest plants to save seeds from - that is the minimum needed to prevent inbreeding depression.

Peas and beans need to remain on the plant until they are “rattle dry”. Seeds should be very hard before they are picked. Collect seeds before the pods break open. Be sure to continue to air dry the seeds for two weeks before you package them.

Family Fabaceae



Lettuce is also an easy plant to save seeds from. Lettuce is similar to dandelion - both belong to the Family Asteraceae.

Lettuce likes cool weather, and as the summer weather warms the plant will bolt, sending up a flower stalk. Grow at least 5 plants for seed saving purposes. A few weeks after the plant bolts, the billowy tufts of seed pods will be ready for harvesting.

Separate the seeds from the chaff, and air dry for three days. Label and store.

Since lettuce has a dandelion-like seed, expect that some of the seed might blow away and replant itself nearby!

Family Asteraceae



Tomato belongs to the Family Solanaceae. The fruit is produced after the flower is pollinated, usually by its own anther (self-pollination). Tomato plants can (rarely) be pollinated by insects.

Shaking the flowers mimics the motion of wind and insects and helps direct pollen onto the female stigma and then downwards into the ovaries.

Tomatoes produce a gel-coated seed. This coating helps the seed maintain dormancy. Remove the gel coating by fermenting the seeds for a couple of days. Dry them well before storing.

For seed saving grow at least five plants near each other to prevent inbreeding depression.

Family Solanaceae



...now the cross-pollinators

Squash are monoecious, and are cross-pollinators. The pollen is transferred from the male flower to the female flower which has an embryonic fruit at the base.

Squash depend on insects to move the pollen around. Squash bees have co-evolved to pollinate squash plants. If bees are in short supply, squash can also be hand-pollinated.

If you are growing squash varieties of the same species, it is recommended that you isolate them by 400 meters to prevent cross-pollination.

Squash plants selected for seeds need to over-ripen in the field, and then further ripen inside for another three weeks. Dry seeds well.

Family Cucurbitaceae



Carrots are biennial plants - they produce their seed head after the carrot is replanted in the second year after a period of vernalization (cold period). This cold dormancy period is needed to trigger the flower head and go to seed. Maybe you left some carrots in your garden over the winter to find a tall umbel flower in your garden - that is the seed head growing in the second year.

Sow between 80 and 100 plants for seed saving. Before removing the seed, dry the plants well. Separate the seed from the chaff.

Carrots will cross-pollinate with the surrounding Queen Anne's Lace (a wild carrot variety). Both are *Daucus carota*. Provide a one mile isolation distance.

Family Apiaceae



Spinach are dioecious - they have separate male plants with male flowers and female plants with female flowers. They are wind pollinated, and require isolation distances between varieties of up to 3 miles.

Spinach are a cold-hardy plant, and can be grown in early spring and later in the fall.

Spinach is a day-length sensitive species, and requires long days to produce the flowers. Flowers can come on rapidly after the plant bolts.

Once the female plants turn yellow, pull them up and dry them. The seeds should have turned brown and be completely dry before storage.

Family Amaranthaceae



8. What about harvesting and storing seeds?

Seeds are alive, and they will germinate if they are warm, moist and exposed to light. To store them, create the opposite environment. Put them in a cool, dark, dry location and this will keep them dormant.

For seed saving, pick healthy plants without signs of pests or diseases. Keep notes on how the plant reacts to weather extremes, or factors such as poor fertilizer, or soil drainage. Plants that survive extremes will carry forth those traits to the next generation.

Research exactly how to harvest the seeds from each type of plant so you know what to expect. In general, allow seeds to mature past the DTM. Don't take seeds from rotten fruits or vegetables.

Once you have harvested your seeds, you must winnow them (blow a current of air through them) to remove the chaff and debris that could bring in diseases and pests. This also helps your seeds dry out faster.

If a seed is a gel-coated seed, you must ferment them for three days to remove

the coating. The gel is nature's way to keep the seed dormant, so it must be removed so the seed can dry out. Gel-coated seeds includes tomato seeds, and some from the squash family.

It is very important to make sure your seeds are dry. It is a good idea to leave seeds to air dry for up to two weeks before packaging. Add a package of silica gel or other desiccant products to your storage jars or envelopes. This will remove any residual moisture.

You can store dry seeds in a sealed container in the refrigerator. Well dried seeds can also be stored in the freezer. Check what is needed for each type of seed you are saving.

Label your seeds with the genus, species, variety, date, generation, hardy or interesting traits you notice, and other information to keep track of how, where and when the plant was grown.

Richmond Grows Seed Lending Library

Common name: _____

Scientific name: _____

Variety: _____

Grower's name: _____

Location of harvest: _____

Year: _____ Days to maturity: _____

Notes: _____

Difficulty of seed to save:

Easy Difficult Hand-pollinate

Seeds saved from _____ (Qty.) plants.

Thank you for saving seeds!

Please return some at the end of the season.

RichmondGrowsSeeds.org

9. What do I need to know about gardening in a warming climate?

It is now undeniable that our climate is warming and the cycles of the seasons are changing - can our gardening practices adapt? As average temperatures climb and weather events become more unpredictable, it is important to monitor your garden for heat stress, drought, earlier blooming, invasive species of plants and pests, and soil health. We can adapt to climate change - it all starts with healthy seeds, good garden planning and a bit of luck! Here are some ideas that will help your garden cope with a warmer and dryer climate. Be sure to get involved in your local seed saving community - check out The Foodshed Project to find out more!

1. Use Heritage/Heirloom Seeds

Purchase open-pollinated seeds non-GMO seeds. Research rare varieties that you can help save from extinction. Select seeds that will mature in your region - how long is your growing season and how does that compare with the DTM (days to maturity)? Many varieties are "short season", and take less DTM's. Look for other traits such as drought and heat resilience. By saving and sharing your own seeds you can help protect rare varieties and enhance locally adapted seed stocks. **Share your seeds with family and friends and with your community at seed exchange events and seed libraries.**

2. Core Gardening

Core gardening is a new way to garden that conserves water and enhances soil health. Basically, it involves layering a row of partially composted straw a few

inches down in the middle of your raised bed. As the straw absorbs rainfall, it wicks out the moisture to drier parts of the raised bed. As the straw breaks down it provides organic matter to the soil, and is a substrate for beneficial fungi and microbes. Remember that straw is different than hay, and does not contain seeds. Also, check out Hugelkultur gardening, which uses untreated waste wood to achieve similar effects.

3. Mulching and Composting

Mulching the top of your growing bed with straw, grass clippings, leaves, or wood chips, reduces water evaporation and keeps the soil cooler. You can also grow a living mulch, and grow your garden plants close together to provide a canopy to help keep soil cooler during the heat of the summer.

4. Integrated Pest Management (IPM)

IPM is a way of managing your garden to keep your crops and soil healthy. For instance, make sure you monitor your garden for pests and diseases. Take appropriate action before the problem gets too serious.

5. Companion Planting

Planting your garden with a wide diversity of plants will help deter plant-specific pests and diseases. Utilize plants that like it to be a little cooler to fill in the spaces between larger plants. Herbs, such as basil, also act to deter some pests, and reduce the transfer of diseases from plant to plant.

10. More links and references...

Seed Saving Organizations

Seeds of Diversity (SOD)

SOD is a Canadian charity. They provide a member-to-member seed exchange and a seed directory of where available heirloom seeds can be purchased. You can also sponsor a seed variety with their “adopt a seed” program. You can contact them to purchase their comprehensive publications on seed saving, such as “The Handbook on Home Seed Production”. Visit the SOD website to find out where local seed exchanges are happening throughout Canada.

Seeds Savers Exchange

[Seeds Savers Exchange](#)

The Seed Savers Exchange is an American charity. They manage a seed storage program and provide a forum for gardeners to be involved in a seed exchanges. They also provide seed saving education for gardeners on Youtube and through their website.

Scatterseed Project

[Scatterseed Project](#)

The Scatterseed Project is an American charity. It collects, maintains, and distributes rare or endangered crop varieties. Part of their mandate is to ensure that seeds are available to the general public, and not simply locked away in a seed vault.

Seed: The Untold Story

Seed: The Untold Story is a documentary that reviews the current status of seed diversity, as well as many of the organizations that are active in saving seed diversity world-wide. You can download the movie for viewing, or purchase on a DVD.

Certified Organic Seeds

Greta’s Organic Gardens

[Greta’s Organic Gardens](#)

Hawthorne Farms

[Hawthorne Farms](#)

Heritage Harvest Seeds

[Heritage Harvest Seeds](#)

Open Seed Vault

[Open Vault Seed](#)

Salt Spring Seeds

[Salt Spring Seeds](#)

Urban Harvest

[Urban Harvest](#)

Seed Saving Publications

Carol Deppe

[Breed Your Own Vegetable Varieties](#)

Storey Basics

[Save Your Own Vegetable Seeds](#)

Dr. John Navazio

[Organic Seed Grower](#)

Organic Certification Programs

Canadian Organic Growers

[CAN Organic Growers](#)

News Articles

Canadian Broadcasting Corporation

United Nations

The Conversation

Now you know...

1. Seeds and most of our staple foods co-evolved with wild stocks from nature and as a part of human culture over the last 10,000 years. Plants were selected for traits such as heat, drought, and disease tolerances.
2. In the last 100 years, seed corporations have amalgamated to control 90% of the world's seed supply. During that span of time, heirloom seed diversity has been decimated to 25% of the original varieties.
3. Climate change will put stress on all the systems that are needed to grow food, including seed, soil and water resources.
4. Industrial monoculture may not be prepared to adapt to global warming because hybrid seeds have low genetic variability.
5. Seeds from heirloom plants carry a wide variety of genetic variability, and are more adaptable to environmental stresses. Select plants for seed saving that are tolerant to extreme growing conditions.
6. Varieties of the same species can cross-pollinate. Isolation distances are required to prevent cross-breeding.
7. Supporting open-pollinated and rare and endangered heirloom varieties will help ensure future genetic resiliency.
8. Protection is needed for wild bees to ensure there are sufficient stocks to pollinate home, market gardens, and farms.
9. Hybrid seeds are bred for specific traits from two separate varieties or are genetically modified from another species. Plants grown from hybrid seeds will produce seeds that are either sterile seeds, or will not grow 'seed true to type'.
10. You can continue to breed any heirloom variety to local conditions, so regional breeding and seed saving projects can help stem the loss of seed biodiversity.