

## Seed processing Tips

### Basil

#### *Ocimum basilicum*

Basil relies on insects for pollination, but can be reliably isolated by as little as 150 feet since most of the pollinating insects are small and don't travel far. **Different basil varieties will cross each other.**

Harvest seed heads as they dry and allow to finish drying in a warm, dry spot. Seeds are easily removed by crumbling the dried flower heads and then blowing away the chaff. You can practice over a plastic sheet at first until you get the hang of it.

**Plants cut back after harvest will grow another set of leaves for harvest—and even produce seeds again**—if your season is long and hot. A branch or two of each plant can easily be left to go to seed while collecting leaves for cooking with from the rest of the plant.

**Basil seeds will last up to 5 years** if properly stored.

### Beans

#### *Phaseolus spp.*

Beans are self-pollinated, and **different bean varieties do not commonly cross-pollinate** each other. Similarly colored varieties should be separated by enough distance to keep the vines from intertwining, to make them easy to distinguish at harvest. Allow pods to dry on the vines before picking and shelling, then finish drying the beans in a dry spot.

If you're eating your beans green, allow just one or two pods per plant to remain and mature for seed... **too many pods maturing on an individual plant will cause it to stop setting more beans** and concentrate on maturing the ones it has.

Pick beans for seed after the pods are ripe and have dried on the plants. Don't allow dried pods to get rained on as the beans may quickly mildew or sprout in their pods. When very dry many pods will split on their own to drop their seeds; the rest can be easily crumbled in the hands and the finer chaff blown away after removing the big pieces. Finish drying the beans in a dry spot indoors or under cover.

**Bean seeds, properly dried and stored, will keep for 4 years.**

### Cabbage Family

#### *Brassicaceae*

Mostly self-infertile, bee-pollinated **members of the Cabbage Family (*Brassicaceae*) require up to a mile for distance isolation.** Members of the same species in the Cabbage Family will cross-pollinate, which presents a problem in species with many members. For instance collards, broccoli, Brussels sprouts, cauliflower, cabbage, kohlrabi and kale (except Siberian kale) are all *Brassica oleracea* and will cross each other. *Brassica rapa* includes all the turnips, Chinese mustards and Chinese cabbages. Different species within the Cabbage Family will not cross.

**Brassicas are mostly biennial**—they grow and mature in the first season, then over-winter before setting seed in spring of their second year. In colder areas where *Brassicas* don't make it through the winter (they're very hardy), they can be over-wintered in pots in the greenhouse and then transplanted into the garden in early spring to flower and produce seeds.

Since **most *Brassica* seeds remain viable for four or more years**, four varieties of a single species can be grown at a time and seed stocks maintained if only one variety is allowed to flower and set seed each year. Alternate-day caging is another option for isolating two or three crossable varieties at a time (the cages must be removed periodically to allow bees to pollinate the flowers. *Brassica* seeds will not continue to ripen after harvesting, so **allow them to mature and dry completely before removing them from the parent plants**—but don't tarry, either. In many *Brassicas* the seed pods shatter and release their seeds just days after they have matured and dried, especially in hot, dry weather.

## Cauliflower

### *Brassica oleracea*

Insect-pollinated, biennial **cauliflower will cross other members of *B. oleracea*** and needs 1 mile for safe distance isolation. Cauliflower plants are mostly self-infertile, and should be planted in groups of 10 or more plants for continuing viability.

Since cauliflower heads don't resprout after harvesting, try one of two ways to get seeds. By cutting carefully, you can **leave a branch or two of cauliflower head on the plant to heal and flower in the spring**. Probably more reliable would be planting a separate planting just for the seed—these plants would need half or less of the usual amount of room, water and nutrients, as small heads from 10+ plants would still produce plenty of seeds.

**Pick seed pods promptly after—not before—they fully mature and dry on the plants.** They won't ripen further after the plants are picked.

**Cauliflower seeds will last up to 5 years** if properly stored.

## Corn

### *Zea mays*

Wind-pollinated **corn requires up to a mile for safe isolation** in exposed areas. Exact isolation distances will depend on neighboring growers and wind patterns, windbreak protection, etc. (corn pollen is relatively heavy and falls to the ground quickly under quiet conditions).

**Instead of distance, "time isolation" can also be used**—plant a first, faster-maturing corn crop early enough so that its ears have been pollinated, and their silks dried, before a second, later-maturing crop's tassels have begun to shed pollen.

Corn is not self-pollinating—pollen must be carried by the wind from tassels of one plant to silks of another for pollination to occur. Seeds which do not get pollinated will not form kernels. For this reason **it is important for good pollination to plant corn in blocks instead of in a single long row**.

**Allow corn ears to mature and dry on the stalks, but harvest as soon as the ears are dry** to keep them from getting rained on or the kernels may rot or sprout. Watch also for ants attacking kernels. Let corn kernels continue to dry thoroughly on the cobs (with husks shucked) in a protected spot. After the kernels are thoroughly dry, rub them off the ears with your hands.

**Be sure to harvest seeds from at least 100 plants** to keep your seed population strong from year to year.

**Sweet corn seeds remain viable for up to 3 years** when properly stored; starchier dent, popcorn and flint corns can remain viable for 5 or more years.

## Cucumbers

### *Cucumis sativus*

**Cucumber varieties will cross each other** (except Armenian cucumbers, which are actually *C. melo*) and should be isolated by ½ mile for reliable distance isolation between varieties.

**Cucumbers should be left on the vine to ripen to well past the eating stage** before being harvested for seed, and then aged another 20 days *in the cuke* before the seeds are removed and cleaned.

**Cucumber seeds are long lasting and may remain viable for as long as 10 years** under good conditions.



## Eggplant

*Solanum melongena*

**Self-pollinating Eggplants can be safely isolated by 50 feet of separation.**

**Eggplants should be left on the plants until well past the eating stage before harvesting for seed.**

The eggplants will have gone past their normal, ripe color and become translucent and dry (usually a dull, unattractive whitish, yellowish, or brownish color).

It's a good idea to **keep eggplants off the ground during ripening, since they may begin to rot** when they rest on the ground. Clean seeds according to the wet-cleaning process outlined in [Cleaning Wet Seeds](#).

**Long-lasting eggplant seeds will remain viable for 5 or more years** if properly stored.

## Lettuce

*Lactuca sativa*

**Lettuce is self-pollinating, but plants can cross under some circumstances. 25 feet of separation is generally sufficient to prevent crossing, however.**

While each flower opens only during the morning of one day, the flowering period is long and there are almost always flowers blooming on the plants. This means that **a flowering plant will have flowers and seeds in all stages of maturity.**

Gather dried seed heads (they are easy to recognize) every couple or three days as they ripen and dry, or **wait until most seed heads have dried and hang the plant upside down** over a tarp or in a paper bag (harvest dry seeds if rains threaten).

**Lettuce seeds can remain viable for 3 years** if properly stored.

## Pea, Garden and Snow

*Pisum sativum*

**Self-pollinating peas do not readily cross**—varieties separated by 50 feet are reasonably safe from crossing. For even greater certainty for preservation purposes, they can be bagged or caged.

Allow pods to reach full size before harvesting the seeds—**ideally, pick pods after they have dried on the vines. Peas are susceptible to mold if wetted after drying, however.** If peas have reached full size, they can be harvested before they are dry if rains threaten. After the pods are completely dry, they crumble easily to release the seeds.

**Pea seeds remain viable for 2 years** if stored properly.

## Peppers

*Capsicum spp.*

Self- or insect-pollinated, **pepper varieties of the same species will cross-pollinate.** There is no crossing between varieties of different species, however. You can safely grow one hot or sweet pepper (*C. annuum*) and one Tabasco pepper (*C. frutescens*) without danger of their crossing.

Peppers within the same species can be safely isolated by 500 feet of separation, or they can be caged since the plants are not overly large. **Allow peppers to ripen and dry fully on the plants before harvesting the pods.** Wash your hands thoroughly with soapy water after harvesting hot pepper seeds, since the residues will burn eyes and lips for some time after contact!

**Pepper seeds will keep for 2 or 3 years** if properly stored.

## Tomatoes

### *Lycopersicon lycopersicum*

**Almost all modern tomatoes can be safely grown without isolation and will not cross**—'currant' tomatoes (such as Cherry Tomatoes), and 'potato-leafed' tomatoes (such as Brandywine) are possible exceptions and may cross other currant or potato-leaf varieties. Grow as many standard tomatoes as desired, but grow only one currant tomato or one potato-leaf tomato at a time to ensure purity (or cage them, or separate varieties by 500 feet). Currant and potato-leaf tomatoes will not usually cross with common tomato varieties.

It's best to **not plant all a valuable variety's seeds in one season until you are sure it doesn't cross with any other varieties you grow.**

Allow tomatoes to ripen thoroughly on their vines to *at least* the eating stage before harvesting them to collect their seeds. Upon harvesting, **tomato seeds are best fermented in order to remove a germination-inhibiting gel which covers the seeds, and to kill diseases.** In nature, fermentation of fallen ripe fruits removes this gel, and this process is imitated when preparing tomato seeds. See [Fermenting Seeds](#) and follow the directions.

**If fermenting tomato seeds seems too much trouble, they will still germinate if the slippery gel surrounding the seeds is carefully rubbed off while you're cleaning them.** Seeds treated this way will germinate, but they will not have had the protection of the fermentation process killing disease organisms. If you noticed any problems with your plants (leaves spotting or dying, inexplicable wilting, etc.), the extra trouble of fermentation will be well worth the effort.

**Dry your tomato seeds on a piece of glass or a shiny plate**—the wet seeds will stick to paper and be difficult to remove without damaging them.

**Tomato seeds will store safely for 4 or more years** after being properly dried and stored.

## Vegetable Seed Saving Handbook

<http://howtosaveseeds.com/index.php>



## Wet or Dry Seeds?

### Cleaning Dry Seeds

**Harvest dry seeds from their plants when their pods or husks have dried.** Some seeds can be picked before they are fully dried on the plants if rains threaten. Other plants, however, (i.e., *Mustard family*), will not finish ripening once they have been removed from the plant. Leaving seeds on the parent plant to full maturity and dryness is always preferable.

**Once pods or husks have been harvested, store them in a dry place and wait until they are thoroughly dry.** When the pods or husks are dry enough they will easily crumble between your hands. Crumble the pods or husks until all the seeds are released. Then place seeds and chaff in a bowl or box and swirl or shake gently. Most of the larger chaff pieces will rise to the top and can simply be removed by hand.

**Seeds and finer chaff are easy to separate** by a variety of methods. One way is to use two screens of varying mesh, one a little smaller than the seeds and the other a little larger. The first screen lets anything smaller than the seeds fall through, and the second lets the seeds through and stops anything larger.

**Another method of separating seeds and chaff is to roll seeds down a gently sloping board,** leaving chaff stranded near the top of the board. This simple method works well with round seeds, but is basically useless for flat seeds such as squashes.

**A very ancient method of cleaning seeds is called 'winnowing.'** In a gentle wind, drop the seed/chaff mixture from a height of several feet into a bucket or onto a sheet or tarp. With a little skill and some cooperation from the wind (a fan in an enclosed space can be used for better control), seeds will fall into the bucket or onto the tarp while chaff blows away to one side.

**Another, very simple way to winnow small quantities of seeds is to swirl or gently bounce the seeds and their chaff in a shallow bowl while carefully blowing chaff away with your breath.** It's a good idea to do this over a cloth or newspaper to catch seeds blown out of the bowl with the chaff. These can then be hand-cleaned or planted.

### Cleaning Wet Seeds

**Wet seeds are easy to clean, though some need the additional step of fermentation.** Seeds which require fermentation should be cleaned *after*—not *before*—fermenting.

**Allow the fruits to fully mature on their plants before harvesting.** See Seed Saving Instructions for Common Vegetables for details on how to judge when seeds have fully matured for particular varieties—in many, the fruits will be well past the eating stage.

To clean wet seeds, scoop the seeds from the fruit, pulp and all. Pour the seeds and pulp into a large, sloping bowl and add water. **Healthy seeds will sink to the bottom of the bowl, while dead seeds and most of the pulp will float.** Use your fingers to gently separate all the seeds from the pulp.

Then, **to remove the pulp and dead seeds, carefully pour the extra water with the floating pulp and dead seeds from the bowl.** Pour quickly enough for dead seeds and pulp to pour off the top, and slowly enough so that the heavier, good seeds remain safely on the bottom. By repeating this rinsing and pouring process several times, the seeds can be gotten very clean (getting seeds as clean as possible helps to keep them from sticking to whatever surface you dry them on).

### Drying Wet Seeds After Cleaning

To initially dry your seeds after cleaning, drain them of excess moisture in a strainer. Pat the bottom of the strainer with a cloth towel to pull extra water from the seeds after they have drained. Then **spread the**



seeds on a piece of glass or a shiny ceramic plate to dry (they will stick to paper, even waxed paper). Place the glass or ceramic plate in a cool, dry shady spot for several days.

After the seeds are dry, they can be carefully removed from the glass or plate and final-dried before being stored in jars.

## **Treating Seeds for Viability and Disease Control**

Seeds can transmit diseases from parent plants to succeeding generations, lowering their productivity and even completely preventing them from producing. Simple treatments exist, however, for controlling many seed-borne diseases. Two such treatments available to home gardeners include *fermentation* and *hot water baths*, both used on wet seeds.

### ***Why Ferment Some Seeds?***

**Fermenting some wet seeds can dramatically improve their ability to sprout.** Fermentation removes germination-inhibiting substances from seed coats, makes them more permeable to water, and also helps reduce or control seed-borne diseases (for healthier seedlings).

Purposely **fermenting wet seeds mimics the natural process of fermentation** that occurs when ripe fruits are eaten by animals or drop to the ground and rot. When we intervene to keep seeds from fermenting naturally, it becomes necessary to ferment them artificially so they can complete their natural ripening cycle.

**Fermentation is needed for tomato seeds (in order to remove a germination-inhibiting gel), and can also benefit Squash Family and eggplant seeds**, though more care must be taken with these to avoid premature sprouting. Ferment Squash Family seeds for only a day-and-a-half or so, eggplants a little longer.

### ***How to Ferment Seeds***

To prepare seeds for fermenting, **simply squeeze or scoop the seeds—together with the pulp that surrounds them—into a jar with a little water** (about half as much water as seeds and pulp). There is no need to include more pulp than naturally comes with the seeds. Store this seed/pulp mixture in a warm place (75 to 85° F) for 1½ to 5 days (depending on the seed type and whether conditions are warmer or cooler).

**Fermentation will be evidenced by bubbling and/or by the formation of a white mold on the surface of the mixture.** As soon as the bubbling or mold have been evident for a day or so, pour the mix into a bowl and clean according to the directions given earlier in the section cleaning wet seeds.

Watch closely, as **seeds left fermenting too long (especially above 80° F or so) may germinate**, ruining their chances for storage. Once the seeds start to 'imbibe' or swell due to taking on water, they will have begun their internal process of germination... by the time their tiny roots have begun to emerge, it is far too late to try and dry them for storage. Sprouted seeds can be planted immediately and grown out (depending on season), but they will die if they are dried out for storage once they have begun to germinate.

**Experience will tell you how long you can ferment seeds under your conditions before they begin to sprout.** Eggplant and squash seeds germinate more readily than tomatoes, so they should only be fermented for a couple days or so. Squash seeds, particularly, are quick to germinate—sometimes even sprouting in well-ripened squashes while they are still on the vine!

**It's not required to ferment squash or eggplant seeds, though it increases their germination rates and kills some seed-borne diseases.** In general, when temperatures are kept between 75 and 80° F or so, fermenting is safe and beneficial and will be safely completed before seeds begin the process of germination.



## Hot Water Baths

Another way to control some seed-borne diseases is to treat seeds for a short time in a hot water bath at high enough temperatures to kill disease pathogens (about 125° F). Treatment times and temperatures are specific to each species, and both must be precisely controlled in order for the treatment to be effective without killing the seeds. For more information, see Suzanne Ashworth's **Seed to Seed**.

## Preparing Your Seeds for Storage is Important

How you prepare and store your seeds can be as important to their eventual viability as how they were grown. Seeds must be carefully dried and then stored under the proper conditions in order to give them the best chances of germinating and producing healthy plants when they are planted. Luckily, all the needs of seeds are easily provided once you are aware of their requirements.

## Avoiding Problems with Stored Seeds

### *Mold and Mildew*

A common problem with stored seeds is mold or mildew resulting from incomplete drying before storage. Dry your seeds thoroughly before storing them (though drying them to 0% moisture will of course cause their death). If seeds sweat on insides of jars during storage, they are too wet and must be dried further in order to store successfully. At this point the use of a desiccant is a good idea. Don't tarry, because damp seeds will mildew quickly.

### *Temperature and Moisture Fluctuations*

Fluctuation in temperature or moisture levels of stored seeds lowers the seeds' longevity significantly, causing loss of viability and vigor or even seed death. Rapid moisture fluctuations are particularly damaging to seeds. High moisture or temperatures encourage mutation of seed tissues—especially in root tips, which remain more active than other seed tissues. Cellular mutations affecting metabolism or root tissue structure are a common cause of seed failure upon germination.

Dry your seeds properly before placing them in cold storage. **Keep your stored seeds at a constant temperature if possible and remove them from storage as seldom and as few times as possible.** When seeds are removed from cold storage in order to retrieve samples, allow the entire container to come slowly to room temperature before opening the seal. This will help prevent condensation of atmospheric moisture onto the cold seeds which might otherwise occur.

### *Insects*

Another common problem with stored seeds is infestation by weevils or other insects. In fact, it is best to assume that some insects are present in any sample of seeds. Seeds kept in frozen storage are safe from insect damage, since—though insects may survive the freezing—they will be rendered inactive while frozen by the low temperature. Even if your seeds will be stored frozen, however, it doesn't hurt to take precautionary measures against insects.

**Insect infestations may be guarded against by the addition of a little diatomaceous earth (D.E.—available at organic gardening stores) to the stored seeds in their jars.** Add just enough D.E. to cover the surfaces of the seeds (add a few pinches to the seeds in a bowl and gently stir to thoroughly cover each seed). Adding D.E. to jars of stored seeds helps insure the long-term safety of your seed stocks and is an inexpensive, safe, non-toxic and wise precaution.