Saving Your Own Vegetable Seeds

ECHO Inc.

In my travels to impoverished countries, one of the problems most frequently mentioned by development workers is that farmers and gardeners face great uncertainty about vegetable seed supply. There may be plenty of seed for a particular vegetable, but not for the varieties the people like and know will thrive. Seed saving would be surprisingly easy with some vegetables, possible but somewhat difficult for others, and almost impossible for still other vegetable crops. It would help to know what the issues are; some basic techniques for seed saving; and which vegetables are easy and which are more difficult.

The July 2006 issue of the Avant Gardener Newsletter had an excellent summary of these very points. The following copyrighted article is adapted for ECHO's network with the generous permission of Avant Gardener. The purpose of their article was to encourage gardeners in the USA to save seed in order to have the varieties they like that are not commercially available. To subscribe to Avant Gardener (US$24, US$30 outside the USA) write them at Box 489, New York, NY 100028.

In EDN 86 (January 2005), we wrote about extending the life of seeds by storing them underground in a sealed PVC pipe. In a future issue of EDN we hope to share more low-cost ideas for storing seeds in areas where there is no electricity or refrigeration. We would like to hear of successful seed-saving techniques you may have seen. Martin Price

Heirloom Plants. To lose or throw away something valuable from the past is foolish, and what is lost may be irreplaceable.

The word "new" has great allure, for it seems to promise something better. In the case of plants, a new introduction is usually superior in one or perhaps a few respects to what has been grown. However, achieving bigger flowers, higher yields or improved disease resistance has too often meant sacrificing other qualities such as flavor, fragrance, or regional adaptability.

In extreme instances, "lost" genes can bring disaster. Dependence on one or a few hybrids can leave a crop vulnerable to catastrophe. In 1970 almost 50% of the maize crop in the southern part of the USA was destroyed by a blight for which the plants had no natural resistance. In 1984, a bacterial disease resulted in destruction of 18 million citrus trees.

Loss of genetic diversity, i.e. the diminishing of the gene pool as older non-hybrid varieties disappear, is an on-going world crisis. Much of the problem is due to consolidation in the seed industry as larger companies buy out smaller companies. A leading research group estimated in 2005 that just ten companies now control

49% of the global seed market. These companies concentrate on selling only their newest hybrids. A study by the FAO has found that 81% of tomato cultivars and 91% of field corn cultivars have been lost in the last century in the USA, and 9,000 wheat cultivars have disappeared in China in the last 50 years.

The Home Seedbank. With so many incentives for growing and multiplying old-time plants, more and more gardeners are learning to save seed. Actually, they are returning to a practice that was once considered as basic to gardening as planting or harvesting.

The principles of seed saving are simple, but carrying them out with a variety of plants can be challenging. The first rule is an important one. Open-pollinated plants are of two types, self- and cross-pollinating. Self-pollinators can be planted anywhere, but a plant that will cross with another variety of its species must be grown either one variety alone or with varieties isolated from each other. [Editor: Many gardening books and web articles tell how far apart cross-pollinating species must be separated. I entered "isolation distance" and "carrot" into Google (a web search engine) and immediately had several articles with carrot isolation distances. If you cannot find information for a particular plant (and if you work in community development) write to ECHO and we will see if we can find the information you need.]

Next to seed purity, you will have to maintain something called genetic vigor. Genetic traits may be concentrated in one plant in "inbreeders" such as tomatoes, or spread over many plants in genetically diverse "outbreeders" like corn. In the former (self-pollinating) plants, 6 to 10 plants are generally considered enough to maintain a broad genetic representation.

With more genetically diverse outbreeders (cross-pollinators), seed for much larger numbers—a minimum of 200 corn plants, for example—is advised to ensure a complete genetic picture.

This is not important if you are saving seed only for your own use—provided you collect seed only from plants that exhibit the vigor, flowering or resistance characteristics you want to preserve. But where the seed is to be exchanged or sold, the minimums should be observed to lessen the chances of undesirable genes "weakening" the plants. [Editor: Though the seeds you select are from plants that do well on YOUR land, at another location with different soils, pests and climates the crop might require some genes that were unimportant in your location and so may not have been included in the seed you selected for propagation.]

For most cross-pollinating plants, mixing seed from 20 to 30 plants can be considered a good average minimum. If space is lacking for this many plants, cooperative growing of small numbers of the same variety by friends or neighbors can supply enough seeds.

Seed must be properly dry before storing it. Its moisture content must be no more than 5-8%. Lacking equipment to measure this, here are two simple methods: either strike a seed with a hammer (if it shatters rather than squashes, it is dry enough) or fold it (it should break cleanly rather than bend).

Collecting and Storing Seeds. Lettuce, carrots, parsley and a few others carry their seeds in the open, so it is easy to collect them as they dry by placing a paper bag over the seed head and shaking and rubbing. Chaff is blown away by pouring the seeds from one bowl to another in a light breeze or with a fan. Seeds that are encased in pods (beans, peas, okra, broccoli) are collected when the pods are dry and brittle. Crushing the pods in a bucket or bowl allows the chaff to be blown away easily.

Seeds that form in fruits (tomatoes, cucumbers, eggplants, peppers, melons, squashes) are coated with a gel that must be washed or fermented away before the seed is stored. It is common practice to place seeds squeezed or scraped from fully ripe tomatoes in a container with water, stirring daily, until a moldy fermented gel mass forms on the surface. This is poured off and the seeds which have sunk to the bottom are rinsed several times and dried on a plate or mesh screen, being stirred occasionally. [Editor: This is not surprising when you consider that the normal experience of a tomato seed is to sit in rotting fruit for several days.]

Heat and moisture will quickly ruin seeds in storage. Properly dried seeds in paper or plastic envelopes or bags will store well in airtight jars with silica gel desiccant (something that will pull moisture from the air). If the jar is kept in the refrigerator, most seeds will remain viable for three to five years (an exception is onions, which keep for only one or two years). Put the container in the freezer, and seed life for many plants will be extended to ten years or more. When seed is removed from the refrigerator or freezer, it is wise to let the container stand unopened overnight so moisture won't condense on the cold seed.

Details for Saving Seed from Specific Kinds of Vegetables. The "integrity" of a batch of seeds rests on care in every operation from selection and harvesting to cleaning and storing. So says a veteran seed saver, and he and others provide tips for success with specific crops:

BEANS – Common beans are mainly self-pollinating, but lima beans and runner beans are cross-pollinated by insects. Varieties of these should be separated by at least a mile or the plants should be caged. For all beans, should wet or humid conditions at harvest time threaten to make the beans sprout or rot in the pods, it is best to remove them from pods for drying as soon as the pods start toughening and changing color.

BRASSICAS – With the exception of radishes and some leafy annual brassicas, many of the cole crops (cabbage, cauliflower, kohlrabi, brussels sprouts, etc.) are biennials. Not many gardeners choose them for seed-saving projects because the plants must be over wintered in the ground or indoors so they can be grown the second year when they go to seed. Harvesting their seed is easy but can take time, since the pods often dry in succession from the bottom to the top of the stalk. [Note that in climates that never have freezing temperatures, some of these species may never set seed.]

CORN – This is a less-than-ideal crop for the seed-saving gardener, because it is wind-pollinated and varieties therefore need to be separated by a mile or more. [Editor: If this is not possible, at least select seed from plants from the center of the field.] Alternatively, the ears can be hand-pollinated and bagged, but the large

number of plants needed to ensure genetic vigor makes this a demanding job. Seed is easily removed from the cobs by rubbing two ears together when both cob and seed are thoroughly dry.

CUCUMBERS – Insects cross-pollinate cucumbers, so varieties need separating by at least a half mile or must be hand pollinated. The fruits must be well past eating, soft and discolored, before harvesting the seed. One expert recommends picking these overripe fruits and letting them stand another three weeks before cutting them open and scraping out the seeds. Like tomatoes, cucumber seeds require fermenting to remove the gelatinous coating on them.

EGGPLANTS – Like cucumbers, eggplant seed is harvested from overripe fruits. Grating or mashing the pulp into a container of water and then squeezing it are necessary to release the seeds, which will drop to the bottom and then can be rinsed and dried.

LETTUCE – Although lettuce is largely self-pollinating, some crossing by insects can occur, so separation of varieties by 20 feet (6 meters) is advised. Seed can ripen over several weeks, and bagging the seed head and shaking it daily is the best collection method. A mesh screen that allows the seed to pass through but holds back the chaff is most efficient for cleaning the seed.

MELONS – The large seeds of all kinds of melons are easy to remove and clean as soon as the fruit is ready for eating. Except for watermelons, melons will cross with each other, so hand-pollinating is necessary if varieties cannot be separated by half a mile.

OKRA – The big and bright hibiscus-like flowers of okra attract many insects that can cross-pollinate these usually self-pollinating plants, so caging the plants or bagging the flowers is advisable if more than one variety is grown. Seed is easily removed by splitting the pods when they are completely dry.

PEAS – Peas are handled just like beans. Pods that are maturing in wet weather can be picked and spread in an airy place to complete drying.

PEPPERS – The plants are fairly small so it is simple to cover them with a mesh screen cage to prevent crossing if different varieties are growing within 500 feet (152 meters) of each other. The fruits must be fully ripe (brightly colored) to contain viable seeds, which are easily scraped out and dried in a bowl.

SQUASH AND PUMPKINS – These are a confusing group. They include several species, and there are often very different forms within the same species. So it is important to study them carefully to be sure that if you are growing two varieties of the same species they are isolated from each other or hand pollinated. Seed of all types is harvested when the skin of the fruit has turned very hard.

TOMATOES – The tomato is both one of the world's favorite garden crops and a favorite among beginning seed savers, being easy and nearly foolproof. The majority of tomatoes are self-pollinating. A major exception is the double flowered beefsteak types and even then their crossing rates are 5% or less; varieties of these should be

isolated by at least 15 feet (4.5 meters). Seed of all kinds of tomatoes should be "bulked" (collected and mixed) from three or more plants of a variety to get the fullest range of genes.

[Editor: When processing seeds that are wet (e.g. from fruits) you may notice that some seeds float while most settle to the bottom. The seeds that float are likely to be immature and should be discarded.]

Cite as:

ECHO Staff 2007. Saving Your Own Vegetable Seeds. *ECHO Development Notes* no. 94

© 2007 ECHO Inc.