



Seed For The Garden

Diane Relf, Extension Specialist, Horticulture

Alan McDaniel, Extension Specialist, Horticulture

Reviewed by David Close, Consumer Horticulture and Master Gardener Specialist, Virginia Tech

Choosing and purchasing vegetable seeds is one of the most enjoyable gardening pastimes. Thumbing through colorful catalogs and dreaming of the season's harvest is one way to make winter seem a little warmer. Seed purchased from a dependable seed company will provide a good start toward realizing that vision of bounty. Keep notes about the seeds you purchase - their germination qualities, vigor of plants, tendencies toward insects and disease, etc. From this information, you can determine whether one seed company is not meeting your needs, or whether the varieties you have chosen are unsuitable for your area or gardening style. For example, if powdery mildew is a big problem on squash family plants in your area, the next year, you may want to look for mildew-resistant varieties.

Saving seed

Saving your own vegetable seed is another pleasurable activity. It offers a sense of self-sufficiency and can save money. You can maintain a variety that is not available commercially, which helps to perpetuate a broad genetic base of plant materials. Breeders often search for old-time varieties when attempting to improve commercial plants, since the heirloom vegetables (as they are sometimes called) often have disease and pest resistance or cold hardiness. Participation in a seed-saver's exchange can be a rewarding experience. Extra seeds that you have may be traded for unusual types that are not available through other sources.

There are certain considerations to be kept in mind when saving seed. Seeds from hybrid varieties will not produce plants that are the same as the parent plants; therefore, only open-pollinated varieties should be used for home seed production. Some seed dealers have responded to the increasing interest in seed saving by clearly marking open-pollinated varieties in their catalogs. Another consideration in saving seed is the possibility of carrying seed-borne diseases into the next year's crop. Many commercially grown seeds are grown in dry areas unsuitable to fungal, viral, and bacterial diseases that may be present in your

region. Take care to control diseases that can be carried in seed. Another weather-related factor is the speed of drying of seeds, which can be adversely affected by frequent rains and/or humidity. Finally, if you've ever saved squash seed during a season in which you had more than one type of squash planted, you have probably seen the weird results that may be obtained from cross-pollination! Saving seeds from cross-pollinated crops is not generally recommended for the novice because of problems with selection, requirements for hand pollination and isolation, biennial habits, and genetic variability. Failure to let the seed mature adequately on the plant also leads to nonviable seed.

Common, self-pollinated, annual plants from which seed may be saved include lettuce, beans, peas, herbs, and tomatoes.

Beans and peas: Allow seed pods to turn brown on the plant. Harvest pods, dry for one to two weeks, shell, then store in a cool (below 50° F), dry environment in a paper bag.

Lettuce seed: Cut off seed stalks when fluffy in appearance, just before all the seeds are completely dried. Seeds will fall off the stalk and be lost if allowed to mature on the plant. Dry the harvested seed stalk further; shake seeds off; then store in a cool, dry environment in an envelope or small glass jar.

Herb seeds: Herbs vary in the way their seeds are produced. In general, allow herb seeds to stay on the plants until they are almost completely dry. Some seed heads, such as dill, will shatter and drop their seeds as soon as they are dry. Watch the early ripening seeds; if they tend to fall off, harvest the other seed heads before they get to that point, leaving several inches of stem attached. Hang several stems upside down, covered with a paper bag to catch falling seed, in a warm, dry place until the drying is complete. Remove seeds from the seed heads, and store in envelopes or small glass jars. Some herb seeds (dill, celery, anise, cumin, coriander, and others) are used for flavoring and are ready to use once dry.

Tomato seeds: Pick fruit from desirable plants when ripe. Cut fruit and squeeze out pulp into a container. Add a little water, then let ferment two to four days at room temperature, stirring occasionally. When seeds settle out, pour off pulp and spread seeds thinly to dry thoroughly. Store in an envelope or glass jar in a cool, dry place.

Saving purchased seed: Properly stored seed remains viable for different lengths of time depending on the type of seed. Be aware that seed companies may store seeds up to the number of years of their viability prior to selling them. To ensure maximum viability of purchased seed after its package has been opened, remaining seed should be sealed in air tight containers and stored in a cool, dark location. Glass jars with rubber seals, such as baby food jars or canning jars, or tightly sealed plastic bags stored inside jars are good choices. Be sure to label all stored seed with the species name and original package date. For all kinds of saved seeds, be sure to mark the storage containers clearly with permanent (preferably waterproof) ink, indicating the variety and date saved. Seeds will remain viable for some time if properly stored. To test for germination, sprout seeds between moist paper towels; if germination is low, either discard the seed or plant enough extra to give the desired number of plants. Excellent books are now available for more details.

Depth for planting vegetable seeds

The depth to cover seeds when you plant them depends on a number of factors, such as the size of the seed, the type of soil you have, and the season of the year.

As a general rule, vegetable and flower seeds should be covered about four to five times their lateral diameter or width (not their length). Most seeds should be planted from 1/4 to 1/2 inch deep. There are exceptions, however, so read the packet directions. Small seeds, such as celery, should be planted only 1/8 inch deep. Vine crops, sweet corn, and beans can be planted 1 inch or deeper. Some seeds require light for germination and should not be covered at all. These instructions apply to seeds planted both inside and out.

Starting seeds indoors

To start seeds indoors, it is important to have enough light. More homegrown seedlings are probably lost to this one factor than to any other. Vegetable seedlings grown under low-light conditions are likely to be leggy and weak, and many will fall over under their own weight after they are 3 to 4 inches tall. If you do not have a sunny room or back

Viability of Vegetable Seeds

(Average number of years seeds may be saved)

Vegetable	Years	Vegetable	Years
Asparagus	3	Leek	2
Bean	3	Lettuce	6
Beet	4	Muskmelon	5
Broccoli	3	Mustard	4
Brussels sprouts	4	Okra	2
Cabbage	4	Onion	1
Carrot	3	Parsley	1
Cauliflower	4	Parsnip	1
Celery	3	Pea	3
Chinese cabbage	3	Pepper	2
Collard	5	Pumpkin	4
Corn, sweet	2	Radish	5
Cress, water	5	Rutabaga	4
Cucumber	5	Spinach	3
Eggplant	4	Squash	4
Endive	5	Tomato	4
Kale	4	Turnip	4
Kohlrabi	3		

porch with a southern exposure, you will probably need supplemental lights. A simple, fluorescent, shop light with grow light bulbs will be sufficient as well as newer more energy efficient LED lighting. With any type of lighting, consider arranging the light source close to the plants with the ability to adjust the height as the plant grows.

It is probably easiest to use a soilless or peat-lite mix to start seedlings, since garden soil contains disease organisms that can be highly destructive to small plants. Soil can be sterilized in the oven by baking it at 200° F until the internal soil temperature is 180° F. It should be held at that temperature for 30 minutes. This is a smelly process, but it works. Garden soil for use in containers should be conditioned with compost and perlite to prevent excess moisture retention and/or shrinkage. You can mix your own peat-like mix if you prefer; 50% vermiculite and 50% fine sphagnum peat is excellent for starting seeds. Fertilizer at half the normal strength may be added to the mixture. Mix well before using.

Many types of containers can be used to start seeds. Flats or other large containers may be used; plant in rows, and grow seedlings until they have one or two sets of true leaves, then transplant into other containers for growing to the size to transplant outdoors. Seedlings may also be started in pots, old cans, cut-off milk cartons, margarine tubs, egg cartons, or other throwaways. The pop-out trays found at garden centers are easy to use and reusable after cleaning. Peat pots are nice, especially for large seeds. Sow one or two large seeds directly in each peat pot. Thin to one seedling per pot. Peat pots may be planted directly in the garden; do not allow the edges of the pot to stick out above the soil since they will act as a wick and moisture will evaporate from this exposed surface. Many seed starting kits are now available and provide everything you will need, but remember that these are used as part of a hobby and not as a way to save money instead of buying plants at a nursery.

Regardless of the type of container chosen, fill it three quarters full with seed-starting mixture and sow the seeds. Cover to the specified depth, and water the mix. It may help to cover the containers with plastic wrap to maintain a steadier moisture level. Seeds and seedlings are extremely sensitive to drying out. They should not be kept soaking wet, however, since this condition is conducive to damping-off, a fungus disease deadly to seedlings. Damping-off can be prevented or diminished by sprinkling milled sphagnum moss, which contains a natural fungicide, on top of the soil.

Another option is to use peat pellets or cubes, which are preformed and require no additional soil mix. The pellets or cubes are soaked until thoroughly wet, then seeds are

planted in the holes provided. The whole pellet or cube may then be planted without disturbing the roots. The only disadvantage to this method is the expense.

Starting seed outdoors

Many seeds may be sown directly in the garden. If garden soil is quite sandy or is mellow (with a high content of organic matter), seeds may be planted deeper. Young seedlings can emerge quite easily from a sandy or organic soil. If garden soil is heavy with a high silt and/or clay content, however, the seeds should be covered only two to three times their diameter. In such soils, it may be helpful to apply a band of sand, fine compost, or vermiculite, 4 inches wide and 1/4 inch thick, along the row after seeds are planted. This will help retain soil moisture and reduce crusting, making it easier for seedlings to push through the soil surface.

Plant Production Data Chart

From Crop	Days to Emergence Soil Temp. Seeding	Optimum Germination Grow Range (°F)	Number of Weeks to Transplants
Beans	5-10	65° - 85°	*
Beets	7-10	50° - 85°	*
Broccoli	3-10	50° - 85°	5-7
Cabbage	4-10	50° - 85°	5-7
Carrots	12-18	50° - 85°	*
Cauliflower	4-10	50° - 85°	5-7
Celery	9-21	50° - 65°	10-12
Chard, Swiss	7-10	65° - 85°	*
Corn, sweet	5-8	65° - 85°	*
Cucumber	6-10	65° - 85°	4 (peat pots)
Eggplant	6-10	65° - 85°	6-9
Lettuce	6-8	50° - 65°	3-5
Melons	6-8	65° - 85°	3-4 (peat pots)
Okra	7-10	65° - 85°	*
Onion	7-10	65° - 85°	8
Parsley	15-21	50° - 85°	8
Peas	6-10	50° - 65°	*
Pepper	9-14	65° - 85°	6-8
Potatoes, Sweet	(slips)	65° - 85°	5-6
Radish	3-6	50° - 65°	*
Spinach	7-12	50° - 65°	*
Squash	4-6	65° - 85°	3-4 (peat pots)
Tomato	6-12	65° - 85°	5-7
Turnip	4-8	50° - 65°	*

* transplants not recommended

Soil temperature has an effect on the speed of seed germination. In the spring, soil is often cold, and seeds of some plants will rot before they have a chance to sprout. The following chart gives optimum soil temperatures.

When planting the fall garden in midsummer, the soil will be warm and dry; therefore, cover the seeds six to eight times their diameter. They may need to be watered each day with a sprinkler or a sprinkling can to promote germination. Moisture can also be retained with shallow mulch or by covering the row with a board until the seeds have sprouted. Shading the area may be helpful to keep the soil cooler for seed germination, especially when planting cool-weather crops in summer. Seed that requires a lower germination temperature may benefit from being kept in the refrigerator for two weeks before planting or from pre-sprouting indoors. Pre-sprouting is a useful technique for planting in cold soils, as well. However, seed must be handled very carefully once sprouted to prevent damaging new root tissue.

Row planting

A string stretched between stakes will provide a guide for nice, straight rows, if desired. Use a hoe handle, a special furrow hoe, or a grub hoe to make a furrow of the appropriate depth for the seed being planted. Sow seed thinly; it may help to mix very small seed with coarse sand to distribute the seeds more evenly. Draw soil over the seed, removing stones and large clods. Firming soil so that it is in direct contact with seeds improves uptake of soil moisture by the seed, hastening germination. Water in the seeds. When plants have grown to 4 to 6 inches tall, thin according to seed packet instructions to provide adequate room for growth.

Wide row or banded planting

Many crops may be sown in wide rows or bands instead of in long, single rows. Crops of spinach, bean, pea, beet, lettuce, and carrot are especially suited to this type of culture. Sow seed evenly over the area, then rake it in, firming soil over the seeds. Thin young plants to allow room for growth.

Hill planting

Larger vegetables, such as melons, squash, sweet corn, and cucumbers, may be planted in hills or groups of seed. Soil is mounded to a foot or so in diameter, at the recommended spacing. Plant four to six seeds per hill, firming the soil well. Thin the seedlings to three to five plants per hill.

Transplants for the Garden

Most gardeners use transplants in the garden at some time or another to give long-season plants a chance to grow to maturity under their preferred weather conditions or just to lengthen the harvest season. Cool-season crops, such as head lettuce, broccoli, and celery, would not have a chance to reach their prime harvest stage in most places in Virginia in spring if not given those extra weeks indoors to get a head start. Tomatoes would certainly have a short harvest period in all but southeastern Virginia if started from seed in the ground, and peppers and eggplants might not produce at all if not grown from transplants.

Due to the amount of time, attention, and need for controlled growing conditions, many gardeners prefer to purchase plants for their gardens. However, for a larger choice in varieties and the control of plant production from seed to harvest, others choose to start their own transplants.

Annual plants

Transplants of annual vegetables and flowers should be stocky, healthy, free from disease, and have good roots. They should not be too small or too mature (tomatoes will transplant all right with fruits already on them, but many other plants will drop flowers or fruit after transplanting). Be sure plants have been hardened-off so that they will easily adapt to environmental change, but they should not be so hardened that they are woody and yellow; otherwise they will not resume active vigorous growth. Successful transplanting is achieved by interrupting plant growth as little as possible so younger plants that do not have dense roots growing out of the pot will usually become established fastest.

Have garden soil prepared before transplanting. All additives that require time to break down, such as manure, limestone, rock fertilizer, and green manure, should be incorporated the autumn before planting if at all possible. Quick-acting (hydrated) lime fertilizers and well-decayed compost may be added just before planting.

Transplant on a shady day, in late afternoon, or in early evening to prevent wilting. It helps to water the plants several hours before transplanting; when using bare-root plants, such as sweet potato slips or plants from a local farm supply store, soak the roots thoroughly an hour or two before setting them out in the garden. They should not be allowed to dry out completely at any time. Handle plants carefully. Avoid disturbing the roots or bruising the stems.

Dig a hole large enough to hold the roots of the plants. Set the plants slightly deeper than previously planted and at recommended intervals. Tomatoes are an exception to the rule of how deep to plant; they will develop roots all along the stems, and you can plant deep enough to leave only two or three sets of leaves exposed. Press soil firmly around the roots of transplants. Pour about a cup of starter solution in the hole around the plant. Use a solution of about half the strength recommended for that type of plant during the normal growing season. Fish emulsion or dilute manure tea may also be used.

For a few days after transplanting, protect the plants from wind and sun by placing newspaper or cardboard on their south sides or by covering with baskets or flowerpots. In cold weather, various season extenders are useful. Water the plants once or twice during the next week if there is insufficient rain.

Perennial plants

When buying small fruit plants and perennial crowns, such as asparagus, order early or buy from reliable local outlets. Occasionally stores allow plants to dry out, so watch for this, especially if you are buying sale plants. Select varieties that will do well in your growing conditions. For perennial plants, it will pay to do some research to find out what the major disease and insect pests are and buy resistant varieties. Dormant, bare root plants, and 1- or 2-year-old crowns are preferred. Look for roots that are full, slightly moist, and have color. Roots that are dry brown or soggy black are indicative of poor storage and will probably not give good results. Check crowns for signs of viable buds. Inspect plants for signs of insects or disease. If you receive plants by mail that are not satisfactory, do not hesitate to send them back.

Once you have the plants, keep the roots moist (but not soaking wet) by misting occasionally, and do not allow them to freeze or be exposed to high temperatures. If it is necessary to keep the crowns for more than a few days, place in cold storage (not freezing) or else heel in a trench of moist soil in a shaded location. Pack soil firmly against roots to eliminate any air pockets.

Transplant crowns according to directions, digging holes large enough to give the roots plenty of room to spread. Remove any discolored or dried out roots. Perennial plants appreciate a dose of compost mixed into the bottom of the hole. Once transplanted, shade the plants if necessary and water when needed. Extra care at the beginning of their growth will result in productive, healthy plants.

Transplant Production Data for Vegetables

(Ease of transplanting)

Easily Survive Transplanting

Broccoli
Brussels sprout
Cabbage
Cauliflower
Chard
Chinese cabbage
Lettuce
Sweet potato slips
Tomato

Require Care in the Operation

Celery
Eggplant
Melon
Onion (tends to bolt)
Pepper

Not Successfully Transplanted by Usual Methods

Bean
Carrot
Corn, sweet
Cucumber (tend to stop growth)
Melon
Okra
Pea
Squash

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