University of Maine
Bulletin #2751, Starting Seeds at Home

# Starting Seeds at Home

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When you grow your own seedlings, your transplants can be ready for the garden as soon as the danger of spring frost has passed, giving you a head start on Maine's short gardening season. You can start enjoying flowers and harvesting vegetables four to six weeks earlier than if you had waited for the ground to warm up enough for you to sow the seeds outside.

Starting your own plants from seed also allows you to choose from the much broader array of varieties offered by seed catalogs; commercial transplant sellers typically offer only a very limited number of different varieties for sale.

Using transplants instead of direct-seeding is especially important for plants that take a long time to mature or are sensitive to frost, such as tomatoes, peppers, eggplants, and melons. Some plants (mostly root crops) do not transplant well, or they mature quickly enough that starting seedlings indoors is not necessary. Vegetables that are typically direct-seeded in the garden include beans, beets, carrots, corn, peas, spinach, turnips, and zucchini.

## Supplies

### Seed

Use fresh seed from a reliable source. Use seeds saved from a previous year only if they have been stored in a cool, dry place.

### Containers

Seeds may be planted in any clean, 2- to 3 1/2-inch deep container with adequate drainage holes. You can use containers made of plastic, compressed peat, or wood, or recycled containers such as the cut-off bottoms of milk jugs. Using shallow trays or flats sold in garden supply stores saves space when you want to start a lot of a single type of seed. The seedlings will need to be separated and transplanted into

containers as they grow. If you want only a small number of plants, skip this step and direct-seed into small individual pots.

Containers that have been previously used for planting should be thoroughly cleaned and disinfected with a solution of one part chlorine bleach to nine parts water. This will help prevent disease.

Growing Medium

Seeds should be germinated in a fine-textured soilless mix with no fertilizer. Standard seed-starting mixes include equal parts of peat moss and vermiculite or perlite. You can either buy a seed-starting mix or prepare your own at home. Soil from your garden is not recommended when germinating seeds in containers—it may contain weed seeds or diseases, and it tends to compact, dry out, and crust over too quickly for fragile seedlings.

Once seedlings have emerged and developed one or two sets of true leaves,* you can transplant them into a slightly larger container with a coarser seedling-growing mix.

## Planting Seeds

You can figure out when to plant your seeds based on how long the seedlings will take to become mature enough to be transplanted into the garden. Seedlings may take from 4 to 12 weeks; the amount of time will usually be indicated on the seed package. To determine when to start seeds indoors, count back from the last spring frost date for your area. Last frost dates for most of Maine are in late May or early June—check with a local nursery.

Some seeds need special treatment before they are ready for germination; be sure to check any instructions on the seed package. Since seeds vary widely in how well they germinate, plan to sow more than you will actually need.

Fill containers with moist growing medium and gently press seeds onto the surface. Some seeds are fussy about the amount of light they need to germinate; follow the package directions and cover accordingly. A general rule of thumb is to cover each seed with a layer of growing medium 1 1/2 times as deep as the seed's diameter. Label the container, and cover it with clear plastic.

Most seeds need warmth to germinate, usually a soil temperature of 65°F–70°F. Find a warm spot in the house, like on top of a refrigerator or near a wood stove, or use heating cables or mats to help ensure a consistent, warm soil temperature. Avoid putting the trays into direct sunlight at this time. The soil could get too hot and kill the seeds.

Keep a record of what you plant, when you planted it, when it germinated, and how well it did in the garden, so that you can see whether you need to make changes next year.

Time and temperature needed to grow vegetable transplants

| Crop | Time from seeding to germination (days) | Optimum soil temperature (°F) | Time from germination to transplanting (weeks) |
|---|---|---|---|
| Broccoli | 7–10 | 50–85 | 5–7 |
| Cabbage | 4–10 | 50–85 | 5–7 |
| Celery | 9–21 | 50–65 | 10–12 |
| Cucumber | 6–10 | 65–85 | 4 |
| Eggplant | 6–10 | 65–85 | 6–9 |

| | | | |
|---|---|---|---|
| Lettuce | 6–8 | 50–65 | 3–5 |
| Melons | 6–8 | 65–85 | 3–4 |
| Onion | 7–10 | 65–85 | 8 |
| Pepper | 9–14 | 65–85 | 6–8 |
| Squash | 4–6 | 65–85 | 3–4 |
| Tomato | 6–12 | 65–85 | 5–7 |

## Growing Seedlings

As soon as sprouts appear, remove the plastic cover and move the seedlings into bright light. They need 14 to 16 hours per day of natural or fluorescent light to keep from becoming leggy. The growing temperature should be about 55°F–65°F, so avoid drafty windowsills.

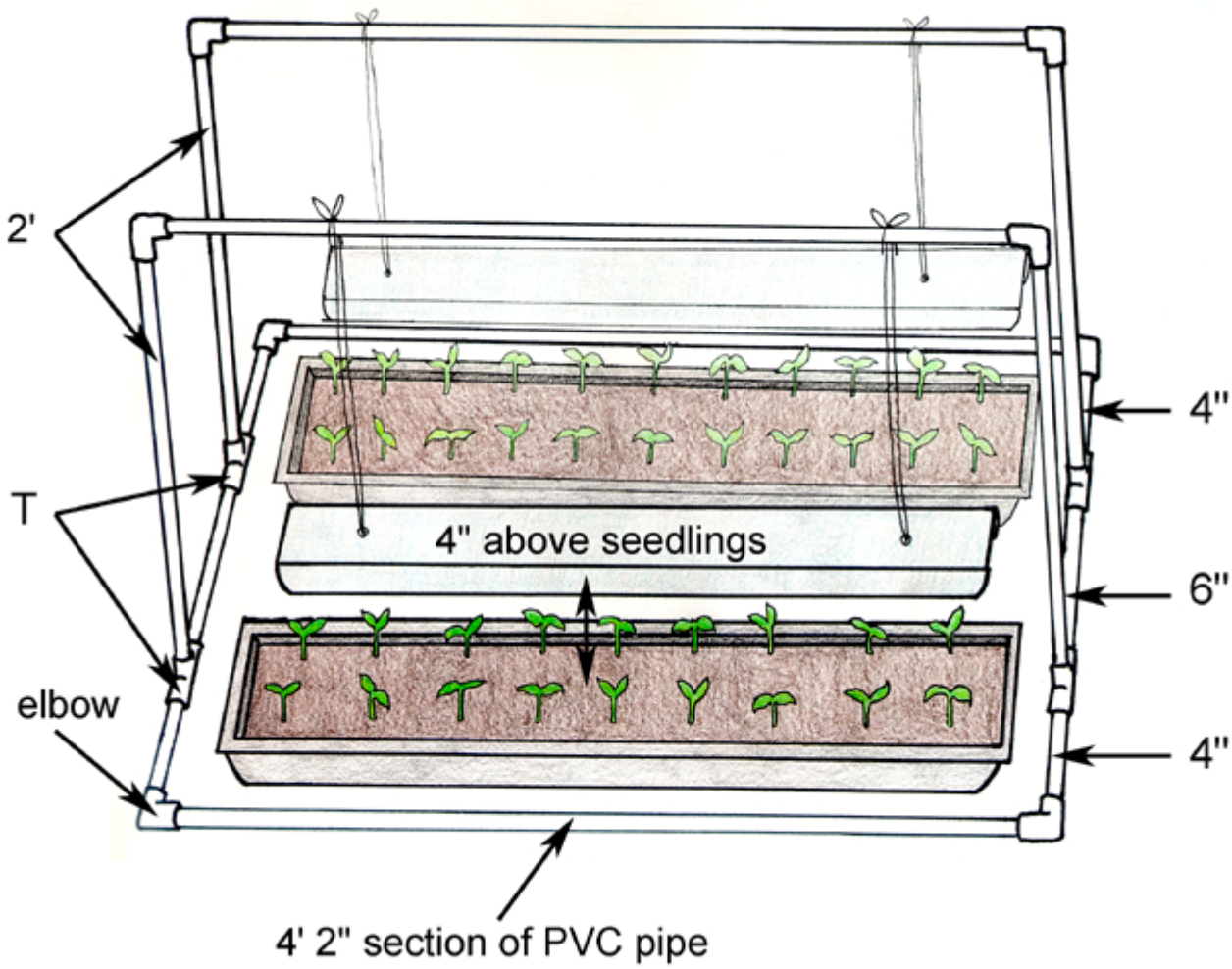
Once the second set of true leaves appears, water with a half-strength solution of fertilizer; you can use a water-soluble, all-purpose plant food, either synthetic or organic.

Gradually increase the strength of the solution over time. Water from the bottom or use a very fine sprinkler to avoid damaging the tender seedlings. Do not overwater—this is the most frequent mistake growers make.

A common problem when growing seedlings is damping-off. Infected seedlings develop a dark-colored rot at the base of the stem, then shrivel and fall over. The fungi that cause damping-off thrive in warm, moist soils—the same conditions that seeds need to germinate and grow.

To minimize the risk of damping-off in your seedling trays, use a sterile, well-drained growing medium. Space your seedlings so that air circulates between them, and do not overwater. Do not sprinkle frequently, as it will keep the soil surface too moist and promote fungal growth. Instead, water the seedling trays thoroughly, and wait until they are almost dry before you water again.

Seedlings should be thinned to at least 1 inch apart or transplanted into individual pots. When transplanting seedlings, you should handle them by the leaves only. Their stems are very delicate, and while a seedling can stand to lose part or all of a leaf, it will not survive with a bruised or broken stem.




You can make an inexpensive, collapsible grow-light frame out of 3/4-inch PVC pipe. Use a regular shop lamp, with two 40-watt fluorescent light bulbs. One cool white bulb and one warm white bulb work especially well, but two cool white bulbs are sufficient. Adjust the height of the lights so they are 2 to 4 inches above the tops of the seedlings.

## Transplanting to the Garden

The young plants will need one to two weeks of hardening off before they go into the garden. Hardening off is the process of acclimating plants to outdoor conditions. Start by setting them outside for a few hours at a time in a protected, semi-shady location, such as on a porch or under a shrub. Outdoor temperatures should be 45°F or warmer. Gradually increase the time outdoors and the exposure to direct sunlight. Transplant your seedlings to the garden in the late afternoon, after the heat of the day has subsided—or on a cloudy day—and water them thoroughly.

*This refers to the second set of “true leaves,” and does not include the cotyledons, the embryonic “seed leaves” that appear before the true leaves.

## Further Resources

Bubel, Nancy. The New Seed-Starters Handbook.  New York: Rodale Press, 1988.

Marinelli, Janet and Karan Davis Cutler, eds. Starting From Seed: The Natural Gardener’s Guide to Propagating Plants. Twenty-First Century Gardening Series. New York: Brooklyn Botanic Garden, 1998.