



Producing and Setting Out Vegetable Transplants

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Many vegetables, such as tomatoes, peppers, broccoli, cabbage, cauliflower, and eggplant, are usually started in the garden by means of transplants. Transplants may be used for various reasons: to shorten the growing season, to avoid the need for thinning and to control spacing; and to overcome the difficulty in achieving good stands with certain vegetables when they are direct-seeded.

When choosing transplants to buy at a greenhouse or garden center, use the same care you would when buying fresh produce. Look for plants with dark green foliage and strong, thick stems. Tall, leggy, pale-green or yellow plants grow more slowly and will not mature as readily. Avoid diseased or damaged plants and those with open flowers or developing fruits. Also, examine the undersides of the leaves for insects and insect eggs.

For a small backyard garden it is often easier to purchase a few healthy transplants from a local commercial greenhouse or garden center. However, many home gardeners like to grow their own transplants. Starting your own plants may be somewhat cheaper than buying them, and you can grow special varieties that otherwise might not be available locally.

The date to sow the seeds of a particular vegetable is determined by the date that the transplants should be set into the garden. It takes approximately 5-7 weeks to grow transplants of cabbage, broccoli, and cauliflower 4-6 weeks for tomatoes, peppers, and eggplant; and 3-4 weeks for cucumbers and melons. Avoid sowing unduly early; starting seeds too soon will result in tall, weak, overgrown, spindly plants.

The dates recommended for setting transplants outside into the garden, depending on where you live in Illinois, are as follows:

Broccoli, Brussels Sprouts, Cauliflower, Chinese Cabbage, and Cabbage:

Southern Illinois – March 25 to April 10

Central Illinois – April 10 to April 25

Northern Illinois – April 25 to May 10

Tomato, Eggplant, Pepper, Melon, and Cucumber:

Southern Illinois – April 25 to May 10

Central Illinois – May 10 to May 20

Northern Illinois – May 15 to May 31

BUYING SEED – CHOOSING VARIETIES

The first step in growing transplants is the most important of all and also the easiest to overlook. Start with fresh, viable seed from a reputable seed company and choose varieties that are well adapted to your area. For a list of recommended vegetable varieties, check with your local Extension office or a garden center.

SOILS AND CONTAINERS FOR SEED GERMINATION

Once you have the seed, you will need soil and some kind of pot or container. The easiest method is to purchase a standard potting mix. A variety of these are available at local garden centers and stores that carry garden products. These commercial mixtures are lightweight, easy-to-use, and contain adequate nutrients to get the plants off to a good start. After that, you should fertilize with a soluble fertilizer at weekly intervals.

Garden soil can be used to grow transplants but cannot be used “as is” because it is usually too heavy, poorly drained, and almost always contains disease organisms, insect eggs, and weed seeds. If garden soil is to be used, it should be mixed with equal portions of clean sand (or perlite or vermiculite) and either compost or peat moss. Pasteurize this mixture by moistening it, then placing it in a shallow pan and heating it for 1 hour at 180°F in the oven. This process creates a rather unpleasant, though ‘earthy’, odor, but is necessary to destroy the plant pests in the soil.

Almost any container that provides good drainage is acceptable for germinating seeds. Seedling trays are available commercially, but old coffee cans (with holes punched in the bottom), plastic or clay pots, peat pots, or cut-off milk cartons all work well. Most developing transplants need a spacing of at least 2 inches x 2 inches x 2 inches. However, melons, cucumbers, squash, and pumpkin should be spaced at least 3 inches x 3 inches.

SEEDING

The potting soil should be moist – but not soggy wet – before planting. Soilless potting mixes absorb moisture better if hot water is used initially. To seed the plants:

1. Fill the container up to 3/4 inch from the top of the container with the potting mixture.
2. Level and gently firm the planting medium.
3. Sow the seeds uniformly and thinly. Label with plant type, variety, and date of planting. (Large-seed vegetables such as cucumbers, muskmelon, and watermelon can be seeded directly in peat pots.)
4. Cover the seeds with dry vermiculite or milled sphagnum peat moss, then moisten the surface with a fine mist, or place the container in a pan of water to absorb moisture from the bottom.
5. For best germination, place the container in a warm (65° to 75° F), bright location. Temperatures below the optimum range will increase the time required for germination or decrease the percentage of healthy seedlings, or both.

WATERING THE SEED FLATS

Although too frequent watering may result in seed rots, infrequent watering can delay emergence of small seeds or even cause the death of the germinating seeds. Do not allow the surface of the soil to dry out completely if small seeds are sown shallowly. For the retention of moisture, a piece of glass or clear plastic can be put over the soil until the seeds germinate. Be sure to watch for excessive condensation and remove the cover if needed.

SEED GERMINATION

Watch daily for germination and remove the glass or plastic as soon as the seedlings have emerged. If the seeds are germinated in a shady location, the pot or tray should be moved gradually into full sun. However, direct transfer from shade to sun may result in burning of the leaves.

A window that received sunlight only part of the day will not furnish enough light to grow the best quality plants. One way to supplement available daylight is with artificial light. Cool-white fluorescent or plant growth lamps placed no more than 12 inches above the plants will provide the additional light necessary to prevent the seedlings from becoming tall and spindly. Use this supplemental light for 12 to 18 hours per day.

The seedlings can be left in the original containers or transplanted into flats, pots, peat pellets, or other growing containers. Since the roots grow rapidly, the seedlings should be moved or transplanted roughly at the stage when they develop their first set of true leaves. Regardless of the type of container used, give the transplant adequate space.

TROUBLE-SHOOTING

In spite of the best intentions in growing good transplants, sometimes you're not successful. Below are some common problems that occur when growing transplants at home:

1. *Tall, spindly plants.* Leggy plants result usually from insufficient light. This condition may occur if you grow the plants in a window with low light intensity or if the seedlings are spaced too closely. Be sure to thin the transplants to the recommended spacing.
2. *Slow growth.* This symptom can be caused by lack of fertility, insufficient light, or poor root growth due to wet soil. If water and light are adequate, a boost with any soluble houseplant fertilizer should stimulate growth. Over-watering or using heavy potting soils causes wet soils that do not allow the roots sufficient air. Drainage can be improved by additions of sand or perlite to the soil mixture. Make sure all containers have proper drainage holes in the bottom.
3. *Chlorosis (yellowing).* Healthy leaves are green because they contain chlorophyll pigments. When chlorophyll is not produced in sufficient quantities, the leaves appear yellow, and growth is slow due to lack of nitrogen. Weekly applications of a 20-20-20 fertilizer or any soluble houseplant fertilizer should correct the problem.

4. *Damping-off*. Poorly drained soil or excessive watering may result in a girdling of the seedling stems at the soil line. This is caused by several fungal organisms, including *Pythium*, which are common in all soils, but are usually more of a problem under wet conditions. Full sunshine and a well-drained potting soil usually minimize the growth of these organisms. A suitable fungicide can be mixed with water and used as a drench over the young seedlings, if the problem is severe. Use of packaged potting mixtures as well as starting with clean containers, tools, etc. is also highly advised to help prevent the damping-off of seedlings.

HARDENING THE SEEDLINGS

Before the seedlings are transplanted outdoors, they should be gradually hardened by being exposed to outside conditions. Place the plants outdoors a few hours each day, starting at least 2 weeks before they are to be set in the garden. Gradually increase the length of exposure as planting time approaches.

SETTING OUT THE TRANSPLANTS

About one hour before planting, thoroughly water the plants. The roots of the plants grown in flats should be blocked out with a knife to get as much soil as possible with each root-mass. Carefully remove the plants, keeping a ball of soil around the roots of each.

Plants grown in individual containers such as clay pots, plastic pots, or cell-packs should be carefully knocked out of the containers before planting. While containers such as Jiffy-7 pellets and peat pots allow roots to penetrate their walls, it is advisable to remove the mesh around the Jiffy-7 pellet and to break off the peat pot to further allow the roots to establish in the planting hole.

It is important to cause as little root injury as possible when setting out young transplants. Even minimal damage to delicate feeder roots may cause a delay in growth. Plants grown in individual containers will have much less root injury than those taken “bare-root” from seedling flats or cut apart in so-called community packs. When the plants are knocked out of their containers, check to see if the roots are tightly crowded in the soil ball. If they are, use a sharp knife or your fingers to gently break them up on three or four sides of the root ball.

Dig a hole large enough so that the plant is at the same level or slightly higher than it was in the container. Handle the plants carefully and avoid disturbing the roots as much as possible. Cover the root system with soil and firm lightly, leaving a slight depression around the plant. Most plants can tolerate being set into the ground *slightly* deeper than they were in the container. This may provide extra support and promote faster growth. Tomatoes, however, can be set in the ground much deeper than they were in the original container. Burying the stem, even up to the first set of true leaves will stimulate root growth.

PRUNING TRANSPLANTS

Pruning transplants to reduce water loss is very poor practice. Although pruning may reduce the extent of wilting after setting out, it will also reduce the rate of new root growth. When a plant is transplanted, food energy stored in the old, large leaves will be transported downward to promote root growth. If these leaves are removed, root growth is delayed.

Plants will almost always wilt somewhat after they are set into the garden or field. The wilted plant is not sick or dying but demonstrating a normal response to extreme water loss. A plant that wilts during the hottest part of the day usually will regain turgidity in the evening. Transplanting on cloudy days or in the early evening will help reduce wilting.

USE A STARTER FERTILIZER SOLUTION

After setting the plants into the garden, water them thoroughly. It is also a good practice to use a starter or booster solution to get the plants off to a good start. Make this solution by dissolving 2 tablespoonsful of a high-phosphorus, water-soluble fertilizer in a gallon of water and watering the newly-set plants.

PROTECTION

If necessary, protect newly-set plants as best you can from heat, cold temperatures, or wind. "Hot caps", baskets, boxes, plastic milk jugs, or jars can be used to protect the plants on occasional frost nights.