

Starting Seeds Indoors

If a gardener has plenty of time and space available, vegetables may be started indoors from seed and then transplanted to the garden. Growing transplants from seed gives the gardener a greater access to many cultivars and produces a large number of transplants inexpensively. To ensure the successful production of transplants, the gardener needs to meet the following requirements: insect-, weed- and disease-free growing medium; adequate heat and moisture; enough light to grow a stocky plant; and the time or materials to harden off the transplants prior to planting them outdoors. Some vegetables transplant to the field more easily than others. Refer to the table to determine which vegetables should be transplanted or directly seeded into the garden.

Buy seed only from dealers who have a reputation for handling good seed, and always look for well-adapted varieties that have insect and disease resistance.

Methods

There are two basic methods of growing transplants from seed. In the one-step method, seed directly into a container and then plant the container or transplant into the garden. The container could be a peat pot, peat pellet or a container with a hole punched in the bottom for drainage. Some common household containers include cut-off milk cartons, plastic jugs, yogurt cups or margarine tubs. Place the container in a plastic bag closed at the top with a twist-tie to keep the soil moist. (This bag should be removed when the seedlings begin to appear.) When planting peat pots directly in the garden, cut or remove one side and do not allow the edges of the pot to stick out above the soil.

In the two-step method, sow the seeds in a flat. Because seeds are extremely sensitive to drying out,

cover the flats with plastic wrap to retain moisture until all the seeds have germinated. When one or two sets of true leaves appear, transplant the seedlings into larger containers. Hold each seedling by the cotyledons or "seed leaves," and not by the stem. The stem is fragile, and the slightest injury could cause permanent damage. Finish growing the plants in these containers until they are ready to plant outdoors.

With either method, it is important that the seeds are started in a sterile media. The media should be well-drained and well-aerated. A wide variety of commercially available and homemade soilless mixtures are suitable. Soilless mixtures reduce the chances of infection by soil-borne fungi such as damping-off (*Pythium* species) from infecting and killing the seedlings.

Transplants grown indoors need adequate light. Under low light conditions, vegetable seedlings become leggy and weak and tend to topple over when they are a few inches tall. A total of 16 to 18 hours of light (natural and artificial) is required to produce stocky seedlings.

Containers can be placed near a south-facing window and receive supplemental light provided by fluorescent lights. Seedlings can be grown under fluorescent lights alone. Forty watt, 48-inch long fluorescent tubes, with a timer, placed 2 to 4 inches above the seedlings is an adequate set-up. Consider attaching aluminum foil from the light fixture to reflect light onto the plants.

Seedlings growing in soilless mixes need to be fertilized when the first true leaves appear. Feed at every other watering with a water-soluble starter fertilizer to promote faster plant growth and until the plants are ready to plant outdoors. Wash the

seedlings with plain water to remove any fertilizer from the leaves. Water between feedings with plain water to prevent any salt from accumulating in the media. Seedlings growing in mixes containing compost, rotted manure or commercially prepared soil may not need to be fertilized.

Water the transplants when they are slightly wilting. Stop watering when water runs out of the bottom of the container. For soilless media, determine the need for watering by squeezing the top half-inch of media between the thumb and forefinger. If water squeezes out easily, there is adequate moisture; if the medium feels slightly moist but water is difficult to squeeze out, water should be added.

Before the transplants are moved into the garden, they need to be hardened off. To condition plants to growing outdoors, set the seedlings outdoors during

the day and bring them inside before sundown. The plants should be gradually exposed to more direct sun to avoid injuring the plants. Outside, the seedlings are exposed to varying temperatures, more direct sunlight, drying winds and greater moisture stress. The transplants will produce a cuticle on leaf and stem surfaces to reduce water loss. Continue this routine for two to three weeks to condition the seedlings. This adjustment may result in a temporary slow-down of growth, but it helps the plant successfully adapt to outdoor conditions. The adjustment must be gradual or the plant will be damaged, resulting in delayed growth, retarded fruiting and reduced yields when the plants are set out. Before being planted in the garden, transplants can also be moved to a hotbed, coldframe or other outdoor location where there will be plenty of sunshine, adequate ventilation and suitable temperature.

Ease of Transplanting

Easily Survive Transplanting	Require Care in the Operation	Not Successfully Transplanted by Usual Methods ¹
Broccoli	Celery	Beans
Brussels sprouts	Chard	Beets
Cabbage	Cucumbers	Carrots
Cauliflower	Melons	Corn
Eggplant	Peas	
Kale	Pumpkins	
Lettuce	Spinach	
Onion, dry	Squash	
Okra		
Pepper		
Sweet potato slips		
Tomato		

¹These crops are best planted in individual containers, cubes, blocks or pellets by usual methods because any root disturbance hinders growth.

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