

## VEGETABLE SEED GERMINATION AND TRANSPLANTS

The most important requirements for seed germination are heat and moisture, and the amount and duration of each necessary for a specific vegetable. Germination temperatures should be constant at 70° to 80°F. Time to germinate doubles for each ten degrees the temperature drops below the ideal level. Seeds of summer or hot weather vegetables will not sprout at lower temperatures. Soil temperatures are available on the web [www.georgiaweather.net](http://www.georgiaweather.net) The following chart displays the days for germination at an ideal temperature:

Seed Germination Crop	Soil Temperature		Days
	Range	Optimum	
Beans	60 – 85	80	7
Beets	50 – 85	85	5
Cabbage	45 – 95	85	4
Corn	60 – 95	95	3
Cucumber	75 - 95	95	3
Eggplant	40 – 80	85	5
Lettuce	40 – 80	75	2
Peppers	65 – 95	85	8
Radishes	45 – 90	85	3
Squash	70 – 95	95	9
Tomatoes	60 – 85	85	5

Water triggers a series of chemical reactions within the seed and softens and weakens the seed coat. Most seeds will germinate in a wide range of soil moisture conditions; however, the following seeds require a fairly moist soil – beets, lettuce, beans, and peas. Provide sufficient moisture, but not too much. If heat and moisture, either or both, are provided intermittently, the viability of the seed is affected; in some cases the seed will not germinate.

Oxygen also influences germination. As growth begins oxygen combines with the seed's stored food to make energy. If the pore space in the soil is saturated with water the seed will be killed. Squash, pumpkin, and cucumber are particularly sensitive to low oxygen.

In addition to these natural requirements, observe the instructions provided on seed packets. The depth to plant seeds varies from ¼ “ for lettuce to 2” for beans. The number of seeds to sow per foot varies from 4 to 8 for beans to 14 to 16 for radishes. Also note the distance between plants and the distance between rows.

Heat and moisture also effect the successful germination of vegetable seedlings for transplanting. The following chart displays the ideal temperature ranges and number of weeks to reach transplant size. Lowering the night time temperature develops plants with stronger stems. Well grown plants will be compact, 4 – 6 inches tall, with about 6 fully developed leaves.

Seed Germination For Transplants	Soil Temperature		Weeks to Transplant
	Day	Night	
Broccoli	60 – 70	50 – 60	5 – 7
Cabbage	60 – 70	50 – 60	5 – 7
Cauliflower	60 – 70	50 – 60	5 – 7
Cucumber	70 – 75	60 – 65	3 – 4
Eggplant	70 – 80	65 – 70	6 – 8
Lettuce	70 – 80	50 – 55	5 – 7
Peppers	65 – 75	60 – 65	6 – 8
Summer Squash	70 – 75	60 – 65	3 – 4
Tomatoes	70 – 75	65 – 75	5 – 7
Watermelon	70 – 80	65 – 70	3 – 4

In addition to heat and water, one needs to focus on soil and light requirements when growing seeds indoors. Artificial soil mixes (not potting soil) are easy to handle and do not require sterilization. Fill the seed flat with soil, press indented rows ¼ to ½ inch deep. Sow seed in the depression and cover it with soil. Apply a fine stream of water to settle the soil but do not soak the soil. Enclose the container with clear plastic wrap to keep it from drying out.

Tall and spindly plants result from insufficient light. A bright window is seldom sufficient light. Growing your plants under artificial light about one inch above the surface will provide the required heat and light.

When seedlings have at least 2 pairs of true leaves, transplant them to cell packs or another container. Be careful – grasp them by the leaves and lift out with a pencil or knife blade. You could crush a tender stem or kill the growing tip. Apply liquid fertilizer after the plants start to grow.

Warm season vegetables – tomatoes, southern peas, peppers, squash and okra – require warm soils. They are killed by even light frost. They should be plants after all danger of late frost has passed, usually two weeks after the average last frost date.

Transplants should be hardened off before planting in the garden. Two weeks before outdoor planting time, stop fertilizing and slow down on the watering. One week before outdoor planting, put the transplants outdoors in a protected area, out of direct sun and wind. Leave them outdoors for 1 hour, then 2 hours, then all morning until reaching a full day. Water frequently.



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