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G80-503 Vegetable Garden Seed Storage and Germination Requirements

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Vegetable Garden Seed Storage and Germination Requirements

This NebGuide has information on the selection and storage of vegetable garden seed.

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A successful garden begins with the selection and use of high quality seed of adapted superior varieties. Start by purchasing seed from a reputable seed company. Save records of your seed orders, so if you do have a complaint you can contact the sales company. Saving records of your seed orders is also useful for keeping track of the varieties you planted.

Storing Seed

Often crop seed is left over in a package after planting. This excess seed can be saved for next year's garden, usually with little loss in germination. Seed stored for more than one year, however, will require additional care to insure high germination for future use.

Storage temperature, relative humidity and seed moisture are the important factors in determining how long seed can be stored without loss of germination. The storage life of seed also varies greatly with species (*Table I*).

In general, longer seed storage life is obtained when seeds are kept dry and at low temperatures. Let seeds air-dry for several weeks before storing. Do this when the relative humidity is low and the air temperatures are warm. Spreading the seed out in direct sunlight for 6 to 8 hours works well, as long as the seed temperature does not generally exceed 100°F. Drying the seed in shade is usually better. The dry seed should be placed in packages and stored in moisture-proof containers. Containers such as sealed cans or jars with air tight caps work satisfactorily. Storage temperatures between 35°F and 50°F are satisfactory when the moisture content of the seed is low.

An alternate method of keeping seeds dry is to place them in a sealed jar with calcium chloride, silica gel or powdered milk. These substances should *not* touch the seed. These products absorb moisture from the seeds. Use enough of the product or replace it as needed so that the moisture absorbed from the seed will produce no visible change in the product used.

Beans, peas and okra may develop "hard" seeds if their moisture content is reduced to 7 percent or

below. This seed will not germinate satisfactorily. "Hard" seed will germinate better if exposed to a humid environment for several weeks before planting.

Germination

It is a good practice to check seed which has been stored for more than one year for germination (*Table II*). If germination is poor, discard it and buy fresh seed. To test for germination, place a counted number of seeds (such as 25 or 50) between paper towels, strips of soft muslin or blotting paper in a petri dish, baking dish or similar container. Label each "lot" of seed with the variety name. Moisten the seeds, and cover the container to prevent the seeds from drying out. Hold at a temperature of 70 to 75 °F. Remove and count the seeds as they germinate. Make your final count at the end of two to three weeks, when all the seeds have had ample time to germinate. Compute the percentage of germination.

Seed "lots" with lowered germination may still be safe for planting if they are sown at higher rates than usual. Also remember that weakly sprouting seeds have a high mortality rate when planted in the soil.

Germination conditions should be optimum when the seed is planted outdoors in the garden or indoors for transplants. This will not only increase germination percentage for older seed but will also insure high germination for fresh seed.

Table II lists information about seed germination for the common vegetables. This table is a guide for comparisons when calculating germination percentages and when germinating seed for home garden use. Germination requirements will vary with seed source, seed storage conditions, age of seed and the environmental conditions under which the seed is germinated. Minimum Federal Standards for vegetable seed germination are also included.

Table I. Seed weight and longevity for home garden vegetables.		
Crop	Seeds per Ounce^a	Relative Longevity under Cool, Dry Condition (Years)^{bc}
Asparagus	700	3
Bean, Lima	25 - 75	3
Bean, Snap	110	3
Beets	1,600	4
Broccoli	9,000	5
Brussels Sprouts	8,500	5
Cabbage	8,500	5
Carrot	23,000	3
Cauliflower	9,000	5
Celeriac	70,000	5
Celery	70,000	5
Chicory	26,000	5

Chinese Cabbage	18,000	5
Cucumber	1,100	5
Eggplant	6,000	5
Endive	26,000	5
Kale	9,500	5
Kohlrabi	9,000	5
Leek	11,000	3
Lettuce	25,000	5
Muskmelon	1,200	5
New Zealand Spinach	350	5
Okra	500	2
Onion	9,000	1 - 2
Parsley	18,000	2
Parsnip	12,000	1 - 2
Pea	75 - 90	3
Pepper	4,500	4
Pumpkin	200	4
Radish	3,000	5
Rutabaga	12,000	5
Salsify	1,900	2
Spinach	2,800	5
Squash	100-300	5
Sweetcorn	120 - 180	1 - 2
Swiss Chard	1,500	1 - 2
Tomato	11,000	4
Turnip	14,000	5
Watermelon	200 - 300	5

^aSeeds, The Yearbook of Agriculture. 1961. Stefferud, A., Editor. The United States Government Printing Office.

^bHandbook for Vegetable Growers. 1960. Knott, Joe. John Wiley & Sons, Inc.

^cVegetable Growing Handbook. 1979. Splittstoesser, W.E. AVI Publishing, Inc.

Table II. Germination data for home garden vegetable seed.

Crop	Minimum Percent Germination ^{ab}	Germination Temperature ^b			Days to Germinate Under Optimum Temperature & Moisture Conditions ^c
		Min °F	Opt. °F	Max. °F	
Asparagus	60	50	75	95	10
Bean, Lima	70	60	85	85	6
Bean, Snap	75	60	80	95	7
Beets	65	40	85	95	4
Broccoli	75		85		4
Brussels Sprouts	70		80		4
Cabbage	75	40	80	100	4
Carrot	55	40	80	95	6
Cauliflower	75	40	80	100	5
Celeriac	55		70		11
Celery	55	40	70	85	7
Chicory	65		80		6
Chinese Cabbage	75		80		4
Cucumber	80	60	95	105	3
Eggplant	60	60	85	95	6
Endive	70		80		6
Kale	75		80		4
Kohlrabi	75		80		4
Leek	60		70		7
Lettuce	80	35	75	85	3
Muskmelon	75	60	90	100	4
New Zealand Spinach	40		70		6
Okra	50	60	95	105	6
Onion	70	35	75	95	6
Parsley	60	40	75	90	13
Parsnip	60	35	65	85	14

Pea	80	40	75	85	6
Pepper	55	60	85	95	8
Pumpkin	75	60	95	100	4
Radish	75	40	85	95	4
Rutabaga	75		80		4
Salsify	75		70		6
Spinach	60	35	70	85	5
Squash	75	60	95	100	4
Sweetcorn	75	50	95	105	3
Swiss Chard	65	40	85	95	4
Tomato	75	50	85	95	6
Turnip	80	40	85	105	3
Watermelon	80	60	95	105	4
^a Minimum percent germination to federal standards. ^b <i>Handbook for Vegetable Growers</i> . 1960. Knott, J.E. John Wiley & Sons, Inc. ^c <i>Seeds, The Yearbook of Agriculture</i> . 1961. Stefferud, A., Editor. The United States Government Printing Office.					

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