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Home storage of vegetable and flower seeds

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Quick Facts

Vegetable and flower seed may be kept for one year without appreciable decrease in germination.

Storage of vegetable and flower seed may be extended to 10 or more years under proper conditions.

Seed moisture and storage temperature are the most important factors in determining how long seed can be stored.

The drier seed are, the longer they will store.

"Hard seed" may be produced if the moisture of certain seed is reduced to below 8 percent; these seed resist germination because they do not absorb enough water.

Hard seed (or over-dried seed) will germinate better if exposed to a humid atmosphere for two weeks before planting.

Longest seed storage life is obtained at low relative humidity and low temperature.

Success of a garden depends in part on the quality of seeds planted. Good quality seed is best assured by planting fresh seed from a reputable seed company.

Often, there are seed left over in the package after a crop has been planted. If there is sufficient quantity to be used the next year, it should be saved.

Storing Seed

In Colorado, all vegetable and flower seed will store on a shelf at room temperature for at least one year without significant loss of germination. If there are enough seed for several years, then further steps must be taken to insure their viability over this period of time.

A 10-year storage life can be obtained by drying seed to less than 8 percent moisture content. This can be done by drying seed at 100° F (38° C) for six hours. This temperature easily can be obtained by spreading the seed out in direct sunlight; however, since sunlight is harsh and easily can exceed this temperature, drying in the shade is better.

A microwave oven never should be used; however, a conventional oven may be used if the door remains open and the seed is not heated to more than 100° F (38° C). The seed then can be packaged in moisture-proof containers and stored in a refrigerator or deep freezer. A moisture-proof container is one that could store seed safely while submerged in water; therefore, sealed cans or jars, rather than plastic bags, should be used.

Factors Affecting Seed Storage

Conditions essential to good seed storage are just the opposite of those required for good germination. Good germination occurs when water and oxygen are present under a favorable temperature. Good seed storage results when seed are kept dry (below 8 percent moisture) and the temperature kept low (between 40° F or 4° C).

When both seed moisture and storage temperature are low, the presence of oxygen has not been shown to be a factor in seed longevity, and germination has been shown to be unaffected by storage in atmospheres of nitrogen, carbon dioxide, partial vacuum or air.

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Relative humidity (RH) influences the moisture content of seed if they are not stored in moisture-proof containers. For example, at 15 percent RH, seed will dry down to 6 percent moisture and will store safely in this condition for several years. However, at 90 percent RH, seed will dry down to only 19 percent moisture and germination will be poor after one year.

Hard Seed

The drier seed are, the longer they will store; however, there is a chance of producing what is known as "hard seed" if moisture of certain seed is reduced below 8 percent. Hard seed resist germination under favorable conditions because they do not absorb enough water. When planted, such seed gradually absorb water, germinate and produce seedlings over an extended period. A seed lot containing 50 percent hard seed is little better than a lot containing 50 percent dead seed because neither produce a stand of seedlings when they should.

Beans and peas are particularly subject to this condition and therefore should not be dried as completely as other seed. If they have been overdried, they will germinate better if exposed to a humid atmosphere for two weeks before planting.

Packets of vegetable seed sold in Colorado must germinate at or above the germination percentage shown in Table 1 to be in compliance with the Colorado Seed Law. As yet, there are no standards for flower seed under Colorado laws and, therefore, the only assurance of quality is the reputation of the seed company.

References

Drying, Storing and Packaging Seeds to Maintain Germination and Vigor, Proc. Short Course for Seedsmen, Mississippi State University, 1959.

Harrington, J.F. and P.A. Minges, *Vegetable Seed Germination*, University of California, Agricultural Extension Service, 1954.

James, Edwin, *An Annotated Bibliography on Seed Storage and Deterioration*, Agricultural Research Service 34-15-1, 1961.

Table 1: Federal and Colorado minimum germination, seed count and relative longevity of selected vegetable seed.

Kind of seed	Minimum germination (percentage)	Average number of seed per:		Relative longevity (years)
		gram	ounce	
asparagus	60	50	1400	3
beans	70	4	100	3
beets	65	70	2000	4
broccoli	75	290	8100	3
brussel sprouts	70	300	8500	4
cabbage	75	280	7700	4
cabbage, Chinese	75	250	7000	3
carrot	55	790	22,000	3
cauliflower	75	310	8600	4
celeriac	55	1800	50,000	3
celery	55	2700	76,000	3
chard, Swiss	65	50	1500	4
chicory	65	710	20,000	4
corn, sweet	75	5	140	2
cucumber	80	40	1100	5
eggplant	60	260	7200	4
endive	70	610	17,000	5
kale	75	360	10,000	4
kohlrabi	75	330	9200	3
leek	60	350	9900	2
lettuce	80	930	26,000	1
muskmelon	75	40	1100	5
okra	50	18	500	2
onion	70	300	8500	1
parsley	60	640	18,000	1
parsnip	60	240	6800	1
pea	80	7	200	3
pepper	55	160	4500	2
pumpkin	75	7	200	4
radish	75	110	3100	4
rutabaga	75	390	11,000	4
salsify	75	70	2000	1
spinach	60	100	2900	3
spinach, New Zealand	40	20	430	3
squash	75	10	300	4
tomato	75	360	10,000	4
turnip	80	500	14,000	4
watermelon	70	10	300	4