



## Understanding Seeds

Seeds. You buy them in packets. You sow them in the soil and they turn into living beauty, and the very source of our survival. Understanding a plant's family history can offer clues to how its seeds will act in the garden.

The history of flowering plants goes back 160 million years, and the fossil record suggests that they evolved quickly from their early beginnings. Today, flowering plant species number more than 300,000. The diversity of shapes and mechanisms in seeds is no less impressive. Each has a structure, a mode of dispersal, and a shelf life. Some germinate almost instantly; others take weeks to show their green.

### Beans and Peas



The wild ancestors of beans had a dispersal technique that has been bred out of cultivated varieties: their seeds literally exploded from the pods and landed about 10 feet from the parent plant. After a short latent period, they germinated over the next couple of years. Modern cultivated varieties of beans and peas maintain their viability for several years.

In the field, bean seeds are protected from scavenging animals by compounds that make them unpalatable, or even mildly toxic. These compounds are rendered harmless by cooking. Once the seeds sprout, however, they are a big attraction to rabbits, mice, and other roaming animals. Covering the seedlings with row cover until they attain some size is a wise practice. Flowers of beans and peas are self-pollinating, so excluding insects will not prevent the development of pods.

## Beets, Chard, and Spinach



Beet seeds are dried fruits, held together with a cork-like material.

Beets originated from wild sea beets, a common coastal plant of Europe and Western Asia. These plants produce copious amounts of pollen, which travels by wind to other plants. Seeds of the sea beet can be carried long distances on ocean currents.

Like their wild ancestors, beets and chard are salt-tolerant and wind-pollinated. Their seeds are actually dried fruits, which are clumps of two or more seeds held together by a buoyant cork-like material. Because of the protective covering, the seeds can be slow to germinate, and they often sprout in clumps that must be thinned. If you want to avoid thinning, look for “monogerm” types, which have just one seed.

Spinach is in the same plant family as beets and chard, and shares their tolerance for cool maritime weather. In fact, spinach refuses to germinate at all if the soil is too warm. If you germinate the seed in a cool location and then transfer the seedlings to the late summer garden, it makes an excellent fall crop.

## Broccoli, Cabbage, Radishes, Turnips, and Mustard Greens (such as mizuna and arugula)



Broccoli flowers develop into seedpods, which have a tendency to shatter and spill their seeds when ripe,

In nature, brassica seedpods shatter. When seeds become ripe, their pods split open and scatter their contents onto the ground in the vicinity of the parent plant. This mechanism has advantages in nature—it allows the plant to shed seed over a period of time. The sheer numbers of seeds and the various weather conditions that occur at the times of their dispersal ensures that the next generation of plants will persist.

Take a cue from this dispersal mode, and do not bury the seeds too deeply. Germination of brassica seeds is normally not a problem. They are, in general, cool season crops, meaning that the plants mature best when the weather is cool. But they have the advantage of germinating very quickly whether the temperatures are hot or cold. This trait makes cauliflower, broccoli, turnips, and the rest of the clan ideal for fall growing.

## **Carrots, Fennel, Parsnip, Parsley, Cilantro**



Carrot family seeds are borne on tall stalks, and are shaken loose by wind.

The beautiful flower aggregates of carrot family plants, known as umbels, attract large numbers of pollinators. Once an insect completes the job of pollination, each individual flower contained in an umbel matures into two seeds. Seeds of the wild carrot have developed bristles, which cling to the fur of animals. The seeds are also lightweight and borne on tall stalks, so they are easily distributed by wind. Cultivated members of the carrot family lack the bristles of their wild relatives.

Carrot seeds mature over a period of time. In the wild, having mature seeds ready under various weather conditions aids in their survival. Under cultivation, the quality of harvested seed reflects their varying levels of maturity, with less mature seeds often taking longer to germinate. Unless stored in optimal cool and dry conditions, the seeds do not last long, so it is best to buy new seed each year.

## **Lettuce and Sunflowers**



Lettuce and sunflowers are related. Both produce flowers that attract pollinators.

Lettuce is related to both sunflowers and dandelions, but the seeds have more in common with those of dandelions. Gardeners tend to pull lettuce plants out when they bolt, but if you allow the bolting plant to follow its course it will produce a mass of small daisy-like yellow flower heads. Each flower (like sunflowers and dandelions) contains many florets, which mature into seeds. The trait lettuce flowers share with dandelions is that the narrow seeds are topped with tufted hairs, allowing them to drift in the wind and land far from the

parent plant. Lettuce seeds require light to germinate—this makes sense, considering that they land lightly on top of the soil.

Sunflower seeds are heavy, and not tufted, and so cannot be carried by the wind. It is fortunate, however, that they are often carried and dropped in new soil by birds and other seed loving animals. Sunflowers have a condition known as autotoxicity. If they come up in the same location year after year, the quality of the plants declines.

### **Onions, Chives, Scallions, and Shallots**



Garlic chives and other onions produce flowers that develop into multiple seed capsules.

Onion flowers rise up from the base of the plant, and are cross-pollinated by various types of bees, flies, and other insects. Each umbel bears capsules containing many seeds, which drop to the ground when the capsules dry and split.

The seeds of all members of this family are short-lived, so purchase fresh seed every year.

### **Tomatoes, Peppers, Eggplants, Melons and Squash**



Juicy tomatoes and other fruits assist with the dispersal of seeds. Animals eat the fruits and deposit their seeds away from the parent plant.

A fruit, such as a tomato, eggplant, or squash, is nothing more than a reproductive aid, when you look at it from the plant's perspective. The starchy flesh protects the seeds until they mature. At that point the starch is converted to sugars and the fruit becomes highly attractive to animals, which eat the flesh and wander off, depositing the seeds elsewhere. Protected by an outer shell, the seed of a fruit will pass through the digestive tract of its consumer unharmed. What's more, the animal's feces provide it with a warm, moist environment that contains mineral nutrients necessary for its growth. The four-legged method of dispersal guarantees that, in nature, some of the seeds will germinate at a distance from the parent

Keep this in mind when you plant seeds of these plants. To germinate, they need warm soil and moist conditions. Not so coincidentally, annual plants that bear fleshy fruits should be rotated to fresh soil each year.