

What is a Biennial Plant?

A biennial plant is one that requires two growing seasons to complete its life cycle. In the first season, the plant grows vegetatively, and then goes through a period of exposure to cold called vernalization (also known as overwintering). In the second season of growth, the plant produces flowers and seeds, then dies.

Many gardeners have never seen a biennial food crop flower and set seeds because most biennials that we grow for food are harvested in their first season of growth, before they have produced seed. For biennials, market maturity (when a crop is good to eat) and seed maturity (when the seed is ready to harvest) are not one and the same.

Most common biennials belong to just four plant families: *Brassicaceae*, *Apiaceae*, *Alliaceae* and *Amaranthaceae* (formerly *Chenopodaceae*). Biennials include onions, leeks, many *Brassica oleracea* crops (collards, kale, kohlrabi, Brussels sprouts, and most broccoli), turnips, rutabagas, chard, beets, celery, carrots, and parsnip.

First Season Growth

When saving seeds from a biennial crop, there are a few considerations to keep in mind during garden planning to help ensure a biennial plant will be able to survive the winter in storage.

Younger plants store/overwinter the best. Crops planted in the spring will overwinter less reliably than crops planted in the late summer or fall. Small, young crops planted later in the year will survive storage best. A good rule of thumb when growing biennials for seed is to plant your biennial transplants eight weeks before your average first frost date in the fall. There are a few exceptions to this rule, including celery, celeriac, and Brussels sprouts, which should be planted twelve weeks before frost, and onions and leeks, which need to be planted in the spring.

The right size for storage varies by crop. For root crops, like beets or turnips, a size between a golf ball and a baseball is about right for overwinter storage. Fibrous rooted crops like kale should be the size a gardener could begin picking a few leaves off for their salads. Cabbage should just be starting to form a head. Carrots and parsnips should have a small but sturdy root, about the size of your little finger.

Preparing Plants for Storage

Biennial crops can either be overwintered directly in the field, or they can be dug up in the fall and moved to a cool storage place for the winter. Biennials need a period of exposure to cool temperatures in order to flower and produce seeds, but if it gets too cold, the plants will not survive. If you live in a region that regularly gets winter temperatures below 30 °F (-1°C), you should move your biennial crops to a root cellar or a cool basement before it gets too cold.

Timing: Biennial plants will be happy to be hit with a couple of light frosts, as it will help spur dormancy. Dig plants before night temperatures fall below 20 °F (-7 °C). A string of consecutive nights in the 23 to 27 °F range (-5 to -2 °C range) is a good sign that it's time.

Preparation: Cut all of the leaves off, being sure not to harm the meristem - the central growing point. Damage to the meristems can prevent growth of the plant's flower stalk. For root crops, cut back the leaves but leave about an inch of stem to keep the growing point intact. For some leafy greens, like kale and collards, the main growing point is at the top of the main stem. Crops can then be buried in a moistened medium such as sawdust, sand, or shredded leaves. Be careful not to put them in a medium that's too wet - you want the media to be dry enough that it doesn't support the growth of molds. Common media include sawdust, sand, and shredded leaves. Sawdust can be packed with peat moss to reduce the moisture content.

Ideal Storage

Ideal storage conditions for most biennials are cool and moist with temperatures just above freezing (35 to 39°F; 1 to 4°C). High humidity is important because it keeps the plants from wilting and dying, and a basement or root cellar makes a good storage environment. You can also pack the crops into a storage medium and put them into a refrigerator.

Spring Re-Planting and Seed Harvest

Replant your biennial crops in the field as soon as the soil can be worked in the spring, a few weeks before your last frost, at increased spacing so that crops have room to reach seed maturity; crops grown for seed often take up more space in the garden than crops grown for eating. Depending on the species, the plant will typically produce mature seeds by the middle to late part of its second growing season. Seed maturity varies by species and crop type, but below are some general rules for knowing how and when to harvest your seeds.

- Harvest brassicas when the seed pods are brown and dry. They shatter easily, so to thresh, invert the stalk into a tub and beat them around. Winnow with a fan or on a breezy day.
- For *apiaceae* crops, harvest flower heads when all of the seeds are brown and dry. Most *apiaceae* crops are relatively easy to thresh by rubbing between your hands.
- Harvest beets and chard when the seeds are brown and dry. Often some seeds near the tip of the seed stalk will be underdeveloped and green. Do not collect these. Seeds can be stripped by pulling the seed stalk through a loosely closed hand.
- Onion seed disperses readily, so to prevent seed loss, harvest alliums when 50% of the seed pods on a flower head have split open to expose the mature black seeds. Harvest umbels with 6-8" of green stalk still attached and bring inside to continue drying. While drying, the seeds will continue to ripen. Only collect the seeds which easily release from the umbel.

All biennial crops are dry fruits and seed processing is the same as dry-fruited annual crops. The first step is removing the seed from the plant or the fruit – a step known as threshing. Further cleaning, usually through screening and winnowing, then separates the seeds from the chaff. To store seeds until they're ready to be planted, keep them in a cool, dry, dark location.