**Bolting in vegetables**

Bolting is the term applied to vegetable crops when they prematurely run to seed, usually making them unusable. A cold spell or changes in day length initiates this behaviour. It can affect a wide range of vegetables including lettuce, spinach and fennel.

**Quick facts**

**Common name** Bolting

**Plants affected** Annual vegetables such as lettuce, spinach, and biennial vegetables that as onions, leeks, carrots, fennel and some of the cabbage family

**Main causes** Cold spells, changes in day length, prolonged dry periods

**Timing** Usually seen on crops which are approaching maturity

* [Cause](https://www.rhs.org.uk/advice/profile?pid=262#section-3)
* [Control](https://www.rhs.org.uk/advice/profile?pid=262#section-4)

**Cause**

Bolting is triggered either by cold spells or by the changes in day length through the seasons. Although bolting is only seen on crops approaching maturity, it is initiated much earlier.

Annual crops will flower naturally in the first year, whereas biennials do not usually flower until the second. In annual crops, bolting occurs before they are ready to gather and, in biennials, when an over-wintering organ (carrot roots for example) flowers before the winter.

**Annual crops**

Annual crops sensitive to photoperiod (how many hours of daylight received) include [lettuce](https://www.rhs.org.uk/Gardening/Grow-Your-Own/Veg-A-to-Z/Lettuce), some [radish](https://www.rhs.org.uk/Gardening/Grow-Your-Own/Veg-A-to-Z/Radish) cultivars and [spinach](https://www.rhs.org.uk/Gardening/Grow-Your-Own/Veg-A-to-Z/Spinach). They are long-day plants, which initiate flowers when day length increases. It is a natural progression for spring-sown annuals to run to seed as summer progresses, but this can happen prematurely under the influence of stress or day-length.

**Biennial crops**

Some biennial crops (which grow in the first year, flower in the second) such as [onions](https://www.rhs.org.uk/Gardening/Grow-Your-Own/Veg-A-to-Z/Onions---shallots), [leeks](https://www.rhs.org.uk/Gardening/Grow-Your-Own/Veg-A-to-Z/Leeks), [carrot](https://www.rhs.org.uk/Gardening/Grow-Your-Own/Veg-A-to-Z/Carrots) and [beetroot](https://www.rhs.org.uk/Gardening/Grow-Your-Own/Veg-A-to-Z/Beetroot) can initiate flowers in the first year. This is due to unsettled weather conditions early in the season and usually occurs after a prolonged cold spell, often during the propagation phase. Cold nights, hot days and late frosts may also contribute to premature initiation of flowering.

**Control**

Sowing times

* With cold-sensitive plants, [sowings](https://www.rhs.org.uk/advice/profile.aspx?PID=619) can be delayed until temperatures are more stable. This strategy is advisable for [endive](https://www.rhs.org.uk/Gardening/Grow-Your-Own/Veg-A-to-Z/Endive) and [Swiss chard](https://www.rhs.org.uk/Gardening/Grow-Your-Own/Veg-A-to-Z/Leaf-beat-Chard)
* Alternatively, for early crops of vegetables such as [onions](https://www.rhs.org.uk/Gardening/Grow-Your-Own/Veg-A-to-Z/Onions---shallots), [beetroot](https://www.rhs.org.uk/Gardening/Grow-Your-Own/Veg-A-to-Z/Beetroot) and [kohl rabi](https://www.rhs.org.uk/Gardening/Grow-Your-Own/Veg-A-to-Z/Kohl-rabi), plants can be raised in modules in a greenhouse and [planted out](https://www.rhs.org.uk/advice/profile.aspx?PID=721) when temperatures are warmer, or they can be directly sown under cloches or horticultural fleece to provide additional warmth
* Spring [cabbages](https://www.rhs.org.uk/Gardening/Grow-Your-Own/Veg-A-to-Z/Cabbage), which are always quick to bolt in spring, should be sown around 20 July (one week earlier in the north and one week later in the south). Although such crops will still run to seed in spring, they will bolt later than crops sown earlier, while later-sown crops may be too small to survive winter
* Successional sowings will also help to achieve a constant harvestable supply if the season is changeable
* To prevent bolting in [Chinese cabbage](https://www.rhs.org.uk/Gardening/Grow-Your-Own/Veg-A-to-Z/Chinese-cabbage) and other oriental brassicas, these crops should be sown from July onwards
* Vegetables such as radicchio, [Florence fennel](https://www.rhs.org.uk/Gardening/Grow-Your-Own/Veg-A-to-Z/Florence-fennel), and oriental greens bolt when the nights become warm – on average above 10-13°C (50-55°F)

**Soil conditions**

* Annuals will inevitably flower but good growing conditions will encourage rapid growth and formation of a usable portion (lettuce hearts, for example) and so an adequate crop should develop before flower production
* Dry soil can also encourage bolting, particularly with [cauliflower](https://www.rhs.org.uk/Gardening/Grow-Your-Own/Veg-A-to-Z/Cauliflower), [rocket](https://www.rhs.org.uk/Gardening/Grow-Your-Own/Veg-A-to-Z/Rocket) and [spinach](https://www.rhs.org.uk/Gardening/Grow-Your-Own/Veg-A-to-Z/Spinach). Careful watering can avoid this
* For over-wintered [onions](https://www.rhs.org.uk/Gardening/Grow-Your-Own/Veg-A-to-Z/Onions---shallots), bolting can be suppressed by topdressing with 70-100g per sq m (2-3oz per sq yd) of nitrogen rich fertiliser in January

**‘Bolt-resistant’ cultivars**

* Gardeners can grow specially-bred cultivars that are resistant to bolting, such as ‘Boltardy’ [beetroot](https://www.rhs.org.uk/Gardening/Grow-Your-Own/Veg-A-to-Z/Beetroot). These are useful for early sowings of annuals, such as spinach, and for sowings of biennials such as [onions](https://www.rhs.org.uk/Gardening/Grow-Your-Own/Veg-A-to-Z/Onions---shallots), [carrots](https://www.rhs.org.uk/Gardening/Grow-Your-Own/Veg-A-to-Z/Carrots) and [turnips](https://www.rhs.org.uk/Gardening/Grow-Your-Own/Veg-A-to-Z/Turnip) in autumn or early spring
* Red [onions](https://www.rhs.org.uk/Gardening/Grow-Your-Own/Veg-A-to-Z/Onions---shallots) seem to be more prone to bolting than white or brown types, so home trials are worthwhile. If bolting in onions is a recurring problem, plant heat-treated sets in early spring (exposure to high temperatures suppresses flower-bud formation)
* [Florence fennel](https://www.rhs.org.uk/Gardening/Grow-Your-Own/Veg-A-to-Z/Florence-fennel) is particularly prone to bolting so try AGM winners such as ‘Amigo’, ‘Victorio’ and ‘Pronto’ [F1](https://www.rhs.org.uk/advice/profile.aspx?PID=710) and sow in mid-summer