



# Seed dispersal

## Ensuring that their species thrives into the future is high on the list of priorities for plants!

Adaptations are the features of organisms that help them to survive and reproduce. One of the adaptations enabling plants to produce new plants, is a mechanism for distributing seeds and fruit to other sites with favourable growing conditions.

## Why is it important for the offspring of plants to disperse?

- Being too crowded can lead to too much competition for food, water and other essentials.
- Colonising new sites reduces the risk of a plant having all its proverbial eggs in one basket. For example, if all members of a species are crowded into one area the gene pool is more limited.
- Fire or disease could easily seal the fate of a species in an isolated patch of forest; if they are more widely dispersed, this risk is reduced enormously.

However, plants are faced with a range of strategic problems.

Imagine you are a plant setting seed: how will your seeds travel any distance and end up in suitable ground?

How do you ensure your offspring have enough energy reserves to give them a good start in life?

Moreover, there is the problem of making sure that enough of your seeds manage to germinate, having run the gauntlet of seed predators.

## Seed transportation

In response to these kinds of problems, plants and fungi have evolved some ingenious ways of using their environment to help them disperse and germinate:



**Wind** – some fruits are adapted to catching the wind and being blown away, such as sycamore helicopters, birch seed, dandelion ‘clocks’ and the downy hairs of the rosebay willow herb. Fungi produce tiny lightweight spores that carry easily on the breeze.



**Bursting** – the seeds of species such as peas, laburnum and gorse, burst suddenly throwing their seeds in all directions.



**Shakers** – poppy and red campion seed heads when dried by the sun, have little holes all around their top (like a salt and pepper pot). These shake when it’s windy and tiny little seeds are thrown out of the shaker through the holes.



**Water** – some fruits are waterproof and can float, such as the wings of alder cones which contain pockets of air that enable them to float on the water and root further downstream. Alder is typically, a riverside tree so this strategy helps continue its dispersal along watercourses ensuring they land in appropriate locations.



**Catching a lift** – some fruits have tiny little hooks on them such as burdocks and cleavers. These little hooks catch on passing animals if they brush against the plant and get carried away. Humans also play a part in this process: we have carried seeds far beyond their normal range on clothes and shoes. Some seeds are dispersed and pushed into the ground by the hooves of large mammals e.g. cows.



**Wild food** – lots of fruits are really tasty to animals such as blackberries, hawthorn or holly berries. When an animal eats these fruits, the little seeds are not digested and pass through the animal, unharmed and surrounded by fertiliser. Both parties benefit.



**Drop and roll** – the casing of the fruits from trees, such as horse chestnut, split when they land on the ground. On impact the fruit then rolls away from the tree.



## Seed Survival

As if transportation isn't enough, plants must ensure that at least some of their seeds avoid the many hungry mouths that inhabit the forest.

Many plants produce large numbers of seed to improve the chances of at least some seeds surviving. Heavier seeds, such as nuts and acorns, have large energy reserves, enabling them to spend time getting firmly established and giving them a better chance of surviving to maturity. However, all that weight causes problems with moving around and oak seeds are very reluctant to germinate in the shadow of their parents.

Jays play an important part in dispersing acorns and creating oak woodlands. Jays eat acorns and can carry up to five per flight for several kilometres. These birds store the acorns by burying them to eat later. In one autumn they can bury as many as 4,600 acorns and can remember their location. Harsh weather and hungry predators however, will take their share of jays and this enables some seeds to germinate.

Hazelnuts are often spread to new areas by squirrels and mice that may store them for later use. Again, while some seeds will be eaten, others aren't reclaimed and manage to grow. One strategy to reduce the risk of seeds being eaten is utilised by the hazel, which produces its nut with a protective shell that requires a lot of effort to get into.

Forest trees that have a lot of seed predators such as oak, have 'mast years' in which they produce a huge glut of seeds every few years. Seed predators, such as jays or squirrels, have their fill and while many seeds may end up in unsuitable ground, at least some are almost guaranteed to germinate. This does take a heavy toll on the tree's resources and the tree will produce hardly any acorns the following year to give itself time to recover.

These cycles have a powerful knock-on effect on the forest ecosystem. The abundant food allows seed predators - herbivores such as rodents - to raise more young than usual and there is a population explosion. This in turn can lead to an increase in predators. However, in the barren period that follows, populations may dip again.

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