

## The Oak Tree, *Quercus species*



**Habitat:** Oak trees can be found around the world across a tremendous diversity of terrestrial biomes. There are more than 80 species of oak in North America.

**Nutrients and Energy:** White and red oaks require slightly acidic, well drained soil from which they access their nutrients. Subterranean mycorrhizal fungi found along the roots of many plants, help oaks to acquire necessary nutrients from the soil. Oaks require full sun.

**Life Cycle/Reproduction:** Oaks are deciduous species and most drop their leaves each fall. The age of first reproduction varies with geographic and local position, tree density, and life span. In order to reproduce, oaks are wind pollinated. Growth of male flowers begins in the spring, they develop in the summer, and produce pollen the following spring. Female flowers develop in late winter or early spring. Acorns, the result of pollination, mature 3 months after fertilization. Birds and mammals are the major predators of acorns, but they also move acorns around.

**Dispersal:** Acorn survival to adulthood depends upon their movement. Small mammals that store acorns can disperse acorns short distances (mice) or greater distances (chipmunks and squirrels). Larger animals and birds tend to destroy the acorns. Some birds that utilize acorns only eat them and others store them above ground (leaving them to be consumed by other predators). Only birds such as jays, who store acorns below ground and "space hoard" - spreading their stash across space, actually facilitate the dispersal of acorns.

**Biotic interactions:** Acorns are a source of food for rodents, deer, birds, and other wildlife. Birds feed on leaf buds. Deer also feed on leaves and twigs while the tree is young. Invertebrates feed on the leaves or on other invertebrates. In particular, adult moths lay eggs on oak leaves. When the caterpillars hatch, they consume the leaves. Some insects cause the tree to produce "galls" outgrowths of the bark, in which the larvae will develop. Other insects, such as beetles, weevils, and spiders can also be found. Fungus and lichens can also grow on oaks.

### References

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Based on the fact sheet, what resources and conditions would favor the growth of a population of oaks? What resources and conditions would benefit an oak tree?

Organism	Resources	Conditions
<i>Quercus sp.</i> (Oak Tree)	<i>Nutrients and energy obtained from accessing available resources</i>	<b>Biotic Conditions</b> <i>Competition</i>
	-Energy, nutrients and water obtained from the sun, soil, and the atmosphere	-compete with other vegetation (oak or otherwise) for access to resources, including nutrients and sunlight
		<i>Predation/Death</i>
		-acorns are susceptible to predation by rodents
		-saplings are highly susceptible to destruction by pathogens
		-adults are susceptible to predation and destruction by invertebrates, especially gypsy moths
		-adults are susceptible to disease
		-trees can be destroyed by humans
		<i>Dispersal</i>
		-invest a significant amount of energy into one massive reproductive effort (masting event)
		-once acorns are released, depend on movement by animal vectors and chance of survival
		<b>Abiotic Conditions</b>
		-a suitable temperature
	-the availability of sunlight, water and air	