

Green and grand spruce

Photo: Leif Öster, Sveaskog's image bank



◀ Spruce cones develop from the red female flowers found at the ends of the branches and it takes about a year from the flower being fertilised to the cone releasing its seeds.

If you think of a lush and snug old forest, most people probably picture a spruce forest. Spruce thrive on damper ground and, thanks to the large number of green branches extending from the trunk, spruce forests become dense and a little mystical, a bit like a John Bauer painting. There are many different kinds of spruces, but in Sweden only the Norway spruce, or red fir, grows naturally. Spruce came to Sweden from the east some 3–5,000 years ago and spread rapidly. Today, spruce is the most common tree species in Sweden and is used for timber and paper production.

Spruce

Spruce is the most common tree in Swedish forests and occurs naturally throughout almost all of the country, with the exception of the very south of Sweden and the barren mountains. In Latin, the spruce tree belongs to the genus *Picea*, which includes approximately 35 different species found in Europe, Asia, North America and Mexico. The Norway spruce found in Sweden is called *Picea abies* in Latin, and is sometimes referred to as red fir, especially when talking about Christmas trees. Spruce trees have short needles and thin, smooth bark.

In the forest, spruce grow straight and tall and tolerate shade well, which means they can grow in already mature forests. Spruce thrive on slightly damper ground with good nutrient availability. They do, however, have fairly shallow root systems, so they are susceptible to being windthrown. The topmost branches point upwards while those further down the trunk face downwards. Compared to pine, which

develop branchless trunks in the forest, spruce keep their branches for a long time. Spruce vary greatly in shape, depending on their geographical location and surroundings. At higher altitudes in northern Sweden, spruce form narrow crowns and short branches to cope with the snow, while if spruce are allowed to develop freely in open areas, they can grow very broad with long, outstretched branches.

There is a variant of the Norway spruce known as snake branch spruce. It has a genetic mutation that prevents offshoots growing from its branches. Instead, it forms long, tail-like branches, reminiscent of a monkey's tail.

Spruce have large cones, and in southern Sweden they can grow up to 15 cm in length. The cones develop from the red female flowers found at the ends of the branches and it takes about a year from the flower being fertilised to the cone releasing its seeds. However, spruce do not flower every year, but rather when the weather is particularly favourable, which

means every three to ten years. The years in which spruce produce cones are referred to as cone years and some years they can produce so many cones that the treetops are almost snapped by the weight of all the cones.

On favourable land, spruce can grow up to 40 metres tall with a diameter at breast height of 3 metres. The tallest, most famous spruce in Sweden stood 48 metres tall and grew close to the norwegian border in Värmland. The broadest spruce ever seen has a diameter of 442 cm at breast height and is found in Linköping. Individual spruces can live for up to 400 years, but in forestry contexts they are logged when aged between 70 and 150 years. The oldest spruce in tree form is found in Njakaffjäll in Västerbotten County and was at least 587 years old when dated. The world's oldest spruce clone can be found in the mountains of Jämtland. The roots of Old Tjikko, as the tree is known, are more than 9,500 years old.

Spruce in the forest

A spruce forest is an interesting place for many reasons. Since spruce keep their branches so long, a mature spruce forest is shady and lush, and it is perhaps this type of forest many people picture when thinking of a forest. Black grouse like spruce when seeking shelter. Some spruce have very dense branchwork low on the trunk, known as skirted spruce in Swedish, and black grouse like to seek them out.

Spruce are quite susceptible to root and trunk damage, so different pests and fungi can easily infest damaged trees. *Heterobasidion annosum*, a fungus that causes root rot, is a major economic concern for the forest industry. It spreads from tree to tree either via the root systems or by means of spores that infest trunk or root damage. The rot decomposes the wood inside the tree, making the trunk unfit for use as

timber. Today, the forest industry works proactively to prevent the spread of root rot, but there are many groups of species in the forest that favour infested spruce. The spruce bark beetle is one of them. This is a beetle that bores its way under the bark and feeds on spruce exhibiting stress due to damage such as root rot.

The rot will eventually cause the infested spruce to fall, and as lying deadwood – or coarse woody debris – in a spruce forest it will provide a welcome habitat to a variety of species, including insects, lichen, moss and fungi. Such deadwood is essential to the forest and ensures a high level of thriving biodiversity.

Christmas trees

When Christmas approaches, the forest enters our homes in the shape of the Christmas tree. Sweden has an estimated 4.5 million households, and 3 million of them will have a Christmas tree. The idea of a Christmas tree originates from Germany, where they have been around since the 1600s, becoming common in Swedish homes in the second half of the 1800s. Back then, Christmas trees were quite small and were placed on a table or hung from the ceiling. The tree was decorated with edible items, such as confectionary and apples. Today, some 2.8 million Christmas trees are logged in Sweden, mainly red fir. Logging your own spruce in the forest is prohibited without permission from the landowner. Some 400,000 spruces are imported, mainly from Denmark, and this is usually a different type of fir, such as Nordmann fir.

Fir is a genus separate from red spruce and is called *Abies*, and is not found naturally in Sweden. Christmas tree plantations are a major industry in Denmark and are regarded as agriculture rather than forestry. Each year they harvest more than 10 million Christmas trees, and in addition to this fir trees are also grown to harvest twigs and branches for flower arrangements and wreaths.

Spruce use

Today, spruce is a very popular tree species in the forest industry. It has long, thin fibres, making spruce very suitable for use in paper production. The paper is then used for magazines, packaging and other items. The wood, which is both soft and durable, is used for various constructions and building elements.

Another product that can be extracted from spruce is the flavouring agent vanillin. Vanillin tastes like vanilla, but unlike real vanilla can be produced on an industrial scale from, for example, rotten spruce wood.



Photo: Leif Öster, Sveaskog's image bank

▲ Spruce forest veiled with hanging lichen.

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Project PINUS, a project for innovative experiences in managed forests, aims to gather the tourism industry, the forest industry and forestry academia in efforts to create opportunities for tourism in managed forests. Project PINUS began in August 2016 and runs until November 2019. The Museum of Forestry in Lycksele is the project owner.



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