Special forms of forest trees for landscaping

Weeping spruce (*Picea abies* f. *pendula*) and golden spruce (*Picea abies* f. *aurea*)

METLA

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Betula pendula 'Dalecarlica'

Among the normal trees in our forests there are, as rare whims of nature, a variety of peculiar tree forms: golden and weeping spruces, dense dwarf spruces, pyramid pines, witches' broom pines, red and golden birches, cut-leaf birches and alders. These special forms of our common spruce, pine, birch and alder are often real rarities that are worth being protected in the same way as other rarities in nature.

Caused by natural mutations

If you find a tree with characteristics that clearly deviate from the norm, and the differences cannot be explained by environmental or other external factors, the phenomenon is caused by a mutation, i.e. a change in its genetic material. If the change has already occurred in pollen or an egg cell, the altered genetic code will be passed on to all cells of the new individual. Examples of such mutations are the golden spruce and the cut-leaf birch. However, if the mutation occurred in the vegetative bud, the change will be limited to that part of the tree, which is developed from the genetically altered bud. The witches' brooms, found in spruce and pine, are considered to be the results of bud mutations - the witches' broom of birch is, however, caused by a fungus.

Various forms and varieties of forest trees have been studied at the Finnish Forest Research Institute (Metla) since the 1930's. In its forest genetic register, Metla has records of 1300 individual trees that are genetic deviants of our native tree species. Many of these have also been conserved in clone archives and arboretums, of which the best-known are the Haapastensyrjä Special Tree Park in southern Finland and the Punkaharju Arboretum in eastern Finland.

Haapastensyrjä Special Tree Park

Kuvat: Metla/Teijo Nikkanen

Breeding of special forms of trees

When breeding, selection and artificial crosses between rare forms are used, a breeder can create new combinations of traits that have not been found anywhere in nature. A new form with desired characteristics can be multiplied into millions of copies by means of vegetative propagation.

Crossing between the compact globe spruce (*Picea abies f. globosa*) and the red coloured spruce (*Picea abies f. cruenta*)

In Metla's project "Special trees and exotic tree species" a small number of crossings between various forms of forest trees were recently produced in order to find new, decorative tree forms for ornamental use. New special forms raised this way are crossings between the red coloured spruce (*Picea abies* f. *cruenta*), the weeping spruce (*P. abies* f. *pendula*) and the compact globe spruce (*P. abies* f. *globosa*).

Use of special tree forms as ornamental trees

The utilisation of special tree forms usually requires vegetative propagation. In this way, the traits of the parent tree are passed on to the cloned offspring. Methods used for vegetative propagation include grafting, cuttings and tissue culture. When using seed propagation, it is often impossible to reproduce the special tree form, because the desired trait is usually recessive. Globe spruces and cut-leaf birches are, however, known to be born through seed.

Tree nursery operators and landscape architects have been interested in special tree forms for several years. However, the demand and supply of hardy, domestic special tree forms have not always been balanced. In Finland, as in the entire Nordic region, the market now demands consistent and sustainable production of at least a small selection of hardy, decorative ornamental conifers. These could replace the less hardy imports from Central Europe and would be suitable for use in landscaping under the harsh Nordic conditions.

Betula pubescens f. rubra

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