

## New Woody Plants for Gardening in Denmark<sup>®</sup>

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### INTRODUCTION

The term "new plant" includes new cultivars within known species as well as new species which have not earlier been grown in Denmark. The new plants described here are all tested for specific diseases according to the Departmental Order no. 576 of 7 July 1999, from the Danish Plant Directorate, and nuclear stock plants are available.

For 35 years the Danish Institute of Agricultural Sciences has developed new plants. It takes 10 to 20 years to develop a good new plant which is tested under Danish climate conditions. For example, we have been working on a new introduction of *Stachyurus praecox* from Japan for 15 years. The following describes some of the new plants selected for Danish growth conditions.

***Abelia* × *grandiflora* 'Nanna'**. *Abelia* is a genus closely related to *Kolkwitzia*, and only includes low shrubs, 1 to 1.5 m tall. This makes the genus interesting for gardening, because gardens of today are often small. In countries like Japan and U.S.A. *Abelia* species are commonly cultivated, but not in Denmark because no hardy cultivars have been available. Another feature of *Abelia* is that many species flower in late summer. 'Nanna' is a new Danish selection, named after Balder's wife in the Nordic Mythology. The cultivar was selected from materials collected in the U.S.A. and Japan. It seems, to be closely related to the cultivar 'Edward Goucher'. It is a deciduous or partly evergreen shrub, which after 10 years becomes about 1.5 m tall. The main branches are upright or arching, side branches are arching, and leaves are ovoid elliptic, pointed, 3 to 5 cm long, 1.5 to 2.5 cm broad, shining dark green, and not hairy. It flowers for a long period from August throughout the autumn until the frost sets in. Flowers are about 2 cm long, tubular to funnel shaped, pink and arranged with two to four together on short shoots. The cultivar needs a warm sunny protected place, and can freeze back in strong winters, but will flower on the new young shoots.

***Aronia arbutifolia* 'Brage'**. This cultivar which was selected through three generations of seed-produced plants is named after Brage in the Nordic Mythology. It is a deciduous, upright growing, densely branched shrub, about 1 m tall and about 1 m broad, which develops a few suckers. Leaves are 5 to 7 cm long, 2.5 to 3.5 cm broad, elliptic, smooth on both sides, green in the summer and turning bright red in the autumn. Flowers are white in May and produce rather small fruits which are about 0.8 cm in diameter. Fruits turn red in August and during September they turn brown red and can stay so until November.

***Aronia* × *prunifolia* 'Gorm'**. 'Gorm' is named after the Danish king Gorm the Old. The cultivar is selected through three generations of seed-produced plants. 'Gorm' is a deciduous, upright growing shrub, 1 to 1.3 m tall, with rather thin main branches producing an open growth, and no suckers. Leaves are 4 to 7 cm long, 2.5 to 3.5 cm broad, elliptic, slightly hairy on the lower side, smoothed on the upper side, and they turn bright red in the autumn. Flowers are white and appear on short shoots in May. Fruits turn shiny black in August, they are hard, rounded, about 1 cm in diameter

and often remain on the plants until December after leaf fall. They are not very much appreciated by birds, as with *A. melanocarpa*.

***Kolkwitzia amabilis* 'Syvdal'**. 'Syvdal' is named after a small valley in the Geographical Garden in Kolding, which was originally a part of Aksel Olsen's nursery, who introduced *Kolkwitzia* to Denmark. 'Syvdal' is a deciduous shrub, 2 to 3 m tall (in Denmark densely branched with many short shoots on the arching branches). Leaves are dark green, 5 to 8 cm long, 2 to 4 cm broad, and are slightly hairy on the upper side. Leaves are largest on 1-year-old long shoots. Flowers are bell shaped, pink, but darker pink than in many other selections. They flower from the middle of June till July.

***Syringa meyeri* 'Heimdal'**. 'Heimdal' is named after a person in the Nordic Mythology and is a clonal selection. A large number of very different clones were collected from nurseries, parks, and botanical collections. Trials showed that clones grown as different *Syringa* species all belonged to *S. meyeri* but had quite different habits. 'Heimdal' is a deciduous shrub, which after 10 years becomes 1 m tall and 1 m broad. It is densely branched with upright main shoots forming a regular nearly rounded shrub. Leaves are broad, elliptic, 2 to 4 cm long, and 1.5 to 2.5 cm broad. The leaves sprout normally in May and fall in October. Flowers appear in June, always in abundance on 8 to 10 cm long racemes, the single flower is tubular red-lilac with a nice smell. The cultivar flowers well every year, which shows that it is suitable in the rather cold Danish climate, sometimes the cultivar can flower a little in August. The cultivar has proved to be completely hardy.

***Thuja plicata* × *T. standishii* 'Rebild'**. 'Rebild' was selected among seedlings from the hybrid *T. plicata* × *T. standishii* by the late Dr. Bent Søgård. The hybrid has the advantage of being resistant to the leaf fungus (*Didymascella thujina*), which is often a problem in *T. plicata* and causes leaf fall. The new cultivar has been submitted for plant breeders' rights. The characteristic of this new cultivar is its rapid growth and after 15 years it is about 10 m tall and 4 m broad at the bottom. The habit of growth is upright with normally one trunk. It is pyramidal and densely branched with horizontal side branches. Branches are typical for *Thuja* with a flat branching system. Side branches are upright with an angle of about 45°. Needle colour on the upper side is dark green, (HC 139AB), the lower side is white spotted due to the glands, but less clear compared to that of *T. plicata*, but clearly distinct from *T. occidentalis*. The colour of the needles below is 143BC. 'Rebild' has a more columnar and densely branched habit than *T. plicata*, and differs from *T. standishii* with a denser and more rapid growth. The top shoot is upright while it is hanging in *T. plicata*. The cultivar has to be vegetatively propagated, which is rather easily done by cuttings just like other *Thuja*. The cultivar has the potential of being used for shelter, hedges, and perhaps wood production. It is perfectly hardy and can stand much wind, although not doing too well on open land in maritime areas.

***Viburnum* × *pragense* 'Kraka'**. 'Kraka' was selected in material from the Botanical Garden in Copenhagen on recommendation of curator Olaf Olsen. The selection came to Hornum in 1976.

The reason for selecting 'Kraka' was that it could to some extent replace *Cotoneaster salicifolius*, which was very susceptible to the disease fireblight. Further, 'Kraka' has also a more decorative growth than *V. rhytidophyllum*. 'Kraka' has proved to be totally hardy during the testing period. 'Kraka' is an evergreen

shrub becoming 2.5 to 4.0 m tall and about 2 to 3 m broad with few main branches from the bottom, side branches horizontal to upright, with a rather open branching system. Leaves are elliptic, 7 to 20 cm long, 2 to 5 cm broad, upper side dark green, shiny, a little shrinky, the lower side is densely yellow-grey with woolly hair. Flowers are small, white, in large corymbs. It flowers in June, and the fruits are first red and later black, but they are not common, probably due to self-sterility. The species has much in common with *V. rhytidophyllum*.

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## Genetic Fingerprinting. What Is It? – And What Is it Used For?®

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### INTRODUCTION

Methods for DNA fingerprinting were originally developed for use in forensic medicine but are now widely used for many purposes concerning analyses of practically any kind of biological system. This mini-review is intended to introduce the concept of DNA fingerprinting; it is in no way an exhaustive and detailed description of techniques and their applications. Rather, the purpose is to present a few examples of the use of fingerprinting, and thereby hopefully enable the plant breeder or propagator to consider whether a problem may be solved easier by using some kind of DNA fingerprinting.

### WHAT IS A GENETIC FINGERPRINT?

In essence, a genetic fingerprint is simply a “bar code” that can be used for identification of a preparation of DNA. It will be necessary briefly to discuss various methods and their strengths and weaknesses, but hopefully this will not blur the main purpose of this paper.

The production of a genetic fingerprint can be divided into three steps:

- 1) Isolation of DNA from the material under investigation.
- 2) Performance of some kind of enzymatic reaction using the isolated DNA.
- 3) Analysis of the outcome of step 2 (usually by gel-electrophoresis).

**Isolation of DNA.** DNA can be isolated from practically any tissue but generally some kind of soft tissue (leaf, shoot) is preferred. Less than 0.1 µg of DNA is needed for making several fingerprints. As a very broad rule of thumb it can be said that a satisfactory yield of DNA can be obtained from 1 cm<sup>2</sup> of leaf material. One person can handle up to 50 DNA isolations per day.

**Enzymatic Reactions.** A number of different procedures have been developed for producing genetic fingerprints. Most of the currently used methods are based on the “Polymerase Chain Reaction” (PCR), but the principles of the procedures will not be described here. There is an ever increasing confusion in the names of the various procedures. I will try to compare three principally different methods: RAPD