

## Toresa®

### Ralf Schilling

Toresa® Deutschland GmbH, Hildesheimer Strasse 3, D-31 185 Söhlde, Germany

### INTRODUCTION

Systematic development of wood fibre products for horticultural purposes was initiated in France at the end of the 1980s by Elf Aquitaine (Horti-Fibre). A critical part in these developments was played by the two Swiss, Gerhard Baumann and Prof. Penningsfeld. Prof. Penningsfeld was at that time head of the Institute of Soil Science and Plant Nutrition at the University for Applied Science, in Weihenstephan. A fundamental problem encountered during early development was the substantial nitrogen fixation that occurred with wood fibres which could not be solved using the technology available to Horti-Fibre at that time. But Baumann and Penningsfeld refused to give up and continued to develop new ideas. These ideas have been further developed and improved, and still form the basis of the Toresa® product today.

By 1990 these developments had reached the stage of the product being patented and the first production site for Toresa® being established in Switzerland.

Experience was accumulated and the products were further developed. Important help in the early years was the strong involvement of the Migros-Genossenschaftsbund, a retailing chain with a dominant position in the market in Switzerland, which has placed its power very heavily behind ecological products. This company does not stock potting composts and substrates containing peat at its stores and prefers to have plants cultivated with reduced or no peat in its garden centres and flower shops. There have also been similar developments in Germany for some years, where leading retail chains, such as the DIY chain, OBI, offer a completely peat-free range in addition to its conventional compost range.

At present there are four Toresa® locations in Switzerland, Austria, The Netherlands, and Germany which operate as separate companies independently of each other. About 200,000 m<sup>3</sup> of Toresa® wood fibre will be produced and distributed at these four sites in 1999, about 80,000 m<sup>3</sup> of which is produced in Germany alone. After the first production site in Switzerland already mentioned, Toresa Netherlands came into being near Amsterdam in 1992. Then in 1995, TD was set up by the Vereinigte Kreidewerke Dammann KG, a well known lime producer in Germany. At the same time the building of a production site on the property of the shareholder, Vereinigte Kreidewerke in Lagerdorf, about 130 km south of Flensburg, was being tackled. It was easy to incorporate Toresa® production in the existing operational infrastructure at the Vereinigte Kreidewerke site in Lagerdorf. In the Pinneberg district one of the major German tree nursery areas is located on the doorstep and major German peat and substrate companies are also close to this area.

### MANUFACTURING AND QUALITATIVE ASPECTS

Toresa® is manufactured from untreated sawn wood residue, mainly from conifers (spruce/pine). Large quantities of these woods accumulate during the production of sawn timber in sawmills. Toresa Deutschland receives the wood, already fractionated, in the form of so-called wood chippings from North German sawmills. The quality of the products is affected strongly by the quality of the woods used.

Therefore, Toresa Deutschland understandably pays a great deal of attention to the quality of the raw materials and monitors them thoroughly. All incoming raw materials are analysed, as are all outgoing products and documented as part of the quality-assurance system. A fundamental quality feature of Toresa®, which also forms part of the patented production process, is compensating for the microbial nitrogen fixation in the wood by means of a precisely adjusted nutrient supply, which has been adapted to the requirements of the microorganisms in the course of lengthy tests.

Microbiological activity is greatly improved in loose, open-structured wood substrates. During the decomposition of the organic substance (carbon), these microorganisms need nitrogen to build up their protein components. Therefore, the so-called nutrient impregnation constitutes the nutrients for the microorganisms present in the wood and not for the cultivated plants. The Toresa® know-how consists in fertiliser formulation adapted to the microorganisms, and it is protected by patent.

The wood chippings are mechanically ground together with an accurately specified quantity of nutrient compounds in so-called retruders (similar to a meat-mincing machine), and the fertiliser components are pressed into the wood's cell structure. The amount of fertiliser can be kept very low as a result of this very homogeneous and intensive mixing. The nutrients are forced into the wood fibres by high pressure created during production. Toresa® adds a minimal quantity of brown coal to give the finished product a dark, soil-like colour. These colorants are of a purely cosmetic nature and do not have any significant effect on the product's properties.

Among the outstanding features of Toresa® are its good structural stability, high air capacity, and low bulk density. Because of a high air capacity, Toresa® improves the drainage and aeration of the substrate which encourages root growth and keeps the roots healthy.

There is considerably less risk of root diseases than with conventional peat substrates. This is particularly evident in systems with ebb-and-flood irrigation. Because of its good structural properties, Toresa® can be used to improve all types of substrates, especially fairly fine and heavy substrates containing compost or clay.

Improved aeration and drainage result in a lower water-retention level than with peat. However, the re-wettability of Toresa®, or substrates containing Toresa®, is considerably better. Experiments show that because the pot's surface dries faster, the growth of moss and weeds is also noticeably lower in substrates containing Toresa® compared to peat.

The decisive factor with Toresa® is that the nitrogen fixing generally seen with wood fibre products does not occur due to the impregnation already mentioned. Therefore, you can maintain your standard method of cultivation and fertilisation. It is only with higher Toresa® proportions, from about 40% to 50%, that slight adjustments to the watering intervals will be necessary, but no change in fertilisation.

## **ADVANTAGES OF TORESA®**

The following may be mentioned as the primary advantages of Toresa®:

- Highly dependable cultivation as a result of constant delivered quality.
- Neutral nutrient behaviour.
- Permanently good structural properties.
- Good wettability.
- Absolute freedom from weed seeds and pests.

Furthermore, Toresa<sup>®</sup> is manufactured from renewable indigenous raw materials and consequently is an ecologically sound material.

Toresa<sup>®</sup> can be used for substrates for containerized plants in proportions up to 70%. Quantities of 20% to 40% are usually mixed into commercially available substrates. Substrates containing Toresa<sup>®</sup> can be processed without problems in potting machines, but if possible, potting pressure should be somewhat firmer when the proportion is higher than 50%. If the pot size is less than 8 cm, it should be tested whether mechanical filling of the pots works without problems. Fertilisation is also done in the usual way, because Toresa<sup>®</sup> only contains the amount of nutrients that it consumes itself during microbial activity.

Toresa<sup>®</sup>'s pH value is 5 to 6 and it is here that the only fundamental difference, compared to conventional potting substrates, exists. Since Toresa<sup>®</sup> itself does not buffer the pH, the Toresa<sup>®</sup> substrate mixtures do not have to be limed in order to adjust the pH value. Therefore, a peat substrate consisting of peat and Toresa<sup>®</sup> (3 : 2, v/v) only has 60% of the usual quantity of lime added.

Germany, a country which used to have extensive and good reserves of peat, is now following the trend in Denmark and other European countries, and is importing large quantities of raw materials from the Baltic, for example, because its own raw materials are, to a certain extent, no longer adequate for horticultural requirements. Approximately 80,000 m<sup>3</sup> of pure Toresa<sup>®</sup> will be used in Germany this year. If it is assumed that on average a 30% proportion of Toresa<sup>®</sup> will be used in substrate mixtures, this means a total substrate quantity of about 240,000 m<sup>3</sup>.

Toresa<sup>®</sup> is manufactured from indigenous fast-growing conifer timber. When combined with indigenous peat, even finer qualities may result, and there are technically perfect, excellently structured and effective substrates available for Toresa<sup>®</sup>.

There is a gradual trend in Austria, Switzerland, and Germany for horticulturists to include substrates containing Toresa<sup>®</sup> in their sales range and to exploit this ecological aspect in their marketing. The Danish firms, such as Nygaards Planteskole and Gartneriet Allan Magelund, are also using Toresa<sup>®</sup>.