



### Utilization of fiber sludge from the forest industry in arable farming

Approximately 420,000 dry matter tonnes of fiber sludge is created annually in Finnish forest industry. They contain mainly wood derived substances such as fibers, lignin, cellulose and peel pulp. Most of the sludge is burned, but some are processed for utilization in agriculture as soil amendments.

Soil amendments processed from fiber sludge are called soil improvement fibers. Low-nutrient zero-fibers are ideal for field parcels that have high soil test phosphorus classes and when terminating crops that contain plenty of nitrogen. The more nutrient-rich nutrient fibers have been treated by composting or lime stabilization and can be used to replace mineral fertilizers.

Soil improvement fibers are used to improve the structure and water retention capacity of the soil, and to increase the amount of soil organic matter. Fibers are also utilized in water conservation. In experiments by the Natural Resources Institute Finland, soil improvement fibers added to the soil (50 t/ha) halved the concentrations of suspended solids and particulate phosphorus in runoff water. The positive effect lasted for several years.

The soil improvement fibers are suitable for various soil types and catchment areas, but most benefits are obtained in mineral soils with low organic matter content. A good time for spreading is in the autumn after early harvests or when terminating the grass vegetation. Spreading volumes are high at 20–50 t/ha. Fibers can be spread using, for example, dry manure spreading equipment, or the spreading can be queried from a fiber supplier. The fiber is prepared in the soil surface layer within one day of application. The fiber treatment can be renewed after a few years.

#### Attention:

1. Soil improvement fibers are rich in carbon. While microbes decompose carbon, nitrogen is bound to microbial mass. When applying nutrient-poor zero fiber, the next crop may need additional nitrogen fertilizing.
2. The product description contains a recommendation on the amount of application and when it is possible to renew the fiber treatment. The spreading amount of fiber may be limited by the cadmium content in the fiber. Over the five-year period considered, no more than 7.5 grams of cadmium per hectare in the soil may be accumulated.



#### KEY WORDS

Arable farming, fiber sludge, nutrient-rich fiber, pulp and paper industry, soil amendment, zero fiber, water protection

#### COUNTRY

Finland

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**ADDITIONAL INFORMATION**

Soilfood is a circular economy company, whose goal is to replace virgin raw materials with recycled materials quickly and in large volumes. At the same time, Soilfood works in co-operation with its customers to reduce emissions and increase carbon removals into the soil. Soilfood offers side stream processing services, which help companies achieve their emissions and recycling targets. Soilfood refines nutrient, fiber, lime and carbon-based side streams into high-quality fertilizers and soil improvers. The product range includes organic fertilizers, effective limes, and innovative Soil Improvement Fibers. The products replace fossil fertilizers with locally produced recycled fertilizers and thus also support agricultural self-sufficiency and the profitability of cultivation.

Soil Improvement Fibers are carbon-rich soil amendment products that are manufactured from pulp and paper industry side-streams. Typically, a fiber application of 20–50 tons per hectare adds significant amount of organic matter and nutrients to soil. Soil Improvement Fibers are proven to be an effective way to improve soil aggregation and structure, improve water infiltration, increase soil water and nutrient holding capacities and overall soil condition and health.

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Photos: Paula Luodeslampi (VHVSY) and Soilfood

**ABOUT BRANCHES**

**BRANCHES** is a H2020 “Coordinator Support Action” project, that brings together 12 partners from 5 different countries. The overall objective of **BRANCHES** is to foster knowledge transfer and innovation in rural areas (agriculture and forestry), enhancing the viability and competitiveness of biomass supply chains and promoting innovative technologies, rural bioeconomy solutions and sustainable agricultural and forest management.



This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No. 101000375

**THE PARTNERSHIP**

