

# Info-sheet

SECURE-BIO-SUPPLY

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## Insights from recent studies on methods for improving the storability of wood chips

### The addition of slaked lime, $\text{Ca}(\text{OH})_2$

Wood generally has an acidic pH of 3–6, which fungi prefer. Fungi degrades wood, but by making the environment in the wood chip pile alkaline (pH ~9), the growth of fungi can be restrained. Slaked lime,  $\text{Ca}(\text{OH})_2$ , has a pH of 11–12.6, is cheap and easy to apply, and can have a positive effect on the combustion of wood chips since calcium-based additives can reduce ash slagging in biofuels (Dumfort et al., 2021). The authors investigated the effects of adding  $\text{Ca}(\text{OH})_2$  to Norway Spruce logging residue wood chips.



**Figure 1**, mixing of the slaked lime with wood chips. Taken from Dumfort et al. (2021). CC BY.

The chips were mixed with  $\text{Ca}(\text{OH})_2$  using a wheel loader. The wood chip piles were stored for four months outdoors without coverage in Austria. The dry matter losses of the pile without added  $\text{Ca}(\text{OH})_2$  and a pile containing 3.0% (dry mass basis) of  $\text{Ca}(\text{OH})_2$  was 15.1% and 9.0%, respectively. The study thus showed promising results for  $\text{Ca}(\text{OH})_2$ 's ability to improve the storability of wood chips. However, the mixing of  $\text{Ca}(\text{OH})_2$  into the wood chips using the wheel loader was time-consuming. Further studies would have to be conducted on the economic feasibility and how to efficiently add the  $\text{Ca}(\text{OH})_2$ .

### Livotech Suoja®, a bio-based cover

Livotech Suoja® is a bio-based cover developed to protect biofuel piles from rain and meltwater. It consists of a mixture of water, pulp fibre and a binding agent, and is applied by spraying a thin layer on the biomass pile to be covered. The product was tested on stemwood chip piles consisting mostly of Norway Spruce and Scots Pine in a 6-month trial in Kuopio (Prinz et al., 2022). The average dry matter losses in uncovered, Livotech Suoja® covered and plastic-



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covered piles were 4.24%, 4.3% and 2.87%, respectively. On average, the Livetech Suoja® and plastic-covered piles dried by 11% and 22%, respectively, while the uncovered piles got 3% wetter.



**Figure 2**, covering of wood chip piles with Livetech Suoja®. Taken from Prinz et al. (2022), source: Luke/Robert Prinz. CC BY.

### Acrylic crusting product

A study carried out in Italy by Picchi et al. (2024) tested an acrylic crusting product, a protective coating originally applied on coal piles to control dust emissions and limit rewetting from rain, on wood chip piles. The solution was sprayed on piles, and the effects on the moisture contents of the piles were examined. The untreated piles performed better than the treated piles. The protective coating seemed to slightly reduce the moisture dispersal through evaporation from the pile, rather than limit the water intake from rain. The crusting product likely does not work

on wood chip piles due to their more porous nature compared to coal stockpiles.



**Figure 3**, The spraying of an acrylic crusting product on a wood chip pile. Taken from Picchi et al. (2024). CC BY.

### References:

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- Prinz, R., Routa, J., Anerud, E., Bergström, D., Sikanen, L., 2022. Performance of an Innovative Bio-Based Wood Chip Storage Pile Cover—Can It Replace Plastic Tarps? *Energies* 15, 1680. <https://doi.org/10.3390/en15051680>

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**SECURE-BIO-SUPPLY**- Development of Long-Term Storage of Solid Biofuels to Enable a Sustainable Energy Transition

#### Contact us:

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#### Project information:

**Time period:** 1.3.2024–28.2.2026

**Project Owner:** Åbo Akademi University

**Project partners:** Novia University of Applied Sciences, Finnish Forest Centre

**Financier:** EU-FRO Just Transition Fund (Ostrobothnia's FRO (JTF) call 2/2023.) The Regional Council of Ostrobothnia.

The goal of the **SECURE-BIO-SUPPLY** project is to analyse the challenges and opportunities that changes in long-term fuel storage can create in Ostrobothnia.



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