



*Forschung, Technologie, Innovation:
Highlights der Biobasierten Industrie*

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12. Dezember

SUSFERT – „from Waste to Value“





SUSFERT



BBI JU Kontribution: €6.6 million



Laufzeit: 1 Mai 2018 – 31 Dezember 2023

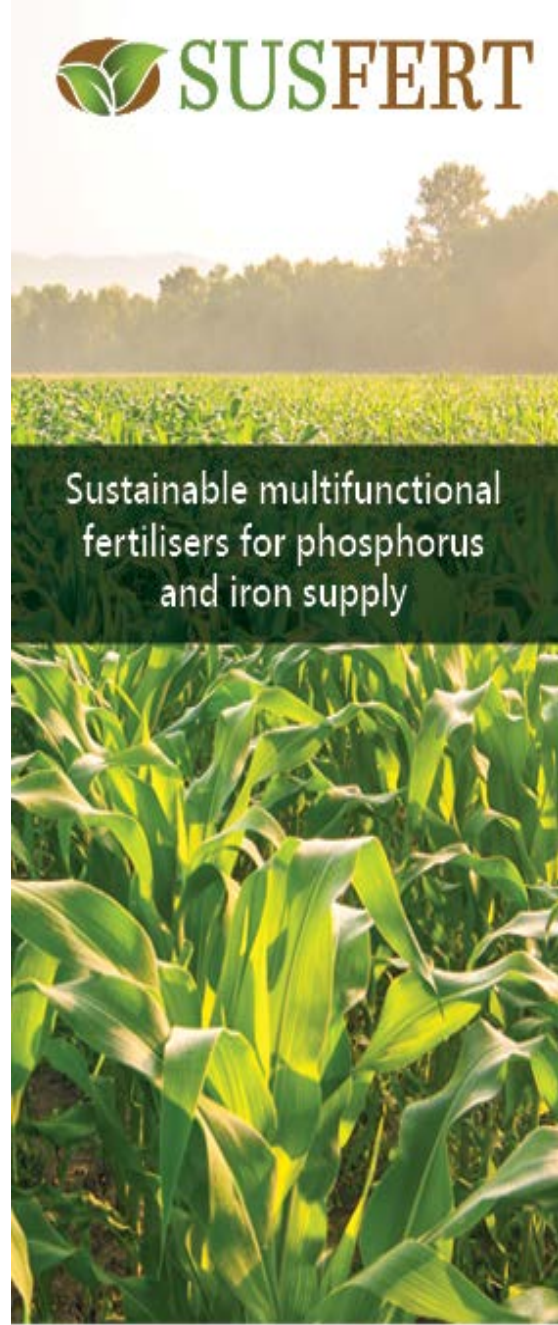


SUSFERT entwickelt nachhaltige, multifunktionale Düngemittel für Phosphor und Eisenversorgung. Es kombiniert biobasierte und biologisch abbaubare „**Coatings**“ für die kontrollierte Freisetzung; **Probiotika**, um die Nährstoffverfügbarkeit zu erhöhen, erneuerbaren Phosphorquellen-**Struvit**, Lignin basierte „**soil improvers**“, und „**nutrigels**“ um den Nährstoff in den Pflanzen zu erhöhen.



SUSFERT Impacts

- 1) **Verringerung der Abhängigkeit von abgebautem Phosphor um 40%**
- 2) **Stärkung der Kreislaufwirtschaft durch Verwertung von Nebenerzeugnissen / Side Streams**
- 3) **Verbesserung der Böden**
- 4) **Verringerung der Bodenverschmutzung durch weniger häufiges Ausbringen von Düngemitteln**
- 5) **Verbesserung des Wasserhaltevermögens**
- 6) **Kontrollierte Nährstofffreisetzung**
- 7) **Innovative grüne Technologien gemeinsam demonstrieren**



Sustainable multifunctional
fertilisers for phosphorus
and iron supply



**SUSKITS in NaKu-
Flaschen
aus natürlichem
Kunststoff**

SUSKITS - 9 prototype solutions for sustainable fertilisers



SUSFERT KEPs

- Neue mikrobielle Produkte
- Siderophore
- Biobasierte, vollständig biologisch abbaubare “Coatings” mit kontrollierter Freisetzung für Düngemittelanwendungen
- Granulierte, Mikrogranulate und Flüssigdünger mit kontrollierter Freisetzungskapazität
- Soil Improvers auf Lignosulfonatbasis für Landwirtschaft und Rasen
- Probiotika, Mikroorganismen, NPK und biobasierte Düngemittel in AgroBiogel zur Umwandlung in Nutrigels



AGRANA Stärke – SUSFERT – Vollständige Rohstoffverwertung
Wien, 12.12.2023



Unternehmen AGRANA Stärke



AGRANA besitzt
einen der
führenden Bio-
Händler in den USA



1.050
Mitarbeiter



5
Fabriken



€1,1 Mrd.
Umsatz



Umwelt, soziale Themen,
Governance: Entschlossen,
Verantwortung für Mensch und Natur
zu übernehmen, verfolgt AGRANA
ambitionierte Nachhaltigkeitsziele.

- ✓ Wir verfolgen das Prinzip der vollständigen Rohstoffverwertung
- ✓ Bewährte nachhaltige landwirtschaftliche Produktion



Regionale Landwirtschaft



- ✓ Wir schaffen durch den regionalen Einkauf von Rohstoffen Werte in der Umgebung.
- ✓ Das spart CO₂ und stärkt die regionale Landwirtschaft.

Futter- & Düngemittel

Hohe Qualitätsstandards
(Mykotoxinüberwachung)

Düngemittel für biologische
Landwirtschaft

Futtermittel für Nutztiere,
Haustiere und Aquakultur



Biobasierte Düngemittel

Produktion und Inhaltsstoffe

- Fermentation oder Abbau organischer Materialien

Vielfalt der Arten

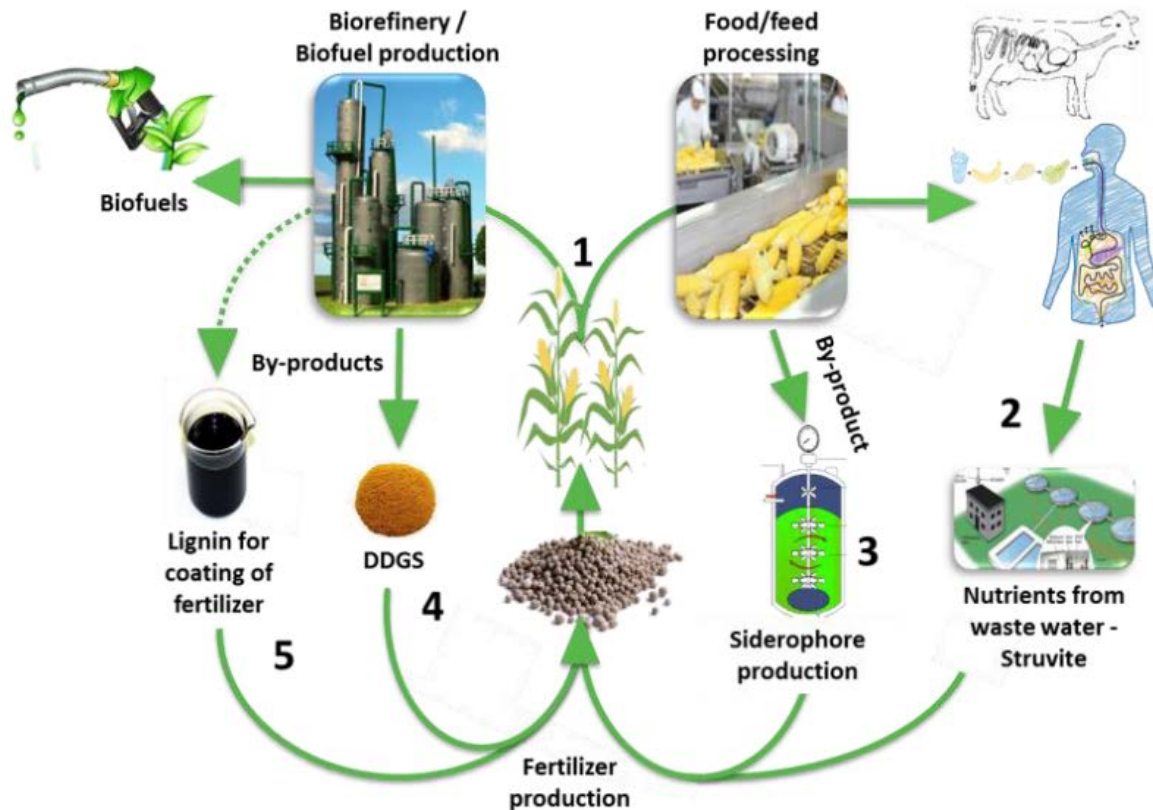
- z.B. organische Dünger wie **BioAgenasol**[®]

Erneuerbare Ressourcen

- Schließung der Kreislaufwirtschaft



Schließung der Kreislaufwirtschaft



✓ *Bedeutende Verbindung*

- (Re-) Upcycling organischer Abfälle
- Ressourceneffizienz
- Kohlenstoff-Sequestrierung
- Geringere Umweltbelastung
- Verbesserte Bodengesundheit
- Unterstützung der lokalen Landwirtschaft

BioAgenasol® – Organischer Dünger

- Rein pflanzlich – frei von tierischen Bestandteilen
- Zugelassen für die biologische Landwirtschaft
- Produziert in Österreich, Pischelsdorf (Bioethanol Produktion)
- “Rohstoffe” von AGRANA Nebenprodukten:

DDGS + flüssige Nebenprodukte z.B. Düngemelasse, PNC, CSL



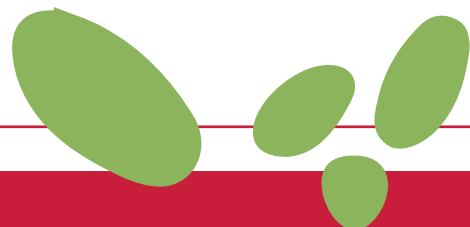
Vorteile

- Organisch & vegan
- Unterstützt Humusaufbau / Bodengesundheit
- Rasche und langanhaltende Wirkung
- Angemessene Nährstoffversorgung
- Keine Gefahr der Überdüngung
- Auswaschungssicher insb. bei Nitrat
- Präventiv gegen Eisen-Chlorose





**FOLGE UNS AUF LINKEDIN FÜR
NEUIGKEITEN ÜBER AGRANA STÄRKE**





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Lignosulfonate-based Polymers in the BioBased Economy

Sappi serves the world through headquarters in four key regions:

- South Africa
- Europe
- North America
- Asia

We are powered by the expertise of more than 12,000 people worldwide.

At a glance: Sappi scale

sappi

4 Mills

10 Mills

5 Mills

165

Years of operation

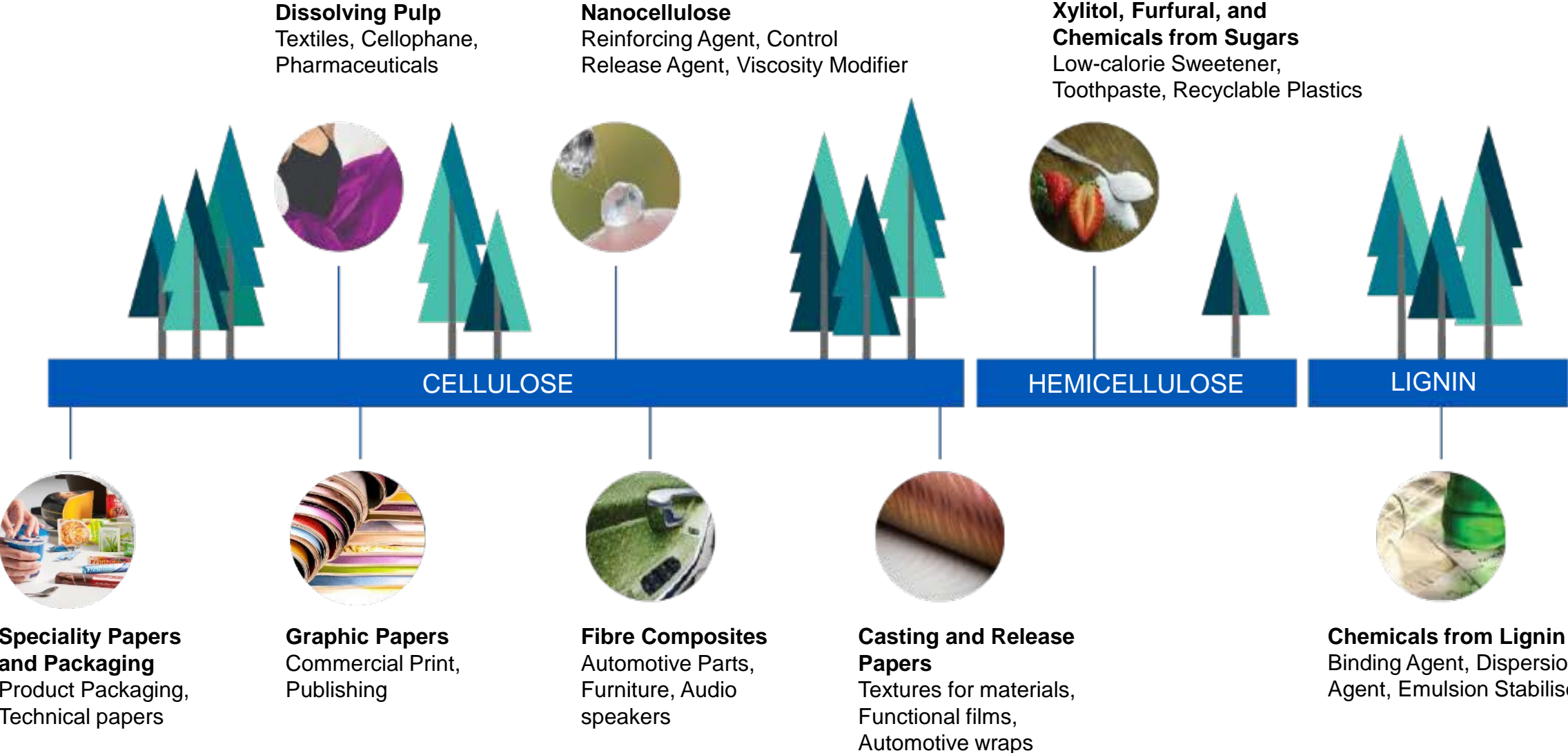
12,800

Employees in 20 countries

150

Customers in over 150 countries

Unlocking the power of trees

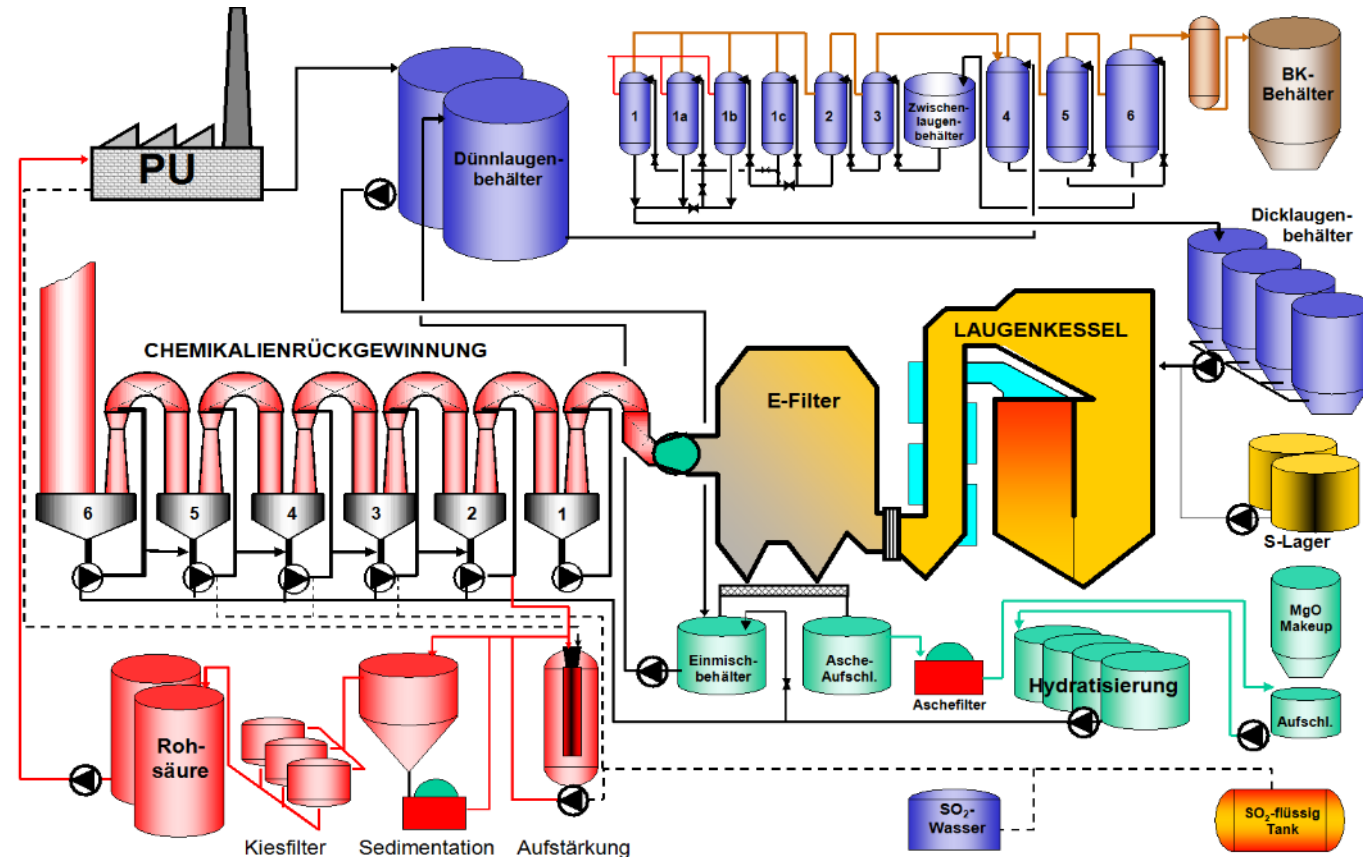


Sulfite pulping

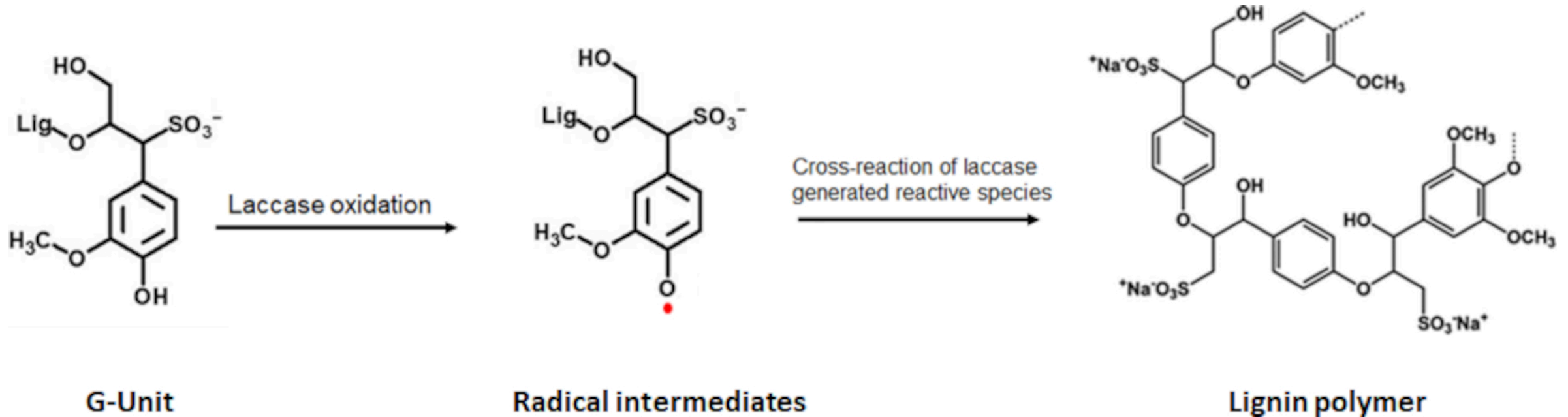
Operated at 3 Sappi mills in Europe

Although some liginosulfonate is currently sold (e.g. as a concrete admixture), most is incinerated, allowing Sappi to recover the magnesium, and generate power and steam.

Our challenge is to develop new applications for lignin without impacting on this energy supply for the mills.



Polymerisation by laccase treatment under oxidising conditions:
Oxygen + Laccase from (*Myceliophthora thermophila*) + Lignosulfonate

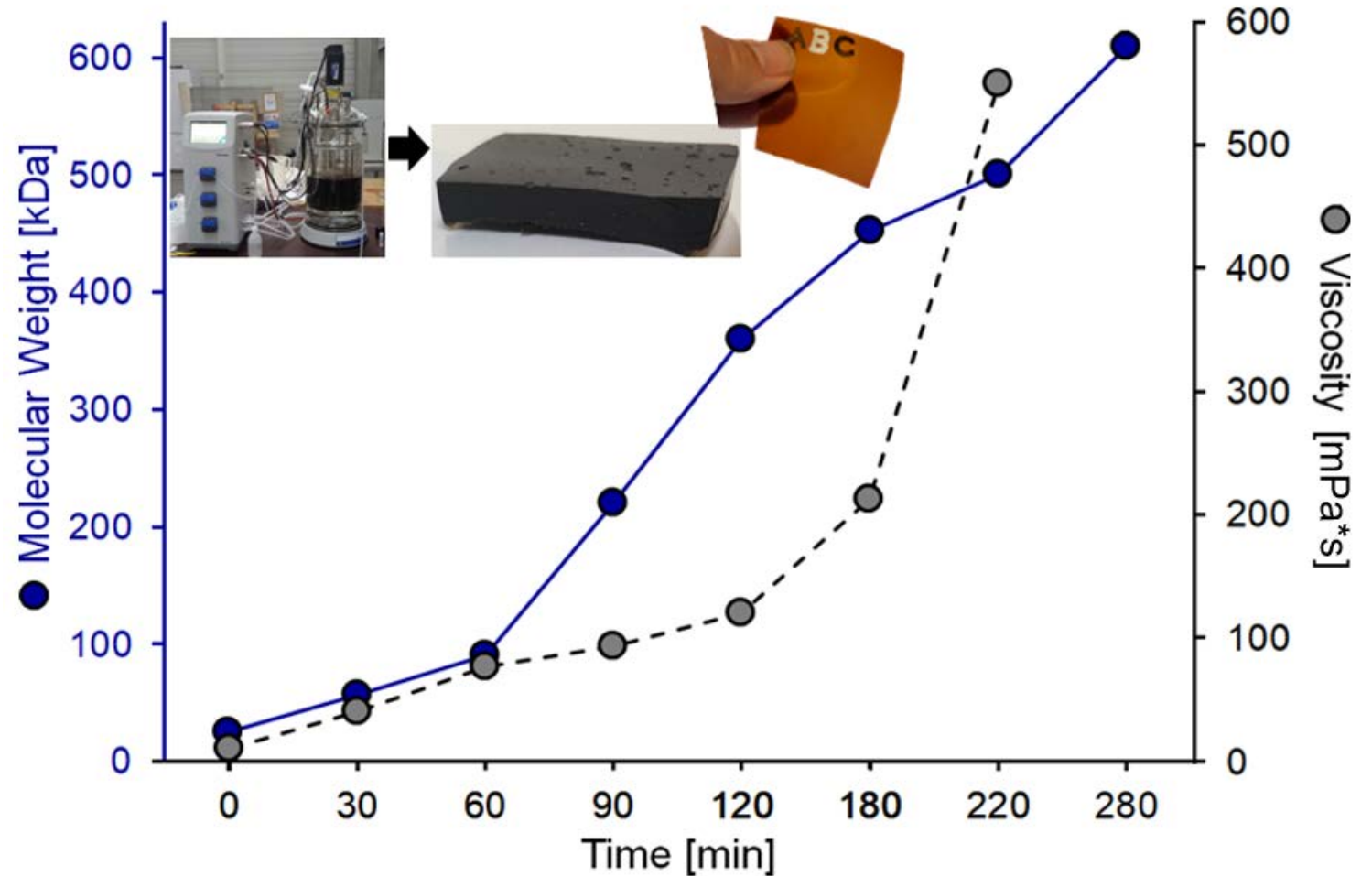


Mayr SA, Schwaiger N, Weber HK, Kovac̃ J, Guebitz GM and Nyanhongo GS (2021) Enzyme Catalyzed Copolymerization of Lignosulfonates for Hydrophobic Coatings. *Front. Bioeng. Biotechnol.* 9:697310. doi: 10.3389/fbioe.2021.697310

Change of material properties

Polymerization of the lignosulfonate is accompanied by a significant increase in viscosity.

This opens up multiple potential applications, including improved binder performance, e.g. for fertilizer pelletization.

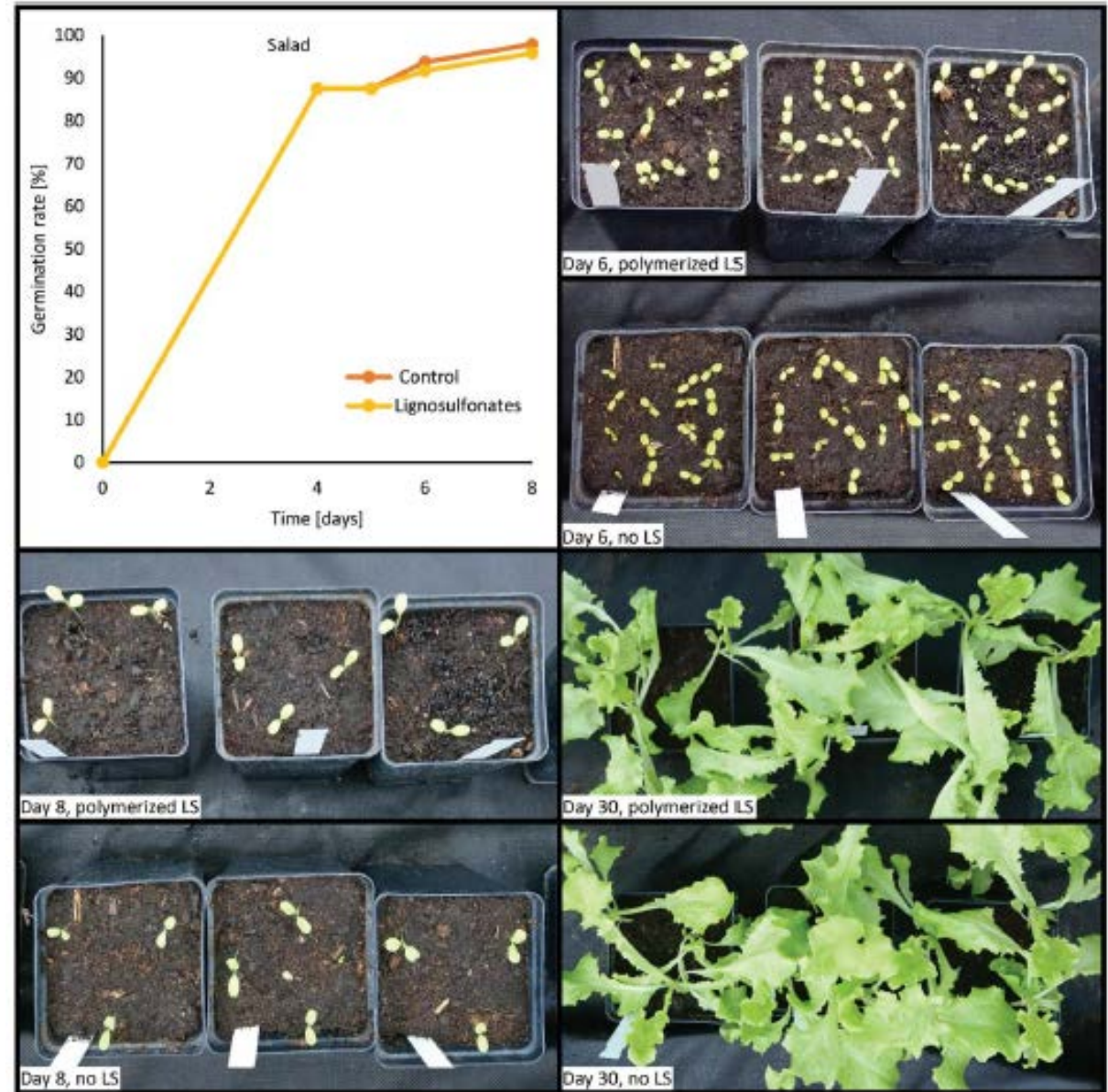


Compatibility of polymerized Lignosulfonates with plant growth

Invitro testing to ensure that the polymerized lignosulfonates are not toxic to plants and that they support plant growth

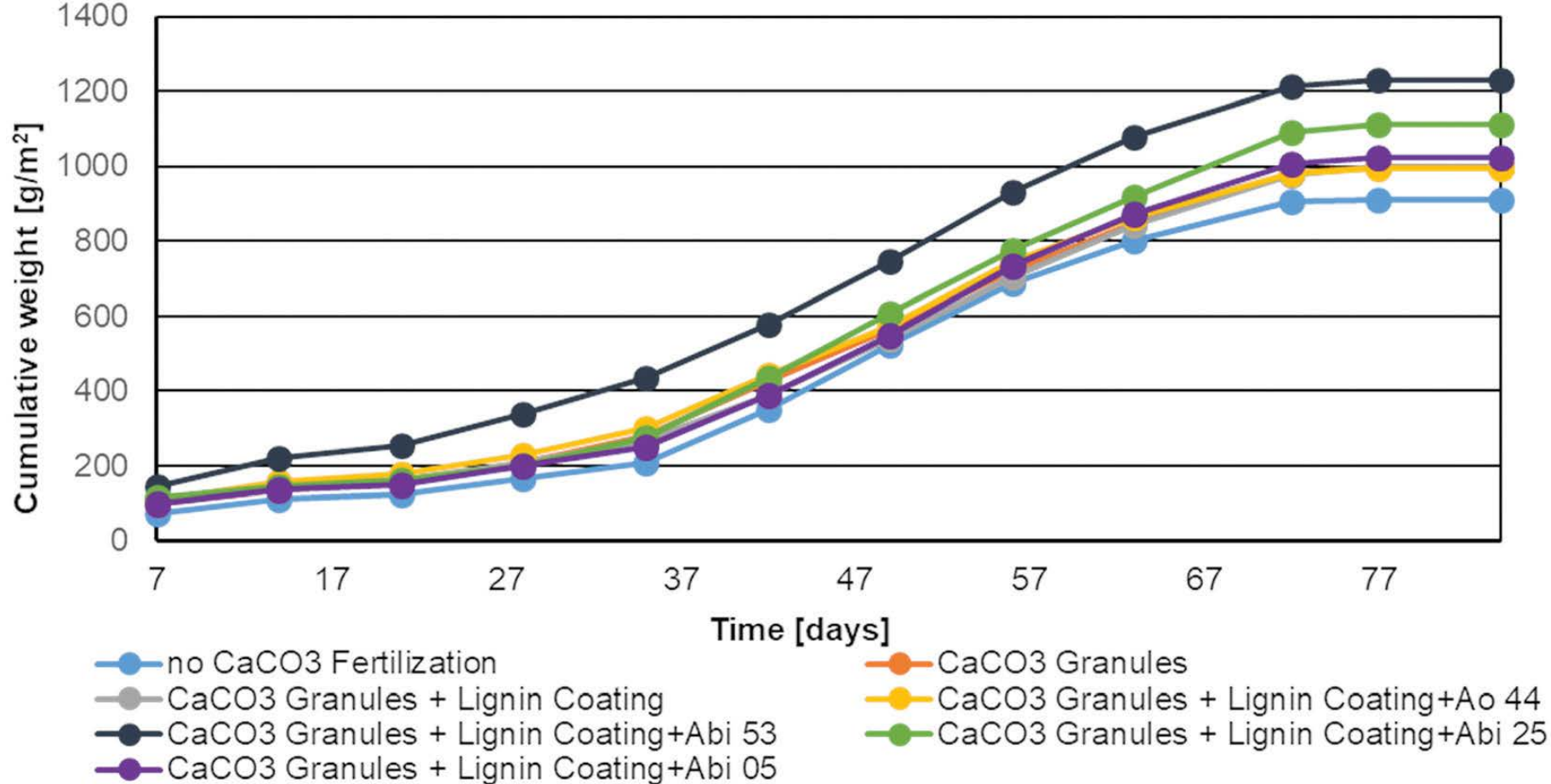
Example shown:

- ice berg salad



Renate Weiß, Sebastian Gritsch, Günter Brader, Branislav Nikolic, Marc Spiller, Julia Santolin, Hedda K. Weber, Nikolaus Schwaiger, Sylvain Pluchon, Kristin Dietel, Georg Gübitza, and Gibson Nyanhongo (2021) A biobased, bioactive, low CO2 impact coating for soil improvers, Green Chem., 2021, Advance Article
DOI: 10.1039/d1gc02221k

Result – improved plant growth by usage of lignosulfonate coated soil improvers



Cumulative fresh weight of lawn cut when different coated soil improvers were added after germination

Field Trial Results

Effectiveness of the soil improver



Thank You

Keep in touch! Stay safe!

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Bio-based Industries
Consortium

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