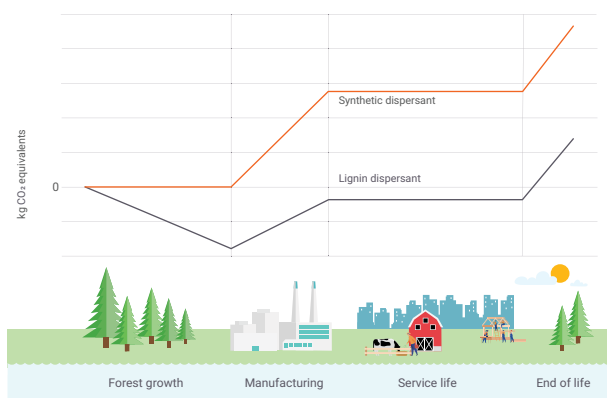


## SUSTAINABILITY OF LIGNIN-BASED BIOPOLYMERS

Borregaard has engaged an independent third-party, Norsus, to conduct life cycle assessments to analyse the environmental impacts of our production, from raw materials to finished products. A considerable difference in the CO<sub>2</sub> footprint is shown in a comparison of Borregaard's bio-based products versus a synthetic dispersant, polycarboxylate.

### COMPARING CO<sub>2</sub> LIFECYCLE OF FOSSIL AND BIO-BASED DISPERSANTS



The Borregaard biopolymer has a 70% lower CO<sub>2</sub> footprint throughout the overall life cycle compared to a synthetic polycarboxylate and has a negative CO<sub>2</sub> footprint during its service life. This beneficial climate footprint contributes positively to your scope 3 emissions compared to using a synthetic product.

The comparison is conducted by the Norwegian Institute for Sustainability Research using life cycle assessment methodology according to ISO-standard 14040/44.



Our competent technical and commercial team is available to evaluate and help you optimise the application of our products. Contact us or visit our webpage for more information.



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## BORREGAARD'S SUSTAINABLE CO-FORMULANTS FOR MODERN AGRICULTURE



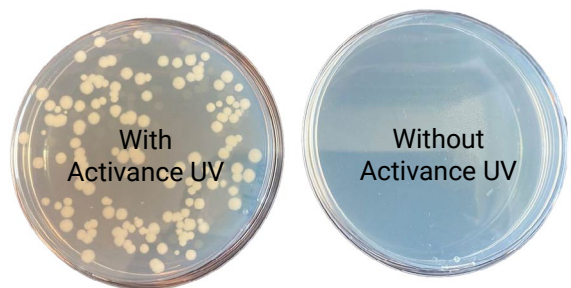
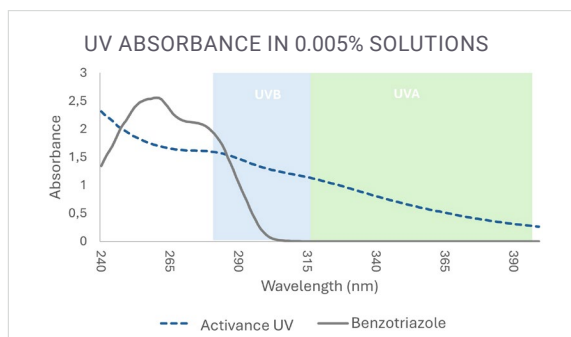
## BIO-BASED CO-FORMULANTS

- Formulate your biologicals with Borregaard's dispersants and binders.
- Improve anti-settling, structure and rheology of suspensions with Borregaard's cellulose fibrils.
- Boost your UV protection with Activance UV
- Borregaard's co-formulants are compatible with Biological actives.

## ACTIVANCE UV

### UV PROTECTION

Activance UV has shown no harm to biologicals. Its efficient UV absorbance can improve the UV protection of the actives, leading to longer shelf-life.

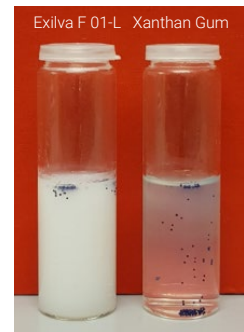


The viability of bacteria is maintained after 4 hours of UV exposure with 1% Activance UV. No viability is observed in the control after UV exposure.

## EXILVA

### BIOCIDE FREE ANTI-SETTLING AGENT

- Due to its microbiological stability, Exilva maintains its suspending ability in the absence of biocide in contrast to xanthan gum
- Exilva is highly compatible with biologicals
- Liquid product formulated with Exilva remains easy to handle and sprayable.



No Biocide added. Anti-settling maintained with Exilva

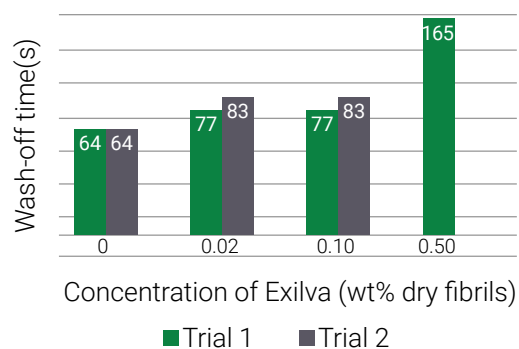
### RAINFASTNESS

Exilva is an excellent film forming product. This leads to improved rainfastness.

Test for fruit bait gel formulation containing:

- Biological Insecticide
- Ingredients to attract flies (sugars etc).

The time required to wash off the insecticide from a hydrophobic surface increases with increasing the concentration of Exilva Cellulose fibrils.

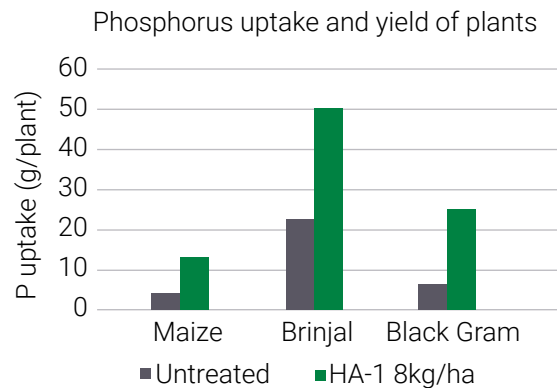


\*Test with 1 drop on Parafilm after 24 hours drying time at 20°C. Dilution 1:1.5.

## BORREGRO HA-1

### SOIL PHOSPHATE RELEASE AND UPTAKE

- Compatible with acidic and high salt fertilizers
- Compatible with fertilizers with high phosphate content
- Limits phosphate fixation and promotes phosphate liberation in the soil



BorreGRO HA-1 releases and prevents fixation of P in soil

↓  
Higher P uptake by plants

↓  
Higher yield

