



MICROPLASTIC FREE SEED COATING WITH EXILVA®

## REDUCED DUSTING OF COMMERCIAL MICROPLASTIC FREE SEED COAT LIQUIDS

The impact of Exilva as a film-former on the seed film coat properties of 4 commercially available seed coat liquids claimed to be microplastic free is reported in this study. Only one concentration of Exilva is tested in this work while treating corn seeds.

This study shows that Exilva is not a drop in additive. Optimizing the addition step, the addition level and the slurry ingredients might improve some of the data reported here further.

It is however possible to add Exilva during the preparation of the treatment slurry as long as the binder and slurry ingredients are all water miscible. Some of the data show that Exilva can have a positive effect on reducing the dust from the coatings with little to no influence on flowability. A slight decrease in the time to germination could be observed as a trend in 3 of the treatments but no statistically significant difference.

### EXPERIMENTAL

Corn seeds were treated with slurries prepared by mixing a commercial flowable concentrate Redigo-M FS and one of the commercial seed coat liquids either with or without Exilva F 01-L. A slurry dosage of 13 g/kg seeds is used for the corn seeds and for all treatments as shown in table 1 below.

**TABLE 1.** Composition of slurry used for coating the seeds

SLURRY CONTENT FOR CORN SEEDS	TREATMENT WITHOUT EXILVA F 01-L (g/kg SEEDS)	TREATMENT WITH EXILVA F 01-L (g/kg SEEDS)
FLOWABLE CONCENTRATE (REDIGO-M FS) <sup>1</sup>	0.91	0.91
SEED COAT LIQUID (COMMERCIAL PRODUCTS)	2.70	2.70
EXILVA F 01-L <sup>2</sup>	–	3.25
WATER	9.39	6.14
<b>SLURRY DOSAGE</b>	<b>13.00</b>	<b>13.00</b>

The 4 commercial seed coat liquids used in this study are:

- Product A: Disco – Microplastic Free Product by Incotec
- Product B: Certicoat – Microplastic Free product by Certis
- Product C: Amulix – Microplastic Free product by Covestro
- Product D: Sapphire – Microplastic Free product by Ad-Terram. Non-water miscible.

These 4 seed coat liquids are formulated products probably already consisting of a rheology additive, a film-former or a co-binder in addition to the typical list of ingredients for example binders, color, defoamer, filler, biocide.

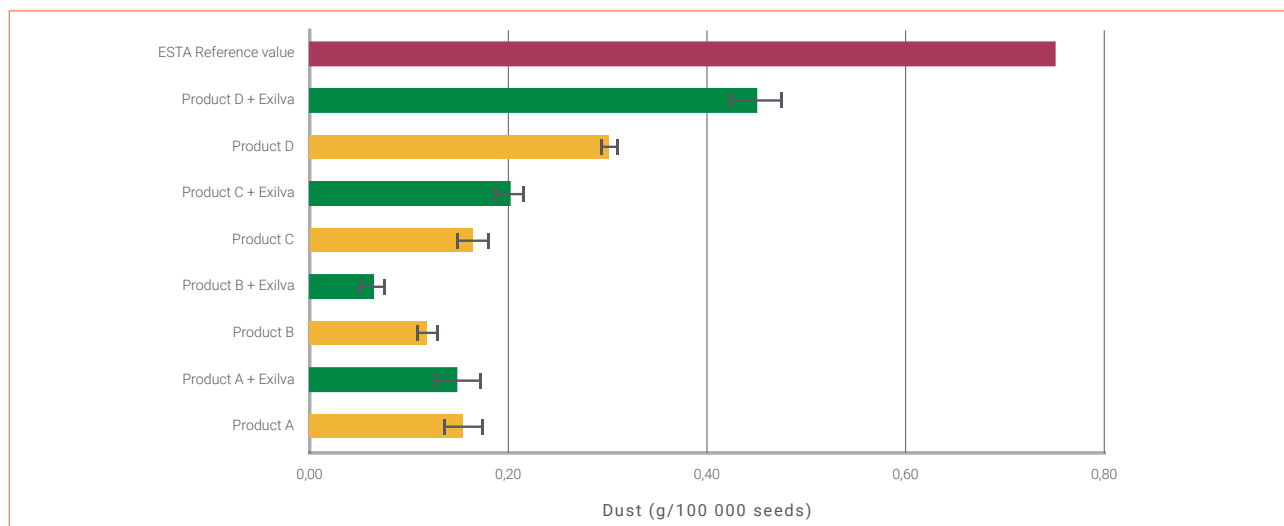
Since these are commercially available seed coat liquids, it is important to note that they have already been optimized to give the optimal seed enhancement properties with low dust, high flowability and good germination. Adding Exilva as a drop in is not the best strategy but does show Exilva's potential on improving the system and reducing dust in this study. As mentioned earlier Exilva is not a drop in additive. Optimizing the addition step, the addition level and the slurry ingredients might improve some of the data reported here further.

## DUST OFF RATES OF TREATED SEEDS

All treatments are within the required maximum limit. Adding Exilva to the slurry did however impact the dust-off rates of some of the products.

Significant decrease in produced dust was observed when Exilva was used with product B. Slight increase to no impact was observed with products A and C.

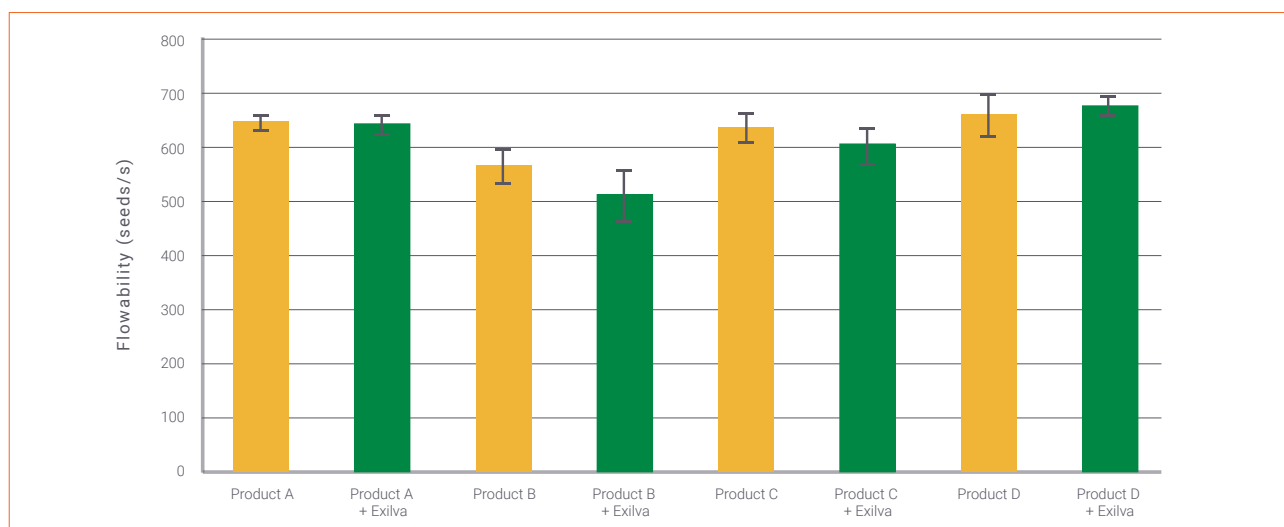
High dust values are observed with product D. This is most probably because product D is not water miscible and recommended to be applied as is, not to dilute in water first. Inhomogeneous blending of this product with Exilva and water is probably the reason for the high dust observed.



**FIGURE 1.** Average mass of the dust gathered on the filter in a dusting test for corn seeds. The graph shows the results for the different treatments with and without Exilva. The ESTA reference value which is also the maximum allowed dust-rate for corn seeds is included in the graph for reference.

## FLOWABILITY RATES

The use of Exilva with these products had no significant impact on the flowability. Depending on the product tested, the results show slight increase, slight decrease or no change. No bridging or stopped movement was observed for any of the samples.



**FIGURE 2.** Average flowability of the treated corn seeds. The graph shows the results for the different treatments with and without Exilva.

## GERMINATION OF THE TREATED SEEDS

The seeds were then left to germinate under optimal conditions. The results obtained show no statistical significant difference between treatments with and without Exilva.

Some trends observed:

- All seeds treated with Exilva germinated to above 97 % except for Product B.
- T50 and U25-75 were all slightly lower with Exilva. These values increased for treatments 7 and 8.

**TABLE 2.** Germination test results

#	SEED COAT LIQUID	GMAX <sup>3</sup> (%)		T50 <sup>4</sup> (hours)		U25-75 <sup>5</sup> (hours)	
1	PRODUCT A	96 %	AB	54	AB	7.02	A
2	PRODUCT A + EXILVA	97 %	AB	53	A	6.90	A
3	PRODUCT B	97 %	AB	69	ABC	12.37	AB
4	PRODUCT B + EXILVA	93 %	A	59	ABC	12.05	AB
5	PRODUCT C	97 %	AB	70	ABC	9.49	AB
6	PRODUCT C + EXILVA	97 %	AB	65	BC	11.86	AB
7	PRODUCT D	97 %	AB	77	ABC	9.64	AB
8	PRODUCT D + EXILVA	99 %	B	80	C	17.39	B

## SUMMARY

Addition of Exilva as a co-binder and film former with commercial biobased seed coat liquids during the preparation of the treatment slurry is possible. The results obtained show potential to use Exilva to reduce the dust produced. No negative impact on germination of the seeds or flowability was observed. All in all, Exilva can help enhance and develop microplastic free seed coatings.

<sup>1</sup> Recommended dosage by supplier

<sup>2</sup> Recommended dosage by supplier. Exilva F 01-L was used as a dosage of 25 wt% of total Slurry dosage. This implies that each slurry dosage contained 0.5 wt% of Cellulose fibrils.

<sup>3</sup> GMAX: Maximum germination

<sup>4</sup> T50: Time until 50 % germination

<sup>5</sup> U25-75: The uniformity of germination



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