

# GREENSPERSE S9 IN WG FORMULATION

Showcase examples of benefits using Greensperse® S9 as a co-formulant for granulated products to increase the compatibility with salts and in high electrolyte environments.



## PURPOSE

Showcase examples of benefits using Greensperse S9 as a co-formulant for granulated products to increase the compatibility with salts and in high electrolyte environments.

## RESULTS

Greensperse S9 has a superior tolerance to high electrolyte environments. Its binding and dispersing abilities are well maintained under challenging conditions, which makes it a good choice of dispersant for formulations with high salt concentration or when increased compatibility in tank mixes is needed.

### Greensperse S9 provides

Better dispersibility in high electrolyte environments

Increased compatibility in a variety of tank mix scenarios



# PROCEDURE

## Example 1: Supreme compatibility in different fertilizer salts (see table 1)

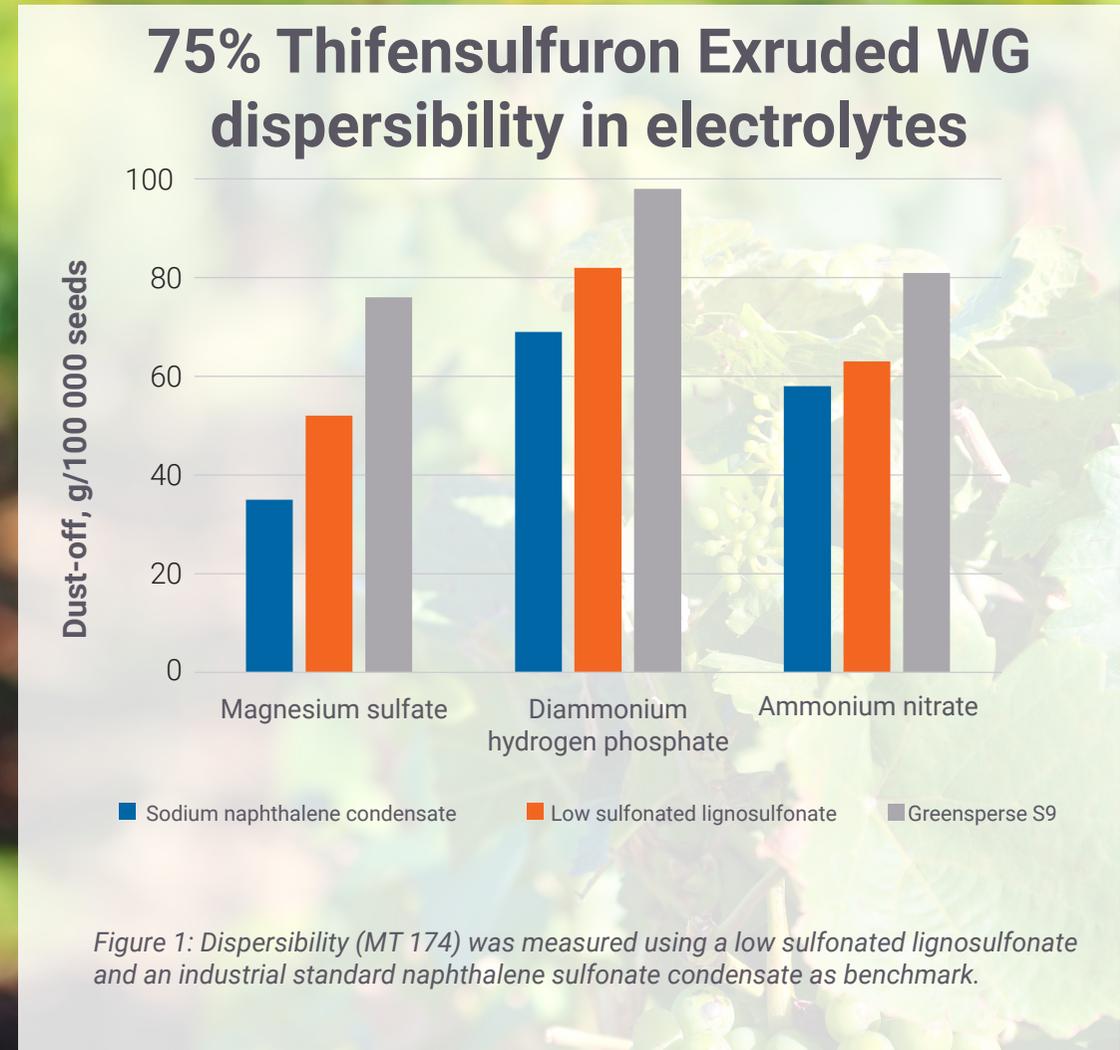
Greensperse S9 was dissolved in aqueous solution of a variety of different fertilizer salts and compared to a low sulfonated lignosulfonate. The concentration of lignosulfonate was 10 w/w %, and the concentrations of the fertilizer salts ranged from 5 g/L to 250 g/L. Compatibility was determined by visually examining the solutions for traces of precipitated lignosulfonates.

Table 1: Compatibility of Greensperse S9 compared to a low sulfonated lignosulfonate in different fertilizer salts.

	Low sulfonated NA LS			Greensperse S9		
	250 g/l	20 g/l	5 g/l	250 g/l	20 g/l	5 g/l
Urea	✓	✓	✓	✓	✓	✓
Ammonium nitrate	✓	✓	✓	✓	✓	✓
Ammonium chloride	✗	✓	✓	✓	✓	✓
Ammonium dihydrogen phosphate	✗	✓	✓	✓	✓	✓
Diammonium hydrogen phosphate	✗	✓	✓	✓	✓	✓
Magnesium sulfate	✗	✗	✓	✓	✓	✓
Ammonium polyphosphate	✗	✗	✗	✗	✗	✓

## Example 2: Extruded granules of Thifensulfuron (see Figure 1)

Extruded thifensulfuron WGs (75%) were produced with Greensperse S9, a low sulfonated lignosulfonate and a sodium naphthalene sulfonate. The dispersibility of the granules was measured in 20 g/L solutions of magnesium sulfate, diammonium hydrogen phosphate and ammonium nitrate.



## DISCUSSION

### **Example 1: Supreme compatibility in different fertilizer salts**

When compared to a low sulfonated lignosulfonate the increased electrolyte tolerance of Greensperse S9 is clearly visualised (Table 1). The low sulfonated lignosulfonate will precipitate with five out of the seven types of salts tested when the concentration reached 250 g/L, whereas Greensperse S9 is able to handle six out of the seven salts. This is a significant increase in electrolyte tolerance and may be crucial in several formulations where electrolyte concentration is high. It may also be an important aspect for preparing a formulation more compatible with different tank mix scenarios, such as hard water or inclusion of liquid fertilizers.

### **Example 2: Extruded granules of Thifensulfuron (Figure 1)**

In this formulation the combined functionality of binding and dispersing ability of Greensperse S9 is exemplified. When compared to both a low sulfonated lignosulfonate and a sodium naphthalene condensate, the dispersibility of Greensperse S9 remains high in 20 g/L solutions of magnesium sulfate, diammonium hydrogen phosphate and ammonium nitrate. The extruded granules of thifensulfuron formulated with Greensperse S9 are able to dissolve, and are also well dispersed with Greensperse S9 in a high electrolyte environment.



## CONCLUSIONS

Greensperse S9 is a robust dispersing agent for granular formulations and shows excellent performance when the environment demands a salt tolerant dispersing agent. Greensperse S9 is able to maintain its dispersion function without aggregation in the presence of several different fertilizer salts.

This work was performed by the Borregaard agricultural laboratory team.

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### Greensperse S9 is designed to

Maintain superior dispersing and binding properties

Give superior performance in hard water or high electrolyte environment

Provide cost advantage versus other high-performance dispersants

