

Aquaholder seed treatment additive trial program at Innoveins seed solutions

InnoVeins seed solutions has carried out a complete testing program with Pewas to test their Aquaholder product as seed treatment for compatibility, germination effects, efficacy against fungal diseases and control of active ingredient leakage. Based on this trial program Innoveins could draw the following key conclusions:

Compatibility

Compatibility was tested on the effect of application and the effect of the additive on germination rates. In general there can be concluded that there is no negative interaction between active ingredients and Aquaholder when applied as a double application sequentially from a chemical standpoint. In corn, sugarbeet, wheat, OSR, no negative effects on germination were observed. The application of Aquaholder is applied as a dual application starting with a base treatment of the standard slurry including the PPP's followed by a final dressing with Aquaholder which is a mixture of alcohol and SAP particles, during the application process the alcohol will evaporate. Since a solvent is used as carrier there is a risk that there is an additional loss of active ingredient during the second application process. The active ingredient Fludioxonil did not show a reduction of active around the seed when applied together with Aquaholder while the active ingredient Ipconazole did show a reduction in active ingredient around the seed. When testing Aquaholder as seed treatment additive this need to be determined before scaling up hence that the selection of binder type in the base slurry will be a basic solution to solve this potential issue.

Data example (Figure 1):

Wheat seeds were treated with 1) polymer only 2) Aquaholder only 3) Systeva and 4) Systeva and Aquaholder. Based on the graph you clearly see that seed treated with Aquaholder shows no negative effect on germination and specifically in wheat a slight positive effect on germination has been observed, theoretically a higher presence of water around the seed due to Aquaholder results in this earlier emergence.

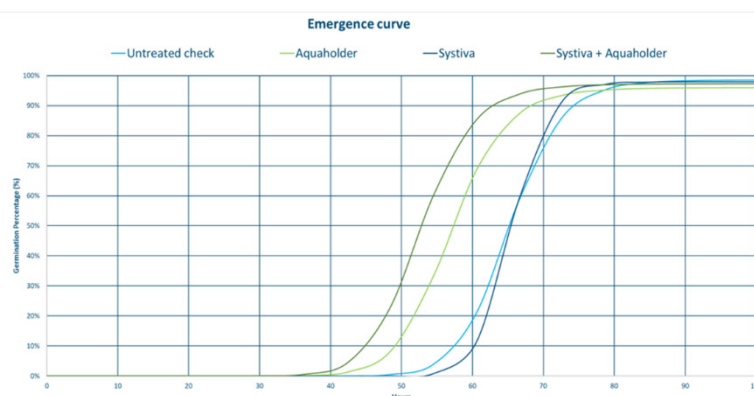


Figure 1 Graph systeva seed treatment

Efficacy

Fungicides

Efficacy of multiple active ingredient / Aquaholder combinations were made within the trial program and tested against *Fusarium graminearum*, *Phoma linguist* and *Rhizoctonia solani*. In general no strong differences were observed between treated with the active ingredients only compared to the active ingredients together with Aquaholder. Under laboratory screening we could observe in some cases that Aquaholder can form a barrier effect in between the pathogen and seed, when screening diseases in planta more research is needed individually per crop or active ingredient. In general plant stand and vigor of plant treated with Aquaholder looks slightly better compared to plants which were not treated with Aquaholder.

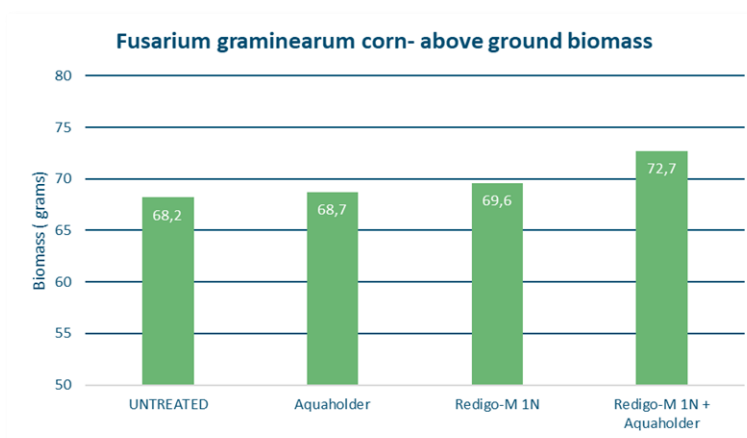


Figure 2 Redigo-m seed treatment

Data example (figure 2):

Corn seeds were treated with 1) polymer only, 2) Aquaholder only 3) Redigo M and 4) Redigo-M + Aquaholder. We clearly see in the graph that biomass of Redigo-M combined with Aquaholder showed increased biomass compared to Redigo-M solo. Based on visual observation it looks like that plants have established better and therefore we see a clear added value. With a ½ dosage of Redigo-M we did not see that effect anymore, out from this we can conclude that Aquaholder has no disease control activity but only supporting the products with enhanced plant establishment. We don't see this as clear in each crop we have tested based on data acquired.

Insecticides (figure 3)

Aquaholder potentially could enhance the active ingredient uptake, due to the water attraction and water holding capacity of Aquaholder more active could potentially be available for the plant for an enlarged period. A test was carried out with the active ingredient Cyantraniliprole as seed treatment and combined with Aquaholder. In one of our tests we observed a double uptake of cyantraniliprole compared to the treatment without Aquaholder, this substantiates the theory that Aquaholder keeps the active ingredient for a longer term closer to the seed.

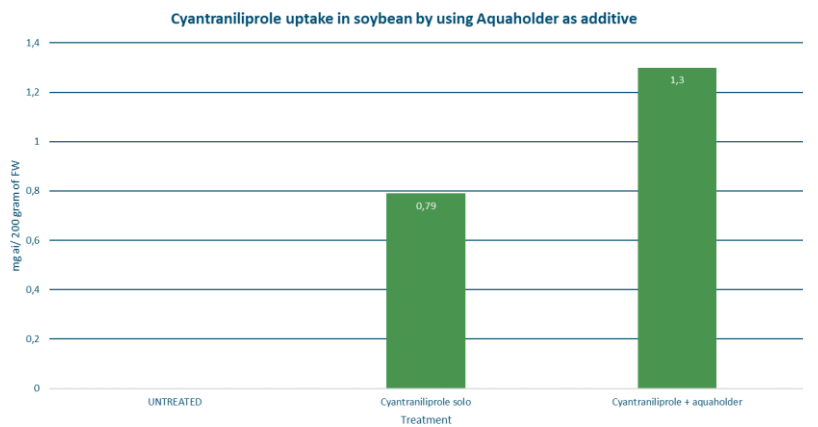


Figure 3 Cyantraniliprole seed treatment

Active ingredient distribution in the soil

Since Aquaholder causes more water availability and keeps active more close to the seed an assumption has been made that Aquaholder causes a reduced active ingredient leakage in the soil and ground water after sowing. A laboratory trial was carried out while seeds were treated with an overdosage of active to be able to measure small volumes in the soil. In figure 4 is clearly explained that treatments including Aquaholder show much lower leakage into the soil compared to treatments without.

Biostimulation effect

No specific research on the biostimulation effect has been carried out, although in the trials including corn an increase in plant vigor was observed. More research needs to be done to further clarify the potential biostimulation effect of aquaholder.

Quality of results

The trial was conducted by independent seed technology trial station Innoveins seed solutions. Data presented in this sheet are part of the complete reports and dataset send to Pewas sro but give a representative view on important findings in the reports for the Aquaholder product.\

		maxim 480FS + Apron XL			
unit	Soil compartment	Metalaxyl	metalaxyl + Aquaholder	Fludioxanile	Fludioxanile + Aquaholder
Values in mg ai per kg soil	Seeds				
	5cm soil	14,00	2,00	4,00	0,75
	10 cm soil	2,30	0,40	1,30	0,63
	15 cm soil	1,30	0,16	0,26	0,16
	20 cm soil	1,10	0,20	0,65	0,12
	25 cm soil	1,50	0,64	0,18	0,09
	Ground water	0,13	0,43	0,00	0,03
	Total leakage in soil	20,3	3,8	6,4	1,8

Figure 4 Soil and ground wate

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