



Adjuvant selection guide



Agricultural solutions

Nouryon

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What is a good Adjuvant? Adjuvants play an important part in improving efficacy and reducing loss of crop protection products in the field. Several different mechanisms and functionalities are involved; to help choose the optimal solution for your needs, we have divided and measured the different functionalities.

Our Adsee™ product portfolio contains a variety of solutions to increase bio-efficacy of pesticides by improving functionalities such as droplet retention, rain fastness, drift and penetration.

- Adsee C80W and Adsee C-70A is a new range of adjuvants suitable for most actives and are highly compatible with different herbicide salts and mixtures
- Ethylan® 995 is in-can adjuvant and superior with triazoles
- Adsee 611 is highly optimized blend and perfect alternative to NPEs
- Adsee 900 can be used as a tank-mix or built-in adjuvant. A good wetting agent and increases penetration of many actives with logP>1
- Adsee AMP40 is an all-in-one biodegradable adjuvant for crop protection formulations. It is a salt-free amphoteric surfactant, designed to be used as an adjuvant both in-can and tank-mix applications

Functionalities	Methods
Drift	Particle size analyzer (<150 µm)
Retention	Tilted plate method (run off angle)
Wetting	Draves test Contact angle
Rain fastness	Rain flush over dry droplets
Humectancy	Moisture uptake
Penetration	Franz diffusion cell Greenhouse/field trials

Adjuvant	Drift	Retention	Wetting	Rain fastness	Humectancy	Penetration
Adsee 611	-	+	+	0	++	+++ Multi
Adsee 900	--	++	+++	0	+	+++ High LogP
Adsee 973		++	0	+	++	+++ Low LogP
Adsee AB 615	-	+++	++	0	+	+++ Multi
Adsee AMP40	0	0	0	0	+++	+++ Herbicide + Fungicide
Adsee C-70A	-	+	0	+	++	+++ Herbicide
Adsee C80W	-	++	0	+	+	+++ Herbicide + Fungicide
Ethylan 995	++	++	++	++	0	+++ Fungicide

Impact: - negative, 0 = no impact, + good, ++ very good, +++ outstanding



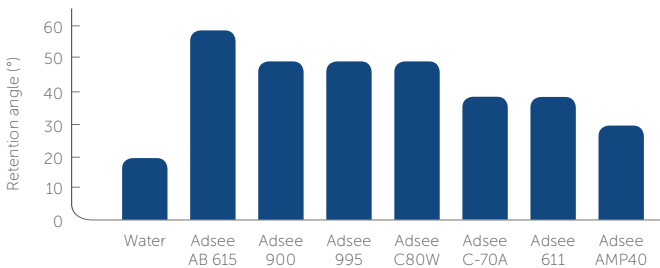


Retention angle

Good retention of droplets on plants is important to avoid pesticide loss that can reduce the efficacy of the formulation.

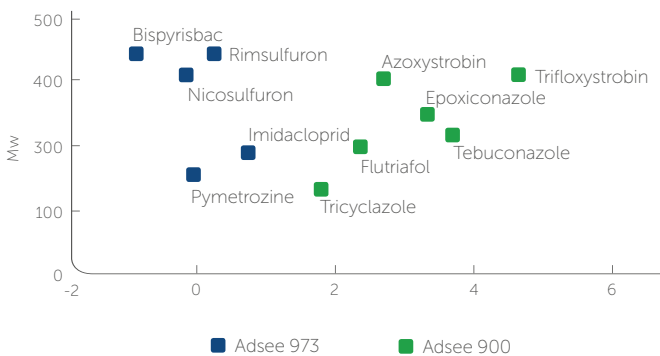
Adsee AB 615 is the best retention aid in our portfolio.

The retention angle is measured by the "Tilted plate" method. A parafilm surface is tilted and the max angle is recorded where a water droplet, containing 0.5% adjuvant, sticks to the surface without any run-off.



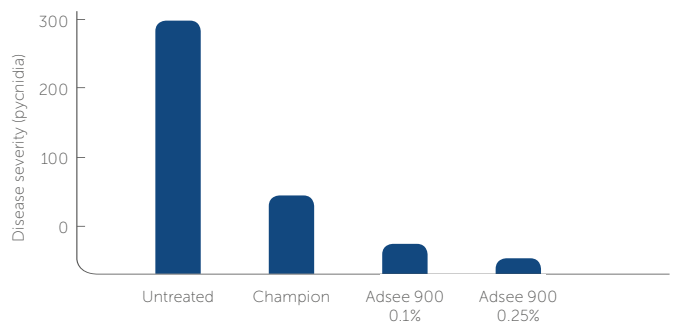
Field trial results

Adsee 900 and Adsee 973 increase bio-efficacy and penetration of most pesticides dependent on the water solubility (log P) of the active. (As reference, Glyphosate has a logP of -4,6). The data shows the best adjuvant rated from field and green house trials.



Adsee 900 greenhouse trial

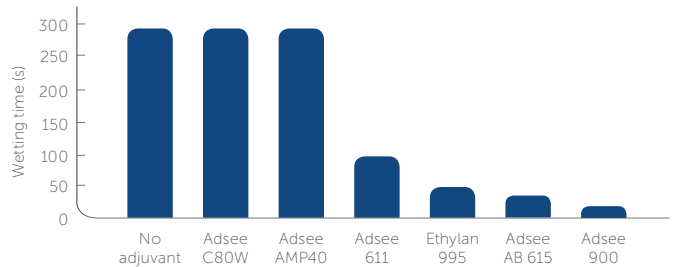
Adsee 900 was added to the fungicide formulation Champion (epoxiconazole + boscalid). Wheat was inoculated with Septoria tritici and treated with Champion, Champion + 0,1% Adsee 900 and Champion + 0,25% Adsee 900. Disease severity was assessed by counting the amount of pycnida. The graph shows that addition of 0,1% of Adsee 900 increase the efficacy of Champion by 20%.



Wetting properties

Wetting properties of different adjuvants according to Draves test. The time it takes for a piece of yarn to sink to the bottom of a cylinder containing a solution of 1% adjuvant in distilled water is measured (max 300 sec).

The data shows that Adsee 900 is the adjuvant with best wetting properties.



Humectancy

Adsee AMP40 adsorption profile towards the wax surface was probed by using QCM-D technique.

An increase (approx 70%) in the elastic modulus of the wax layer was observed during the adsorption, suggesting to soften/hydrate the wax layer and ease penetration of active ingredient.

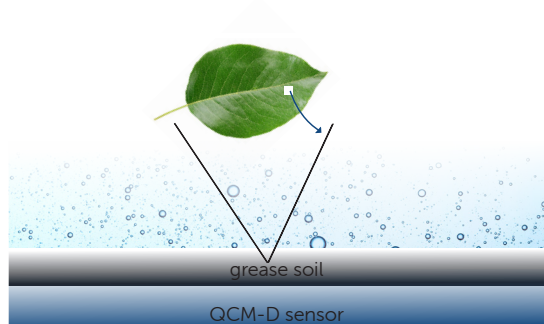


Illustration of the wax coated sensor, mimicking the cuticle of a leaf

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