

Adjuvant Newsletter

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Symposium report

Tips, tools and trends on adjuvant symposium

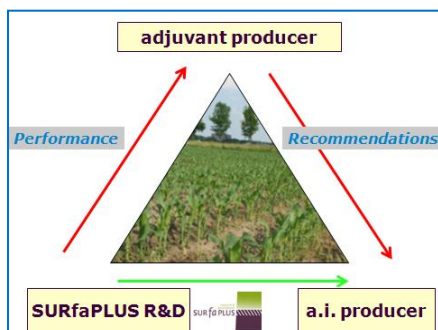
In Europe, adjuvants are appreciated by growers more and more and they are also subject to discussion. [SURfaPLUS](#) celebrated its 10-years existence with a one-day symposium in Amsterdam. In ten presentations, trend-setting experts told about new adjuvant concepts, new chemistries, adjuvant and formulation trends and tools to test the performance of adjuvants and formulations.

“Adjuvants always act concentration-dependent”. With this phrase [Peter Baur](#) from [Clariant Produkte \(Deutschland\) GmbH](#) sets the tone for the one-day symposium on the development and application of adjuvants for agrochemicals. “I am not aware of any rate (kg/ha)-dependent products”, so he continues his thought-



Over 100 people from five continents attended the Amsterdam meeting in the [Okura Hotel](#); [SURfaPLUS](#)

10 YEARS SURFAPLUS



The meeting in Amsterdam was organised with the scope of 10 years SURfaPLUS. In his opening, Hans de Ruiter explained how SURfaPLUS functions in the triangle with the producers of a.i.'s and adjuvants.

provoking discourse about the way in which adjuvants do help active ingredients pass the barriers of a leaf's cuticle. Peter Baur started with some general consideration regarding adjuvant performance and adjuvant mode of action, followed by highlighting some specific and sometimes unexpected interaction in sprays and drop deposits. He illustrated that, generally, the adjuvant concentration for optimum adjuvant performance is 0.1% for non-ionic surfactants and drift retardants (polymers), 0.5% for esterified seed oils and up to 5% for mineral oils. He also demonstrated that most foliar penetration of active ingredient occurs from the drop deposit after visually drying and not from the spray drops (not known by many people applying agrochemicals; ed.). The interaction between adjuvant and

active ingredient in the drop deposit depends on the nature of both products and may cause some unexpected outcomes when measuring the foliar uptake of an active at various concentrations but at one adjuvant concentration. A 10x higher concentration of the active ingredient may even result in a lower (absolute) uptake of active ingredient.

Peter Baur expects an increasing role for both tank-mix and built-in adjuvants. In addition, he mentioned that the challenge will remain to demonstrate and to apply very robust adjuvant effects.

Since August 2010 the German formulation expert is president of the [ISAA Society](#) – the association that organizes the triennial International Symposium on Adjuvants for Agrochemicals.

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NEW CHEMISTRY

Specialists and formulators discussed various aspects of adjuvants, whether built-in or tank-mixed. [David Stock \(Syngenta\)](#) said to see a need for tank-mix adjuvants. However he cautions for relying on such products as pricing is in hand of third parties. "Sometimes you see high prices for simple products", the British Syngenta Fellow continues to say. During his research on one-pack formulations, he learned that results from glasshouse experiments and field trials may vary because of differences in the rate of wax layer abrasion between indoor and outdoor grown plants.

[Kathryn Knight](#) presented the work of [Croda Crop Protection](#) on so-called hybrid oil adjuvants. With these additives the British company caters for the increasing use of mixtures of glyphosate with other herbicides. "Combination formulations need combination adjuvants", the British applications team leader states. Hybrid oil adjuvants mitigate the antagonism between glyphosate and oil loving selective herbicides, she says. According to Kathryn Knight, the patented hybrid oil adjuvants are cost effective and "can be used with all herbicides, fungicides, and insecticides that recommend a COC or MSO adjuvant".

[Kristof Moonen \(Taminco, Belgium\)](#) also presented new adjuvant chemistry. In his lecture he explains the preparation of bisDMAPA (dimethylaminopropyl) amides and quats and their properties as adjuvants for glyphosate and other active ingredients. "Quat amides behave as amphiphiles, but not as typical quaternary ammonium surfactants", Moonen says. According to the Belgian researcher the non ionic amides are "excellent solubilizers", with "good adjuvancy effects for glyphosate". Furthermore these bisDMAPA derivatives are compatible with charged, polar and apolar active ingredients and usable as compatibilizer in high load formulations and as adjuvant for systemic fungicides. Kristof Moonen demonstrated that the bisDMAPA adjuvants can enhance the performance of various herbicides: glyphosate, nicosulfuron, bentazone, carfentrazone-ethyl, dicamba and fenoxaprop-P-ethyl. "Subtle structural differences in the development of new adjuvants can lead to significant effects on the performance

of active ingredients", says [Ingo Fleute-Schlachter](#). "It makes even a difference whether a surfactant is part of a formulation or used as a stand alone tank-mix adjuvant as shown by results from field trials". His findings suggest that there can be an optimum combination of an active ingredient, its mode of action, the crop and a corresponding adjuvant for in-can formulations. Fleute-Schlachter is global platform leader agricultural additives at [BASF](#), Germany.

TOOLS AND TRENDS

[Peter Westbye \(AkzoNobel, Sweden\)](#) and [Henk Jalink \(Plant Research International, The Netherlands\)](#) introduced specific tools to examine the performance of adjuvants. Westbye – a chemist with interest in models – explained the use of [multivariate data analysis \(MVDA\)](#) to predict the efficacy of adjuvants. He encouraged the audience to take advantage of this kind of statistics: "The hurdle to learn MVDA is low".

Using videos in his presentation Henk Jalink demonstrated the use of [fluorescence imaging](#) as research tool to monitor plants in a non-destructive way. According to Jalink this "visually appealing" imaging technology is fast, accurate, objective and reliable. Jalink collaborates with SURfaPLUS in the measurement and illustration of adjuvant effects on the performance of herbicides and fungicides.

[Alan Knowles \(FORM-AK, UK\)](#) highlighted the current trend towards more environment-friendly agrochemical formulation and the use of less toxic adjuvants, especially for EC formulations. In his presentation he discussed advantages and disadvantages of suspension concentrates (including nanosized ones), oil-in-water emulsions, microemulsions, microcapsule suspensions, water dispersible granules and a new formulation type: non-aqueous suspension concentrates (oil dispersions). See more in the article by Alan Knowles in this issue.

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IMPRESSIONS AMSTERDAM



From the top downwards: Hans de Ruiter (SURfaPLUS), Peter Baur (Clariant) and chairman Han Rieffe (Croda); SURfaPLUS

[John Groome](#) ([Battelle](#), UK) regaled his listeners with a special interest presentation about trends in seed treatment. He observes a shift from DS and WS formulations to dust-free formulations. Other trends are the increased interest in built-in polymers/stickers in FS formulations and the shift to ever lower volume applications. Trends in adjuvant and formulation are also the headlines of the final presentation of SURfaPLUS director [Hans de Ruiter](#). In his presentation he

discussed strategic trends on the long term and short term trends in adjuvant development and application. Adjuvancy has become a mature field of research and the present products are far beyond the snake oil age.

The well-attended SURfaPLUS symposium – held halfway between two ISAA symposia – reflects the intense need for information and knowledge concerning adjuvants and formulation.

STATEMENTS MADE IN AMSTERDAM



[Peter Baur \(Clariant\)](#)

"Adjuvants always act concentration-dependent, never rate dependent"



[David Stock \(Syngenta\)](#)

"Results from glasshouse experiments and field trials may vary because of differences in the rate of wax layer abrasion"



[Kathryn Knight \(Croda Crop Protection\)](#)

"Combination formulations need combination adjuvants"



[Peter Westbye \(AkzoNobel\)](#)

"MVDA is a powerful tool to learn more about the influence of different physico-chemical properties of adjuvants"



[Ingo Fleute-Schlachter \(BASF\)](#)

"Subtle structural differences in the development of new adjuvants can lead to significant effects on the performance of active ingredients"

AVAILABILITY PRESENTATIONS AMSTERDAM

Most presenters are able and willing to provide you a pdf version of their presentation. E-mail addresses are provided as links under the names above and other presenters follow here:

[Kristof Moonen](#), [Alan Knowles](#), [Henk Jalink](#) and [Hans de Ruiter](#)

IMPRESSIONS AMSTERDAM



From the top downwards: Break out, Henk Jalink (WUR Wageningen), Kristof Moonen (Taminco) and relax afterwards; SURfaPLUS