



ASSOCIATION OF APPLIED BIOLOGISTS

President: Professor Christine Foyer

Closed Transfer Systems Workshop

Silsoe Research Institute and Silsoe Spray Applications Unit,
Bedford MK45 4HP, UK

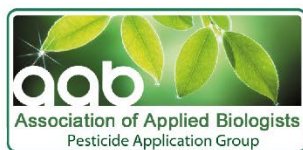
11th May 2022



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DELEGATE INFORMATION

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President: Prof. Christine Foyer, BSc, PhD

International Advances in Pesticide Application



**A three day conference
at the Chamber of Agriculture, North Rhine
Westphalia, Germany
on 27-29 September 2022**



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<https://www.aab.org.uk/event/international-advances-in-pesticide-application/>

Closed Transfer Systems Workshop

at Silsoe Research and Silsoe Spray Applications Unit,
Bedford MK45 4HP, UK

on 11th May 2022

(5 BASIS Points have been awarded as follows: 1CP, 1E & 3AP)

Filling of the of the Agricultural Sprayer with crop protection products can be a complex, time consuming task which impacts the operator's ability to apply product in a timely manner. It also is the area of maximum exposure for the operator to the product and carries the highest risk of point source contamination. With increases in changeable weather effecting application timing, regulatory pressures and a need to protect operators Closed Transfer Systems have become very relevant as a risk mitigation technology. This workshop aims to exchange experiences from different stakeholders in order to provide improvements on the topic of Closed Transfer Systems through the demonstration and dissemination of solutions which are able to improve filling efficiencies whilst minimising or avoiding operator and environmental contamination risk.

PROGRAMME

WEDNESDAY 11th MAY 2022

09:00 Workshop Registration

09:40 Welcome and Introduction

PAUL MILLER (Silsoe Spray Applications Unit, Bedford, UK)

Session 1 : Why do we need CTS - What is the challenge?

09:50 Operator Exposure – What's the problem?

JUAN SASTURAIN (BASF, Mannheim, Baden-Württemberg, Germany)

10:15 What's in the Water? – a perspective from the water industry on challenges of Pesticide contamination

ALEX COOKE (Severn Trent Water, Coventry, UK)

Session 2 : Technological solutions that may solve the above issue (mixture of practical demos and papers)

10:40 Conventional Liquid

NICK LIGHT - Sprayer Operator (E J Barker & Sons, Stowmarket, UK) with experience of using Closed Transfer Systems

11:05 New Closed Loop Knapsack Sprayer system for sustainable smallholder farming

ANDY COOK, PHILIPP HABERSTROH, RÜDIGER KOTZIAN, GRAHAM SANDERSON and NAN XU (Syngenta Crop Protection AG, Basel, Switzerland)

11:30 TEA/COFFEE

Session 3 : Conventional liquid

12:00 Closed Transfer Systems for PPP containers 20 L and larger

RICHARD GARNETT (Wisdom Systems, Hereford, UK)

12:25 DISCUSSION

12:45 LUNCH

13:45 DEMONSTRATIONS

CLKS system

GRAHAM SANDERSON (Syngenta Crop Protection, Basel, Switzerland)

Goatthroat Closed Transfer and Dosing Systems

JAN LANGENAKENS (AAMS BV, Maldegem, Belgium)

Tefen's AccuRite – CTS devise

CHAIM SCHWARTZ (Tefen, AccuRite Business Division Director, Israel)

easyFlow M - closed transfer system for partial or full dosing of liquid plant protection products

JOACHIM HERFORT (Agrotop GmbH, Obertraubling, Germany)

Cleanload Nexus, Coupler for easyconnect caps

ROGER JAMES (Pentair Hypro, UK)

15:00 TEA/COFFEE

Session 4 : How do we get this accepted by regulators?

15:15 An open discussion section led by JAMES THOMAS (Syngenta, Cambridge, UK)

16:00 DEPART

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Session One:

***Why do we need CTS -
What is the challenge?***

Why do we need CTS - What is the challenge?

JUAN SASTURAIN (on behalf the easyconnect working group, ECWG)

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ABSTRACT

Closed Transfer Systems (CTS) have been around in the market since the 1980s. However, for many years the acceptance on farm had not been good for various reasons. Now, that the first practicable CTSs are appearing on the market, farmers and regulators are struggling to understand the implications of substituting the conventional filling via the induction bowl using a CTS for liquid products.

The presentation describes the driving factors for the development of innovative CTS concepts and the efforts made to increase the acceptance with farmers and regulators. This includes the establishment of the first ISO standard for CTS. A focus is on the challenges to plan and perform a meaningful operator exposure study to substantiate the claimed benefits for operator protection.

Aiming to improve the safe handling of crop protection products, the easyconnect Working Group (ECWG) has been formed in 2019. Now in 2022, it consists of 10 leading Crop Protection companies including all CropLife Europe full members. Several other CP companies but also tollers, and manufacturers of biologicals and fertilizers are expressing their interest to join as well.

Based on preparatory work from BASF, the ECWG is jointly developing a CTS tool that combines good operational performance with increased safety for the operator and the environment. Cap and container manufacturers, and several companies from the agricultural machinery industry are partnering with the ECWG to offer attractive and competitive solutions for the farming community. Such broad industry support for a new technology is extraordinary and will guarantee a high visibility of easyconnect from first launch.

As easyconnect is different to other CTS approaches, the presentation closes with a description of the easyconnect technology and the roll-out plans in Europe.

References

www.easyconnect.tech

The pesticide challenge: Perspectives from a water utility

ALEX COOKE

*Catchment Team, Severn Trent Water, 2 St John's Street, Coventry
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ABSTRACT

Pesticides have been a challenge for the water industry for decades, with pre-1995 annual detections above the water quality standard regularly exceeding 1000 annum⁻¹. With fewer pesticide products available, and with better regulation and guidance around risk management, the pesticide challenge has reduced in recent years resulting in improved river water quality. However, with increasing water demand and with the impact of extreme weather events, the challenge to produce clean potable water for distribution is harder than ever before.

Water treatment investment remains driven by the pesticide challenge, with billions of pounds spent annually by the sector on removing pesticides, a cost which is picked up by customers through their bills. Severn Trent Water (STW) have committed to reducing and removing treatment where possible, instead turning to catchment management approaches and nature-based solutions to manage the risks.

STW's *Farming 4 Water* programme has now been operational for over 10 years, working with the agricultural sector to reduce pesticide applications at source through the provision of grant systems, advice, best-practice training, and tests/trials.

The programme has not only targeted pesticides but has also helped to reduce the risks from other agricultural pollutants such as nutrients, whilst simultaneously creating wider environmental benefits throughout the region, helping to create a more resilient water environment. This work has saved over £74 million of direct investment in treatment technologies, and for every £1 spent on catchment management measures, between £2–£20 is saved in operational treatment costs. The successes that have been had and cost savings that have been made have ensured that catchment management is the preferred methodology for the business to manage agricultural risks to water quality going forward.

***Session Two:
Technological solutions
that may solve the above
issue (mixture of practical
demos and papers)***

Conventional Liquid

NICK LIGHT

E J Barker & Sons, Stowmarket, UK

BIOGRAPHY

Nick Light works for EJ Barker & Sons, based in Suffolk as the Sprayer Operator. He operates a 30 m Sands Horizon sprayer which he uses to cover 1350 ha of mixed combinable cropping. EJ Barker & Sons is a progressive farming business and also a AHDB Strategic farm, which looks to improve environmental credentials whilst maintaining high output yields. Nick has practical experience with both bulk closed transfer systems during his time spent in Canada, and more recently the new easyconnect Closed Transfer System which is currently being rolled out across Europe.

New Closed Loop Knapsack Sprayer system for sustainable smallholder farming

ANDY COOK, PHILIPP HABERSTROH, RÜDIGER KOTZIAN,
GRAHAM SANDERSON and NAN XU

Syngenta Crop Protection AG, Rosentalstrasse 67, 4002 Basel, Switzerland

ABSTRACT

This paper briefly reviews the importance of smallholder farming for food security in developing countries and highlights the risks of pesticide uses with currently available on farm equipment. It proposes the introduction of the new direct injection technology which can be retrofitted to commonly used knapsack sprayers bringing significant end user benefits and representing a step change towards sustainable farming.

Smallholder farmers are the main food producers in developing countries. The contribution of smallholders to global food production is significant. Smallholders supply up to 50% of global cereals, 60% of global meat and 75% of the world's dairy production (Kremen *et al.*, 2012). Smallholders, as domestic food providers, have a special role to play in the global efforts to improve food and nutrition security.

Smallholder farmers heavily depend on synthetic pesticides as their main method of pest control to secure crop yields and their income. Most farmers consider pesticides to be highly effective and an indispensable farm input.

Unfortunately, until recently small-scale farmers have not been the primary focus of agricultural development, and their actual and potential contribution to food and nutrition security is not yet fully recognized. Innovative technology in agriculture is much more targeted to large industrial farming than to small scale local food production. The technology available to small farmers for pesticide application has not fundamentally changed for decades and can be sub-optimal with faulty or leaking knapsacks and lack of protective equipment adapted to tropical conditions

Agricultural pesticide use is rapidly increasing in many developing countries, but particularly in Southeast Asia. The fast rate of this increase poses enormous challenges to manage the associated risks to people and ecosystems. It is generally well understood that pesticides pose the greatest risk to applicators and their families, but spraying is done manually with simple equipment and use of protective equipment during spraying is very rare.

Statistics show that poorer nations use more so-called highly hazardous pesticides (HHPs) than high income countries in Western Europe leading to concerns voiced by NGOs and other stakeholders. Storage and handling, PPE availability, affordability and safe disposal are issues which industry and other stakeholders continue to address through stewardship.

Introducing innovative knapsack technology like Closed Loop Knapsack System (CLKS) brings significant benefits for the user through reduction in handling (no mixing/loading operation) and spraying (only clean water in the tank) and is a massive step towards safeguarding the use of pesticides and supports sustainability initiatives with regards to smallholder food production. CLKS introduces a closed spraying system from the shop to the field. It improves handling, storage and filling operations

and can dramatically reduce the risk of access to the undiluted product concentrate. It is simpler, easier, and safer than any currently performed pesticide application with existing knapsack spraying systems.

References

Kremen C, Iles A, Bacon C. 2012. Diversified farming systems: an agroecological, systems-based alternative to modern industrial agriculture. *Ecology and Society* 7(4): 44. <http://dx.doi.org/10.5751/ES-05103-170444>.

Session Three:
Conventional liquid

Closed Transfer Systems for PPP containers 20 L and larger

RICHARD GARNETT

Wisdom Systems, Hereford, HR1 4SW, UK

ABSTRACT

Larger farms apply PPP's, specialist nutrients and foliar feeds through field crop sprayers. The amount of concentrate required per hectare varies and typically these products are applied by combining the concentrated products with water to achieve an application volume within the range of 100 to 200 L ha⁻¹.

The amount of concentrate used to achieve these mixtures can be from <1 L ha⁻¹ to over >11 L ha⁻¹. The loading process for these concentrates can present serious challenges to the operator as the volumes concerned can be large resulting in multiple containers to be opened, measured, emptied and rinsed. The consequences of traditional manual dispensing of these products are high levels of operator and environmental exposure to the concentrate, slow loading and mixing and significant volumes of packaging waste. The associated reduction of time, concentrate losses and costs of CTS enabled packs compared to using traditional packaging, delivers significant advantages in terms of operational safety, environmental impact and improvement in agronomic performance.

A change in product packaging selection to larger container sizes reduces the amount of packaging required per litre of product delivered to farm. The addition of a specialist container connection systems allows the direct connection to the application device and the rapid and clean transfer of concentrates from the delivery packaging into the applicator for efficient dilution and loading prior to application. This results in less time taken to load the applicator, more efficient use of the application equipment and operator, reduced packaging for disposal and more Ha covered in the time available, this results in at least one and often two additional applications made by applicators each day. This delivers reduced concentrate losses and an increase in operational efficiency unobtainable by any other means.

References

Understanding exposure to agricultural pesticide concentrates

HSE Contract Ref: 4030/R51.193-DEFRA Contract Ref: PA1722 - Glass C R, Mathers J J, Lewis R J, Harrington P M and Gilbert A J and Smith S, Central Science Laboratory Sand Hutton.

AAB Conference – Harper Adams May 2005 – Roy Metcalf – BASF.

DEMONSTRATIONS

Goatthroat Closed Transfer and Dosing System

NANCY WESTCOTT¹, ROGER POCOCK¹ and JAN LANGENAKENS²

¹*GoatThroat Pumps, 151 Freestone Ave, Portland, CT 06480, USA*

²*AAMS BV, Sint Barbarastraat 34, 9990 Maldegem, Belgium*

ABSTRACT

Operating efficient and successful farms requires the use of industry-grade organic and agricultural chemicals like fertilizer, herbicide, pesticide, and insecticides. These chemicals are often dangerous to handle. They are also expensive and necessary. Health detriments from improper chemical handling procedures can cause severe physical damage. With GoatThroat agriculture pumps, farmers and farmhands can safely transfer chemicals with precise control.

The enhanced safety provided by GoatThroat's chemical-compatible seals and materials dramatically lower the risk of chemical exposure. This allows large and small farms alike to easily comply with OSHA and EPA chemical safety and environmental safety standards.

GoatThroat's insecticide pumps, herbicide pumps, pesticides pumps, and liquid fertilizer transfer pumps also provide the handler with direct control of the rate of flow. This means that farms can better manage their chemical reserves and material costs while providing a safer working environment for farmworkers, crops, and livestock.

Our pumps reduce the risk of spills, chemical exposure, and agrichemical waste. By improving the efficiency of application and reducing waste opportunities, your farm will have reduced maintenance and chemical costs.

GoatThroat pumps are also a perfect solution for facilities with limited access to power or remote storage locations. As our pumps are operated by hand, they can be applied creatively for unique situations. For example, transferring agrichemicals from storage to a mixer tank or sprayer can be performed efficiently by one worker. They also lend themselves for use in small area application processes as GoatThroat pumps can be fit for both 5 liter up to 1.000 liter containers.

With our pumps, your agrichemicals will remain sealed away from possible unwanted exposure. From the time the chemicals are delivered to the farm to their application in the field, GoatThroat's agriculture pumps help to create a closed and safe transfer process to each container along the way.

Tefen's AccuRite – CTS devise

CHAIM SCHWARTZ

*Tefen, AccuRite Business Division Director, 5 Menachem Begin Avenue, 4th Floor,
Bet Dagan, Central District, Israel*

ABSTRACT

Tefen Flow and Dosing Technologies is offering, an advanced Close Transfer System which enables safe pesticides transfer into sprayer. Tefen's AccuRite is compatible to the easyconnect cap and conforms the ISO CTS standard. Tefen's AccuRite smart technology is focusing on the user interface and simplicity of operation.

We have designed a user-friendly touch panel, that enables operators to dose the exact quantity of Pesticides rate and can choose between partial drain or full use of the container's content. It is a smart yet simple operation panel, very intuitive. No need to be expert as the text on the screen will guide you through the entire process. At any time, if operator is not sure about the process, he can push the stop button, and stop the operation. The entire automatically process obtains a clean container ready for recycling. AccuRite is a Robust CTS and is designed to be used on the sprayer or at the filling station and can last harsh conditions and environment.

Further information

<https://tefen-accurite.tefentech.com/after-webinar/>

easyFlow M - closed transfer system for partial or full dosing of liquid plant protection products

JOACHIM HERFORT¹, LUKAS WACHTER¹, SIMON NICOLS² and
MARK STANBRIDGE²

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²*BFS Ltd, 12-14 School Road, Downham, Billericay, Essex CM11 1QU, UK*

ABSTRACT

The reduction of the contamination risk for sprayer operators and the prevention from spilling of plant protection products PPP, while filling a sprayer, is a decisive measure to achieve an emission free agriculture in the future.

The first easyFlow closed transfer system CTS has been introduced by agrotop GmbH in 2013. It is composed of a container adapter, that fits to any PPP container with a 63 mm thread, and a tank adapter. The container adapter stays connected to the PPP container until it is completely empty and rinsed. It also has an integrated seal breaking mechanism, if needed. The tank adapter is installed directly on top of the sprayer, it connects to the container adapter and allows a contact and spilling free dosing of a full or partial PPP container into the sprayer tank.

In 2015 an enhanced version, the easyFlow M, was introduced to the market. It uses the same container adapter, but a measuring cylinder was integrated to the tank adapter. This allows an accurate reading of partial volumes of PPP, even of small quantities. The easyFlow M connects to the suction side of the sprayer. This allows a user-friendly installation close to the induction hopper of the sprayer, or an external installation at a mixing station or trolley, connecting to a free port on the suction line.

Today there is also an integrated option available that allows connecting an IBC or larger drum to the easyFlow system.

The easyFlow CTS is available for farmers through a broad dealer network in Europe and other parts of the world.

Cleanload Nexus, Coupler for easyconnect caps

ROGER JAMES

*HYPRO EU LTD (PENTAIR), Station Road, Longstanton, Cambridge
CB24 3DS, UK*

ABSTRACT

Cleanload Nexus is a manually operated coupler suitable for use with easyconnect caps from all agrochemical manufacturers. It has just 2 handles, the first is rotated to lock and open the flow in one action and the second activates rinse. The operator places the bottle upside down onto the Cleanload Nexus and rotates the operating handle. Emptying starts immediately and outflow rates are 0.5–1 L Sec⁻¹ even for thick formulations. Once empty, the rinse lever operates two powerful rinse jets to clean the inside of the container, the operating handle is then moved back replacing the plug into the cap and re-sealing the container. The outside of the cap must be rinsed before returning the handle to its starting position releasing the container.

Partial emptying is possible using an inverted scale moulded into containers, or an optional in-line measuring unit that will also be demonstrated at the AAB workshop.

Cleanload Nexus' has been designed to be fail-safe with back-up systems to prevent leaks and interlocking to prevent rinsing at the wrong time. It meets the requirements of the new ISO 21191 Closed Transfer standard and has already been approved by JKI.

To discover more about Pentair Hypro's Cleanload Nexus, how to access online training or to find out where to buy, please visit www.cleanloadnexus.com.

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ASSOCIATION OF APPLIED BIOLOGISTS

AAB FORWARD CONFERENCE PROGRAMME

2022

- 23-24 May [Acrylamide reduction in foods, from plant breeding to food processing](#)
[Discovery Park](#), Ramsgate Road, Sandwich CT13 9FF, Kent, UK
- 20-24 June [International Conference on Arabidopsis Research \(ICAR2022\)](#)
[International Convention Centre \(ICC\) Belfast](#), 2 Lanyon Place, Belfast BT1 3WH, UK
- 6-8 September [Shaping the Future for Pollinators: Innovations in Farmed Landscapes](#)
[Copthorne Hotel](#), Cippenham Lane, Slough SL1 2YE, UK
([Cropping and the Environment group](#)/[University of Reading](#)/
[British Ecological Society](#)/[Royal Entomological Society](#))
- 27-29 September [International Advances in Pesticide Application](#)
[Alexanier Hotel am Wasserturm](#), Alexianerweg 9, North Rhine, Westphalia 48163, Münster, Germany
([Pesticide Application Group](#))
- 5-7 October [International Advances in Plant Virology 2022](#)
Ljubljana, Slovenia
([Virology Group](#))
- 1-3 November **Biennial AAB Presidential**
Look Forward: Nature-based and engineered biology solutions to climate mitigation
[Rothamsted Research](#), West Common, Harpenden AL5 2JQ, UK
- 16-17 November **Advances in Biocontrol and IPM: Putting IPM into Practice**
[Olde Barn Hotel](#), Grantham, UK
Biological Control and Integrated Pest Management ([IPM Group](#))
- December **AAB-BSPP event. ‘Coping with Change within Agrosystem health and resilience’**
Venue: TBC
- 8 December **Advances in Nematology**
[Linnean Society](#), Burlington House, Piccadilly, London W1J 0BF, UK
([Nematology Group](#))

CLOSED TRANSFER SYSTEM – CTS

for liquid plant protection products
automated · compatible · remote control

CONCEPT STUDY

Benefits

- Automated performance
 - of canister depletion
 - of partial quantities depletion and -dosage
 - of canister and cap cleaning
- Remote control via external devices (e.g. smartphone)
- Compatible to canisters with easyconnect-cap
- Compatible with different farm-management-systems

Innovative drive

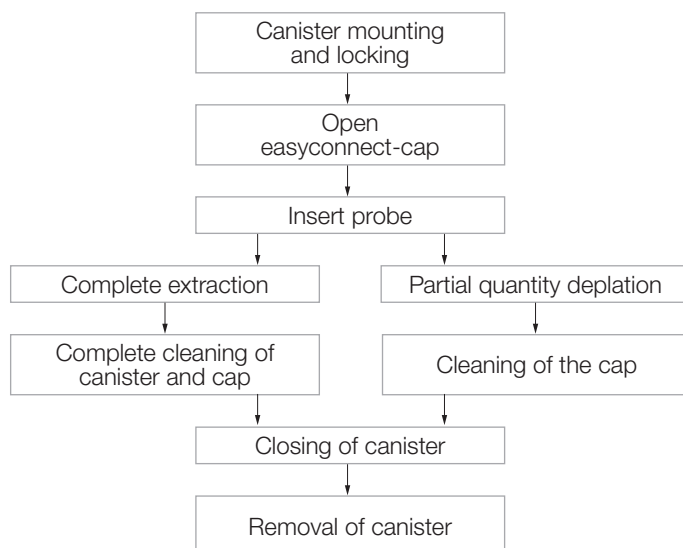
- 12V engine
- Automatic locking and unlocking of the canister
- Vertical probe movement for depletion and cleaning
- Emergency operation

Valve

- Electric valve
- Automatic control of the cleaning process for canisters and caps (with clear water)



Extraction process



EASY CONNECT

The easyconnect-system is a closed transfer system (CTS) for liquid plant protection products from the canister to the field sprayer. Consisting of two components:

- Special cap with integrated inner lid on the canister
- Connecting element CTS-Coupler