



Closed Transfer System (CTS)



Farmer's name

João Cardoso, CropLife Portugal



Contact

joao.cardoso@croplifeportugal.pt



Name of the farm

SMART FARM CropLife Portugal



Country

Portugal



Description of the farm context

Located at Companhia das Lezírias since 2016, SMART FARM is a pioneering example at national level in the fields of technical and scientific innovation within the context of national agricultural production. It serves as a demonstration site for the implementation of Good Agricultural Practices recommended by the Plant Science Industry, establishing itself as a benchmark for training, promotion, and dissemination of techniques, technologies, equipment, and best practices for the safe and sustainable use of plant protection products.

Partner Organization



AdvisoryNetPEST

The **AdvisoryNetPEST** project aims to create a **network** and **upgrade advisory services** across the EU to increase the sharing of knowledge and the **adoption of innovative solutions to reduce the use and risks of pesticides** (RURP) in all **EU Member States**, enabling the agricultural sector to achieve the targets proposed by the Farm to Fork Strategy.



[AdvisoryNetPEST](#)



www.advisorynetpest.eu

The practices identified in this project are called 'Novel Approaches' and abbreviated as 'NA'

THE TECHNIQUE

Short Description:

CTS is a device that enables to pour and mix the PPPs into the spraying in a closed circuit, reducing the contact of PPP with the operator.

Crop Sector:

Viticulture

Targeted pest and diseases:

For all type of PPP application

Objective of the NA:

CTS is a non-electronic device which can be set up on a sprayer to do the mixing of the spray. The best merit of this device is to isolate the operator from the liquid PPP during the mixing operation, which is the riskiest for him. Using this system reduces the risk of using PPP.

Level of practice adoption across the country:

1 2 3 4





Expectations regarding RURP

The EasyConnect system is a closed-transfer system designed to make the filling and rinsing of pesticide (agrochemical) sprayers faster, easier, and safer.

It is proved and accepted that CTS can reduce the operator contamination and exposure. It is considered that CTS can reduce more than 90% during mixing and loading compared with open pour.



Methods/strategy of application in the farm

Two main components: a pre-installed cap on the chemical container, and a coupler fitted on the sprayer.

Faster operation: the cap has an integrated seal so no additional aluminium seal is needed; the coupler opens and then cleans/seals the container automatically.

Ease of use: it holds the container securely, allows filling, rinsing and emptying without needing to remove the cap manually, and does not require adapters (when caps are pre-installed).

Built-in rinsing: after emptying (fully or partially), the system flushes the container, its interior, and cap to prepare for reuse or safe disposal.

Reusability & leakage protection: the cap is reusable, leak-proof, and also includes a dust cover to protect the internal seal.



Key success factors

The farmer needs to be trained to learn how to use the CTS.

Safety: because the transfer is “closed” (i.e. contained within the system) it reduces operator exposure and the risk of spills.

Compatibility: the cap is suitable for all containers with an IS 63 neck, across sizes (1 L, 3 L, 5 L, 10 L, 15 L) and from different manufacturers.



Improvements of the NA

Currently, the main PPP industries support its adoption and are adapting their packaging to fit this technology. The CTS is also compatible with greenhouse irrigation systems.



Resources and skills needed to adopt the NA

No modifications or specialized infrastructure are required to adopt and implement the CTS. Training is required to use the CTS correctly, but since the system is simple, the training is not very time-consuming.



Figure 1: CTS system



Figure 2: CTS with the container correctly sealed to the system

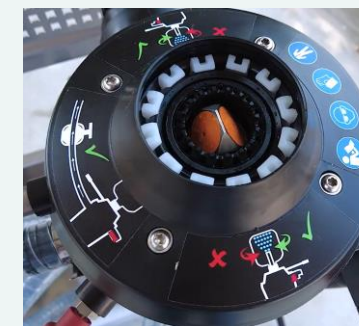


Figure 3: Instructions to couple and seal the container to the CTS



Advice from the Advisor

A Closed Transfer System (CTS) helps you handle plant protection products more safely by avoiding direct contact and reducing spills. Systems like easyconnect® and easyflow® allow faster, cleaner filling and rinsing, improving operator safety and saving time. Farmers report easier work, less waste and greater comfort.



Policies and Regulatory Support

Funding these technologies can encourage their adoption, especially among smaller farmers who have less capacity to invest in new technology.



Social and Cultural Acceptance

Farmers are generally motivated to adopt solutions that help them comply with regulations and improve work efficiency, as is the case with CTS.

Transferability of the Novel Approach across countries and sectors

Closed Transfer Systems show strong replicability because they are simple to install, compatible with various sprayers, and supported by multiple PPP manufacturers. Demonstrations across Portugal and other EU countries confirm easy adaptation, especially for medium and large farms.



BENEFITS

Time saving – faster filling and rinsing of sprayers thanks to the pre-installed cap and automatic coupler.

Increased operator comfort – reduced need for full PPE (personal protective equipment) during handling, since the system minimizes exposure to chemicals.

Higher safety – closed, spill-free transfer reduces operator contact with crop protection products and prevents leaks.

Ease of use – no need to remove caps manually, no adapters required (when containers come with pre-installed EasyConnect caps).



Boundaries

It is not compatible with water-dispersible granule formulations, even though these formulations pose less risk to farmers. For smaller producers, the cost may be a factor that discourages the adoption of this technology.

Systemic Feasibility Analysis: Expert insights from Literature and Field Data

CRITERIUM	INDICATOR	INDICATOR SCORE	EVALUATION
<u>Biodiversity</u>	Impact on aquatic organisms	-- / - / 0 / + / ++	☹️
	Impact on bees	-- / - / 0 / + / ++	☹️
	Impact on arthropods other than bees	-- / - / 0 / + / ++	☹️
	Impact on <u>earthworms</u>	-- / - / 0 / + / ++	☹️
	Impact on non-target <u>soil micro-organisms</u>	-- / - / 0 / + / ++	☹️
<u>Water quality</u>	Impact on pesticide losses to surface water (runoff)	-- / - / 0 / + / ++	😊
<u>Air quality</u>	Impact on pesticide <u>emissions</u>	-- / - / 0 / + / ++	😊
	Impact on air <u>pollutants emissions</u>	-- / - / 0 / + / ++	😊
<u>Working conditions</u>	Knowledge <u>requirements</u>	high training level moderate training level low training level no training	😊
	Impact on <u>working-time</u>	- 30%	😊
	Impact on work <u>peaks</u>	-- / - / 0 / + / ++	😊
	Impact on human health	high risk moderate risk low risk no risk	😊
	Risk mitigation on operator/employee exposure	high mitigation moderate mitigation low mitigation none	😊
<u>Costs</u>	<u>Required level of investment</u>	> EUR 100.000 EUR 50.000 - 100.000 EUR 10.000 - 50.000 < EUR 10.000	😊

Impact Highlights

The Closed Transfer System (CTS) is a non-electronic safety device for viticulture that enables sealed mixing of plant protection products (PPPs).

By significantly reducing operator exposure, its primary strength lies in improving working conditions and minimizing health risks for operators, and indirectly for consumer. It involves no peak workloads, no investment costs, and no additional labor or training are required.

As it does not affect pest control efficacy or environmental indicators such as biodiversity or water quality, it is a practical, high-impact solution for safer PPP handling.

Evaluation:



Not Satisfying



Not Satisfying



Moderately Satisfying



Satisfying



Very Satisfying