

## **Closed Transfer System (CTS): determination of field data to measure the reduction of operator exposure during mixing and loading by using three types of CTS**

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### INTRODUCTION

Closed transfer systems were developed to minimise the exposure of operators to plant protection products during the mixing and loading of the spray tank. However, authorities and other regulators still hesitate to accept these risk mitigation measures in a regulatory context. There are still concerns and hesitations regarding the efficacy of these systems in terms of operator safety because appropriate data to demonstrate the safety of CTS in the field are still lacking.

CropLife Europe conducted an operator exposure study to determine the reduction of operator exposure during mixing and loading with three types of CTS under realistic field conditions. This study should help to propose a general exposure reduction factor that is valid for all closed transfer systems that are currently available, and that should also cover future systems.

### METHODOLOGY

The test system comprises operators undertaking mixing/loading activities at various sites within Europe (Germany, the Netherlands, Spain and France) using three types of closed transfer system. Dermal exposure to the test item was measured by the operators wearing two layers of whole-body dosimeters in order to determine potential and actual exposure.

Protective nitrile gloves were worn throughout the mixing/loading activities. The gloves will be sampled for exposure measurement. Hand exposure was measured using a hand wash method. The operators performed monitored hand washes prior to any natural breaks and at the end of the respective mixing/loading procedure. All samples were analysed via LC/MS

Twelve operators were monitored for all of the activities associated with mixing/loading for each closed transfer system (total of 36 operators). The number of mixing/loading activities performed by each operator was representative of an application to 50 ha. Two surrogate products were used to mimic high and low application rates. The actual working operations were described in the raw data by a team of field observers.

## RESULTS

The study was conducted in the second half of 2021. The operator exposure determined whilst using closed transfer systems was compared with existing data from the Agricultural Operator Exposure Model (AOEM) as a benchmark for open pour loading. The AOEM is currently used by EFSA to estimate operator exposure for European plant protection product registration processes. We aimed for an exposure reduction of >90 % for all systems to propose a minimum operator exposure reduction factor that is relevant for all CTS. This study will also represent future CTS solutions that comply with tests from ISO 21191:2021, which are relevant for operator safety.

## DISCUSSION

The key objective of this project was to increase the regulatory acceptance of CTS by measuring operator exposure, when using CTS, under realistic field scenarios. The use of different types of systems covered a common variability and increased the scientific validity of the study. The results will be made publicly available to EFSA with no data ownership claims. Public outreach events before and after the actual study gave regulators the chance to provide comments. The whole data generation process was made as transparent as possible.