



Overview on the EFSA GD on emissions from protected crops

Tiered approach to surface water
assessment with respect to covered crops

EFSA technical stakeholder meeting,
Parma, 17/18 June 2014

BASIC ASSUMPTIONS

Basic assumptions made for all structures except **closed buildings, greenhouses and walk-in tunnels**:

- net precipitation is not changed/hardly influenced
- temporal pattern and overall precipitation pattern is not changed
- wash-off from crop is not changed (at least not becoming larger)
- temperature is on the average not lower than open field
- soil has not been changed (at least %OM is not lower)
- drip irrigation is not covered as for open field (EFSA, 2012a, b)




BASIC ASSUMPTIONS

With regards to **spray-drift** and in relation to open field assessment the following assumptions are made for all covered structures **except closed buildings, greenhouses and walk-in tunnels**:

- distance to the receptor surface water is not less, i.e. no differences in the distance between the surface water and the last row of the crop.
- wind speed during application is not higher
- boom height above canopy (downwards spraying only) is at least not higher
- the speed of machine during application is not worse with regards to drift
- same drift reducing technology and/or distance to the non-target object (e.g. surface water) as for the open field (if applicable)

PROPOSED ASSESSMENT METHODS FOR RECEPTOR SURFACE WATER



Structure/System	Surface water
Low net shelter	FOCUS all*
Low plastic shelter	FOCUS all
Low net tunnel	FOCUS all
Low plastic tunnel	FOCUS all
High net shelter	FOCUS all
High plastic shelter	FOCUS all
Shade house	FOCUS all
Closed building	Not relevant
Walk-in tunnel	FOCUS Drainage scenarios only
Greenhouse	Scenarios to be developed for receptors soil, surface water and groundwater.

Outline

- For all structures except *walk-in tunnels*, *closed buildings* and *greenhouses*, the *same approach as for open field* should be used as this approach for open field is considered to cover covered crops as well (i.e. in the cumulative distribution cc and open field are evenly distributed).
- For *walk-in tunnels* it is proposed that the standard FOCUS surface water drainage scenarios are used.
- For **greenhouses** differentiation is made between soil-bound and soil-less situation with different approaches, more information later in the presentation.

EXISTING VS PROPOSED PROCEDURE

Existing procedures: FOCUS surface water in four steps in ten scenarios using MACRO for drainage, PRZM for run-off and TOXSWA final PECs in surface waters.



EXISTING VS PROPOSED PROCEDURE

Proposed procedures:

Closed buildings

Emissions to surface water are not assessed.

Walk-in tunnels

Standard Drainage scenarios in FOCUS surface water step 3.

Greenhouses

Scenario justified by applicant Example scenarios provided by the Working group and described in appendix A and B. MACRO/PEARL for calculating emissions and TOXSWA for concentrations in surface water.

Waterstreams model may be used to calculate crop water demands.

GEM (Greenhouse Emission Model) is combination of Waterstreams, substance e-fate properties and TOXSWA) is used for soilless situation (three variants: application with nutrient solution, spraying and ebb/flow systems)


TIERED APPROACH

Open field approach-All structures ***except walk-in tunnels, closed buildings and greenhouses***

- Step 1, maximum loading of the SW based on total applied amount of substance applied over the entire season/year
- Step 2, loading as is Step 1, but accounting for disappearance of substance between two applications
- Step 3, advanced modelling using FOCUS SW scenarios
- Step 4, based on Step 3, but accounting for mitigation.

TIERED APPROACH

Walk-in tunnels

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- Only soil-bound cultivation, for soil-less cultivation see greenhouse soil-less.
 - Assessment is according to FOCUS D scenarios, i.e. run-off and erosion are not considered.
 - At Step 1, if inadequate safety margins are obtained (toxicity exposure ratios < trigger values), proceed to Step 2.
 - At Step 2, if inadequate safety margins are obtained (toxicity exposure ratios < trigger values), proceed to Step 3.
 - Step 3 is the final stage. Steps equivalent to step 4 for open fields are not recommended as in general the necessary information is not available.

TIERED APPROACH

Greenhouses

- **Greenhouses (soil bound)**

See walk-in tunnel.

- **Greenhouses (soil-less)**

1. *Drip irrigation (DI)*

Emission to surface water is due to discharge only; other potential routes considered negligible.

Steps 1 and 2 are probably only theoretical because criteria will not be met unless the substance has very low toxicity. It is not necessary to account for volatilisation and subsequent deposition in surface water in these steps, because this process would contribute negligibly.

Step 3 is GEM (greenhouse Emission Model) approach.

2. *Spraying/Fogging*

Step1: The total dosage over a season assumed to be applied in one time.

Step 2: may look into the separate applications.

Step 3 is GEM (greenhouse Emission Model) approach.