

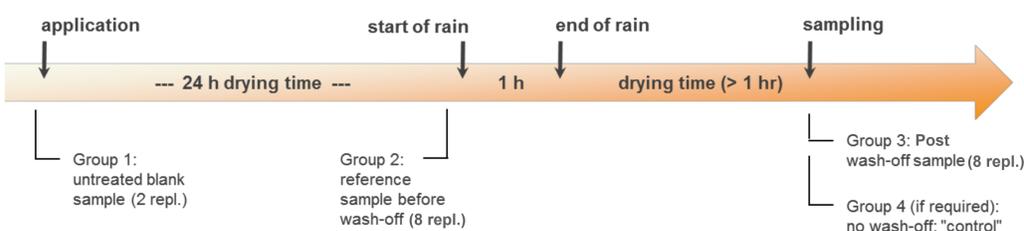
Development of a Harmonised Study Design for the Measurement of a Foliar Wash-off: Impact of Crop Type on Wash-off

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1. Introduction

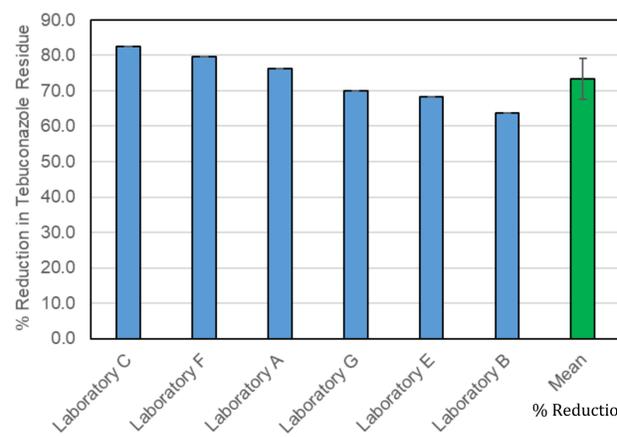
The foliar wash-off coefficient in FOCUS modelling can refine the soil loading after a sprayed application of pesticides. The modelling default can be superseded by experimental data, however previous attempts to generate such data have suffered from the lack of harmonised guidance for the study conduct. Based on an ECPA workshop in 2015, a protocol for a “single test” (i.e. a single crop/growth stage/AI/formulation) was devised and a ring test on this design was conducted, primarily to establish the robustness of the design in several laboratories and, importantly, to understand the impact of the specific rainfall delivery system used. The results of this first ring test demonstrated good agreement in wash-off across the participants, showing that the proposed study design was suitable for robust experiment measurement of wash-off for use in regulatory modelling. Following the success of the first phase of the project, the next aspect to be investigated was the variation of wash-off across range of crop types, with the ultimate aim of assessing the potential for selection of exemplar crops to represent a larger groups of crops. This poster summarises the results obtained from this phase of the project.

2. Phase 1 Study Concept



- Tomato plants at BBCH 25 were sprayed with Tebuconazole (Folicur EW 250) - formulation not optimised for rainfastness
- Groups of plants (8 replicates) were analysed with and without rainfall
- Plant material was analysed using the validated crop residue method for the tested active ingredient.

3. Phase 1 Results



- Good agreement between 6 of the 8 participating laboratories (mean of 73.4% wash-off with a 95% CI of ± 5.8%)
- Wash-off was significantly lower in 2 laboratories (41.1 and 52.6% wash-off)

$$\% \text{ Reduction} = \left(\frac{\text{Group 2 Residues} - \text{Group 3 Residues}}{\text{Group 2 Residues}} \right) \times 100\%$$

4. Phase 2 Materials and Methods

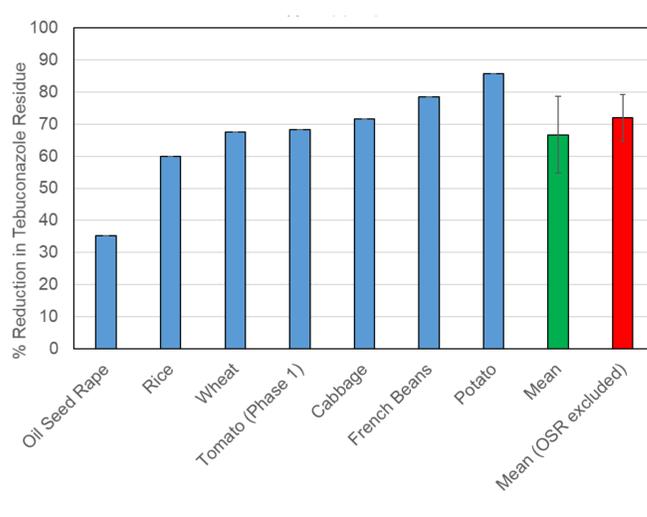
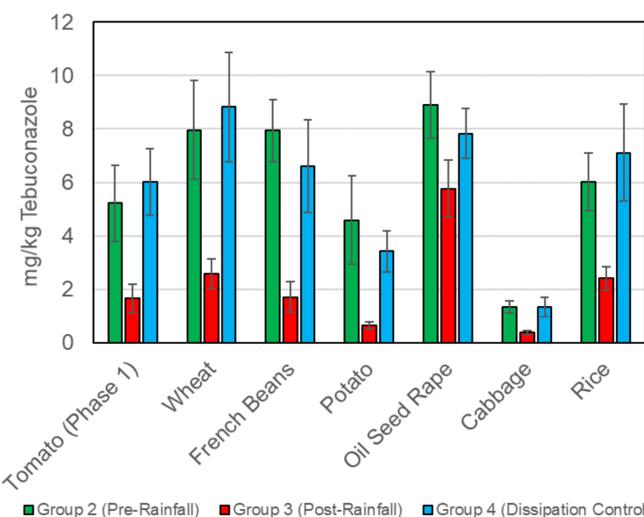


- 7 crops selected to cover both monocotyledon and dicotyledon species, a range of OECD metabolism and residue crop groups and, importantly, both high and low wettability leaf surface
- 24 plants were sprayed with Tebuconazole (Folicur EW 250) at 100 g ai/ha
- Analysis as per Phase 1
- Study conducted entirely by Eurofins DE (Laboratory E from Phase 1)

Crop	Growth Stage	Wettability	Monocot/Dicot	OECD Residue Crop Group	OECD Metabolism Crop Group
Tomato (Phase 1)	BBCH 25	Easy	Dicot	Fruiting Vegetables	Fruit
Potato	BBCH 25	Easy	Dicot	Roots and Tubers	Root crops
French Bean	BBCH 51	Easy	Dicot	Legumes and Pulses	Pulses and Oilseeds
Wheat	BBCH 31	Difficult	Monocot	Cereal Grains	Cereal/Grass Crops
Cabbage	BBCH 42	Difficult	Dicot	Brassica	Leafy Crops
Oil Seed Rape	BBCH 31	Difficult	Dicot	Oilseeds	Pulses and Oilseeds
Rice	BBCH 31	Difficult	Monocot	Cereal Grains	Cereal/Grass Crops



5. Phase 2 Results



- Absolute residues varied considerably between crops
- Likely resulting from variation in leaf size and variation in morphology of cuticula
- No significant difference between Group 2 (pre-rainfall) and Group 4 (dissipation control) residues for any crop
- Confirming no significant alternative dissipation processes for any crop
- % wash-off was similar across most crops (and similar to Tomato from phase 1)
- Wash off in Oil Seed Rape was significantly lower (the reason for this is unclear)
- Mean % wash-off was 66.7% with a 95% CI of ±12.0%
- Mean increased to 72.0% with a 95% CI of ±7.2% when oil seed rape excluded

6. Conclusions

- Despite a wide range of crop types, % wash-off was relatively consistent for this unoptimized formulation
- Suggests that selection of a small range of “worst-case” crop types may be feasible for products with a very wide label
- The results from Phase 1 and 2 show that the proposed protocol is reproducible between different laboratories and that the extent of wash-off did not vary significantly between crops for this formulation for tebuconazole. The protocol therefore is appropriate for use in measuring the extent of wash-off.
- Next stage of the project is currently being defined. Potential areas for further experimental work include:
 - Impact of Different Rainfall scenarios (intensity and/or duration) including investigation into the kinetics of wash-off
 - Impact of crop growth stage