

EUROPEAN UNION PROFICIENCY TEST FOR PESTICIDES IN FRUIT AND VEGETABLES.
SCREENING METHODS 14 (EUPPT-FV-SM14)

Pesticide Residues in Tomato Homogenate

Final Report
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EUROPEAN UNION PROFICIENCY TEST FOR PESTICIDES IN FRUIT AND VEGETABLES.

SCREENING METHODS 14

BACKGROUND

According to Article 28 of Regulation 396/2005/EC of the European Parliament and European Council regarding maximum residue levels for pesticides in, or on, food and feed of plant and animal origin¹: all laboratories analysing samples for the official control of pesticide residues shall participate in the European Union Proficiency Tests (EUPTs) for pesticide residues, facilitated by the Commission. These proficiency tests are carried out on an annual basis in order to ensure the quality, accuracy and comparability of the residue data reported by EU Member States to the European Commission, as well as by other Member States within the framework of coordinated national monitoring and surveillance programmes.

Regulation (EU) No 625/2017² lays down the responsibilities and tasks of European Union Reference Laboratories (EURLs) for Food, Feed and Animal Health. Among these tasks is the provision for regular inter-laboratory comparative testing or proficiency tests. This is a proficiency test on qualitative screening methods for pesticides in fruits and vegetable commodities.

The aim of these tests is to evaluate laboratory capability when using wide-scope qualitative and/or semi-quantitative screening methods during routine analysis, for detecting and identifying unexpected pesticides at levels at, or above 0.01 mg/kg – included in and/or in addition to the laboratories' quantitative methods used for frequently-detected pesticides. A second aim is to encourage official laboratories (OfLs) to extend the scope of their methods in a cost-effective way, by using the different mass spectrometry (MS) instruments/software and methods available (whether they are old or new).

Participation in this PT remains on a voluntary basis, given that the EURL-FV already organises the Proficiency Tests for quantitative multi-residue pesticide analysis (EUPT-FVs) over the same time period. Nevertheless, all FV-National Reference Laboratories (FV-NRLs) and FV-Official Laboratories (FV-OfLs) involved in the determination of pesticide residues in fruit and vegetables for the EU-coordinated monitoring programme, or for their own national programmes, are invited to take part.

DG-SANTE has full access to all EUPT data including the individual lab-codes/lab-name keys. This report may be presented to the Phytopharmaceuticals – Pesticides Residues section of the Plants, Animals, Food and Feed Committee.

¹Regulation (EC) No 396/2005, published in the OJ of the EU L70 of 16.03.2005, as last amended by Regulation 839/2008 published in the OJ of the EU L234 of 30.08.2008.

²Regulation (EU) No 625/2017 of the European Parliament and of the Council on official controls and other official activities performed to ensure the application of food and feed law, rules on animal health and welfare, plant health and plant protection products. Published in the OJ of the EU L95/1 of 07/04/2017

1. INTRODUCTION

The EURL-FV has decided to continue its operation in these screening proficiency tests because of the good acceptance in the EURL-FV laboratory network.

Mass Spectrometry plays an essential role in the everyday work carried out by laboratories. Technological improvements in modern MS systems offer new possibilities for greatly increasing the scope of MRM (multiresidue methods) analysis. Whereas full-scan or all ion fragmentation measurements are theoretically the best approach for MS screening, developments in targeted measurements also offer the potential for a substantially increased scope of analysis. Another reason for conducting this proficiency test on screening methods is to gather information from laboratories as to the type of software they use for processing data: whether laboratories are using commercial software and databases or whether they are internally constructed and search manually. This type of test provides an overview of such information as well as valuable insight into the possible need for further software development in the near future.

The objective of the EURL-FV screening proficiency tests is for laboratories to be able to use mass-spectrometry-based screening methods routinely, following validation. This is in line with Document No SANTE/11312/2021 "Analytical quality control and method validation procedures for pesticide residues and analysis in food and feed".

This EUPT-FV-SM14 is aimed at all NRLs and all OfLs for fruits and vegetables in EU Member States. Laboratories outside this EURL/NRL/OfL-Network were also invited to participate.

The evaluation of this PT was based on qualitative information, although an estimated concentration was requested for those pesticides that were detected, only for informative purposes. It was decided, as in previous PTs, not to provide the laboratories with a Target Pesticide List so that their capability in detecting whatever pesticides were present was also evaluated.

2. TEST ITEM

2.1 Preparation of the treated test item.

This proficiency test is based on the pesticide-residue analysis of tomato homogenate. Tomatoes were cultivated in a greenhouse in Almería, Spain.

The pesticides used to spike the tomato were decided upon by the Quality Control Group. No target pesticide list was provided to participants. The pesticides selected for treating the test item for this EUPT-FV-SM14 were mainly chosen taking into account the following considerations:

- That they were not included in the EU-Coordinated Multiannual Control Programme.
- That they had particularly acute toxicity and/or had low ARfD values.

Tomatoes were grown in a greenhouse in Almería, Spain. The same plants had been treated with commercial formulations for the preparation of EUPT-SRM17 test item; for this reason, the EUPT-SM14 material contained incurred pesticides.

For the preparation of the EUPT-SM14 test item, once harvested, tomatoes were milled, and the tomato homogenate was then spiked with the pesticides applied as analytical standards. The mixture was homogenised and packed in plastic bags. The bags were frozen for 48 hours and then, the ice blocks were milled again using an ice crusher. After that, the test item was sub-sampled into polyethylene bottles that had previously been coded. The bottles were sealed and stored in a freezer at about -20 °C prior to distribution to participants. Tables 2.1.1 and 2.1.2 show the pesticide residues present in the EUPT-SM14 test item.

Table 2.1.1 Pesticides present in the test item.

Incurred and Spiked Pesticides	
EUPT-SRM17 incurred	Analytical Standards
Bifenazate/Bifenazate diazene	8-Hydroxyquinoline
Captan	Aclonifen
Chlorothalonil	Cyflumetofen
Flonicamid	Cyhalofop butyl
Folpet	Mefentrifluconazole
Formetanate	Oxadiargyl
Propamocarb	Oxyfluorfen
Pymetrozine	Pencycuron
Spirotetramat (below 0.01 mg/kg)	Penflufen
	Permethrin
	Pyraclostrobin
	Pyridate
	Triazophos

Table 2.1.2 Metabolites present in the test item.

Metabolite
Phthalimide (folpet)
Pyridafol (pyridate) (below 0.01 mg/kg)
Spirotetramat-enol (spirotetramat)
Spirotetramat-enol-glucoside (spirotetramat)
Spirotetramat-ketohydroxy (spirotetramat) (below 0.01 mg/kg)
Tetrahydrophthalimide (THPI) (captan)
TFNA (flonicamid) (below 0.01 mg/kg)
TFNG (flonicamid)

The parent compound is shown between brackets

To evaluate the detections in this EUPT, we will consider the following:

- Phthalimide has been evaluated as Folpet residue
- All the propamocarb metabolites have been evaluated as Propamocarb residue
- Pyridafol has been evaluated as Pyridate residue
- All the spirotetramat metabolites have been evaluated as Spirotetramat residue
- Tetrahydrophthalimide (THPI) has been evaluated as Captan residue
- TFNA, TFNA-AM and TFNG have been evaluated as Flonicamid residue

For the evaluation of this proficiency test, we will consider ONLY those compounds above 0.01 mg/kg. The present pesticides, but below 0.01 mg/kg are not going to be considered as "other reported compounds" and they will be excluded from the evaluation. Therefore, the evaluated pesticides are shown in table 2.1.3.

Table 2.1.3 Evaluated pesticides in EUPT-FV-SM14.

Evaluated Pesticides		
8-Hydroxyquinoline+	Folpet*	Permethrin+
Aclonifen+	Formetanate*	Propamocarb*
Bifenazate/Bifenazate diazene*	Mefentrifluconazole+	Pymetrozine*
Captan*	Oxadiargyl+	Pyraclostrobin+
Chlorothalonil*	Oxyfluorfen+	Pyridate+
Cyflumetofen+	Pencycuron+	Spirotetramat*
Cyhalofop butyl+	Penflufen+	Triazophos+
Flonicamid*		

*spiked in EUPT-FV-SM14

*incurred in EUPT-SRM17

2.2 Homogeneity and stability tests.

The PT test item was analysed in order to identify the present pesticides, which were consistently confirmed to be above 0.01 mg/kg.

To confirm the homogeneity of the test item sent, ten test samples were randomly chosen from those stored in the freezer and analysed in duplicate so as to check for the presence of the pesticides.

The injection sequence of the 20 analyses by GC and LC was determined from a table of randomly-generated numbers. The statistical evaluation was performed according to the International Harmonized Protocol published by IUPAC, ISO and AOAC³. The results of the homogeneity tests are given in Table 2.2.1. The acceptance criteria for the test item to be sufficiently homogenous for the proficiency test were that: $Ss^2 < c$, where Ss is the between-bottle sampling standard deviation and $c = F_1\sigma_{all}^2 + F_2S^2_{an}$; F_1 and F_2 being constant values of 1.88 and 1.01, respectively, from the ten samples taken, and $\sigma_{all}^2 = 0.3 \times FFP RSD(25\%) \times$ the analytical sampling mean for all the pesticides. This was used to demonstrate that the between-bottle variance was not higher than the within-bottle variance. All the compounds passed the homogeneity test.

Table 2.2.1 shows the statistical analyses for each of the pesticides used to treat the sample. All pesticides passed this test.

Table 2.2.1 Statistical evaluation of the homogeneity test data (n = 20 analyses)

Pesticide	Mean Conc. (mg/Kg)	Ss^2	c	$Ss^2 < c$ Pass/Fail
8-hydroxyquinoline	0.035	0	0.00002	Pass
Aclonifen	0.052	0.00001	0.00003	Pass
Bifenazate/Bifenazate diazene	0.097	0.00009	0.00014	Pass
Captan	0.232	0	0.00012	Pass
Chlorothalonil	0.048	0.00002	0.00032	Pass
Cyflumetofen	0.113	0.00006	0.00014	Pass
Cyhalofop butyl	0.078	0.00004	0.00019	Pass
Flonicamid	0.132	0.00004	0.00022	Pass
TFNG	0.015	0	0.00024	Pass
Folpet	0.036	0	0.00033	Pass
Formetanate	0.475	0.00018	0.00256	Pass
Mefentrifluconazole	0.050	0.00001	0.00014	Pass
Oxadiargyl	0.053	0.00001	0.00019	Pass
Oxyfluorfen	0.073	0.00009	0.00034	Pass
Pencycuron	0.065	0.00001	0.00015	Pass
Penflufen	0.054	0.00002	0.00024	Pass
Permethrin	0.062	0.00002	0.00036	Pass
Propamocarb	1.050	0.00018	0.00796	Pass
Pymetrozine	0.030	0	0.00013	Pass
Pyraclostrobin	0.092	0.00002	0.00015	Pass
Pyridate	0.075	0.00005	0.00016	Pass
Spirotetramat-enol	0.048	0	0.00014	Pass
Spirotetramat-enol-glucoside	0.038	0	0.00019	Pass
Triazophos	0.110	0.00002	0.00006	Pass

The stability tests were also carried out by the EURL-FV laboratory at the University of Almería. The tests were performed according to ISO 13528:2015. Shortly before the test item shipment, three bottles that were stored in the freezer at -20 °C were chosen randomly and stored in a -80 °C freezer

³ ISO 13528:2015, Statistical methods for use in proficiency testing by interlaboratory comparison, International Organization for Standardization

(Day 1). After the deadline for reporting results, those three bottles stored at -80 °C, together with three other bottles that were stored in the freezer at -20 °C and were chosen randomly (Day 2) were analysed by duplicate.

A pesticide was considered to be adequately stable if $|x_1 - y_1| \leq 0.3 \times \sigma$, where x_1 is the mean value of the Day 1 stability test, y_1 the mean value of the Day 2 stability test and σ the standard deviation used for proficiency assessment (typically 25 % of the assigned value).

The individual results are given in Table 2.2.2 This test did not show any significant decrease in the pesticide concentrations with time. This demonstrates that, for the duration of the proficiency test, and provided that the storage conditions prescribed were followed, the time elapsed until the participants performed the analysis would not have influenced their results.

Table 2.2.2

Statistical test for analytical precision and to demonstrate results stability after the interval of time-elapsed between the shipment of the test item and the deadline for reporting of results.

(mg/Kg)	Day 1						Day 2						Mean 2	$(M_2 - M_1)$	$M_2 - M_1 \leq 0.3 \times \sigma$	
	Sample 46_A	Sample 46_B	Sample 124_A	Sample 124_B	Sample 28_A	Sample 28_B	Mean 1	Sample 42_A	Sample 42_B	Sample 88_A	Sample 88_B	Sample 27_A	Sample 27_B			
8-hydroxyquinoline	0.045	0.042	0.037	0.040	0.046	0.049	0.043	0.040	0.039	0.045	0.051	0.040	0.039	0.042	-0.001	Pass
Aclonifen	0.060	0.055	0.051	0.055	0.060	0.055	0.056	0.050	0.052	0.055	0.054	0.057	0.060	0.055	-0.001	Pass
Bifenazate/Bifenazate diazene	0.100	0.095	0.098	0.110	0.089	0.088	0.097	0.098	0.095	0.100	0.108	0.096	0.098	0.099	0.003	Pass
Captan	0.250	0.246	0.235	0.237	0.240	0.243	0.242	0.238	0.235	0.249	0.248	0.240	0.239	0.242	0.000	Pass
Chlorothalonil	0.050	0.051	0.047	0.048	0.050	0.050	0.049	0.048	0.045	0.043	0.046	0.050	0.048	0.047	-0.003	Pass
Cyflumetofen	0.110	0.112	0.113	0.111	0.115	0.116	0.113	0.109	0.110	0.109	0.100	0.120	0.117	0.111	-0.002	Pass
Cyhalofop butyl	0.079	0.080	0.083	0.082	0.077	0.080	0.080	0.078	0.080	0.083	0.086	0.076	0.075	0.080	-0.001	Pass
Flonicamid	0.134	0.136	0.141	0.139	0.144	0.143	0.140	0.133	0.130	0.140	0.138	0.129	0.130	0.133	-0.006	Pass
TFNG	0.010	0.011	0.013	0.046	0.015	0.017	0.019	0.020	0.018	0.015	0.017	0.018	0.019	0.018	-0.001	Pass
Folpet	0.034	0.035	0.037	0.035	0.038	0.036	0.036	0.035	0.038	0.038	0.038	0.039	0.038	0.038	0.002	Pass
Formetanate	0.466	0.468	0.472	0.473	0.478	0.479	0.473	0.478	0.478	0.476	0.475	0.469	0.470	0.474	0.002	Pass
Mefentrifluconazole	0.048	0.048	0.052	0.051	0.050	0.053	0.050	0.054	0.052	0.049	0.050	0.048	0.049	0.050	0.000	Pass
Oxadiargyl	0.050	0.052	0.049	0.049	0.051	0.055	0.051	0.056	0.054	0.055	0.055	0.047	0.050	0.053	0.002	Pass
Oxyfluorfen	0.075	0.076	0.073	0.073	0.072	0.073	0.074	0.070	0.072	0.078	0.077	0.071	0.072	0.073	0.000	Pass
Pencycuron	0.067	0.062	0.063	0.059	0.068	0.072	0.065	0.071	0.072	0.070	0.072	0.066	0.068	0.070	0.005	Pass
Penflufen	0.055	0.053	0.050	0.051	0.055	0.053	0.053	0.053	0.055	0.051	0.049	0.052	0.052	0.052	-0.001	Pass
Permethrin	0.064	0.065	0.066	0.066	0.064	0.066	0.065	0.060	0.066	0.059	0.058	0.062	0.060	0.061	-0.004	Pass
Propamocarb	1.000	1.010	1.030	1.020	1.044	1.054	1.026	1.048	1.055	1.050	1.051	1.053	1.052	1.052	0.025	Pass
Pymetrozine	0.025	0.027	0.033	0.032	0.030	0.031	0.030	0.029	0.029	0.031	0.030	0.032	0.030	0.030	0.000	Pass
Pyraclostrobin	0.100	0.098	0.097	0.098	0.096	0.099	0.098	0.099	0.098	0.101	0.100	0.098	0.099	0.099	0.001	Pass
Pyridate	0.078	0.076	0.074	0.074	0.079	0.079	0.077	0.079	0.078	0.077	0.078	0.079	0.080	0.079	0.002	Pass
Spirotetramat-enol	0.050	0.049	0.050	0.050	0.047	0.048	0.049	0.048	0.046	0.046	0.047	0.048	0.049	0.047	-0.002	Pass
Spirotetramat-enol-glucoside	0.040	0.041	0.039	0.040	0.040	0.038	0.040	0.038	0.037	0.040	0.037	0.038	0.037	0.038	-0.002	Pass
Triazophos	0.109	0.110	0.112	0.104	0.107	0.108	0.108	0.112	0.107	0.108	0.109	0.110	0.109	0.109	0.001	Pass

Moreover, regarding the stability of the sample arriving not completely frozen, a duplicate analysis of three bottles reproducing the delivery conditions that the samples experienced for 48 hours was performed (Day 3). Laboratories could therefore be sufficiently confident in accepting the treated test item even if it was not completely frozen. All the pesticides passed this second stability test. Results for this 48-hour stability test are indicated in Table 2.2.3.

Table 2.2.3 Statistical test for analytical precision and to demonstrate stability for the 48-hour time-elapsed interval.

(mg/Kg)	Day 1						Day 3									
	Sample 46_A	Sample 46_B	Sample 124_A	Sample 124_B	Sample 28_A	Sample 28_B	Mean 1	Sample 103_A	Sample 103_B	Sample 5_A	Sample 5_B	Sample 82_A	Sample 82_B	Mean 2	(M2 - M1)	M2-M1 ≤ 0.3*σ
8-hydroxyquinoline	0.045	0.042	0.037	0.040	0.046	0.049	0.043	0.045	0.051	0.040	0.039	0.040	0.039	0.042	-0.001	Pass
Aclonifen	0.060	0.055	0.051	0.055	0.060	0.055	0.056	0.055	0.054	0.050	0.052	0.058	0.060	0.055	-0.001	Pass
Bifenazate/Bifenazate diazene	0.100	0.095	0.098	0.110	0.089	0.088	0.097	0.100	0.108	0.098	0.095	0.096	0.097	0.099	0.002	Pass
Captan	0.250	0.246	0.235	0.237	0.240	0.243	0.242	0.237	0.235	0.248	0.249	0.241	0.242	0.242	0.000	Pass
Chlorothalonil	0.050	0.051	0.047	0.048	0.050	0.050	0.049	0.050	0.047	0.044	0.046	0.050	0.047	0.047	-0.002	Pass
Cyflumetofen	0.110	0.112	0.113	0.111	0.115	0.116	0.113	0.110	0.109	0.160	0.118	0.120	0.110	0.121	0.008	Pass
Cyhalofop butyl	0.079	0.080	0.083	0.082	0.077	0.080	0.080	0.079	0.084	0.085	0.083	0.082	0.078	0.082	0.002	Pass
Flonicamid	0.134	0.136	0.141	0.139	0.144	0.143	0.140	0.133	0.132	0.130	0.129	0.130	0.130	0.131	-0.009	Pass
TFNG	0.010	0.011	0.013	0.046	0.015	0.017	0.019	0.019	0.019	0.020	0.021	0.018	0.019	0.019	0.001	Pass
Folpet	0.034	0.035	0.037	0.035	0.038	0.036	0.036	0.036	0.037	0.039	0.039	0.038	0.037	0.038	0.002	Pass
Formetanate	0.466	0.468	0.472	0.473	0.478	0.479	0.473	0.473	0.474	0.470	0.472	0.474	0.475	0.473	0.000	Pass
Mefentrifluconazole	0.048	0.048	0.052	0.051	0.050	0.053	0.050	0.052	0.055	0.054	0.053	0.054	0.054	0.054	0.003	Pass
Oxadiargyl	0.050	0.052	0.049	0.049	0.051	0.055	0.051	0.049	0.050	0.048	0.054	0.055	0.055	0.052	0.001	Pass
Oxyfluorfen	0.075	0.076	0.073	0.073	0.072	0.073	0.074	0.080	0.080	0.082	0.080	0.076	0.075	0.079	0.005	Pass
Pencycuron	0.067	0.062	0.063	0.059	0.068	0.072	0.065	0.060	0.066	0.059	0.058	0.067	0.067	0.063	-0.002	Pass
Penflufen	0.055	0.053	0.050	0.051	0.055	0.053	0.053	0.054	0.052	0.049	0.050	0.054	0.053	0.052	-0.001	Pass
Permethrin	0.064	0.065	0.066	0.066	0.064	0.066	0.065	0.070	0.072	0.066	0.068	0.060	0.062	0.066	0.001	Pass
Propamocarb	1.000	1.010	1.030	1.020	1.044	1.054	1.026	1.050	1.051	1.048	1.047	1.054	1.053	1.051	0.024	Pass
Pymetrozine	0.025	0.027	0.033	0.032	0.030	0.031	0.030	0.032	0.031	0.033	0.031	0.031	0.032	0.032	0.002	Pass
Pyraclostrobin	0.100	0.098	0.097	0.098	0.096	0.099	0.098	0.100	0.098	0.099	0.098	0.100	0.099	0.099	0.001	Pass
Pyridate	0.078	0.076	0.074	0.074	0.079	0.079	0.077	0.078	0.077	0.071	0.072	0.075	0.074	0.075	-0.002	Pass
Spirotetramat-enol	0.050	0.049	0.050	0.050	0.047	0.048	0.049	0.049	0.050	0.048	0.049	0.047	0.048	0.049	-0.001	Pass
Spirotetramat-enol-glucoside	0.040	0.041	0.039	0.040	0.040	0.038	0.040	0.038	0.038	0.039	0.038	0.036	0.036	0.038	-0.002	Pass
Triazophos	0.109	0.110	0.112	0.104	0.107	0.108	0.108	0.107	0.108	0.109	0.108	0.110	0.110	0.109	0.000	Pass

2.3 Distribution of test item and protocol to participants

Approximately 200 g of treated tomato homogenate were shipped to participants on 7th March 2022. The deadline for results submission to the Organiser was 72 hours after receipt of the test item. Participants were asked to report all the pesticides that they detected.

Laboratories were asked to screen the test items using the wide-scope screening methods they would normally apply, or anticipate applying, for official monitoring purposes. This typically involves full-scan techniques or all ion fragmentation with HRMS (High Resolution Mass Spectrometry). However, extended targeted methods using LC-MS/MS (triple quadrupole, Q-trap, Q-ToF) or GC-MS/MS (triple quadrupole, ion trap, Q-trap, Q-ToF) could also be used.

Before shipment, the laboratories received full instructions for the receipt and analysis of the test item, and they were encouraged to use their own screening methods. These instructions, laid out as the General and Specific Protocols, were uploaded onto the EUPT-FV-SM14 web page, designed especially for this Proficiency Test. This information was also sent by e-mail to all participant laboratories. The Application Form was uploaded onto this same web site together with the Sample Receipt and the results forms. These allowed the evaluation of the mass-spectrometric screening methods that each of the participants used.

3. STATISTICAL METHODS

3.1 Type of results reported

The evaluation of this PT was based on qualitative information, although an estimated concentration was requested (on a voluntary basis) for those pesticides that were detected, only for informative purposes.

The robust mean of the estimated concentrations reported was calculated using robust statistics as described in ISO 13528:2015, considering the results reported by EU and EFTA countries laboratories only.

3.1.1 Other Reported Pesticides

These were considered as those results showing the apparent presence of pesticides which were: (i) not used in the test item treatment, or (ii) not identified by the Organiser, even after repeated analyses. However, if several participants detect the same additional pesticide(s), then a decision as to whether, or not, this should be considered an 'Other Reported Pesticide' result was made on a case-by-case basis.

Organiser's Note: Not all screening methods immediately provide sufficient information to allow full identification. In such cases, when they detect a pesticide in real life, laboratories normally do a follow-up confirmatory analysis: using, for example, LC-MS/MS.

3.1.2 Non-Reported Pesticides

These were considered as any pesticide present in the sample but not reported by the lab even though the Organiser had confirmed it as present in the test item above 0.010 mg/kg.

4. RESULTS

4.1 Summary of reported results

Sixty-nine laboratories agreed to participate in this proficiency test on screening methods. Sixty-three laboratories submitted results on time. All results reported by the participants are given in Appendix 1. Graphical representations of the results reported are shown in Appendix 2. Details of the methods used are provided in Appendix 3 (available on the EUPT-FV-SM14 webpage, not in the printed version). The laboratories that agreed to participate are listed in Annex 1.

A summary of the results reported by pesticide can be seen in Table 4.1.1.

Table 4.1.1 Summary of Reported Results.

Pesticide	Reported		Not Reported	
	No. of laboratories	% of Laboratories [#]	No. of laboratories	% of laboratories *
8-hydroxyquinoline	7	11	56	89
Aclonifen	54	86	9	14
Bifenazate/Bifenazate diazene	52	83	11	17
Captan	52	83	11	17
Chlorothalonil	53	84	10	16
Cyflumetofen	40	63	23	37
Cyhalofop butyl	43	68	20	32
Flonicamid	59	94	4	6
Folpet	42	67	21	33
Formetanate	52	83	11	17
Mefentrifluconazole	41	65	22	35
Oxadiargyl	36	57	27	43
Oxyfluorfen	54	86	9	14
Pencycuron	60	95	3	5

Pesticide	Reported		Not Reported	
	No. of laboratories	% of Laboratories [#]	No. of laboratories	% of laboratories *
Penflufen	46	73	17	27
Permethrin	62	98	1	2
Propamocarb	58	92	5	8
Pymetrozine	54	86	9	14
Pyraclostrobin	61	97	2	3
Pyridate	47	75	16	25
Spirotetramat	52	83	11	17
Triazophos	61	97	2	3

[#]The % of laboratories is calculated based on the total number of laboratories submitting results (63 laboratories).

Phthalimide has been evaluated as Folpet residue

All the propamocarb metabolites have been evaluated as Propamocarb residue

Pyridafol has been evaluated as Pyridate residue

All the spirotetramat metabolites have been evaluated as Spirotetramat residue

Tetrahydrophthalimide (THPI) has been evaluated as Captan residue

TFNA, TFNA-AM and TFNG have been evaluated as Flonicamid residue

In this EUPT-FV-SM14, the estimated concentration was requested for those pesticides that were detected, only for informative purposes. However, not all the laboratories reported concentration results (Appendix 1 – Estimated Concentrations Reported). Table 4.1.2 shows the average concentration from the homogeneity test, the robust mean of the estimated concentrations reported by EU/EFTA laboratories, the number of concentration results reported and the dispersion of the concentration results reported.

NOTE: All compounds reported by the laboratories above 0.01 mg/kg and present in the sample are shown in Table 4.1.2.

Spirotetramat was reported below 0.01 mg/kg but two of its metabolites, enol and enol-glucoside were reported above that value. Some other metabolites were reported above 0.01 mg/kg too, and they appear in the table.

Table 4.1.2 Robust mean values and CVs (%) for all present pesticides reported.

Pesticides	No of Conc. Reported	No of Conc. Reported by EU/EFTA labs	Conc. Homogeneity Test (mg/kg)	Robust mean (mg/kg)	CV (%)
8-hydroxyquinoline	4	2	0.035	0.058	34.0
Aclonifen	53	49	0.052	0.053	26.5
Bifenazate/Bifenazate diazene	69	63	0.097	0.067	53.6
Captan Tetrahydrophthalimide (THPI)	44	41	0.232	0.173	44.3
	38	35	NA	0.291	43.9
Chlorothalonil	49	45	0.048	0.058	45.7
Cyflumetofen	37	30	0.113	0.087	34.9
Cyhalofop butyl	41	37	0.078	0.069	23.9
Flonicamid TFNG	62	58	0.132	0.137	27.5
	27	26	0.015	0.045	38.6
Folpet Phthalimide	40	38	0.036	0.032	41.2
	23	21	NA	0.014	44.1
Formetanate	49	44	0.475	0.536	53.6
Mefentrifluconazole	41	35	0.050	0.045	26.3
Oxadiargyl	36	33	0.053	0.056	21.5
Oxyfluorfen	52	47	0.073	0.064	28.7
Pencycuron	59	54	0.065	0.069	22.9

Pesticides	No of Conc. Reported	No of Conc. Reported by EU/EFTA labs	Conc. Homogeneity Test (mg/kg)	Robust mean (mg/kg)	CV (%)
Penflufen	47	43	0.054	0.051	19.1
Permethrin	67	62	0.062	0.071	34.4
Propamocarb	60	55	1.050	1.105	28.3
Pymetrozine	54	51	0.030	0.043	41.0
Pyraclostrobin	59	54	0.092	0.086	17.9
Pyridate	46	41	0.075	0.107	46.4
Spirotetramat-enol	48	41	0.048	0.052	45.8
	40	36	0.038	0.041	34.7
Triazophos	62	58	0.110	0.096	27.9

No other compounds were identified and quantified by the organizer at concentrations above 0.010 mg/kg.

Other compounds were identified and quantified by the organizer at concentrations below 0.010 mg/kg: Azoxystrobin Emamectin Metalaxyl Sulfotep

4.1.1 Other Reported Compounds

Some laboratories reported additional compounds to those present in the test item. Some of them were reported below 0.01 mg/kg or not quantified. The reported compounds at or above 0.01 mg/kg are marked in light blue.

Table 4.1.1.1 Other reported compounds.

Laboratory Code	Other Reported Compounds	Concentration Reported (mg/kg)
Lab028	1,3-dichloro-2-propanol phosphate (TDCPP)	0.034
Lab020	Allethrin	
Lab011	Amitraz	< 0.005
Lab028	Benazolin	0.018
Lab006	Bromide	0.337
Lab010	Cinmethylin	
Lab034	Dichlofenthion	0.123
Lab010	Diethyltoluamide (DEET)	
Lab044	Diphenylamine	0.047
Lab021	Dithiocarbamate (as CS2)	0.015
Lab027		0.071
Lab046	Dodemorph	
Lab067	Fenpyrazamine	0.073
Lab011	Fenuron	
Lab010	Fuberidazole	
Lab069	Haloxyfop	
Lab044	Metrafenone	0.042
Lab004	Oxadixyl	0.046
Lab006	Perchlorate	0.005
Lab060		0.007
Lab046	Phenisopham	
Lab040	Phosmet	
Lab010	Propisochlor	
Lab046	Pyracarbolid	

Thiram, was reported by three laboratories, but this pesticide is analysed by SRM so we haven't evaluated it.

4.2 Assessment of laboratory performance.

Laboratory performance was assessed with the number of results reported by each laboratory. Table 4.2.1 classifies the laboratories according to the number of pesticides reported.

Table 4.2.1 Classification of laboratories according to the number of pesticides reported.

Laboratory Code	Number of Present Pesticides Reported (22 Evaluated Pesticides)	% of Present Pesticides Reported (22 Evaluated Pesticides)	Other Reported Pesticides Not Confirmed by the Organiser
Lab007	22	100	2
Lab001	21	95	1
Lab017	21	95	2
Lab019	21	95	0
Lab039	21	95	0
Lab041	21	95	2
Lab042	21	95	2
Lab056	21	95	1
Lab059	21	95	2
Lab064	21	95	0
Lab015	21	95	1
Lab027	21	95	1
Lab060	21	95	3
Lab066	21	95	3
Lab011	21	95	4
Lab020	21	95	5
Lab008	20	91	3
Lab012	20	91	2
Lab014	20	91	1
Lab018	20	91	0
Lab025	20	91	0
Lab029	20	91	0
Lab037	20	91	0
Lab049	20	91	2
Lab055	20	91	0
Lab062	20	91	4
Lab010	20	91	8
Lab003	19	86	2
Lab009	19	86	2
Lab013	19	86	0
Lab023	19	86	0
Lab024	19	86	0
Lab047	19	86	0
Lab052	19	86	0
Lab061	19	86	0
Lab053	19	86	4
Lab006	19	86	4
Lab069	18	82	1
Lab044	18	82	4
Lab022	17	77	0
Lab030	17	77	0
Lab051	17	77	3

Laboratory Code	Number of Present Pesticides Reported (22 Evaluated Pesticides)	% of Present Pesticides Reported (22 Evaluated Pesticides)	Other Reported Pesticides Not Confirmed by the Organiser
Lab054	17	77	0
Lab057	17	77	0
Lab065	16	73	0
Lab034	16	73	1
Lab040	16	73	3
Lab046	16	73	6
Lab002	15	68	2
Lab021	15	68	1
Lab043	14	64	0
Lab068	14	64	0
Lab067	14	64	1
Lab016	13	59	0
Lab038	12	55	1
Lab026	11	50	0
Lab035	10	45	0
Lab004	9	41	1
Lab032	7	32	0
Lab063	7	32	0
Lab028	6	27	2
Lab031	4	18	0
Lab005	3	14	1

The extraction methods used by the laboratories, the chromatographic techniques, detectors, instrumentation, etc... are detailed in Appendix 3 (available only on the EUPT-FV-SM14 webpage).

Table 4.2.2 shows the same data shown in Table 4.2.1 but classified by laboratory code.

Table 4.2.2 Results classified by laboratory code

Laboratory Code	Number of Present Pesticides Reported (22 Evaluated Pesticides)	% of Present Pesticides Reported (22 Evaluated Pesticides)	Other Reported Pesticides Not Confirmed by the Organiser
Lab001	21	95	1
Lab002	15	68	2
Lab003	19	86	2
Lab004	9	41	1
Lab005	3	14	1
Lab006	19	86	4
Lab007	22	100	2
Lab008	20	91	3
Lab009	19	86	2
Lab010	20	91	8
Lab011	21	95	4
Lab012	20	91	2
Lab013	19	86	0
Lab014	20	91	1
Lab015	21	95	1
Lab016	13	59	0

Laboratory Code	Number of Present Pesticides Reported (22 Evaluated Pesticides)	% of Present Pesticides Reported (22 Evaluated Pesticides)	Other Reported Pesticides Not Confirmed by the Organiser
Lab017	21	95	2
Lab018	20	91	0
Lab019	21	95	0
Lab020	21	95	5
Lab021	15	68	1
Lab022	17	77	0
Lab023	19	86	0
Lab024	19	86	0
Lab025	20	91	0
Lab026	11	50	0
Lab027	21	95	1
Lab028	6	27	2
Lab029	20	91	0
Lab030	17	77	0
Lab031	4	18	0
Lab032	7	32	0
Lab034	16	73	1
Lab035	10	45	0
Lab037	20	91	0
Lab038	12	55	1
Lab039	21	95	0
Lab040	16	73	3
Lab041	21	95	2
Lab042	21	95	2
Lab043	14	64	0
Lab044	18	82	4
Lab046	16	73	6
Lab047	19	86	0
Lab049	20	91	2
Lab051	17	77	3
Lab052	19	86	0
Lab053	19	86	4
Lab054	17	77	0
Lab055	20	91	0
Lab056	21	95	1
Lab057	17	77	0
Lab059	21	95	2
Lab060	21	95	3
Lab061	19	86	0
Lab062	20	91	4
Lab063	7	32	0
Lab064	21	95	0
Lab065	16	73	0
Lab066	21	95	3
Lab067	14	64	1
Lab068	14	64	0
Lab069	18	82	1

Table 4.2.3 is a summary of the chromatographic techniques used for each pesticide. Graphical representation is shown in Appendix 2.

Table 4.2.3 Chromatographic techniques used to determine each pesticide in the test item

Pesticide	Total Number of Laboratories Reporting Data	*Total Number of Reported Detections	GC	Full Scan/AIF GC	LC	Full Scan/AIF LC
8-hydroxyquinoline	7	7	5	2	2	
Aclonifen	54	58	38	10	19	7
Bifenazate/Bifenazate diazene	52	84	18	7	64	22
Captan	52	97	88	26	6	2
Chlorothalonil	53	55	51	14	2	2
Cyflumetofen	40	42	2	1	39	15
Cyhalofop butyl	43	48	28	11	20	7
Flonicamid	59	104	5	3	98	25
Folpet	42	74	68	19	3	1
Formetanate	52	54	1	1	52	18
Mefentrifluconazole	41	45	9	2	35	12
Oxadiargyl	36	39	6	1	32	14
Oxyfluorfen	54	59	44	14	14	4
Pencycuron	60	64	4	1	59	19
Penflufen	46	52	9	5	42	16
Permethrin	62	73	62	16	10	5
Propamocarb	58	72	4	4	67	22
Pymetrozine	54	56	1		54	13
Pyraclostrobin	61	66	5	3	60	18
Pyridate	47	68			68	23
Spirotetramat	52	145	1		142	47
Triazophos	61	69	28	8	40	16

*Note: the number of reported detections for each of the pesticides could be different to the number of laboratories reporting the pesticide because a particular laboratory might have analysed one pesticide with more than one technique.

5. CONCLUSIONS

Sixty-nine laboratories agreed to participate in this proficiency test on screening methods. Sixty-three laboratories submitted results on time.

Twenty EU Member States, 2 EFTA countries (Norway and Switzerland) and four non-EU/EFTA countries (China, Costa Rica, Peru and Turkey) participated in this European Union Proficiency Test.

All results reported by the participants are given in Appendix 1. Graphical representations of the results reported are shown in Appendix 2. Details of the methods used are provided in Appendix 3 (available on the EUPT-FV-SM14 webpage, not in the printed version). The laboratories that agreed to participate are listed in Annex 1.

Most laboratories analysed the test item using methods based on both gas and liquid chromatography combined with mass spectrometric detection. The total amount of detections (without the other reported compounds) were 1431; 477 were made by GC and 928 by LC. 32% of the detections were made using full-scan or all ion fragmentation (AIF)(148 by GC-full scan/AIF techniques and 308 by LC-full scan/AIF techniques). 32% of the laboratories reported their results using HRMS and 1301 of the results were reported indicating a concentration value (91% of the total results).

Only one laboratory was able to detect all 22 present pesticides in the test item. Seven laboratories detected less than 50% of the pesticides present. Seventy-six percent of the laboratories (48 laboratories) that reported results were able to detect more than 70% of the evaluated pesticides.

No other compound different from the present pesticides was reported by three or more laboratories in concentrations above 0.01 mg/mg, but Azoxystrobin, Emamectin, Metalaxyl and Sulfotep were reported by more than 3 laboratories below 0.01 mg/kg or not quantified. The organizer found all of them but below LOQ, so they haven't been evaluated.

Fifteen participants reported 22 different compounds not evaluated in this proficiency test.

Whether this should be judged as poor performance, or not, depends on how each participant would act on these positive findings in routine analysis. If the reported pesticide was reported as positive with no further identifying confirmation, then the result would be a false positive and hence erroneous monitoring data would be reported. If the reported pesticide is regarded simply as 'suspect' or 'indicatively present', leading to additional analysis to confirm identity before reporting the result, then those pesticides indicated as 'other reported pesticides' in this report are not really an issue.

As in previous years, EUPT-SM interlaboratory tests on wide-scope screening methods showed that such an approach can substantially expand the scope of pesticide residue analysis. This is especially useful for pesticides not frequently found in food and feed, or not monitored by the laboratories because they are not part of the EU-Coordinated Programme. The use of screening methods can greatly increase the chance of detecting less commonly found pesticides. However, the test also revealed that improvements in scope (both in number and the choice of pesticides included) and verification of the screening methods performance (i.e. validation) are necessary to increase the reliability of such methods.

6. SUGGESTIONS FOR FUTURE WORK

The Organiser and the Scientific Committee consider that screening methods have provided additional value to the current quantitative multiresidue methods routinely used for monitoring purposes. The results of this test are most encouraging, but also indicate the need for continued evaluation of screening methods. Therefore, further proficiency tests will be organised to provide support to those laboratories using screening methods in order to extend their use and improve their reliability. These methods will be used more and more as screens/filters, to make routine laboratory work easier and faster. The need for screening method validation has been recognised and guidelines for such validation have been prepared and included in Document SANTE/11312/2021

Next year, once again, participants will be invited to report the estimated concentration of the pesticides identified. The concentration value will be used for informative purposes only, and not for the evaluation of the laboratories.

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8. ACKNOWLEDGEMENTS

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The Organiser wishes to give a special thank-you to University of Almería for the use of their facilities.

APPENDIX 1. Results

Table AP1.1. Reported pesticides

Laboratory Code Total No of Reporting Laboratories=63	Evaluated Pesticides (22)																		R: Reported Pesticide										Reported Pesticides by Laboratory	% Reported Pesticides by Laboratory
	8-Hydroxyquinaline	Aclonifen	Bifenazate/ Bifenazate diazene	Captan	Chlorothalonil	Cyflumetofen	Cyhalofop butyl	Hionicamid	Folpet	Formetanate	Mefenitifluconazole	Oxadiangyl	Oxyfluorfen	Pencycuron	Penflufen	Permethrin	Propamocarb	Pymetrozine	Pyraclostrobin	Pyridate	Spirotetramat	Triazophos								
Lab001	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	21	95		
Lab002	R	R		R		R	R	R	R			R	R		R	R	R	R	R	R	R	R	R	R	R	R	15	68		
Lab003	R	R	R	R	R	R	R	R		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	19	86			
Lab004	R	R				R						R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	9	41		
Lab005				R			R						R															3	14	
Lab006	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	19	86			
Lab007	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	22	100			
Lab008	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	20	91			
Lab009	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	19	86			
Lab010	R	R	R		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	20	91			
Lab011	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	21	95			
Lab012	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	20	91			
Lab013	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	19	86			
Lab014	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	20	91			
Lab015	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	21	95			
Lab016	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	13	59			
Lab017	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	21	95			
Lab018	R	R	R	R		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	20	91			
Lab019	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	21	95			
Lab020	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	21	95			
Lab021	R	R			R	R	R		R			R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	15	68		
Lab022	R	R	R	R		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	17	77			
Lab023	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	19	86			
Lab024	R	R			R		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	19	86			
Lab025	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	20	91			
Lab026		R	R									R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	11	50		
Lab027	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	21	95			
Lab028							R	R				R		R		R		R		R		R		R		R	6	27		
Lab029	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	20	91			
Lab030	R	R			R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	17	77			
Lab031		R	R																									R	4	18
Lab032									R	R				R	R	R	R	R	R	R	R	R	R	R	R	R	R	7	32	
Lab034	R		R	R		R	R			R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	16	73		
Lab035	R						R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	10	45		
Lab037	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	20	91			
Lab038	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	12	55			
Lab039	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	21	95			
Lab040		R	R	R		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	16	73			
Lab041	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	21	95			
Lab042	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	21	95			
Lab043	R	R	R	R			R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	14	64			
Lab044	R	R	R	R	R		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	18	82			
Lab046	R		R	R			R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	16	73			
Lab047	R	R	R	R		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	19	86			
Lab049	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	20	91			
Lab051	R	R	R	R	R		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	17	77			
Lab052	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	19	86			
Lab053	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	19	86			
Lab054	R		R	R	R		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	17	77			
Lab055	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	20	91			
Lab056	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	21	95			
Lab057	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	17	77			
Lab059	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	21	95			
Lab060	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	21	95			
Lab061	R	R	R	R		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	19	86			
Lab062	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	20	91			
Lab063							R					R		R	R	R	R	R	R	R	R	R	R	R	R	R	7	32		
Lab064	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	21	95			
Lab065	R	R	R	R	R		R		R		R		R	R	R	R	R	R	R	R	R	R	R	R	R	R	16	73		

APPENDIX 1. Results

Laboratory Code Total No of Reporting Laboratories=63	Evaluated Pesticides (22)																				R: Reported Pesticide				Reported Pesticides by Laboratory	
	8-Hydroxyquinaline	Aclonifen	Bifenazate/ Bifenazate diazene	Captan	Chlorothalonil	Cyflumetofen	Cyhalofop butyl	Flonicamid	Folpet	Formetanate	Mefentrifluconazole	Oxadiargyl	Oxyfluorfen	Pencycuron	Penflufen	Permethrin	Propamocarb	Pymetrozine	Pyraclostrobin	Pyridate	Spirotetramat	Triazophos				
Lab066	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	21	95		
Lab067		R	R				R		R			R	R	R	R	R	R	R	R	R	R	R	14	64		
Lab068	R	R	R			R	R				R	R	R	R	R	R	R	R	R	R	R	R	14	64		
Lab069	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	18	82		
Reported Pesticides	7	54	52	52	53	40	43	59	42	52	41	36	54	60	46	62	58	54	61	47	52	61				
% of Reported Pesticides	11	86	83	83	84	63	68	94	67	83	65	57	86	95	73	98	92	86	97	75	83	97				

Table AP1.2. Estimated Concentrations Reported on a voluntary basis (only informative purposes)

NOTES: Not all the laboratories reporting results have reported estimated concentration values. Some Laboratories reported more than one result for the same pesticide.
 All compounds reported by the laboratories above 0.01 mg/kg and present in the sample are shown in this table. Spirotetramat was reported below 0.01 mg/kg but two of its metabolites, enol and enol-glucoside were reported above that value. Some other metabolites were reported above 0.01 mg/kg too, and they appear in the table.
 The reported concentrations of bifenazate and bifenazate diazene have been summed.

LABORATORY CODE	Reported Pesticide Concentrations																										
	8-hydroxyquinoline	Aclonifen	Bifenazate/ Bifenazate diazene	Captan	Tetrahydropthalimide (THP)	Chlorothalonil	Cyflumetofen	Cyhalofop butyl	Flonicamid	TFNG	Folpet	Phthalimide	Formetanate	Mefenitifluronazole	Oxadiargyl	Oxyfluorfen	Pencycuron	Penflufen	Permethrin	Propamocarb	Pymetrozine	Pyraclostrobin	Pyridate	Spirotetramat-enol	Spirotetramat-enol- glucoside	Triazophos	
Concentration Homogeneity test (mg/kg)	0.035	0.052	0.097	0.232	NA	0.048	0.113	0.078	0.132	0.015	0.036	NA	0.475	0.050	0.053	0.073	0.065	0.054	0.062	1.050	0.030	0.092	0.075	0.048	0.038	0.110	
Robust mean of estimated concentrations reported (mg/kg)	0.058	0.053	0.067	0.173	0.291	0.058	0.087	0.069	0.137	0.045	0.032	0.014	0.536	0.045	0.056	0.064	0.069	0.051	0.071	1.105	0.043	0.086	0.107	0.052	0.041	0.096	
CV (%)	34.0	26.5	53.6	44.3	43.9	45.7	34.9	23.9	27.5	38.6	41.2	44.1	53.6	26.3	21.5	28.7	22.9	19.1	34.4	28.3	41.0	17.9	46.4	45.8	34.7	27.9	
Lab001		0.052	0.050	0.158	0.358	0.066	0.180	0.066	0.135		0.025	0.038	0.360	0.051	0.061	0.072	0.072	0.051	0.061	1.300	0.027	0.088	0.010	0.024	0.039	0.110	
		0.052		0.400		0.160	0.075	0.120			0.067	0.410	0.047	0.053		0.062	0.045	0.077	1.100	0.025	0.085	0.240	0.026		0.100		
																					0.010			0.370			
Lab002		0.050	0.088			0.092		0.050	0.200		0.028	0.012	0.640			0.057	0.066		0.042	1.100	0.073	0.088				0.085	
Lab003		0.027	0.097	0.530		0.027	0.140	0.062	0.301	0.048					0.020	0.036	0.052	0.042	0.045	0.098	1.700	0.054	0.072	0.160	0.130	0.110	0.045
Lab004	0.046	0.052							0.130								0.070			0.120	1.500	0.044	0.066				0.110
Lab005						0.050														0.060							
Lab006		0.050	0.129	0.139	0.232	0.054	0.085		0.136		0.022	0.011	0.153	0.030		0.062	0.046	0.038	0.067	1.200	0.030	0.060	0.152	0.034	0.027	0.077	
Lab007	0.071	0.072	0.194	0.176	0.275	0.071	0.117	0.077	0.154	0.068	0.034	0.006	0.097	0.061	0.061	0.083	0.064	0.055	0.103	1.261	0.103	0.082	0.098	0.055	0.057	0.102	
Lab008		0.042	0.087		0.273	0.067	0.136		0.109			0.013				0.059	0.076	0.059	0.063	1.003	0.057	0.108		0.044	0.038	0.088	
Lab009		0.048	0.121	0.114		0.084	0.084		0.141		0.024			0.285	0.036	0.044	0.055	0.068	0.039	0.055	1.100	0.048	0.073		0.033		0.069
Lab010																											
Lab011		0.030	0.047	0.090		0.034		0.035	0.075		0.018		0.380	0.022	0.042	0.025	0.040	0.032	0.033	0.750	0.015	0.058	0.025	0.027	0.022	0.070	
Lab012		0.040	0.065	0.130	0.350	0.031	0.088	0.066	0.120	0.023	0.025	0.011	0.660	0.035		0.046	0.046	0.038	0.060	1.500	0.027	0.067	0.059	0.038	0.025	0.060	

APPENDIX 1. Results

LABORATORY CODE	Reported Pesticide Concentrations																									
	8-hydroxyquinoline	Aclonifen	Bifenazate/ Bifenazate diazene	Captan	Tetrahydropthalimide (THPI)	Chlorothalonil	Cyflumetofen	Cyhalofop butyl	Flonicamid	TFNG	Folpet	Phthalimide	Formetanate	Mefentrifluconazole	Oxadiargyl	Oxyfluorfen	Pencycuron	Penflufen	Permethrin	Propamocarb	Pymetrozine	Pyraclostrobin	Pyridate	Spirotetramat-enol	Spirotetramat-enol- glucoside	Triazophos
Concentration Homogeneity test (mg/kg)	0.035	0.052	0.097	0.232	NA	0.048	0.113	0.078	0.132	0.015	0.036	NA	0.475	0.050	0.053	0.073	0.065	0.054	0.062	1.050	0.030	0.092	0.075	0.048	0.038	0.110
Robust mean of estimated concentrations reported (mg/kg)	0.058	0.053	0.067	0.173	0.291	0.058	0.087	0.069	0.137	0.045	0.032	0.014	0.536	0.045	0.056	0.064	0.069	0.051	0.071	1.105	0.043	0.086	0.107	0.052	0.041	0.096
CV (%)	34.0	26.5	53.6	44.3	43.9	45.7	34.9	23.9	27.5	38.6	41.2	44.1	53.6	26.3	21.5	28.7	22.9	19.1	34.4	28.3	41.0	17.9	46.4	45.8	34.7	27.9
Lab013	0.046	0.081	0.118	0.278	0.064	0.087	0.050	0.141	0.037	0.031		0.515	0.048		0.051	0.075		0.059	1.051	0.048	0.081	0.211	0.052		0.098	
		0.081	0.674					0.170																		
Lab014	0.117	0.072	0.248	0.434	0.047	0.168	0.085	0.136	0.046	0.057	0.022	0.492	0.098	0.077	0.098	0.087	0.066	0.099	1.215	0.036	0.110	0.062			0.128	
													0.061													
Lab015	0.059	0.131	0.182	0.351	0.068	0.117	0.087	0.157	0.057	0.027	0.009	0.461	0.051	0.062	0.069	0.080	0.057	0.076	1692.00	0.052	0.099	0.091	0.053	0.045	0.124	
Lab016	0.057	0.155	0.111		0.295			0.131		0.019		2.463				0.078		0.071	0.484	0.034	0.098				0.084	
Lab017	0.072	0.280	0.094	0.180	0.100	0.110	0.078	0.300	0.038	0.043	0.013	0.360	0.029	0.051	0.088	0.067	0.062	0.072	1.200	0.042	0.078	0.120	0.085	0.042	0.120	
															0.088		0.050									0.082
Lab018	0.036	0.164	0.920		0.055		0.058	0.180			0.018	0.870	0.042	0.028	0.059	0.037	0.045	0.069	1.400	0.083	0.081	0.067	0.084	0.056	0.076	
Lab019	0.069	0.140	0.190	0.290	0.053	0.150	0.074	0.120	0.020	0.042		0.300	0.065	0.062	0.090	0.089	0.059	0.056	1.100	0.020	0.120	0.085	0.055	0.032	0.150	
Lab021	0.047	0.084				0.084	0.054	0.042				0.990			0.055	0.064		0.044	1.700	0.058	0.081	0.120	0.140	0.034	0.077	
								0.130																		
								0.180																		
Lab022	0.050	0.070	0.136	0.171	0.082		0.066	0.168	0.051	0.030		0.367		0.067		0.053		0.072	0.761	0.055	0.067	0.058	0.071	0.050	0.067	
Lab023	0.047	0.087	0.100	0.310	0.060	0.080	0.055	0.150	0.038	0.025		1.400			0.049	0.023	0.050	0.066	0.930	0.022	0.084	0.090	0.043	0.035	0.082	
Lab024	0.058				0.079		0.075	0.239		0.062		3.600	0.052	0.059		0.078	0.056	0.077	0.806	0.041	0.101	0.108	0.041	0.058	0.128	
Lab025	0.048	0.093	0.199	0.296	0.098	0.113	0.062	0.037		0.033		0.440	0.042		0.075	0.065	0.045	0.069	1.100	0.071	0.090	0.155	0.041	0.043	0.093	
								0.122																		
Lab026			0.140	0.210	0.031											0.066	0.150	0.053	0.056	0.890		0.089	0.400			0.040
Lab027	0.038	0.098	0.143	0.338	0.077	0.072	0.060	0.159	0.062	0.029	0.008	0.357	0.033	0.056	0.061	0.066	0.053	0.088	0.914	0.055	0.089	0.103	0.052	0.056	0.054	
								0.087				0.756				0.072			0.624		0.053				0.074	
Lab028																			0.004							
Lab029	0.083	0.043	0.030		0.269	0.069	0.103	0.098	0.123			0.650	0.045	0.052	0.064	0.059	0.053	0.124	0.633		0.079	0.104	0.049		0.116	
Lab030		0.060	0.206						0.127			0.900	0.060	0.071	0.074	0.171	0.071	0.091	1.290	0.078	0.172		0.072	0.117	0.130	

LABORATORY CODE	Reported Pesticide Concentrations																									
	8-hydroxyquinoline	Aclonifen	Bifenazate/ Bifenazate diazene	C Captan	Tetrahydropthalimide (THPI)	Chlorothalonil	Cyflumetofen	Cyhalofop butyl	Flonicamid	TFNG	Folpet	Phthalimide	Formetanate	Mefentrifluconazole	Oxadiargyl	Oxyfluorfen	Pencycuron	Penflufen	Permethrin	Propamocarb	Pymetrozine	Pyraclostrobin	Pyridate	Spirotetramat-enol	Spirotetramat-enol- glucoside	Triazophos
Concentration Homogeneity test (mg/kg)	0.035	0.052	0.097	0.232	NA	0.048	0.113	0.078	0.132	0.015	0.036	NA	0.475	0.050	0.053	0.073	0.065	0.054	0.062	1.050	0.030	0.092	0.075	0.048	0.038	0.110
Robust mean of estimated concentrations reported (mg/kg)	0.058	0.053	0.067	0.173	0.291	0.058	0.087	0.069	0.137	0.045	0.032	0.014	0.536	0.045	0.056	0.064	0.069	0.051	0.071	1.105	0.043	0.086	0.107	0.052	0.041	0.096
CV (%)	34.0	26.5	53.6	44.3	43.9	45.7	34.9	23.9	27.5	38.6	41.2	44.1	53.6	26.3	21.5	28.7	22.9	19.1	34.4	28.3	41.0	17.9	46.4	45.8	34.7	27.9
Lab032													0.336			0.080	0.079		0.078		0.027	0.084		0.041		
Lab034		0.052		0.247	0.421	0.032		0.072	0.104	0.085				0.041		0.010	0.074	0.061	0.068	1.244	0.122	0.080	0.072	0.055		0.102
Lab035	0.062							0.099				0.195			0.065	0.068		0.100	0.632			0.089		0.083		0.110
Lab037	0.046	0.060	0.220	0.110	0.060	0.100	0.090	0.190	0.064	0.030	0.015	0.500		0.060	0.078	0.060	0.057	0.110	0.940	0.035	0.080	0.090	0.050	0.050	0.100	
Lab038					0.085										0.052			0.058			0.067				0.075	
Lab039	0.047	0.050	0.096	0.120	0.055	0.120	0.100	0.170	0.057	0.025		0.410	0.060	0.066	0.080	0.076	0.050	0.089	1.100	0.040	0.100	0.104	0.057	0.050	0.120	
Lab040			0.340						0.025					300.000						0.050		0.050				200.000
Lab041	0.028	0.105		0.240	0.029	0.150	0.050	0.160	0.048	0.022	0.012	0.670	0.033	0.085	0.052	0.110	0.070	0.083	1.370	0.058	0.098	0.091	0.036	0.054	0.120	
Lab042	0.044	0.118	0.122		0.047	0.099	0.064	0.154	0.028			0.693	0.040	0.049	0.052	0.072	0.048	0.152	0.730	0.060	0.078	0.181	0.056		0.067	
Lab043		0.030		0.488	0.070			0.173	0.050			0.383			0.088	0.070		0.099	1.414	0.050	0.098	0.108	0.034	0.031	0.082	
Lab044	0.056	0.092	0.209	0.514		0.076		0.129				0.004	0.038	0.053	0.634	0.095	0.045	0.088	2.900		0.073	0.112	0.039	0.033	0.214	
	0.065	0.053					0.107					0.044	0.035	0.040	0.052	0.033	0.117	1.551							0.077	
Lab046	0.052		0.360		0.072			0.014	0.048	0.045					0.063	0.073		0.097	0.216	0.050	0.100				0.120	
Lab047	0.056	0.019	0.081		0.039		0.070	0.128		0.040	0.034	0.487	0.048	0.059	0.055	0.054	0.051	0.067	1.173	0.029	0.091	0.104			0.124	
Lab049	0.078		0.410	0.183	0.150	0.150	0.083	0.128	0.051	0.035		0.762	0.060	0.088	0.097	0.077	0.058	0.134	1.124	0.026	0.100		0.172	0.041	0.126	
Lab051	0.038	0.057	0.135		0.009		0.056	0.099		0.016			0.037	0.049	0.066			0.072	0.380	0.021	0.084		0.006	0.020	0.070	
Lab052	0.048	0.130	0.612		0.115	0.120	0.028	0.160		0.054		1.300	0.036		0.067	0.065		0.085	3.800	0.060	0.085	0.090	0.175	0.066	0.084	
Lab053		0.045		0.093	0.055			0.219				0.170	0.047	0.053		0.052	0.043	0.010		0.046	0.076	0.054		0.018	0.093	
Lab054		0.050		0.097		0.050		0.114		0.100		0.399			0.050	0.066	0.050	0.045	1.060	0.030	0.095	0.146	0.168	0.054	0.127	
Lab055	0.066	0.073	0.059		0.251		0.140	0.078	0.113			0.235	0.081	0.058	0.103	0.074	0.092	0.501	0.494		0.137	0.093	0.042	0.015	0.183	

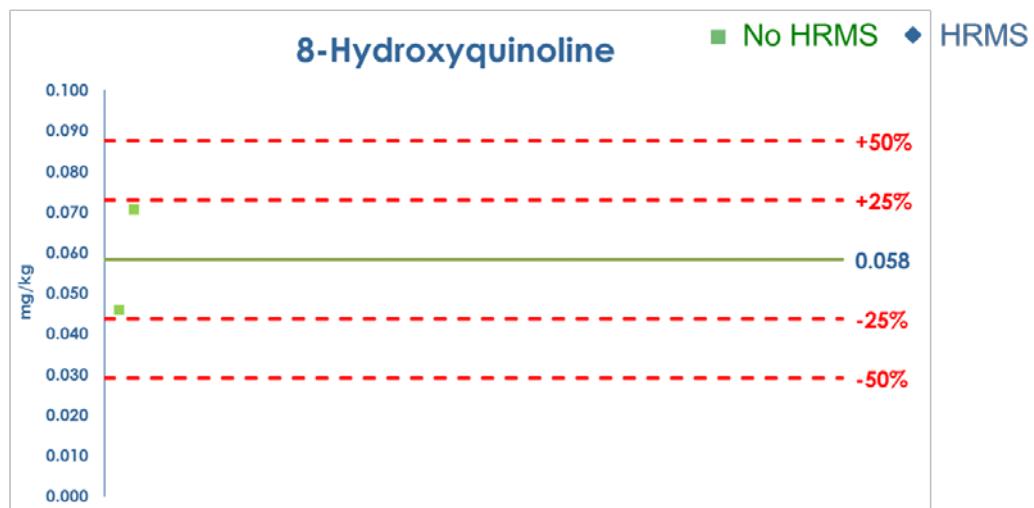
APPENDIX 1. Results

LABORATORY CODE	Reported Pesticide Concentrations																										
	8-hydroxyquinoline	Aclonifen	Bifenazate/ Bifenazate diazene	C Captan	Tetrahydropthalimide (THPI)	Chlorothalonil	Cyflumetofen	Cyhalofop butyl	Flonicamid	TFNG	Folpet	Phthalimide	Formetanate	Mefentrifluconazole	Oxadiargyl	Oxyfluorfen	Pencycuron	Penflufen	Permethrin	Propamocarb	Pymetrozine	Pyraclostrobin	Pyridate	Spirotetramat-enol	Spirotetramat-enol- glucoside	Triazophos	
Concentration Homogeneity test (mg/kg)	0.035	0.052	0.097	0.232	NA	0.048	0.113	0.078	0.132	0.015	0.036	NA	0.475	0.050	0.053	0.073	0.065	0.054	0.062	1.050	0.030	0.092	0.075	0.048	0.038	0.110	
Robust mean of estimated concentrations reported (mg/kg)	0.058	0.053	0.067	0.173	0.291	0.058	0.087	0.069	0.137	0.045	0.032	0.014	0.536	0.045	0.056	0.064	0.069	0.051	0.071	1.105	0.043	0.086	0.107	0.052	0.041	0.096	
CV (%)	34.0	26.5	53.6	44.3	43.9	45.7	34.9	23.9	27.5	38.6	41.2	44.1	53.6	26.3	21.5	28.7	22.9	19.1	34.4	28.3	41.0	17.9	46.4	45.8	34.7	27.9	
Lab056		0.043	0.184	0.107	0.367	0.084		0.063	0.119	0.054	0.025	0.010	1.860	0.038	0.052	0.054	0.079	0.042	0.054	1.020	0.029	0.083		0.091	0.039	0.078	
		0.042		0.622	0.259	0.051		0.067	0.170		0.016	0.015				0.058		0.044	0.053							0.070	
								0.089																			
												0.044															
Lab057		0.032	0.145		0.356	0.023	0.079	0.046	0.119	0.030	0.017		31.800		0.032	0.041	0.043		0.069	1.070	0.022	0.052				0.066	
Lab059		0.039	0.157	0.130	0.192	0.055	0.106	0.052	0.110	0.033	0.026	0.015	0.501	0.033	0.067	0.045	0.071	0.049	0.086	1.002	0.042	0.078	0.115	0.037	0.033	0.088	
Lab060		0.057	0.210	0.192	0.423	0.050	0.125	0.080	0.160	0.048	0.017	0.010	0.400	0.042	0.052	0.077	0.060	0.050	0.112	0.971	0.040	0.080	0.099	0.045	0.067	0.099	
																				0.005							
Lab061		0.079	0.075	0.094	0.148		0.125	0.089	0.168	0.048			0.524	0.056	0.063	0.115	0.131	0.058	0.109	1.362	0.025	0.100	0.132		0.020	0.117	
Lab062		0.040				0.116	0.096	0.092	0.013				0.650	0.042	0.054		0.070	0.043	0.055	1.706	0.019	0.089	0.083	0.028	0.035	0.050	
Lab063								0.153									0.046		0.075	0.840	0.056	0.086				0.099	
Lab064		0.064	0.115	0.198	0.270	0.086	0.123	0.076	0.163	0.060	0.054		2.145	0.043	0.059	0.072	0.079	0.054	0.098	1.202	0.028	0.105	0.082	0.158	0.035	0.115	
Lab065		0.076	0.043	0.165		0.037			0.114					0.038		0.060	0.081	0.046	0.087	1.350	0.053	0.074	0.401	0.042	0.050	0.084	
Lab066		0.069	0.535		0.481	0.010	0.107	0.078	0.092	0.015			0.504	0.041	0.050	0.071	0.063	0.043	0.082	0.790	0.054	0.080	0.115	0.043	0.034	0.102	
Lab067			0.036		0.085				0.248				0.477				0.052	0.064	0.096	0.018	1.490	0.044	0.069	0.154		0.053	0.113
																			0.020								
Lab068		0.058	0.095	0.159	0.315				0.106		0.036	0.021					0.070	0.111	0.044	0.045	1.179	0.030	0.088		0.025	0.035	0.103
Lab069		0.060	0.030			0.015	0.130	0.050	0.120				0.610		0.050		0.076	0.070	0.064		0.041	0.120	0.060	0.042		0.140	

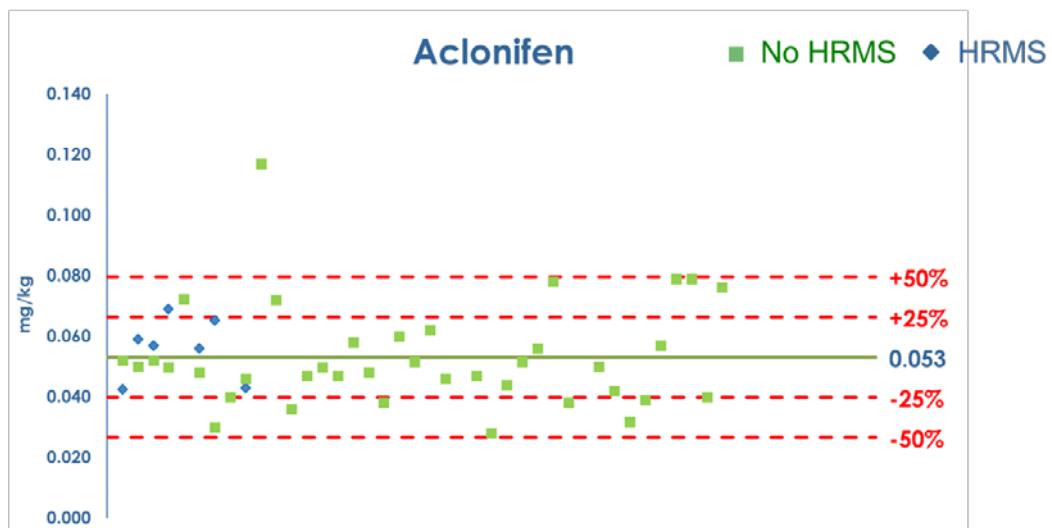
APPENDIX 2. Graphical Representations

The green line represents the robust mean

Pesticides	No of Detections	Nº of Labs detected the pesticide	% of Labs detected the pesticide	No of Conc. Reported	No of Conc. Reported by EU/EFTA labs	Conc. Homogeneity test (mg/kg)	Robust mean (mg/kg)	CV (%)
8-hydroxyquinoline	7	7	11	4	2	0.035	0.058	34.0



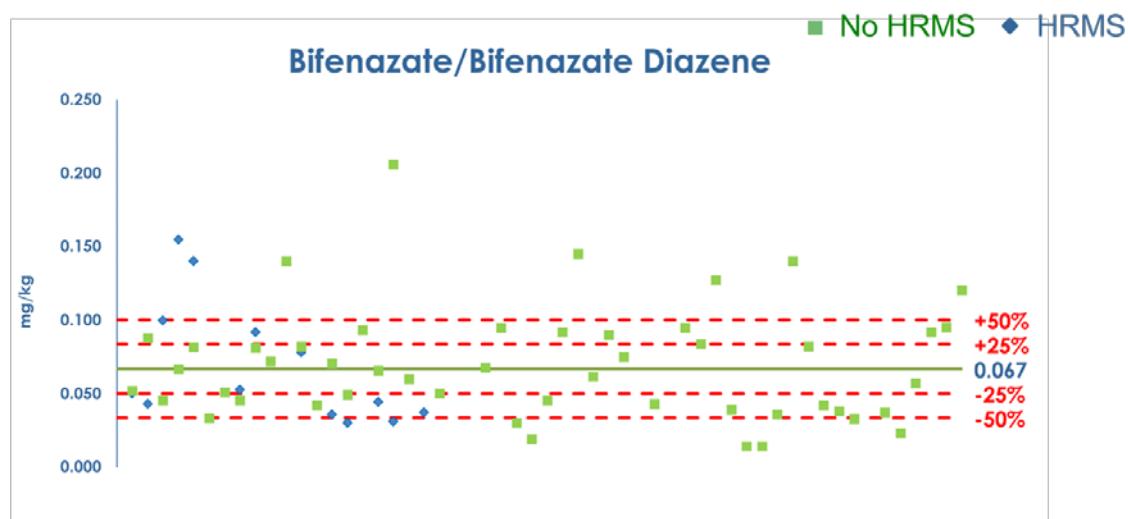
Pesticides	No of Detections	Nº of Labs detected the pesticide	% of Labs detected the pesticide	No of Conc. Reported	No of Conc. Reported by EU/EFTA labs	Conc. Homogeneity test (mg/kg)	Robust mean (mg/kg)	CV (%)
Aclonifen	58	54	86	53	49	0.052	0.053	26.5



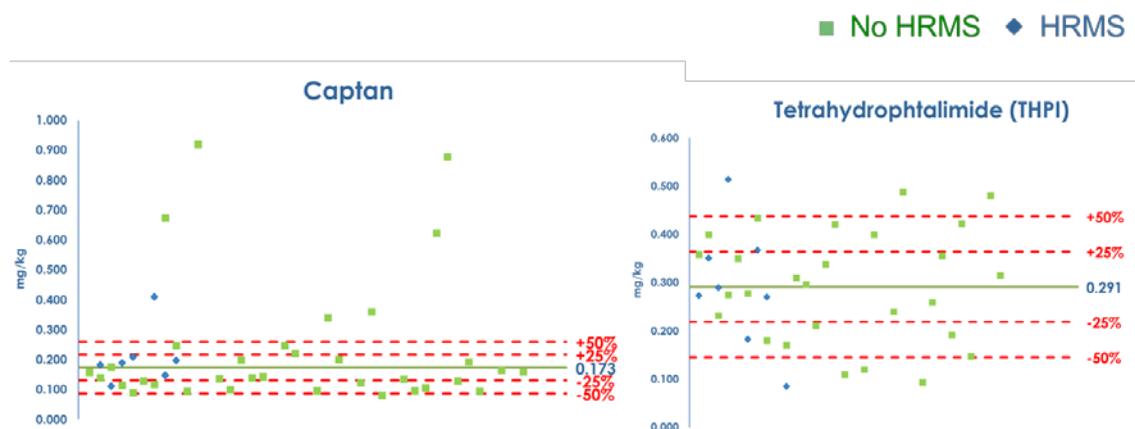
APPENDIX 2. Graphical Representations

The green line represents the robust mean

Pesticides	No of Detections	Nº of Labs detected the pesticide	% of Labs detected the pesticide	No of Conc. Reported	No of Conc. Reported by EU/EFTA labs	Conc. Homogeneity test (mg/kg)	Robust mean (mg/kg)	CV (%)
Bifenazate/Bifenazate diazene	84	52	83	69	63	0.097	0.067	53.6



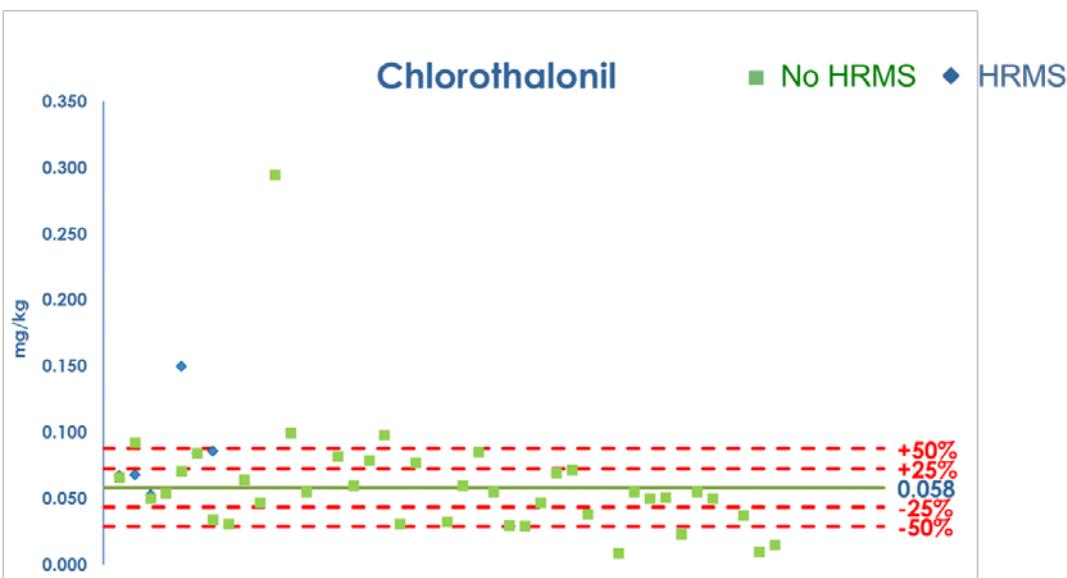
Pesticides	No of Detections	Nº of Labs detected the pesticide	% of Labs detected the pesticide	No of Conc. Reported	No of Conc. Reported by EU/EFTA labs	Conc. Homogeneity test (mg/kg)	Robust mean (mg/kg)	CV (%)
Captan	52	45	71	44	41	0.232	0.173	44.3
Tetrahydropthalimide (THPI)	45	41	65	38	35	NA	0.291	43.9



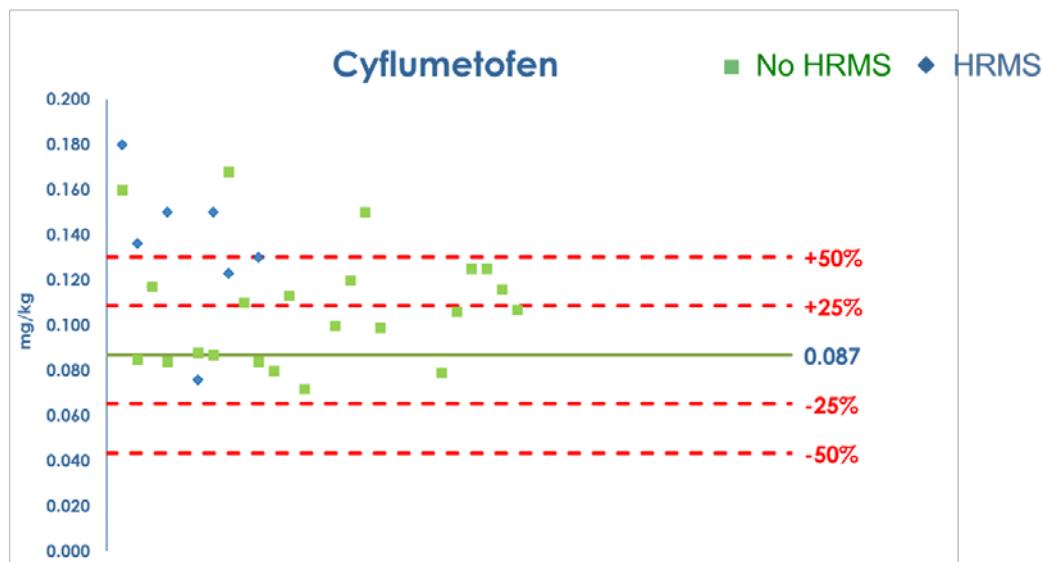
APPENDIX 2. Graphical Representations

The green line represents the robust mean

Pesticides	No of Detections	Nº of Labs detected the pesticide	% of Labs detected the pesticide	No of Conc. Reported	No of Conc. Reported by EU/EFTA labs	Conc. Homogeneity test (mg/kg)	Robust mean (mg/kg)	CV (%)
Chlorothalonil	55	53	84	49	45	0.048	0.058	45.7



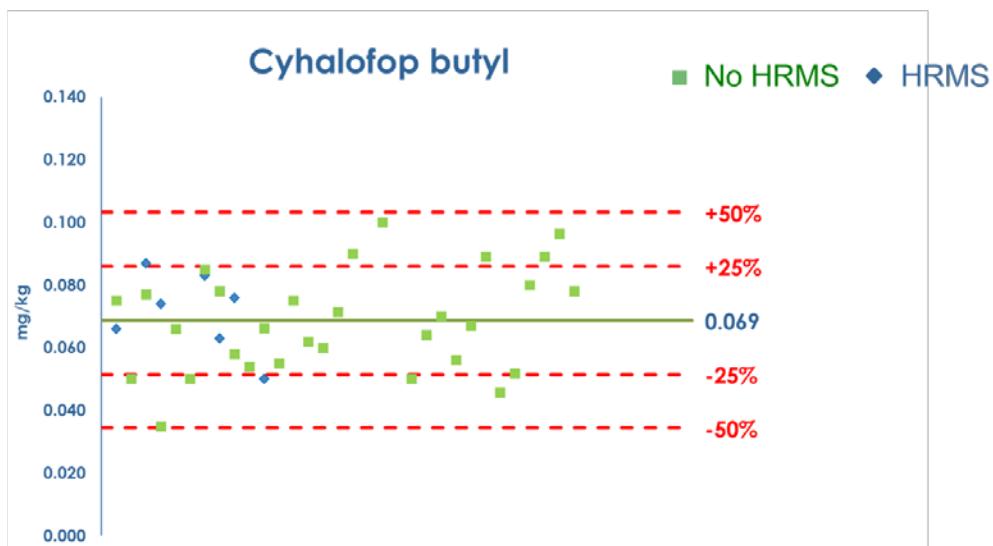
Pesticides	No of Detections	Nº of Labs detected the pesticide	% of Labs detected the pesticide	No of Conc. Reported	No of Conc. Reported by EU/EFTA labs	Conc. Homogeneity test (mg/kg)	Robust mean (mg/kg)	CV (%)
Cyflumetofen	42	40	63	37	30	0.113	0.087	34.9



APPENDIX 2. Graphical Representations

The green line represents the robust mean

Pesticides	No of Detections	Nº of Labs detected the pesticide	% of Labs detected the pesticide	No of Conc. Reported	No of Conc. Reported by EU/EFTA labs	Conc. Homogeneity test (mg/kg)	Robust mean (mg/kg)	CV (%)
Cyhalofop butyl	48	43	68	41	37	0.078	0.069	23.9



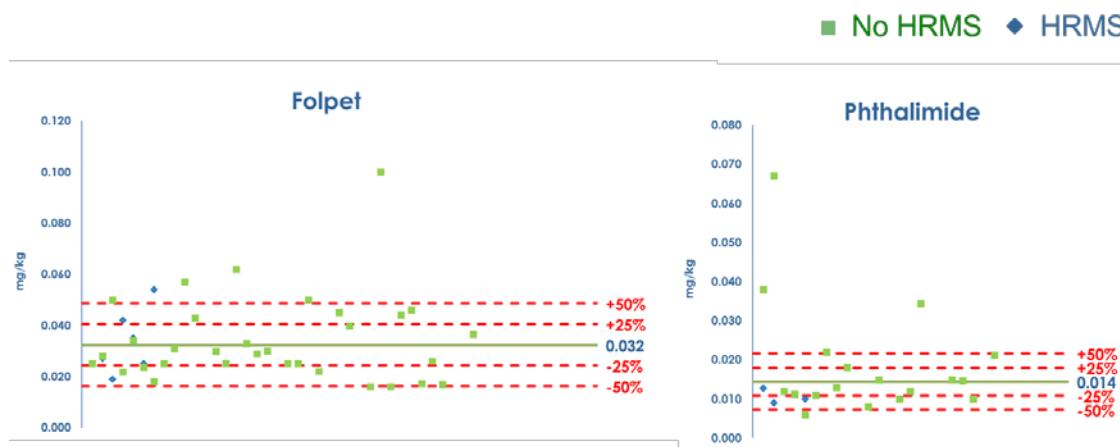
Pesticides	No of Detections	Nº of Labs detected the pesticide	% of Labs detected the pesticide	No of Conc. Reported	No of Conc. Reported by EU/EFTA labs	Conc. Homogeneity test (mg/kg)	Robust mean (mg/kg)	CV (%)
Flonicamid	68	59	94	62	58	0.132	0.137	27.5
TFNG	28	28	44	27	26	0.015	0.045	38.6



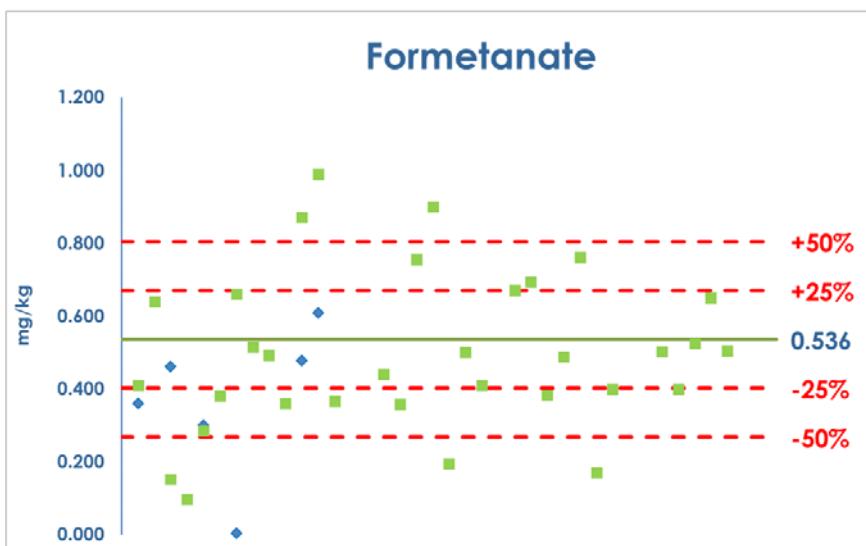
APPENDIX 2. Graphical Representations

The green line represents the robust mean

Pesticides	No of Detections	Nº of Labs detected the pesticide	% of Labs detected the pesticide	No of Conc. Reported	No of Conc. Reported by EU/EFTA labs	Conc. Homogeneity test (mg/kg)	Robust mean (mg/kg)	CV (%)
Folpet	46	41	65	40	38	0.036	0.032	41.2
	28	24	38	23	21	NA	0.014	44.1



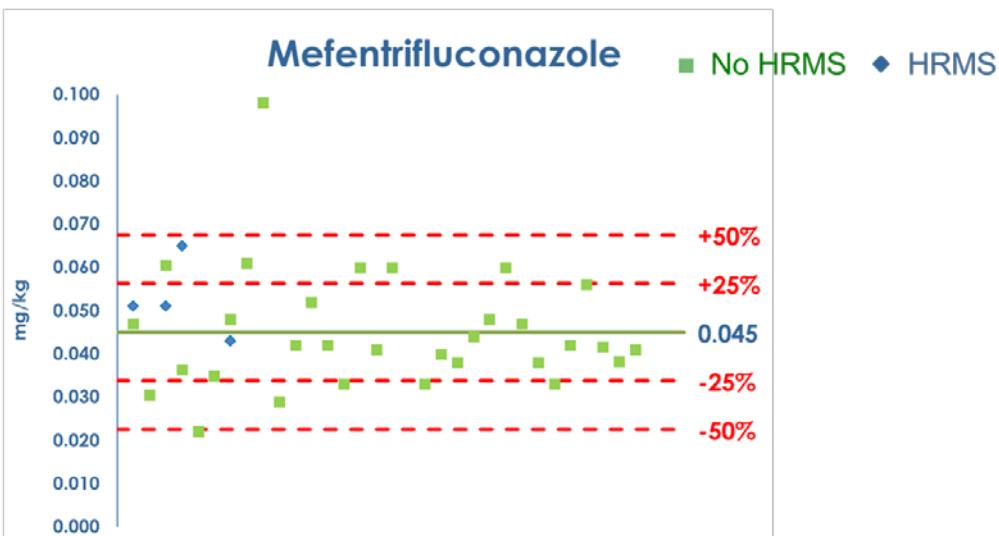
Pesticides	No of Detections	Nº of Labs detected the pesticide	% of Labs detected the pesticide	No of Conc. Reported	No of Conc. Reported by EU/EFTA labs	Conc. Homogeneity test (mg/kg)	Robust mean (mg/kg)	CV (%)
Formetanate	54	52	83	49	44	0.475	0.536	53.6



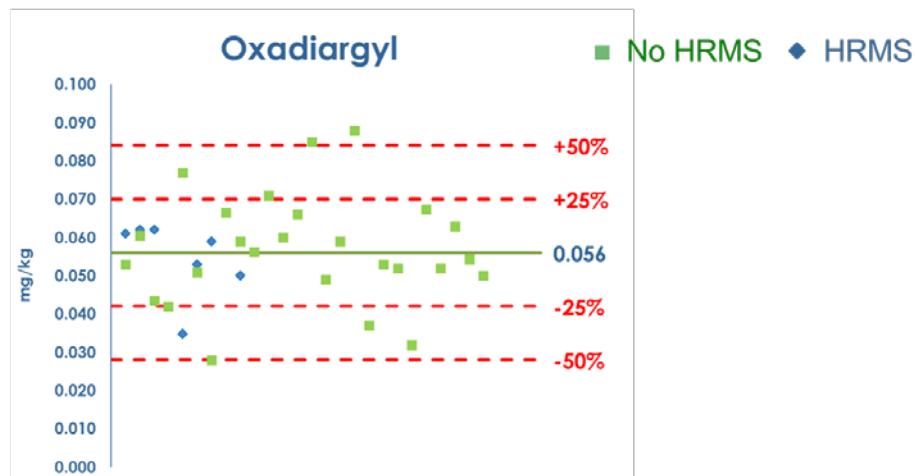
APPENDIX 2. Graphical Representations

The green line represents the robust mean

Pesticides	No of Detections	Nº of Labs detected the pesticide	% of Labs detected the pesticide	No of Conc. Reported	No of Conc. Reported by EU/EFTA labs	Conc. Homogeneity test (mg/kg)	Robust mean (mg/kg)	CV (%)
Mefentrifluconazole	45	41	65	41	35	0.050	0.045	26.3

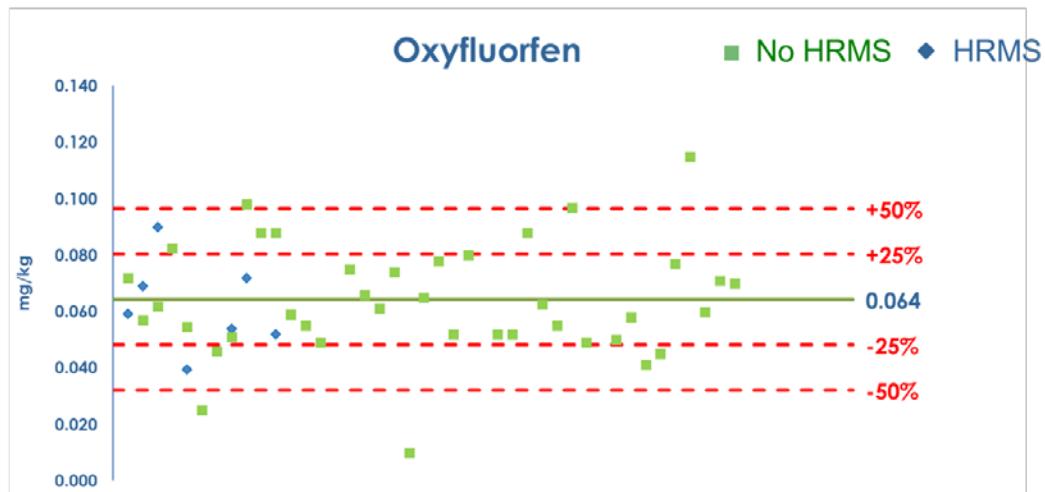


Pesticides	No of Detections	Nº of Labs detected the pesticide	% of Labs detected the pesticide	No of Conc. Reported	No of Conc. Reported by EU/EFTA labs	Conc. Homogeneity test (mg/kg)	Robust mean (mg/kg)	CV (%)
Oxadiargyl	39	36	57	36	33	0.053	0.056	21.5

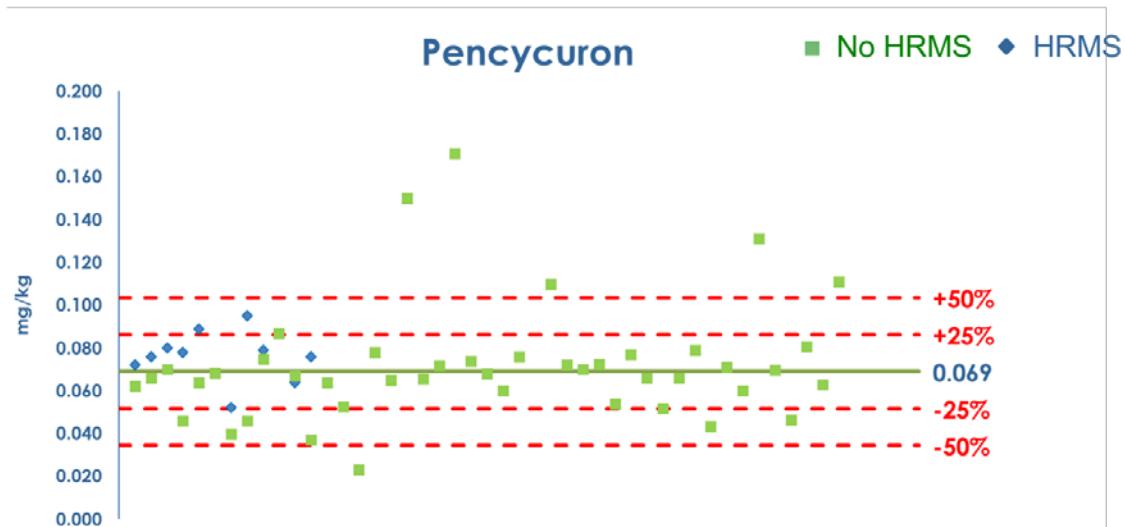


The green line represents the robust mean

Pesticides	No of Detections	Nº of Labs detected the pesticide	% of Labs detected the pesticide	No of Conc. Reported	No of Conc. Reported by EU/EFTA labs	Conc. Homogeneity test (mg/kg)	Robust mean (mg/kg)	CV (%)
Oxyfluorfen	59	54	86	52	47	0.073	0.064	28.7



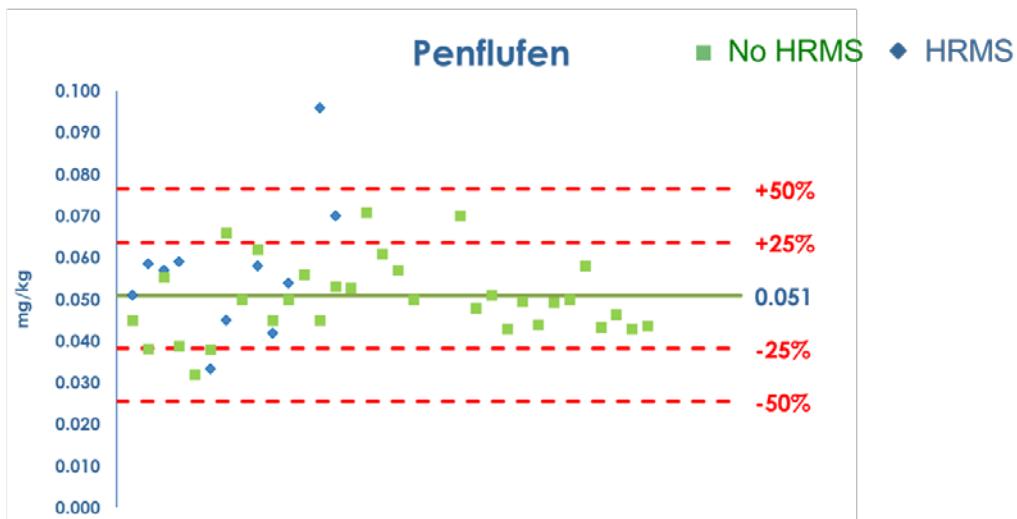
Pesticides	No of Detections	Nº of Labs detected the pesticide	% of Labs detected the pesticide	No of Conc. Reported	No of Conc. Reported by EU/EFTA labs	Conc. Homogeneity test (mg/kg)	Robust mean (mg/kg)	CV (%)
Pencycuron	64	60	95	59	54	0.065	0.069	22.9



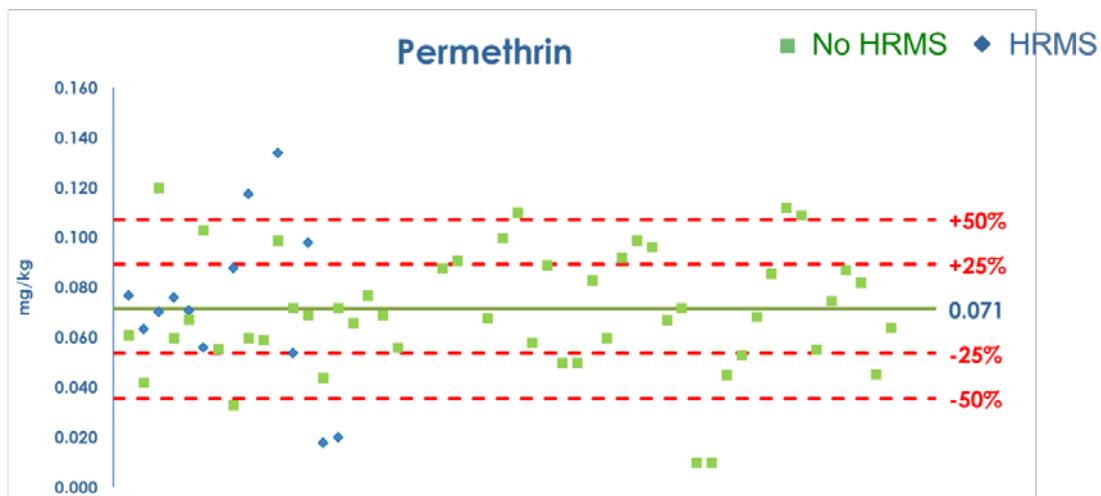
APPENDIX 2. Graphical Representations

The green line represents the robust mean

Pesticides	No of Detections	Nº of Labs detected the pesticide	% of Labs detected the pesticide	No of Conc. Reported	No of Conc. Reported by EU/EFTA labs	Conc. Homogeneity test (mg/kg)	Robust mean (mg/kg)	CV (%)
Penflufen	52	46	73	47	43	0.054	0.051	19.1



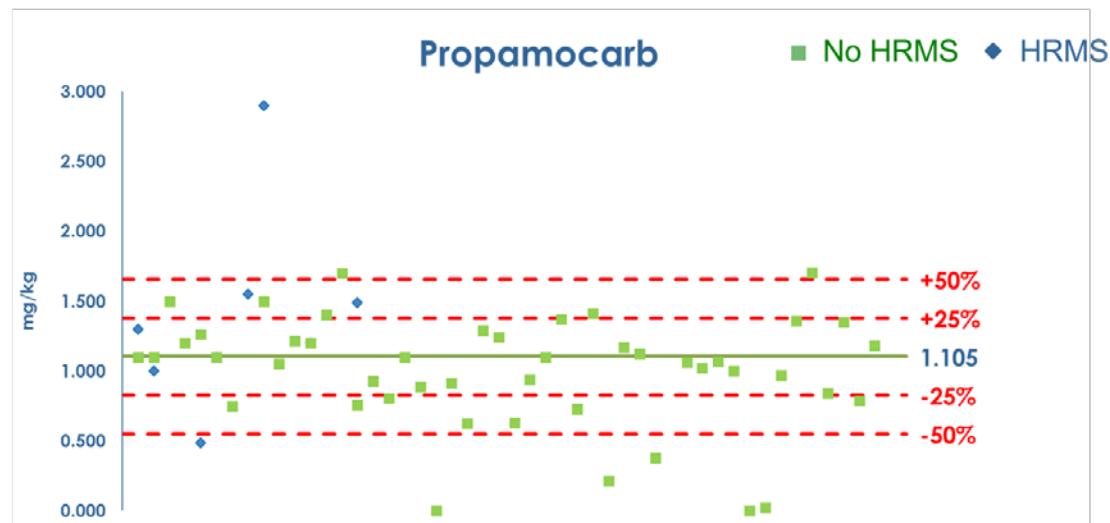
Pesticides	No of Detections	Nº of Labs detected the pesticide	% of Labs detected the pesticide	No of Conc. Reported	No of Conc. Reported by EU/EFTA labs	Conc. Homogeneity test (mg/kg)	Robust mean (mg/kg)	CV (%)
Permethrin	73	62	98	67	62	0.062	0.071	34.4



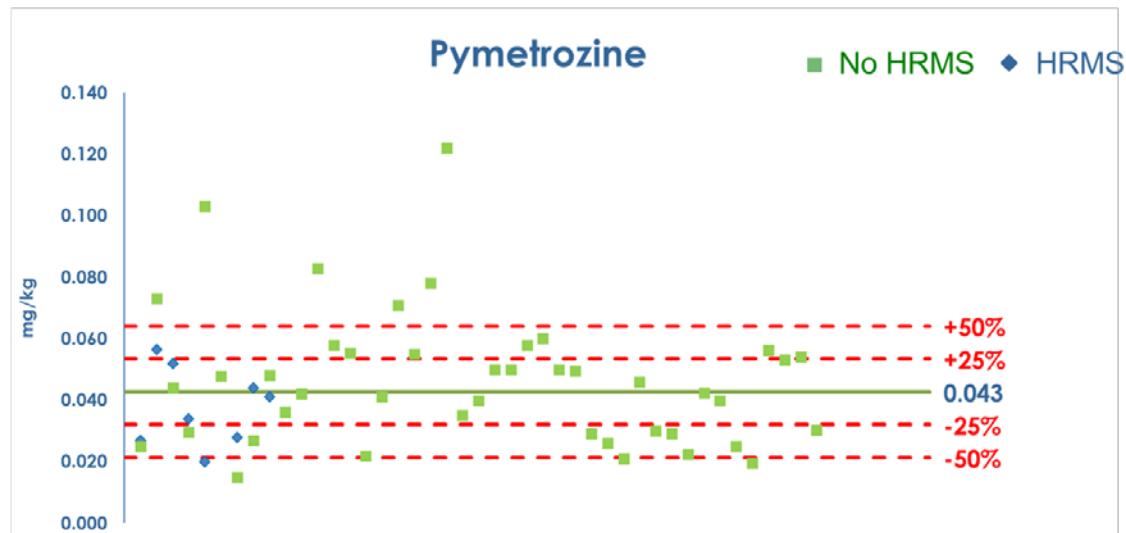
APPENDIX 2. Graphical Representations

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Pesticides	No of Detections	Nº of Labs detected the pesticide	% of Labs detected the pesticide	No of Conc. Reported	No of Conc. Reported by EU/EFTA labs	Conc. Homogeneity test (mg/kg)	Robust mean (mg/kg)	CV (%)
Propamocarb	72	58	92	60	55	1.050	1.105	28.3



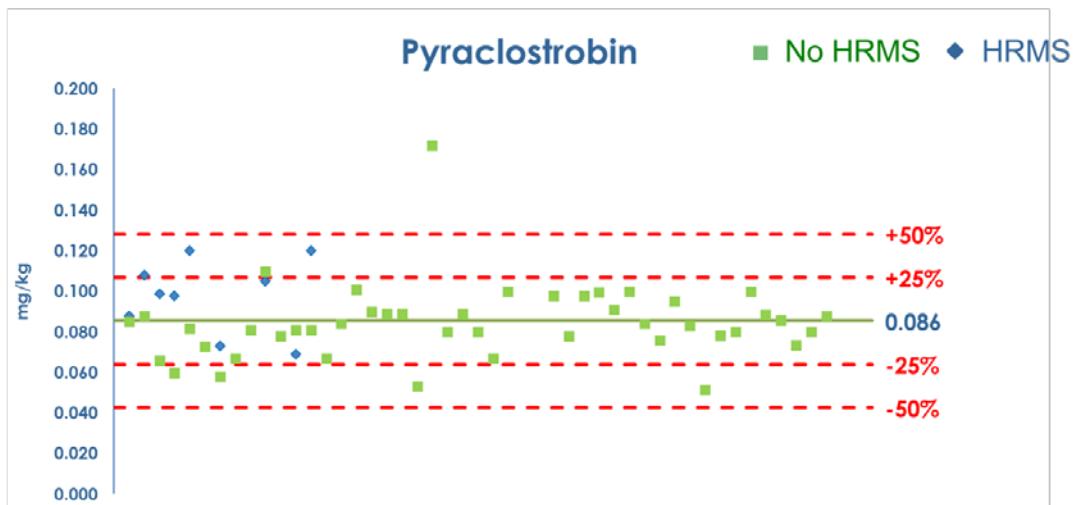
Pesticides	No of Detections	Nº of Labs detected the pesticide	% of Labs detected the pesticide	No of Conc. Reported	No of Conc. Reported by EU/EFTA labs	Conc. Homogeneity test (mg/kg)	Robust mean (mg/kg)	CV (%)
Pymetrozine	56	54	86	54	51	0.030	0.043	41.0



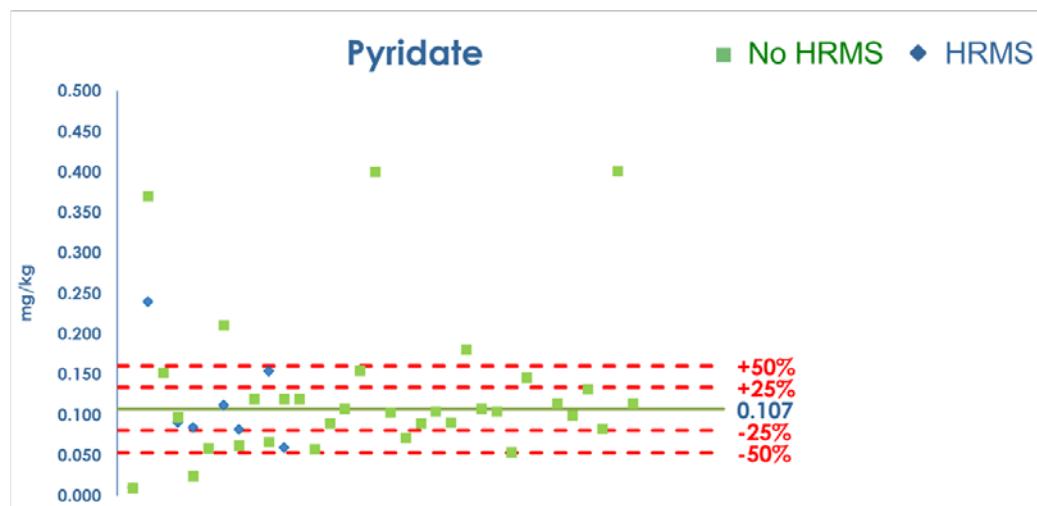
APPENDIX 2. Graphical Representations

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Pesticides	No of Detections	Nº of Labs detected the pesticide	% of Labs detected the pesticide	No of Conc. Reported	No of Conc. Reported by EU/EFTA labs	Conc. Homogeneity test (mg/kg)	Robust mean (mg/kg)	CV (%)
Pyraclostrobin	66	61	97	59	54	0.092	0.086	17.9

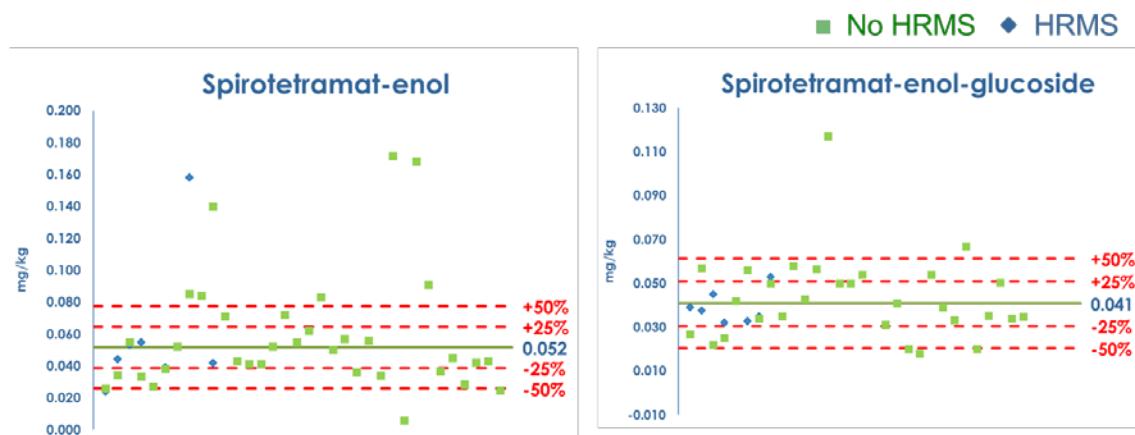


Pesticides	No of Detections	Nº of Labs detected the pesticide	% of Labs detected the pesticide	No of Conc. Reported	No of Conc. Reported by EU/EFTA labs	Conc. Homogeneity test (mg/kg)	Robust mean (mg/kg)	CV (%)
Pyridate	50	45	71	46	41	0.075	0.107	46.4

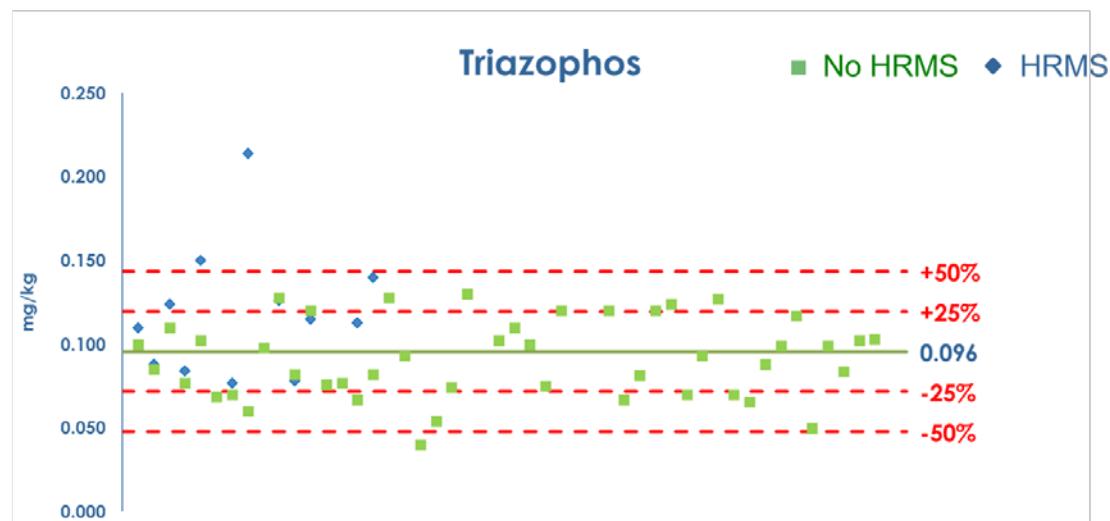


The green line represents the robust mean

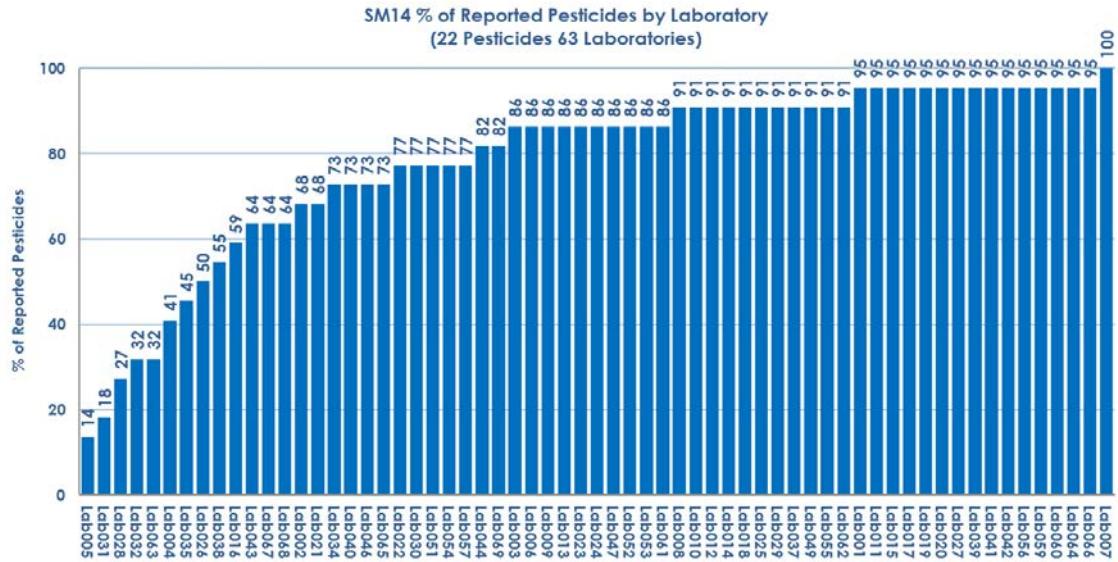
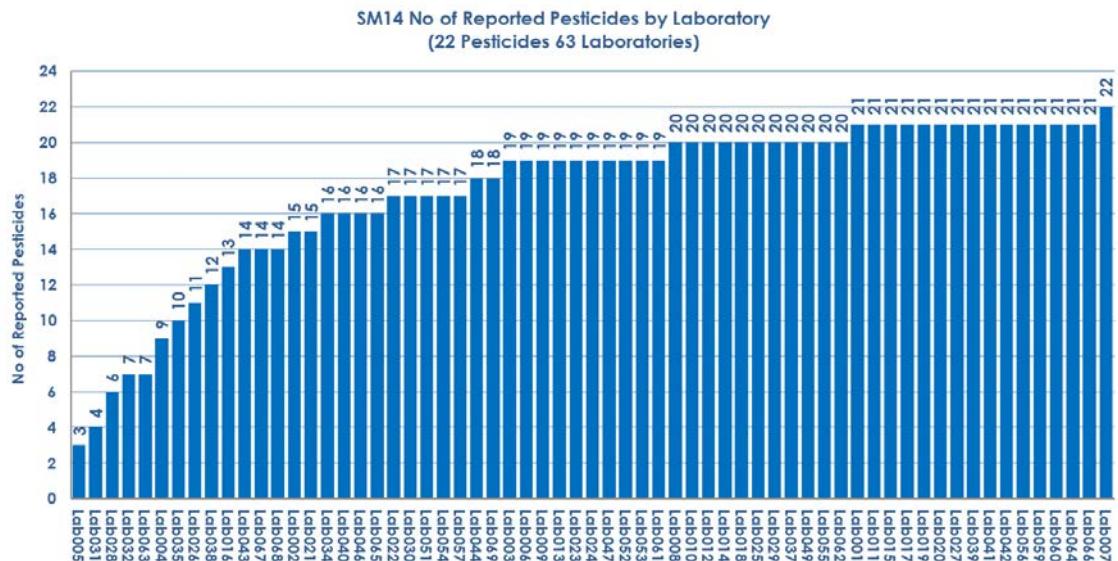
Pesticides	No of Detections	Nº of Labs detected the pesticide	% of Labs detected the pesticide	No of Conc. Reported	No of Conc. Reported by EU/EFTA labs	Conc. Homogeneity test (mg/kg)	Robust mean (mg/kg)	CV (%)
Spirotetramat-enol	51	47	75	48	41	0.048	0.052	45.8
Spirotetramat-enol-glucoside	42	42	67	40	36	0.038	0.041	34.7



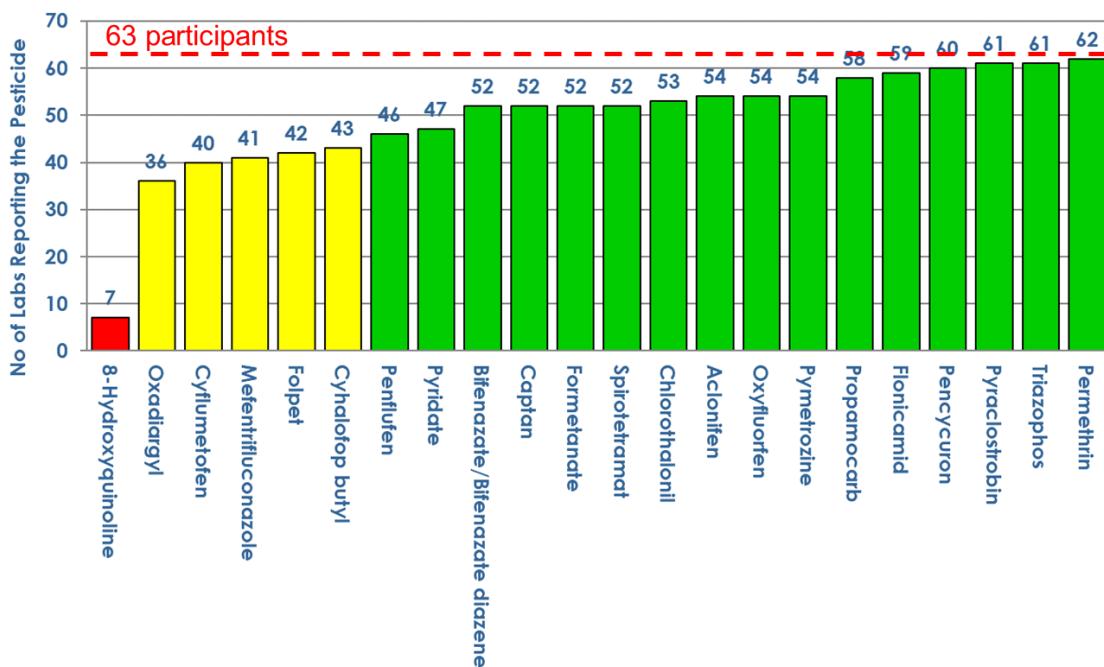
Pesticides	No of Detections	Nº of Labs detected the pesticide	% of Labs detected the pesticide	No of Conc. Reported	No of Conc. Reported by EU/EFTA labs	Conc. Homogeneity test (mg/kg)	Robust mean (mg/kg)	CV (%)
Triazophos	69	61	97	62	58	0.110	0.096	27.9



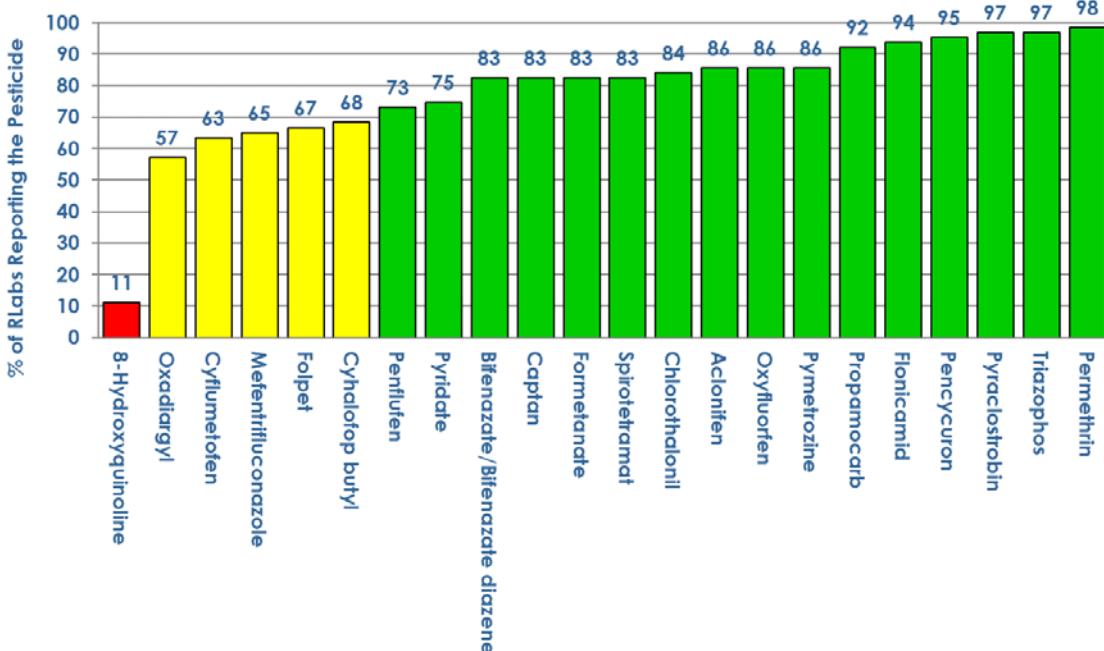
APPENDIX 2. Graphical Representations



**SM14 No of Reported Pesticides
(63 Laboratories Reported Data)**

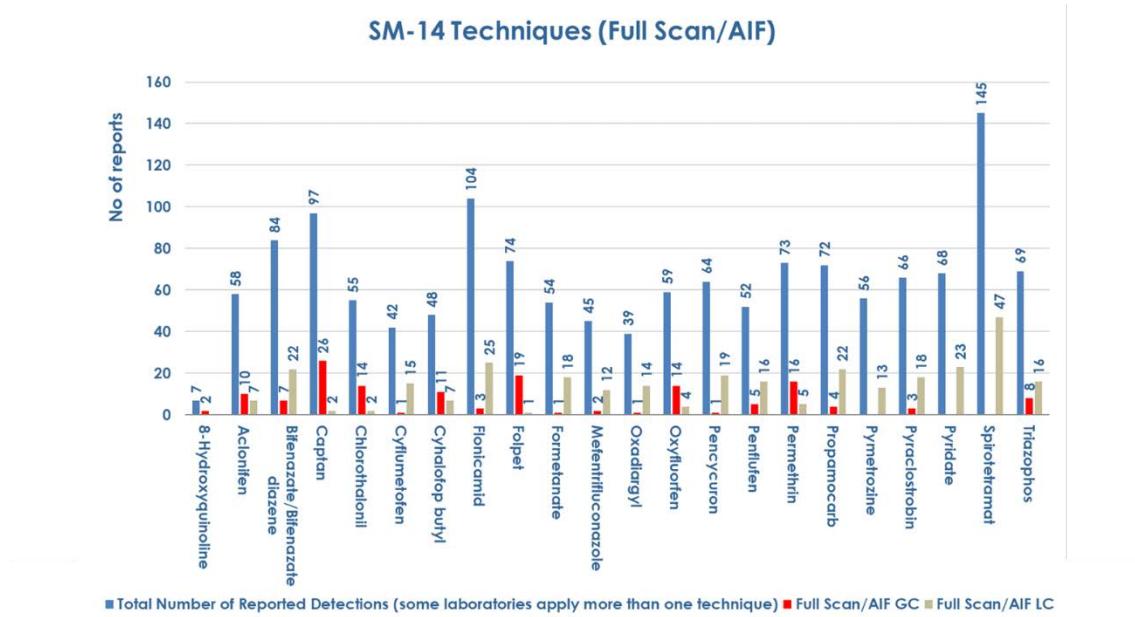


**SM14 % of Reported Pesticides
(63 Laboratories Reported Data)**

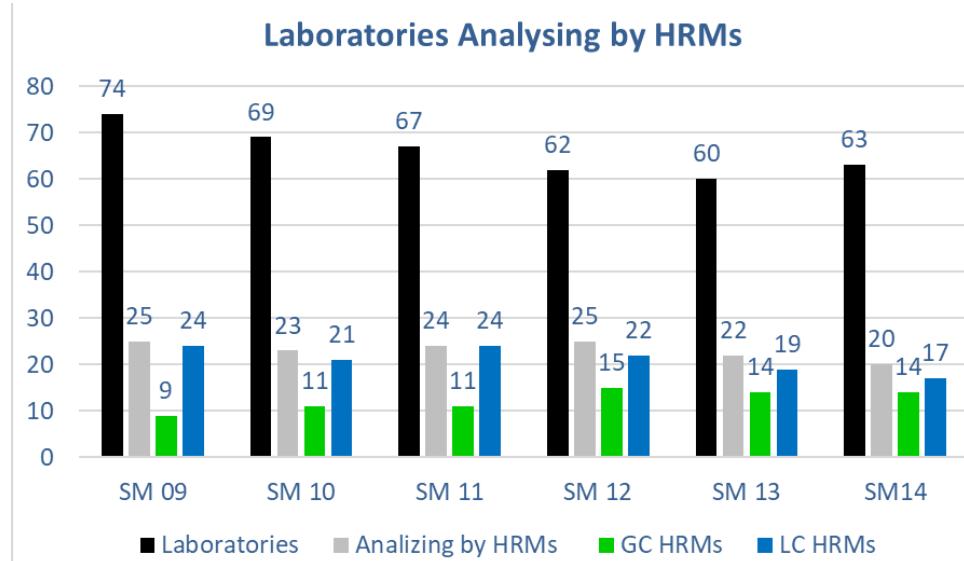


APPENDIX 2. Graphical Representations

Chromatographic Techniques used in Full Scan/AIF to determine each pesticide in the test item



Number of laboratories analysing the test items by HRMs



ANNEX 1. List of Laboratories that participate in EUPT-FV-SM14.

ANNEX 1. List of Laboratories that reported results in EUPT-FV-SM14.

COUNTRY	LABORATORY NAME	CITY
AUSTRIA	AGES (AUSTRIAN AGENCY FOR HEALTH AND FOOD SAFETY) INSTITUTE FOR FOOD SAFETY	INNSBRUCK
BELGIUM	LOVAP NV	GEEL
BELGIUM	PRIMORIS BELGIUM	GHENT
CHINA	AGRO-PRODUCT SAFETY RESEARCH CENTER, CAIQ	BEIJING
CHINA	BEIJING UNI-STAR INSPECTION TECHNOLOGY CO., LTD.	BEIJING
CHINA	SHANGHAI MUNICIPAL CENTER FOR DISEASE CONTROL AND PREVENTION	SHANGHAI
COSTA RICA	LABORATORIO DE ANÁLISIS DE RESIDUOS DE AGROQUÍMICOS	SAN JOSE
CROATIA	BIOINSTITUT D.O.O.	CAKOVEC
CROATIA	SAMPLE CONTROL D.O.O.	ZAGREB-LUČKO
CZECH REPUBLIC	CZECH AGRICULTURE AND FOOD INSPECTION AUTHORITY	PRAHA
CZECH REPUBLIC	UNIVERSITY OF CHEMISTRY AND TECHNOLOGY PRAHA	PRAGUE 6
DENMARK	NATIONAL FOOD INSTITUTE, TECHNICAL UNIVERSITY OF DENMARK	LYNGBY
FINLAND	FINNISH CUSTOMS LABORATORY	ESPOO
FRANCE	ANSES - LSAL - UPBM	MAISONS-ALFORT CEDEX
FRANCE	CAMP - LDA 66	PERPIGNAN
FRANCE	INOVALYS	LE MANS CEDEX 02
FRANCE	SERVICE COMMUN DES LABORATOIRES 34 (SCL 34)	MONTPELLIER
FRANCE	SERVICE COMMUN DES LABORATOIRES DE PARIS	MASSY
GERMANY	ANALYTICA ALIMENTARIA GMBH	KLEINMACHNOW
GERMANY	BAVARIAN HEALTH AND FOOD SAFETY AUTHORITY	ERLANGEN
GERMANY	CENTRAL INSTITUTE OF BUNDESWEHR MEDICAL SERVICES MUNICH	GARCHING
GERMANY	CHEMISCHES LABOR DR. MANG	FRANKFURT
GERMANY	CHEMISCHES UND VETERINÄRUNTERSUCHUNGSAKT RHEIN-RUHR-WUPPER	KREFELD
GERMANY	CVUA STUTTGART - PESTIS	FELLBACH
GERMANY	EUROFINS DR. SPECHT LABORATORIEN GMBH	HAMBURG
GERMANY	EUROFINS DR. SPECHT LABORATORIEN GMBH	HAMBURG
GERMANY	GALAB LABORATORIES GMBH	HAMBURG
GERMANY	LABOR FRIEDE GMBH	TEGERNHEIM
GERMANY	LANDWIRTSCHAFTLICHES TECHNOLOGIEZENTRUM AUGUSTENBERG (LTZ)	KARLSRUHE
GERMANY	LAVES; LVI OLDENBURG	OLDENBURG
GERMANY	LUA SACHSEN	DRESDEN
HUNGARY	FCSCN LTD., PESTICIDE RESIDUE ANALYTICAL LABORATORY, MISKOLC	MISKOLC
HUNGARY	FOOD CHAIN SAFETY CENTRE NON-PROFIT LTD., PESTICIDE RESIDUE ANALYTICAL LABORATORY, SZOLNOK	SZOLNOK
HUNGARY	NATIONAL FOOD CHAIN SAFETY OFFICE, FOOD CHAIN SAFETY LABORATORY DIRECTORATE, PESTICIDE ANALYTICAL NATIONAL REFERENCE LABORATORY	VELENCE

ANNEX 1. List of Laboratories that participate in EUPT-FV-SM14

COUNTRY	LABORATORY NAME	CITY
IRELAND	PESTICIDE RESIDUE LABORATORY	CELCBRIDGE
ITALY	APPA BOLZANO - LAB ACQUE E CROMATOGRAFIA	BOLZANO
ITALY	ISTITUTO ZOOPROFILATTICO G. CAPORALE TERAMO	TERAMO
LITHUANIA	NATIONAL FOOD AND VETERINARY RISK ASSESSMENT INSTITUTE	VILNIUS
NORWAY	NORWEGIAN INSTITUTE OF BIOECONOMY RESEARCH, PESTICIDES AND NATURAL PRODUCTS CHEMISTRY	AAS
PERÚ	INSPECTORATE SERVICES PERU	LIMA
POLAND	HAMILTON UO-TECHNOLOGIA	GRÓJEC
PORTUGAL	LABORATÓRIO REGIONAL DE VETERINÁRIA E SEGURANÇA ALIMENTAR - MADEIRA	FUNCHAL
ROMANIA	INSITUTUL DE IGIENA SI SANATATE PUBLICA VETERINARA	BUCURESTI
SPAIN	AGÈNCIA DE SALUT PÚBLICA DE BARCELONA	BARCELONA
SPAIN	ANALYTICA ALIMENTARIA SPAIN	ALMERÍA
SPAIN	INSTITUTO TECNOLOGICO DE CANARIAS, S. A. LABORATORIO DE RESIDUOS. DEPARTAMENTO DE ANALISIS AMBIENTAL	AGÜIMES, GRAN CANARIA
SPAIN	LABORATORIO AGRARIO Y FITOPATOLÓGICO DE GALICIA	ABEGONDO. A CORUÑA
SPAIN	LABORATORIO AGROALIMENTARIO DE EXTREMADURA	CÁCERES
SPAIN	LABORATORIO AGROALIMENTARIO Y MEDIOAMBIENTAL	EL PALMAR (MURCIA)
SPAIN	LABORATORIO AGROAMBIENTAL DE ZARAGOZA	ZARAGOZA
SPAIN	LABORATORIO ANALITICO BIOCLINICO, SLU	ALMERIA
SPAIN	LABORATORIO DE SALUD PÚBLICA DEL AYUNTAMIENTO DE MADRID. MADRID SALUD	MADRID
SPAIN	LABORATORIO KUDAM SLU	PILAR DE LA HORADADA
SPAIN	LABORATORIO SOIVRE ALMERÍA	ALMERÍA
SPAIN	NATIONAL CENTER FOR TECHNOLOGY AND FOOD SAFETY (CNTA)	SAN ADRIÁN (NAVARRA)
SWEDEN	EUROFINS FOOD AND FEED TESTING SWEDEN AB	LIDKOPING
SWEDEN	NATIONAL FOOD AGENCY	UPPSALA
SWITZERLAND	KANTONALES LABOR ZURICH	ZURICH
SWITZERLAND	SERVICE DE LA CONSOMMATION ET DES AFFAIRES VÉTÉRINAIRES (GENÈVE)	GENÈVE
THE NETHERLANDS	GROEN AGRO CONTROL	DELFFGAUW
THE NETHERLANDS	NOFALAB B.V.	SCHIEDAM
THE NETHERLANDS	WAGENINGEN FOOD SAFETY RESEARCH	WAGENINGEN
TURKEY	SGS MERSIN GIDA KONTROL LABORATUVARI	MERSIN