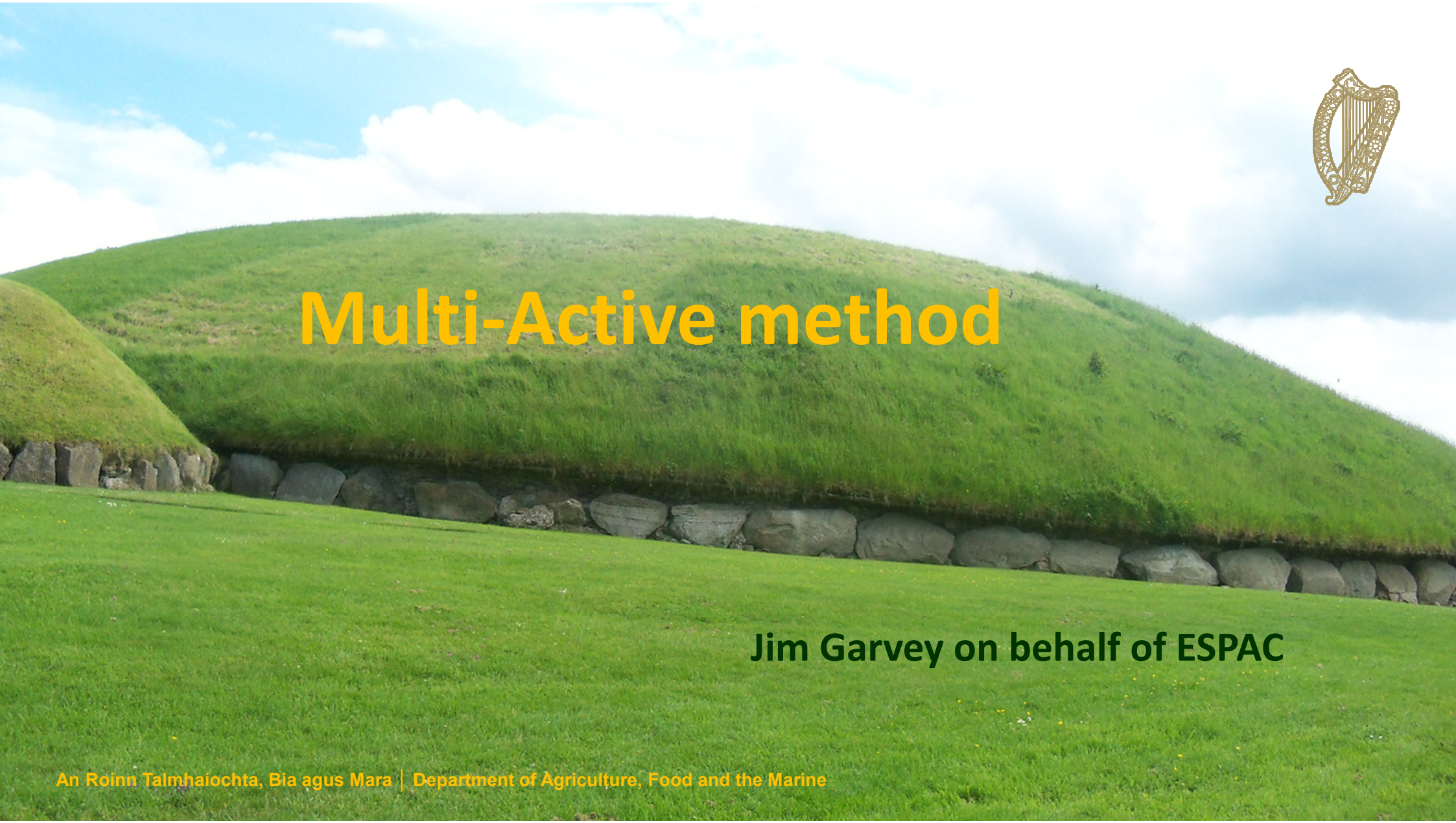


Multi-Active method

Jim Garvey on behalf of ESPAC

Summary

- 1. Introduction
- 2. Scope
- 2. Outline of Method
- 4. Preparation of calibration standards
- 5. Preparation of samples
- 6. GC Method
- 7. LC Method
- 8. Calculation
- 9. Extending the scope of the method
- 10. Conclusion

MULTI-ACTIVE METHOD FOR THE ANALYSIS OF ACTIVE SUBSTANCES IN FORMULATED PRODUCTS

SCOPE

The method is suitable for determining a range of active substances in a range of formulated product types. The current GC scope is given in **Appendix 1** and the current HPLC scope is given in **Appendix 2**.

1 Sampling. Ideally an intact product should be taken from the market as intended for use with an oral user

2 Identity tests

2.1 DAD, UV, GC-MS, LC-MS or FTIR or any other suitable technique, depending on the product

3.1 Active substances

OUTLINE OF METHOD.

The sample preparation is different depending on the formulation type being analysed. Procedures are given for solid and liquid formulations. Once the samples are prepared the active substances are analysed by either gas chromatography with flame ionisation detection (GC-FID) or high performance liquid chromatography with UV detection (HPLC-DAD) with internal or external standard calibration.

REAGENTS

Analytical standards of known purity, stored in refrigerator

Ethyl Acetate: HPLC grade

Acetonitrile: HPLC grade

Water: HPLC grade

Formic Acid: HPLC grade

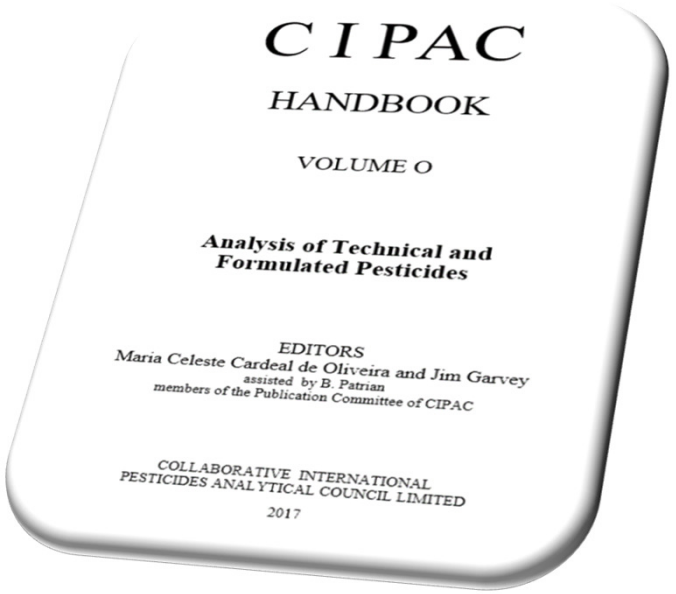
Diisobutyl phthalate internal standard

Internal standard solution where appropriate

HPLC Mobile Phase: A = 0.1% Phosphoric acid
B = Acetonitrile

ESPAC

- English Speaking Pesticide Advisory Council
- Local PAC within CIPAC
- Government and Industry representatives
- Members from Ireland, U.K., U.S.A, Australia, ~~South~~ ~~Africa~~, Switzerland, Hungary, Czech Republic, Denmark, France, Belgium and Netherlands



Introduction

- **Currently Quality Control laboratories for Formulated products require access to:**
  - **GC and LC, usually FID and DAD detectors will suffice**
  - **Multiple GC and LC columns**
  - **Multiple sample preparation procedures**
  - **“Every sample’s a project” © DC**
  - **Deal with products from all companies**

  And they

  - **Waste a lot of time switching from one system to another**

Introduction

- **Residues laboratories, on the other hand:**

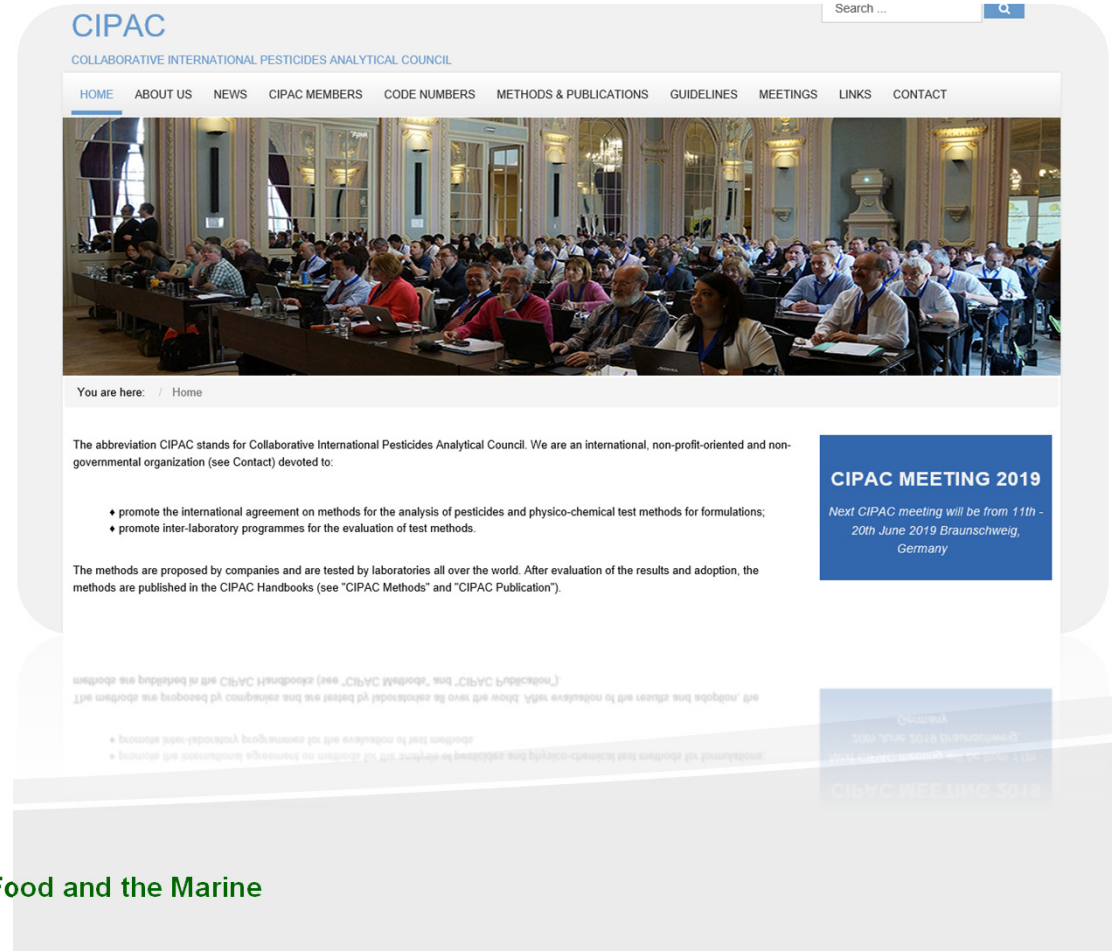
1. **Have a small number of sample preparation procedures**
2. **Use a limited number of GC and LC columns**
3. **Analyse for a large number of compounds in a single method**
4. **Maximise the efficiency of the analytical process by using multi residue methods.**

- **Can Formulations Laboratories learn from Residues laboratories ?**

Introduction

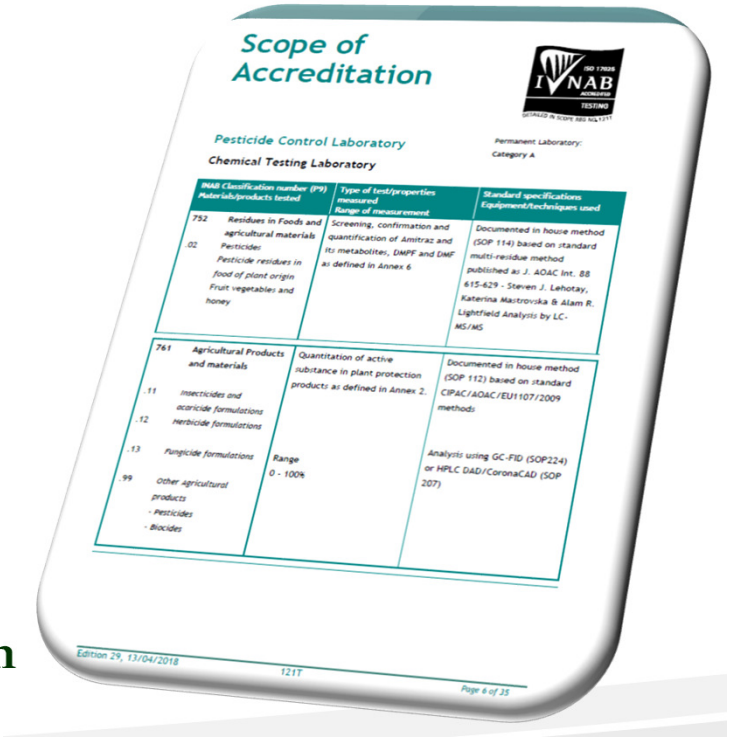
- At CIPAC 2018 it was agreed that ESPAC would prepare a draft MAM to be presented at the next CIPAC meeting

- The first draft of the method was presented at the ESPAC meeting in October 2018



Scope

- The method used in the PCL has been used to cover a wide range of active substances and formulation types
- Each active and product is validated before being added to the scope
- The method is accredited by INAB for a flexible scope - https://www.inab.ie/ Lab 121T
- The flexible scope must define the active substance, the analytical range and the determination method used.
- For a CIPAC method more information is required in the scope


Scope of Accreditation

Pesticide Control Laboratory
Chemical Testing Laboratory

Permanent Laboratory:
Category A

INAB Classification number (PT) Materials/products tested	Type of test/properties measured Range of measurement	Standard specifications Equipment/techniques used
752 Residues in Foods and agricultural materials .02 Pesticides Pesticide residues in food of plant origin Fruit vegetables and honey	Screening, confirmation and quantification of Amitraz and its metabolites, DMPF and DMF as defined in Annex 6	Documented in house method (SOP 114) based on standard multi-residue method published as J. AOAC Int. 88 615-629 - Steven J. Lehotay, Katerina Maštrovska & Alam R. Lightfield Analysis by LC-MS/MS
761 Agricultural Products and materials .11 Insecticides and acaricide formulations .12 Herbicide formulations .13 Fungicide formulations .99 Other agricultural products - Pesticides - Biocides	Quantitation of active substance in plant protection products as defined in Annex 2. Range 0 - 100%	Documented in house method (SOP 112) based on standard CIPAC/AOAC/EU1107/2009 methods Analysis using GC-FID (SOP224) or HPLC DAD/CoronaCAD (SOP 207)

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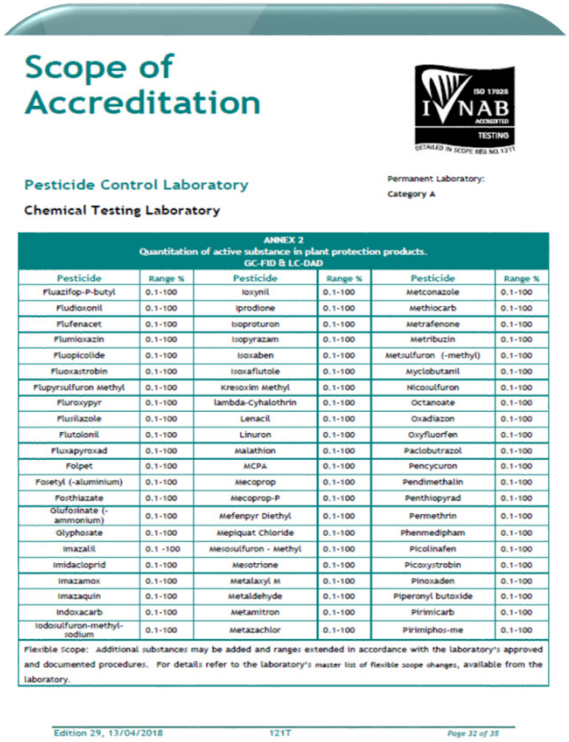
Scope



Scope of Accreditation

Pesticide Control Laboratory

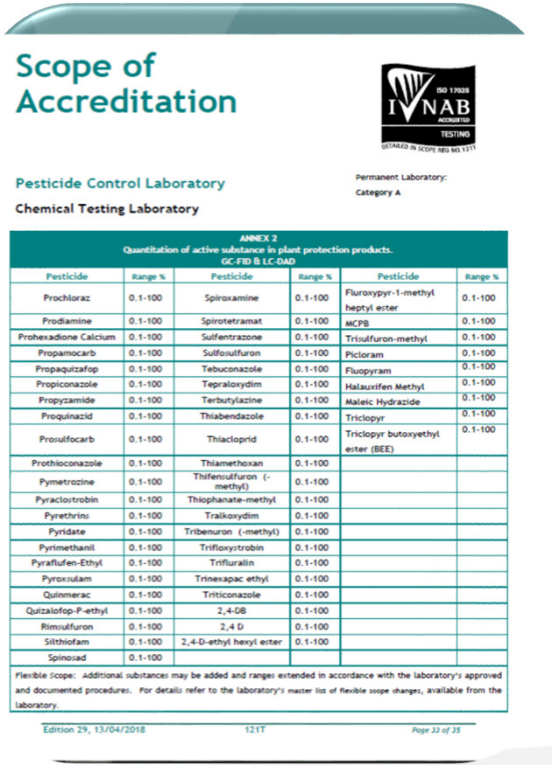
Chemical Testing Laboratory

Permanent Laboratory:
Category A

ANNEX 2
Quantitation of active substance in plant protection products.
GC-FID & LC-DAD

Pesticide	Range %	Pesticide	Range %	Pesticide	Range %
Fluazifop-P-butyl	0.1-100	Ioxynil	0.1-100	Metconazole	0.1-100
Fludioxonil	0.1-100	Iprodione	0.1-100	Methiocarb	0.1-100
Flufenacet	0.1-100	Isoproturon	0.1-100	Metrafenone	0.1-100
Flumioxazin	0.1-100	Isopyrazam	0.1-100	Metribuzin	0.1-100
Fluopicolide	0.1-100	Isoxaben	0.1-100	Metsulfuron (-methyl)	0.1-100
Fluoxastrobin	0.1-100	Isoxaflutole	0.1-100	Myclobutanil	0.1-100
Flupyrsulfuron Methyl	0.1-100	Kresoxim Methyl	0.1-100	Nicosulfuron	0.1-100
Fluroxypyr	0.1-100	lambda-Cyhalothrin	0.1-100	Octanoate	0.1-100
Flusilazole	0.1-100	Lenacil	0.1-100	Oxadiazon	0.1-100
Flutolonil	0.1-100	Linuron	0.1-100	Oxyfluorfen	0.1-100
Fluxapyroxad	0.1-100	Malathion	0.1-100	Paclobutrazol	0.1-100
Folpet	0.1-100	MCPA	0.1-100	Pencycuron	0.1-100
Fosetyl (-aluminium)	0.1-100	Mecoprop	0.1-100	Pendimethalin	0.1-100
Fosthiazate	0.1-100	Mecoprop-P	0.1-100	Penthiopyrad	0.1-100
Glufosinate (-ammonium)	0.1-100	Mefenpyr Diethyl	0.1-100	Permethrin	0.1-100
Glyphosate	0.1-100	Mepiquat Chloride	0.1-100	Phenmedipham	0.1-100
Imazalil	0.1 -100	Mesosulfuron - Methyl	0.1-100	Picolinafen	0.1-100
Imidacloprid	0.1-100	Mesotrione	0.1-100	Picoxystrobin	0.1-100
Imazamox	0.1-100	Metalaxyl M	0.1-100	Pinoxaden	0.1-100
Imazaquin	0.1-100	Metaldehyde	0.1-100	Piperonyl butoxide	0.1-100
Indoxacarb	0.1-100	Metamitron	0.1-100	Pirimicarb	0.1-100
Iodosulfuron-methyl-sodium	0.1-100	Metazachlor	0.1-100	Pirimiphos-me	0.1-100

Flexible Scope: Additional substances may be added and ranges extended in accordance with the laboratory's approved and documented procedures. For details refer to the laboratory's master list of flexible scope changes, available from the laboratory.



Scope of Accreditation

Pesticide Control Laboratory

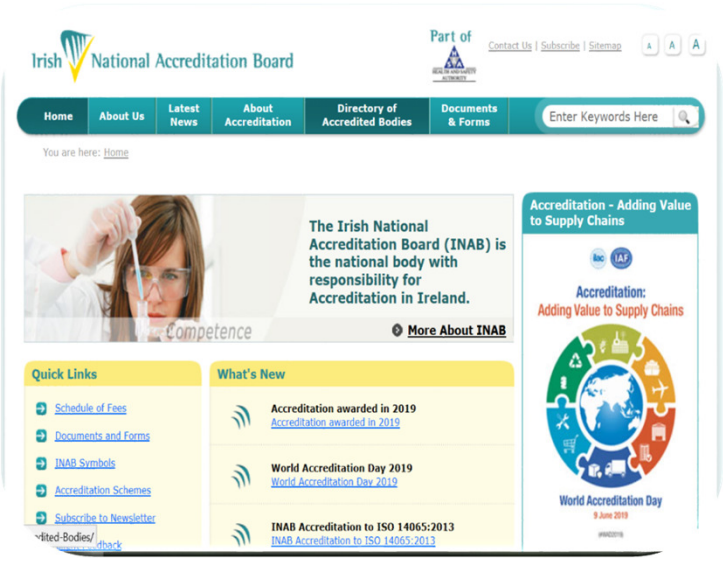
Chemical Testing Laboratory

Permanent Laboratory:
Category A

ANNEX 2
Quantitation of active substance in plant protection products.
GC-FID & LC-DAD

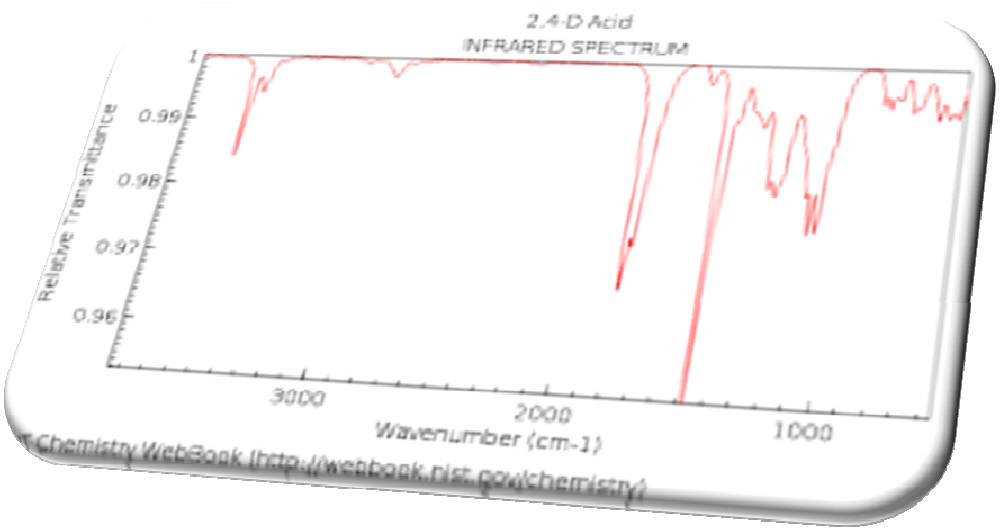
Pesticide	Range %	Pesticide	Range %	Pesticide	Range %
Prochloraz	0.1-100	Spiroxamine	0.1-100	Fluroxypyr-1-methyl heptyl ester	0.1-100
Prodiamine	0.1-100	Spirotetramat	0.1-100	MCPB	0.1-100
Prohexadione Calcium	0.1-100	Sulfentrazone	0.1-100	Trisulfuron-methyl	0.1-100
Propamocarb	0.1-100	Sulfosulfuron	0.1-100	Picloram	0.1-100
Propaquizafop	0.1-100	Tebuconazole	0.1-100	Fluopyram	0.1-100
Propiconazole	0.1-100	Tepraloxydim	0.1-100	Halauxifen Methyl	0.1-100
Propyzamide	0.1-100	Terbutylazine	0.1-100	Maleic Hydrazide	0.1-100
Proquinazid	0.1-100	Thiabendazole	0.1-100	Triclopyr	0.1-100
Prosulfocarb	0.1-100	Thiacloprid	0.1-100	Triclopyr butoxyethyl ester (BEE)	0.1-100
Prothioconazole	0.1-100	Thiamethoxan	0.1-100		
Pymetrozine	0.1-100	Thifensulfuron (-methyl)	0.1-100		
Pyraclostrobin	0.1-100	Thiophanate-methyl	0.1-100		
Pyrethrins	0.1-100	Tralkoxydim	0.1-100		
Pyridate	0.1-100	Tribenuron (-methyl)	0.1-100		
Pyrimethanil	0.1-100	Trifloxystrobin	0.1-100		
Pyraflufen-Ethyl	0.1-100	Trifluralin	0.1-100		
Pyroxsulam	0.1-100	Trinexapac ethyl	0.1-100		
Quinmerac	0.1-100	Triticonazole	0.1-100		
Quizalofop-P-ethyl	0.1-100	2,4-DB	0.1-100		
Rimsulfuron	0.1-100	2,4 D	0.1-100		
Silthiofam	0.1-100	2,4-D-ethyl hexyl ester	0.1-100		
Spinosad	0.1-100				

Flexible Scope: Additional substances may be added and ranges extended in accordance with the laboratory's approved and documented procedures. For details refer to the laboratory's master list of flexible scope changes, available from the laboratory.



Outline of method

- **Identity check**
  - Any appropriate technique
  - MS, DAD, FTIR
- **Specificity check**
  - Mass spectrometry
  - DAD

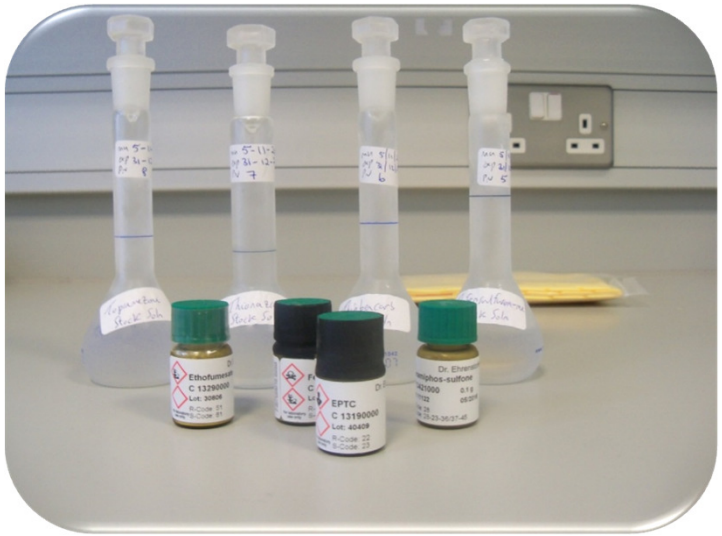


Outline of method

- The sample preparation is different depending on the formulation type being analysed.
- Procedures are given for solid and liquid formulations.
- Once the samples are prepared the active substances are analysed by either GC-FID or HPLC-DAD with external standard calibration.
- Internal standards can be used, if required.
- Reagents and apparatus are listed without attempting to be exhaustive

Preparation of calibration standards

- Weigh (to the nearest 0.1mg) about 10mg the required analytical standard (s mg) into a volumetric flask (100ml).
- Dissolve and fill to mark with solvent.
- Mix well. This gives a standard concentration of 100mg/l
- Two standards can be made for comparison purpose if necessary



Preparation of samples

- **Liquid or suspension formulations:** Prior to analysis the product container is shaken for 30min

- To achieve a homogeneous sample the laboratory should not have to do anything beyond what a discerning user would be required to do

Preparation of samples

- **Liquid or suspension formulations:** Thoroughly shake the sample container to homogenize the sample before use.
- Weigh in duplicate (to the nearest 0.1 mg) sufficient sample to contain 9 to 11 mg (*w* mg) of the active substance into a volumetric flask (100 ml). Sample concentration ~ 100mg/l
- Make up to volume with ethyl acetate or acetonitrile (for either GC or LC) and mix well (Solutions S_A and S_B).

Preparation of samples

- **Solid formulations:** Weigh ~15 -20g of the sample into a mortar and pestle and homogenise thoroughly.
- Subsample by weighing in duplicate (to the nearest 0.1 mg) sufficient sample to contain 9 to 11 mg (*w* mg) of the active substance into a volumetric flask (100 ml).
- Make up to volume with ethyl acetate or acetonitrile (for GC or LC) and mix well (Solutions S_A and S_B). Sample concentration ~ 100mg/l

GC Method

- (a) Chromatographic conditions
- Column HP5MS, 30 x 0.25mm x 0.25µm
- Injection system
- Injector — Split injection
Injection volume 0.2µl
Split ratio 5:1
- Detector — Flame ionisation detector
- Temperatures:
Injection port 70°C
Detector 310°C

GC Method

Temperature program

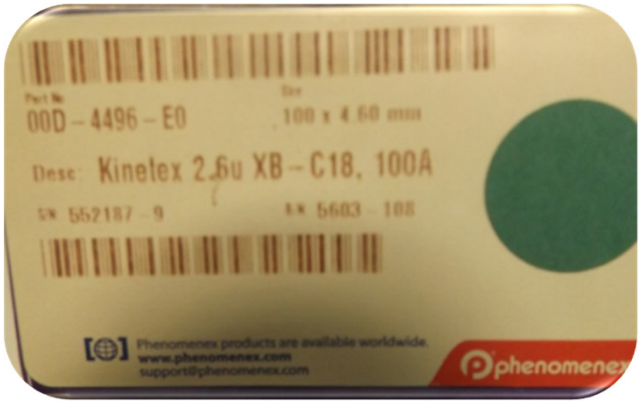
Temp °C	Rate °C/min	Time (min)
65	---	0.5
280	50	0
280	0	6

Total Run Time = 10.80 mins

HPLC Method

- ***(a) Chromatographic conditions***

- *Column* HPLC column, Kinetex C18, 100 mm x 4.6 mm (id) x.2.6 µm / 100Å **or equivalent**



- *Flow rate* 1.0 ml/min

- *Injection volume* **5** µL

- *Detector wavelength* **220 nm – 280 nm. The optimum wavelength can be established by analyzing the analytical standard on PDA detector prior to analysis**

- *Run Time* **18** min

HPLC Method

Mobile Phase

A = 65% - 0.1% Aqueous Formic acid (or o-Phosphoric acid)

B = 35% Acetonitrile

Pump Gradient:

Time (min)	% A	%B
0.01	65	35
10.0	15	85
16.0	15	85
16.4	65	35
18.0	65	35

Column temperature 25 ℃

Typical sequence

- **Determination:**
- **Inject in duplicate required portions of each sample solution**
- **Bracketing them by injections of the calibration solutions as follows;**
- **C_A, $S1_A$, $S1_B$, C_B, $S2_A$, $S2_B$, C_A, and so on.**
- **Measure the relevant peak areas.**

Calculations

- (d) Calculation. **Calculate the mean value of each pair of response factors bracketing the two injections of a sample and use this value for calculating the active substance contents of the bracketed sample injections.**

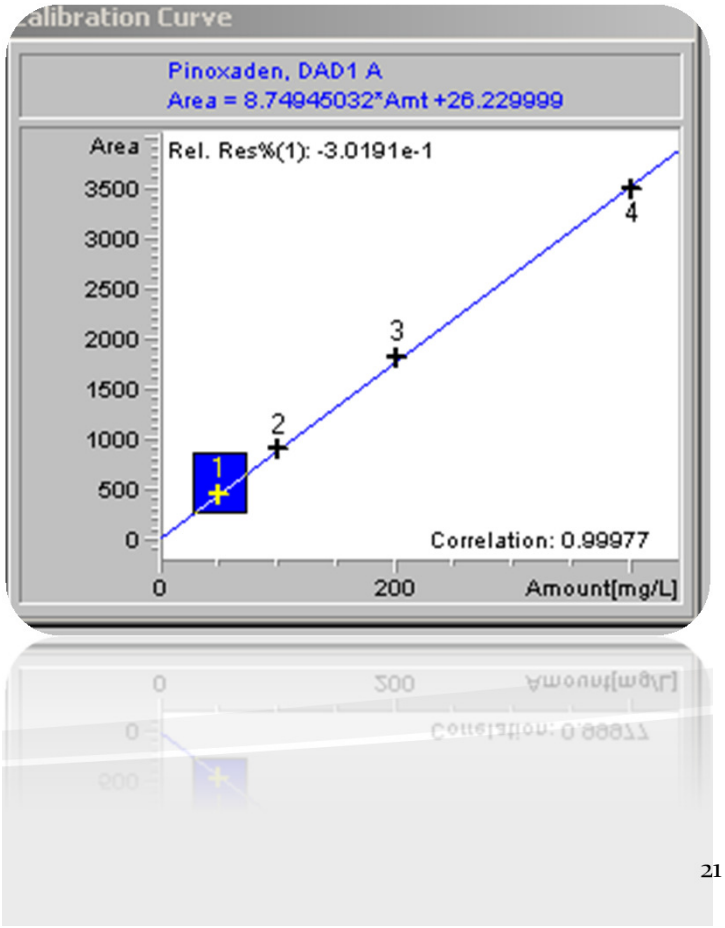
- $fi = \frac{s \times P}{Hs}$

- Content of active substance $= \frac{f \times Hw}{w}$ g/kg

- where:
- fi = individual response factor
- f = mean response factor
- H_s = peak area of active substance in the calibration solution
- H_w = peak area of the active substance in the sample solution
- s = mass of the active substance working standard in the calibration solution (mg)
- w = mass of sample taken (mg)
- P = purity of the active substance working standard (g/l)

Extending the scope

- To add a new active substance to the scope of this method the following validation data must be provided:
- An unequivocal identity test
- Specificity check
- Injection repeatability data – should be better than 1%
- Linearity should be demonstrated between at least 50 and 150ppm
- PT or collaborative trial data would also be beneficial



GC Scope

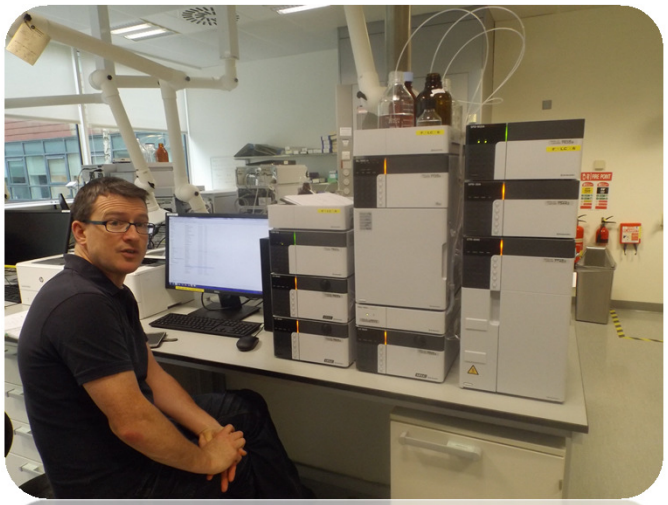
	Active substance	Form. Type	unit	Spec	Tol (±)
1	Azoxystrobin	EC	g/L	62.5	6.3
2	b-Cyfluthrin	WP	w/w	10	1
3	Chlorothalonil	SC	g/L	500	25
4	Chlorpyrifos	EC	g/L	480	24
5	Chlorpyrifos methyl	EC	g/L	225	13.5
6	Clodinafop propargil ester	EC	g/L	100	10
7	Cypermethrin	EC	g/L	100	10
8	Cypermethrin	EW	g/L	100	10
9	Cyprodinil	EC	g/L	187.5	11.3
10	Deltamethrin	DP	w/w	0.05	0.013
11	Difenoconazole	SC	g/L	250	15
12	Dimethoate	EC	g/L	400	20
13	Epoxiconazole	SC	g/L	125	7.5
14	Esfenvalerate	EC	g/L	25	3.8
15	Fenoxaprop p ethyl	EW	g/L	69	6.9
16	Fenpropidin	EC	g/L	750	25
17	Fenpropimorph	SC	g/L	250	15
18	Fluazifop-P-Butyl	EC	g/L	125	7.5
19	Fluroxypyr 1 MHE	EC	g/L	144	8.6
20	Folpet	SC	g/L	500	25
21	Ioxynil Octanoate	EC	g/L	268.1	13.4
22	Isopyrazam	EC	g/L	62.5	6.3

GC Scope - cont

	Active substance	Form. Type	unit	Spec	Tol (±)
23	λ - Cyhalothrin	CS	g/L	100	10
24	Metconazole	EC	g/L	25	3.8
25	Metribuzin	WG	%w/w	70	2.5
26	Myclobutanil	EW	g/L	200	12
27	Paclobutrazol	SC	g/L	125	7.5
28	Permethrin	DP	w/w	0.488	0.12
29	Picoxystrobin	SC	%w/w	17.9	1.07
30	Piperonyl butoxide	XX	w/w	1.0	0.15
31	Pirimicarb	WG	w/w	50	2.5
32	Pirimiphos-me	EC	g/L	50	5
33	Procloraz	EC	g/L	300	15
34	Prodiamine	XX	w/w	2.73	0.27
35	Prometron	SC	w/w	14.3	0.86
36	Propiconazole	EC	g/L	104	6.2
37	Propyzamide	WG	w/w	4.0	1.0
38	Prosulfocarb	EC	g/L	800	25
39	Pyrethrins	XX	w/w	0.1	0.02
40	Spiroxamine	EC	g/L	250	15
41	Tebuconazole	SC	g/L	250	15
42	Terbutylazine	SC	g/L	330	16.5
43	Triclopyr butoxy ethyl ester	EO	g/L	334	16.7
44	Trifluralin	WG	w/w	1.47	0.37

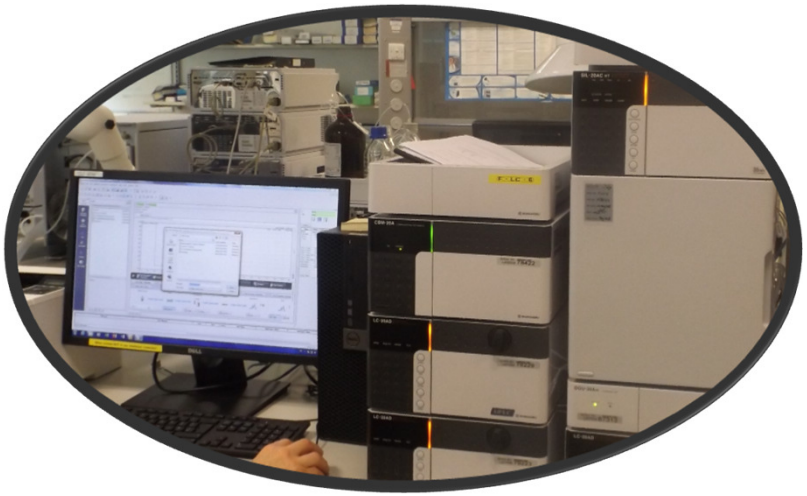
HPLC Scope

	Active substance	Form. Type	l (nm)	unit	Spec	Tol (±)
1	Abamectin	EC	240	g/L	18	2.7
2	Acetamiprid	ME	260	w/w	0.05	0.008
3	Acetamiprid	ME	260	g/kg	0.05	0.008
4	Amidosulfuron	WG	240	w/w	75	2.5
5	Amisulbrom	WG	260	g/kg	50	5
6	Asulam	SL	260	g/L	400	20
7	Atrazine	SL	280	g/L	4	0.6
8	Benzovindiflupyr	EC	260	g/L	75	7.5
9	Bifenthrin	ME	260	g/L	0.02	0.003
10	Bixafen	EC	260	g/L	60	6
11	Boscalid	WG	260	g/kg	500	25
12	Carfentrazone-et	WG	260	w/w	33.3	1.67
13	Chloridazon	WP	260	w/w	650	25
14	Chloroantriniliprole	FS	280	w/w	50	25
15	Chloroantriniliprole	WG	280	g/kg	350	17.5
16	Chloroantriniliprole	SC	280	g/kg	184	11.04
17	Chloroantriniliprole	Tech	280	g/kg	1000	25
18	Chlorothalonil*	SC	260	g/L	500	25
19	Chlorotoluron	SC	240	g/L	250	15
20	Cloquintocet-mexyl	EC	340	g/L	25	2.5
21	Cyantraniliprole	OD	280	g/L	100	10
22	Cymoxanil	WG	260	w/w	500	25
23	Daminozide	WG	220	w/w	85	8.5
24	Dazomet	GR	280	g/kg	970	25
25	Difenacoum	RB	260	w/w	0.005	0.0013
26	Diflufenican	SC	280	w/w	200	12
27	Dimethomorph	WP	260	w/w	500	25
28	Epoxiconazole	SC	260	g/L	50	5



HPLC Scope cont

	Active substance	Form. Type	l (nm)	unit	Spec	Tol (±)
30	Fipronil	XX	260	g/kg	0.14	0.035
31	Flazasulfuron	WG	260	w/w	250	12.5
32	Flonicamid	WG	260	w/w	500	25
33	Florasulam	SC	260	g/L	50	5
34	Fluazinam	EC	260	g/L	400	20
35	Flufenacet	SC	245	g/L	400	20
36	Flumioxazin	SC	280	g/L	300	15
37	Fluopicolide	SC	260	w/w	5.53	0.55
38	Fluopyram	EC	260	g/L	65	6.5
39	Fluoxastrobin	EC	260	g/L	75	7.5
40	Flurprimidol	XX	260	g/kg	130	0.78
41	Flurtamone	SC	280	g/L	120	7.2
42	Fluxapyroxad	EC	260	g/L	62.5	6.25
43	Halauxifen-methyl	XX	260	g/L	6.3	0.9
44	Imidacloprid	SL	260	g/L	0.125	0.0188
45	Iodosulfuron-Me-Na	SC	240	g/L	0.3	0.05
46	Iprodione	SC	240	g/L	256	12.8
47	Isoproturon	SC	260	g/L	500	25
48	Isoxaben	SC	260	g/L	500	25
49	Isoxaflutole	WG	260	w/w	100	10
50	Linuron	SC	260	g/L	450	22.5
51	Mesosulfuron-Me	WG	240	w/w	0.9	0.14
52	Mesotrione	SC	260	g/L	70	7
53	Metamitron	SC	260	g/L	700	70
54	Metazachlor	SC	260	g/L	375	18.8
55	Metconazole*	EC	260	g/L	60	6
56	Methomyl	SC	240	w/w	20	1.2
57	Metsulfuron-methyl	WG	260	w/w	68	10
58	Myclobutanil*	ME	260	g/L	0.075	0.0113
59	Nicosulfuron	WG	260	w/w	750	25



HPLC Scope cont

	Active substance	Form. Type	l (nm)	unit	Spec	Tol (±)
60	Oxadiazon	SC	260	g/L	4.8	0.72
61	Oxamyl	GR	240	w/w	5	0.5
62	Pendimethalin	SC	260	g/L	455	22.8
63	Penoxsulam	WG	280	w/w	0.04	0.01
64	Penthiopyrad	SC	260	g/L	100	10
65	Picloram	SL	260	g/L	67	6.7
66	Pinoxaden	EC	260	g/L	100	10
67	Prohexadione calcium	WG	260	g/kg	50	12.5
68	Propaquizafop	EC	340	g/L	100	10
69	Proquinazid	EC	260	g/L	200	12
70	Prothioconazole	EC	260	g/L	200	12
71	Pyraclostrobin	SC	260	g/L	133	8
72	Pyraflufen-ethyl	SL	260	g/L	0.33	0.05
73	Pyriate	WP	260	w/w	45	2.25
74	Pyrimethanil	SC	260	g/L	400	20
75	Pyroxsulam	WG	310	w/w	7.1	0.71
76	Quinoclamine	WP	240	g/kg	250	12.5
77	Quizalofop-p-tefuryl	EC	240	g/L	40	4
78	Sulfoxaflor	WG	260	g/kg	500	25
79	Tebuthiuron	WG	260	w/w	20	1.2
80	Tepraloxydim	EC	260	g/L	50	5
81	Thiacloprid	SC	240	g/L	40.4	2.02
82	Thifensulfuron-methyl	WG	260	w/w	682	25
83	Tribenuron-methyl	SG	260	w/w	40	2
84	Trifloxystrobin	SC	260	g/L	16	1.6
85	Triflusulfuron-methyl	WG	260	w/w	500	25
86	Trinexapac-ethyl	EC	260	g/L	250	12.5
87	Triticonazole	ME	260	g/L	7.5	1.1

Proficiency test results - AAPCO

2016

			Reported	Median	s	z
2016 - 1	Pale amber liquid	Propiconazole	14.74	14.3	0.519	0.57
2016 – 2	White dust	Deltamethrin	0.035	0.038	0.0036	-0.56
3026 – 3	Opaque yellow liquid	Sulfentrazone	1.325	1.33	0.059	-0.06
2026 – 4	Opaque yellow liquid	Prodiamine	2.64	2.676	0.115	-0.21

2017

			Reported	Median	s	z
2017 - 01	White pressed liquid	Prometon	4.82	4.995	0.479	-0.23
2017 - 02	White opaque liquid	Atrazine	4.11	4.01	0.432	0.675
2017 - 03	Transparent amber liquid	Acetamiprid	8.63	8.779	0.468	-0.762
2017 - 04	Brown granules	Penoxsulam	0.0401	0.04	0.012	-0.067

2018

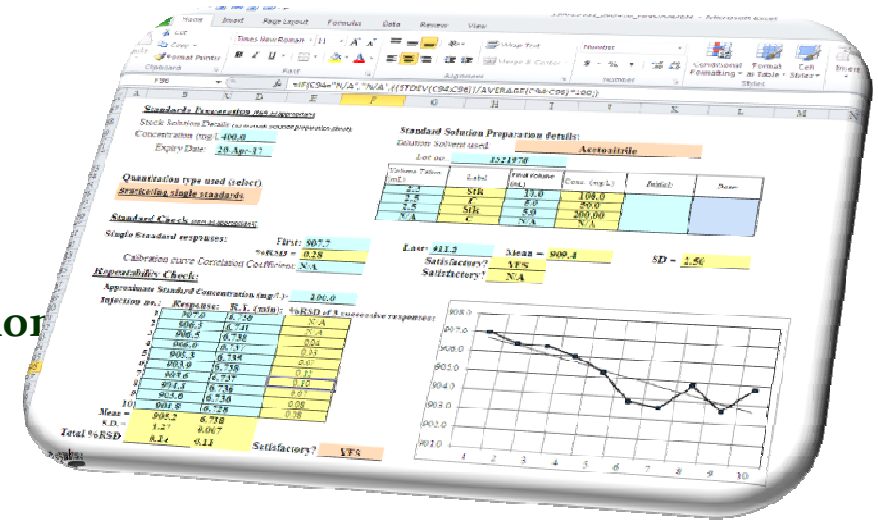
			Reported	Median	s	z
2018 – 01	Grey pressed pellets	Tebuthiuron	22.4	21.94	1.181	0.667
2018 – 02	White emulsified liquid	Iprodione	24	23.51	0.974	0.868
2018 – 03	Grey wettable powder	Cyfluthrin	9.855	10.2	0.709	-0.675

Proficiency test results

2018			Reported	Median	s	z
	Grey pellets	Fipronil	0.01545	0.0131	0.0015	1.9
	Transparent green liquid	Flurprimidol	13.55	13.41	0.508	0.285
		Trinexapac-ethyl	3.59	3.626	0.363	-0.326
ITPT 2018			Reported %	Average %	s	z
2018_01	Wettable powder	Cymoxanil	20	20	0.78	0
2018_02	Soluble liquid	Methomyl	19.3	19.4	1.05	-0.92
2018_03	Granuales	Oxamyl	5.23	5.27	0.16	-0.11
ITPT 2019			Reported %	Average %	s	z
2019_01	Water dispersible granules	Amisulbron	4.75	4.96	0.25	-0.84
2019_02	Wettable powder	Dimethomorph	6.05	6.07	0.14	-0.14
2019_03	Liquid	Pirimiphos-methyl	5.1	5.3	0.5	-0.40
2019_04	Emulsifiable concentrate	Propiconazole	26.05	25.8	3.41	0.07

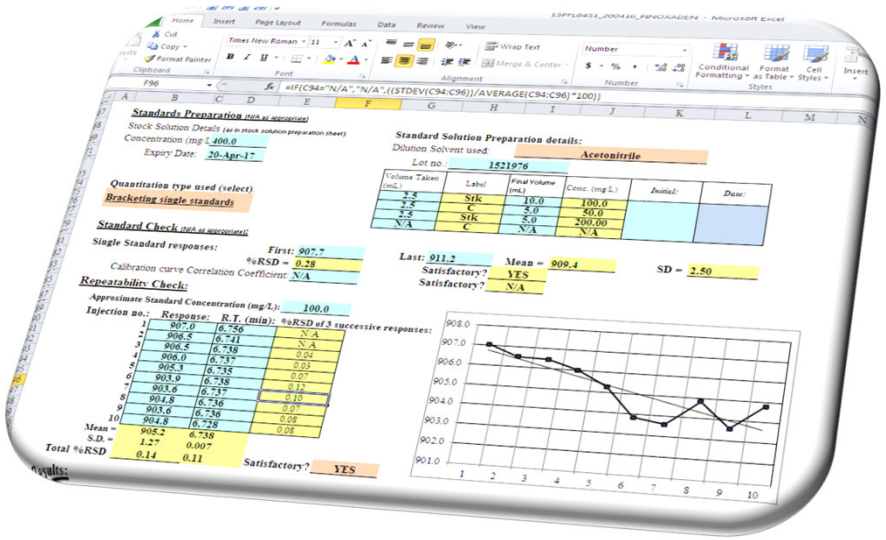
Conclusion

- The reality is that Quality Control Laboratories are using MAM's – could become methods of choice within the EU
- These methods are cost efficient and minimise the downtime changing from one batch of samples to another
- These methods are already recognised by accreditation bodies
- They can potentially give companies a starting point when trying to develop new analytical methods
- They will not cover all active substance – product types – if they can cover over 90% then that is a major simplification



Conclusion

- Acknowledgement of these methods would be helpful for laboratories preparing for accreditation
- CIPAC methods extended to cover the full range of laboratory activities
- Maybe need to create a new method “type” or accept as MT methods
- Acceptance of reality




danke
謝謝
ngiyabonga
teşekkür ederim
thank you
gracias
tapadh leat
dank je
hvala
mauruuru
dziękuje
bedankt
obrigado
sukriya
kop khun krap
go raibh maith agat
mochchakkeram
terima kasih
grazie
arigato
dakujem
merci