

Proficiency Testing Scheme for Water Analysis

Round HB87
Herbicides

Sample Dispatch: 4 November 2013





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This report summarises the results of round HB87 (herbicides) within the IFA-Test Proficiency Testing Scheme for water analysis. The samples HB87A and HB87B were distributed to the participants on Monday, 4 November 2013. Closing date for reporting results to the IFA-Tulln was Friday, 29 November 2013.

Fourteen laboratories participated in this interlaboratory comparison. Eleven laboratories submitted results.

Samples

The samples consisted of simulated ground water, which was spiked with solutions of the herbicides. For sample preparation, ultrapure water was spiked with concentrated solutions of inorganic salts in order to simulate the ionic composition of natural ground water. The following salts were added to the samples: $\text{Mg}(\text{NO}_3)_2$, MgSO_4 , Na_2SO_4 , NaHCO_3 , KHCO_3 , CaCl_2 and $\text{Ca}(\text{NO}_3)_2$. The calculation of the target concentrations of the compounds was based on the mass of standard added to the samples.

MCPA was not added to sample HB87A. Dichlorprop was not added to sample HB87B in order to check the analytical blank values.

Homogeneity, accuracy and stability tests at the IFA-Tulln

For verification of homogeneity, each sample bottle was analysed for dissolved organic carbon (DOC). The DOC in each bottle is defined by the volume of organic solvent added with the pesticide stock solution. The results of these DOC measurements showed a relative standard deviation of max. 1.17 %. Thus, sufficient sample homogeneity could be demonstrated.

Accuracy of the assigned pesticide concentrations of Bentazone, 2,4-D, Dicamba, Dichlorprop, MCPA and Mecoprop was confirmed by HPLC-DAD measurements. For these measurements three bottles of HB87A and HB87B were analysed prior to sample dispatch. The accuracy of the concentration of Chloridazon, Desphenylchloridazon and Methyldesphenylchloridazon was proven by LC-MS/MS analysis of aliquots from two bottles each of HB87A and HB87B. The results are listed in the results tables and the parameter oriented part of the report ("IFA result").

Stability tests for the water samples of the present proficiency testing round were carried out four weeks after dispatch. From each sample, two bottles that had been stored at 5°C in the dark were analysed for their herbicide concentrations. The results (mean values) are listed in the parameter-oriented part of this report ("Stability test").

Results

Data evaluation was based on target concentrations that were calculated from the weights of the standards used to produce the samples. Their uncertainty intervals correspond to the expanded uncertainty (coverage factor $k = 2$) as described in the EURACHEM/CITAC Guide "Quantifying Uncertainty in Analytical Measurement" (Second Edition).

Recoveries for individual laboratory results and overall mean values were calculated from these target concentrations. The results were tested for outliers using the Hampel outlier test (level of significance 99 %). A minimum number of four results was required for the outlier test.

The target concentration of MCPA in sample HB87A and Dichlorprop in sample HB87B, which were not added to the sample, were set to $< 0.05 \mu\text{g/L}$ MCPA and $< 0.05 \mu\text{g/L}$ Dichlorprop, which meets the minimum quantifiable values defined by the Austrian ground and river water monitoring program and the quantification limits of the analytical methods applied in the IFA.

Standard deviations and coefficients of variation (CVs) were only calculated when at least three results were available. The between laboratory CVs covered the range between 3.3 % (Chloridazon in sample HB87B) and 39.0 % (Methyldesphenylchloridazon in sample HB87B).

The recoveries of the target concentrations, calculated from outlier-corrected data mean values ranged between 88.4 % (Bentazone in sample HB87B) and 129.1 % (Dicamba in sample HB87A).

All confidence intervals of the outlier-corrected laboratory mean values encompass the corresponding target values with their uncertainties. Thus statistically, no difference could be detected between theoretical target concentrations and outlier corrected laboratory means.

z-Scores

The most common approach is to form the z-score given by

$$z = \frac{x_i - \bar{x}}{\sigma}$$

z z-score
 x_i result of laboratory
 \bar{x} target value or mean value („consensus value“)
 σ standard deviation

Thus, the z-score is the ratio of the estimated bias (difference between result and target value) and a standard deviation. The z-score criteria were determined from relative standard deviations from all interlaboratory comparisons that were organised by the IFA-Tulln in the period from 2002 to 2012. They represent long-term performance data of all former participating laboratories. The z-scores are listed together with the recoveries in the tables of the parameter oriented part.

Additionally, each laboratory obtained for every sample a single sheet that summarises the z-scores of the laboratory in graphical and tabular form.

The following table lists the z-score criteria as relative standard deviation and their limits of applicability. Z-scores were only calculated, if the target values were higher than these limits.

Parameter	z-Score-criteria (%)	Lower limit [µg/L]
Bentazone	20	0.05
2,4-D	19	0.05
Dicamba	25	0.05
Dichlorprop	17	0.05
MCPA	20	0.05
Mecoprop	19	0.05
Chloridazon	16	0.05
Desphenylchloridazon	15	0.05
Methyl-desphenylchloridazon	12	0.05

Normally, a classification based on z-scores is made this way:

z-Score	Classification
<2	satisfactory
2< z <3	questionable
>3	unsatisfactory

Please note that this evaluation is made on the background of the average performance of all participants of the IFA-Test-Systems proficiency testing scheme during the period from 2002 to 2012.

Illustration of results

An explanation to the illustration of the results is given on the following page. Graphical and tabular illustration of results can be divided into a parameter oriented and a laboratory-oriented part.

The **laboratory-oriented part** contains the measurement results and reported uncertainties of each individual laboratory for all parameters together with the achieved recoveries in graphical and tabular form. This part of the report also lists tables with the results originally reported by the laboratories.

In the **parameter-oriented part** the reported results and corresponding uncertainties are illustrated together with recoveries of the target values for each parameter and all laboratories. This information is presented in graphical and tabular form. Results which were identified as outliers by the Hampel test are marked with an asterisk in the column "out". These values were not considered for calculating statistical parameters (mean values, standard deviations and confidence intervals). Moreover, the parameter oriented part contains the uncertainties of the target value. The reported uncertainty is an expanded uncertainty calculated using a coverage factor (k) of 2 which gives a level of confidence of approximately 95% (as described in the EURACHEM / CITAC Guide "Quantifying Uncertainty in Analytical Measurement" (Second Edition)). The uncertainty interval of the reference concentration is illustrated in the graph as a grey band around the 100% recovery line.

Results for which no recoveries can be calculated, are illustrated by one of the following symbols: **FN** (false negative), **FP** (false positive) or the • - symbol.

- **FN**: A result is false negative when the "< result" reported is lower than the corresponding target value (under consideration of the uncertainty of the target value)
- **FP**: False positive results can be obtained for compounds not added to the samples: a result is termed FP when it is higher than the corresponding method quantification limit of the procedure employed at the IFA-Tulln.
- **•**: all other results for which no recovery rate can be calculated are illustrated by this symbol

Tulln, 10 December 2013

Sample C10B
Parameter Dichloromethane

Target value ± U (k=2) 10,4 µg/l ± 0,5 µg/l **Obtained from mass weighed out, U = uncertainty**

IFA result ± U (k=2) 10,2 µg/l ± 1,0 µg/l **Determined at IFA prior to shipment of samples**

Stability test ± U (k=2) 10,2 µg/l ± 1,0 µg/l **Determined at IFA 5 weeks after sample dispatch**

Lab code	Result	Out	+/-	Unit	Recovery	z-Score
A	11,0		1,28	µg/l	106 %	0,30
B	9,0		1,8	µg/l	87 %	-0,71
C	10		2	µg/l	96 %	-0,20
D				µg/l		
E	13,7		0,40	µg/l	132 %	1,67
F	6,8		0,7	µg/l	65 %	-1,82
G	< 20			µg/l		
H				µg/l		
I	11,0			µg/l	106%	0,30
J	24,1	*	1,51	µg/l	232 %	6,93
K	10,09		1,22	µg/l	97 %	-0,16
L	2,76	*		µg/l	27 %	-3,87
M	6,38		1,87	µg/l	61 %	-2,03
N	< 5		0,5	µg/l	FN	
O	15,6	*	4	µg/l	150 %	2,63
P	10,3		1,0	µg/l	99 %	-0,05
Q	10		1,14	µg/l	96 %	-0,20
R	8,88		0,46	µg/l	85 %	-0,77
S				µg/l		
T	9,03		0,08	µg/l	87 %	-0,69
U	22,5	*	0,5	µg/l	216 %	6,12
V	10,33		0,25	µg/l	99 %	-0,04

Recovery of target value in percent

z-Score of the laboratory

An asterisk indicates a result detected as outlier by Hampel test

Interval expected to encompass target value as stated by participant

	All results	Outliers excl.	Unit
Mean +/- CI (99%)	11,3 ± 3,8	9,7 ± 1,6	µg/l
Recov. +/- CI (99%)	108,3 ± 36,3	93,6 ± 15,1	%
SD between labs	5,3	1,9	µg/l
RSD between labs	47,3	19,1	%
n for calculation	17	13	

Between laboratory standard deviation

Overall laboratory mean and recovery with corresponding confidence intervals (p=99%)

Number of data used for calculation of statistic parameters

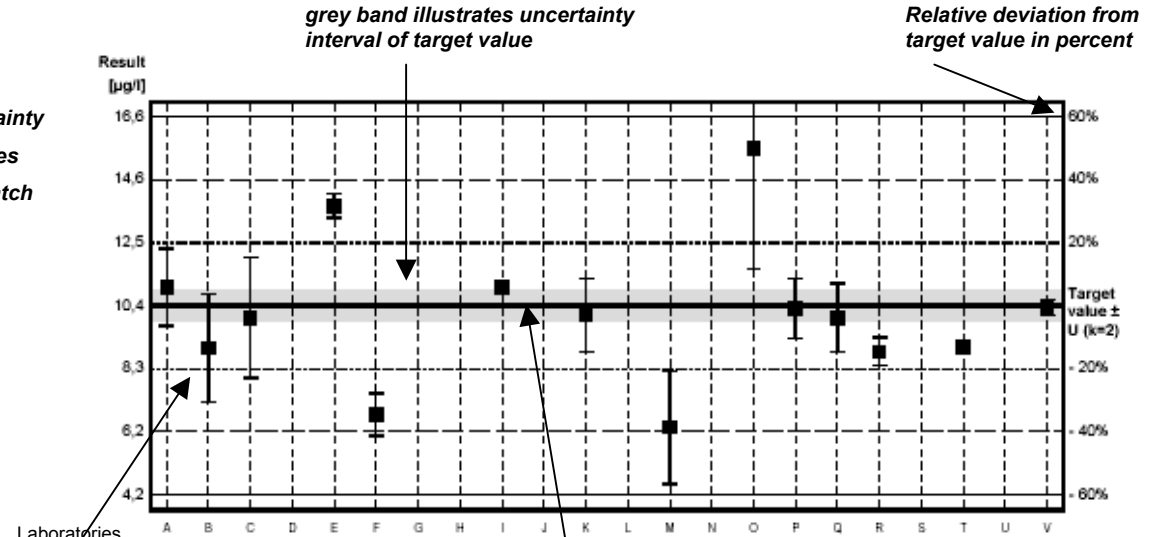
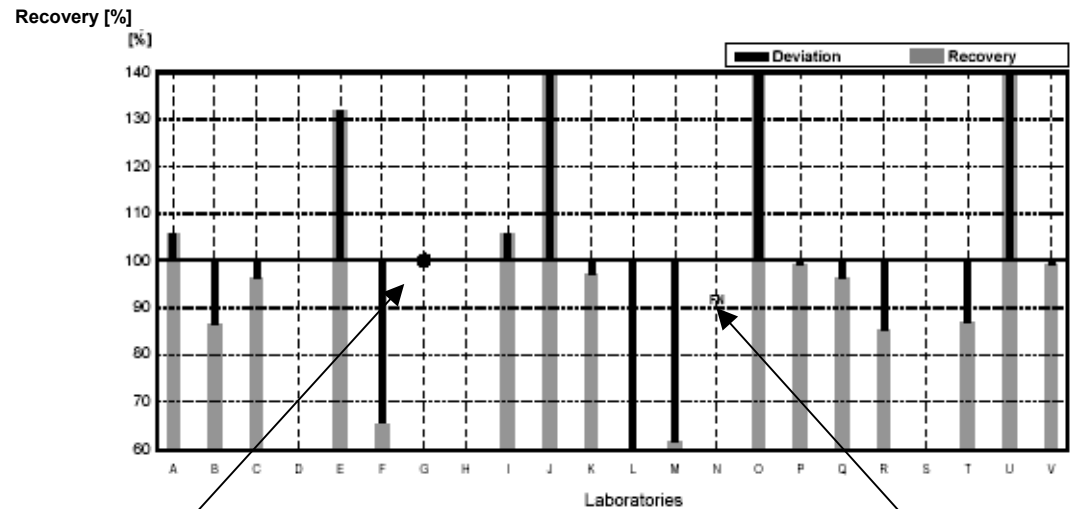


Diagram 1. Measurement results and corresponding uncertainty intervals

Result ± uncertainty as stated by participant

target value obtained from mass weight



Result neither false positive, false negative nor possible to calculate recovery

False negative: reported "<-result" is lower than target value

Diagram 2. Recoveries and deviations from target values

EXPLANATION

Illustration of Results Tables and Parameter Oriented Part

Round HB87
Herbicides

Sample Dispatch:
4 November 2013



Results Sample HB87A

	Bentazone	2,4-D	Dicamba	Dichlorprop	MCPA
Unit	µg/L	µg/L	µg/L	µg/L	µg/L
Target value	0.055	0.203	0.154	0.072	<0.05
IFA result	0.065	0.205	0.161	0.081	<0.01
Stability test	0.062	0.208	0.155	0.075	<0.01
A	0.053	0.166	0.138	0.070	<0.03
B					
C					
D					
E	0.051	0.216	0.167	0.076	<0.020
F	0.058	0.314	0.265	0.115	<0.025
G					
H					
I	0.049	0.404		0.125	<0.01
J	0.06	0.246	0.240	0.09	<0.05
K	0.24	0.25	0.28	0.10	<0.05
L	0.063	0.213		0.077	<0.010
M	0.051	0.219		0.078	<0.01
N	0.048	0.188	0.103	0.071	<0.02

Uncertainties Sample HB87A

	Bentazone	2,4-D	Dicamba	Dichlorprop	MCPA
	±	±	±	±	±
Unit	µg/L	µg/L	µg/L	µg/L	µg/L
Target value	0.003	0.010	0.008	0.004	
IFA result	0.007	0.020	0.016	0.008	
Stability test	0.006	0.021	0.016	0.008	
A	0.008	0.025	0.021	0.011	
B					
C					
D					
E	0.010	0.043	0.033	0.015	
F	0.006	0.027	0.165	0.009	
G					
H					
I	0.01	0.08		0.025	
J	0.02	0.06	0.06	0.02	0.02
K	0.02	0.02	0.03	0.02	
L					
M	0.002	0.022		0.006	
N	0.005	0.18	0.01	0.007	

Results Sample HB87A

	Mecoprop	Chloridazon	Desphenyl chloridazon	Methyl desphenyl chloridazon
Unit	µg/L	µg/L	µg/L	µg/L
Target value	0.064	0.098	0.192	0.230
IFA result	0.069	0.116	0.205	0.247
Stability test	0.068	0.086	0.168	0.215
A	0.064	0.107	0.173	0.228
B		0.106	0.190	0.286
C				
D				
E	0.069			
F	0.104	0.273	n.a.	n.a.
G	0.076			
H				
I	0.093	0.103	0.184	0.258
J	0.09			
K	0.06			
L	0.034	0.102		0.096
M	0.063	0.095	0.167	0.289
N	0.063			

Uncertainties Sample HB87A

	Mecoprop ±	Chloridazon ±	Desphenyl chloridazon ±	Methyl desphenyl chloridazon ±
Unit	µg/L	µg/L	µg/L	µg/L
Target value	0.003	0.005	0.010	0.012
IFA result	0.007	0.023	0.041	0.049
Stability test	0.007	0.017	0.034	0.043
A	0.010	0.016	0.026	0.034
B		0.02	0.06	0.06
C				
D				
E	0.013			
F	0.013	0.051		
G	0.020			
H				
I	0.018	0.021	0.037	0.052
J	0.02			
K	0.02			
L				
M	0.005	0.008	0.011	0.030
N	0.006			

Results Sample HB87B

	Bentazone	2,4-D	Dicamba	Dichlorprop	MCPA
Unit	µg/L	µg/L	µg/L	µg/L	µg/L
Target value	0.300	0.250	0.280	<0.05	0.298
IFA result	0.267	0.240	0.265	<0.01	0.275
Stability test	0.282	0.270	0.285	<0.01	0.342
A	0.293	0.209	0.250	<0.03	0.245
B					
C					
D					
E	0.263	0.269	0.308	<0.020	0.301
F	0.278	0.369	0.365	<0.025	0.318
G					
H					
I	0.235	0.543		<0.01	0.696
J	0.263	0.272	0.294	<0.05	0.373
K	0.40	0.30	0.40	<0.05	0.36
L	0.243	0.216		<0.020	0.261
M	0.276	0.254		<0.01	0.295
N	0.271	0.229	0.252	<0.02	0.273

Uncertainties Sample HB87B

	Bentazone	2,4-D	Dicamba	Dichlorprop	MCPA
	±	±	±	±	±
Unit	µg/L	µg/L	µg/L	µg/L	µg/L
Target value	0.015	0.013	0.014		0.015
IFA result	0.027	0.024	0.027		0.028
Stability test	0.028	0.027	0.028		0.034
A	0.044	0.031	0.038		0.037
B					
C					
D					
E	0.053	0.054	0.062		0.060
F	0.010	0.050	0.144		0.057
G					
H					
I	0.047	0.109			0.139
J	0.07	0.07	0.07	0.02	0.09
K	0.05	0.02	0.05		0.02
L					
M	0.011	0.026			0.025
N	0.027	0.023	0.0252		0.027

Results Sample HB87B

	Mecoprop	Chloridazon	Desphenyl chloridazon	Methyl desphenyl chloridazon
Unit	µg/L	µg/L	µg/L	µg/L
Target value	0.114	0.353	0.456	0.184
IFA result	0.108	0.367	0.528	0.190
Stability test	0.116	0.340	0.483	0.189
A	0.114	0.348	0.431	0.178
B		0.370	0.480	0.245
C				
D				
E	0.123			
F	0.168	1.01	n.a.	n.a.
G	0.135			
H				
I	0.141	0.352	0.470	0.213
J	0.138			
K	0.10			
L	0.275	0.260		0.063
M	0.110	0.343	0.433	0.221
N	0.118			

Uncertainties Sample HB87B

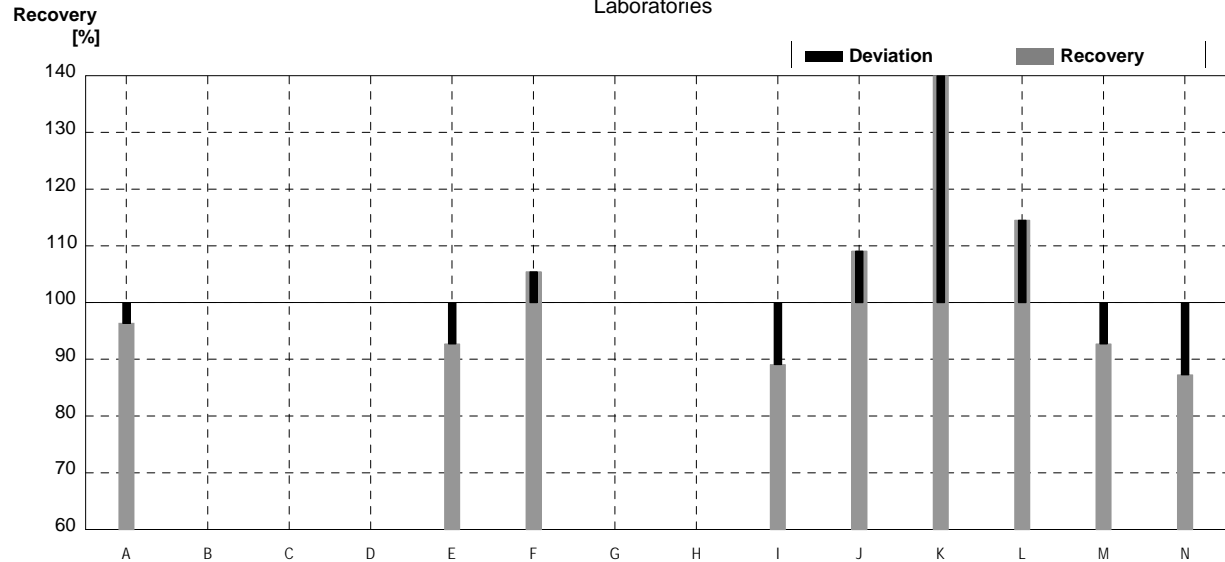
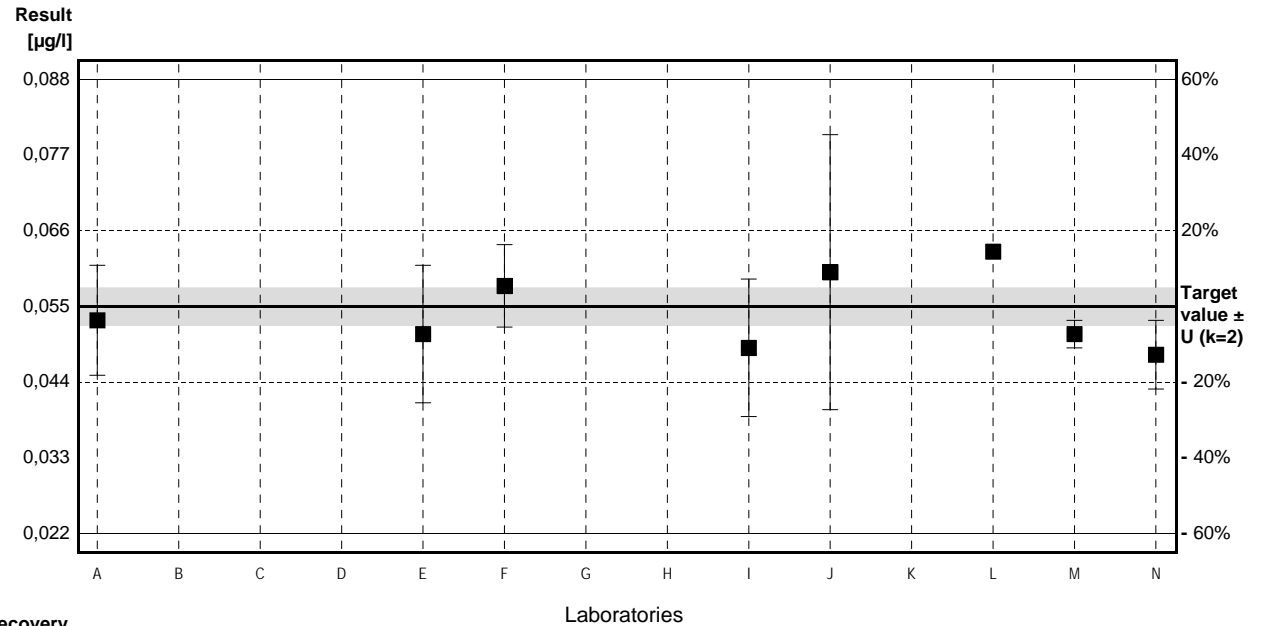
	Mecoprop ±	Chloridazon ±	Desphenyl chloridazon ±	Methyl desphenyl chloridazon ±
Unit	µg/L	µg/L	µg/L	µg/L
Target value	0.006	0.018	0.023	0.009
IFA result	0.011	0.073	0.106	0.038
Stability test	0.012	0.068	0.097	0.038
A	0.017	0.052	0.065	0.027
B		0.07	0.14	0.05
C				
D				
E	0.025			
F	0.003	0.116		
G	0.035			
H				
I	0.028	0.070	0.094	0.043
J	0.03			
K	0.02			
L				
M	0.009	0.056	0.042	0.023
N	0.012			

Sample HB87A

Parameter Bentazone

Target value $\pm U$ (k=2) 0,055 $\mu\text{g/l}$ \pm 0,003 $\mu\text{g/l}$
 IFA result $\pm U$ (k=2) 0,065 $\mu\text{g/l}$ \pm 0,007 $\mu\text{g/l}$
 Stability test $\pm U$ (k=2) 0,062 $\mu\text{g/l}$ \pm 0,006 $\mu\text{g/l}$

Lab Code	Result	\pm	Unit	Recovery	z-Score
A	0,053	0,008	$\mu\text{g/l}$	96%	-0,18
B			$\mu\text{g/l}$		
C			$\mu\text{g/l}$		
D			$\mu\text{g/l}$		
E	0,051	0,010	$\mu\text{g/l}$	93%	-0,36
F	0,058	0,006	$\mu\text{g/l}$	105%	0,27
G			$\mu\text{g/l}$		
H			$\mu\text{g/l}$		
I	0,049	0,01	$\mu\text{g/l}$	89%	-0,55
J	0,06	0,02	$\mu\text{g/l}$	109%	0,45
K	0,24 *	0,02	$\mu\text{g/l}$	436%	16,82
L	0,063		$\mu\text{g/l}$	115%	0,73
M	0,051	0,002	$\mu\text{g/l}$	93%	-0,36
N	0,048	0,005	$\mu\text{g/l}$	87%	-0,64



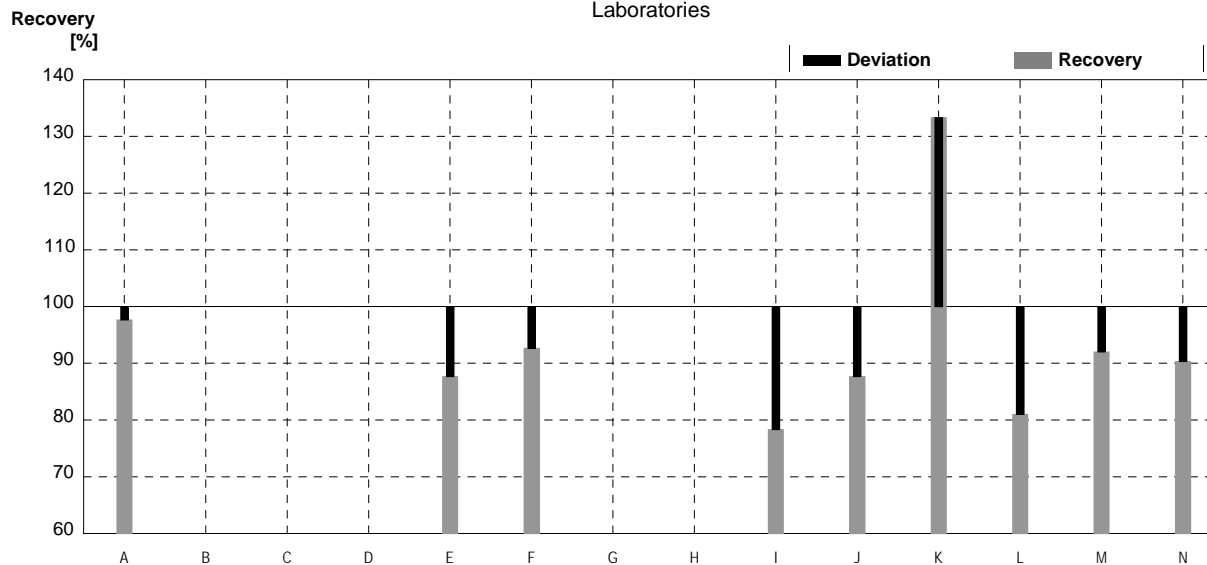
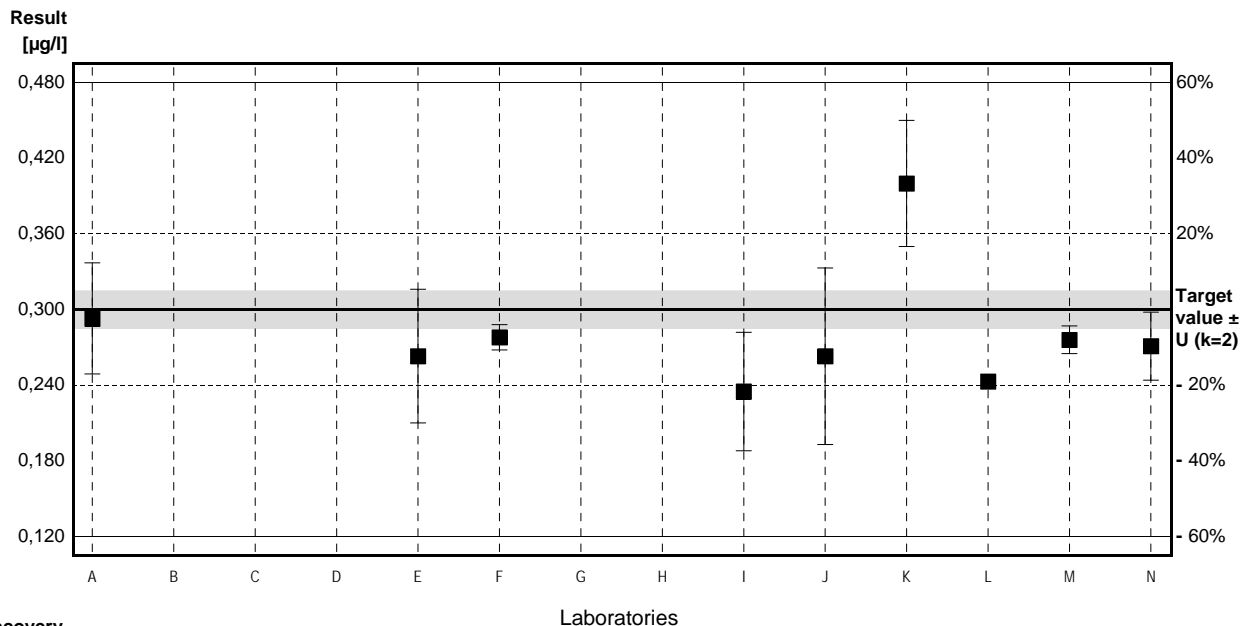
	All results	Outliers excl.	Unit
Mean \pm CI(99%)	0,075 \pm 0,070	0,054 \pm 0,007	$\mu\text{g/l}$
Recov. \pm CI(99%)	136,0 \pm 126,6	98,4 \pm 12,4	%
SD between labs	0,062	0,006	$\mu\text{g/l}$
RSD between labs	83,1	10,2	%
n for calculation	9	8	

Sample HB87B

Parameter Bentazone

Target value $\pm U$ (k=2) 0,300 $\mu\text{g/l}$ \pm 0,015 $\mu\text{g/l}$
 IFA result $\pm U$ (k=2) 0,267 $\mu\text{g/l}$ \pm 0,027 $\mu\text{g/l}$
 Stability test $\pm U$ (k=2) 0,282 $\mu\text{g/l}$ \pm 0,028 $\mu\text{g/l}$

Lab Code	Result	\pm	Unit	Recovery	z-Score
A	0,293	0,044	$\mu\text{g/l}$	98%	-0,12
B			$\mu\text{g/l}$		
C			$\mu\text{g/l}$		
D			$\mu\text{g/l}$		
E	0,263	0,053	$\mu\text{g/l}$	88%	-0,62
F	0,278	0,010	$\mu\text{g/l}$	93%	-0,37
G			$\mu\text{g/l}$		
H			$\mu\text{g/l}$		
I	0,235	0,047	$\mu\text{g/l}$	78%	-1,08
J	0,263	0,07	$\mu\text{g/l}$	88%	-0,62
K	0,40 *	0,05	$\mu\text{g/l}$	133%	1,67
L	0,243		$\mu\text{g/l}$	81%	-0,95
M	0,276	0,011	$\mu\text{g/l}$	92%	-0,40
N	0,271	0,027	$\mu\text{g/l}$	90%	-0,48



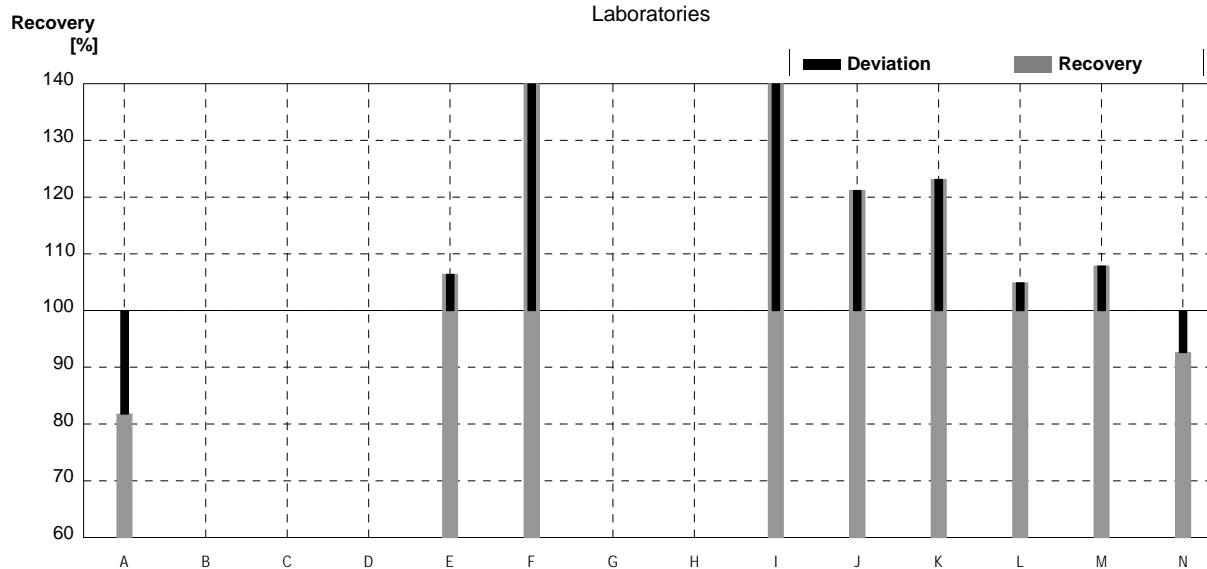
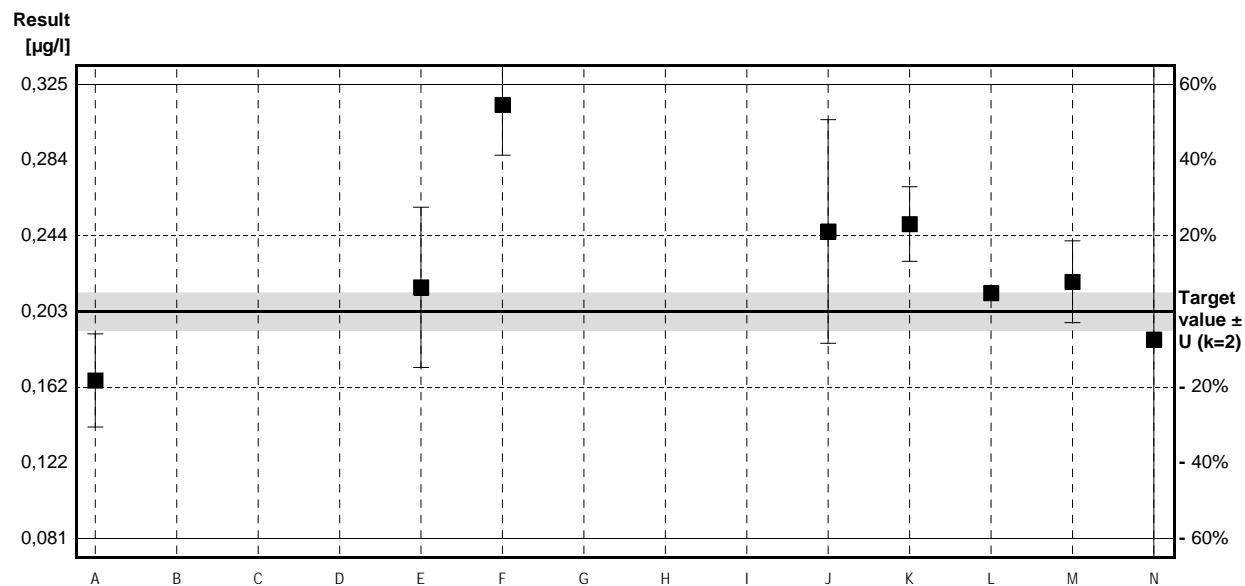
	All results	Outliers excl.	Unit
Mean \pm CI(99%)	0,280 \pm 0,054	0,265 \pm 0,023	$\mu\text{g/l}$
Recov. \pm CI(99%)	93,4 \pm 18,0	88,4 \pm 7,8	%
SD between labs	0,048	0,019	$\mu\text{g/l}$
RSD between labs	17,2	7,1	%
n for calculation	9	8	

Sample HB87A

Parameter 2,4-D

Target value $\pm U$ (k=2) 0,203 $\mu\text{g/l}$ \pm 0,010 $\mu\text{g/l}$
 IFA result $\pm U$ (k=2) 0,205 $\mu\text{g/l}$ \pm 0,021 $\mu\text{g/l}$
 Stability test $\pm U$ (k=2) 0,208 $\mu\text{g/l}$ \pm 0,021 $\mu\text{g/l}$

Lab Code	Result	\pm	Unit	Recovery	z-Score
A	0,166	0,025	$\mu\text{g/l}$	82%	-0,96
B			$\mu\text{g/l}$		
C			$\mu\text{g/l}$		
D			$\mu\text{g/l}$		
E	0,216	0,043	$\mu\text{g/l}$	106%	0,34
F	0,314	0,027	$\mu\text{g/l}$	155%	2,88
G			$\mu\text{g/l}$		
H			$\mu\text{g/l}$		
I	0,404 *	0,08	$\mu\text{g/l}$	199%	5,21
J	0,246	0,06	$\mu\text{g/l}$	121%	1,11
K	0,25	0,02	$\mu\text{g/l}$	123%	1,22
L	0,213		$\mu\text{g/l}$	105%	0,26
M	0,219	0,022	$\mu\text{g/l}$	108%	0,41
N	0,188	0,18	$\mu\text{g/l}$	93%	-0,39



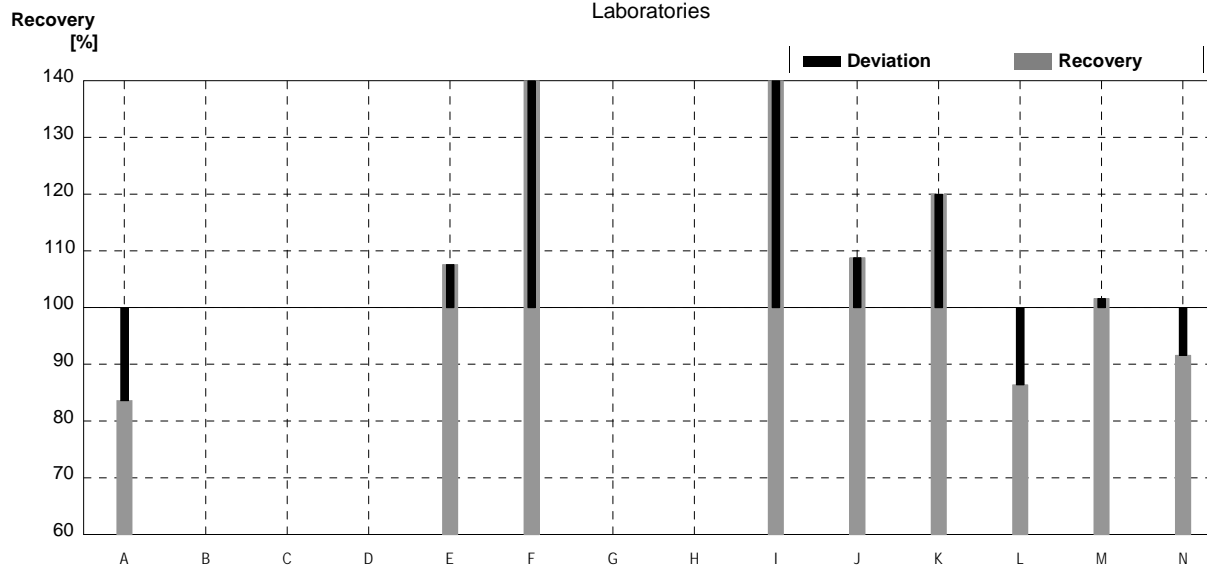
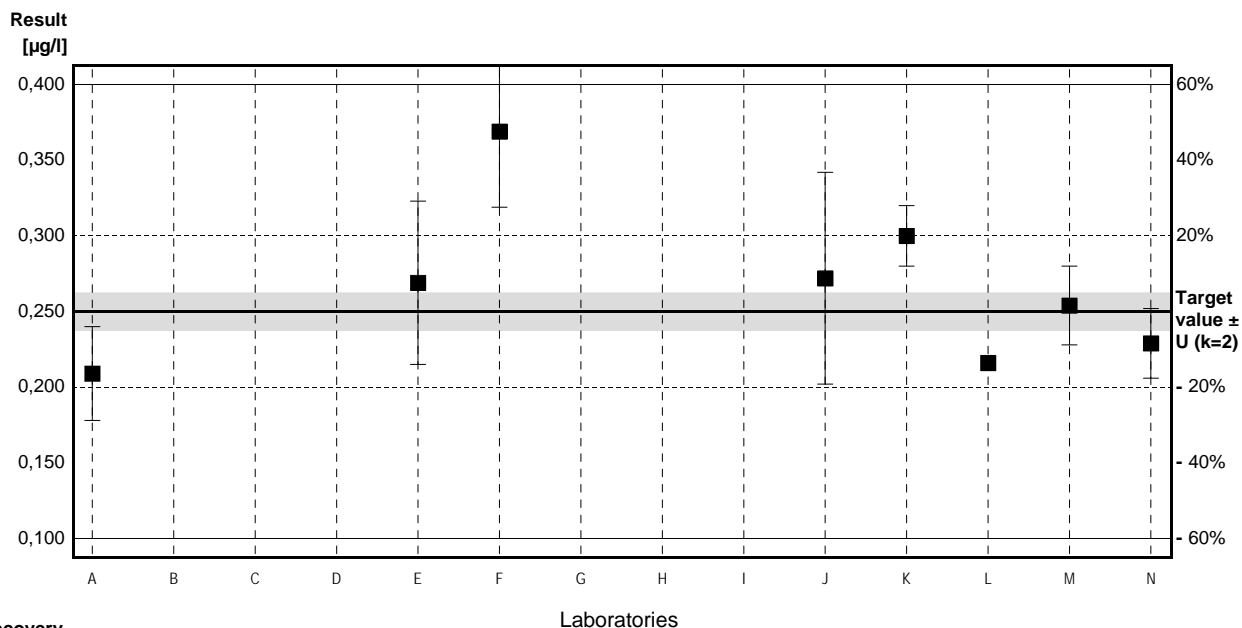
	All results	Outliers excl.	Unit
Mean \pm CI(99%)	0,246 \pm 0,081	0,227 \pm 0,055	$\mu\text{g/l}$
Recov. \pm CI(99%)	121,3 \pm 40,0	111,6 \pm 27,3	%
SD between labs	0,073	0,045	$\mu\text{g/l}$
RSD between labs	29,5	19,8	%
n for calculation	9	8	

Sample HB87B

Parameter 2,4-D

Target value $\pm U$ (k=2) 0,250 $\mu\text{g/l}$ \pm 0,013 $\mu\text{g/l}$
 IFA result $\pm U$ (k=2) 0,240 $\mu\text{g/l}$ \pm 0,024 $\mu\text{g/l}$
 Stability test $\pm U$ (k=2) 0,270 $\mu\text{g/l}$ \pm 0,027 $\mu\text{g/l}$

Lab Code	Result	\pm	Unit	Recovery	z-Score
A	0,209	0,031	$\mu\text{g/l}$	84%	-0,86
B			$\mu\text{g/l}$		
C			$\mu\text{g/l}$		
D			$\mu\text{g/l}$		
E	0,269	0,054	$\mu\text{g/l}$	108%	0,40
F	0,369	0,050	$\mu\text{g/l}$	148%	2,51
G			$\mu\text{g/l}$		
H			$\mu\text{g/l}$		
I	0,543 *	0,109	$\mu\text{g/l}$	217%	6,17
J	0,272	0,07	$\mu\text{g/l}$	109%	0,46
K	0,30	0,02	$\mu\text{g/l}$	120%	1,05
L	0,216		$\mu\text{g/l}$	86%	-0,72
M	0,254	0,026	$\mu\text{g/l}$	102%	0,08
N	0,229	0,023	$\mu\text{g/l}$	92%	-0,44



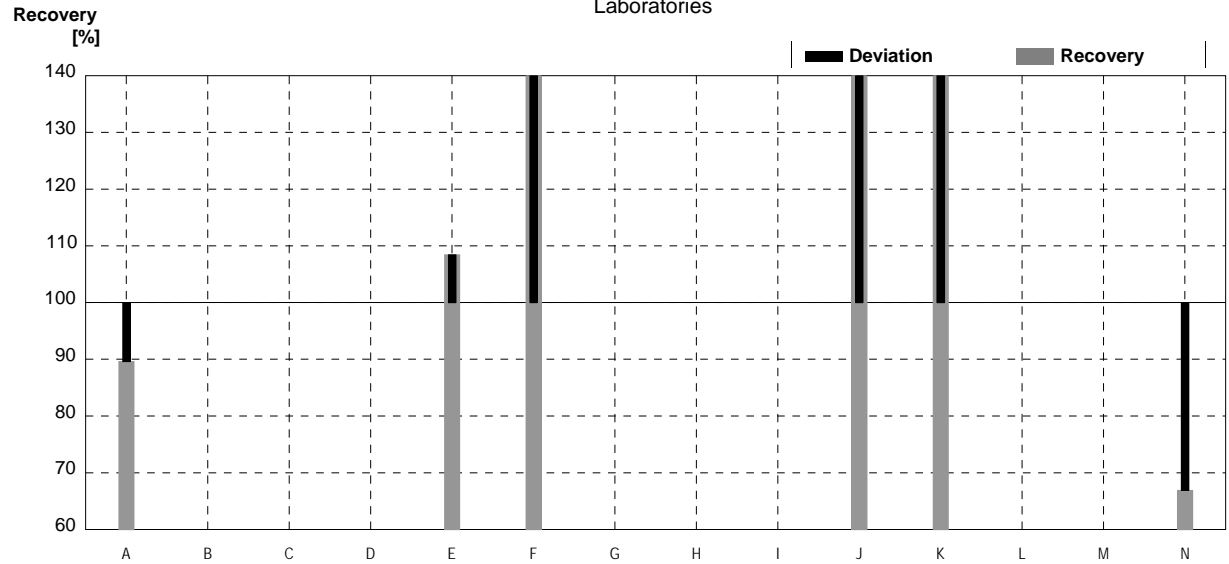
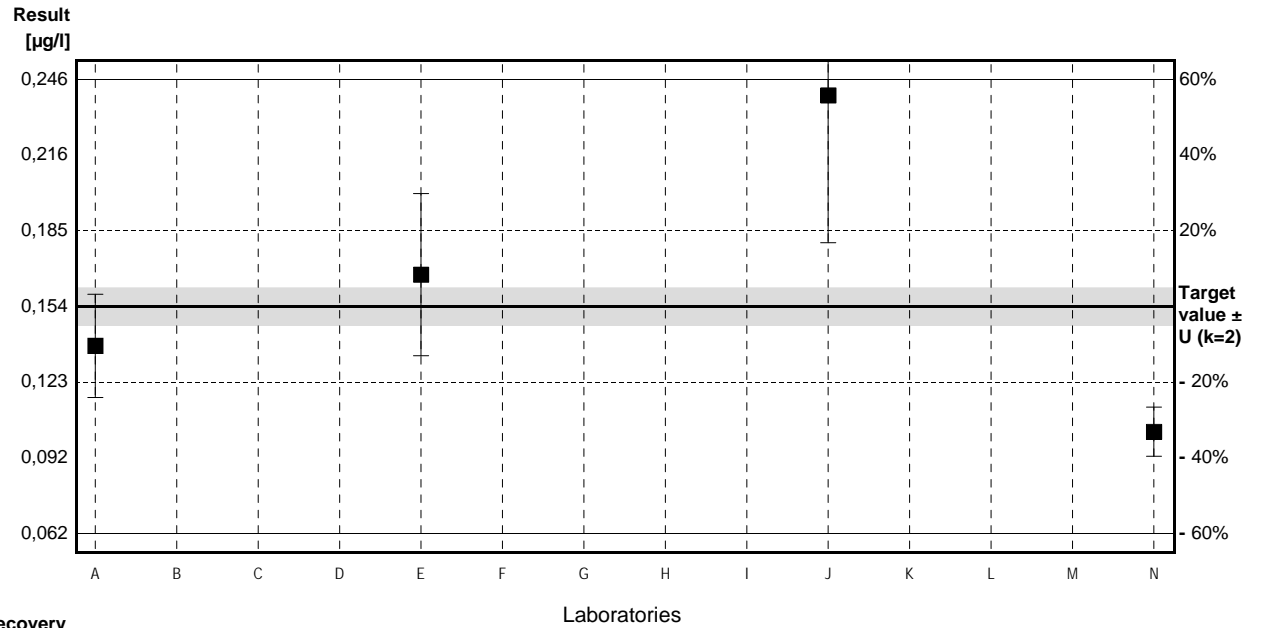
	All results	Outliers excl.	Unit
Mean \pm CI(99%)	0,296 \pm 0,117	0,265 \pm 0,065	$\mu\text{g/l}$
Recov. \pm CI(99%)	118,3 \pm 47,0	105,9 \pm 25,8	%
SD between labs	0,105	0,052	$\mu\text{g/l}$
RSD between labs	35,4	19,7	%
n for calculation	9	8	

Sample HB87A

Parameter Dicamba

Target value $\pm U$ (k=2) 0,154 $\mu\text{g/l}$ \pm 0,008 $\mu\text{g/l}$
 IFA result $\pm U$ (k=2) 0,161 $\mu\text{g/l}$ \pm 0,016 $\mu\text{g/l}$
 Stability test $\pm U$ (k=2) 0,155 $\mu\text{g/l}$ \pm 0,016 $\mu\text{g/l}$

Lab Code	Result	\pm	Unit	Recovery	z-Score
A	0,138	0,021	$\mu\text{g/l}$	90%	-0,42
B			$\mu\text{g/l}$		
C			$\mu\text{g/l}$		
D			$\mu\text{g/l}$		
E	0,167	0,033	$\mu\text{g/l}$	108%	0,34
F	0,265	0,165	$\mu\text{g/l}$	172%	2,88
G			$\mu\text{g/l}$		
H			$\mu\text{g/l}$		
I			$\mu\text{g/l}$		
J	0,240	0,06	$\mu\text{g/l}$	156%	2,23
K	0,28	0,03	$\mu\text{g/l}$	182%	3,27
L			$\mu\text{g/l}$		
M			$\mu\text{g/l}$		
N	0,103	0,01	$\mu\text{g/l}$	67%	-1,32



	All results	Outliers excl.	Unit
Mean \pm CI(99%)	0,199 \pm 0,120	0,199 \pm 0,120	$\mu\text{g/l}$
Recov. \pm CI(99%)	129,1 \pm 77,9	129,1 \pm 77,9	%
SD between labs	0,073	0,073	$\mu\text{g/l}$
RSD between labs	36,7	36,7	%
n for calculation	6	6	

Sample HB87B

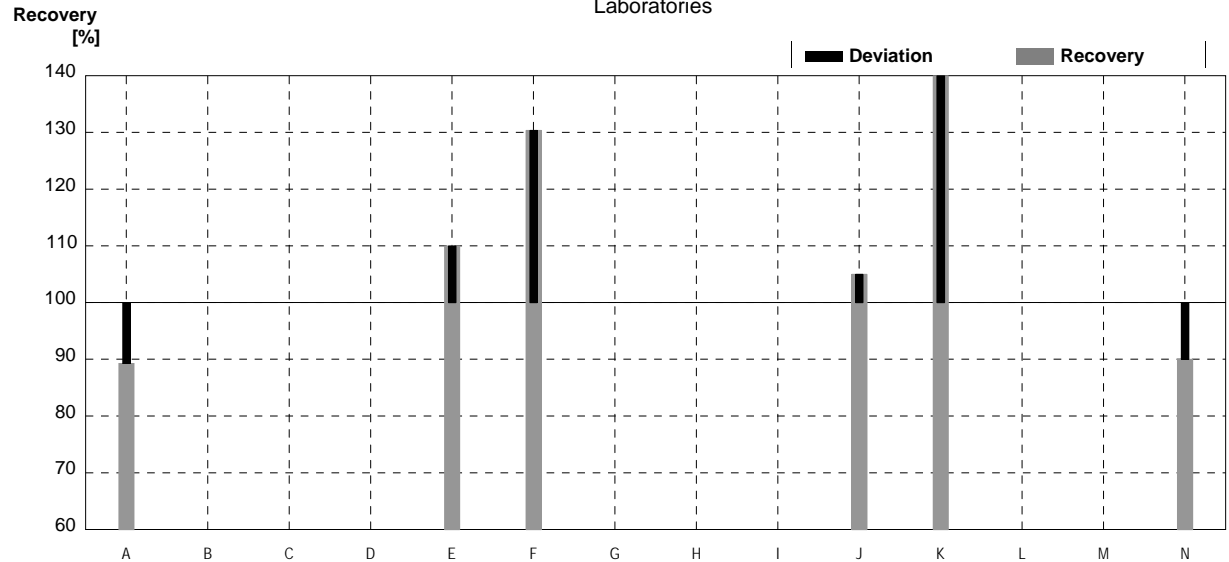
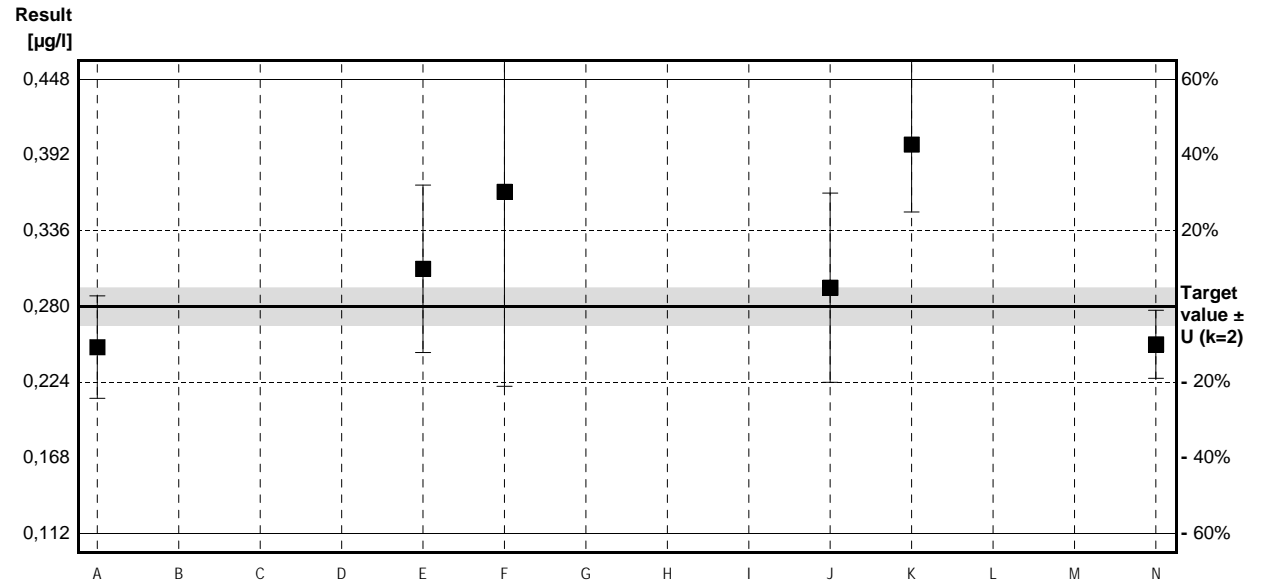
Parameter Dicamba

Target value $\pm U$ (k=2) 0,280 $\mu\text{g/l}$ \pm 0,014 $\mu\text{g/l}$

IFA result $\pm U$ (k=2) 0,265 $\mu\text{g/l}$ \pm 0,027 $\mu\text{g/l}$

Stability test $\pm U$ (k=2) 0,285 $\mu\text{g/l}$ \pm 0,029 $\mu\text{g/l}$

Lab Code	Result	\pm	Unit	Recovery	z-Score
A	0,250	0,038	$\mu\text{g/l}$	89%	-0,43
B			$\mu\text{g/l}$		
C			$\mu\text{g/l}$		
D			$\mu\text{g/l}$		
E	0,308	0,062	$\mu\text{g/l}$	110%	0,40
F	0,365	0,144	$\mu\text{g/l}$	130%	1,21
G			$\mu\text{g/l}$		
H			$\mu\text{g/l}$		
I			$\mu\text{g/l}$		
J	0,294	0,07	$\mu\text{g/l}$	105%	0,20
K	0,40	0,05	$\mu\text{g/l}$	143%	1,71
L			$\mu\text{g/l}$		
M			$\mu\text{g/l}$		
N	0,252	0,0252	$\mu\text{g/l}$	90%	-0,40



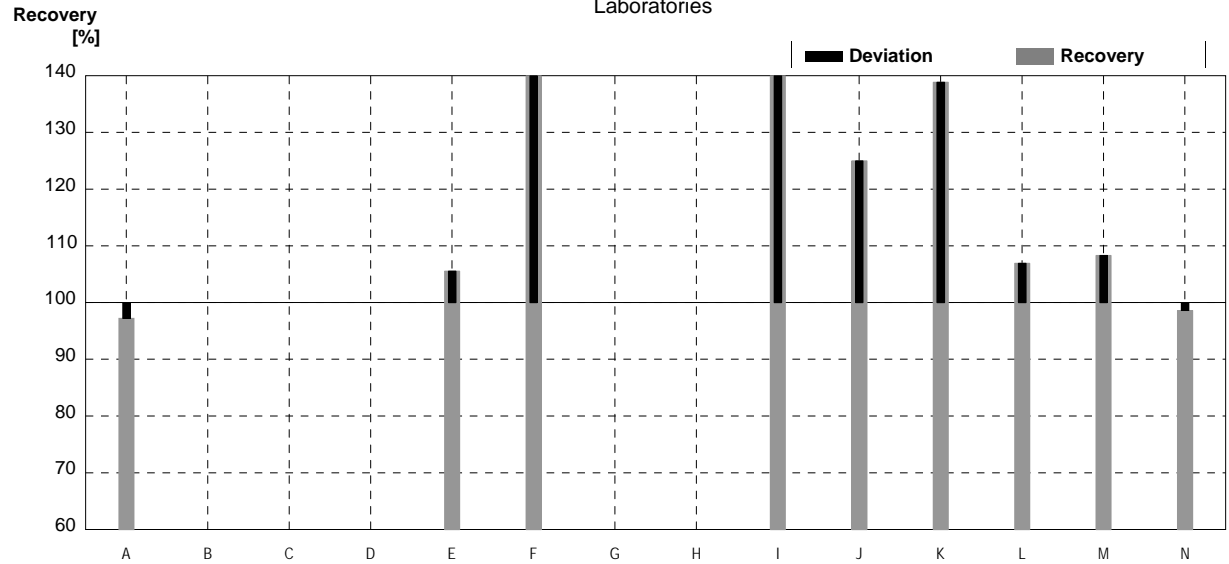
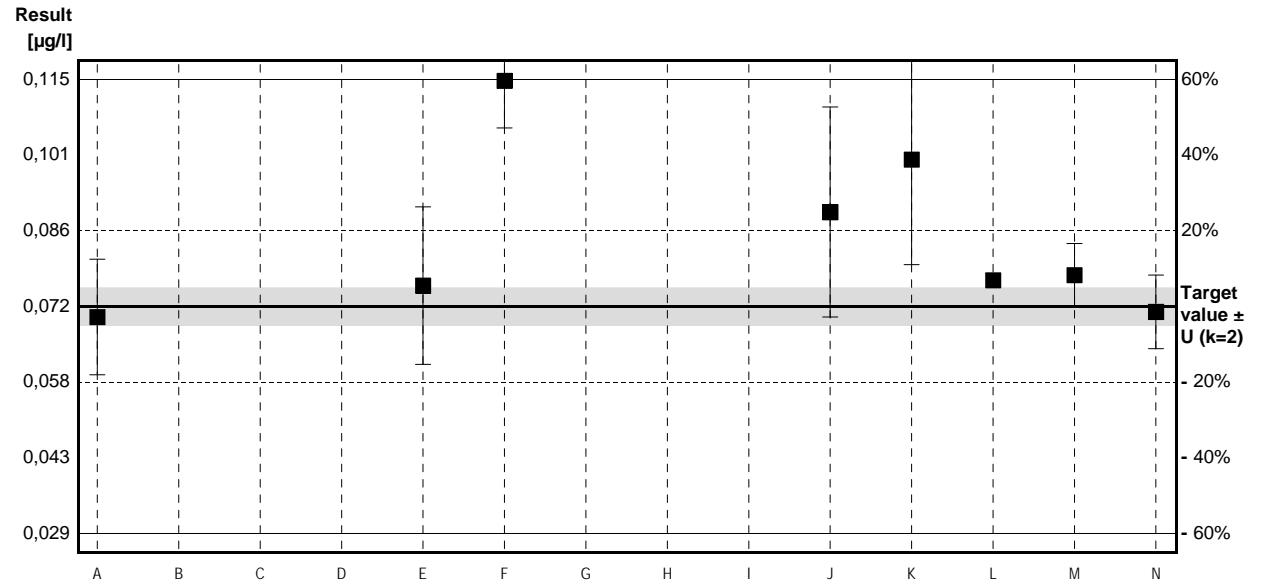
	All results	Outliers excl.	Unit
Mean \pm CI(99%)	0,312 \pm 0,100	0,312 \pm 0,100	$\mu\text{g/l}$
Recov. \pm CI(99%)	111,3 \pm 35,6	111,3 \pm 35,6	%
SD between labs	0,061	0,061	$\mu\text{g/l}$
RSD between labs	19,4	19,4	%
n for calculation	6	6	

Sample HB87A

Parameter Dichlorprop

Target value $\pm U$ (k=2) 0,072 $\mu\text{g/l}$ \pm 0,004 $\mu\text{g/l}$
 IFA result $\pm U$ (k=2) 0,081 $\mu\text{g/l}$ \pm 0,008 $\mu\text{g/l}$
 Stability test $\pm U$ (k=2) 0,075 $\mu\text{g/l}$ \pm 0,008 $\mu\text{g/l}$

Lab Code	Result	\pm	Unit	Recovery	z-Score
A	0,070	0,011	$\mu\text{g/l}$	97%	-0,16
B			$\mu\text{g/l}$		
C			$\mu\text{g/l}$		
D			$\mu\text{g/l}$		
E	0,076	0,015	$\mu\text{g/l}$	106%	0,33
F	0,115	0,009	$\mu\text{g/l}$	160%	3,51
G			$\mu\text{g/l}$		
H			$\mu\text{g/l}$		
I	0,125 *	0,025	$\mu\text{g/l}$	174%	4,33
J	0,09	0,02	$\mu\text{g/l}$	125%	1,47
K	0,10	0,02	$\mu\text{g/l}$	139%	2,29
L	0,077		$\mu\text{g/l}$	107%	0,41
M	0,078	0,006	$\mu\text{g/l}$	108%	0,49
N	0,071	0,007	$\mu\text{g/l}$	99%	-0,08



	All results	Outliers excl.	Unit
Mean \pm CI(99%)	0,089 \pm 0,022	0,085 \pm 0,020	$\mu\text{g/l}$
Recov. \pm CI(99%)	123,8 \pm 31,2	117,5 \pm 27,3	%
SD between labs	0,020	0,016	$\mu\text{g/l}$
RSD between labs	22,5	18,8	%
n for calculation	9	8	

Sample HB87B

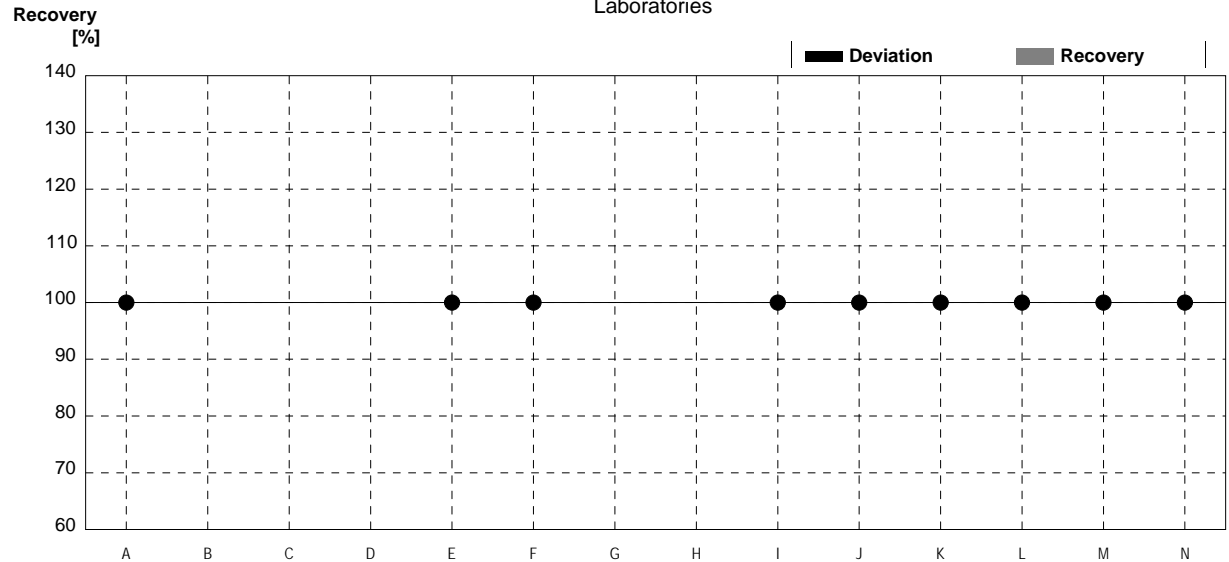
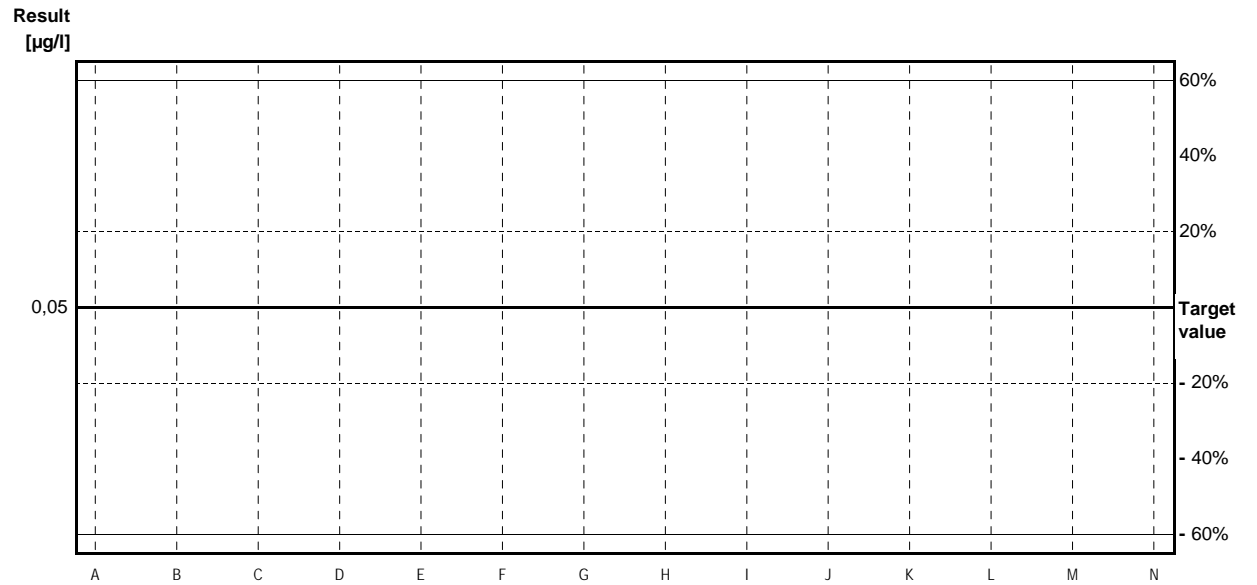
Parameter Dichlorprop

Target value <0,05 µg/l

IFA result <0,01 µg/l

Stability test <0,01 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	<0,03		µg/l	•	
B			µg/l		
C			µg/l		
D			µg/l		
E	<0,020		µg/l	•	
F	<0,025		µg/l	•	
G			µg/l		
H			µg/l		
I	<0,01		µg/l	•	
J	<0,05	0,02	µg/l	•	
K	<0,05		µg/l	•	
L	<0,020		µg/l	•	
M	<0,01		µg/l	•	
N	<0,02		µg/l	•	

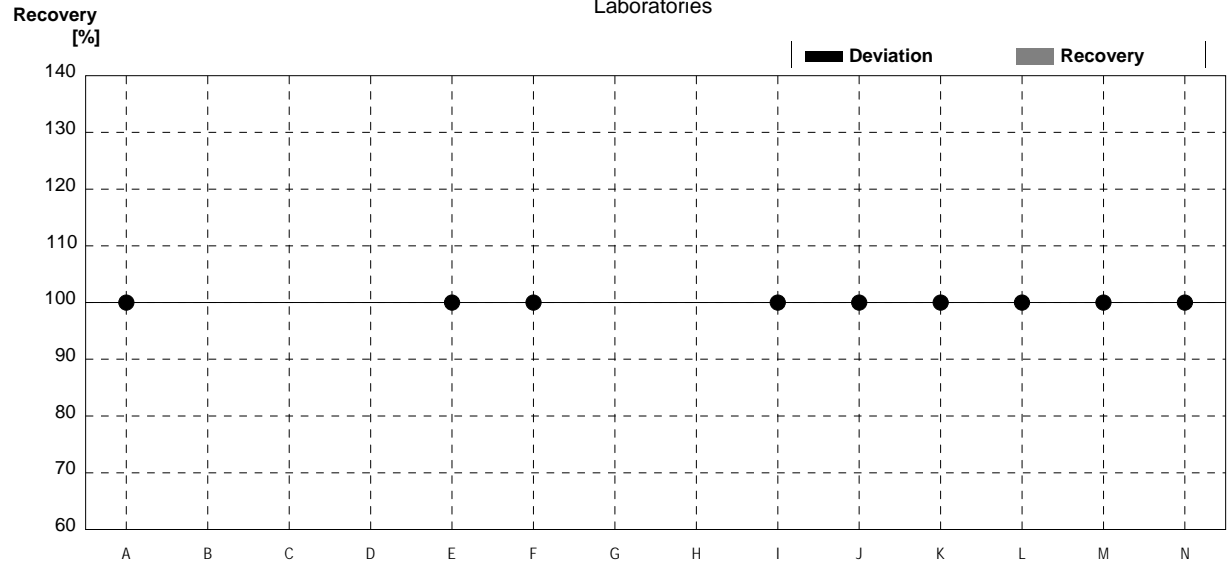
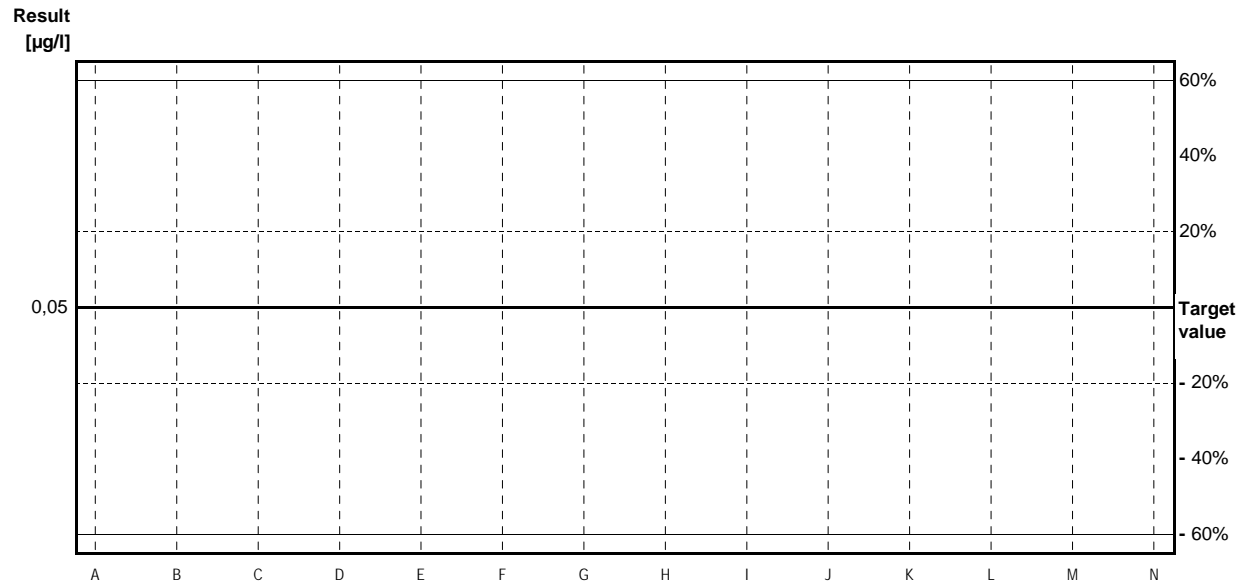


	All results	Outliers excl.	Unit
Mean ± CI(99%)			µg/l
Recov. ± CI(99%)			%
SD between labs			µg/l
RSD between labs			%
n for calculation			

Sample HB87A
Parameter MCPA

Target value <0,05 µg/l
IFA result <0,01 µg/l
Stability test <0,01 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	<0,03		µg/l	•	
B			µg/l		
C			µg/l		
D			µg/l		
E	<0,020		µg/l	•	
F	<0,025		µg/l	•	
G			µg/l		
H			µg/l		
I	<0,01		µg/l	•	
J	<0,05	0,02	µg/l	•	
K	<0,05		µg/l	•	
L	<0,010		µg/l	•	
M	<0,01		µg/l	•	
N	<0,02		µg/l	•	



	All results	Outliers excl.	Unit
Mean ± CI(99%)			µg/l
Recov. ± CI(99%)			%
SD between labs			µg/l
RSD between labs			%
n for calculation			

Sample HB87B

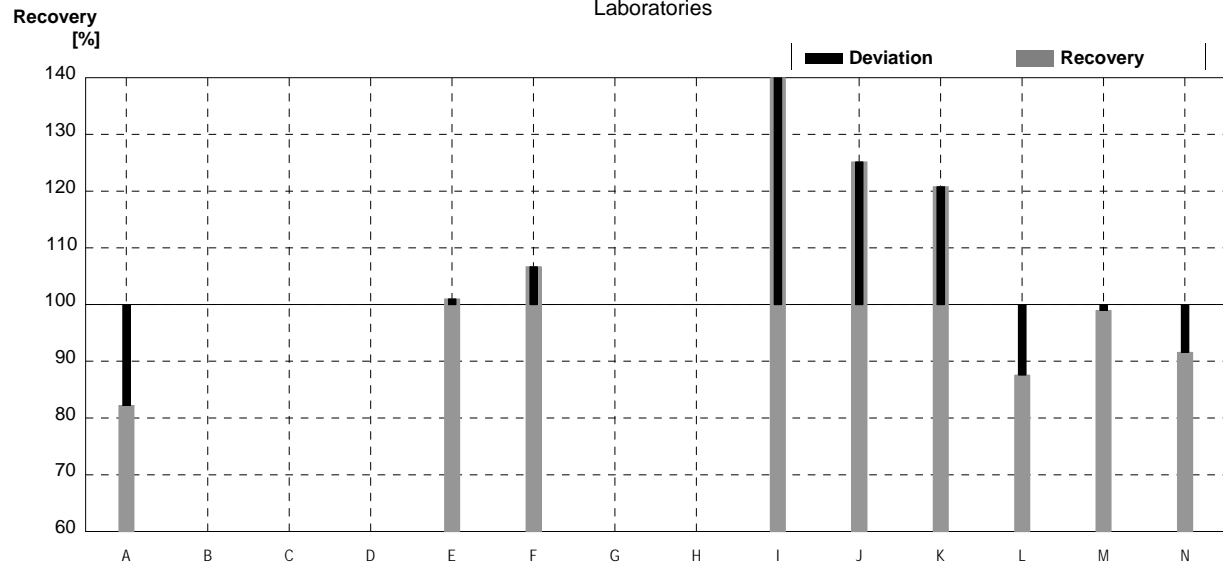
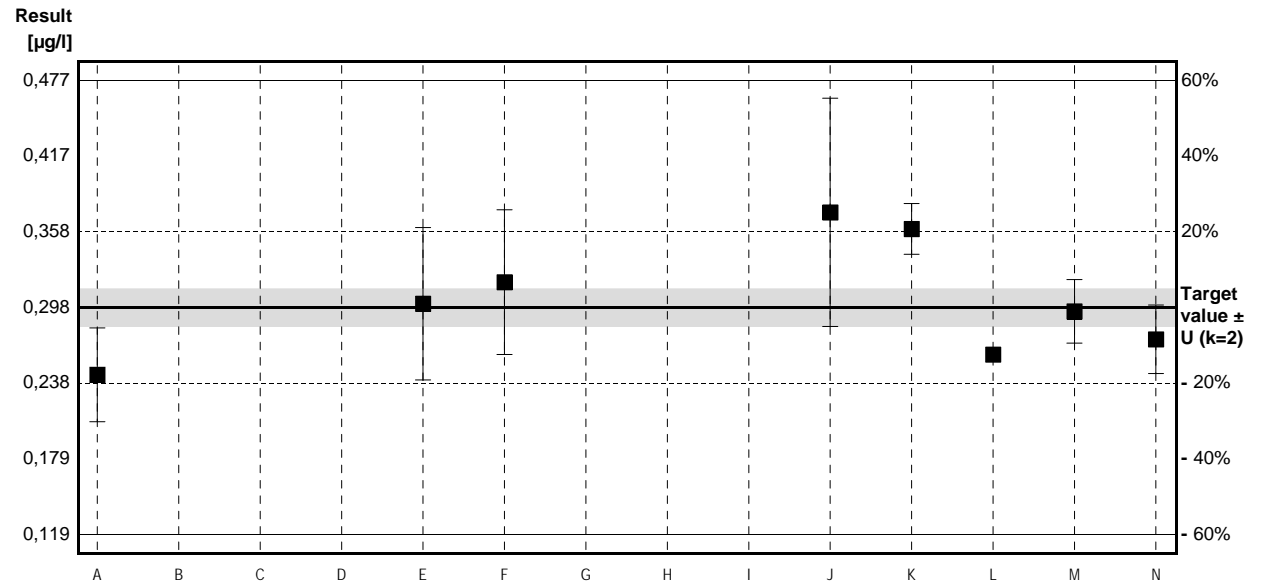
Parameter MCPA

Target value $\pm U$ (k=2) 0,298 $\mu\text{g/l}$ \pm 0,015 $\mu\text{g/l}$

IFA result $\pm U$ (k=2) 0,275 $\mu\text{g/l}$ \pm 0,028 $\mu\text{g/l}$

Stability test $\pm U$ (k=2) 0,342 $\mu\text{g/l}$ \pm 0,034 $\mu\text{g/l}$

Lab Code	Result	\pm	Unit	Recovery	z-Score
A	0,245	0,037	$\mu\text{g/l}$	82%	-0,89
B			$\mu\text{g/l}$		
C			$\mu\text{g/l}$		
D			$\mu\text{g/l}$		
E	0,301	0,060	$\mu\text{g/l}$	101%	0,05
F	0,318	0,057	$\mu\text{g/l}$	107%	0,34
G			$\mu\text{g/l}$		
H			$\mu\text{g/l}$		
I	0,696 *	0,139	$\mu\text{g/l}$	234%	6,68
J	0,373	0,09	$\mu\text{g/l}$	125%	1,26
K	0,36	0,02	$\mu\text{g/l}$	121%	1,04
L	0,261		$\mu\text{g/l}$	88%	-0,62
M	0,295	0,025	$\mu\text{g/l}$	99%	-0,05
N	0,273	0,027	$\mu\text{g/l}$	92%	-0,42



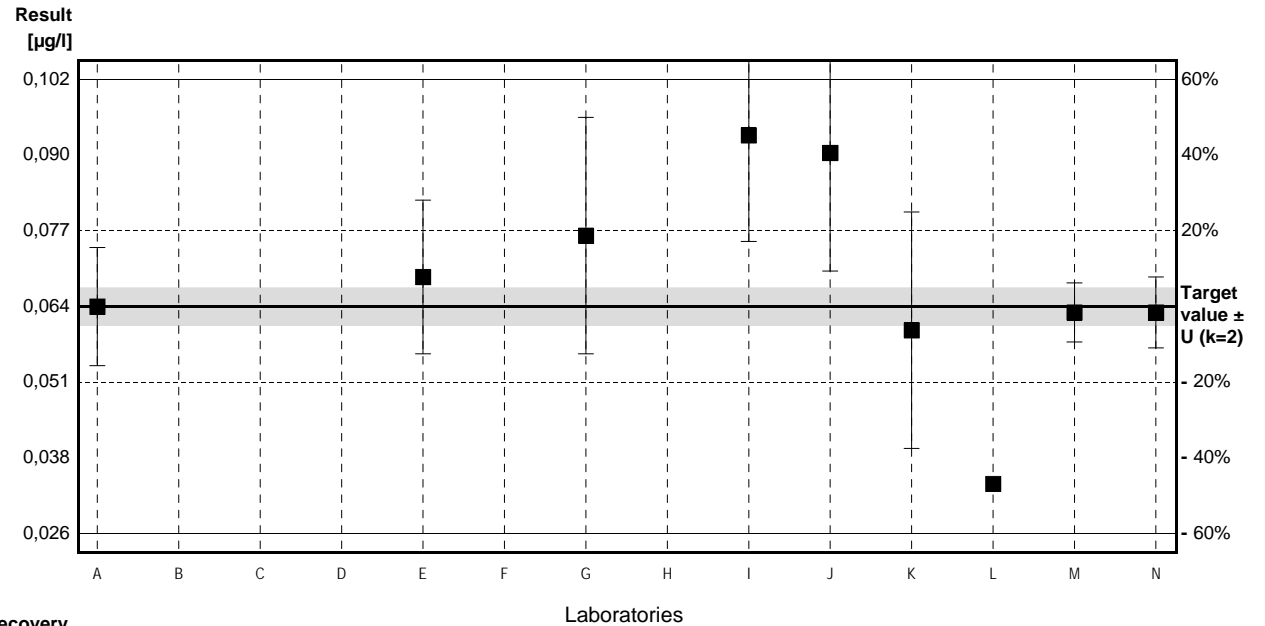
	All results	Outliers excl.	Unit
Mean \pm CI(99%)	0,347 \pm 0,154	0,303 \pm 0,056	$\mu\text{g/l}$
Recov. \pm CI(99%)	116,4 \pm 51,7	101,8 \pm 18,9	%
SD between labs	0,138	0,045	$\mu\text{g/l}$
RSD between labs	39,7	15,0	%
n for calculation	9	8	

Sample HB87A

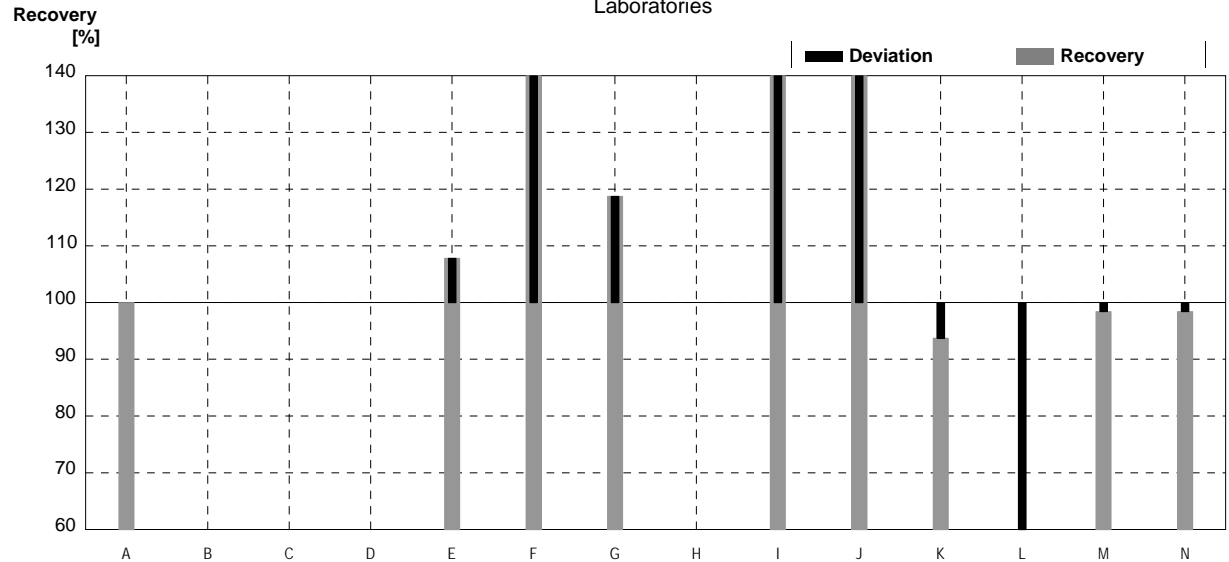
Parameter Mecoprop

Target value $\pm U$ (k=2) 0,064 $\mu\text{g/l}$ \pm 0,003 $\mu\text{g/l}$
 IFA result $\pm U$ (k=2) 0,069 $\mu\text{g/l}$ \pm 0,007 $\mu\text{g/l}$
 Stability test $\pm U$ (k=2) 0,068 $\mu\text{g/l}$ \pm 0,007 $\mu\text{g/l}$

Lab Code	Result	\pm	Unit	Recovery	z-Score
A	0,064	0,010	$\mu\text{g/l}$	100%	0,00
B			$\mu\text{g/l}$		
C			$\mu\text{g/l}$		
D			$\mu\text{g/l}$		
E	0,069	0,013	$\mu\text{g/l}$	108%	0,41
F	0,104	0,013	$\mu\text{g/l}$	163%	3,29
G	0,076	0,020	$\mu\text{g/l}$	119%	0,99
H			$\mu\text{g/l}$		
I	0,093	0,018	$\mu\text{g/l}$	145%	2,38
J	0,09	0,02	$\mu\text{g/l}$	141%	2,14
K	0,06	0,02	$\mu\text{g/l}$	94%	-0,33
L	0,034		$\mu\text{g/l}$	53%	-2,47
M	0,063	0,005	$\mu\text{g/l}$	98%	-0,08
N	0,063	0,006	$\mu\text{g/l}$	98%	-0,08



	All results	Outliers excl.	Unit
Mean \pm CI(99%)	0,072 \pm 0,021	0,072 \pm 0,021	$\mu\text{g/l}$
Recov. \pm CI(99%)	111,9 \pm 32,5	111,9 \pm 32,5	%
SD between labs	0,020	0,020	$\mu\text{g/l}$
RSD between labs	28,0	28,0	%
n for calculation	10	10	



Sample HB87B

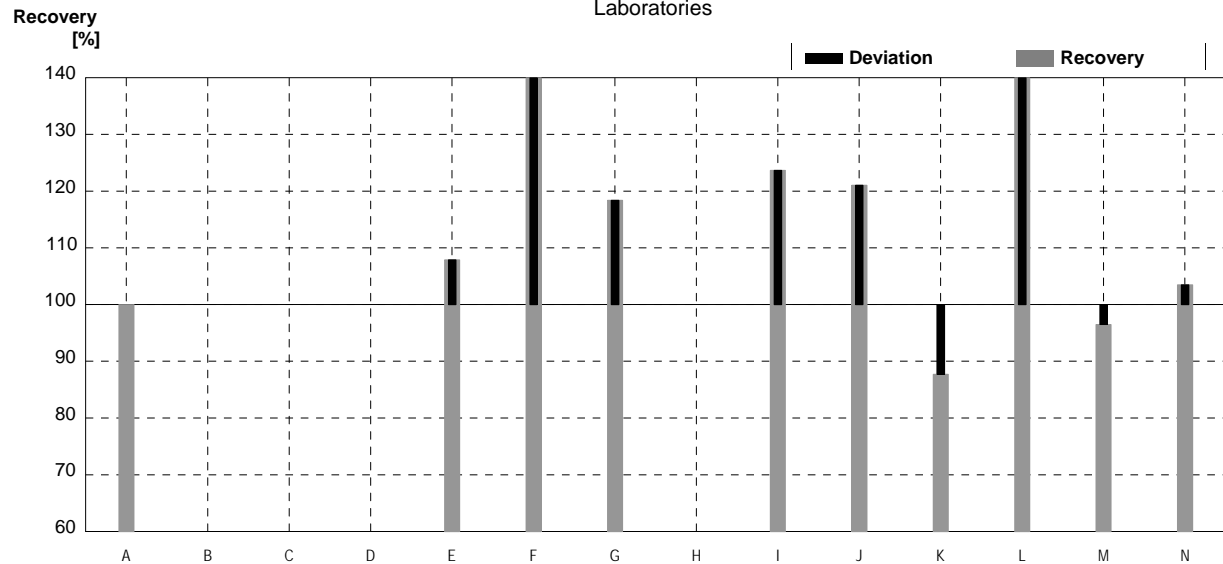
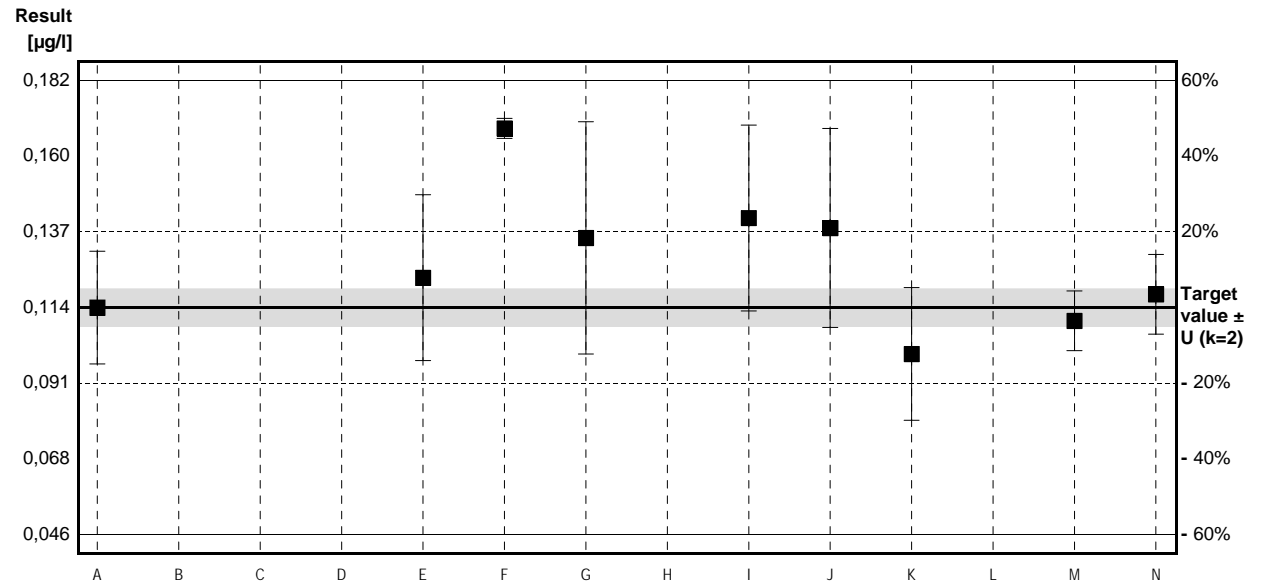
Parameter Mecoprop

Target value $\pm U$ (k=2) 0,114 $\mu\text{g/l}$ \pm 0,006 $\mu\text{g/l}$

IFA result $\pm U$ (k=2) 0,108 $\mu\text{g/l}$ \pm 0,011 $\mu\text{g/l}$

Stability test $\pm U$ (k=2) 0,116 $\mu\text{g/l}$ \pm 0,012 $\mu\text{g/l}$

Lab Code	Result	\pm	Unit	Recovery	z-Score
A	0,114	0,017	$\mu\text{g/l}$	100%	0,00
B			$\mu\text{g/l}$		
C			$\mu\text{g/l}$		
D			$\mu\text{g/l}$		
E	0,123	0,025	$\mu\text{g/l}$	108%	0,42
F	0,168	0,003	$\mu\text{g/l}$	147%	2,49
G	0,135	0,035	$\mu\text{g/l}$	118%	0,97
H			$\mu\text{g/l}$		
I	0,141	0,028	$\mu\text{g/l}$	124%	1,25
J	0,138	0,03	$\mu\text{g/l}$	121%	1,11
K	0,10	0,02	$\mu\text{g/l}$	88%	-0,65
L	0,275 *		$\mu\text{g/l}$	241%	7,43
M	0,110	0,009	$\mu\text{g/l}$	96%	-0,18
N	0,118	0,012	$\mu\text{g/l}$	104%	0,18



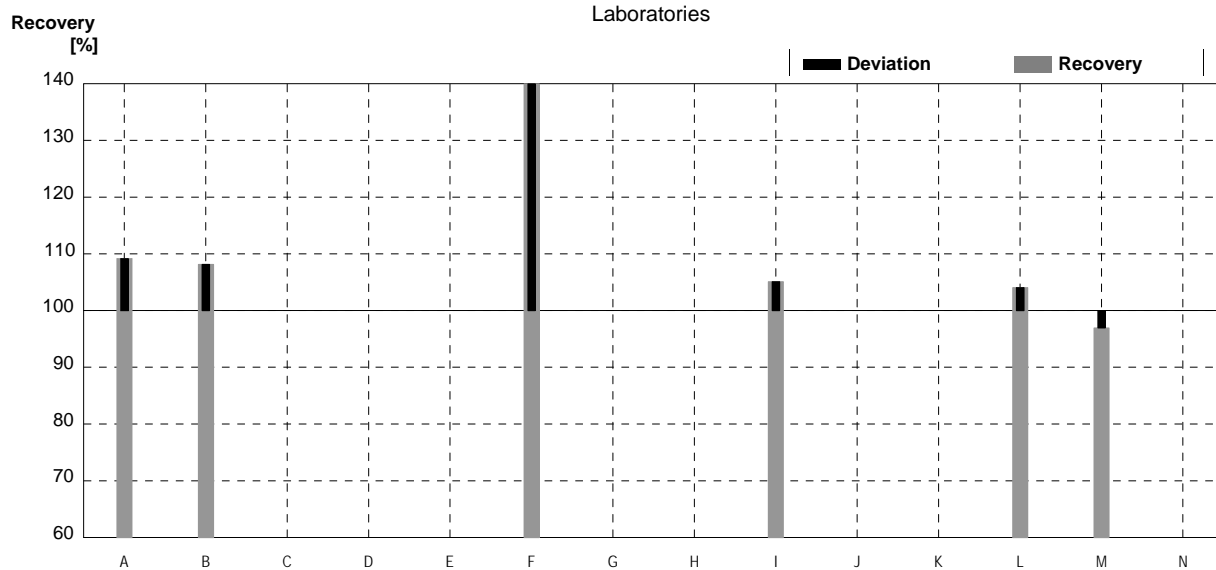
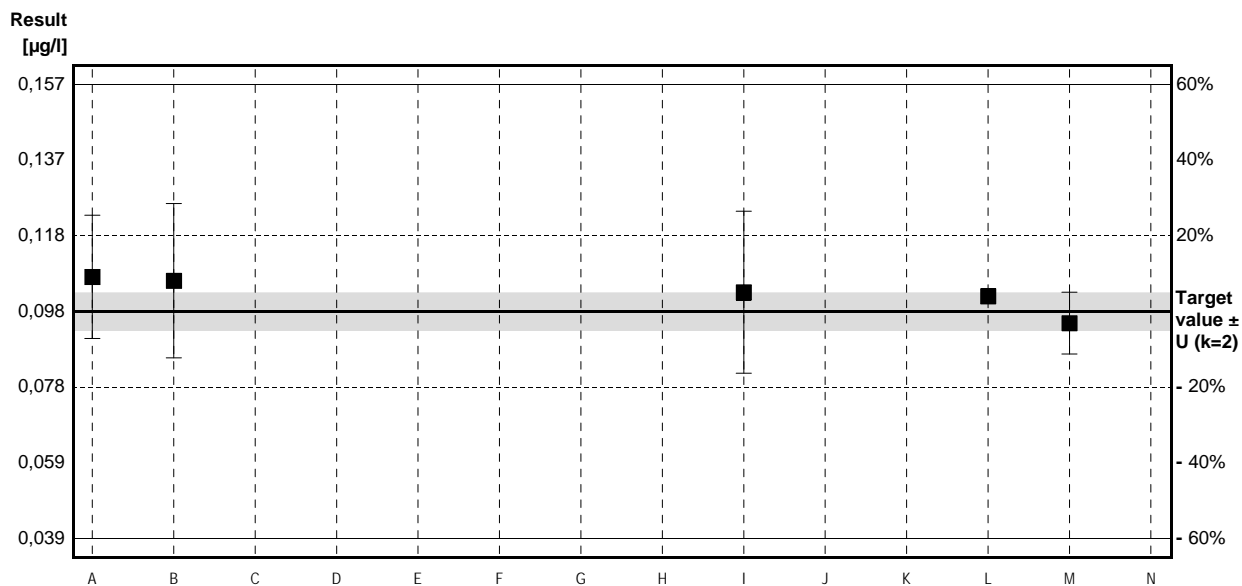
	All results	Outliers excl.	Unit
Mean \pm CI(99%)	0,142 \pm 0,052	0,127 \pm 0,023	$\mu\text{g/l}$
Recov. \pm CI(99%)	124,7 \pm 45,9	111,8 \pm 20,1	%
SD between labs	0,050	0,020	$\mu\text{g/l}$
RSD between labs	35,5	16,0	%
n for calculation	10	9	

Sample HB87A

Parameter Chloridazon

Target value $\pm U$ (k=2) 0,098 $\mu\text{g/l}$ \pm 0,005 $\mu\text{g/l}$
 IFA result $\pm U$ (k=2) 0,116 $\mu\text{g/l}$ \pm 0,023 $\mu\text{g/l}$
 Stability test $\pm U$ (k=2) 0,086 $\mu\text{g/l}$ \pm 0,017 $\mu\text{g/l}$

Lab Code	Result	\pm	Unit	Recovery	z-Score
A	0,107	0,016	$\mu\text{g/l}$	109%	0,57
B	0,106	0,02	$\mu\text{g/l}$	108%	0,51
C			$\mu\text{g/l}$		
D			$\mu\text{g/l}$		
E			$\mu\text{g/l}$		
F	0,273 *	0,051	$\mu\text{g/l}$	279%	11,16
G			$\mu\text{g/l}$		
H			$\mu\text{g/l}$		
I	0,103	0,021	$\mu\text{g/l}$	105%	0,32
J			$\mu\text{g/l}$		
K			$\mu\text{g/l}$		
L	0,102		$\mu\text{g/l}$	104%	0,26
M	0,095	0,008	$\mu\text{g/l}$	97%	-0,19
N			$\mu\text{g/l}$		



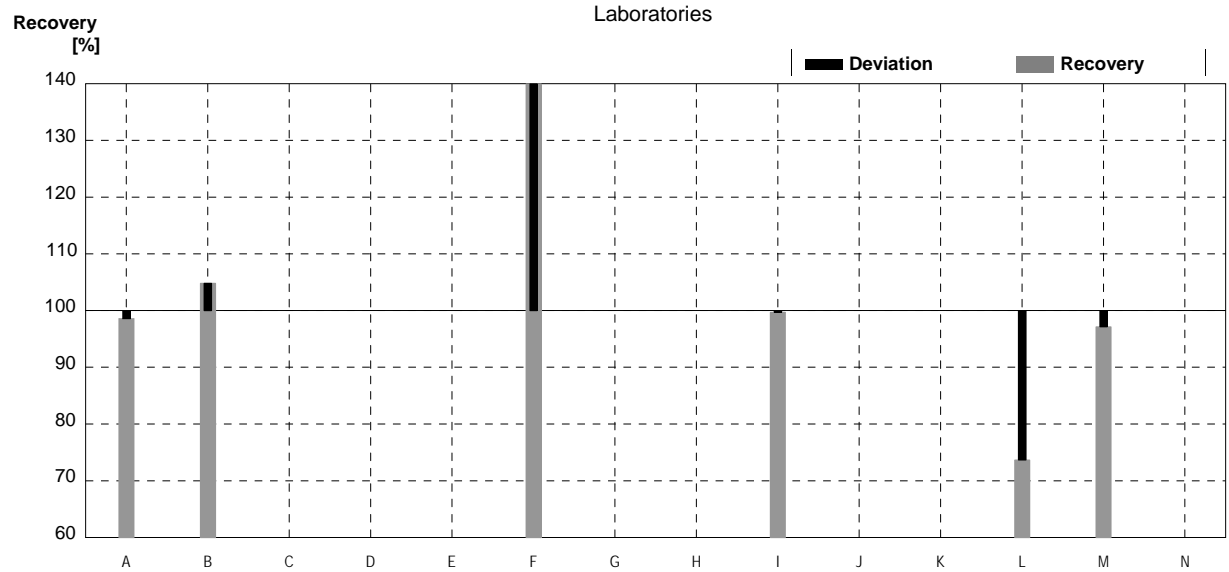
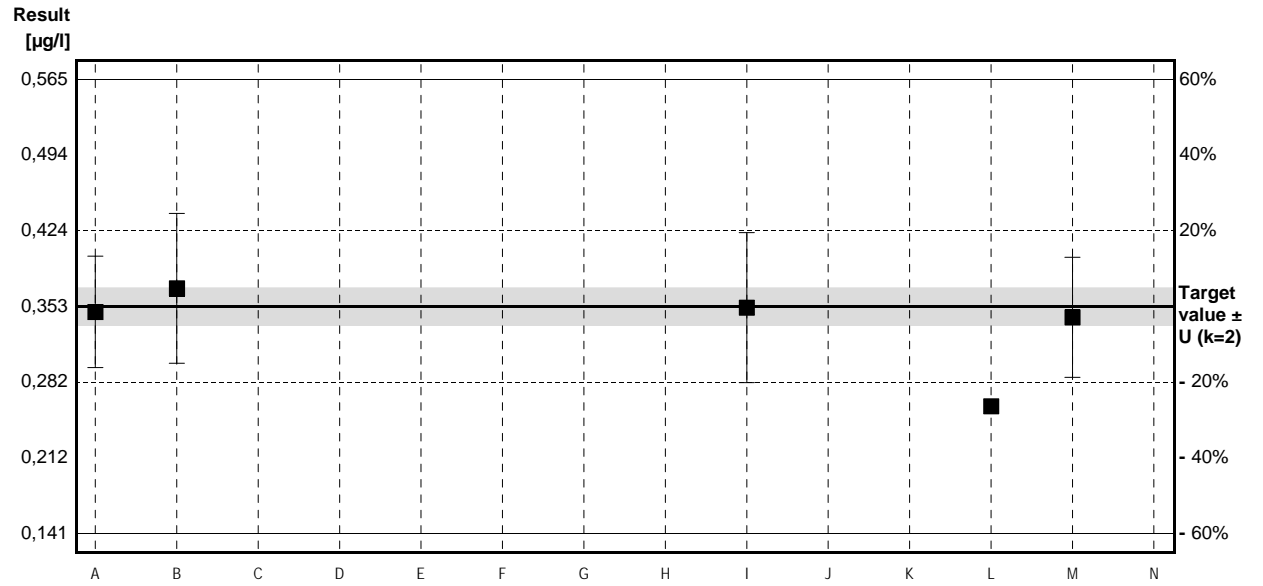
	All results	Outliers excl.	Unit
Mean \pm CI(99%)	0,131 \pm 0,115	0,103 \pm 0,010	$\mu\text{g/l}$
Recov. \pm CI(99%)	133,7 \pm 117,0	104,7 \pm 9,9	%
SD between labs	0,070	0,005	$\mu\text{g/l}$
RSD between labs	53,2	4,6	%
n for calculation	6	5	

Sample HB87B

Parameter Chloridazon

Target value $\pm U$ (k=2) 0,353 $\mu\text{g/l}$ \pm 0,018 $\mu\text{g/l}$
 IFA result $\pm U$ (k=2) 0,367 $\mu\text{g/l}$ \pm 0,073 $\mu\text{g/l}$
 Stability test $\pm U$ (k=2) 0,340 $\mu\text{g/l}$ \pm 0,068 $\mu\text{g/l}$

Lab Code	Result	\pm	Unit	Recovery	z-Score
A	0,348	0,052	$\mu\text{g/l}$	99%	-0,09
B	0,370	0,07	$\mu\text{g/l}$	105%	0,30
C			$\mu\text{g/l}$		
D			$\mu\text{g/l}$		
E			$\mu\text{g/l}$		
F	1,01 *	0,116	$\mu\text{g/l}$	286%	11,63
G			$\mu\text{g/l}$		
H			$\mu\text{g/l}$		
I	0,352	0,070	$\mu\text{g/l}$	100%	-0,02
J			$\mu\text{g/l}$		
K			$\mu\text{g/l}$		
L	0,260 *		$\mu\text{g/l}$	74%	-1,65
M	0,343	0,056	$\mu\text{g/l}$	97%	-0,18
N			$\mu\text{g/l}$		



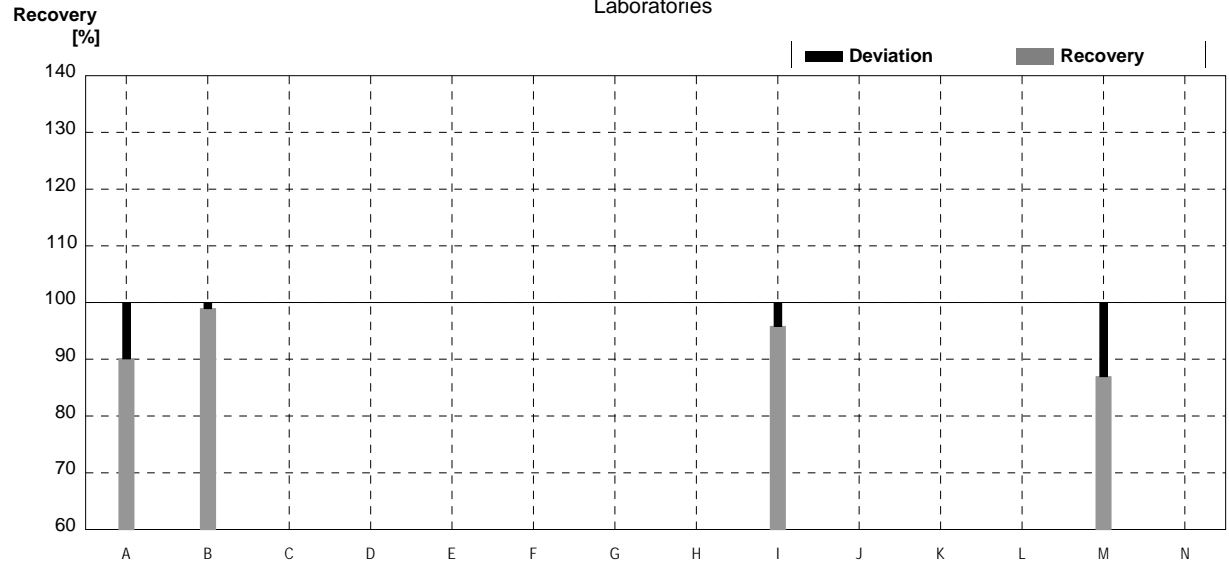
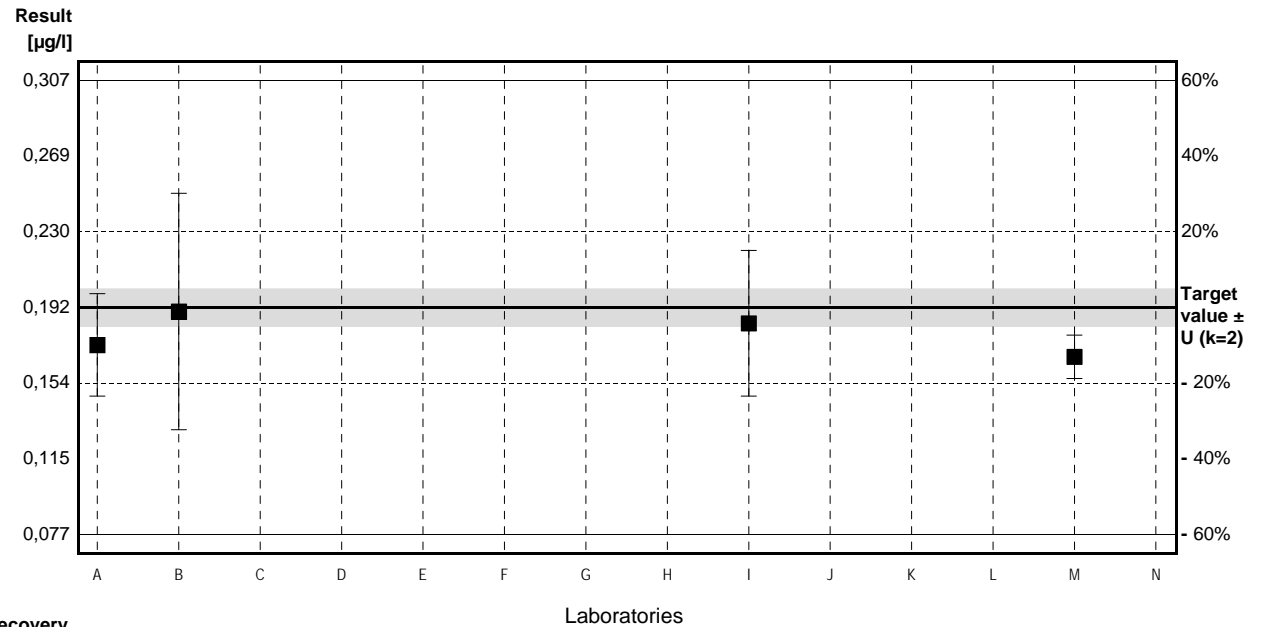
	All results	Outliers excl.	Unit
Mean \pm CI(99%)	0,447 \pm 0,458	0,353 \pm 0,034	$\mu\text{g/l}$
Recov. \pm CI(99%)	126,7 \pm 129,8	100,1 \pm 9,7	%
SD between labs	0,278	0,012	$\mu\text{g/l}$
RSD between labs	62,3	3,3	%
n for calculation	6	4	

Sample HB87A

Parameter DPhChloridazon

Target value $\pm U$ (k=2) 0,192 $\mu\text{g/l}$ \pm 0,010 $\mu\text{g/l}$
 IFA result $\pm U$ (k=2) 0,205 $\mu\text{g/l}$ \pm 0,041 $\mu\text{g/l}$
 Stability test $\pm U$ (k=2) 0,168 $\mu\text{g/l}$ \pm 0,034 $\mu\text{g/l}$

Lab Code	Result	\pm	Unit	Recovery	z-Score
A	0,173	0,026	$\mu\text{g/l}$	90%	-0,66
B	0,190	0,06	$\mu\text{g/l}$	99%	-0,07
C			$\mu\text{g/l}$		
D			$\mu\text{g/l}$		
E			$\mu\text{g/l}$		
F	n.a.		$\mu\text{g/l}$		
G			$\mu\text{g/l}$		
H			$\mu\text{g/l}$		
I	0,184	0,037	$\mu\text{g/l}$	96%	-0,28
J			$\mu\text{g/l}$		
K			$\mu\text{g/l}$		
L			$\mu\text{g/l}$		
M	0,167	0,011	$\mu\text{g/l}$	87%	-0,87
N			$\mu\text{g/l}$		



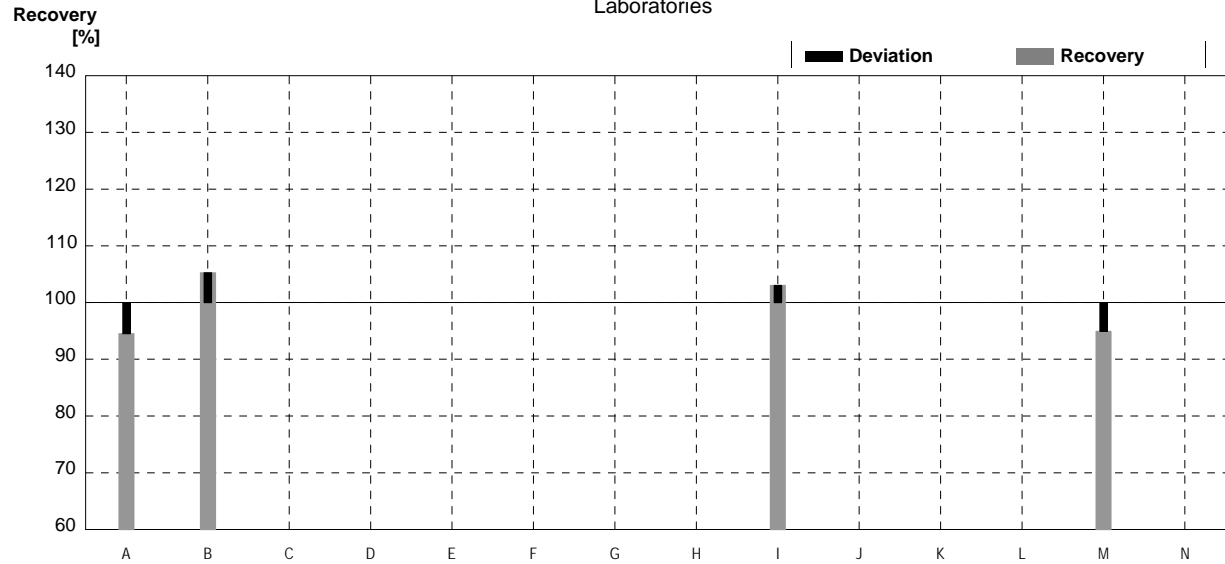
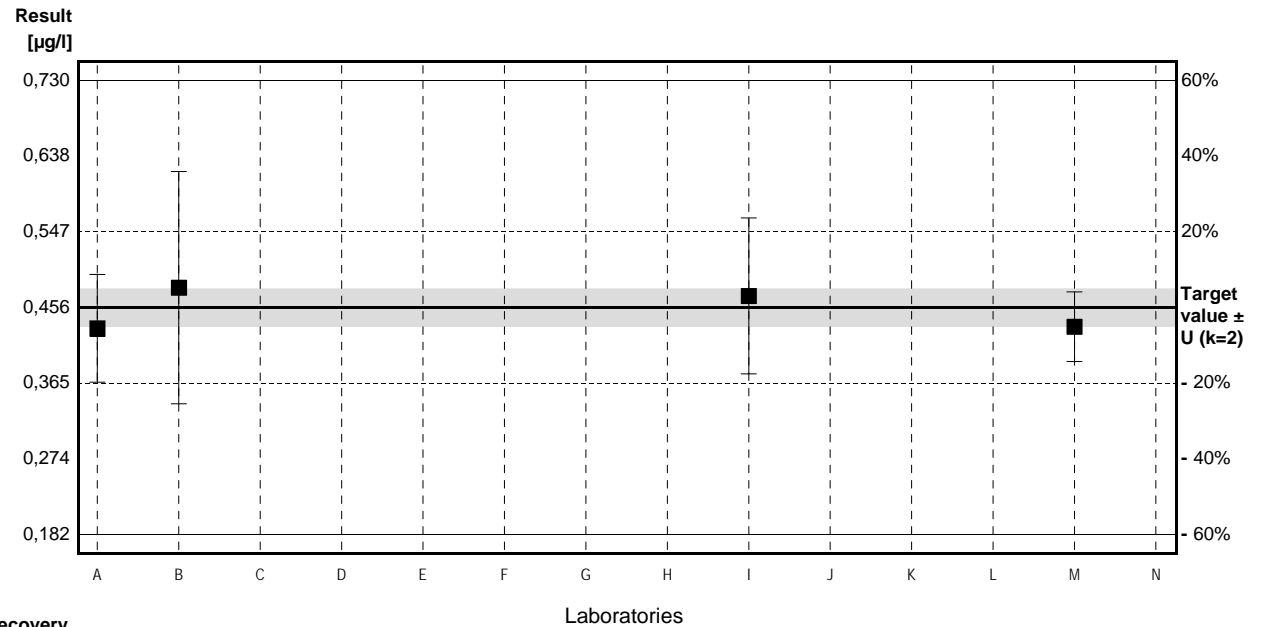
	All results	Outliers excl.	Unit
Mean \pm CI(99%)	0,179 \pm 0,030	0,179 \pm 0,030	$\mu\text{g/l}$
Recov. \pm CI(99%)	93,0 \pm 15,8	93,0 \pm 15,8	%
SD between labs	0,010	0,010	$\mu\text{g/l}$
RSD between labs	5,8	5,8	%
n for calculation	4	4	

Sample HB87B

Parameter DPhChloridazon

Target value $\pm U$ (k=2) 0,456 $\mu\text{g/l}$ \pm 0,023 $\mu\text{g/l}$
 IFA result $\pm U$ (k=2) 0,528 $\mu\text{g/l}$ \pm 0,106 $\mu\text{g/l}$
 Stability test $\pm U$ (k=2) 0,483 $\mu\text{g/l}$ \pm 0,097 $\mu\text{g/l}$

Lab Code	Result	\pm	Unit	Recovery	z-Score
A	0,431	0,065	$\mu\text{g/l}$	95%	-0,37
B	0,480	0,14	$\mu\text{g/l}$	105%	0,35
C			$\mu\text{g/l}$		
D			$\mu\text{g/l}$		
E			$\mu\text{g/l}$		
F	n.a.		$\mu\text{g/l}$		
G			$\mu\text{g/l}$		
H			$\mu\text{g/l}$		
I	0,470	0,094	$\mu\text{g/l}$	103%	0,20
J			$\mu\text{g/l}$		
K			$\mu\text{g/l}$		
L			$\mu\text{g/l}$		
M	0,433	0,042	$\mu\text{g/l}$	95%	-0,34
N			$\mu\text{g/l}$		



	All results	Outliers excl.	Unit
Mean \pm CI(99%)	0,454 \pm 0,074	0,454 \pm 0,074	$\mu\text{g/l}$
Recov. \pm CI(99%)	99,5 \pm 16,1	99,5 \pm 16,1	%
SD between labs	0,025	0,025	$\mu\text{g/l}$
RSD between labs	5,6	5,6	%
n for calculation	4	4	

Sample HB87A

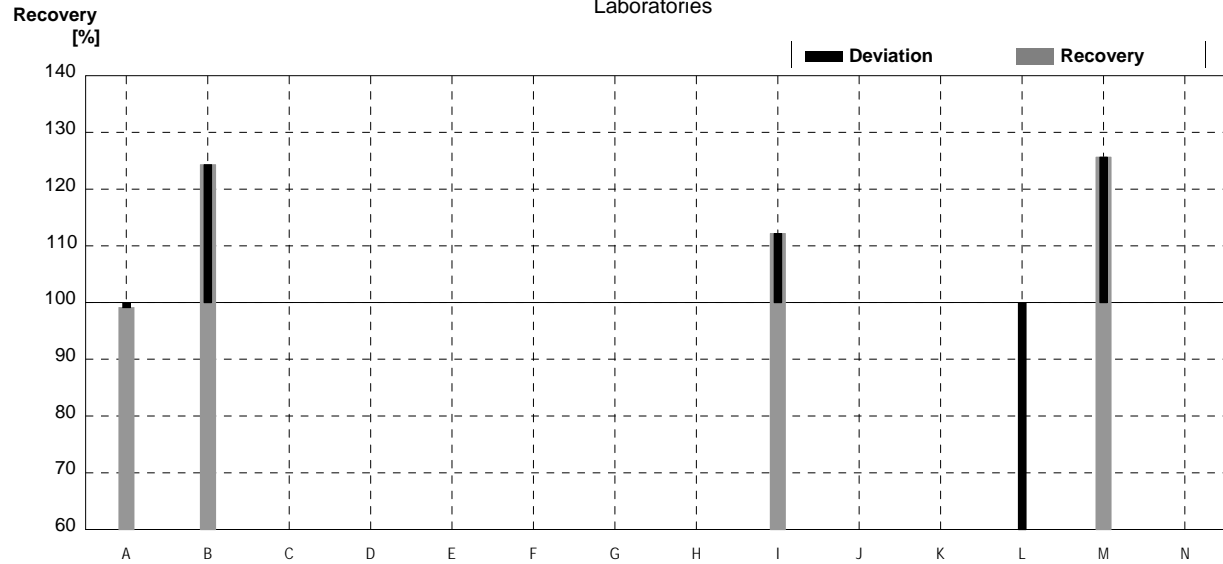
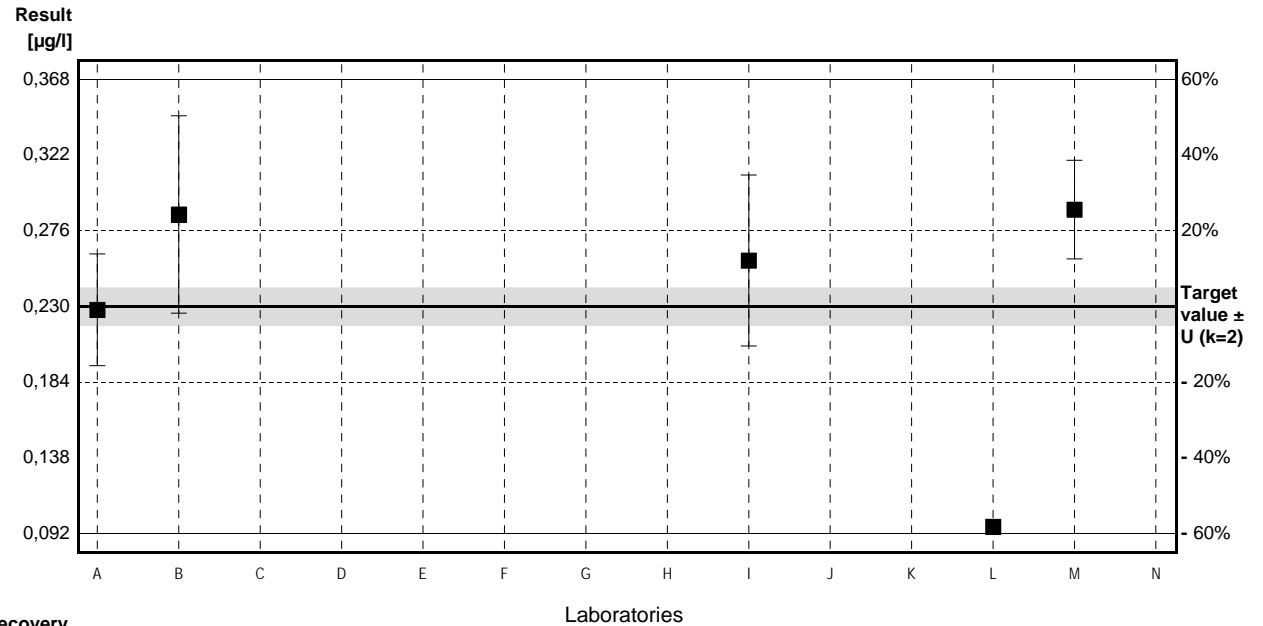
Parameter MDPHChloridazon

Target value $\pm U$ (k=2) 0,230 $\mu\text{g/l}$ \pm 0,012 $\mu\text{g/l}$

IFA result $\pm U$ (k=2) 0,247 $\mu\text{g/l}$ \pm 0,049 $\mu\text{g/l}$

Stability test $\pm U$ (k=2) 0,215 $\mu\text{g/l}$ \pm 0,043 $\mu\text{g/l}$

Lab Code	Result	\pm	Unit	Recovery	z-Score
A	0,228	0,034	$\mu\text{g/l}$	99%	-0,07
B	0,286	0,06	$\mu\text{g/l}$	124%	2,03
C			$\mu\text{g/l}$		
D			$\mu\text{g/l}$		
E			$\mu\text{g/l}$		
F	n.a.		$\mu\text{g/l}$		
G			$\mu\text{g/l}$		
H			$\mu\text{g/l}$		
I	0,258	0,052	$\mu\text{g/l}$	112%	1,01
J			$\mu\text{g/l}$		
K			$\mu\text{g/l}$		
L	0,096		$\mu\text{g/l}$	42%	-4,86
M	0,289	0,030	$\mu\text{g/l}$	126%	2,14
N			$\mu\text{g/l}$		



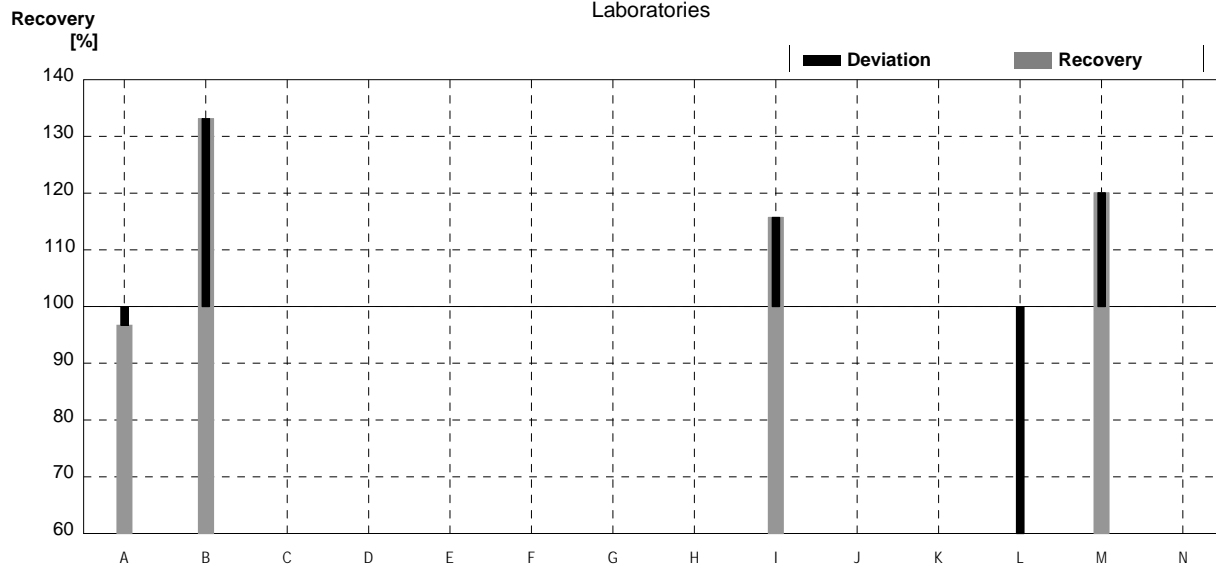
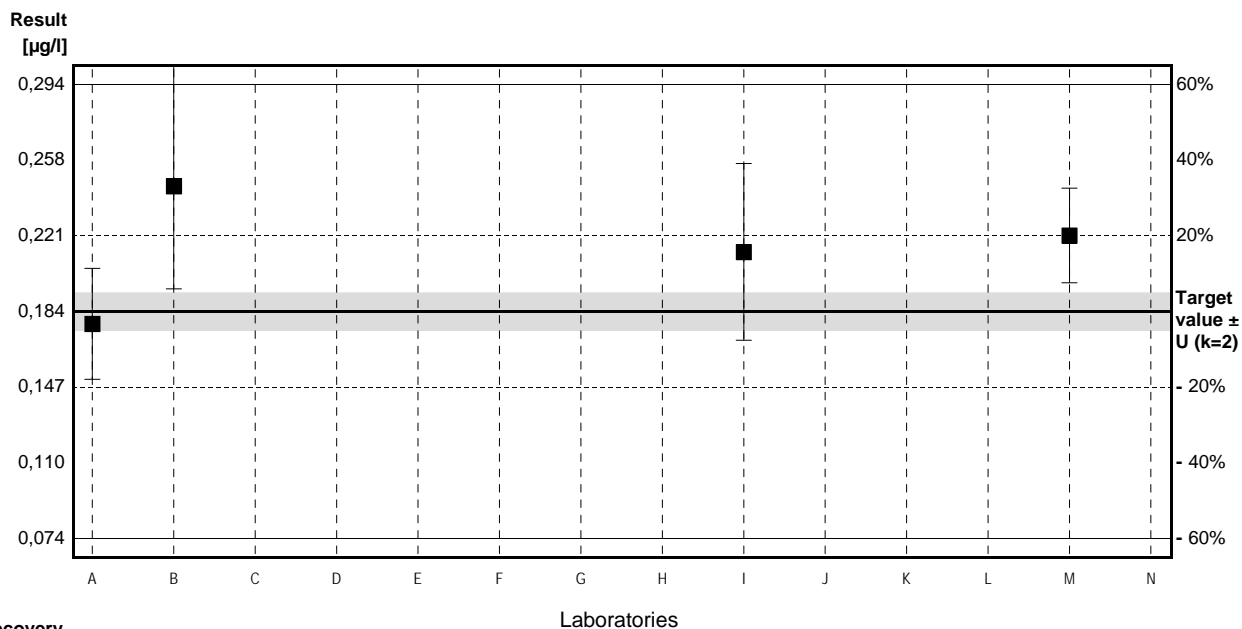
	All results	Outliers excl.	Unit
Mean \pm CI(99%)	0,231 \pm 0,164	0,231 \pm 0,164	$\mu\text{g/l}$
Recov. \pm CI(99%)	100,6 \pm 71,2	100,6 \pm 71,2	%
SD between labs	0,080	0,080	$\mu\text{g/l}$
RSD between labs	34,4	34,4	%
n for calculation	5	5	

Sample HB87B

Parameter MDPHChloridazon

Target value $\pm U$ (k=2) 0,184 $\mu\text{g/l}$ \pm 0,009 $\mu\text{g/l}$
 IFA result $\pm U$ (k=2) 0,190 $\mu\text{g/l}$ \pm 0,038 $\mu\text{g/l}$
 Stability test $\pm U$ (k=2) 0,189 $\mu\text{g/l}$ \pm 0,038 $\mu\text{g/l}$

Lab Code	Result	\pm	Unit	Recovery	z-Score
A	0,178	0,027	$\mu\text{g/l}$	97%	-0,27
B	0,245	0,05	$\mu\text{g/l}$	133%	2,76
C			$\mu\text{g/l}$		
D			$\mu\text{g/l}$		
E			$\mu\text{g/l}$		
F	n.a.		$\mu\text{g/l}$		
G			$\mu\text{g/l}$		
H			$\mu\text{g/l}$		
I	0,213	0,043	$\mu\text{g/l}$	116%	1,31
J			$\mu\text{g/l}$		
K			$\mu\text{g/l}$		
L	0,063		$\mu\text{g/l}$	34%	-5,48
M	0,221	0,023	$\mu\text{g/l}$	120%	1,68
N			$\mu\text{g/l}$		



	All results	Outliers excl.	Unit
Mean \pm CI(99%)	0,184 \pm 0,148	0,184 \pm 0,148	$\mu\text{g/l}$
Recov. \pm CI(99%)	100,0 \pm 80,2	100,0 \pm 80,2	%
SD between labs	0,072	0,072	$\mu\text{g/l}$
RSD between labs	39,0	39,0	%
n for calculation	5	5	

Illustration of Results Laboratory Oriented Part

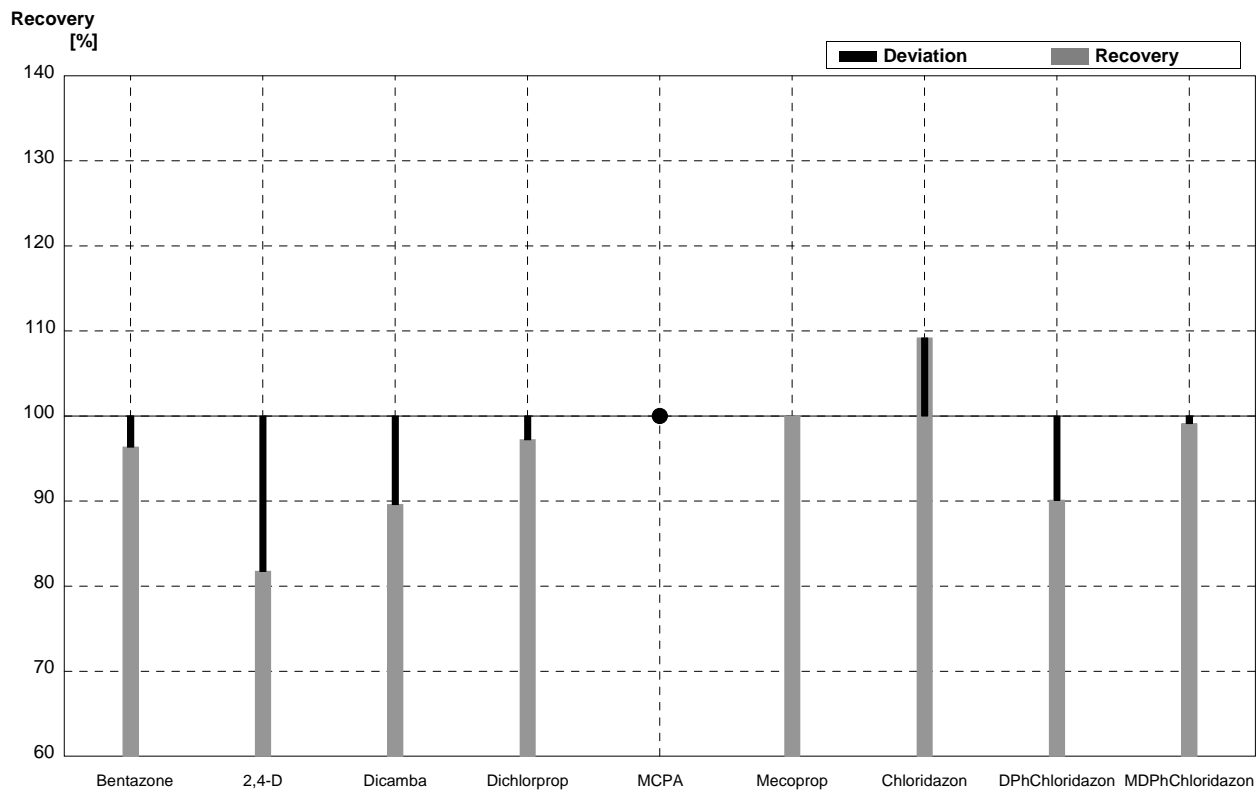
Round HB87
Herbicides

Sample Dispatch:
4 November 2013



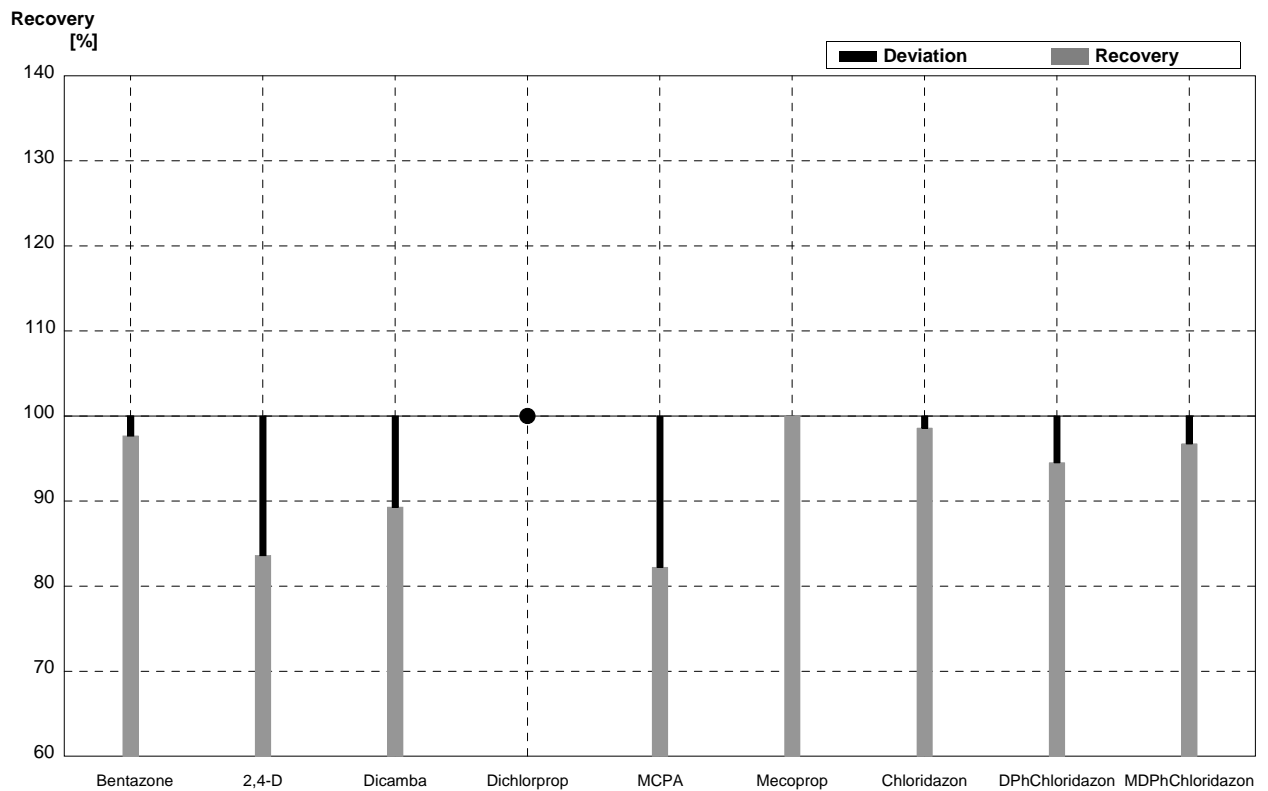
Sample HB87A
Laboratory A

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Bentazone	0,055	0,003	0,053	0,008	µg/l	96%
2,4-D	0,203	0,010	0,166	0,025	µg/l	82%
Dicamba	0,154	0,008	0,138	0,021	µg/l	90%
Dichlorprop	0,072	0,004	0,070	0,011	µg/l	97%
MCPA	<0,05		<0,03		µg/l	•
Mecoprop	0,064	0,003	0,064	0,010	µg/l	100%
Chloridazon	0,098	0,005	0,107	0,016	µg/l	109%
DPhChloridazon	0,192	0,010	0,173	0,026	µg/l	90%
MDPhChloridazon	0,230	0,012	0,228	0,034	µg/l	99%



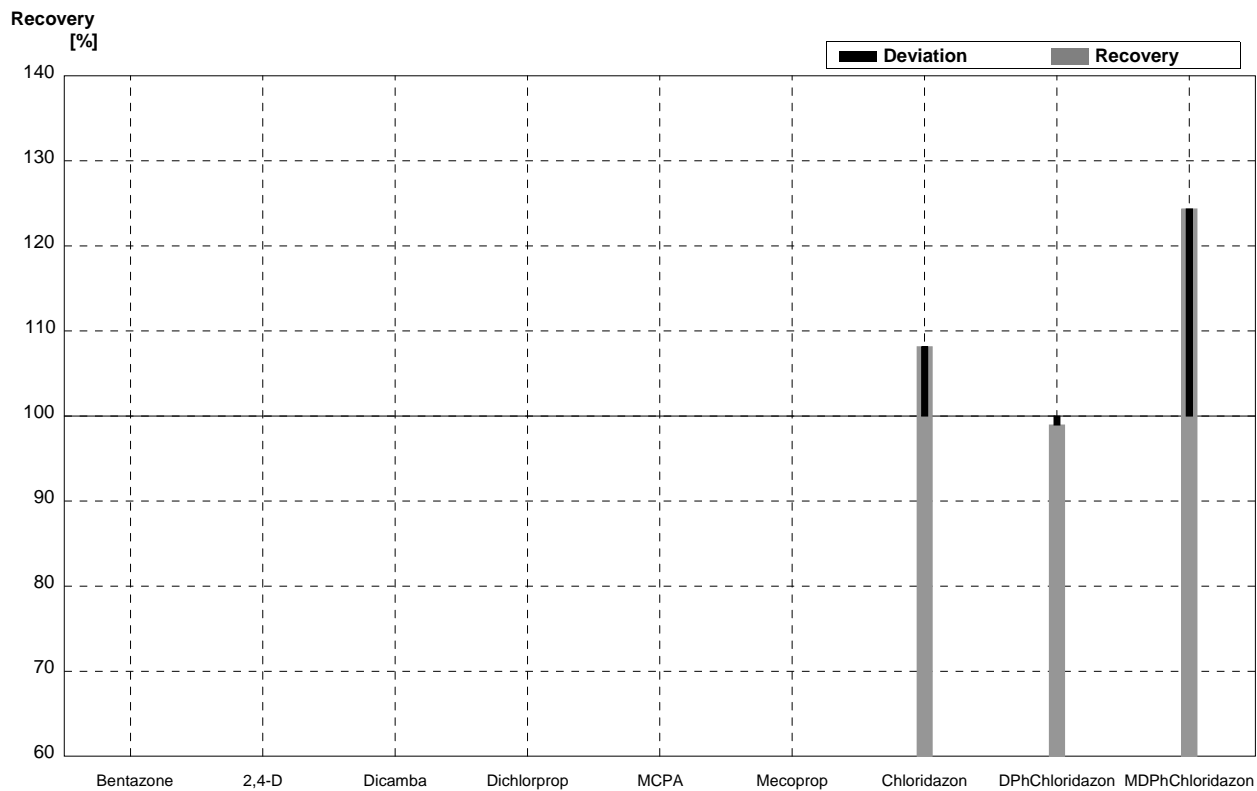
Sample HB87B
Laboratory A

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Bentazone	0,300	0,015	0,293	0,044	µg/l	98%
2,4-D	0,250	0,013	0,209	0,031	µg/l	84%
Dicamba	0,280	0,014	0,250	0,038	µg/l	89%
Dichlorprop	<0,05		<0,03		µg/l	•
MCPA	0,298	0,015	0,245	0,037	µg/l	82%
Mecoprop	0,114	0,006	0,114	0,017	µg/l	100%
Chloridazon	0,353	0,018	0,348	0,052	µg/l	99%
DPhChloridazon	0,456	0,023	0,431	0,065	µg/l	95%
MDPhChloridazon	0,184	0,009	0,178	0,027	µg/l	97%



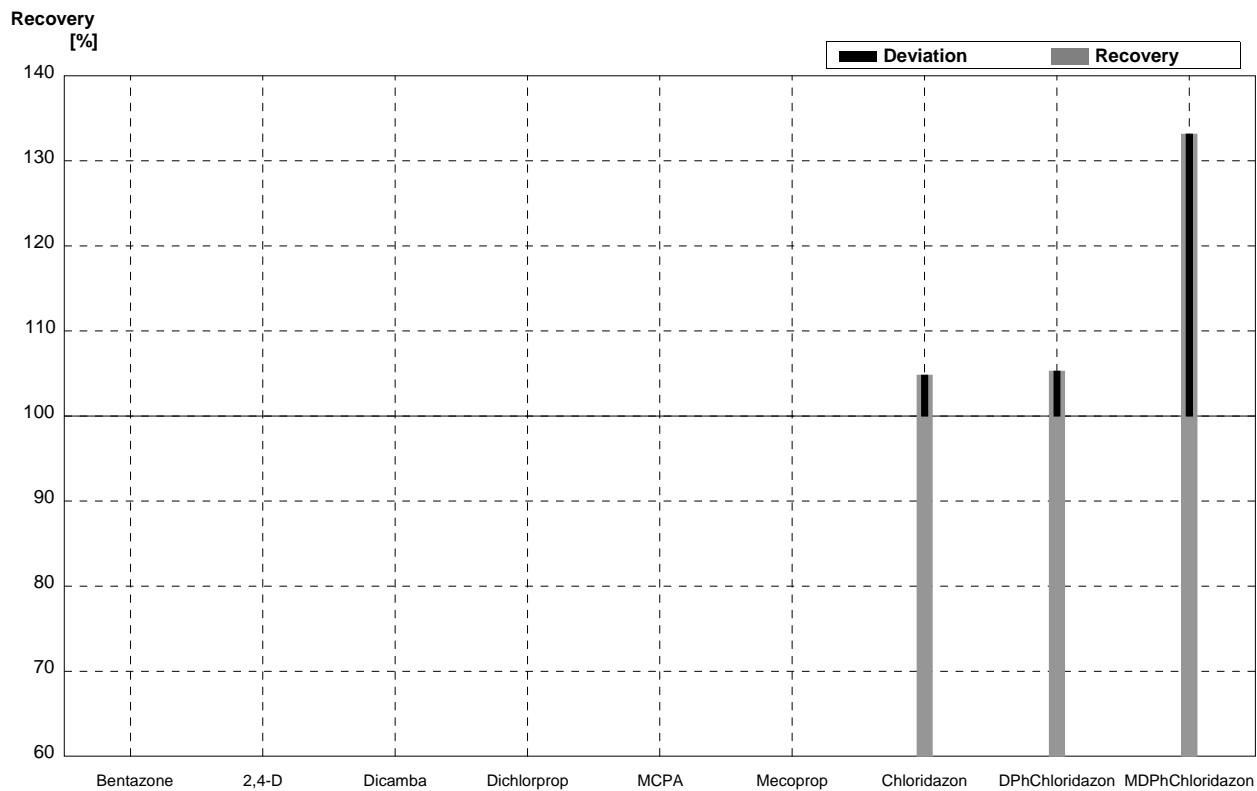
Sample HB87A
Laboratory B

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Bentazone	0,055	0,003			µg/l	
2,4-D	0,203	0,010			µg/l	
Dicamba	0,154	0,008			µg/l	
Dichlorprop	0,072	0,004			µg/l	
MCPA	<0,05				µg/l	
Mecoprop	0,064	0,003			µg/l	
Chloridazon	0,098	0,005	0,106	0,02	µg/l	108%
DPhChloridazon	0,192	0,010	0,190	0,06	µg/l	99%
MDPhChloridazon	0,230	0,012	0,286	0,06	µg/l	124%



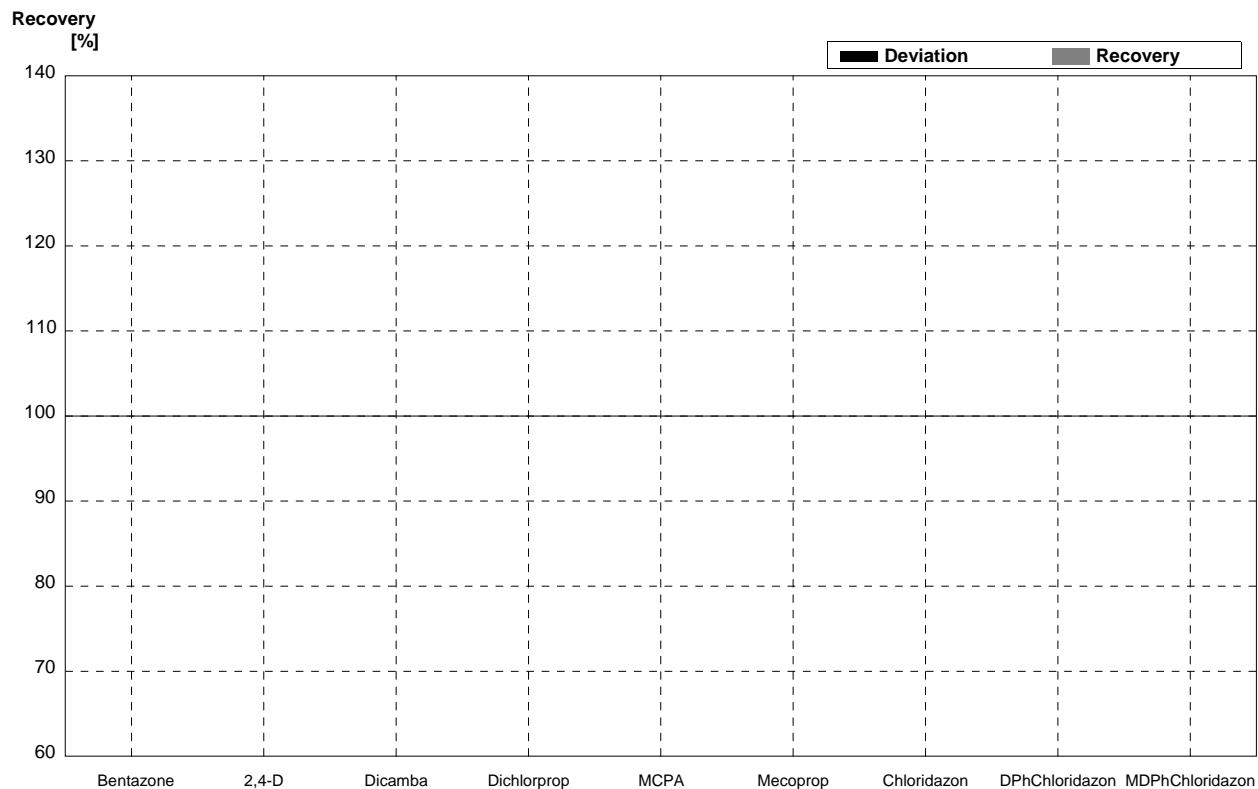
Sample HB87B
Laboratory B

Parameter	Target value	$\pm U$ (k=2)	Result	\pm	Unit	Recovery
Bentazone	0,300	0,015			$\mu\text{g/l}$	
2,4-D	0,250	0,013			$\mu\text{g/l}$	
Dicamba	0,280	0,014			$\mu\text{g/l}$	
Dichlorprop	<0,05				$\mu\text{g/l}$	
MCPA	0,298	0,015			$\mu\text{g/l}$	
Mecoprop	0,114	0,006			$\mu\text{g/l}$	
Chloridazon	0,353	0,018	0,370	0,07	$\mu\text{g/l}$	105%
DPhChloridazon	0,456	0,023	0,480	0,14	$\mu\text{g/l}$	105%
MDPhChloridazon	0,184	0,009	0,245	0,05	$\mu\text{g/l}$	133%



Sample HB87A
Laboratory C

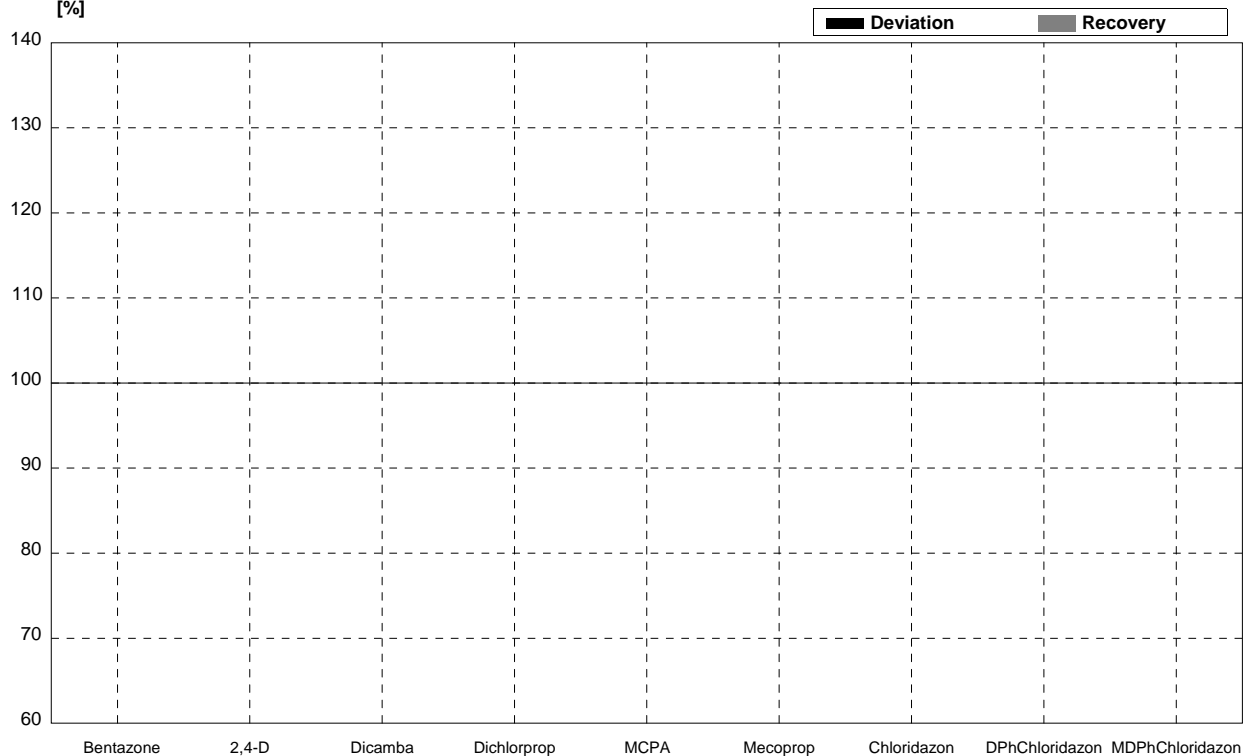
Parameter	Target value	$\pm U (k=2)$	Result	\pm	Unit	Recovery
Bentazone	0,055	0,003			$\mu\text{g/l}$	
2,4-D	0,203	0,010			$\mu\text{g/l}$	
Dicamba	0,154	0,008			$\mu\text{g/l}$	
Dichlorprop	0,072	0,004			$\mu\text{g/l}$	
MCPA	<0,05				$\mu\text{g/l}$	
Mecoprop	0,064	0,003			$\mu\text{g/l}$	
Chloridazon	0,098	0,005			$\mu\text{g/l}$	
DPhChloridazon	0,192	0,010			$\mu\text{g/l}$	
MDPhChloridazon	0,230	0,012			$\mu\text{g/l}$	



Sample HB87B
Laboratory C

Parameter	Target value	$\pm U$ (k=2)	Result	\pm	Unit	Recovery
Bentazone	0,300	0,015			$\mu\text{g/l}$	
2,4-D	0,250	0,013			$\mu\text{g/l}$	
Dicamba	0,280	0,014			$\mu\text{g/l}$	
Dichlorprop	<0,05				$\mu\text{g/l}$	
MCPA	0,298	0,015			$\mu\text{g/l}$	
Mecoprop	0,114	0,006			$\mu\text{g/l}$	
Chloridazon	0,353	0,018			$\mu\text{g/l}$	
DPhChloridazon	0,456	0,023			$\mu\text{g/l}$	
MDPhChloridazon	0,184	0,009			$\mu\text{g/l}$	

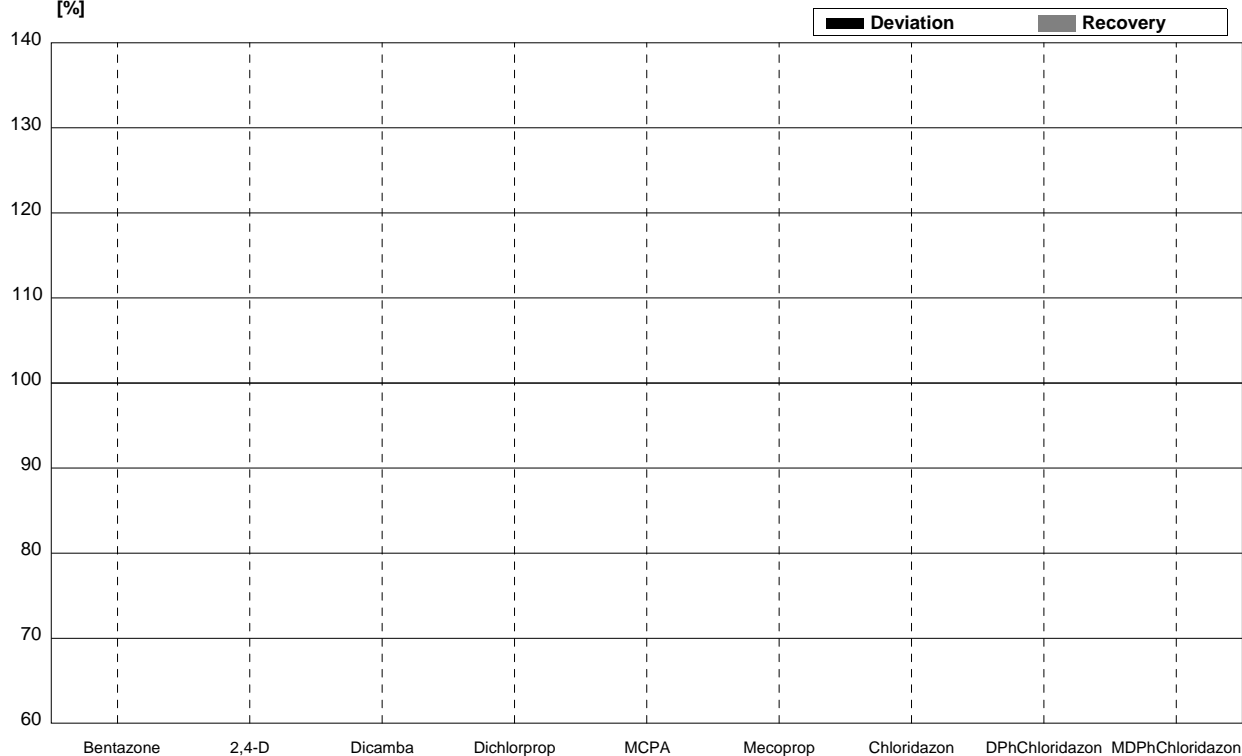
Recovery [%]



Sample HB87A
Laboratory D

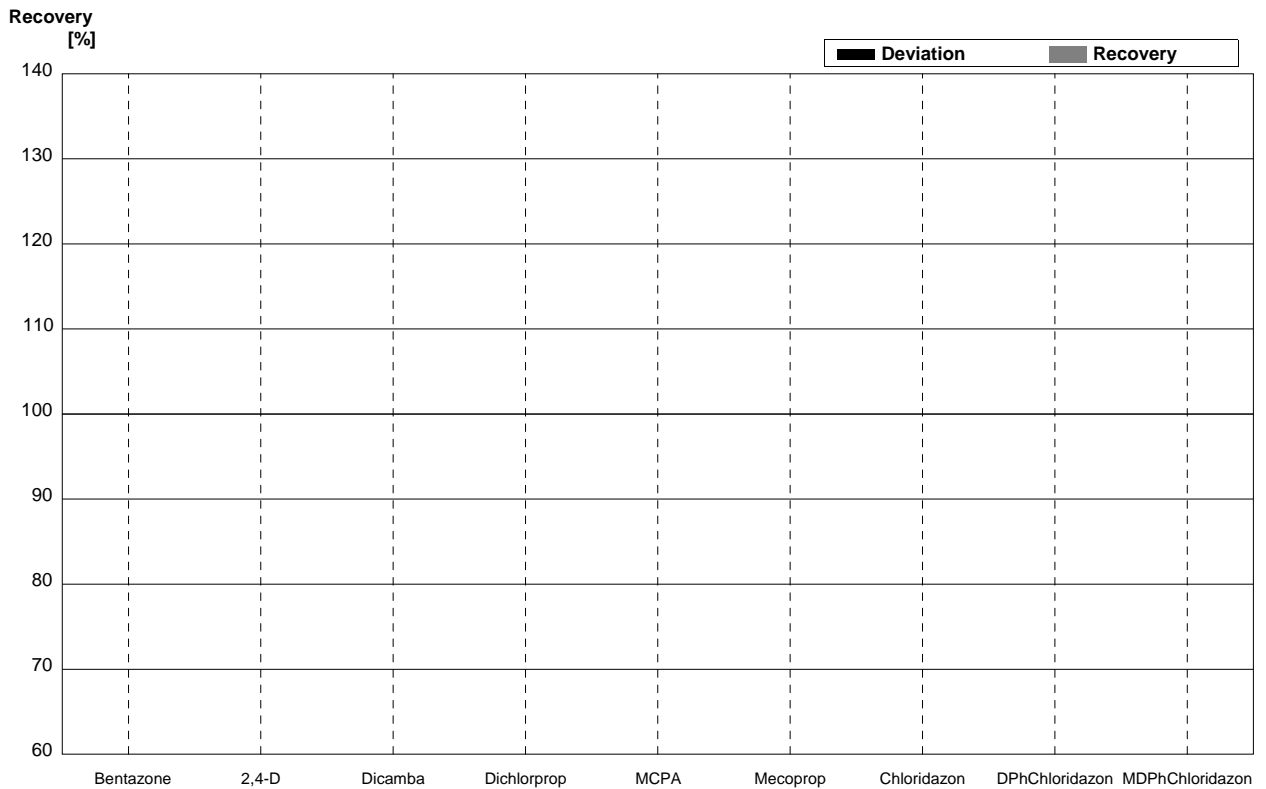
Parameter	Target value	$\pm U (k=2)$	Result	\pm	Unit	Recovery
Bentazone	0,055	0,003			$\mu\text{g/l}$	
2,4-D	0,203	0,010			$\mu\text{g/l}$	
Dicamba	0,154	0,008			$\mu\text{g/l}$	
Dichlorprop	0,072	0,004			$\mu\text{g/l}$	
MCPA	<0,05				$\mu\text{g/l}$	
Mecoprop	0,064	0,003			$\mu\text{g/l}$	
Chloridazon	0,098	0,005			$\mu\text{g/l}$	
DPhChloridazon	0,192	0,010			$\mu\text{g/l}$	
MDPhChloridazon	0,230	0,012			$\mu\text{g/l}$	

Recovery [%]



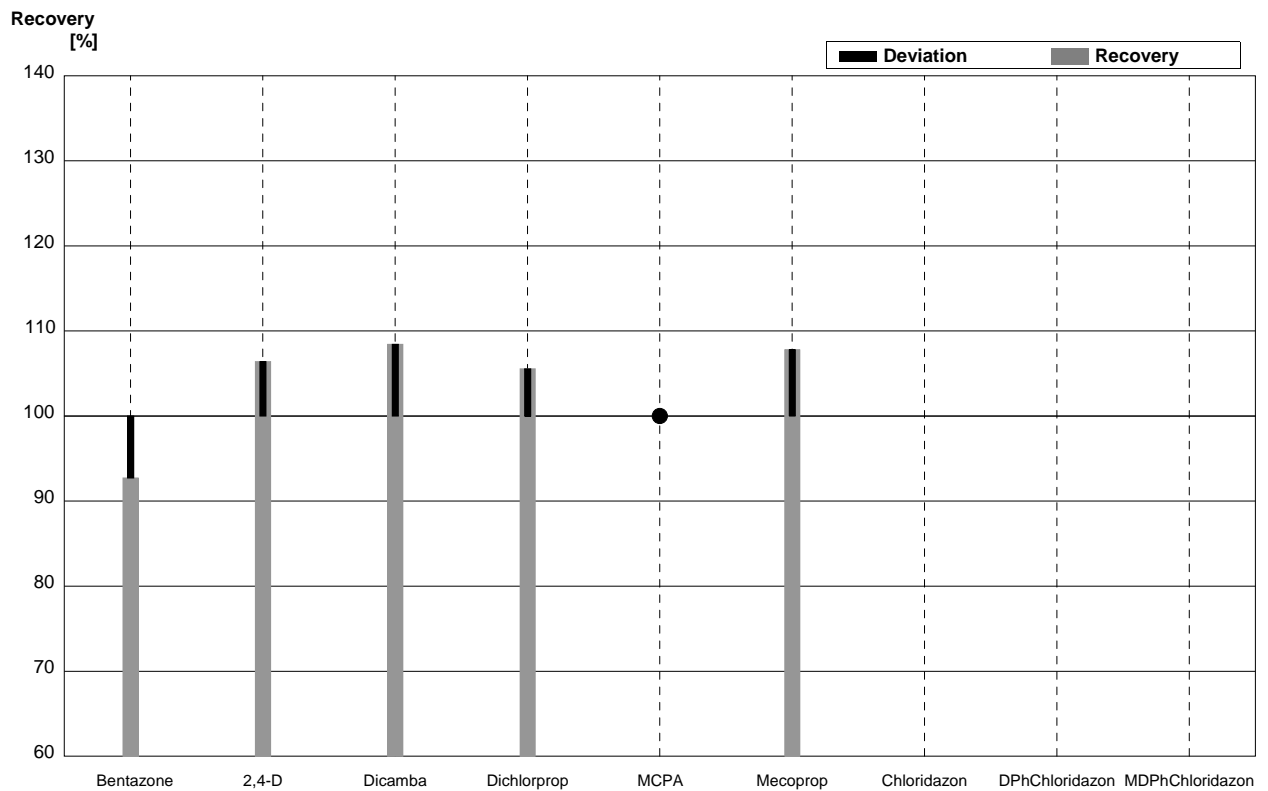
Sample HB87B
Laboratory D

Parameter	Target value	$\pm U (k=2)$	Result	\pm	Unit	Recovery
Bentazone	0,300	0,015			$\mu\text{g/l}$	
2,4-D	0,250	0,013			$\mu\text{g/l}$	
Dicamba	0,280	0,014			$\mu\text{g/l}$	
Dichlorprop	<0,05				$\mu\text{g/l}$	
MCPA	0,298	0,015			$\mu\text{g/l}$	
Mecoprop	0,114	0,006			$\mu\text{g/l}$	
Chloridazon	0,353	0,018			$\mu\text{g/l}$	
DPhChloridazon	0,456	0,023			$\mu\text{g/l}$	
MDPhChloridazon	0,184	0,009			$\mu\text{g/l}$	



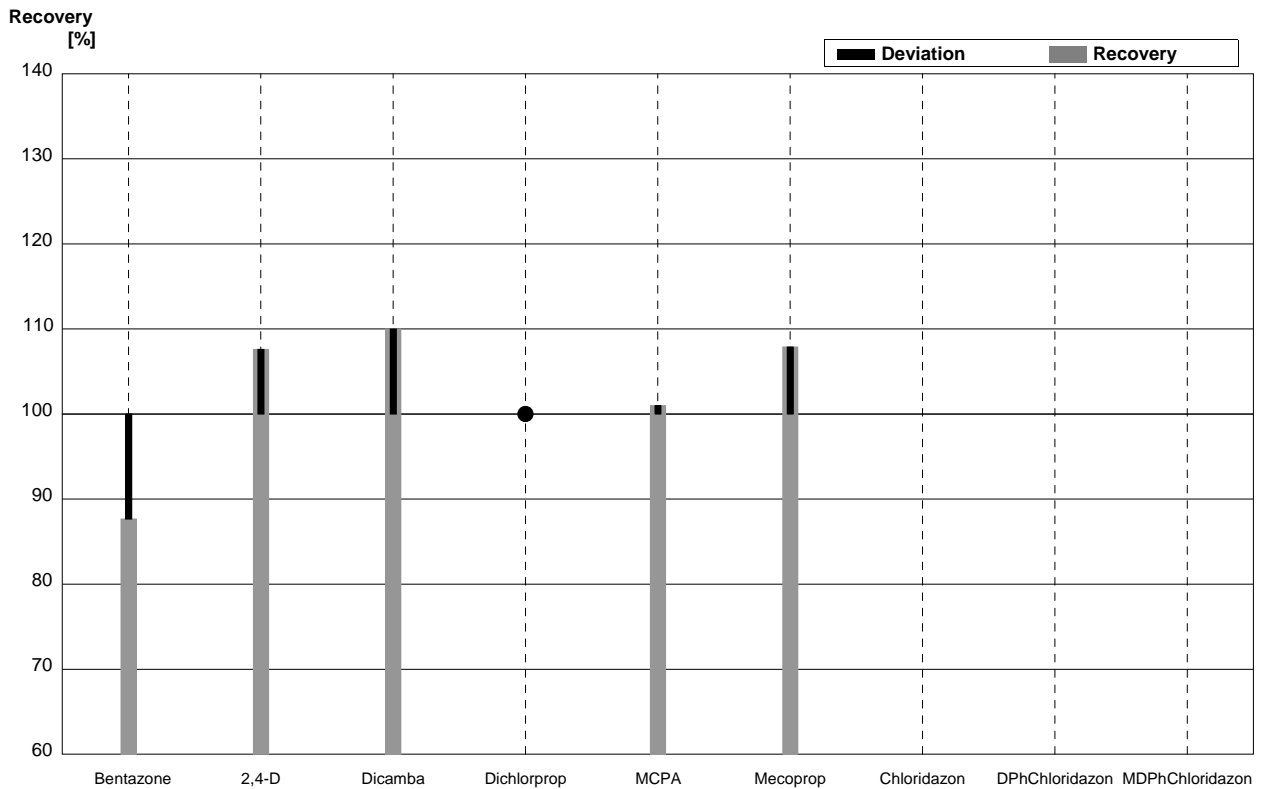
Sample HB87A
Laboratory E

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Bentazone	0,055	0,003	0,051	0,010	µg/l	93%
2,4-D	0,203	0,010	0,216	0,043	µg/l	106%
Dicamba	0,154	0,008	0,167	0,033	µg/l	108%
Dichlorprop	0,072	0,004	0,076	0,015	µg/l	106%
MCPA	<0,05		<0,020		µg/l	•
Mecoprop	0,064	0,003	0,069	0,013	µg/l	108%
Chloridazon	0,098	0,005			µg/l	
DPhChloridazon	0,192	0,010			µg/l	
MDPhChloridazon	0,230	0,012			µg/l	



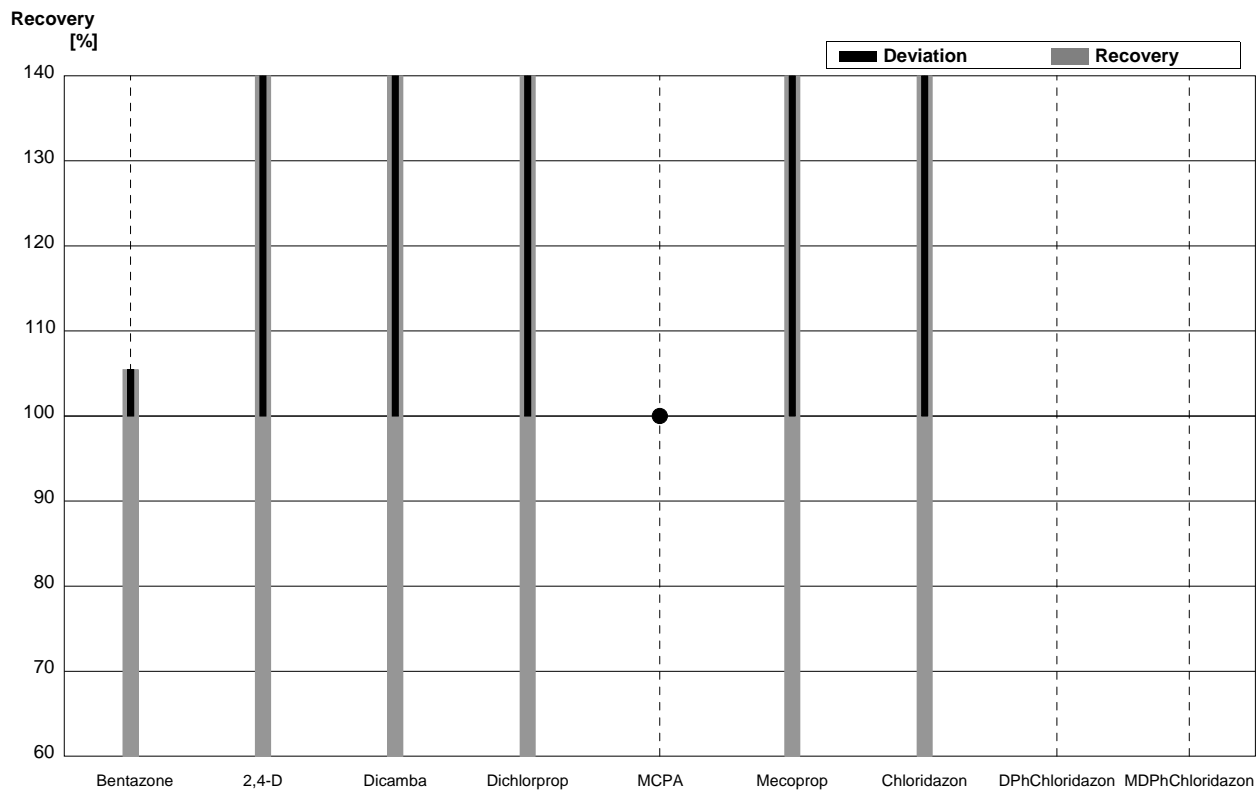
Sample HB87B
Laboratory E

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Bentazone	0,300	0,015	0,263	0,053	µg/l	88%
2,4-D	0,250	0,013	0,269	0,054	µg/l	108%
Dicamba	0,280	0,014	0,308	0,062	µg/l	110%
Dichlorprop	<0,05		<0,020		µg/l	•
MCPA	0,298	0,015	0,301	0,060	µg/l	101%
Mecoprop	0,114	0,006	0,123	0,025	µg/l	108%
Chloridazon	0,353	0,018			µg/l	
DPhChloridazon	0,456	0,023			µg/l	
MDPhChloridazon	0,184	0,009			µg/l	



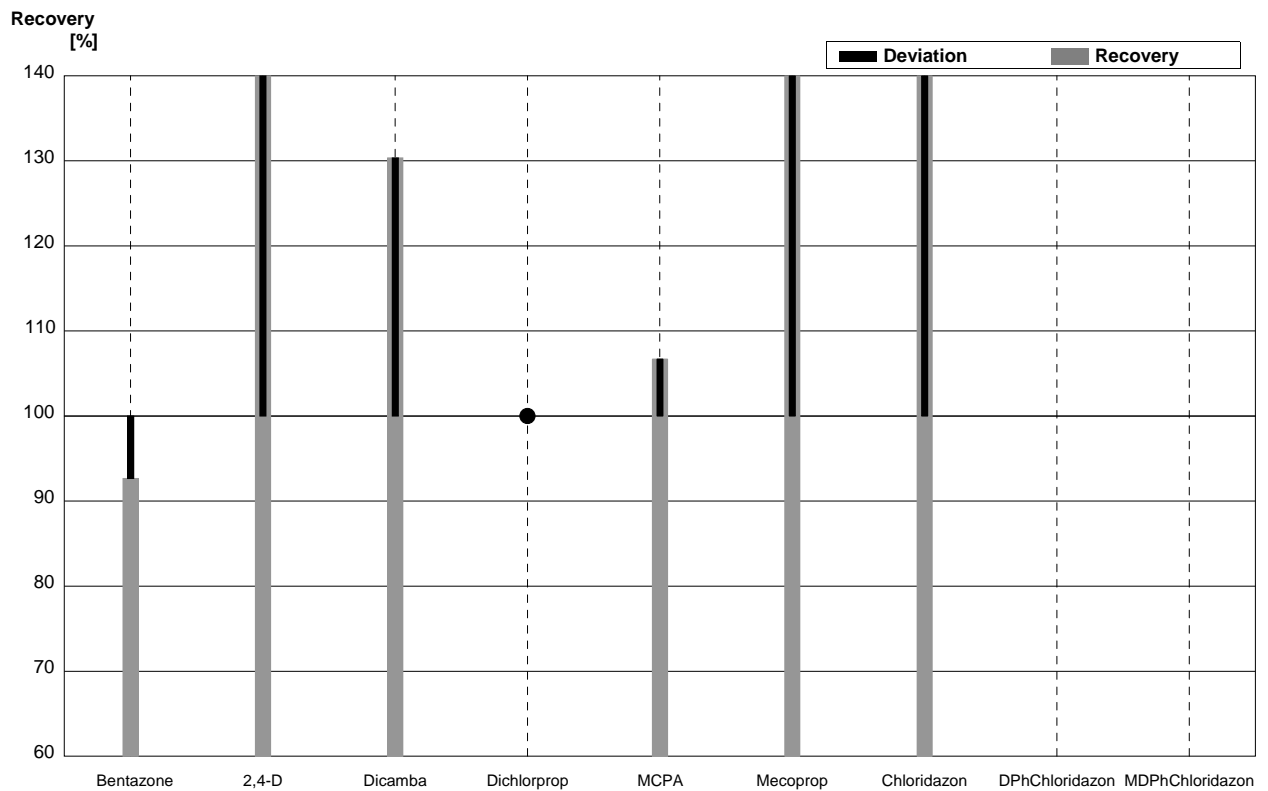
Sample HB87A
Laboratory F

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Bentazone	0,055	0,003	0,058	0,006	µg/l	105%
2,4-D	0,203	0,010	0,314	0,027	µg/l	155%
Dicamba	0,154	0,008	0,265	0,165	µg/l	172%
Dichlorprop	0,072	0,004	0,115	0,009	µg/l	160%
MCPA	<0,05		<0,025		µg/l	•
Mecoprop	0,064	0,003	0,104	0,013	µg/l	163%
Chloridazon	0,098	0,005	0,273	0,051	µg/l	279%
DPhChloridazon	0,192	0,010	n.a.		µg/l	
MDPhChloridazon	0,230	0,012	n.a.		µg/l	



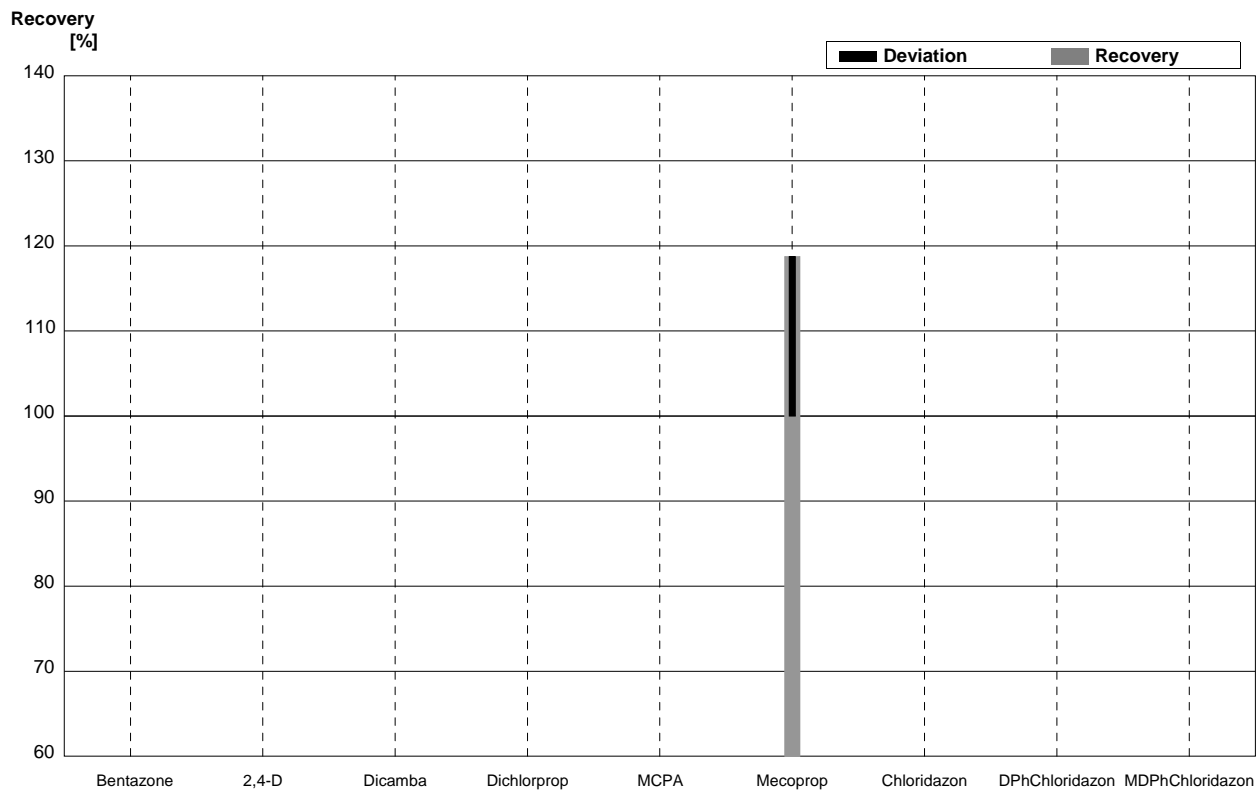
Sample HB87B
Laboratory F

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Bentazone	0,300	0,015	0,278	0,010	µg/l	93%
2,4-D	0,250	0,013	0,369	0,050	µg/l	148%
Dicamba	0,280	0,014	0,365	0,144	µg/l	130%
Dichlorprop	<0,05		<0,025		µg/l	•
MCPA	0,298	0,015	0,318	0,057	µg/l	107%
Mecoprop	0,114	0,006	0,168	0,003	µg/l	147%
Chloridazon	0,353	0,018	1,01	0,116	µg/l	286%
DPhChloridazon	0,456	0,023	n.a.		µg/l	
MDPhChloridazon	0,184	0,009	n.a.		µg/l	



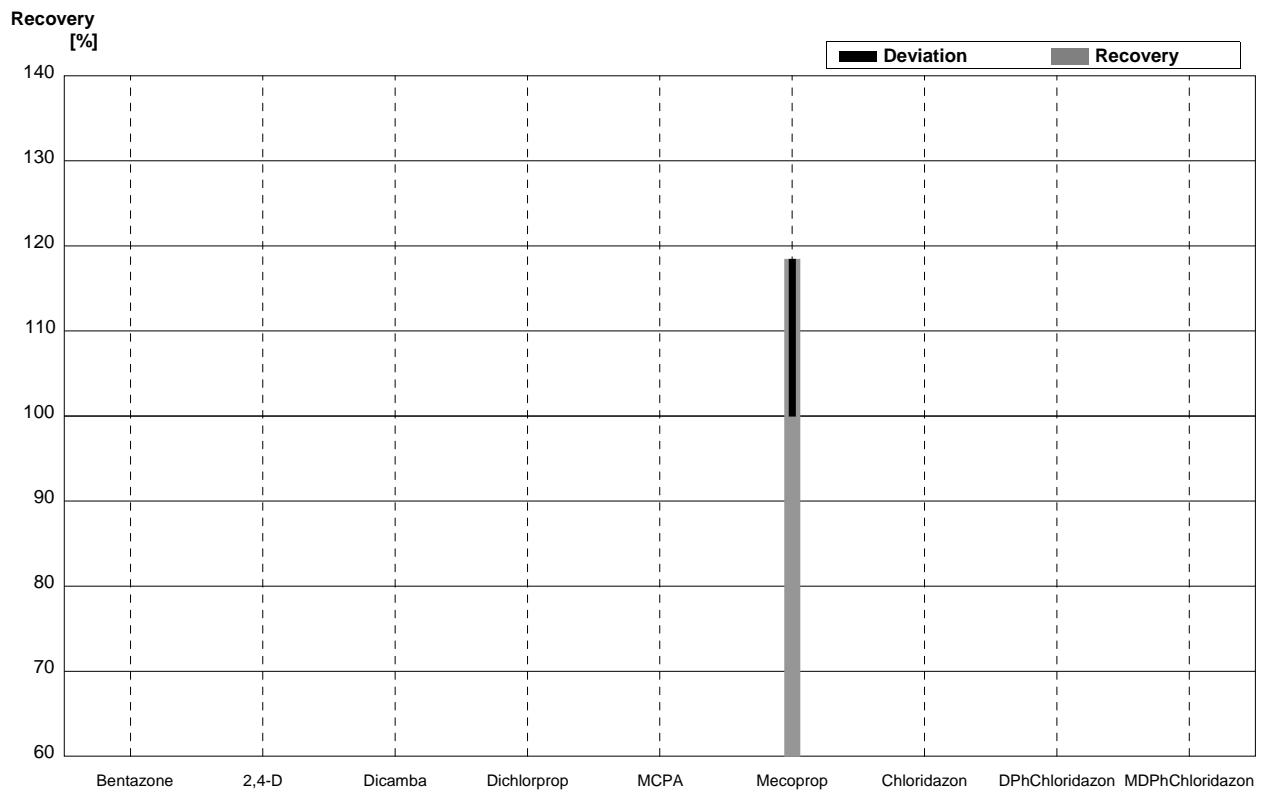
Sample HB87A
Laboratory G

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Bentazone	0,055	0,003			µg/l	
2,4-D	0,203	0,010			µg/l	
Dicamba	0,154	0,008			µg/l	
Dichlorprop	0,072	0,004			µg/l	
MCPA	<0,05				µg/l	
Mecoprop	0,064	0,003	0,076	0,020	µg/l	119%
Chloridazon	0,098	0,005			µg/l	
DPhChloridazon	0,192	0,010			µg/l	
MDPhChloridazon	0,230	0,012			µg/l	



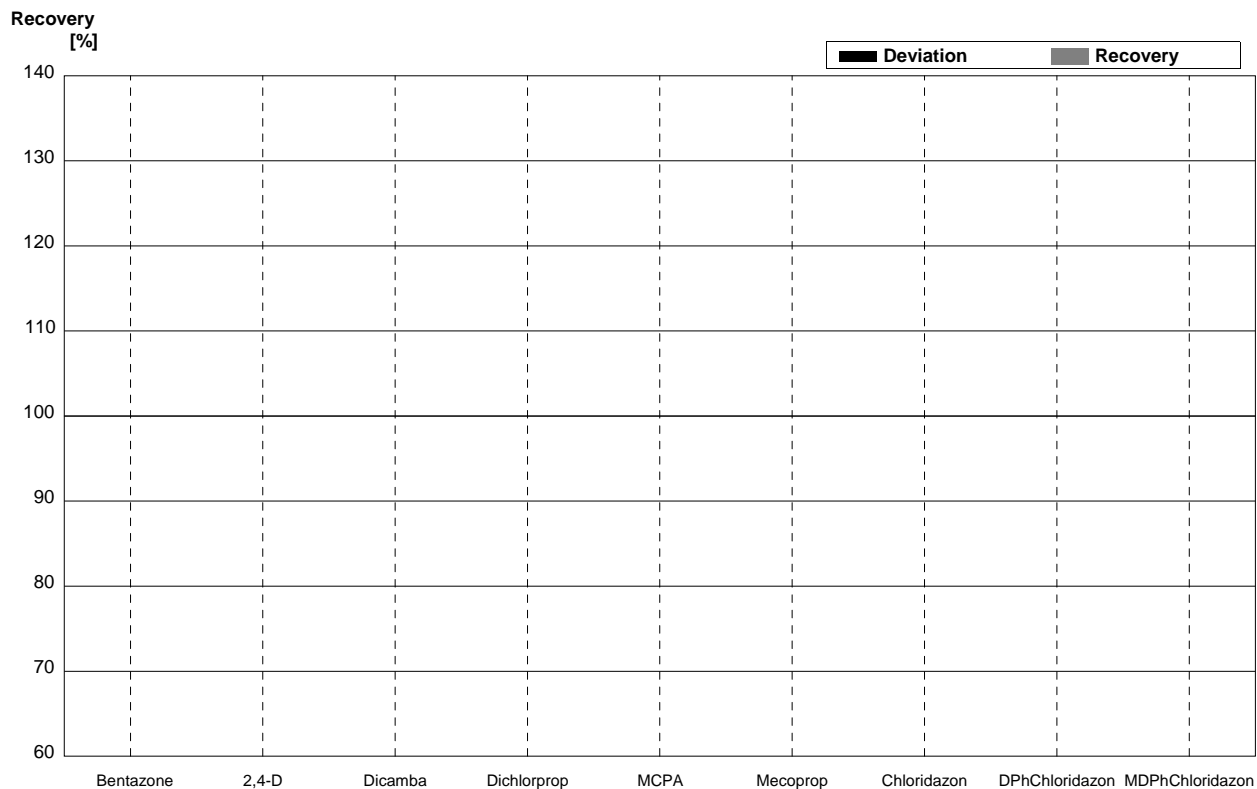
Sample HB87B
Laboratory G

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Bentazone	0,300	0,015			µg/l	
2,4-D	0,250	0,013			µg/l	
Dicamba	0,280	0,014			µg/l	
Dichlorprop	<0,05				µg/l	
MCPA	0,298	0,015			µg/l	
Mecoprop	0,114	0,006	0,135	0,035	µg/l	118%
Chloridazon	0,353	0,018			µg/l	
DPhChloridazon	0,456	0,023			µg/l	
MDPhChloridazon	0,184	0,009			µg/l	



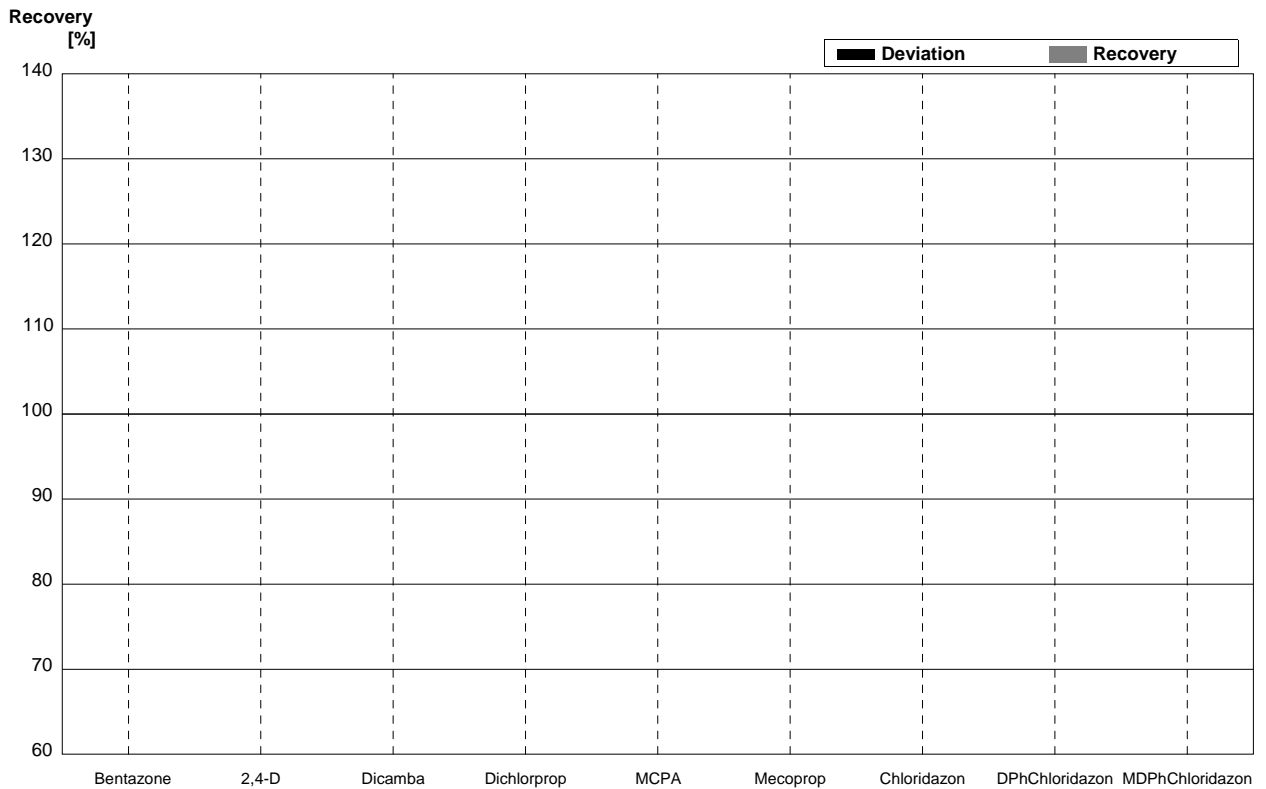
Sample HB87A
Laboratory H

Parameter	Target value	$\pm U (k=2)$	Result	\pm	Unit	Recovery
Bentazone	0,055	0,003			$\mu\text{g/l}$	
2,4-D	0,203	0,010			$\mu\text{g/l}$	
Dicamba	0,154	0,008			$\mu\text{g/l}$	
Dichlorprop	0,072	0,004			$\mu\text{g/l}$	
MCPA	<0,05				$\mu\text{g/l}$	
Mecoprop	0,064	0,003			$\mu\text{g/l}$	
Chloridazon	0,098	0,005			$\mu\text{g/l}$	
DPhChloridazon	0,192	0,010			$\mu\text{g/l}$	
MDPhChloridazon	0,230	0,012			$\mu\text{g/l}$	



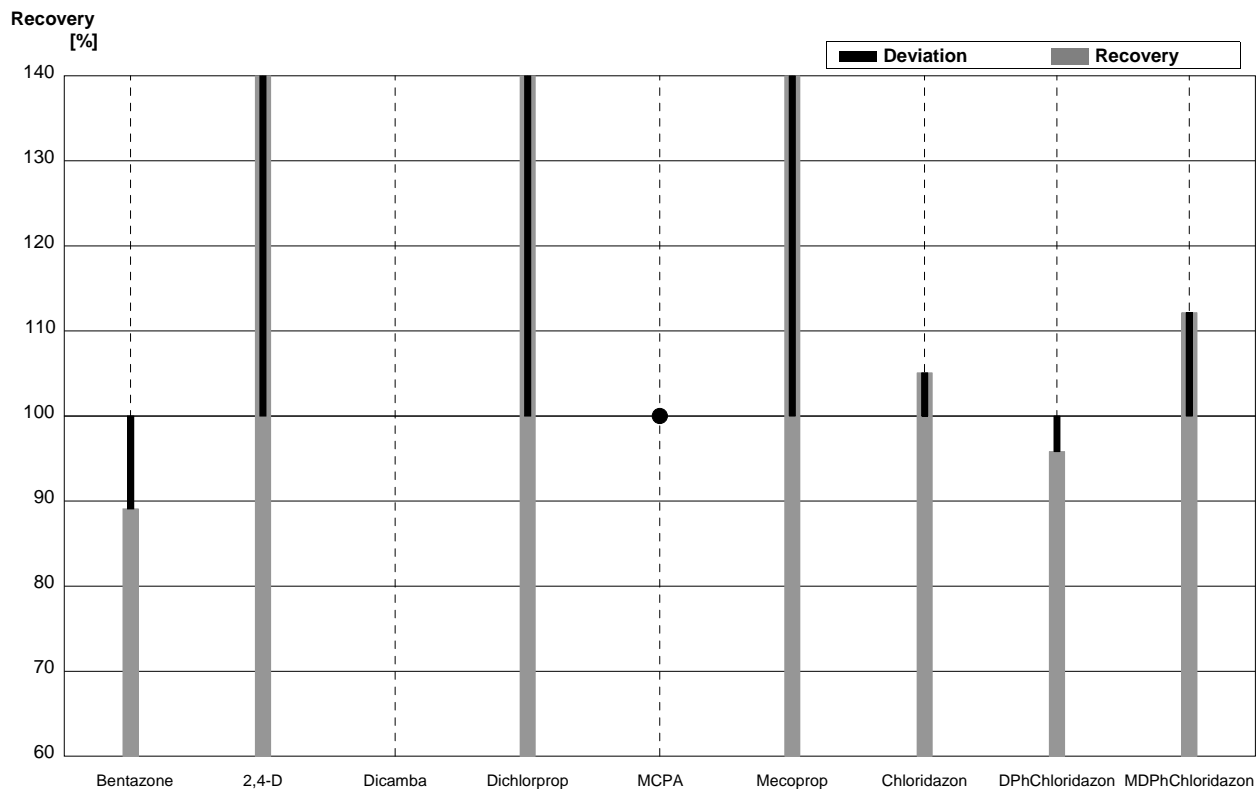
Sample HB87B
Laboratory H

Parameter	Target value	$\pm U (k=2)$	Result	\pm	Unit	Recovery
Bentazone	0,300	0,015			$\mu\text{g/l}$	
2,4-D	0,250	0,013			$\mu\text{g/l}$	
Dicamba	0,280	0,014			$\mu\text{g/l}$	
Dichlorprop	<0,05				$\mu\text{g/l}$	
MCPA	0,298	0,015			$\mu\text{g/l}$	
Mecoprop	0,114	0,006			$\mu\text{g/l}$	
Chloridazon	0,353	0,018			$\mu\text{g/l}$	
DPhChloridazon	0,456	0,023			$\mu\text{g/l}$	
MDPhChloridazon	0,184	0,009			$\mu\text{g/l}$	



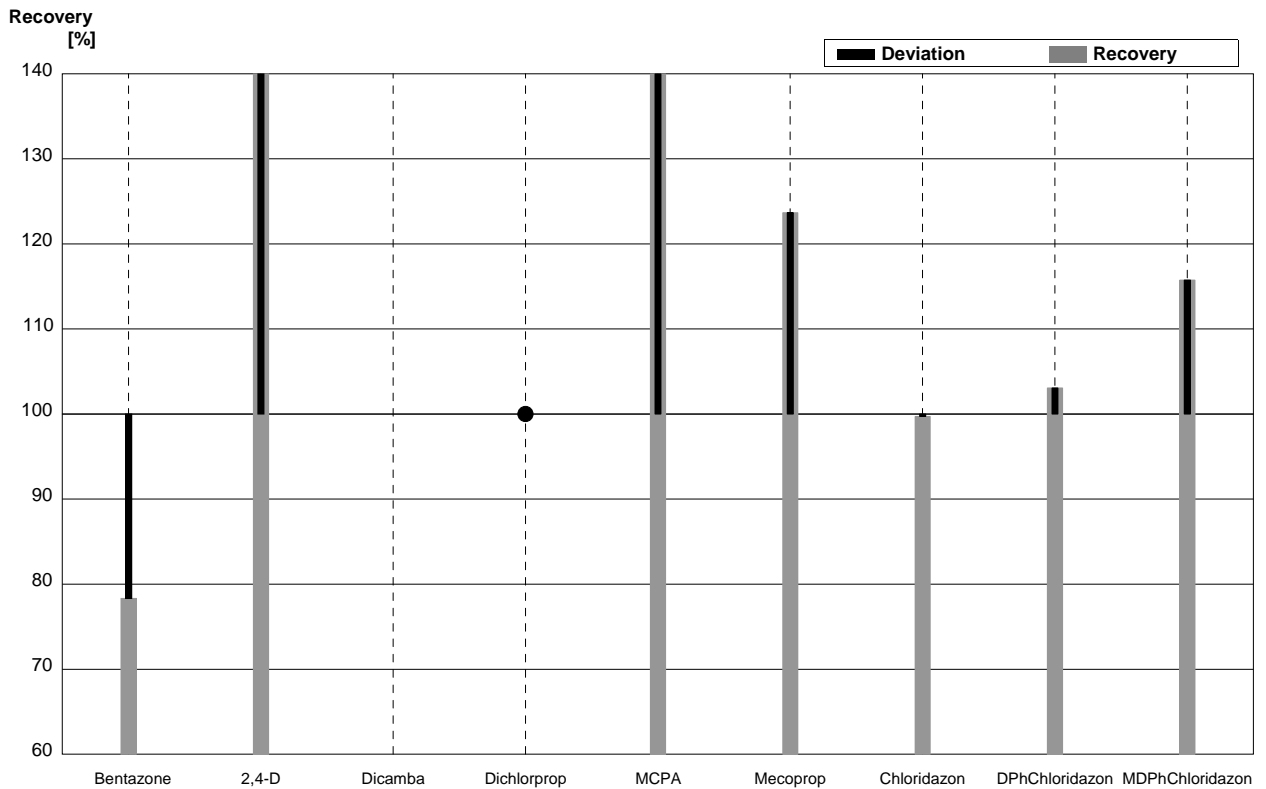
Sample HB87A
Laboratory I

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Bentazone	0,055	0,003	0,049	0,01	µg/l	89%
2,4-D	0,203	0,010	0,404	0,08	µg/l	199%
Dicamba	0,154	0,008			µg/l	
Dichlorprop	0,072	0,004	0,125	0,025	µg/l	174%
MCPA	<0,05		<0,01		µg/l	•
Mecoprop	0,064	0,003	0,093	0,018	µg/l	145%
Chloridazon	0,098	0,005	0,103	0,021	µg/l	105%
DPhChloridazon	0,192	0,010	0,184	0,037	µg/l	96%
MDPhChloridazon	0,230	0,012	0,258	0,052	µg/l	112%



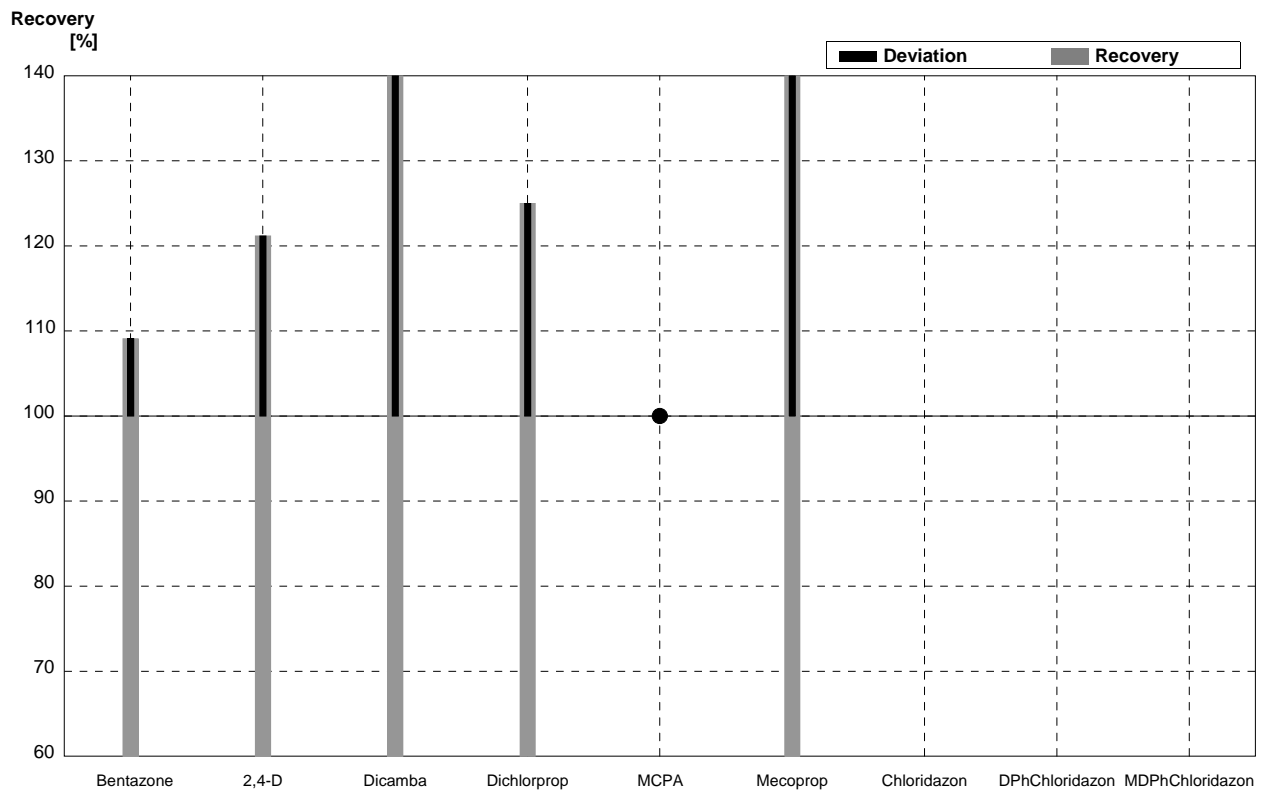
Sample HB87B
Laboratory I

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Bentazone	0,300	0,015	0,235	0,047	µg/l	78%
2,4-D	0,250	0,013	0,543	0,109	µg/l	217%
Dicamba	0,280	0,014			µg/l	
Dichlorprop	<0,05		<0,01		µg/l	•
MCPA	0,298	0,015	0,696	0,139	µg/l	234%
Mecoprop	0,114	0,006	0,141	0,028	µg/l	124%
Chloridazon	0,353	0,018	0,352	0,070	µg/l	100%
DPhChloridazon	0,456	0,023	0,470	0,094	µg/l	103%
MDPhChloridazon	0,184	0,009	0,213	0,043	µg/l	116%



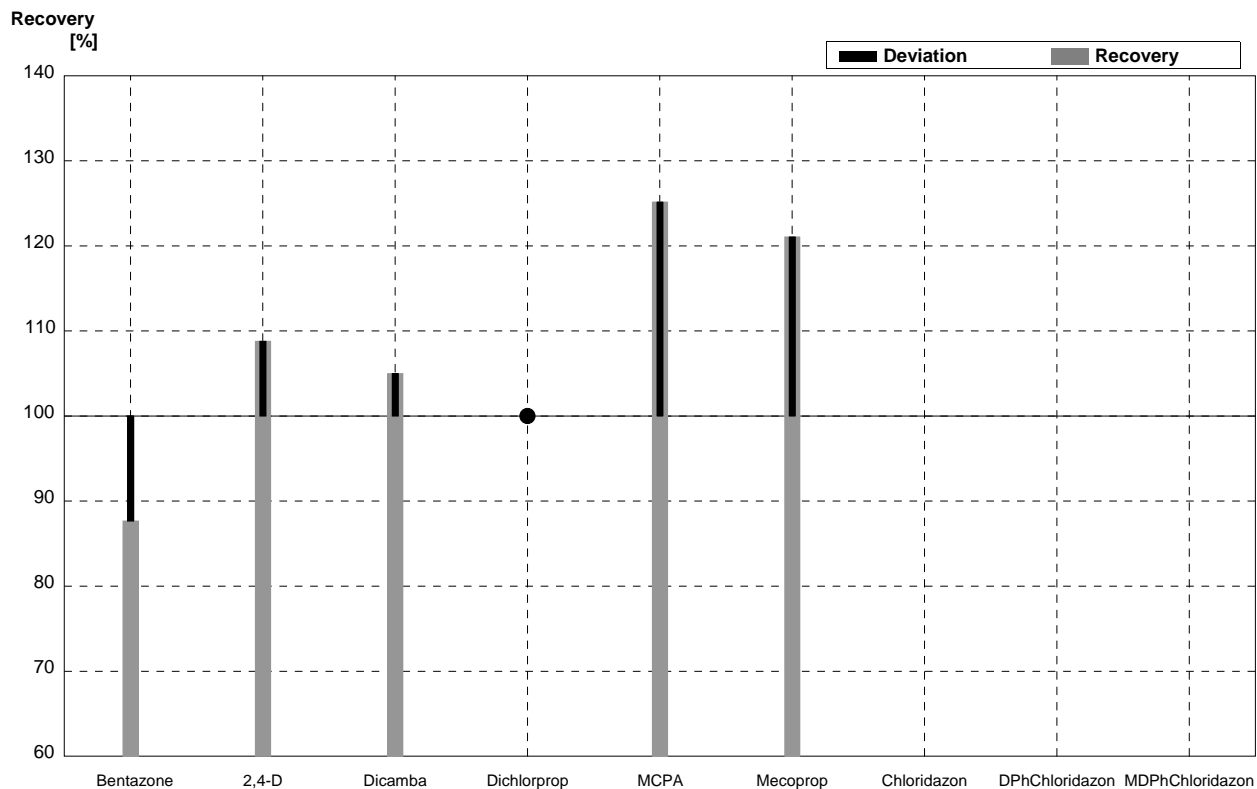
Sample HB87A
Laboratory J

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Bentazone	0,055	0,003	0,06	0,02	µg/l	109%
2,4-D	0,203	0,010	0,246	0,06	µg/l	121%
Dicamba	0,154	0,008	0,240	0,06	µg/l	156%
Dichlorprop	0,072	0,004	0,09	0,02	µg/l	125%
MCPA	<0,05		<0,05	0,02	µg/l	•
Mecoprop	0,064	0,003	0,09	0,02	µg/l	141%
Chloridazon	0,098	0,005			µg/l	
DPhChloridazon	0,192	0,010			µg/l	
MDPhChloridazon	0,230	0,012			µg/l	



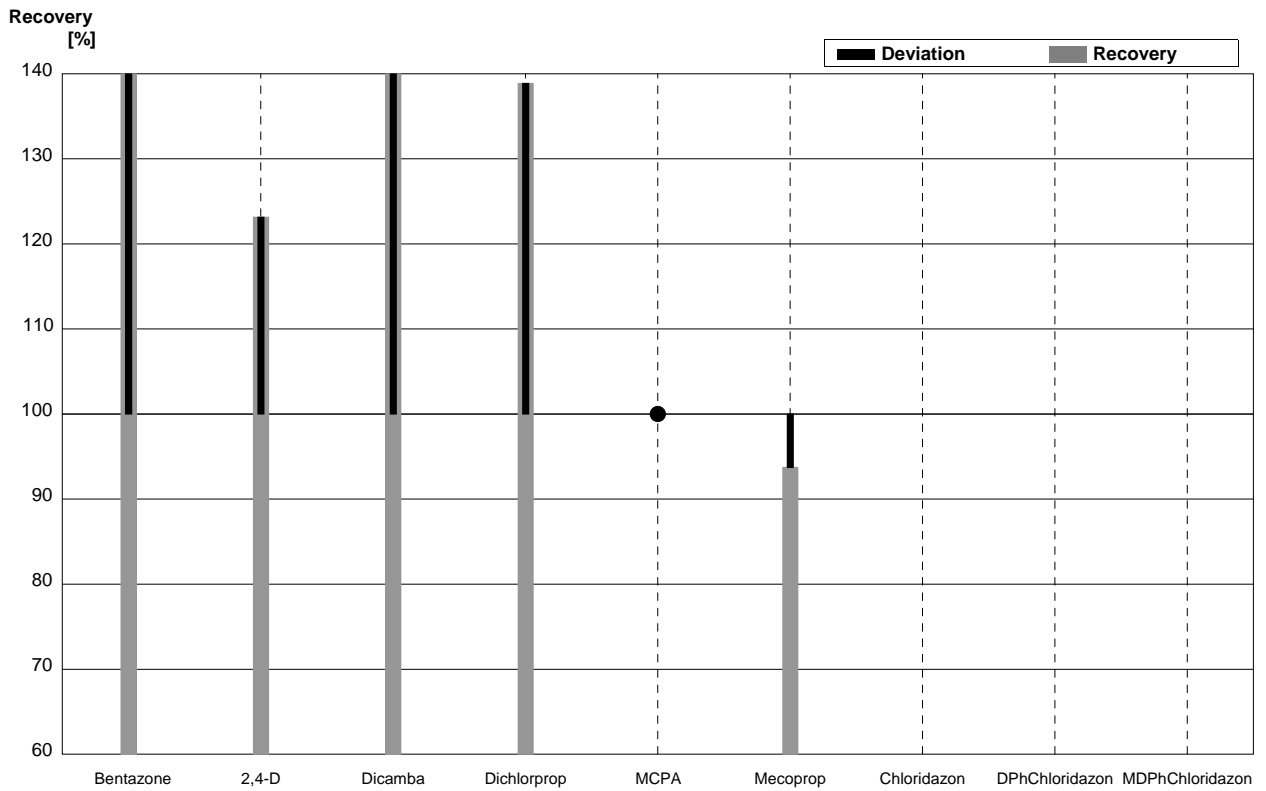
Sample HB87B
Laboratory J

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Bentazone	0,300	0,015	0,263	0,07	µg/l	88%
2,4-D	0,250	0,013	0,272	0,07	µg/l	109%
Dicamba	0,280	0,014	0,294	0,07	µg/l	105%
Dichlorprop	<0,05		<0,05	0,02	µg/l	•
MCPA	0,298	0,015	0,373	0,09	µg/l	125%
Mecoprop	0,114	0,006	0,138	0,03	µg/l	121%
Chloridazon	0,353	0,018			µg/l	
DPhChloridazon	0,456	0,023			µg/l	
MDPhChloridazon	0,184	0,009			µg/l	



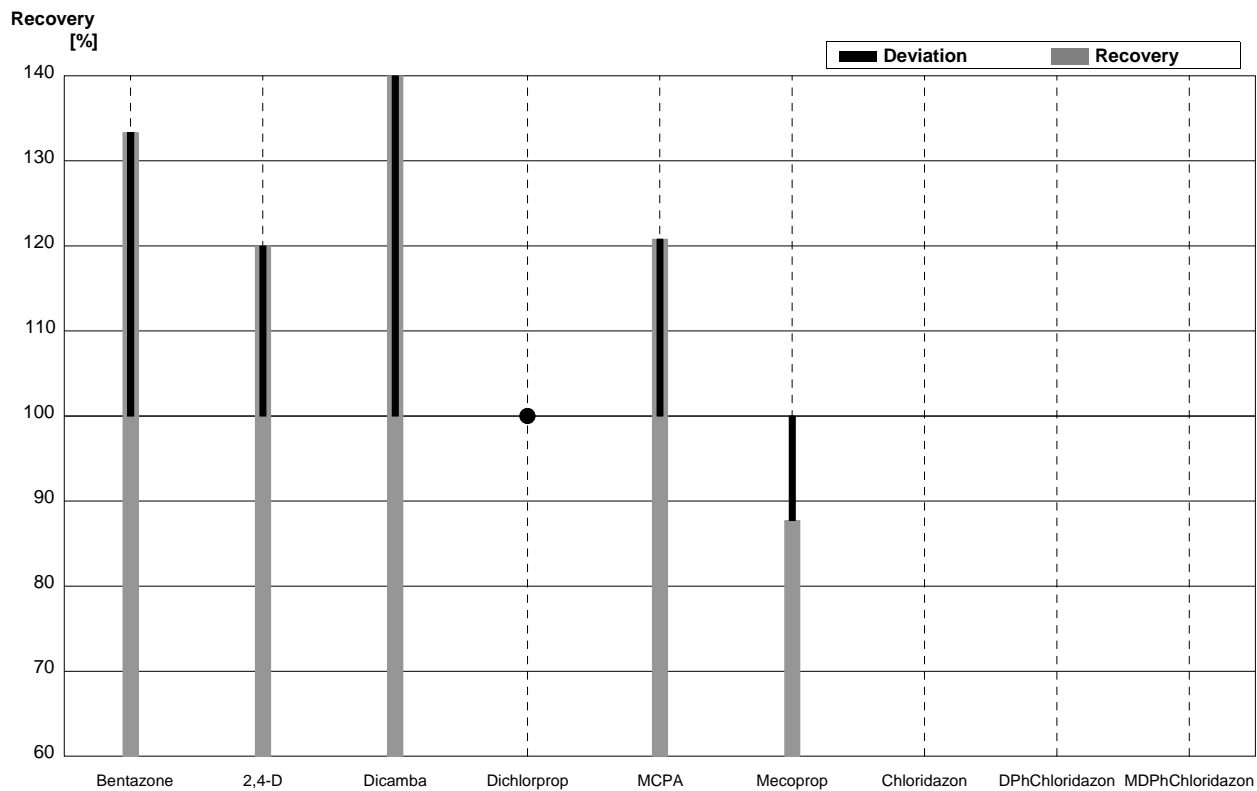
Sample HB87A
Laboratory K

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Bentazone	0,055	0,003	0,24	0,02	µg/l	436%
2,4-D	0,203	0,010	0,25	0,02	µg/l	123%
Dicamba	0,154	0,008	0,28	0,03	µg/l	182%
Dichlorprop	0,072	0,004	0,10	0,02	µg/l	139%
MCPA	<0,05		<0,05		µg/l	•
Mecoprop	0,064	0,003	0,06	0,02	µg/l	94%
Chloridazon	0,098	0,005			µg/l	
DPhChloridazon	0,192	0,010			µg/l	
MDPhChloridazon	0,230	0,012			µg/l	



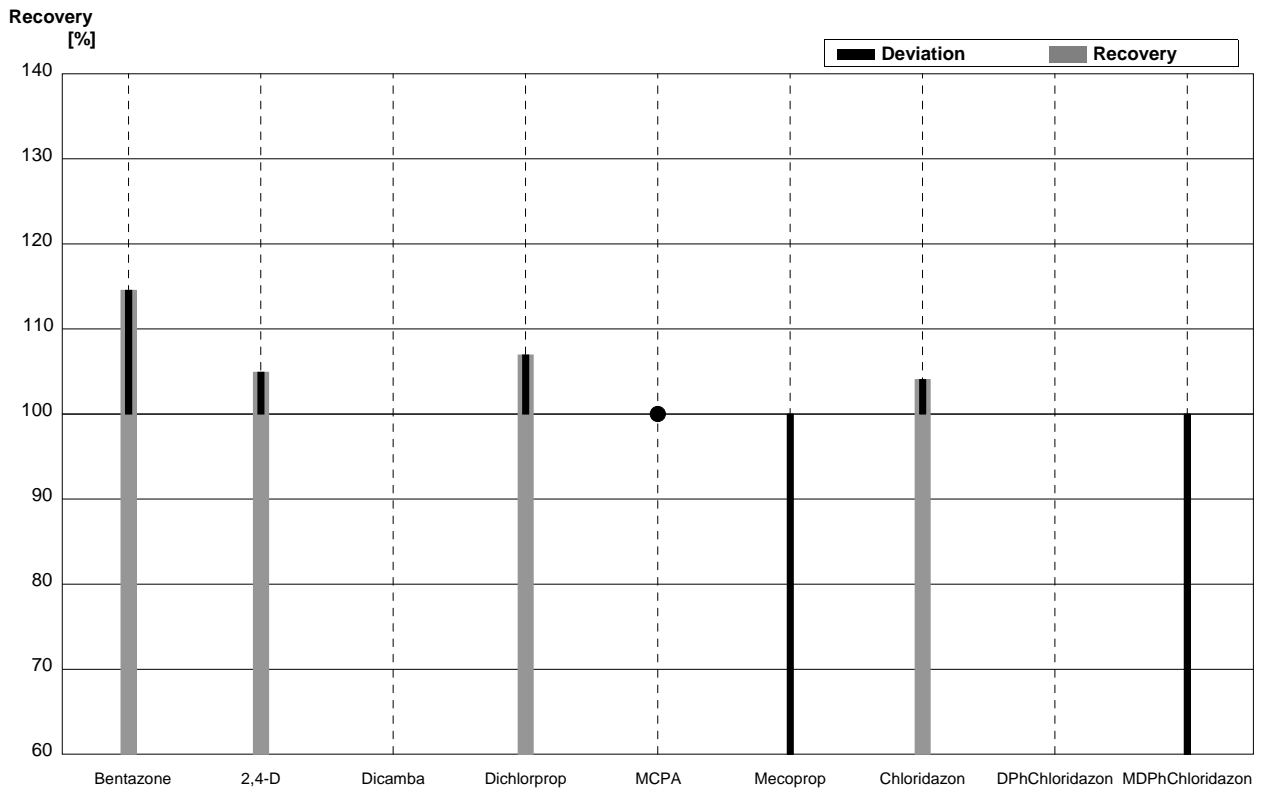
Sample HB87B
Laboratory K

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Bentazone	0,300	0,015	0,40	0,05	µg/l	133%
2,4-D	0,250	0,013	0,30	0,02	µg/l	120%
Dicamba	0,280	0,014	0,40	0,05	µg/l	143%
Dichlorprop	<0,05		<0,05		µg/l	•
MCPA	0,298	0,015	0,36	0,02	µg/l	121%
Mecoprop	0,114	0,006	0,10	0,02	µg/l	88%
Chloridazon	0,353	0,018			µg/l	
DPhChloridazon	0,456	0,023			µg/l	
MDPhChloridazon	0,184	0,009			µg/l	



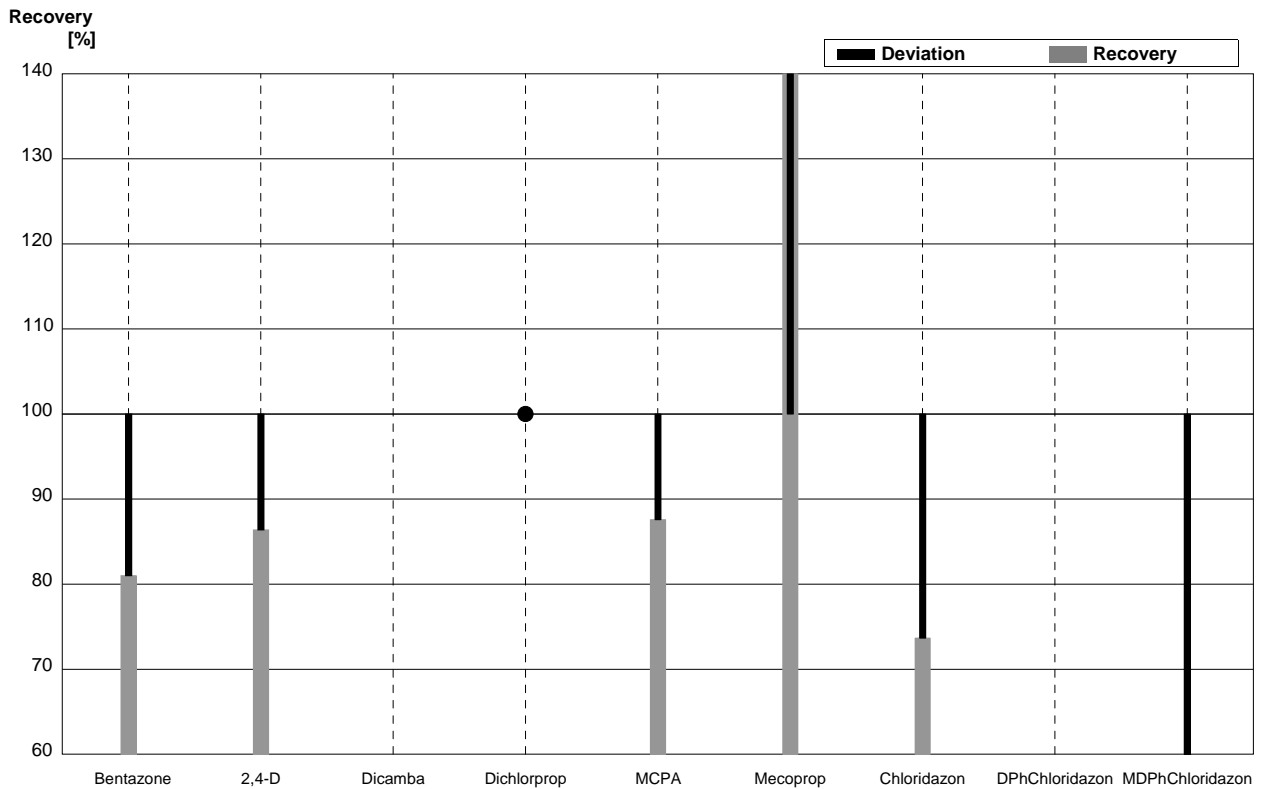
Sample HB87A
Laboratory L

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Bentazone	0,055	0,003	0,063		µg/l	115%
2,4-D	0,203	0,010	0,213		µg/l	105%
Dicamba	0,154	0,008			µg/l	
Dichlorprop	0,072	0,004	0,077		µg/l	107%
MCPA	<0,05		<0,010		µg/l	•
Mecoprop	0,064	0,003	0,034		µg/l	53%
Chloridazon	0,098	0,005	0,102		µg/l	104%
DPhChloridazon	0,192	0,010			µg/l	
MDPhChloridazon	0,230	0,012	0,096		µg/l	42%



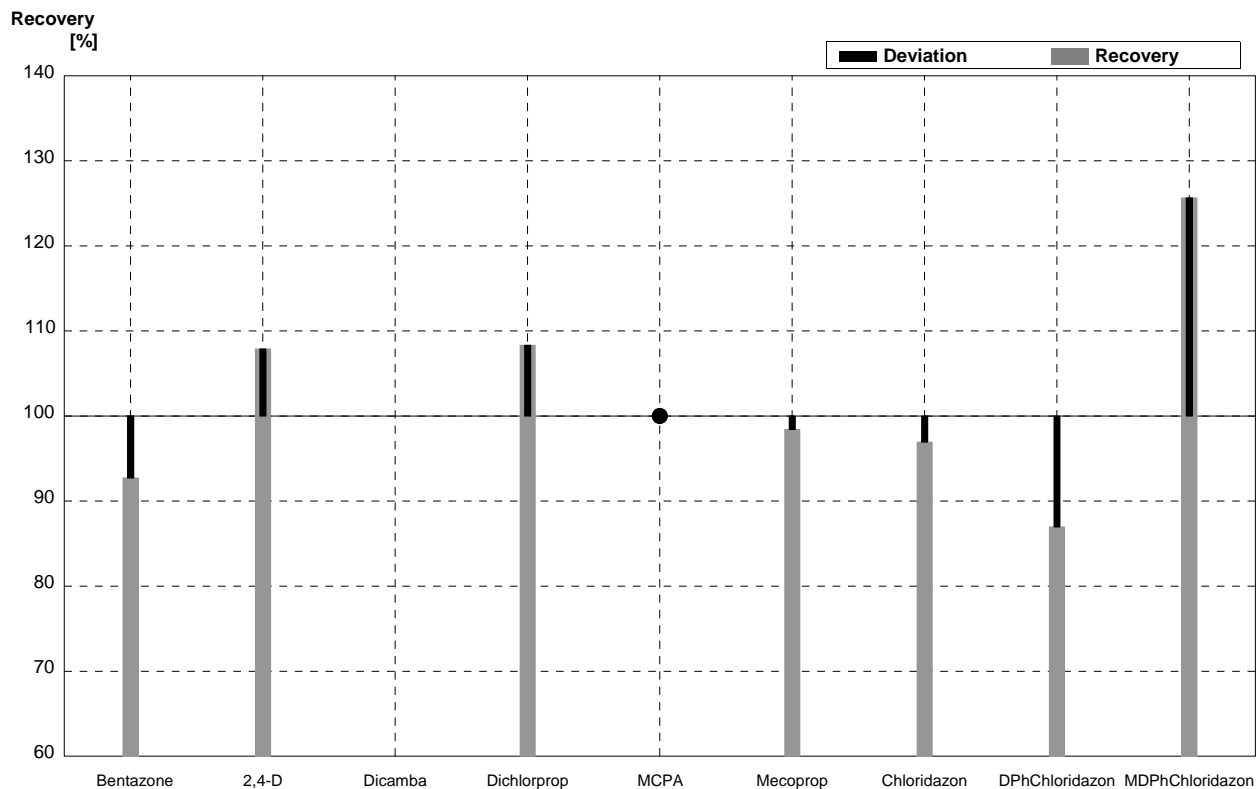
Sample HB87B
Laboratory L

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Bentazone	0,300	0,015	0,243		µg/l	81%
2,4-D	0,250	0,013	0,216		µg/l	86%
Dicamba	0,280	0,014			µg/l	
Dichlorprop	<0,05		<0,020		µg/l	•
MCPA	0,298	0,015	0,261		µg/l	88%
Mecoprop	0,114	0,006	0,275		µg/l	241%
Chloridazon	0,353	0,018	0,260		µg/l	74%
DPhChloridazon	0,456	0,023			µg/l	
MDPhChloridazon	0,184	0,009	0,063		µg/l	34%



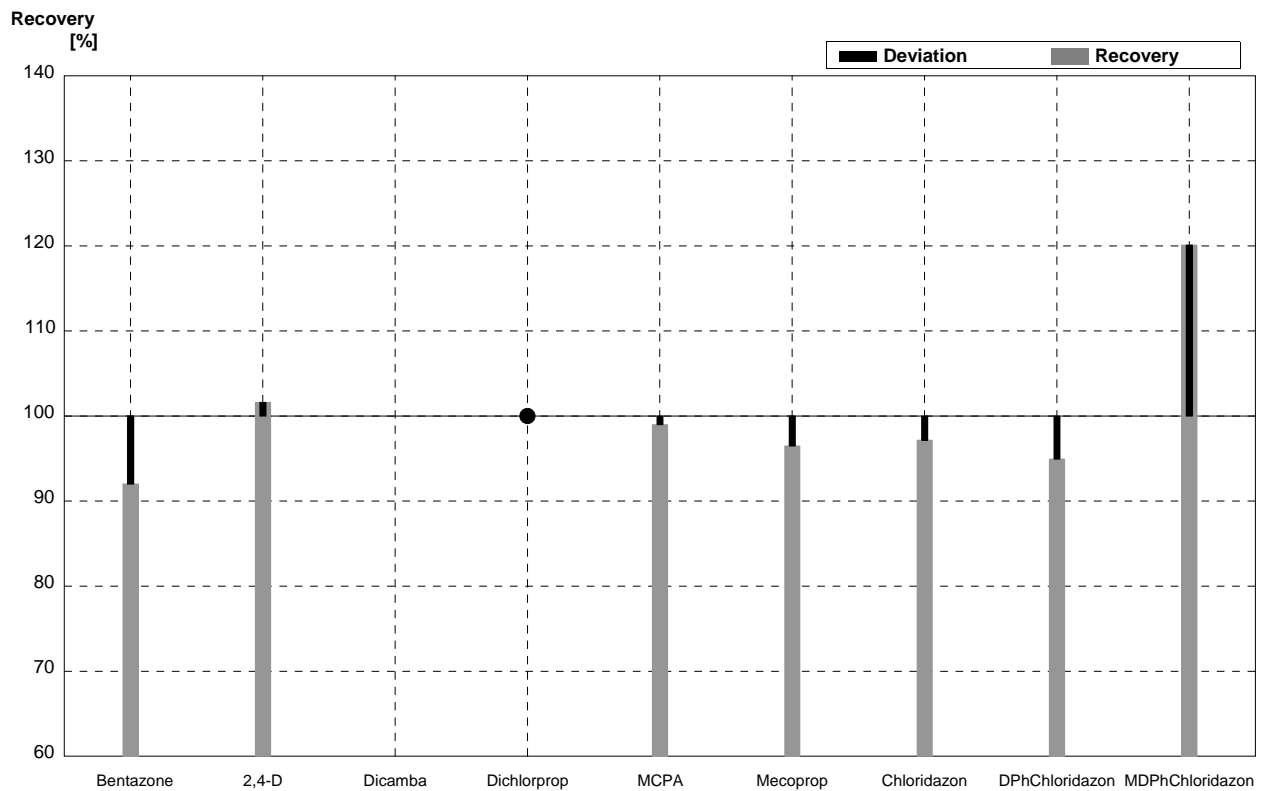
Sample HB87A
Laboratory M

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Bentazone	0,055	0,003	0,051	0,002	µg/l	93%
2,4-D	0,203	0,010	0,219	0,022	µg/l	108%
Dicamba	0,154	0,008			µg/l	
Dichlorprop	0,072	0,004	0,078	0,006	µg/l	108%
MCPA	<0,05		<0,01		µg/l	•
Mecoprop	0,064	0,003	0,063	0,005	µg/l	98%
Chloridazon	0,098	0,005	0,095	0,008	µg/l	97%
DPhChloridazon	0,192	0,010	0,167	0,011	µg/l	87%
MDPhChloridazon	0,230	0,012	0,289	0,030	µg/l	126%



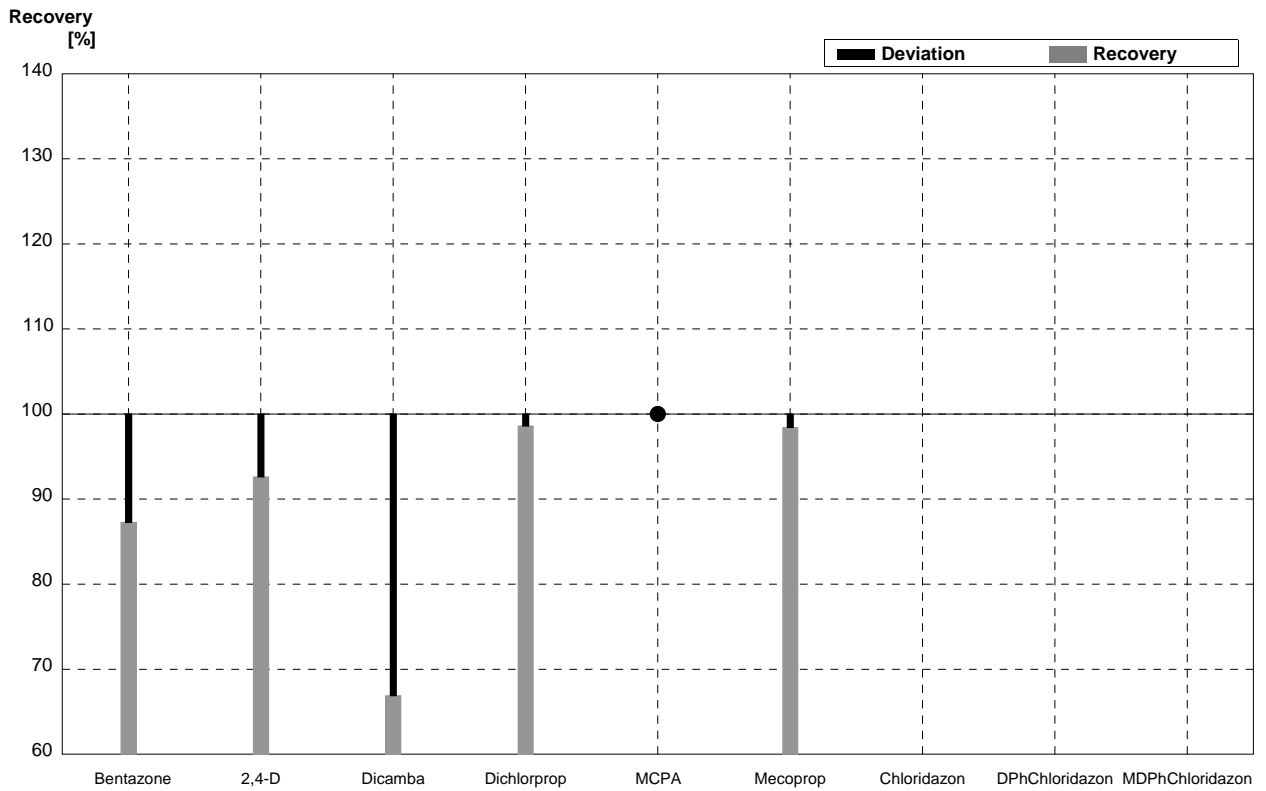
Sample HB87B
Laboratory M

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Bentazone	0,300	0,015	0,276	0,011	µg/l	92%
2,4-D	0,250	0,013	0,254	0,026	µg/l	102%
Dicamba	0,280	0,014			µg/l	
Dichlorprop	<0,05		<0,01		µg/l	•
MCPA	0,298	0,015	0,295	0,025	µg/l	99%
Mecoprop	0,114	0,006	0,110	0,009	µg/l	96%
Chloridazon	0,353	0,018	0,343	0,056	µg/l	97%
DPhChloridazon	0,456	0,023	0,433	0,042	µg/l	95%
MDPhChloridazon	0,184	0,009	0,221	0,023	µg/l	120%



Sample HB87A
Laboratory N

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Bentazone	0,055	0,003	0,048	0,005	µg/l	87%
2,4-D	0,203	0,010	0,188	0,18	µg/l	93%
Dicamba	0,154	0,008	0,103	0,01	µg/l	67%
Dichlorprop	0,072	0,004	0,071	0,007	µg/l	99%
MCPA	<0,05		<0,02		µg/l	•
Mecoprop	0,064	0,003	0,063	0,006	µg/l	98%
Chloridazon	0,098	0,005			µg/l	
DPhChloridazon	0,192	0,010			µg/l	
MDPhChloridazon	0,230	0,012			µg/l	



Sample HB87B
Laboratory N

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Bentazone	0,300	0,015	0,271	0,027	µg/l	90%
2,4-D	0,250	0,013	0,229	0,023	µg/l	92%
Dicamba	0,280	0,014	0,252	0,0252	µg/l	90%
Dichlorprop	<0,05		<0,02		µg/l	•
MCPA	0,298	0,015	0,273	0,027	µg/l	92%
Mecoprop	0,114	0,006	0,118	0,012	µg/l	104%
Chloridazon	0,353	0,018			µg/l	
DPhChloridazon	0,456	0,023			µg/l	
MDPhChloridazon	0,184	0,009			µg/l	

