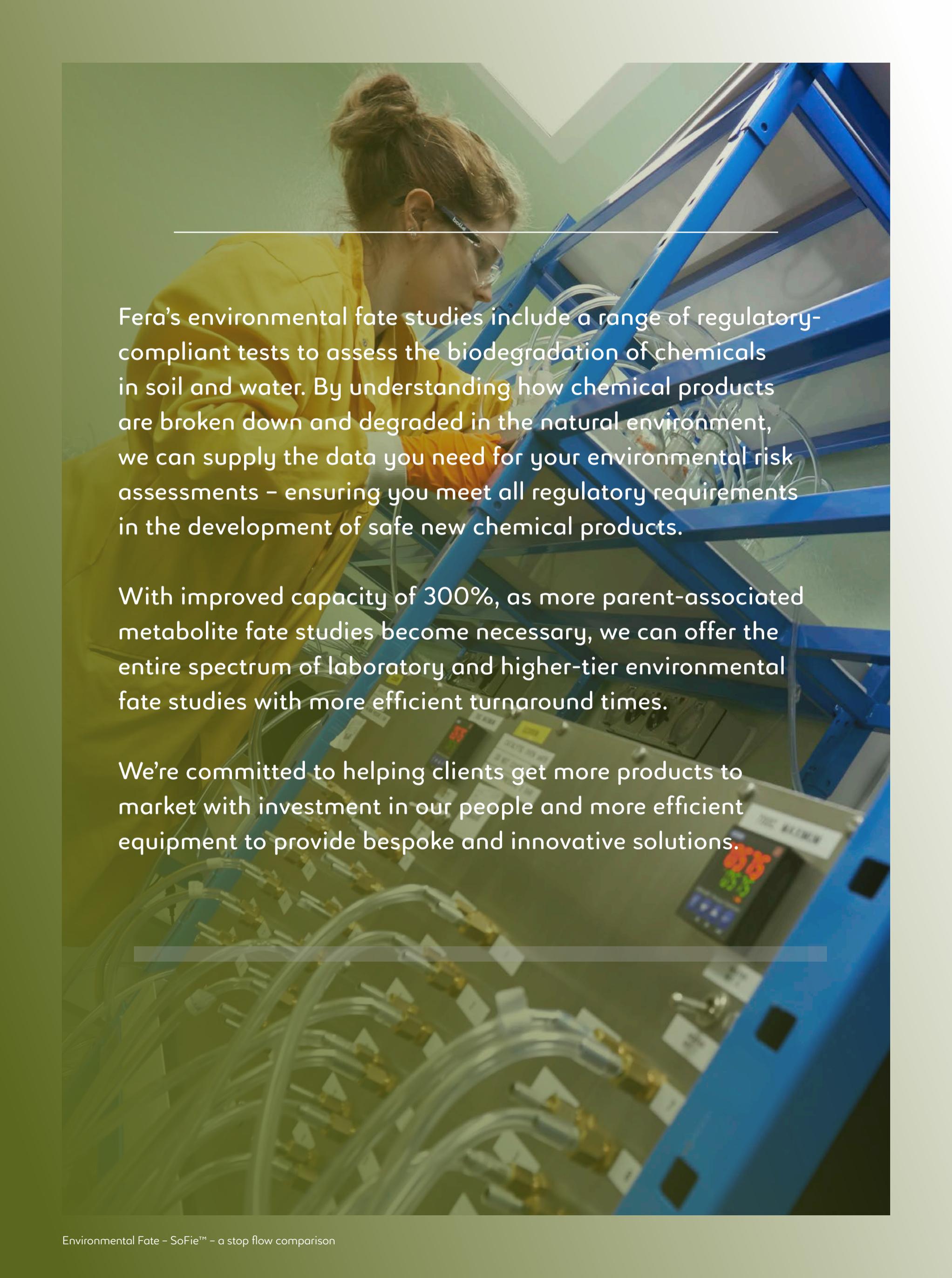




Original thinking... applied

Environmental Fate

SoFie™ – a stop flow comparison



Fera's environmental fate studies include a range of regulatory-compliant tests to assess the biodegradation of chemicals in soil and water. By understanding how chemical products are broken down and degraded in the natural environment, we can supply the data you need for your environmental risk assessments – ensuring you meet all regulatory requirements in the development of safe new chemical products.

With improved capacity of 300%, as more parent-associated metabolite fate studies become necessary, we can offer the entire spectrum of laboratory and higher-tier environmental fate studies with more efficient turnaround times.

We're committed to helping clients get more products to market with investment in our people and more efficient equipment to provide bespoke and innovative solutions.

Discover our full range of Degradation Services:

- Aerobic and Anaerobic Transformation in Soil (OECD 307)
- Aerobic and Anaerobic Transformation in Aquatic Sediment Systems (OECD 308)
- Aerobic Mineralisation in Surface Water – Simulation Biodegradation Test (OECD 309)
- Ready Biodegradability – CO₂ in sealed vessels (Headspace Test) (OECD 310)
- Simulation Tests to Assess the Biodegradability of Chemicals Discharged in Wastewater (OECD 314)
- Phototransformation of Chemicals in Water – Direct Photolysis (OECD 316)
- Field dissipation studies for actives and transformation products (EFSA 2014/NAFTA 2006)

HPLC (High Performance Liquid Chromatography) lab

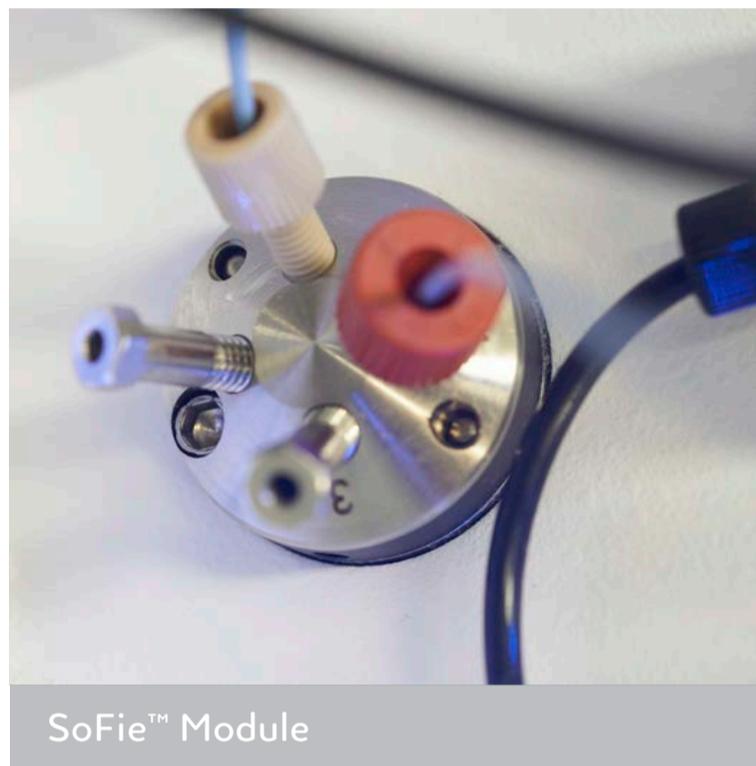
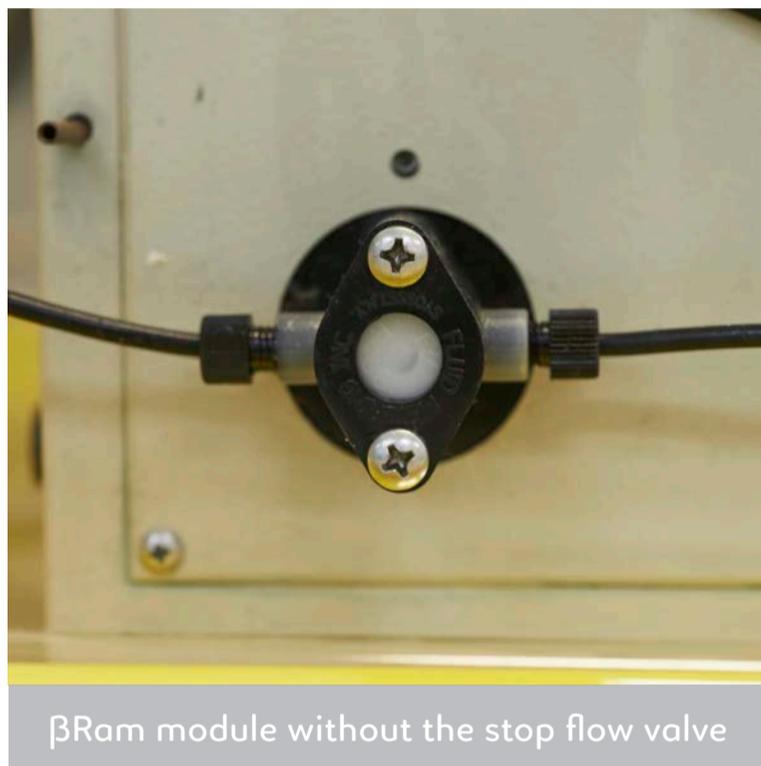
Our investment in our HPLC lab provides customers with a more efficient and cost effective service. With our SoFie™ modules we can detect smaller levels of radioactivity due to the stop-flow mechanism. With improved sensitivity of signal to noise SoFie™ gives better counting statistics without adversely affecting the chromatography.



What is stop flow?

SoFie™ can be used in order to detect smaller levels of radioactivity due to the stop-flow mechanism. This takes a snapshot of the sample at regular intervals, which can be adjusted according to the sample.

This provides the customer with more reliable transformation results.



SoFie™ can be used on any ¹⁴C and tritium based study including:

-  Soil degradation
-  Mineralisation
-  Hydrolysis
-  Photolysis
-  ADME

Improving results, whilst saving time and money

Stop flow delivers detection limits that are comparable to offline counting, eliminating the need for fraction collection, a labour intensive process, with expensive consumables and the need for manual data transfer and QC checking.

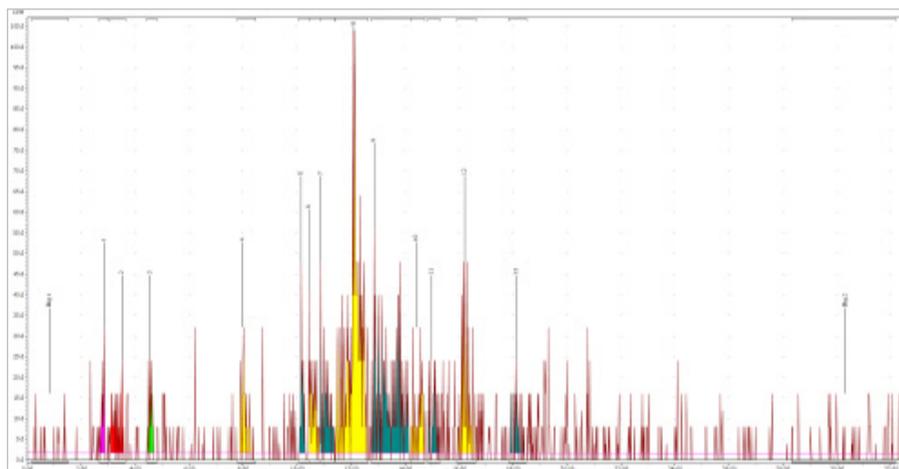
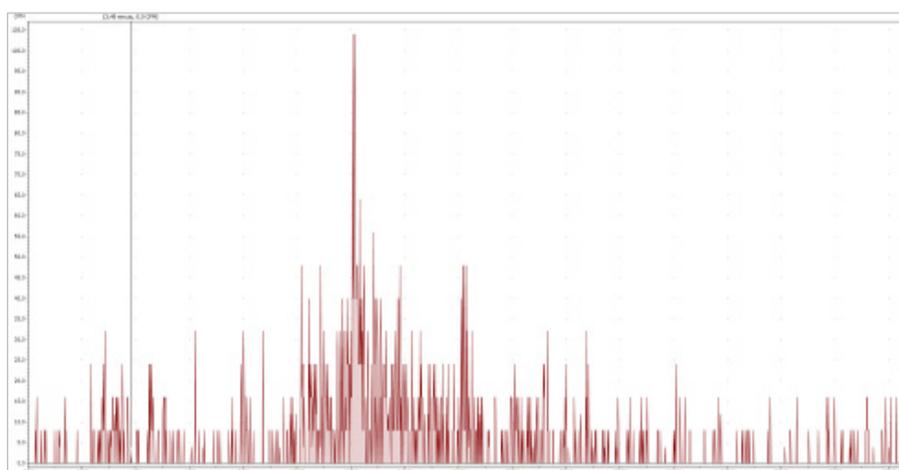
The stop flow method has the advantage of needing much less user involvement, by improving the necessary sampling and data interpretation process, by producing a full, automated chromatogram at the end of the run rather than requiring a manual splicing process from other instruments, improving the turnaround time for customers and reducing costs.

Stop Flow Comparison

Analysis conducted with direct injection

The following chromatograms are recent data from a poorly soluble (<24µg/L), highly metabolised chemical under aerobic conditions. The chromatograms represent direct analysis from a surface water sample using the same detector in different modes. One chromatogram via direct analysis mode and the other under stop-flow conditions.

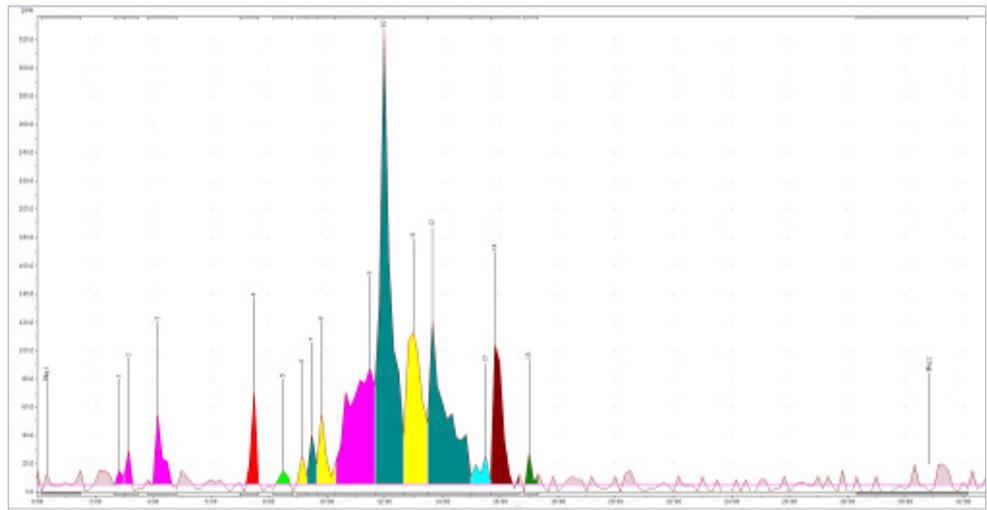
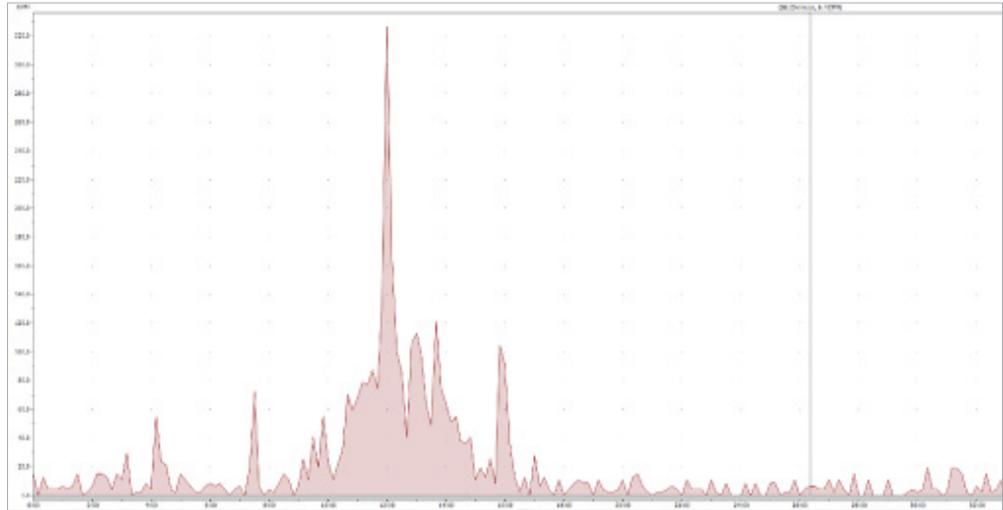
The stop-flow allowed better resolution between 'true' detections of ¹⁴C transformation products and background levels. This enables the operator to better determine individual peaks, reducing the risk of integrating multiple components as one larger peak. This decreases the risk of triggering artificial 'major' metabolites and improves the reliability of the transformation data at lower levels of radioactivity (50 dpm).



fera
Original thinking... applied

Name (C-14)	Colour	Start (mm:ss)	End (mm:ss)	Retention (mm:ss)	Area (CPM)	Background (CPM)	%Total (%)	%ROI (%)	Peak Type
Bkg 1		0:10	1:31	0:50		12.6			
1		2:40	3:01	2:51	108.8		1.72	1.94 To Baseline	
2		3:05	3:38	3:30	240.7		3.80	4.30 To Baseline	
3		4:26	4:48	4:33	131.2		2.07	2.34 To Baseline	
4		7:47	8:28	8:00	203.7		3.21	3.64 To Baseline	
5		10:03	10:26	10:09	161.8		2.55	2.89 To Baseline	
6		10:26	10:51	10:26	278.5		4.39	4.97 To Baseline	
7		10:51	11:24	10:53	361.2		5.70	6.45 To Baseline	
8		11:26	12:38	12:06	1728.5		27.27	30.87 To Baseline	
9		12:44	14:12	12:51	1254.2		19.79	22.40 To Baseline	
10		14:12	14:44	14:25	291.0		4.59	5.20 To Baseline	
11		14:51	15:17	15:00	221.0		3.49	3.95 To Baseline	
12		15:56	16:37	16:13	452.3		7.13	8.08 To Baseline	
13		17:50	18:30	18:07	166.0		2.62	2.97 To Baseline	
Bkg 2		28:20	32:11	30:19		12.2			
13 Peaks					5598.9		88.33	100.00	
Total Area					6338.9		100.00		
Background						12.4			

Analysis conducted by Stop Flow





Original thinking... applied

Name (C-14)	Colour	Start (mm:ss)	End (mm:ss)	Retention (mm:ss)	Area (DPM)	Background (CPM)	%Total (%)	%ROI (%)	Peak Type
Bkg 1		0:10	1:30	0:20		15.0			
1	Magenta	2:40	3:00	2:50	8.5		0.30	0.30	To Baseline
2	Magenta	3:00	3:30	3:10	24.5		0.87	0.87	To Baseline
3	Magenta	3:50	4:50	4:10	85.3		3.01	3.01	To Baseline
4	Red	7:00	7:40	7:30	76.7		2.71	2.71	To Baseline
5	Green	8:10	8:50	8:30	14.8		0.52	0.52	To Baseline
6	Yellow	9:00	9:20	9:10	21.3		0.75	0.75	To Baseline
7	Teal	9:20	9:40	9:30	40.5		1.43	1.43	To Baseline
8	Yellow	9:40	10:20	9:50	87.3		3.08	3.09	To Baseline
9	Magenta	10:20	11:40	11:30	452.1		15.96	15.98	To Baseline
10	Teal	11:40	12:40	12:00	851.3		30.05	30.09	To Baseline
11	Yellow	12:40	13:30	13:00	395.7		13.97	13.98	To Baseline
12	Teal	13:30	15:00	13:40	482.9		17.05	17.07	To Baseline
13	Cyan	15:00	15:40	15:30	46.7		1.65	1.65	To Baseline
14	Dark Red	15:40	16:40	15:50	223.7		7.90	7.91	To Baseline
15	Green	16:50	17:20	17:00	17.9		0.63	0.63	To Baseline
Bkg 2		28:20	32:10	30:50		15.4			
15 Peaks					2829.2		99.87	100.00	
Total Area					2832.8		100.00		
Background						15.2			



Soil Photolysis

Designed by our own scientist's original thinking our unique incubation rig provides more reliable testing for our customers with improved mass balance, temperature control, airflow and soil moisture regulation.



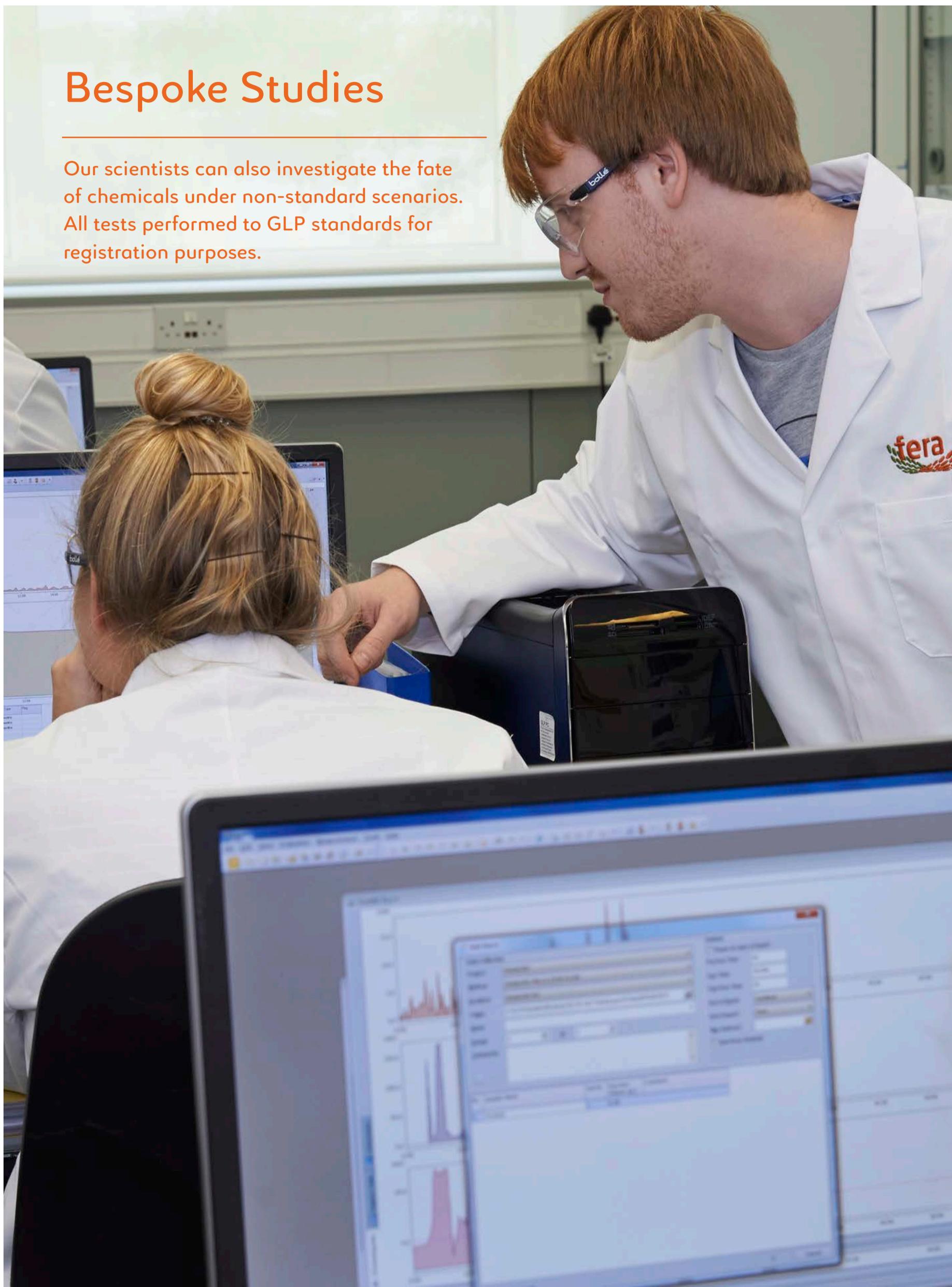
Plant Uptake Factor studies

Fera has been a key participant into standardised IVA/ ECPA protocol design with the main objectives being to propose a new standardised, validated test design to drive Plant Uptake Factors (PUF) for regulatory leaching models.

Using our GLP compliant hydroponic system to evaluate a more accurate plant uptake factor enables you to estimate potential ground and surface water concentrations of your Plant Protection Products and refine your chemical exposure, aiding that more successful path to registration.

Bespoke Studies

Our scientists can also investigate the fate of chemicals under non-standard scenarios. All tests performed to GLP standards for registration purposes.





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