



# Application Report

## Pesticide Testing in Cannabis



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As Cannabis production becomes legalised across the United States and Australia the governing regulations regarding the use of pesticides have not been looked into. With no regulations in place, the safety of patients and consumers is at risk. There are risks that pesticides deemed illegal or harmful to humans or wildlife can be used during the production of cannabis and go undetected, resulting in pesticides considered dangerous for human consumption being inhaled, ingested and absorbed. As a pharmaceutical drug, Cannabis should be rigorously tested to comply with stringent rules and regulations regarding quality and safety of the product. As there is currently no centralised regulatory body for Cannabis quality control, responsibility for testing falls to the dispenser, manufacturer and even the individual consumer - if they are growing their own for personal medical use. To circumvent potential criminal restrictions, many providers of Medicinal Cannabis are also responsible for the cultivation or manufacture of the finished edible product. Growers and dispensers need to protect themselves against future potential lawsuits – similar to the pharmaceutical industry, as well as protecting the consumer.

Pesticides, herbicides, fungicides and other chemicals used in cultivation and storage of cannabis products could remain within the plant structure and result in a patient being exposed to potentially toxic chemicals. Screening for these chemicals is fundamental.

Pesticides in Cannabis were tested by using a readily available standard to show that the compounds can be clearly and easily detected when using an Ellutia 200 Series Gas Chromatograph.

# GC Conditions

Injector Temperature (°C):	250
Detector Type:	FID
Detector Temperature:	300°C
Carrier Gas Type:	Hydrogen
Simulated Constant Flow:	3.5ml min <sup>-1</sup>
Split Flow:	70ml min <sup>-1</sup>
Column Type:	EL-5 30 m x 0.25 mm x 0.25µm
Initial Temperature:	100°C
Ramp 1:	30 °C min <sup>-1</sup> to 200 °C (hold 5 mins)

# Results

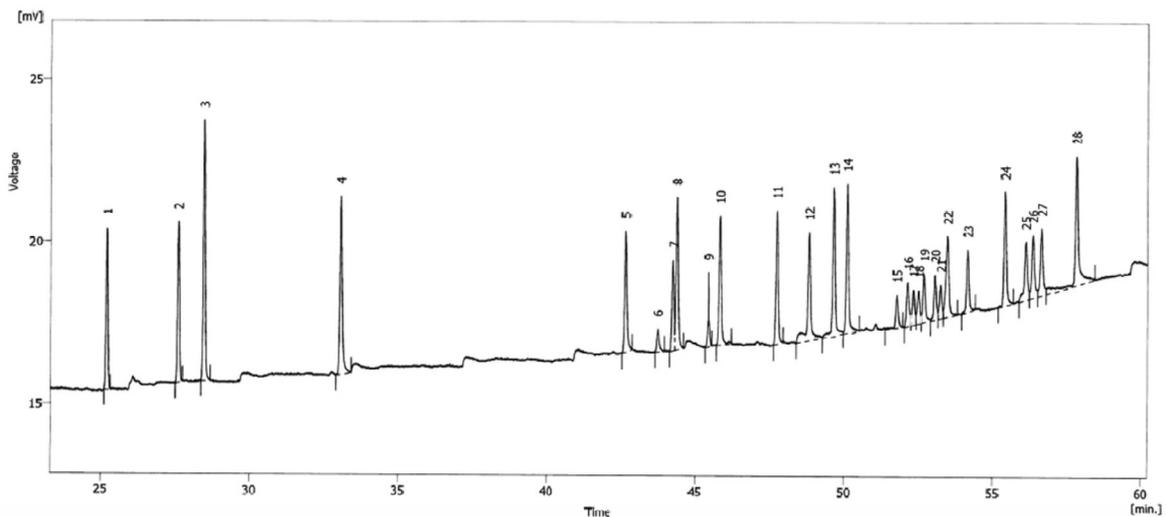


Figure 1 - A 1.0 µL injection of a Synthetic Pyrethroid Pesticide standard

1. Tefluthrin	11. L-Cyhalothrin	21. Cypermethrin
2. Transfluthrin	12. Acrinathrin	22. Cypermethrin
3. Anthraquinone	13. c-Permethrin	23. Flucythrinate
4. Bioallethrin	14. t-Permethrin	24. Fenvalerate
5. Resmethrin	15. Cyfluthrin	25. tau-Fluvalinate
6. Tetramethrin	16. Cyfluthrin	26. Fenvalerate
7. Tetramethrin	17. Cyfluthrin	27. tau-Fluvalinate
8. Bifenthrin	18. Cyfluthrin	28. Deltamethrin
9. Phenothrin	19. Cypermethrin	
10. Phenothrin	20. Cypermethrin	

A liquid sampling technique was used when testing for pesticides. Some pesticides have large, complex non-volatile molecules. Using liquid samples is the easiest and quickest way to carry out pesticide analysis. A headspace can be used, but this would require more time to prepare the sample for injection.

The samples were placed in an EL3000A liquid autosampler, and then it was left to run. The 200 Series Gas Chromatograph with FID (Flame Ionisation Detector) analysis conditions are available above. The GC paired with the liquid autosampler took up very little bench space, energy and time.

As shown in figure 1, all components normally found when testing the pesticide standard were detected

## Equipment Used

### Main Instruments

200 Series GC with FID  
Part no. 20500130

Ellution Software  
Part no. 23001001

Colibrick  
Part no. 23001022

EL 5 30 m x 0.25 mm x 0.25 µm column  
Part no. 51100157

### Liquid Autosampler

Ellutia EL3100A - Automatic Liquid Sampler - 15 position  
Part no. 30500011

Ellutia EL3000A - Automatic Liquid Sampler - 121 position  
Part no. 30500010

GC Mounting Kit for EL3100A/ EL3000A Autosampler  
Part no. 30500018

### Accessories

7000 Series Flowmeter  
Part no. 21007000

5µl Syringe  
Part no. 20511202

2ml Short-cap Screw Thread Vials  
Part no. 20511101

Pre-assembled Short Blue Screw Vial Closures  
Part no. 20511102



For more information on this application, equipment used or ordering,  
please visit: [www.ellutia.com](http://www.ellutia.com) or scan the QR code below



Colston House, 200 Lancaster Way Business Park, ELY, Cambridgeshire, CB6 3NX, UK

Tel: +44 (0)1353 669916 Web: [www.ellutia.com](http://www.ellutia.com)

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Registered Address Colston House, 200 Lancaster Way Business Park, Ely, Cambridgeshire, England, CB6 3NX



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