

Analysis Method for Testing Oregon Pesticides in Cannabis (Prepared by Julie Kowalski (Restek) and Jeff Dahl (Shimadzu), February 2016)

Instrument: [Shimadzu LCMS-8050 with Prominence HPLC](#)
Column: [Raptor™ ARC-18 column, 100 mm x 2.1 mm, 2.7 μm \(cat# 9314A12\)](#)
Guard Column: [Raptor™ ARC-18 Guard Column Cartridges \(3pk, cat# 9314A0252\) with EXP® Direct Connect Holder \(cat# 25808\)](#)
Column Temperature : 40 °C
Autosampler Temperature: 15 °C
Injection Volume: 1 μL
Concentration: sample dependent
Diluent: sample dependent
Flow Rate (mL/min): 0.5 mL/min

Mobile Phase Gradient
Solvent A: Water with 5 mM ammonium acetate and 0.1% formic acid
Solvent B: Methanol

Time (min)	%A	%B
0.00	90	10
1.50	90	10
5.50	37	63
9.00	25	75
10.00	0	100
12.00	0	100
12.01	90	10
15.00	90	10

MS Parameters
Maximum Pressure: 4000 psi typical
Interface Temperature: 300 °C
Voltage†: 4 kv (pos mode), -3 kv (neg mode)
Nebulizing Gas: 2 L/min
Heating Gas: 10 L/min
Drying Gas: 10 L/min
DL Temperature: 250 C
HB Temperature: 400 C
Ionization Mode: ESI with continuous polarity switching
Collision Gas: Argon, 270 kPa

Mode: MRM
Detection Window: 48 sec
Loop time: 750 msec

Name	CAS	Rt (min)	Polarity	Target (Quant) ion			Reference (Qual) ion 1			Reference (Qual) ion 2		
				Precursor	Product	CE	Precursor	Product	CE	Precursor	Product	CE
Abamectin B1a	71751-41-2	11.28	+	890.50	305.15	-30	890.50	307.20	-25	890.50	567.20	-17
Abamectin B1b	71751-41-2	11.28	+	876.50	553.40	-16	876.50	145.10	-44			
Acephate	30560-19-1	1.51	+	184.00	143.00	-11	184.00	48.95	-20			
Acequinocyl*	57960-19-7	10.50	+	357.3	178.2	-14	357.3	119.25	-34	357.3	91.15	-53
Acetamiprid	135410-20-7	5.44	+	223.00	126.00	-22	223.00	56.10	-17			
Aldicarb	116-06-3	5.97	+	208.10	116.05	-8	208.10	89.05	-17			
Azoxystrobin	131860-33-8	7.38	+	404.20	329.00	-33	404.20	344.00	-27			
Bifenazate	149877-41-8	7.81	+	301.10	198.00	-10	301.10	170.10	-20	301.10	152.00	-43
Bifenthrin	82657-04-3	11.36	+	440.10	166.10	-39	440.10	181.20	-15			
Boscalid	188425-85-6	7.50	+	343.00	306.80	-24	343.00	140.00	-20			
Carbaryl	63-25-2	6.61	+	202.10	145.00	-15	202.10	127.00	-40			
Carbofuran	1563-66-2	6.47	+	222.20	165.00	-12	222.20	123.10	-23			
Chlorantraniliprole	500008-45-7	7.15	+	484.00	452.80	-19	484.00	285.80	-17			
Chlorpyrifos	2921-88-2	10.79	+	349.90	198.10	-18	349.90	97.05	-31	349.90	125.15	-20
Clofentezine	74115-24-5	9.20	+	303.00	138.00	-16	303.00	102.00	-37			
Cyfluthrin†	68359-37-5	10.35	+	434.1	226.2	-15	434.1	191	-11	434.1	91.15	-40
Cypermethrin	52315-07-8	8.25	+	416.1	119.2	-25	416.1	91.1	-55			
Daminozide	1596-84-5	0.71	+	161.10	143.20	-14	161.10	44.20	-24	161.10	61.15	-12
Diazinon	62-73-7	9.01	+	305.00	153.25	-22	305.00	97.00	-34	305.00	169.20	-21
Dichlorvos	333-41-5	6.38	+	238.00	221.10	-8	238.00	109.20	-21			
Dimethoate	60-51-5	5.13	+	230.00	199.00	-15	230.00	125.00	-30			
Ethoprophos	13194-48-4	8.23	+	242.95	131.05	-18	242.95	173.05	-14	242.95	97.05	-32
Etofenprox	80844-07-1	11.37	+	394.20	359.20	-11	394.20	177.15	-15	394.20	107.05	-40
Etoxazole	153233-91-1	11.00	+	360.20	141.00	-30	360.20	57.05	-29			
Fenoxycarb	72490-01-8	8.43	+	302.20	88.10	-21	302.20	116.10	-12			
Fenpyroximate	134098-61-6	11.14	+	422.10	366.10	-16	422.10	214.00	-31			
Fipronil	120068-37-3	8.24	-	436.90	332.00	15	436.90	252.00	28			
Fonicamid•	158062-67-0	3.75	+	230.10	203.00	-18	230.10	148.00	-27	230.10	97.95	-42
Fonicamid	158062-67-0	3.74	-	228.05	81.05	10	228.05	146.15	22	228.05	119.10	37
Fludioxonil	131341-86-1	7.42	-	247.05	180.10	27	247.05	126.10	32			
Hexythiazox	78587-05-0	10.84	+	353.15	228.00	-17	353.15	168.05	-27			
Imazalil	35554-44-0	6.77	+	297.10	159.00	-23	297.10	41.10	-31			
Imidacloprid	138261-41-3	4.96	+	256.10	175.00	-21	256.10	209.00	-17			
Kresoxim-methyl	143390-89-0	8.62	+	314.00	267.10	-7	314.00	116.00	-15			
Malathion	121-75-5	7.61	+	331.00	285.05	-8	331.00	127.15	-12			
Metalaxyl	57837-19-1	7.09	+	280.10	220.05	-15	280.10	192.10	-20			
Methiocarb	2032-65-7	7.41	+	226.10	169.10	-9	226.10	121.05	-20			
Methomyl	16752-77-5	3.96	+	163.10	88.00	-9	163.10	106.05	-11			
Methyl parathion	298-00-0	5.9	+	264	223.05	-10	264	109.15	-25			
MGK-265	113-48-4	4.96	+	276.20	211.05	-22	276.20	175.15	-20	276.20	84.15	-22
Myclobutanil	88671-89-0	7.71	+	289.20	70.10	-21	289.20	125.05	-33			
Oxamyl	23135-22-0	3.80	+	237.10	72.00	-16	237.10	90.00	-9			
Paclobutrazol	76738-62-0	7.59	+	294.00	70.05	-22	294.00	125.00	-37			
Permethrin†	54774-45-7, 51877-74-8	11.32	+	408.10	183.05	-20	408.10	153.10	-49			
Phosmet	732-11-6	7.21	+	318.00	160.15	-13	318.00	133.15	-33	318.00	77.15	-51
Piperonyl butoxide	51-03-6	10.77	+	356.20	177.00	-20	356.20	149.00	-35	356.20	119.10	-38
Prallethrin	23031-36-9	9.95	+	301.15	169.20	-9	301.15	123.25	-15	301.15	77.15	-55
Propiconazole	60207-90-1	9.17	+	342.00	158.95	-33	342.00	69.00	-22			
Propoxur	114-26-1	6.42	+	210.10	111.00	-17	210.10	168.05	-10			
Pyrethrin I	8003-34-7	11.06	+	329.20	161.25	-11	329.20	128.15	-31	329.20	133.20	-16
Pyridaben	96489-71-3	11.22	+	365.15	147.00	-25	365.15	309.05	-14			
Spinosad A	168316-95-8	9.31	+	732.50	142.10	-33	732.50	98.05	-55			
Spinosyn D	168316-95-9	9.97	+	746.45	142.00	-33	746.45	98.00	-55			
Spiromesifen	283594-90-1	11.01	+	371.30	273.20	-14	371.30	255.15	-26			
Spirotetramat	203313-25-1	8.13	+	374.10	330.10	-17	374.10	302.00	-17			
Spiroxamine	118134-30-8	7.27	+	298.20	144.15	-20	298.20	58.15	-47	298.20	100.10	-32
Tebuconazole	80443-41-0	8.74	+	308.00	70.05	-23	308.00	124.90	-38			
Thiacloprid	111988-49-9	5.81	+	253.00	126.00	-22	253.00	99.00	-45			
Thiamethoxam	153719-23-4	4.22	+	292.05	211.05	-14	292.05	181.05	-24			
Trifloxystrobin	141517-21-7	9.97	+	409.00	186.00	-19	409.00	206.00	-16			

*Confirmed by Shimadzu. Also note very unstable in light or in solution.

†Single acquisition window for isomers

•Can be monitored in both positive and negative ESI modes.

Compounds requiring GC analysis

Chlorfenapyr 122453-73-0
Naled 300-76-5