



12423 NE Whitaker Way
Portland, OR 97230
503-254-1794



Report Number: 22-012186/D011.R000
Report Date: 10/17/2022
ORELAP#: OR100028
Purchase Order:
Received: 10/10/22 10:10

Customer: Hawaiian Heart/31 Labs
Product identity: CBD NLTS
Project Number: CBD100322
Client/Metric ID: .
Laboratory ID: 22-012186-0005

Summary

Potency:

Analyte	Result (%)	- CBD - CBG - CBE - CBDV - Δ9-THC - CBN	CBD-Total49.8% THC-Total0.259% (Reported in percent of total sample)
CBD	49.8		
CBG	11.0		
CBE	8.46		
CBDV	2.39		
Δ9-THC	0.259		
CBN	0.158		

Residual Solvents:

All analytes passing and less than LOQ.

Pesticides:

All analytes passing and less than LOQ.

Metals:

Less than LOQ for all analytes.



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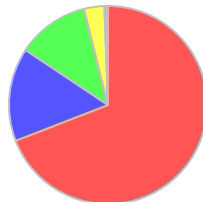
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Received: 10/10/22 10:10

Customer: Hawaiian Heart/31 Labs
3505 Cadillac Ave BLDG E
Costa Mesa 92626
United States of America (USA)

Product identity: CBD NLTS
Project Number: CBD100322
Client/Metric ID: .
Sample Date:
Laboratory ID: 22-012186-0005
Evidence of Cooling: No
Temp: 21 °C
Relinquished by: UPS

Sample Results

Potency	Method: J AOAC 2015 V98-6 (mod) ^b			Units %	Batch: 2208681	Analyze: 10/12/22 8:47:00 AM
Analyte	As Received	Dry weight	LOQ	Notes		
CBC	< LOQ		0.0717			
CBC-A	< LOQ		0.0717			
CBC-Total	< LOQ		0.135			
CBD	49.8		0.717			
CBD-A	< LOQ		0.0717			
CBD-Total	49.8		0.780			
CBDV	2.39		0.0717			
CBDV-A	< LOQ		0.0717			
CBDV-Total	2.39		0.134			
CBE	8.46		0.0717			
CBG	11.0		0.0717			
CBG-A	< LOQ		0.0717			
CBG-Total	11.0		0.134			
CBL	< LOQ		0.0717			
CBL-A	< LOQ		0.0717			
CBL-Total	< LOQ		0.135			
CBN	0.158		0.0717			
CBT	< LOQ		0.0717			
Δ10-THC	< LOQ		0.0717			
Δ8-THC	< LOQ		0.0717			
Δ8-THCV	< LOQ		0.0717			
Δ9-THC	0.259		0.0717			
exo-THC	< LOQ		0.0717			
THC-A	< LOQ		0.0717			
THC-Total	0.259		0.135			
THCV	< LOQ		0.0717			
THCV-A	< LOQ		0.0717			
THCV-Total	< LOQ		0.134			
Total Cannabinoids	72.1					



● CBD
● CBG
● CBE
● CBDV
● Δ9-THC
● CBN



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Solvents						Method: Residual Solvents by GC/MS ^b						Units µg/g		Batch 2208661		Analyze 10/12/22 11:45 AM			
Analyte	Result	Limits	LOQ	Status	Notes	Analyte	Result	Limits	LOQ	Status	Notes								
1,4-Dioxane	< LOQ	380	100	pass		2-Butanol	< LOQ	5000	200	pass									
2-Ethoxyethanol	< LOQ	160	30.0	pass		2-Methylbutane (Isopentane)	< LOQ		200										
2-Methylpentane	< LOQ		30.0			2-Propanol (IPA)	< LOQ	5000	200	pass									
2,2-Dimethylbutane	< LOQ		30.0			2,2-Dimethylpropane (neo-pentane)	< LOQ		200										
2,3-Dimethylbutane	< LOQ		30.0			3-Methylpentane	< LOQ		30.0										
Acetone	< LOQ	5000	200	pass		Acetonitrile	< LOQ	410	100	pass									
Benzene	< LOQ	2.00	1.00	pass		Butanes (sum)	< LOQ	5000	400	pass									
Cyclohexane	< LOQ	3880	200	pass		Ethyl acetate	< LOQ	5000	200	pass									
Ethyl benzene	< LOQ		200			Ethyl ether	< LOQ	5000	200	pass									
Ethylene glycol	< LOQ	620	200	pass		Ethylene oxide	< LOQ	50.0	20.0	pass									
Hexanes (sum)	< LOQ	290	150	pass		Isopropyl acetate	< LOQ	5000	200	pass									
Isopropylbenzene (Cumene)	< LOQ	70.0	30.0	pass		m,p-Xylene	< LOQ		200										
Methanol	< LOQ	3000	200	pass		Methylene chloride	< LOQ	600	60.0	pass									
Methylpropane (Isobutane)	< LOQ		200			n-Butane	< LOQ		200										
n-Heptane	< LOQ	5000	200	pass		n-Hexane	< LOQ		30.0										
n-Pentane	< LOQ		200			o-Xylene	< LOQ		200										
Pentanes (sum)	< LOQ	5000	600	pass		Propane	< LOQ	5000	200	pass									
Tetrahydrofuran	< LOQ	720	100	pass		Toluene	< LOQ	890	100	pass									
Total Xylenes	< LOQ		400			Total Xylenes and Ethyl benzene	< LOQ	2170	600	pass									



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Pesticides					Method: AOAC 2007.01 & EN 15662 (mod) ^b	Units mg/kg	Batch 2208761	Analyze 10/14/22 10:49 AM			
Analyte	Result	Limits	LOQ	Status	Notes	Analyte	Result	Limits	LOQ	Status	Notes
Abamectin [¥]	< LOQ	0.50	0.250	pass		Acephate [¥]	< LOQ	0.40	0.250	pass	
Acequinocyl [¥]	< LOQ	2.0	1.00	pass		Acetamiprid [¥]	< LOQ	0.20	0.100	pass	
Aldicarb [¥]	< LOQ	0.40	0.200	pass		Azoxystrobin [¥]	< LOQ	0.20	0.100	pass	
Bifenazate [¥]	< LOQ	0.20	0.100	pass		Bifenthrin [¥]	< LOQ	0.20	0.100	pass	
Boscalid [¥]	< LOQ	0.40	0.200	pass		Carbaryl [¥]	< LOQ	0.20	0.100	pass	
Carbofuran [¥]	< LOQ	0.20	0.100	pass		Chlorantraniliprole [¥]	< LOQ	0.20	0.100	pass	
Chlorfenapyr [¥]	< LOQ	1.0	0.500	pass		Chlorpyrifos [¥]	< LOQ	0.20	0.100	pass	
Clofentezine [¥]	< LOQ	0.20	0.100	pass		Cyfluthrin [¥]	< LOQ	1.0	0.500	pass	
Cypermethrin [¥]	< LOQ	1.0	0.500	pass		Daminozide [¥]	< LOQ	1.0	0.500	pass	
Diazinon [¥]	< LOQ	0.20	0.100	pass		Dichlorvos [¥]	< LOQ	1.0	0.500	pass	
Dimethoate [¥]	< LOQ	0.20	0.100	pass		Ethoprophos [¥]	< LOQ	0.20	0.100	pass	
Etofenprox [¥]	< LOQ	0.40	0.200	pass		Etiozazole [¥]	< LOQ	0.20	0.100	pass	
Fenoxycarb [¥]	< LOQ	0.20	0.100	pass		Fenpyroximate [¥]	< LOQ	0.40	0.200	pass	
Fipronil [¥]	< LOQ	0.40	0.200	pass		Flonicamid [¥]	< LOQ	1.0	0.400	pass	
Fludioxonil [¥]	< LOQ	0.40	0.200	pass		Hexythiazox [¥]	< LOQ	1.0	0.400	pass	
Imazalil [¥]	< LOQ	0.20	0.100	pass		Imidacloprid [¥]	< LOQ	0.40	0.200	pass	
Kresoxim-methyl [¥]	< LOQ	0.40	0.200	pass		Malathion [¥]	< LOQ	0.20	0.100	pass	
Metalaxyl [¥]	< LOQ	0.20	0.100	pass		Methiocarb [¥]	< LOQ	0.20	0.100	pass	
Methomyl [¥]	< LOQ	0.40	0.200	pass		MGK-264 [¥]	< LOQ	0.20	0.100	pass	
Myclobutanil [¥]	< LOQ	0.20	0.100	pass		Naled [¥]	< LOQ	0.50	0.250	pass	
Oxamyl [¥]	< LOQ	1.0	0.500	pass		Paclobutrazole [¥]	< LOQ	0.40	0.200	pass	
Parathion-Methyl [¥]	< LOQ	0.20	0.200	pass		Permethrin [¥]	< LOQ	0.20	0.100	pass	
Phosmet [¥]	< LOQ	0.20	0.100	pass		Piperonyl butoxide [¥]	< LOQ	2.0	1.00	pass	
Prallethrin [¥]	< LOQ	0.20	0.200	pass		Propiconazole [¥]	< LOQ	0.40	0.200	pass	
Propoxur [¥]	< LOQ	0.20	0.100	pass		Pyrethrin I (total) [¥]	< LOQ	1.0	0.500	pass	
Pyridaben [¥]	< LOQ	0.20	0.100	pass		Spinosad [¥]	< LOQ	0.20	0.100	pass	
Spiromesifen [¥]	< LOQ	0.20	0.100	pass		Spirotetramat [¥]	< LOQ	0.20	0.100	pass	
Spiroxamine [¥]	< LOQ	0.40	0.200	pass		Tebuconazole [¥]	< LOQ	0.40	0.200	pass	
Thiacloprid [¥]	< LOQ	0.20	0.100	pass		Thiamethoxam [¥]	< LOQ	0.20	0.100	pass	
Trifloxystrobin [¥]	< LOQ	0.20	0.100	pass							

Metals										
Analyte	Result	Limits	Units	LOQ	Batch	Analyzed Method		Status	Notes	
Arsenic	< LOQ	0.200	mg/kg	0.0905	2208721	10/12/22	AOAC 2013.06 (mod.) ^b	pass		
Cadmium	< LOQ	0.200	mg/kg	0.0905	2208721	10/12/22	AOAC 2013.06 (mod.) ^b	pass		
Lead	< LOQ	0.500	mg/kg	0.0905	2208721	10/12/22	AOAC 2013.06 (mod.) ^b	pass		
Mercury	< LOQ	0.100	mg/kg	0.0452	2208721	10/12/22	AOAC 2013.06 (mod.) ^b	pass		



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Mycotoxins

Analyte	Result	Limits	Units	LOQ	Batch	Analyzed Method	Status	Notes
Aflatoxin B2 [¥]	< LOQ		µg/kg	5.00	2208731	10/13/22 AOAC 2007.01 & EN 15662 (mod) ^Þ		
Aflatoxin B1 [¥]	< LOQ		µg/kg	5.00	2208731	10/13/22 AOAC 2007.01 & EN 15662 (mod) ^Þ		
Aflatoxin G1 [¥]	< LOQ		µg/kg	5.00	2208731	10/13/22 AOAC 2007.01 & EN 15662 (mod) ^Þ		
Aflatoxin G2 [¥]	< LOQ		µg/kg	5.00	2208731	10/13/22 AOAC 2007.01 & EN 15662 (mod) ^Þ		
Ochratoxin A [¥]	< LOQ	20.0	µg/kg	5.00	2208731	10/13/22 AOAC 2007.01 & EN 15662 (mod) ^Þ	pass	
Total Aflatoxins [¥]	0.000	20.0	µg/kg	20.0		10/14/22 AOAC 2007.01 & EN 15662 (mod) ^Þ	pass	



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These test results are representative of the individual sample selected and submitted by the client.

Abbreviations

Limits: Action Levels per OAR-333-007-0400, OAR-333-007-0210, OAR-333-007-0220, CCR title 16-division 42. BCC-section 5723

Limit(s) of Quantitation (LOQ): The minimum levels, concentrations, or quantities of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence.

Ⓟ = ISO/IEC 17025:2017 accredited method.

* = TNI accredited analyte.

Units of Measure

µg/g = Microgram per gram

µg/kg = Micrograms per kilogram = parts per billion (ppb)

mg/kg = Milligram per kilogram = parts per million (ppm)

% = Percentage of sample

% wt = µg/g divided by 10,000

Approved Signatory

Derrick Tanner
General Manager



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Hemp & Cannabis: Usable / Extract / Finished Product Chain of Custody Record

ORELAP ID: OR100028 ANAB ISO 17025 ID: AT-1508

Document Control ID: 2832 Revision: 5
Effective: 01/04/2022

Company: Hawaiian Heart/31 Labs			Analysis Requested										PO Number:		
Contact: Paisley Byrnes													Project ID: CBD/D8 Testing		
Address: 3505 Cadillac Ave BLDG E													Batch ID: CBD100322		
City: Costa Mesa State: CA Zip Code: 92626													Sampled by: Paisley Byrnes		
☒ Email Results: team@purehawaiianheart.com													Custom Reporting:		
☐ Ph: (949) - 4637643													Source Material: ☒ - Ind. Hemp product ☒ - Rec. Cannabis		
Billing Contact (if different)													Reporting Type: ☐ - Compliance ☒ - R&D		
Name: DNG LLC Email: team@purehawaiianheart.com													Report to: ☐ - METRC ☐ - ODA ☐ - USDA		
Address: 24040 Camino Del Avion													☐ - Other:		
City: Dana Point State: CA Zip: 92629													Turnaround time (TAT - Business Days):		
Ph: (949) - 4637643													☒ - 5BD ☐ - 3BD* ☐ - 2BD*		
													*Check for availability		
Lab ID	Client Sample Identification	Sample date	Potency	Pesticides	Residual Solvents	Heavy Metals	Mycotoxins						Material Type	Weight (Units)	Comments/Metric ID
	CBD BDAY	09/29/22	✓	✓	✓	✓	✓								
	CBD GELATO	09/29/22	✓	✓	✓	✓	✓								
	CBD GRNC	09/29/22	✓	✓	✓	✓	✓								
	CBD MNGHZ	09/29/22	✓	✓	✓	✓	✓								
	CBD NLTS	09/29/22	✓	✓	✓	✓	✓								
	CBD NYC	09/29/22	✓	✓	✓	✓	✓								
	CBD REM	09/29/22	✓	✓	✓	✓	✓								
	D8 BDAY	09/29/22	✓	✓	✓	✓	✓								
	D8 BLUD	09/29/20	✓	✓	✓	✓	✓								
	D8 GEL	09/29/22	✓	✓	✓	✓	✓								
Signature - Relinquished By:		Date	Time	Signature - Received By:		Date	Time	Lab Use Only:							
		10/03/20	9:30am	RBS		10/10/22	10:10	☒ Shipped Via: UPS or ☐ Client drop off							
								Evidence of cooling: ☐ Yes ☒ No - Temp (°C): 21.0							
								Sample in good condition: ☐ Yes ☐ No							
								Payment: ☐ Cash ☐ Check ☐ CC ☐ Net:							
								Prelog storage:							

* - Material Type Codes: Plant Material (P) ; Isolate (I) ; Concentrate/Extract (C) ; Tincture/Topical (T) ; Edible (E) ; Beverage (B) ; Vapor Product (V)

Samples submitted to Columbia Laboratories with testing requirements constitute an agreement for services in accordance with the current terms of service associated with this COC. By signing "Relinquished by" you are agreeing to these terms

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Hemp & Cannabis: Usable / Extract / Finished Product
Chain of Custody Record

ORELAP ID: OR100028 ANAB ISO 17025 ID: AT-1508

Document Control ID: 2832 Revision: 5
Effective: 01/04/2022

Company: Hawaiian Heart/31 Labs Contact: Paisley Byrnes Address: 3505 Cadillac Ave BLDG E City: Costa Mesa State: CA Zip Code: 92626 ☒ Email Results: team@purehawaiianheart.com ☐ Ph: (949) - 4637643 <i>Billing Contact (if different)</i> Name: DNG LLC Email: team@purehawaiianheart.com Address: 24040 Camino Del Avion City: Dana Point State: CA Zip: 92629 Ph: (949) - 4637643			Analysis Requested						PO Number: Project ID: CBD/D8 Testing Batch ID: CBD100322 Sampled by: Paisley Byrnes Custom Reporting: Source Material: ☒ - Ind. Hemp product ☒ - Rec. Cannabis Reporting Type: ☐ - Compliance ☒ - R&D Report to: ☐ - METRC ☐ - ODA ☐ - USDA ☐ - Other: Turnaround time (TAT - Business Days): ☒ - 5BD ☐ - 3BD* ☐ - 2BD* <i>*Check for availability</i>		
Lab ID	Client Sample Identification	Sample date	Potency	Pesticides	Residual Solvents	Heavy Metals	Mycotoxins	Material Type †	Weight (Units)	Comments/Metric ID	
D8 MNGHZ		09/29/22	✓	✓	✓	✓	✓				
D8 MWOW		09/29/22	✓	✓	✓	✓	✓				
D8 NLTS		09/29/22	✓	✓	✓	✓	✓				
D8 NYCD		09/29/22	✓	✓	✓	✓	✓				
D8 REM		09/29/22	✓	✓	✓	✓	✓				
D8 ZTZ		09/29/22	✓	✓	✓	✓	✓				
Signature - Relinquished By:			Date	Time	Signature - Received By:			Date	Time	Lab Use Only:	
			10/03/20	9:30am				10/10/22	10:11	Shipped Via: UPS or ☐ Client drop off Evidence of cooling: ☐ Yes ☒ No - Temp (°C): 21.0 Sample in good condition: ☐ Yes ☐ No Payment: ☐ Cash ☐ Check ☐ CC ☐ Net: Prelog storage:	

† - Material Type Codes: Plant Material (P) ; Isolate (I) ; Concentrate/Extract (C) ; Tincture/Topical (T) ; Edible (E) ; Beverage (B) ; Vapor Product (V)

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Revision: 2 Document ID: 7087
Legacy ID: CFL-E33Effective:

Laboratory Quality Control Results

Residual Solvents				Batch ID: 2208661					
Method Blank				Laboratory Control Sample					
Analyte	Result	LOQ	Notes	Result	Spike	Units	% Rec	Limits	Notes
Propane	ND	< 200		493	572	µg/g	86.2	60 - 120	
Isobutane	ND	< 200		582	731	µg/g	79.6	60 - 120	
Butane	ND	< 200		575	731	µg/g	78.7	60 - 120	
2,2-Dimethylpropane	ND	< 200		877	936	µg/g	93.7	60 - 120	
Methanol	ND	< 200		1710	1650	µg/g	103.6	60 - 120	
Ethylene Oxide	ND	< 30		54.3	56.2	µg/g	96.6	60 - 120	
2-Methylbutane	ND	< 200		1580	1650	µg/g	95.8	60 - 120	
Pentane	ND	< 200		1600	1650	µg/g	97.0	60 - 120	
Ethanol	ND	< 200		1610	1660	µg/g	97.0	70 - 130	
Ethyl Ether	ND	< 200		1530	1630	µg/g	93.9	60 - 120	
2,2-Dimethylbutane	ND	< 30		173	189	µg/g	91.5	60 - 120	
Acetone	ND	< 200		1640	1650	µg/g	99.4	60 - 120	
2-Propanol	ND	< 200		1610	1650	µg/g	97.6	60 - 120	
Ethyl Formate	ND	< 500		1420	1610	µg/g	88.2	70 - 130	
Acetonitrile	ND	< 100		490	504	µg/g	97.2	60 - 120	
Methyl Acetate	ND	< 500		1620	1630	µg/g	99.4	70 - 130	
2,3-Dimethylbutane	ND	< 30		168	174	µg/g	96.6	60 - 120	
Dichloromethane	ND	< 60		467	521	µg/g	89.6	60 - 120	
2-Methylpentane	ND	< 30		165	187	µg/g	88.2	60 - 120	
MTBE	ND	< 500		1560	1600	µg/g	97.5	70 - 130	
3-Methylpentane	ND	< 30		176	188	µg/g	93.6	60 - 120	
Hexane	ND	< 30		176	182	µg/g	96.7	60 - 120	
1-Propanol	ND	< 500		1560	1610	µg/g	96.9	70 - 130	
Methylethylketone	ND	< 500		1520	1600	µg/g	95.0	70 - 130	
Ethyl acetate	ND	< 200		1580	1630	µg/g	96.9	60 - 120	
2-Butanol	ND	< 200		1530	1630	µg/g	93.9	60 - 120	
Tetrahydrofuran	ND	< 100		455	506	µg/g	89.9	60 - 120	
Cyclohexane	ND	< 200		1480	1640	µg/g	90.2	60 - 120	
2-methyl-1-propanol	ND	< 500		1530	1620	µg/g	94.4	70 - 130	
Benzene	ND	< 1		4.3	4.93	µg/g	87.2	60 - 120	
Isopropyl Acetate	ND	< 200		1590	1640	µg/g	97.0	60 - 120	
Heptane	ND	< 200		1580	1630	µg/g	96.9	60 - 120	
1-Butanol	ND	< 500		1600	1600	µg/g	100.0	70 - 130	
Propyl Acetate	ND	< 500		1610	1620	µg/g	99.4	70 - 130	
1,4-Dioxane	ND	< 100		426	493	µg/g	86.4	60 - 120	
2-Ethoxyethanol	ND	< 30		173	171	µg/g	101.2	60 - 120	
Methylisobutylketone	ND	< 500		1600	1620	µg/g	98.8	70 - 130	
3-Methyl-1-butanol	ND	< 500		1610	1610	µg/g	100.0	70 - 130	
Ethylene Glycol	ND	< 200		443	494	µg/g	89.7	60 - 120	
Toluene	ND	< 100		435	506	µg/g	86.0	60 - 120	
Isobutyl Acetate	ND	< 500		1640	1620	µg/g	101.2	70 - 130	
1-Pentanol	ND	< 500		1660	1610	µg/g	103.1	70 - 130	
Butyl Acetate	ND	< 500		1670	1610	µg/g	103.7	70 - 130	
Ethylbenzene	ND	< 200		867	996	µg/g	87.0	60 - 120	
m,p-Xylene	ND	< 200		885	1010	µg/g	87.6	60 - 120	
o-Xylene	ND	< 200		854	979	µg/g	87.2	60 - 120	
Cumene	ND	< 30		160	188	µg/g	85.1	60 - 120	
Anisole	ND	< 500		1530	1610	µg/g	95.0	70 - 130	
DMSO	ND	< 500		1520	1600	µg/g	95.0	70 - 130	
1,2-dimethoxyethane	ND	< 50		189	190	µg/g	99.5	70 - 130	
Triethylamine	ND	< 500		1550	1610	µg/g	96.3	70 - 130	
N,N-dimethylformamide	ND	< 150		518	496	µg/g	104.4	70 - 130	
N,N-dimethylacetamide	ND	< 150		482	483	µg/g	99.8	70 - 130	
Pyridine	ND	< 50		155	167	µg/g	92.8	70 - 130	
1,2-Dichloroethane	ND	< 1		1.04	1	µg/g	104.0	70 - 130	
Chloroform	ND	< 1		1.01	1	µg/g	101.0	70 - 130	
Trichloroethylene	ND	< 1		1.01	1	µg/g	101.0	70 - 130	
1,1-Dichloroethane	ND	< 1		0.96	1	µg/g	96.0	70 - 130	



12423 NE Whitaker Way
Portland, OR 97230
503-254-1794



Report Number: 22-012186/D011.R000
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Received: 10/10/22 10:10

Revision: 2 Document ID: 7087
Legacy ID: CFL-E33Effective:

QC - Sample Duplicate				Sample ID: 22-012140-0001			
Analyte	Result	Org. Result	LOQ	Units	RPD	Limits	Accept/Fail
Propane	ND	ND	200	µg/g	0.0	< 20	Acceptable
Isobutane	ND	ND	200	µg/g	0.0	< 20	Acceptable
Butane	ND	ND	200	µg/g	0.0	< 20	Acceptable
2,2-Dimethylpropane	ND	ND	200	µg/g	0.0	< 20	Acceptable
Methanol	ND	ND	200	µg/g	0.0	< 20	Acceptable
Ethylene Oxide	ND	ND	30	µg/g	0.0	< 20	Acceptable
2-Methylbutane	ND	ND	200	µg/g	0.0	< 20	Acceptable
Pentane	ND	ND	200	µg/g	0.0	< 20	Acceptable
Ethanol	ND	ND	200	µg/g	0.0	< 20	Acceptable
Ethyl Ether	ND	ND	200	µg/g	0.0	< 20	Acceptable
2,2-Dimethylbutane	ND	ND	30	µg/g	0.0	< 20	Acceptable
Acetone	ND	ND	200	µg/g	0.0	< 20	Acceptable
2-Propanol	ND	ND	200	µg/g	0.0	< 20	Acceptable
Ethyl Formate	ND	ND	500	µg/g	0.0	< 20	Acceptable
Acetonitrile	ND	ND	100	µg/g	0.0	< 20	Acceptable
Methyl Acetate	ND	ND	500	µg/g	0.0	< 20	Acceptable
2,3-Dimethylbutane	ND	ND	30	µg/g	0.0	< 20	Acceptable
Dichloromethane	ND	ND	60	µg/g	0.0	< 20	Acceptable
2-Methylpentane	ND	ND	30	µg/g	0.0	< 20	Acceptable
MTBE	ND	ND	500	µg/g	0.0	< 20	Acceptable
3-Methylpentane	ND	ND	30	µg/g	0.0	< 20	Acceptable
Hexane	ND	ND	30	µg/g	0.0	< 20	Acceptable
1-Propanol	ND	ND	500	µg/g	0.0	< 20	Acceptable
Methyl ethyl ketone	ND	ND	500	µg/g	0.0	< 20	Acceptable
Ethyl acetate	ND	ND	200	µg/g	0.0	< 20	Acceptable
2-Butanol	ND	ND	200	µg/g	0.0	< 20	Acceptable
Tetrahydrofuran	ND	ND	100	µg/g	0.0	< 20	Acceptable
Cyclohexane	ND	ND	200	µg/g	0.0	< 20	Acceptable
2-methyl-1-propanol	ND	ND	500	µg/g	0.0	< 20	Acceptable
Benzene	ND	ND	1	µg/g	0.0	< 20	Acceptable
Isopropyl Acetate	ND	ND	200	µg/g	0.0	< 20	Acceptable
Heptane	ND	ND	200	µg/g	0.0	< 20	Acceptable
1-Butanol	ND	ND	500	µg/g	0.0	< 20	Acceptable
Propyl Acetate	ND	ND	500	µg/g	0.0	< 20	Acceptable
1,4-Dioxane	ND	ND	100	µg/g	0.0	< 20	Acceptable
2-Ethoxyethanol	ND	ND	30	µg/g	0.0	< 20	Acceptable
Methyl isobutyl ketone	ND	ND	500	µg/g	0.0	< 20	Acceptable
3-Methyl-1-butanol	ND	ND	500	µg/g	0.0	< 20	Acceptable
Ethylene Glycol	ND	ND	200	µg/g	0.0	< 20	Acceptable
Toluene	ND	ND	100	µg/g	0.0	< 20	Acceptable
Isobutyl Acetate	ND	ND	500	µg/g	0.0	< 20	Acceptable
1-Pentanol	ND	ND	500	µg/g	0.0	< 20	Acceptable
Butyl Acetate	ND	ND	500	µg/g	0.0	< 20	Acceptable
Ethylbenzene	ND	ND	200	µg/g	0.0	< 20	Acceptable
m,p-Xylene	ND	ND	200	µg/g	0.0	< 20	Acceptable
o-Xylene	ND	ND	200	µg/g	0.0	< 20	Acceptable
Cumene	ND	ND	30	µg/g	0.0	< 20	Acceptable
Anisole	ND	ND	500	µg/g	0.0	< 20	Acceptable
DMSO	ND	ND	500	µg/g	0.0	< 20	Acceptable
1,2-dimethoxyethane	ND	ND	50	µg/g	0.0	< 20	Acceptable
Triethylamine	ND	ND	500	µg/g	0.0	< 20	Acceptable
N,N-dimethylformamide	ND	ND	150	µg/g	0.0	< 20	Acceptable
N,N-dimethylacetamide	ND	ND	150	µg/g	0.0	< 20	Acceptable
Pyridine	ND	ND	50	µg/g	0.0	< 20	Acceptable
1,2-Dichloroethane	ND	ND	1	µg/g	0.0	< 20	Acceptable
Chloroform	ND	ND	1	µg/g	0.0	< 20	Acceptable
Trichloroethylene	ND	ND	1	µg/g	0.0	< 20	Acceptable
1,1-Dichloroethane	ND	ND	1	µg/g	0.0	< 20	Acceptable

Abbreviations

ND - None Detected at or above MRL
RPD - Relative Percent Difference
LOQ - Limit of Quantitation

Units of Measure:

µg/g - Microgram per gram or ppm



12423 NE Whitaker Way
Portland, OR 97230
503-254-1794



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Laboratory Quality Control Results

J AOAC 2015 V98-6 Batch ID: 2208681

Laboratory Control Sample										
Analyte	LCS	Result	Spike	Units	% Rec	Limits			Evaluation	Notes
CBDVA	2	0.114	0.103	%	110	80.0	-	120	Acceptable	
CBDV	2	0.120	0.110	%	110	80.0	-	120	Acceptable	
CBE	2	0.115	0.105	%	110	80.0	-	120	Acceptable	
CBDA	1	0.0972	0.100	%	96.8	90.0	-	110	Acceptable	
CBGA	1	0.0983	0.101	%	97.7	80.0	-	120	Acceptable	
CBG	1	0.102	0.103	%	99.0	80.0	-	120	Acceptable	
CBD	1	0.102	0.103	%	98.9	90.0	-	110	Acceptable	
THCV	2	0.123	0.113	%	109	80.0	-	120	Acceptable	
d8THCV	2	0.121	0.110	%	109	80.0	-	120	Acceptable	
THCVA	2	0.111	0.101	%	110	80.0	-	120	Acceptable	
CBN	1	0.101	0.101	%	99.6	90.0	-	110	Acceptable	
exo-THC	2	0.111	0.103	%	109	80.0	-	120	Acceptable	
d9THC	1	0.104	0.104	%	100	90.0	-	110	Acceptable	
d8THC	1	0.106	0.100	%	106	90.0	-	110	Acceptable	
CBL	2	0.108	0.099	%	110	80.0	-	120	Acceptable	
d10THC	1	0.0939	0.096	%	98.1	80.0	-	120	Acceptable	
CBG	2	0.120	0.108	%	111	80.0	-	120	Acceptable	
THCA	1	0.0965	0.099	%	97.0	90.0	-	110	Acceptable	
CBGA	2	0.116	0.105	%	110	80.0	-	120	Acceptable	
CBLA	2	0.0613	0.056	%	109	80.0	-	120	Acceptable	
CBT	2	0.122	0.112	%	109	80.0	-	120	Acceptable	

Method Blank

Analyte	Result	LOQ	Units	Limits	Evaluation	Notes
CBDVA	<LOQ	0.0077	%	< 0.0077	Acceptable	
CBDV	<LOQ	0.0077	%	< 0.0077	Acceptable	
CBE	<LOQ	0.0077	%	< 0.0077	Acceptable	
CBDA	<LOQ	0.0077	%	< 0.0077	Acceptable	
CBGA	<LOQ	0.0077	%	< 0.0077	Acceptable	
CBG	<LOQ	0.0077	%	< 0.0077	Acceptable	
CBD	<LOQ	0.0077	%	< 0.0077	Acceptable	
THCV	<LOQ	0.0077	%	< 0.0077	Acceptable	
d8THCV	<LOQ	0.0077	%	< 0.0077	Acceptable	
THCVA	<LOQ	0.0077	%	< 0.0077	Acceptable	
CBN	<LOQ	0.0077	%	< 0.0077	Acceptable	
exo-THC	<LOQ	0.0077	%	< 0.0077	Acceptable	
d9THC	<LOQ	0.0077	%	< 0.0077	Acceptable	
d8THC	<LOQ	0.0077	%	< 0.0077	Acceptable	
CBL	<LOQ	0.0077	%	< 0.0077	Acceptable	
d10THC	<LOQ	0.0077	%	< 0.0077	Acceptable	
CBG	<LOQ	0.0077	%	< 0.0077	Acceptable	
THCA	<LOQ	0.0077	%	< 0.0077	Acceptable	
CBGA	<LOQ	0.0077	%	< 0.0077	Acceptable	
CBLA	<LOQ	0.0077	%	< 0.0077	Acceptable	
CBT	<LOQ	0.0077	%	< 0.0077	Acceptable	

Abbreviations

ND - None Detected at or above MRL
RPD - Relative Percent Difference
LOQ - Limit of Quantitation

Units of Measure:

% - Percent



12423 NE Whitaker Way
Portland, OR 97230
503-254-1794



Report Number: 22-012186/D011.R000
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Laboratory Quality Control Results

J AOAC 2015 V98-6							
Batch ID: 2208681							
Sample Duplicate							
Sample ID: 22-012177-0001							
Analyte	Result	Org. Result	LOQ	Units	RPD	Limits	Evaluation
CBDVA	<LOQ	<LOQ	0.0077	%	NA	< 20	Acceptable
CBDV	0.283	0.289	0.0077	%	1.98	< 20	Acceptable
CBE	<LOQ	<LOQ	0.0077	%	NA	< 20	Acceptable
CBDA	<LOQ	<LOQ	0.0077	%	NA	< 20	Acceptable
CBGA	<LOQ	<LOQ	0.0077	%	NA	< 20	Acceptable
CBG	1.23	1.23	0.0077	%	0.136	< 20	Acceptable
CBD	58.2	57.6	0.0077	%	1.15	< 20	Acceptable
THCV	<LOQ	<LOQ	0.0077	%	NA	< 20	Acceptable
d8THCV	<LOQ	<LOQ	0.0077	%	NA	< 20	Acceptable
THCVA	<LOQ	<LOQ	0.0077	%	NA	< 20	Acceptable
CBN	0.356	0.355	0.0077	%	0.517	< 20	Acceptable
exo-THC	<LOQ	<LOQ	0.0077	%	NA	< 20	Acceptable
d9THC	1.15	1.15	0.0077	%	0.135	< 20	Acceptable
d8THC	<LOQ	<LOQ	0.0077	%	NA	< 20	Acceptable
CBL	<LOQ	<LOQ	0.0077	%	NA	< 20	Acceptable
d10THC	<LOQ	<LOQ	0.0077	%	NA	< 20	Acceptable
CBC	2.32	2.19	0.0077	%	5.62	< 20	Acceptable
THCA	<LOQ	<LOQ	0.0077	%	NA	< 20	Acceptable
CBCA	<LOQ	<LOQ	0.0077	%	NA	< 20	Acceptable
CBLA	<LOQ	<LOQ	0.0077	%	NA	< 20	Acceptable
CBT	0.631	0.626	0.0077	%	0.829	< 20	Acceptable

Abbreviations

ND - None Detected at or above MRL
RPD - Relative Percent Difference
LOQ - Limit of Quantitation

Units of Measure:



12423 NE Whitaker Way
Portland, OR 97230
503-254-1794



Report Number: 22-012186/D011.R000
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Legacy ID: CFL-C21 Worksheet Validated 10/30/2020

Laboratory Pesticide Quality Control Results

AOAC 2007.1 & EN 15662									
Units: mg/Kg									
Batch ID: 2208761									
Method Blank				Laboratory Control Sample					
Analyte	Blank Result	Blank Limits	Notes	LCS Result	LCS Spike	LCS % Rec	Limits	Notes	
Abamectin	0.000	< 0.250		0.880	1.000	88.0	50.0	150	
Acephate	0.000	< 0.250		0.824	1.000	82.4	60.0	120	
Acequinocyl	0.000	< 1.000		3.353	4.000	83.8	40.0	160	
Acetamiprid	0.000	< 0.100		0.368	0.400	91.9	60.0	120	
Aldicarb	0.000	< 0.200		0.717	0.800	89.7	60.0	120	
Azoxystrobin	0.000	< 0.100		0.363	0.400	90.8	60.0	120	
Bifenazate	0.000	< 0.100		0.362	0.400	90.6	60.0	120	
Bifenthrin	0.000	< 0.100		0.350	0.400	87.5	50.0	150	
Boscalid	0.000	< 0.200		0.719	0.800	89.8	60.0	120	
Carbaryl	0.000	< 0.100		0.367	0.400	91.8	60.0	120	
Carbofuran	0.000	< 0.100		0.371	0.400	92.7	60.0	120	
Chlorantraniliprole	0.000	< 0.100		0.350	0.400	87.4	60.0	120	
Chlorfenapyr	0.000	< 0.500		1.607	2.000	80.3	60.0	120	
Chlorpyrifos	0.000	< 0.100		0.368	0.400	92.0	60.0	120	
Clofentezine	0.000	< 0.100		0.357	0.400	89.2	60.0	120	
Cyfluthrin	0.000	< 0.500		1.919	2.000	95.9	50.0	150	
Cypermethrin	0.000	< 0.500		1.806	2.000	90.3	50.0	150	
Daminozide	0.000	< 0.500		1.886	2.000	94.3	60.0	120	
Diazinon	0.000	< 0.100		0.372	0.400	93.1	60.0	120	
Dichlorvos	0.000	< 0.500		1.842	2.000	92.1	60.0	120	
Dimethoate	0.000	< 0.100		0.369	0.400	92.4	60.0	120	
Ethoprophos	0.000	< 0.100		0.347	0.400	86.6	60.0	120	
Etofenprox	0.000	< 0.200		0.707	0.800	88.4	50.0	150	
Etoxazole	0.000	< 0.100		0.361	0.400	90.2	60.0	120	
Fenoxycarb	0.000	< 0.100		0.355	0.400	88.8	60.0	120	
Fenpyroximate	0.000	< 0.200		0.708	0.800	88.5	60.0	120	
Fipronil	0.000	< 0.200		0.719	0.800	89.9	60.0	120	
Flonicamid	0.000	< 0.250		0.944	1.000	94.4	60.0	120	
Fludioxonil	0.000	< 0.200		0.805	0.800	100.6	50.0	150	
Hexythiazox	0.000	< 0.250		0.893	1.000	89.3	60.0	120	
Imazalil	0.000	< 0.100		0.371	0.400	92.6	60.0	120	
Imidacloprid	0.000	< 0.200		0.727	0.800	90.8	60.0	120	
Kresoxim-methyl	0.000	< 0.200		0.749	0.800	93.7	60.0	120	
Malathion	0.000	< 0.100		0.364	0.400	91.0	60.0	120	
Metaxyl	0.000	< 0.100		0.369	0.400	92.1	60.0	120	
Methiocarb	0.000	< 0.100		0.367	0.400	91.8	60.0	120	
Methomyl	0.000	< 0.200		0.666	0.800	83.2	60.0	120	
MGK-264	0.000	< 0.100		0.364	0.400	91.1	50.0	150	
Myclobutanil	0.000	< 0.100		0.360	0.400	90.1	60.0	120	
Naled	0.000	< 0.250		0.877	1.000	87.7	50.0	150	
Oxamyl	0.000	< 0.500		1.911	2.000	95.5	60.0	120	
Paclobutrazole	0.000	< 0.200		0.715	0.800	89.4	60.0	120	
Parathion-Methyl	0.000	< 0.200		0.728	0.800	91.0	50.0	150	
Permethrin	0.000	< 0.100		0.355	0.400	88.8	50.0	150	
Phosmet	0.000	< 0.100		0.351	0.400	87.9	50.0	150	
Piperonyl butoxide	0.000	< 0.500		1.739	2.000	87.0	60.0	120	
Prallethrin	0.000	< 0.100		0.368	0.400	91.9	60.0	120	
Propiconazole	0.000	< 0.200		0.734	0.800	91.7	60.0	120	
Propoxur	0.000	< 0.100		0.374	0.400	93.5	60.0	120	
Pyrethrin (Summe)	0.000	< 0.100		0.377	0.413	91.2	60.0	120	
Pyridaben	0.000	< 0.100		0.349	0.400	87.3	50.0	150	
Spirosad	0.000	< 0.100		0.319	0.388	82.2	50.0	150	
Spiromesifen	0.000	< 0.100		0.363	0.400	90.7	60.0	120	
Spirotetramat	0.000	< 0.100		0.369	0.400	92.2	60.0	120	
Spiroxamine	0.000	< 0.200		0.732	0.800	91.4	60.0	120	
Tebuconazole	0.000	< 0.200		0.723	0.800	90.4	60.0	120	
Thiacloprid	0.000	< 0.100		0.374	0.400	93.5	60.0	120	
Thiamethoxam	0.000	< 0.100		0.359	0.400	89.8	60.0	120	
Trifloxystrobin	0.000	< 0.100		0.360	0.400	89.9	60.0	120	



12423 NE Whitaker Way
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Received: 10/10/22 10:10

Revision: 3 Document ID: 3120
Legacy ID: CFL-C21 Worksheet Validated 10/30/2020

Laboratory Pesticide Quality Control Results

AOAC 2007.1 & EN 15662 Units: mg/Kg Batch ID: 2208761										
Matrix Spike/Matrix Spike Duplicate Recoveries Sample ID: 22-012177-0001										
Analyte	Result	MS Res	MSD Res	Spike	RPD%	Limit	MS % Rec	MSD % Rec	Limits	Notes
Abamectin	0.000	0.638	0.648	1.000	1.6%	< 30	63.8%	64.8%	50 - 150	
Acephate	0.000	0.605	0.654	1.000	7.8%	< 30	60.5%	65.4%	50 - 150	
Acequinocyl	0.000	1.501	1.570	4.000	4.5%	< 30	37.5%	39.2%	50 - 150	Q
Acetamiprid	0.000	0.347	0.354	0.400	2.0%	< 30	86.8%	88.5%	50 - 150	
Aldicarb	0.000	0.669	0.718	0.800	7.1%	< 30	83.6%	89.7%	50 - 150	
Azoxystrobin	0.000	0.269	0.268	0.400	0.7%	< 30	67.3%	66.9%	50 - 150	
Bifenazate	0.000	0.300	0.319	0.400	6.2%	< 30	74.9%	79.7%	50 - 150	
Bifenthrin	0.000	0.200	0.217	0.400	8.3%	< 30	49.9%	54.2%	50 - 150	Q
Boscalid	0.069	0.683	0.645	0.800	6.4%	< 30	76.8%	72.0%	50 - 150	
Carbaryl	0.000	0.300	0.297	0.400	1.1%	< 30	74.9%	74.1%	50 - 150	
Carbofuran	0.000	0.278	0.280	0.400	0.9%	< 30	69.4%	70.0%	50 - 150	
Chlorantraniliprole	0.000	0.303	0.312	0.400	3.0%	< 30	75.7%	78.0%	50 - 150	
Chlorfenapyr	0.000	1.231	1.067	2.000	14.2%	< 30	61.5%	53.4%	50 - 150	
Chlorpyrifos	0.000	2.487	2.665	0.400	6.9%	< 30	621.8%	666.2%	50 - 150	Q
Clofentezine	0.000	0.229	0.235	0.400	2.7%	< 30	57.1%	58.7%	50 - 150	
Cyfluthrin	0.000	0.871	0.940	2.000	7.6%	< 30	43.5%	47.0%	30 - 150	
Cypermethrin	0.000	0.759	0.817	2.000	7.5%	< 30	37.9%	40.9%	50 - 150	Q
Daminozide	0.000	0.290	0.318	2.000	9.3%	< 30	14.5%	15.9%	30 - 150	Q
Diazinon	0.000	0.205	0.205	0.400	0.4%	< 30	51.3%	51.1%	50 - 150	
Dichlorvos	0.000	1.564	1.589	2.000	1.6%	< 30	78.2%	79.5%	50 - 150	
Dimethoate	0.000	0.352	0.358	0.400	1.7%	< 30	88.1%	89.6%	50 - 150	
Ethoprophos	0.000	0.250	0.250	0.400	0.2%	< 30	62.4%	62.5%	50 - 150	
Etofenprox	0.000	0.347	0.351	0.800	1.3%	< 30	43.3%	43.9%	50 - 150	Q
Etoxazole	0.000	0.275	0.271	0.400	1.6%	< 30	68.8%	67.7%	50 - 150	
Fenoxycarb	0.000	0.259	0.269	0.400	3.7%	< 30	64.7%	67.2%	50 - 150	
Fenpyroximate	0.000	0.308	0.343	0.800	10.6%	< 30	38.5%	42.8%	50 - 150	Q
Fipronil	0.000	0.519	0.550	0.800	5.7%	< 30	64.9%	68.7%	50 - 150	
Fonicamid	0.000	0.927	0.910	1.000	1.9%	< 30	92.7%	91.0%	50 - 150	
Fludioxonil	0.000	0.809	0.777	0.800	4.0%	< 30	101.1%	97.1%	50 - 150	
Hexythiazox	0.000	0.658	0.665	1.000	1.1%	< 30	65.8%	66.5%	50 - 150	
Imazalil	0.000	0.326	0.340	0.400	4.3%	< 30	81.5%	85.1%	50 - 150	
Imidacloprid	0.000	0.773	0.808	0.800	4.4%	< 30	96.6%	101.0%	50 - 150	
Kresoxim-methyl	0.000	0.477	0.486	0.800	1.8%	< 30	59.7%	60.7%	50 - 150	
Malathion	0.000	0.236	0.241	0.400	2.3%	< 30	58.9%	60.3%	50 - 150	
Metaxyl	0.000	0.275	0.284	0.400	3.3%	< 30	68.8%	71.1%	50 - 150	
Methiocarb	0.000	0.282	0.281	0.400	0.6%	< 30	70.5%	70.1%	50 - 150	
Methomyl	0.000	0.748	0.630	0.800	17.2%	< 30	93.5%	78.7%	50 - 150	
MGK-264	0.000	0.154	0.158	0.400	2.2%	< 30	38.5%	39.4%	50 - 150	Q
Myclobutanil	0.000	0.236	0.279	0.400	16.5%	< 30	59.0%	69.7%	50 - 150	
Naled	0.000	0.634	0.644	1.000	1.5%	< 30	63.4%	64.4%	50 - 150	
Oxamyl	0.000	1.904	1.702	2.000	11.2%	< 30	95.2%	85.1%	50 - 150	
Paclobutrazole	0.000	0.575	0.602	0.800	4.6%	< 30	71.8%	75.2%	50 - 150	
Parathion-Methyl	0.000	0.454	0.359	0.800	23.4%	< 30	56.7%	44.9%	30 - 150	
Permethrin	0.000	0.212	0.213	0.400	0.5%	< 30	53.0%	53.2%	50 - 150	
Phosmet	0.000	0.283	0.293	0.400	3.4%	< 30	70.7%	73.2%	50 - 150	
Piperonyl butoxide	0.000	1.325	1.377	2.000	3.8%	< 30	66.2%	68.8%	50 - 150	
Prallethrin	0.000	0.197	0.193	0.400	1.6%	< 30	49.1%	48.3%	50 - 150	Q
Propiconazole	0.000	0.622	0.634	0.800	2.0%	< 30	77.8%	79.3%	50 - 150	
Propoxur	0.000	0.297	0.298	0.400	0.3%	< 30	74.4%	74.6%	50 - 150	
Pyrethrin (Summe)	0.000	0.320	0.323	0.413	0.9%	< 30	77.5%	78.3%	50 - 150	
Pyridaben	0.000	0.226	0.231	0.400	2.4%	< 30	56.5%	57.9%	50 - 150	
Spinosad	0.000	0.230	0.230	0.388	0.1%	< 30	59.3%	59.4%	50 - 150	
Spiromesifen	0.000	0.267	0.247	0.400	7.7%	< 30	66.7%	61.8%	50 - 150	
Spirotetramat	0.000	0.506	0.525	0.400	3.7%	< 30	126.5%	131.3%	50 - 150	
Spiroxamine	0.000	0.576	0.625	0.800	8.2%	< 30	72.0%	78.2%	50 - 150	
Tebuconazole	0.000	0.601	0.649	0.800	7.7%	< 30	75.1%	81.1%	50 - 150	
Thiacloprid	0.000	0.334	0.344	0.400	3.0%	< 30	83.4%	86.0%	50 - 150	
Thiamethoxam	0.000	0.358	0.330	0.400	8.2%	< 30	89.6%	82.5%	50 - 150	
Trifloxystrobin	0.000	0.243	0.247	0.400	1.5%	< 30	60.9%	61.8%	50 - 150	



12423 NE Whitaker Way
Portland, OR 97230
503-254-1794



Report Number: 22-012186/D011.R000
Report Date: 10/17/2022
ORELAP#: OR100028
Purchase Order:
Received: 10/10/22 10:10





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Explanation of QC Flag Comments:

Code	Explanation
Q	Matrix interferences affecting spike or surrogate recoveries.
Q1	Quality control result biased high. Only non-detect samples reported.
Q2	Quality control outside QC limits. Data considered estimate.
Q3	Sample concentration greater than four times the amount spiked.
Q4	Non-homogenous sample matrix, affecting RPD result and/or % recoveries.
Q5	Spike results above calibration curve.
Q6	Quality control outside QC limits. Data acceptable based on remaining QC.
R	Relative percent difference (RPD) outside control limit.
R1	RPD non-calculable, as sample or duplicate results are less than five times the LOQ.
R2	Sample replicates RPD non-calculable, as only one replicate is within the analytical range.
LOQ1	Quantitation level raised due to low sample volume and/or dilution.
LOQ2	Quantitation level raised due to matrix interference.
B	Analyte detected in method blank, but not in associated samples.
B1	The sample concentration is greater than 5 times the blank concentration.
B2	The sample concentration is less than 5 times the blank concentration.