

Regulatory Laboratory Perspective on Colorado's Cannabis Industry

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Department of Agriculture

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Disclaimer

The views and opinions expressed in this presentation are solely those of the author and do not necessarily reflect those of any state agency nor those of any state officials. No legal or regulatory opinions or advice are being proffered and none should be intended nor inferred.

Background

Colorado has three types of legalized Cannabis:

- ❖ **Industrial Hemp**
- ❖ **Medical Marijuana**
- ❖ **Recreational Marijuana**

Background

- **Industrial Hemp - authorized in the US FARM Bill and State legislation enacted in 2013** [C.R.S. 35-61-101]

- **Medical Marijuana – voter initiative approved in 2000; State Constitution - Amendment 20**

[Article XVIII Section 14. Medical Use of Marijuana for Persons Suffering from Debilitating Medical Conditions]

- **Recreational Marijuana - voter initiative approved in 2013; State Constitution - Amendment 64**

[Article XVIII Section 16. Personal Use and Regulation of Marijuana (Recreational)]

Background

- **Industrial Hemp** – Regulated by the CO Department of Agriculture
- **Medical Marijuana** – Regulated by the CO Department of Public Health & Environment
- **Recreational Marijuana**– Regulated by the CO Department of Revenue

Background

- **2.9% State Sales Tax**
- **15% State Retail Tax**
- **15% Excise Tax**
- **County, District, Local Taxes**
- **1.5 Billion dollar industry**
- **Estimated ~\$200 million in state taxes & fees (2016)**

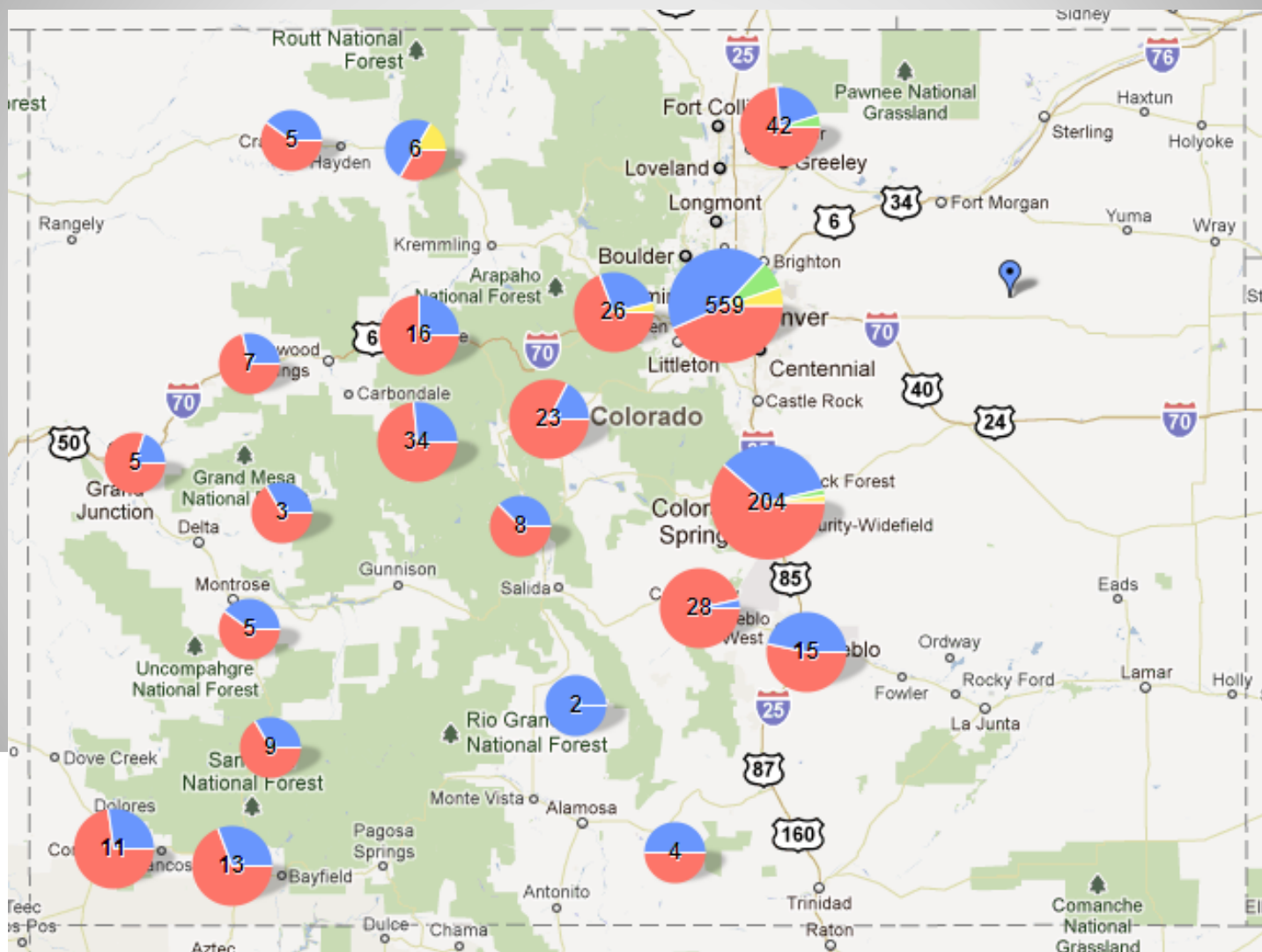
CO Cannabis Marketplace

Number of Licensed Medical Marijuana Businesses as of February 1, 2017		Number of Licensed Retail Marijuana Businesses as of February 1, 2017	
Centers	524	Stores	463
Cultivations	782	Cultivations	631
Infused Product Manufacturers	249	Product Manufacturers	246
Testing Facilities	14	Testing Facilities	13

Number of CDA Industrial Hemp
Grow Permits >500 for 2017

CO Cannabis Marketplace

- Marijuana bud (loose or rolled joint)
- Oils/Hash Oil/Hemp Oil
- CBD Oils (e.g., *Charlotte's Web*, *Angel Tears*)
- Butters
- Edibles
- Baked goods
- Lotions
- Patches
- Shampoos
- Lip Balms
- Personal Lubricants
- Toothpastes
- Chocolate bars
- Candies (infamous gummy bears)
- Kief/Keef/Kif
- Vaping pen cartridges
- Shatter



CDA Regulatory Environment

- **Colorado Pesticide Act**
 - **C.R.S. 35-9-101**
- **Colorado Pesticide Applicators' Act**
 - **C.R.S. 35-10-101**
- **Colorado Industrial Hemp Regulatory Program**
 - **C.R.S. 35-61-101**
- **Colorado Measurement Standards Act**
 - **C.R.S. 35-14-101**

CDA Regulatory Environment

- **Governor's Executive Order D2015-015 was issued 11/12/2015.**

Excerpt:

Until scientific assessment establishes which additional pesticides can be safely applied to marijuana, marijuana contaminated by an Off-Label Pesticide shall constitute a threat to the public safety.

II. Declaration and Directives

1. The Colorado Department of Health and Environment ("CDPHE") shall hereby deem all marijuana contaminated by an Off-Label Pesticide a risk to public health, and the Department of Revenue is authorized to find such contaminated marijuana a threat to public safety.
2. Several executive branch agencies, including CDPHE, the Colorado Department of Agriculture ("CDA") and the Colorado Department of Revenue ("DOR") are statutorily charged with executing state policy governing cultivation and sale of marijuana. These agencies are hereby directed to utilize all existing investigatory and enforcement authorities established by law to protect against threats to the public safety posed by contaminated marijuana including, but not limited to, placing contaminated marijuana on administrative hold and destroying contaminated marijuana pursuant to existing law.

CDA Regulatory Environment

- **CDA published in 2015 a list of pesticides allowed for use in marijuana grows**

CDA Website:

<https://www.colorado.gov/pacific/agplants/pesticide-use-cannabis-production-information>

- **CDA updates the list regularly**

Chemistry Overview

- **Method SOPs are on CDA lab's ISO 17025 Scope of Accreditation (A2LA)**
- **Marijuana samples extracted with QuEChERS**
- **Analyzed by LC/MS/MS, GC/MS and/or Q-TOF**
- **Hemp samples extracted with methanol**
- **Analyzed by GC-FID**
- **Cannabinoids extracted with methanol**
- **Analyzed by HPLC**

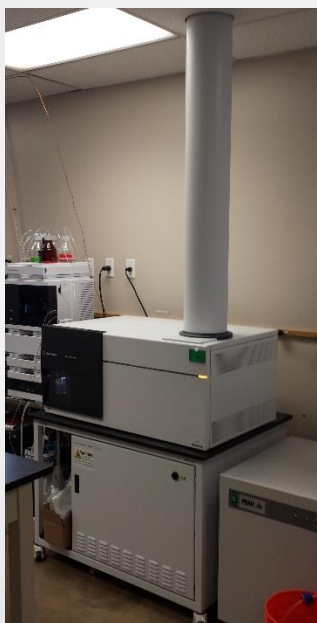
The Seven Workhorses



6460 LC/MS/MS



6460 LC/MS/MS



6545 Q-TOF



7890/5975 GC/MSD



7890/5975 GC/MSD



6890 GC-FID



1100 HPLC

Regulatory Composite Data

FY 2016 (Sample Results Reported 7/1/15 Thru 06/30/16)

Samples Tested: 599

Samples with Detects of illegal pesticides: 294 49%

Non-detect Samples: 208 35%

16% of the samples had detects of pesticides but these pesticides were not a violation to use

Compounds Detected

of Detects

Myclobutanil

190

Azadirachtins

165

(Allowed for use)

Imidacloprid

77

Spiromesifen

72

Avermectins

44

Bifenanzate

43

Etoxazole

27

Piperonyl Butoxide (Adjuvant)

15

(Allowed for use)

Azoxystrobin

13

Spinosyn A

15

Spinosyn D

6

Pyrethrins

3

Propiconazole

3

Chlorfenapyr

2

Spirotetramat

1

Regulatory Composite Data

FY 2017 (Sample Results Reported 7/1/16 Thru 02/28/17)

Samples Tested:	437	
Samples with Detects of illegal pesticides:	57	13%
Non-detect Samples:	191	44%

43% of the samples had detects of pesticides but these pesticides were not a violation to use

<u>Compounds Detected</u>	<u># of Detects</u>	
Myclobutanil	27	
Azadirachtins	117	(Allowed for use)
Imidacloprid	9	
Spiromesifen	8	
Avermectins	6	
Bifenazate	-	
Etoxazole	-	
Piperonyl Butoxide (Adjuvant)	72	(Allowed for use)
Azoxystrobin	-	
Spinosyn A	4	
Spinosyn D	1	
Pyrethrins	-	
Propiconazole	-	
Chlorfenapyr	-	
Spirotetramat	-	
Prallethrin	1	
Permethrin (Pyrethroid)	1	

Regulatory Composite Data

➤ Industrial Hemp Testing Metadata

CY 2016			CY 2015			CY 2014		
% THC Range	# Samples	% of Total	% THC Range	# Samples	% of Total	% THC Range	# Samples	% of Total
0.0 to 0.05	34	16.8	0.0 to 0.05	10	10.4	0.0 to 0.05	7	25.0
0.06 to 0.10	35	17.3	0.06 to 0.10	12	12.5	0.06 to 0.10	4	14.3
0.11 to 0.15	36	17.8	0.11 to 0.15	13	13.5	0.11 to 0.15	2	7.1
0.16 to 0.20	14	6.9	0.16 to 0.20	10	10.4	0.16 to 0.20	3	10.7
0.21 to 0.25	12	5.9	0.21 to 0.25	8	8.3	0.21 to 0.25	2	7.1
0.26 to 0.30	10	5.0	0.26 to 0.30	4	4.2	0.26 to 0.30	0	0
0.31 to 0.35	8	4.0	0.31 to 0.35	2	2.1	0.31 to 0.35	1	3.6
0.36 to 0.40	6	3.0	0.36 to 0.40	0	0	0.36 to 0.40	2	7.1
0.41 to 0.45	8	4.0	0.41 to 0.45	2	2.1	0.41 to 0.45	2	7.1
0.46 to 0.50	4	2.0	0.46 to 0.50	2	2.1	0.46 to 0.50	1	3.6
> 0.51	35	17.3	> 0.51	33	34.4	> 0.51	4	14.3
(202 Samples) 141/202 69.8			(96 Samples) 57/96 59.4			(28 Samples) 18/28 64.3		

Industry Insight

“What we’re seeing in the acquisition market currently are exhausted owners,” Lord said.

“What I believe we’ll continue to see here is further consolidation in the industry, and it will not be driven by competition. It will be driven by compliance.”

John Lord, Livwell
5/7/2016 The Denver Post

SUMMARY

The landscape is a still unfolding saga of the social, legal, regulatory, economic, medical and moral/ethical effects of state legalization of cannabis. Colorado has made significant progress in regulating the industry. There is a lot of work left to do.

Comments? Questions?