

This presentation premiered at WaterSmart Innovations

watersmartinnovations.com



Rocky Mountain High: Efficient water use for a budding industry

**USE ONLY
WHAT YOU
NEED.**

 **DENVER WATER**
denverwater.org

A Single Pot Plant Uses HOW Much Water?!

—By **Tom Philpott** | Wed Apr. 16, 2014 6:00 AM EDT

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No federal water for pot crops

The U.S. Bureau of Reclamation says it won't provide any federal controlled water for marijuana growers in Washington state where pot is legal for recreational use. The eastern part of the state relies on water from the Columbia, Yakima and Snake river watersheds.

A pot plant consumes six gallons of water every day.



Study: Pot Growers Inhale 1% of U.S. Electricity, Exhale GHGs of 3M Cars

Marijuana Linked To Water Scarcity

By *Sara Jerome*
[@sarmje](#)

Marijuana may be exacerbating the effects of the California drought.

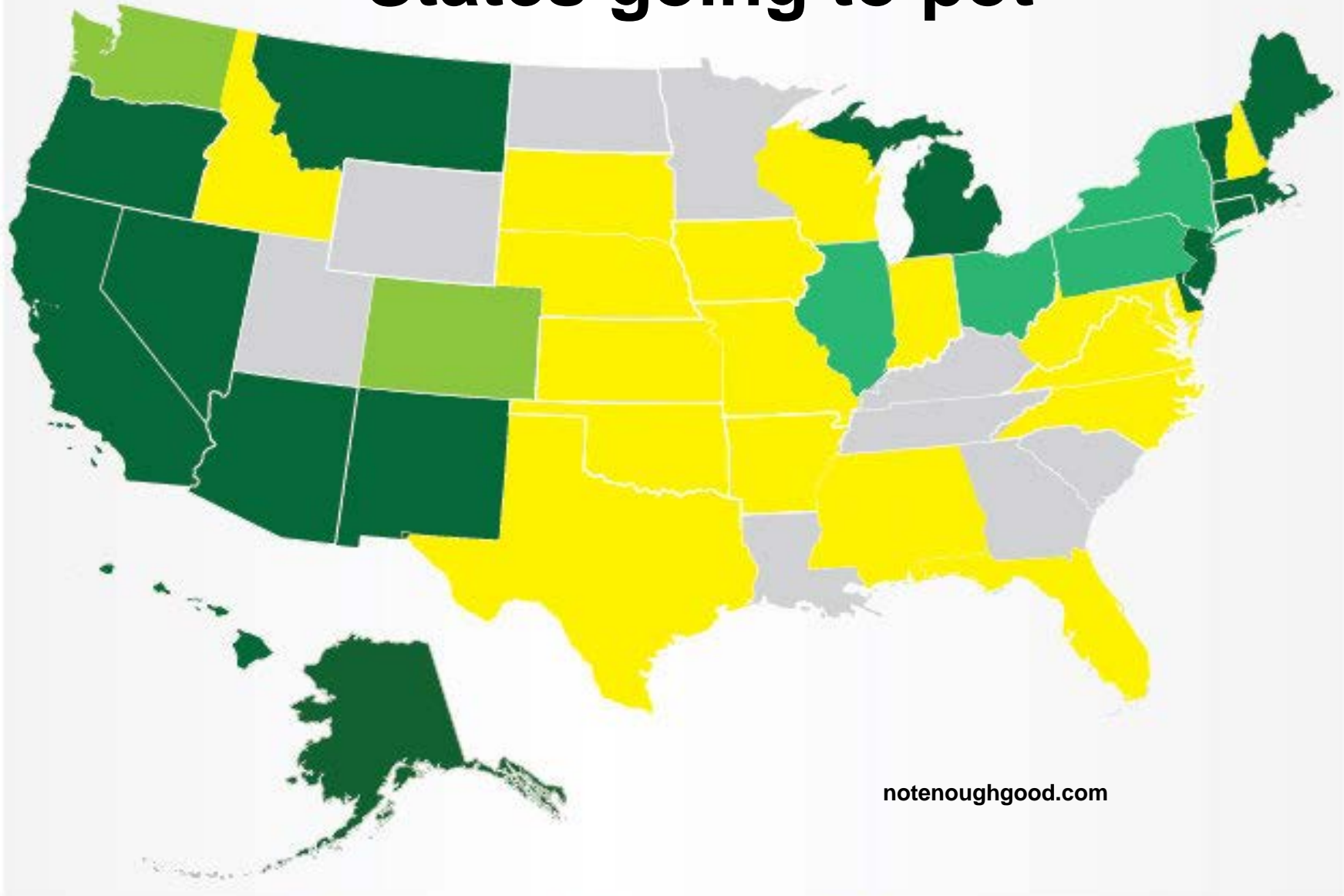
"Streams in Northern California's prime marijuana-growing watersheds likely will be sucked dry this year if pot cultivation isn't curtailed," the *Press Democrat* reported.



Water-Guzzling Pot
Drought-Wracked Ca

North Coast's booming marijuana farm

States going to pot



notenoughgood.com

- Medical use
- Recreation use
- Considering legislation
- Failed legislation
- No legislation

Brief Legislative Timeline

2000

Medical Marijuana becomes legal in Colorado

2005

Voters approve recreational use of one ounce for those over 21

2009

DEA to only go after operations that not in line with state laws
532 dispensaries
4,800 Medical MJ cards

2012

108,000 Medical cards
Recreational legalized

2014

150 Recreational stores opened
Over 100 in Denver Metro
Allowed more on Oct. 1



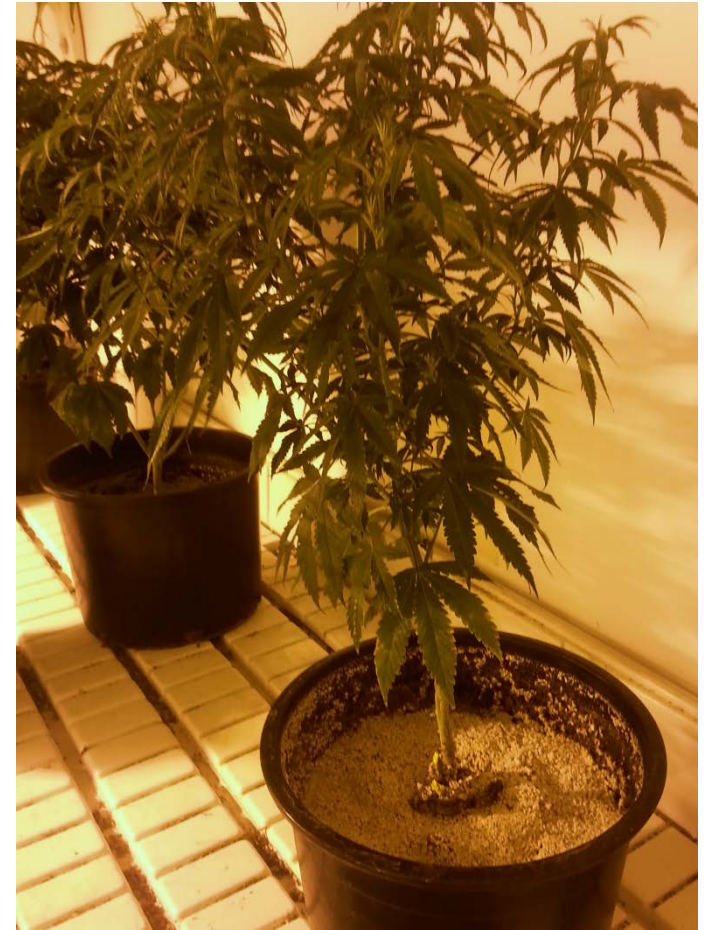
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New water intensive business

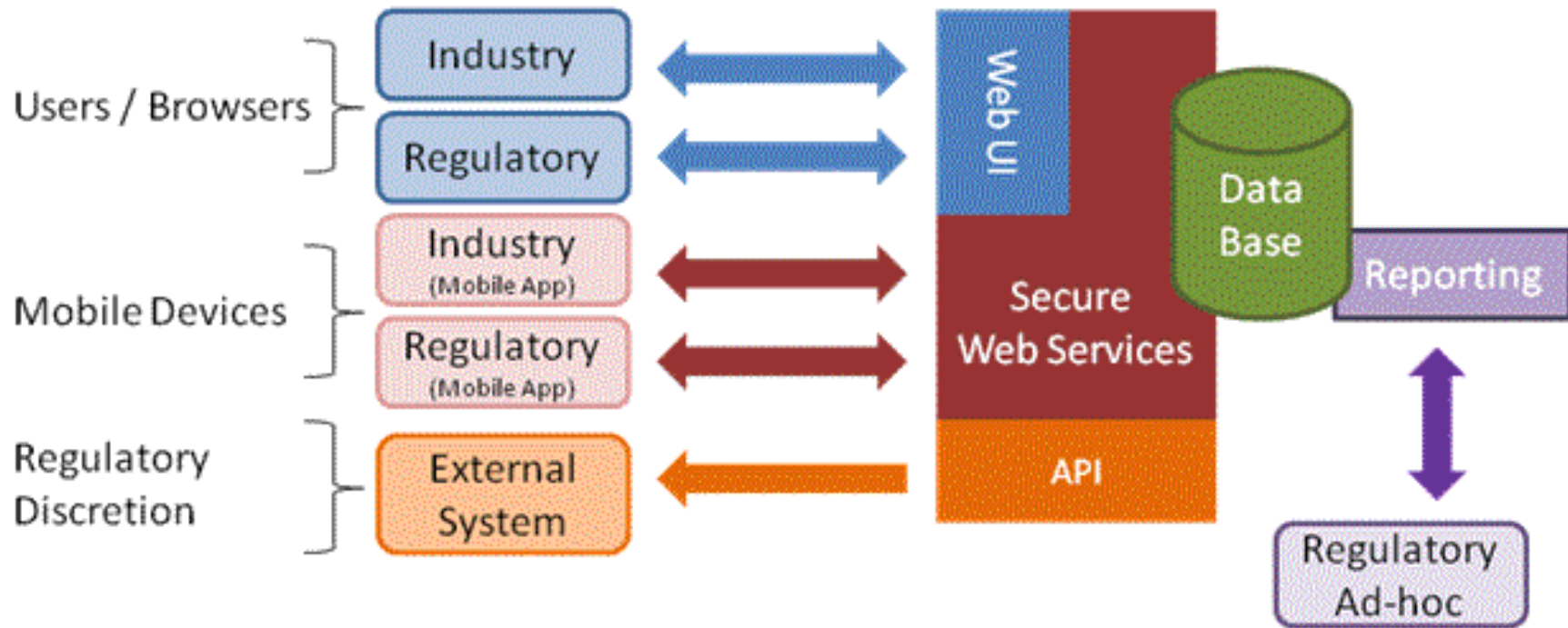
- How much water?
- What is efficient use?
- Where to start?
 - Audit
 - Ask the experts
 - Follow the data



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Data tracking in Colorado

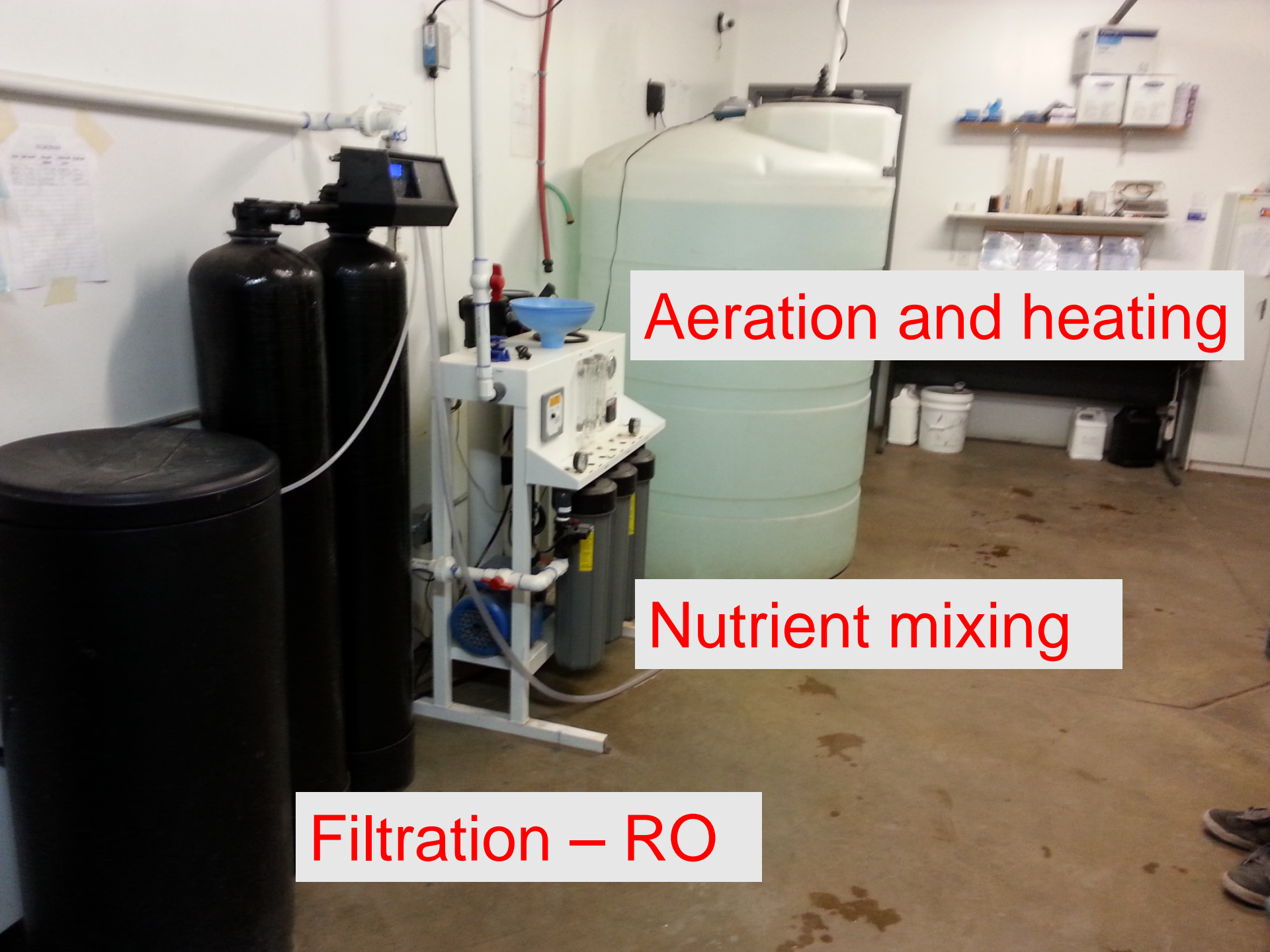


RETAIL

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Aeration and heating

Nutrient mixing

Filtration – RO





Veg Room

Date: 8/17

Initials: H

Gallons: 230g

Day: 12

Base Nutrients

Nutrients w/ Supplements

PPM: 510

PPM: 630

pH: 5.9

pH: 5.8

Temp: 76°

Temp: 75°

Notes:

Flower Room 1

Date: 8/21

Initials: H

Gallons: 230

Day: 20

Base Nutrients

Nutrients w/ Supplements

PPM: 1190

PPM: 1270

pH: 5.8

pH: 5.9

Temp: 72°

Temp: 72°

Notes:



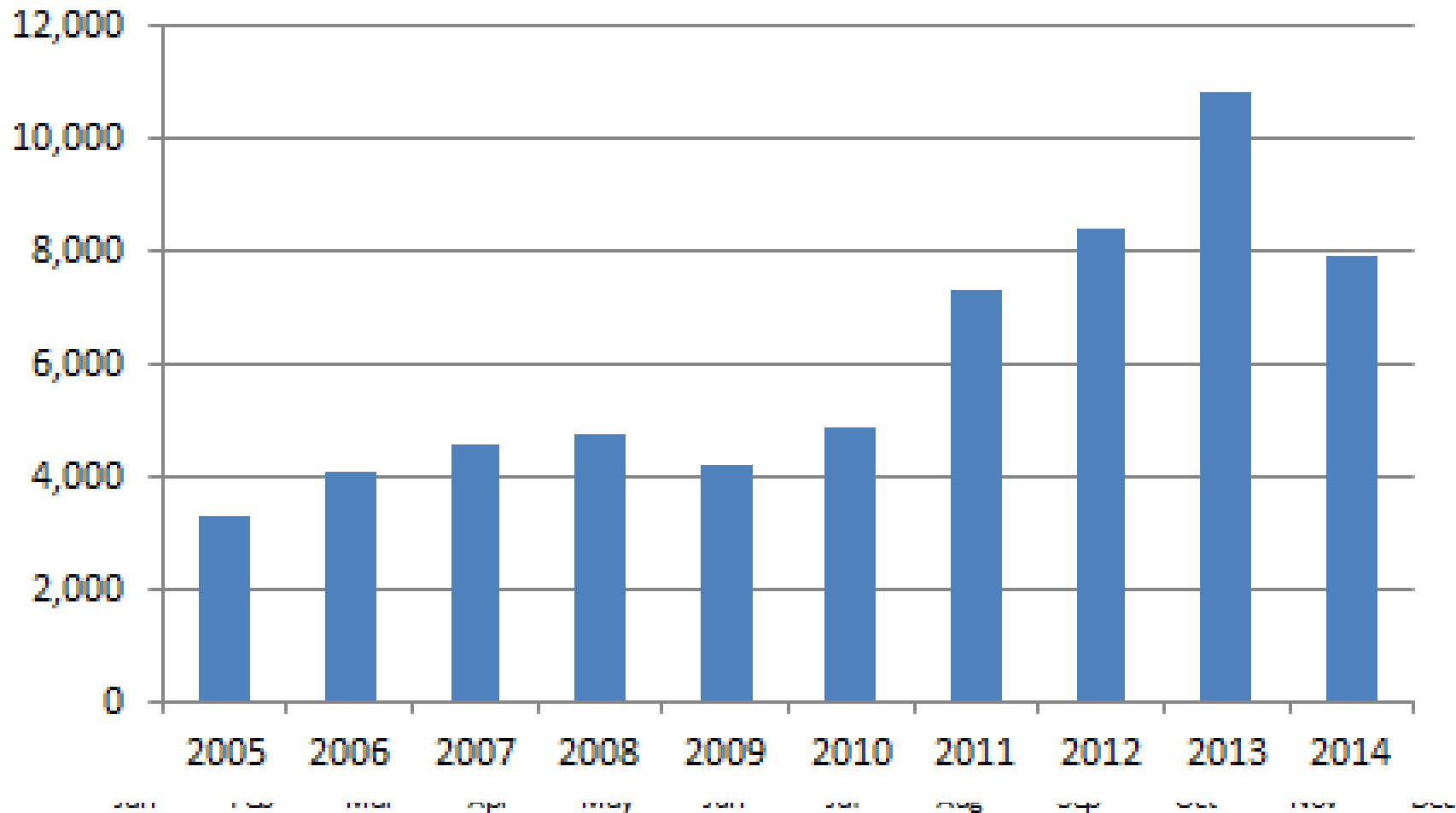
Solar
Radiation

Transpiration

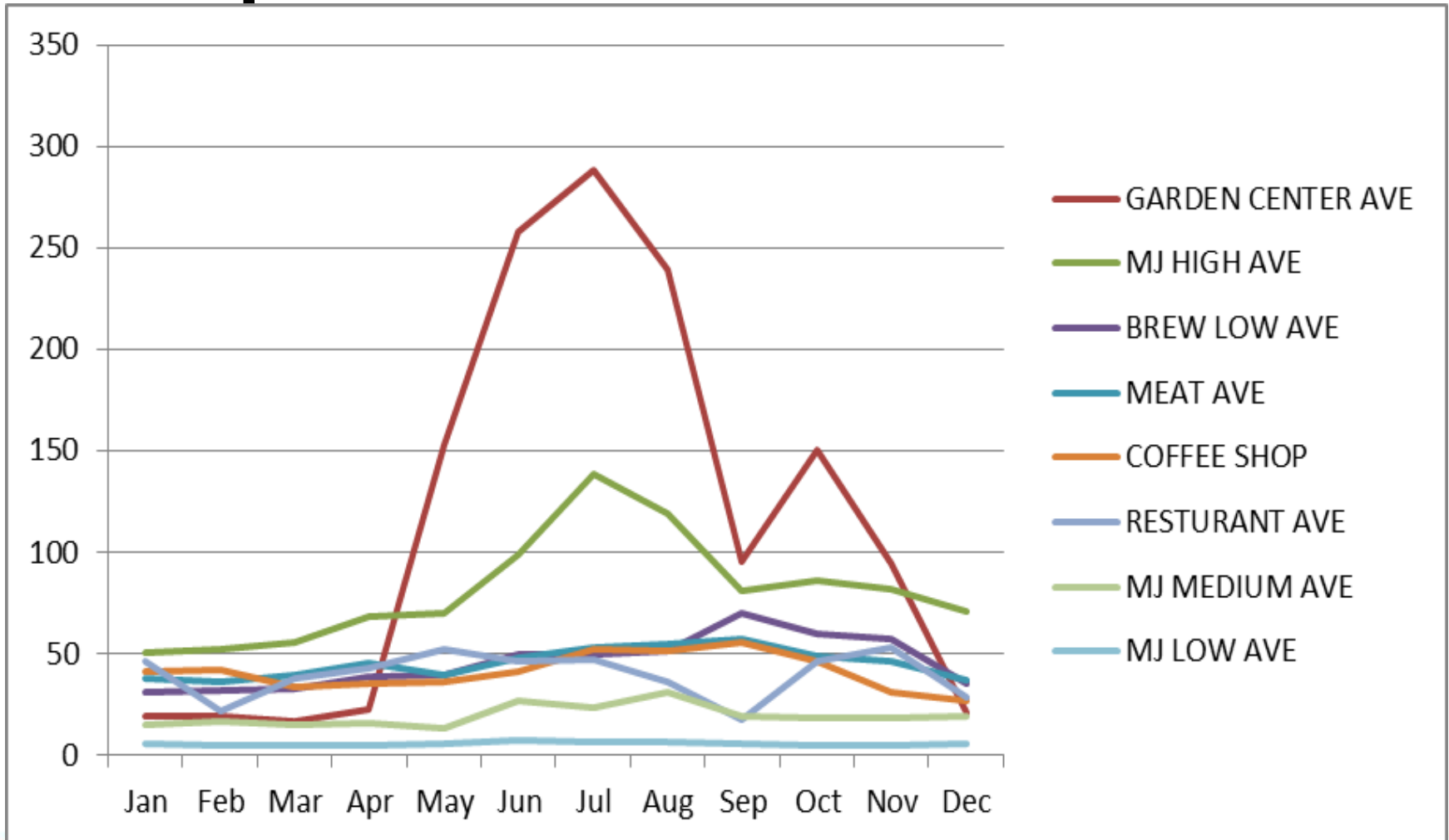
Soil
Moisture

How much water?

Total Yearly Consumption

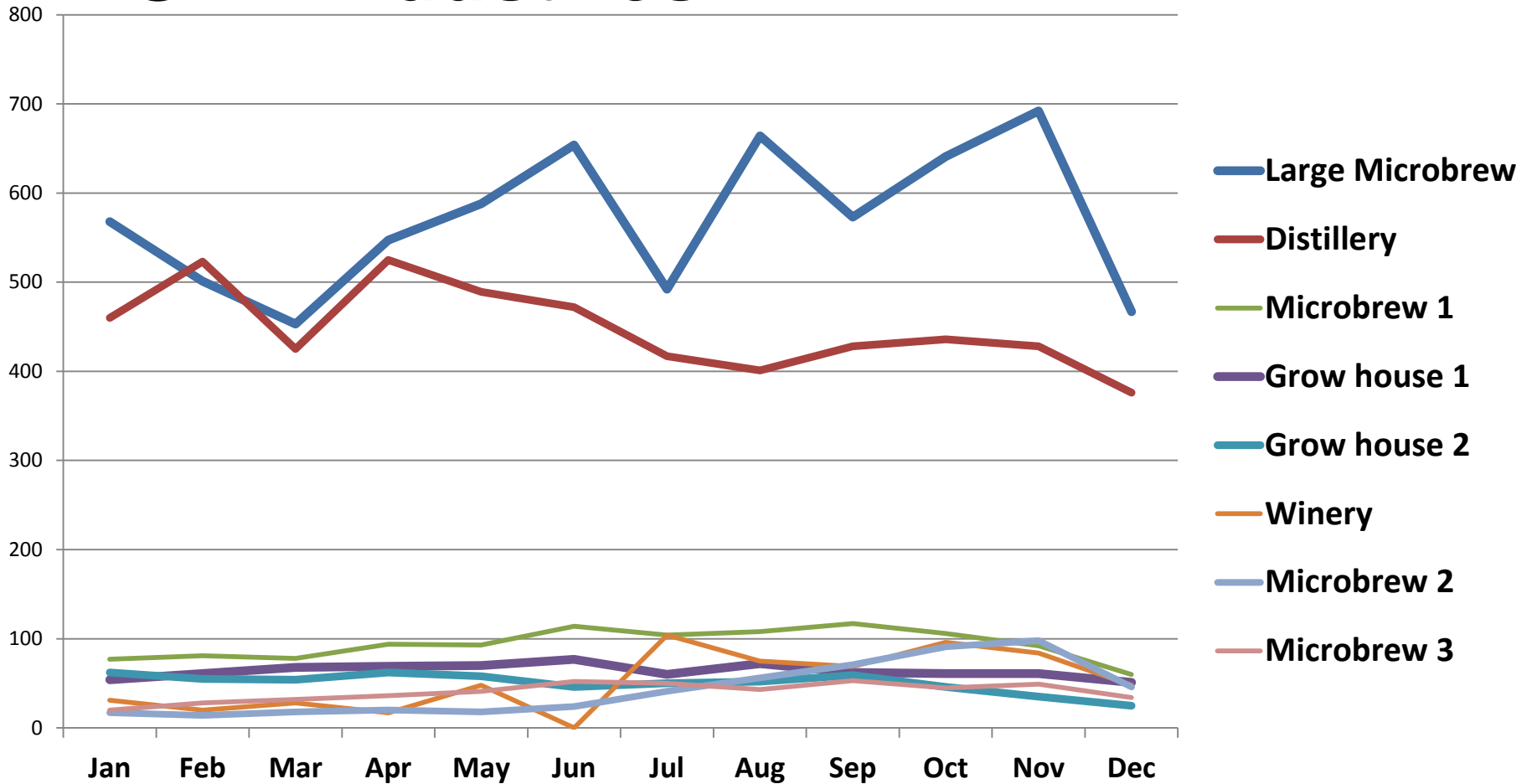


Comparable commercial



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“Sin” industries



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Lessons learned

- **Get in early – regulators and industry don't have time later**
- **Go big - economies of scale**
- **Still too early to get an efficiency baseline**
- **Lots of variability**

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LOT 30

Strain	Quantity
Bio-Diesel	2
Bio-Jesus	
Blue Dream	
Chem D	
DJ Shorts Flo	
Headband	2
Jack x SSH	
Outerspace	
Q3	
Ultimate 91	
Sour D	2
The Sister	1

LOT 31

Strain	Quantity
707 Headband	
AK47	2
Bio-Diesel	1
Bio-Diesel (80 Day)	
Bio-Jesus	4
Boston Blue Dream	
Blue Dream	2
Bubbalicious	
Bubba Kush	
Chem D x Mass x NL5	
Chem D	3
Dopium	11
Durban	3
DJ Shorts Flo	
Girl Scout	
Golden Goat	1
Gumbo	4
G.T.H	
Hashberry	
UP12	

Durban	23
DJ Shorts Flo	
Girl Scout	
Golden Goat	21
Gumbo	84
G.T.H	
Hashberry	
HP13	21
Harlequin	
Headband	
I.S.S	
Jack x SSH	
Lemon D	2
LA OG	
LA OG (LED)	23
OG18	24
OG18 (Organic)	
Outer Space	21 9
Q3	21
Rectangle	
Reserva	
S.L.H.	
Sour D	4
Tahoe	
The Sister	
Ultimate 91	23
White Widow	
Yumbolt	
99 Silver	

Best Practices for Growers

- No RO
- Track everything
- Monitor washing of soilless mediums

Best Practices for Utilities

- Know your customers
- Check metering for warehouse
- Create partnerships

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Next steps

- Explore reuse opportunities
- University of Maryland research
- Continue to partner with industry



COLORADO
Department of Revenue
Enforcement Division

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Q & A