

NATIONAL FIRE PROTECTION ASSOCIATION
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Growing Pains



Fire Safety for the Budding Marijuana Industry
 March 22, 2017 | Raymond B. Bizal, P.E. | Senior Regional Director

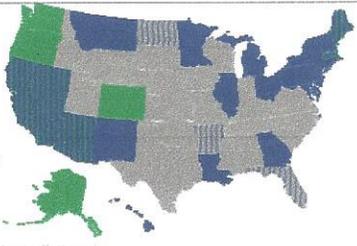
Agenda

- From Seed to Sale
- From Basement to Boardroom
- Grow Operation Hazards
- Extraction Hazards
- New Fire Safety Regulations



Decriminalization

The Pot Industry Continues to Grow
 The growing of cannabis has become a multi-billion dollar industry, with some states reporting significant revenue from the sale of cannabis. Other states are also looking to legalize the sale of cannabis, which could mean more jobs and tax revenue for those states.



- Decriminalized & legalized
- Legalized
- Legalized, with restrictions on THC levels
- Legalized, with medical use

Marijuana Industry

- Grow and extraction
 - Unlicensed operations
 - Licensed operations
 - Takeovers
- Basement
- Warehouses
- Strip malls



Marijuana Industry

- Connect with other agencies in the jurisdiction
 - Political offices (mayor, council)
 - Tax offices
 - Health Department
 - Law Enforcement
 - Business Licensing
 - Building Department
 - Zoning Department

Marijuana Industry

- Licensed facilities:
 - Grow Operations
 - Marijuana Manufacturing
 - Laboratories
 - Retail Sales
- Unlicensed facilities:
 - Residential Occupancies



Marijuana Industry

- Unlicensed residential
 - Electrical loads
 - Lighting ignition sources
 - Open blasting
 - Refrigerator explosions
 - Security



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Marijuana Industry

- Unlicensed residential
 - Reactive enforcement
 - Public education



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Marijuana Cycle

- Clone/Seedling
- Grow
- Flower/Bud
- Harvest/Trim
- Process/Extraction
- Retail



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Cloning/Seeding

- Most cloned
- Some seeded

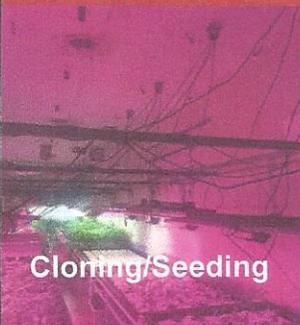


Cloning/Seeding

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Cloning/Seeding

- Most cloned
- Some seeded



Cloning/Seeding

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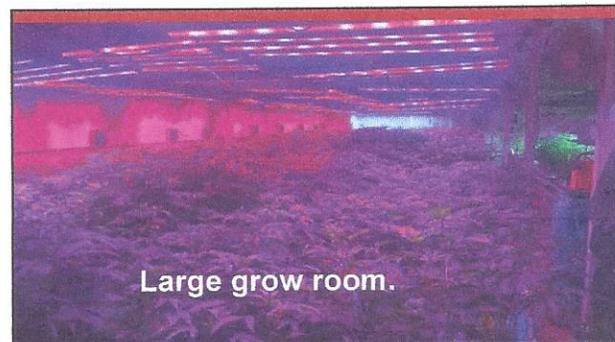
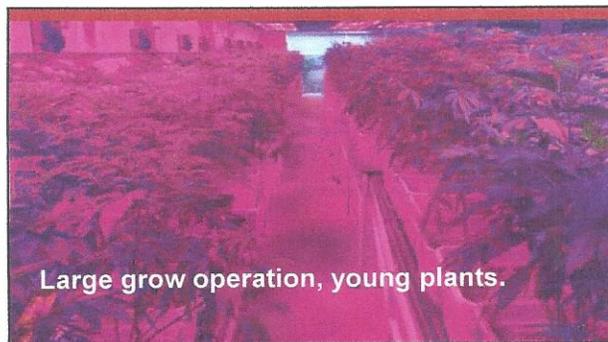
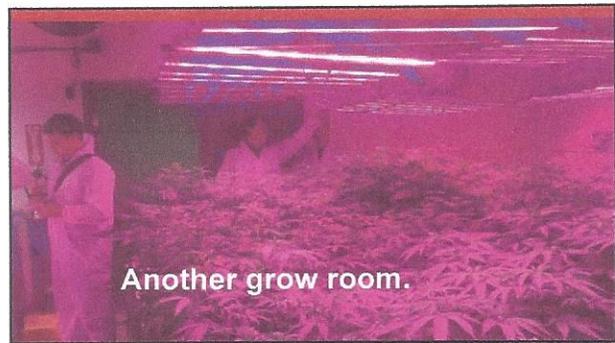
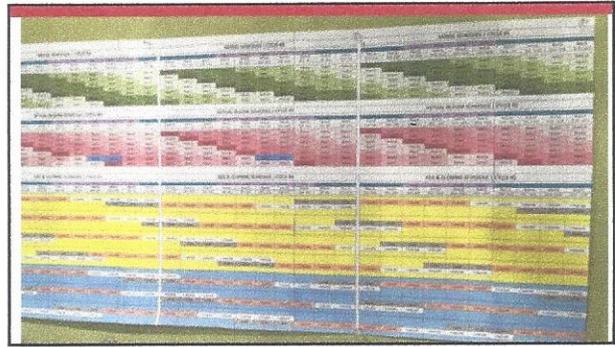
Tracking

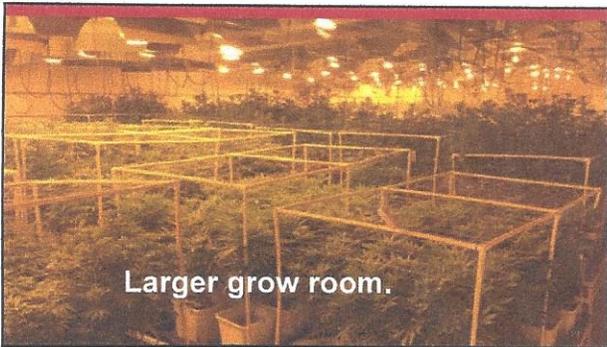
- Each plant
- Entire life
- Accountability



Tracking

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Grow Operations

- Lights may be on a timer
- At some point, a room may be dark at all times.

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Grow Operations

- Plants can be grown on multi-level racks

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Flower/Bud

- These rooms often have netting to support branches
- Lighting can change

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Flower/Bud

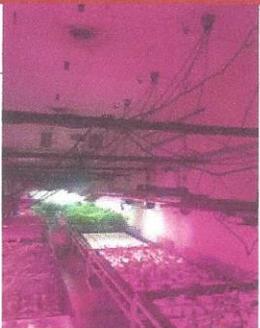
- Going for the waxy stuff on the bud which holds the THC, CBDs and terpenes.

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Grow Operation Hazards

- Lighting
 - Heat source
 - Extension cords
 - Electrical loading
- HVAC
 - Increase electrical load
 - Filters



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Grow Operation Hazards

- Electrical
 - Illegal tapping
 - Overloaded circuits
 - Fans cooling panels
 - Unpermitted electrical work



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Grow Operation Hazards

- Room subdivision
 - Plastic sheets to subdivide
 - Unpermitted construction
 - Sprinkler extensions
 - Egress from rooms
 - Aisles



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Grow Operation Hazards

- Room subdivision



Grow Operation Hazards

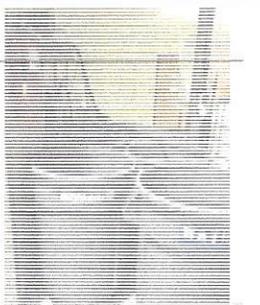
- Fire Operations
 - Movable grow racks
 - Electrical cords
 - Fertilizing tubes
 - Movable light hangars
 - Multiple small rooms
 - Hazmat
- Mutual Aid considerations



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Grow Operation Hazards

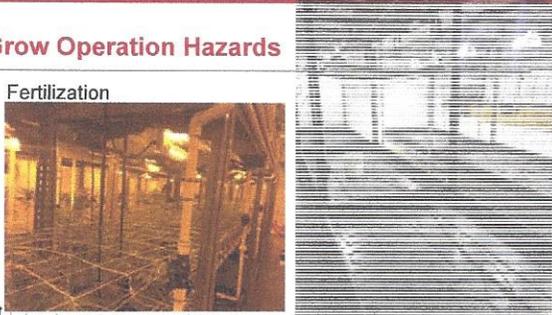
- Fertilization
 - What chemicals are being used
 - What is the delivery system
 - Where is the holding tank.
 - HMMP/HMIS
 - MAQ



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Grow Operation Hazards

- Fertilization



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Grow Operation Hazards

- Fumigation



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Grow Operation Hazards

- Fumigation



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Grow Operation Hazards

- Carbon Dioxide Enrichment
 - Elevated CO2 increase crop yields
 - Typical range 1,500 ppm or less
 - OSHA 8 hr limit for human occupancy is 5,000 ppm
 - CDC IDLH is 40,000 ppm
 - Potential asphyxiation hazard to occupants in the grow room and adjacent occupants in multi-tenant buildings

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Grow Operation Hazards

- Carbon Dioxide Generators
 - Unvented fuel fire appliances
 - Potential elevated CO2 levels
 - Potential elevated CO levels

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Grow Operation Hazards

- Compressed or Liquefied Carbon Dioxide
 - Potential elevated levels

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Grow Operation Hazards

- Carbon Dioxide Enrichment



Harvest & trim.

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Harvest/Trim

- Buds are harvested and dried
- Remainder of plant is destroyed
- Accountability

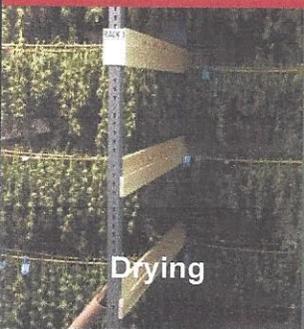


Harvest & trim.

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Harvest/Trim

- Buds are dried



Drying

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Drying.

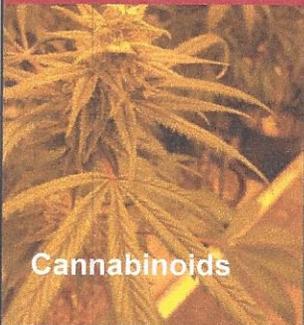


Most of the plant is waste.

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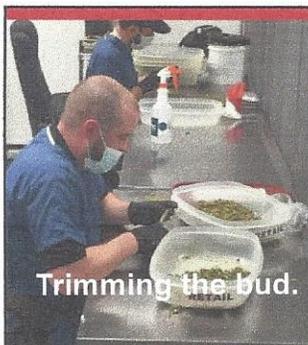
Processing

- Sticky wax holds the cannabinoids
- Processing them removes them from the bud.



Cannabinoids

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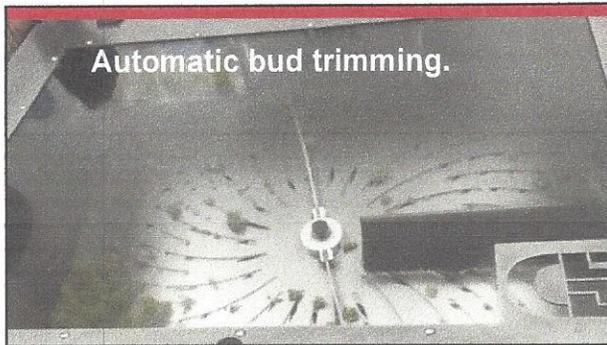


Trimming the bud.

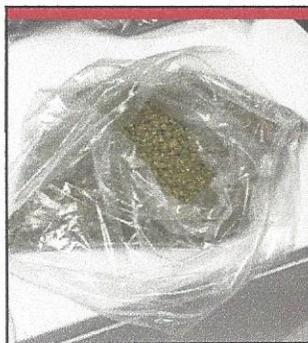
Processing

- Product is separated
 - Bud and bud trim
- Both are usable product

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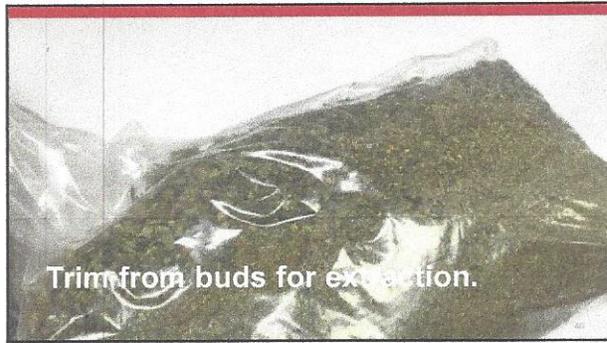
Automatic bud trimming.



Processing

- Trimmed bud, ready for sale.

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Trim from buds for extraction.



Processing bud for joints.

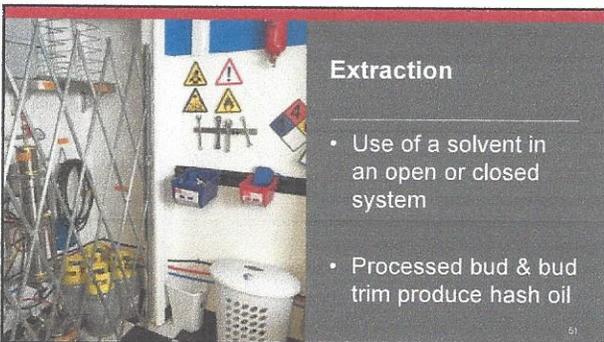
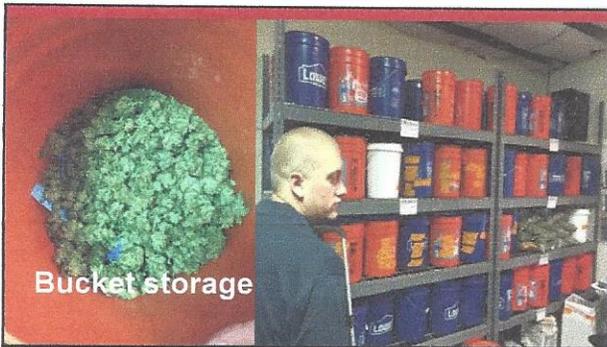


Freezer storage.

Processing

- Bud and bud trim storage

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Extraction

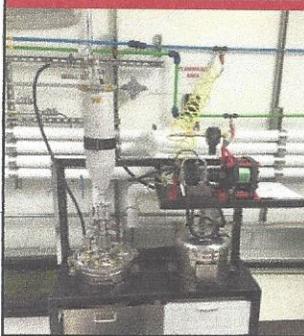
- Types of extraction methods
 - Liquefied Petroleum Gas (Butane and Propane)
 - Carbon Dioxide
 - Flammable Liquids (Distillation or boil off)
 - Cold water extraction/Dry Ice/Food Based/Rosin Technique

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Extraction

- Types of extraction methods
 - Closed loop
 - Open blasting

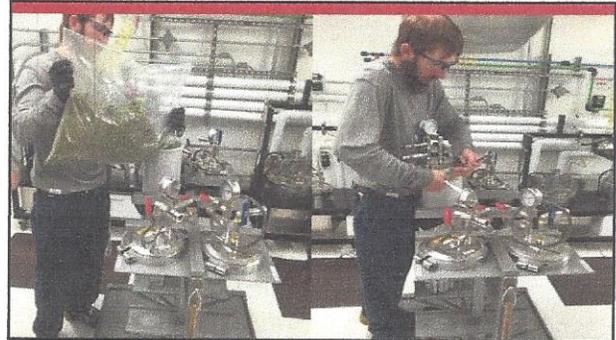
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Extraction

- Typical extraction equipment
- How does it work?
- Is it listed and labeled?

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Extraction Room Hazards

- LPG Fuel
- Electrical
- Ventilation
- Gas detection
- Combustibles
- Exiting
- Sprinklers
- Engineered Equipment

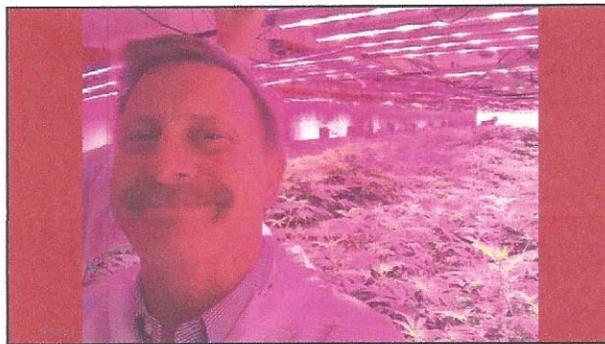
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Extraction Room Hazards

- LPG Fuel
- Storage and transfer per NFPA 58.

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Thank You, Questions?

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