

# 2018 KDA Industrial Hemp Open Dialogue and Information Exchange

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## Colorado

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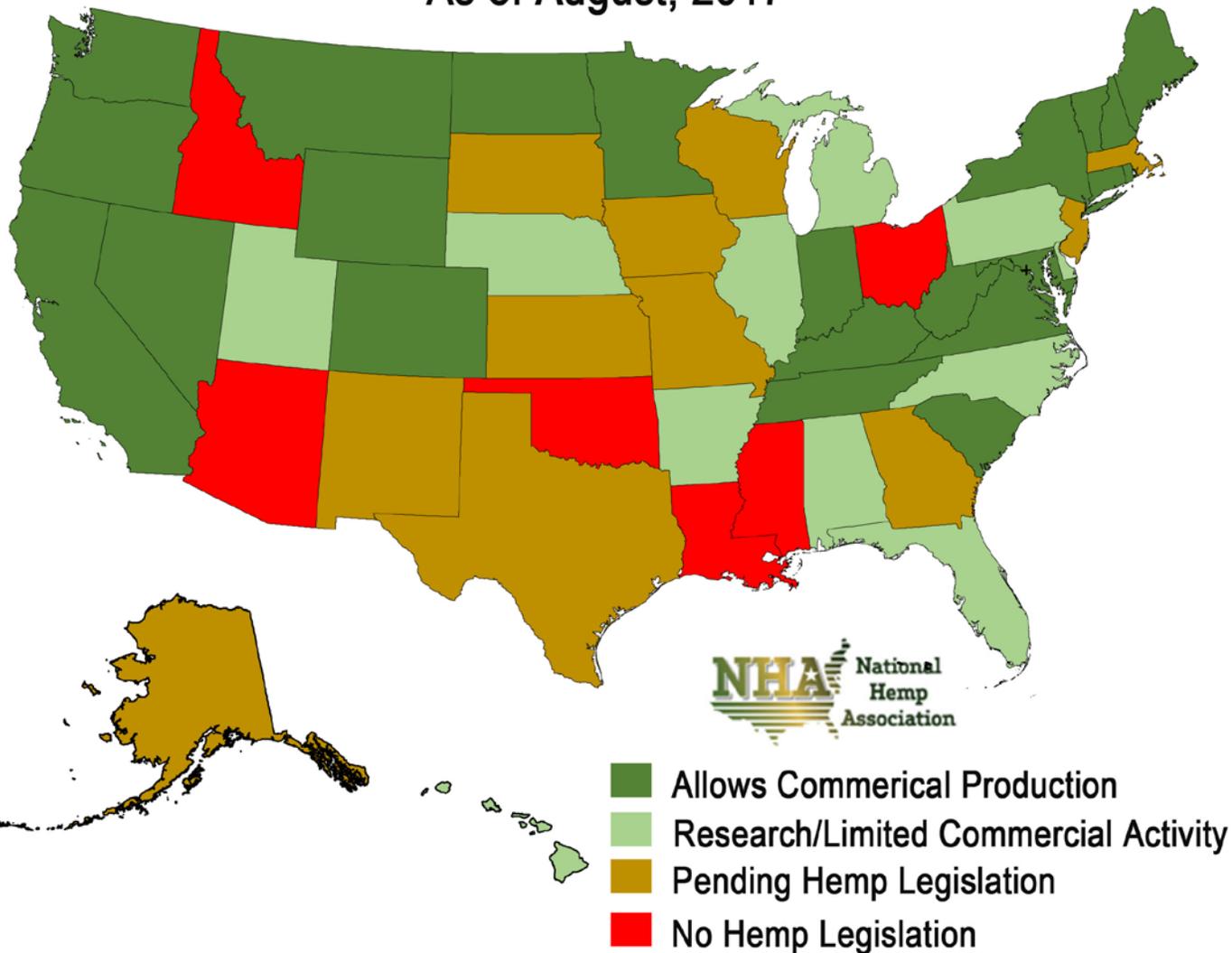
Colorado Department of Agriculture

# Welcome to Hemp Production

- Lots of states have hemp production
- Help is available
- It is a unique world compared to other crops
- It is possible to be successful

# U.S. Industrial Hemp Status by State

As of August, 2017



Change is continual in hemp

- Kansas legalized hemp
- New Mexico legalized hemp
- Missouri Legislature passed a hemp bill, now at the Governor for consideration

# Hemp Registrations in Colorado

<b>Production Year</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>
Registered Acres:	1,811	3,657	8,988	12,024
Registered Square feet :	253,000	570,980	1.36M	2.35M
Registrants:	131	166	312	386

## **Current Numbers as of Feb 1, 2018**

Registered Acres - 12,609

Registered Square Feet - 2,724,487

Registrations - 553

Registrants – 432

**50 of 64 Colorado counties have a registered land area for hemp production**

# Hemp Registrations in Colorado

- 20% are 1 acre or less
- 56% are 10 acres or less
- 25% greater than 30 acres

**While Colorado's overall acres for hemp registration is large, most producers are only producing on small land areas.**





# Hemp Field Production (Seed or Fiber)



# Hemp Field Production (CBD)



# Hemp Greenhouse Production











Wispy



Bushy



Tall



Compact

Differences in **Hemp Phenotypes**

# Colorado's Advisory Committee

**A member for each of the following categories:**

- Hemp Farmer from a Cooperative
- Attorney General's Office
- Cannabinoid Industry
- Higher Education Research Institution
- Industrial Hemp Regulation
- Seed Development and Genetics
- Hemp Manufacturing Industry
- Certified Seed Industry
- Commercial Farmer
- Citizen Advocate
- Hemp Small Business

# Requirements for the Hemp Producer

## Application process

- *Lengthy and detailed*
- Must be submitted at least 30 days prior to planting
- Demographic information
- Contacts – officially who can provide information to CDA
- List all individuals with a 10% or more interest
- Identify the land area – legal description, address and GPS coordinates
- Map – detailed
- Good for 365 days
- Changes to application information are required

# Requirements for the Hemp Producer

## Application process

- \$500 application fee, plus \$5 per acre and/or \$0.33 per 1,000 square feet (this fee is based on the program being self-funded)
- We utilize 3 full time office staff for the program, portions of 3 other office staff and approximately 0.5 FTE for sample collection.

# Requirements for the Hemp Producer

## Application process

- If all of the previous items are provided and it meets the requirements of the law and rules, a registration is issued.
- Planting may then proceed.
- **Note:** CDA does conduct background checks on applicants for a hemp registration.

# Requirements for the Hemp Producer

- **Pre planting report**

- must be provided prior to planting
- state that the intended plants will be hemp ( $\leq 0.3\%$  THC) not marijuana
- list varieties intended to be planted
- declare intended end use

- **Planting report**

- Must provide within 10 days of planting or emergence of volunteers

- **Harvest report**

- within 30 of the expected harvest date
- must harvest with 5 days either side of the submitted harvest date or submit a new harvest report

# Requirements for the Hemp Producer

## Certified seed is not required in Colorado

- If you do use CDA certified seed, sampling for verification of THC content may be decreased
- Seed source is not verified unless the producer claims it is CDA certified seed.

# Importing of Hemp Seed

- CDA does have a DEA registration and will import hemp seed from other countries for Institutions of Higher Ed to conduct research.

# Requirements for the Hemp Producer

## Inspection program in Colorado

- CDA has the right to inspect at any time throughout the production process.
- Risk and random process for determining who is sampled
  - Non-planted registered acres are verified
- Sampling is based on the harvest report submitted - as close to harvest as possible
- We sample the female flower and about the upper two inches; if the plant is being grown for biomass and harvested before flowering we sample the top two inches of the plant

# Requirements for the Hemp Producer

## Inspection program in Colorado continued

- Inspector discretion on which plants in the field to sample
- Size of the sample is reflective of crop size; ½ oz. for individual plants, small plots with less than 100 plants the target is 3 oz. with a minimum of 1 oz.; larger plots but less than an acre the target is 8 oz. with a 3 oz. minimum and for multi acre plots the minimum amount is 8 oz.



# Requirements for the Hemp Producer

## Inspection program in Colorado continued

- Sampled material is transported to the CDA lab under chain of custody procedures
- Material is dried at the lab. All stem and seed are removed before testing.
- CDA uses gas chromatography to look at a total delta-9 concentration after decarboxylation - with this analysis method we convert THCA to THC
- CDA does not look for other cannabinoids for compliance purposes

# Requirements for the Hemp Producer

## Inspection program in Colorado continued

- Results are provided to the producer for all samples collected.
- If the results are above 0.3 % THC the crop must be destroyed on site in a method approved by the Commissioner.
- Verification of destruction is required.
- If the sample fails but is below 1.0 % THC CDA will take enforcement action against the producer. If it is above 1.0% THC CDA may take enforcement action.
- Anything that fails may be subject to standard law enforcement if the law enforcement agency so chooses irrespective of what CDA does.

# Law Enforcement Concerns

- CDA has not seen hemp production be a cover for marijuana production – sampling results show low THC values
- CDA encourages growers to talk to local law enforcement (city police, sheriff) about their hemp crop and location
- All registrants are listed on the CDA website
- CDA will verify for law enforcement if a location is questioned as to whether it is a legal hemp registration.
- If a producer claims to be producing hemp but is not in the CDA program it is considered an illegal cannabis grow site and all applicable drug enforcement actions may be taken by law enforcement.

# HEMP RESEARCH

economic development for fiber and hurd

**fibershed**  
local fibers • local eyes • local labor



**ADAMS STATE UNIVERSITY**  
**COLLEGE**  
*Great People. Great Flow.*  
*Community Partnerships*

A Project of  
Fibershed • Adams State University • Rezolana Institute

Field Contains  
NO-THC

INDUSTRIAL HEMP  
USED FOR CLOTH/ROPE  
\* POLLINATING MALES \*

ALL AMERICAN HEMP  
REG # 66847

# Production Issues

## Pest management

- **Weeds:** all of them
- **Insects:** hops aphid, hemp russet mite, hemp borer (in the east), Lygus bugs, stink bugs, grasshoppers, thrips, two spotted spider mites.
- **Diseases:** Powdery Mildew, Xanthomonas leaf spot, Xanthomonas campestris pv. Cannabis, Fusarium wilt, Hemp Canker
- **Nematodes:** Columbia root knot nematode, stem and bulb nematode
- **Viruses:** Alfalfa mosaic, Cucumber mosaic, Hemp mosaic, Hemp Streak





# Production Issues

- **Very limited pesticide products are available for hemp**
  - Herbicides are the most limited
  - CDA allowed list on the website, WA and OR have allowed lists also

# Are processors licensed by CDA?

- Colorado does not license processors outside of already developed regulatory programs.

# Market Issues

- Demand for hemp products?
- Is there a market?
- Economics of growing hemp?

# The Future – Research is Needed

- Agronomic practices
- Certified seed
- Market development
- Processing methods
- Any other issues

# Thank You

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# Tangential Issues Of Hemp Production

- Agency requires a DEA marijuana import registration to import hemp seed
- University specialists for pests may not be available as impact to federal dollars is a concern
- Labs for seed testing for germination, etc. may not be available
- Hemp has minimal agronomic and other research available for production
- Surface water use on hemp can be an issue if it goes through a federal water project.
- Crop insurance/federal program dollars on farms with cannabis
- Organic hemp
- Export certificates for hemp

# Tangential Issues of Hemp Production

- Do we need two inspectors to collect samples hemp samples?
- Can inspectors carry samples in state vehicles?
- Can you mail samples as USPS is a federal entity?
- Possibly can't use FedEx or UPS because those samples would leave the state before being delivered
- After sampling or being in fields/facilities inspectors clothes smell like cannabis
- Labs need to gear up for THC analysis

# Tangential Issues Of Hemp Production

- Lab techniques for cannabis analysis for pesticides are difficult
- Inspectors or other staff may be philosophically opposed to cannabis
- Number of participants at industry meetings can be a challenge



# Certified Seed

- The Association of Official Seed Certifying Agencies, (AOSCA) adopted Industrial Hemp Standards in 2015, however it does not address THC.

# Certified Seed

- **Why Grow Certified Seed:**
  - Certified Seed: Abates Crop Destruction
  - Varietal Purity
  - Weed & Disease Free Seed
  - Viability (maximize genetic potential)
- **Open Source**
  - Possible Crop Destruction
  - Variety Genetic Drift
  - %THC Testing Costs

# CDA Approved Certified Seed Varieties

- CDA conducts trials at five locations in Colorado to verify THC content.
- Factors include geographic location (latitude), elevation, temperature range, irrigation method, soil type.

# CDA Approved Certified Seed Varieties

- **2016 Approved Varieties**

- Eletta Campana, Source: Schiavi Seeds (Fiber variety)
- Fibranova, Source: Schiavi Seeds (Fiber variety)
- Helena, Source: Schiavi Seeds (Dual purpose: Grain/Fiber)

# CDA Approved Certified Seed Varieties

- **2017 Approved Varieties**
  - Beniko, Source: Schiavi Seeds (Dual purpose: Grain/Fiber)
  - Bialobrzeskie, Source: International Hemp Solutions/ Bija (Dual purpose: Grain/Fiber)
  - Elite, Source: New West Genetics, Ft. Collins, CO (Dual purpose: Grain/Fiber)
  - Tygra, Source: Schiavi Seeds (Dual purpose: Grain/Fiber)

# CDA Approved Certified Variety Contact Information

- [https:// www.schiaviseeds.com](https://www.schiaviseeds.com)
- [https:// www.newwestgenetics.com](https://www.newwestgenetics.com)
- [https:// www.bijahemp.com](https://www.bijahemp.com)



# Importance of Testing

- **Compliance**
- **Credibility of the Program**

# Factors That Can Impact Cannabinoid Content

- **Genetics**

- **Environment**

  - Weather Conditions

  - Insect & Disease Pressure

  - Irrigation

  - Soil Nutrient Composition

- **Seed Set**

- **Flower Maturity**

- **Harvest Date**

# What Part of the Plant You Sample Makes a Difference

DATE	LOCATION	VARIETY	PART	RESULT
8/12/2016	Fruita	A	Female Flower 2"	0.24
8/12/2016	Fruita	A	Female Lower Leaf	0.09
8/17/2016	Ft. Collins	B	Female Flower 2"	0.06
8/17/2016	Ft. Collins	B	Female Upper Leaf	Below LOQ
8/17/2016	Ft. Collins	B	Female Lower Leaf	ND
8/17/2016	Ft. Collins	B	Male Upper Leaf	ND
8/17/2016	Ft. Collins	B	Male Lower Leaf	ND
8/12/2016	Fruita	B	Female Flower 2"	0.3
8/12/2016	Fruita	B	Female Lower Leaf	0.11
8/12/2016	Fruita	B	Male Flower	0.13
8/12/2016	Fruita	C	Female Flower 2"	Below LOQ
8/12/2016	Fruita	C	Male Flower	Below LOQ
8/12/2016	Fruita	C	Female Lower Leaf	ND
8/12/2016	Fruita	F	Female Flower 2"	0.09
8/12/2016	Fruita	F	Male Flower	Below LOQ
8/12/2016	Fruita	F	Female Lower Leaf	ND

# When You Sample Makes a Difference

Date of Test	Location	Plant Part Tested	THC Concentration	
8/23/2016	Center	F Flower top 2"	0.12	PASS
9/8/2016	Center	F Flower top 2"	0.48	FAIL
8/17/2016	Ft. Collins	F Flower top 2"	0.06	PASS
9/1/2016	Ft. Collins	F Flower top 2"	0.33	PASS
8/12/2016	Fruita	F Flower top 2"	0.3	PASS
9/7/2016	Fruita	F Flower top 2"	0.63	FAIL
8/17/2016	Atwood	F Flower top 2"	0.1	PASS
9/1/2016	Atwood	F Flower top 2"	0.26	PASS
8/23/2016	CSSP	F Flower top 2"	0.12	PASS
9/8/2016	CSSP	F Flower top 2"	0.52	FAIL

# 2016 Testing Overview

- Inspected and/or sampled 6006 acres & 434,043 sq. ft. (9.9 ac. ) indoor
- 75% of the lab samples passed
- 25% that failed in 2016 represented 1,232 acres
- 957 of the 132 acres that failed were in three groups identified
- As Colorado Gold (78%), Rocky Hemp (100%), and US Landrace (25%)

# 2017 Testing Overview

- Registered acres at sampling 12, 292
- Planted acres 9,890
- Acres selected for inspection/sampling 9,213
- Percentage of acres selected 75%
- Acres failed as of 10/24/17 774.9
- % of Planted Acres that failed 7.8%

# 2017 Testing Overview

- 774 Failed Acres
- 688 of the 774 failed acres (89%) From (2) “varieties”
- \*\*\* The CDA Only recognizes CDA Approved Varieties as “Varieties”

# 2017 Testing Overview

## Varieties that Failed

• Marquis M-1	420 acres
• <u>Colorado Gold</u>	<u>268</u>
	688
• ECHA-2	30
• Colorado Queen	14
• Otto Bao X Cross	14
• A-1 7 Cherry	6.7
• Spectrum	5
• R4/Workhorse & X2	4
• Berry Blossom	3
• Trump	3
• Variety 3 C	0.1
• F1 C & D	0.1

# What You Test For Matters

CANNABINOID PROFILE		
CANNABINOID	%(w/w)	mg/g
THC	0.28%	2.8
THC-A	25.07%	250.7
CBD	0.00%	0.0
CBD-A	0.92%	9.2
CBN	0.00%	0.0
CBG	0.09%	0.9
<b>TOTAL CANNABINOIDS</b>	<b>26.36%</b>	<b>263.6</b>

**Measuring Total THC is Critical**

**0.28% THC + 21.99 THC-A = 22.27% Total THC**



- States group has meet for two years to work on hemp regulatory issues
- A states call is held quarterly.