

Hemp in Indiana - Eyes Wide Open

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2018 Farm Bill (selected key provisions)

- ▶ **Removed hemp from Schedule 1 drug status** and from definition of marijuana in federal law.
- ▶ **Moved hemp from DEA** (Department of Justice) oversight **to USDA** oversight with requirement for new rules and recognition of state programs.
- ▶ Did not remove current hemp research law until 1 year after USDA adopts final rules.
- ▶ Did not change status of marijuana, CBD, CBN, etc. Under the FDA Food, Drug, Cosmetic Act. This applies to human and animal foods.

Indiana Legislation - IC 15-15-13

- ▶ Brings language to Indiana law to conform with new federal law.
- ▶ Decarboxylation? What is it?
 - ▶ A process of converting THC-A to THC.
 - ▶ Brownies? Smoking hemp? Heat is a way to convert THC-A into THC.
 - ▶ Delta 9 THC? YES! But, need to read the whole law...
 - ▶ AFTER Decarboxylation it is all Delta 9 THC
 - ▶ *15-15-13-12-(3) Establishing necessary testing criteria and protocols, **including a procedure for testing, using post decarboxylation** or other similarly reliable methods, delta-9-tetrahydrocannabinol concentration levels of the hemp produced.*

OISC Administrative Rule *Considerations*

- ▶ Draft rules will be discussed with agriculture and hemp leaders, and the governor's office, prior to being submitted as emergency rule and then submitted as permanent rule. By end of 2019 by law.
- ▶ Licenses will be required of anyone who is conducting the activities that are regulated. OISC focus is agronomic and field to processor (raw materials).
- ▶ Hemp that is grown in Indiana without a license is the same as marijuana.
- ▶ Back ground checks - propose adopting the process used by TSA (not confirmed). Propose background check be conducted upon submitting an application
- ▶ **Fees will be required to support the program** - have surveyed other states' fees:
 - ▶ Non-refundable registration fee estimated? **\$750? Proposed**
 - ▶ Acreage/field/sq. ft. fee being proposed
 - ▶ Licensed will include: Growers, Handlers, and Researchers.

OISC Administrative Rule *Considerations (2)*

- ▶ Civil penalties will be applied (not to exceed \$2500. as per Indiana law). Fines will be deposited in the Indiana State Department of Agriculture into a Hemp Fund for hemp marketing and research.
- ▶ **Minimum acreage/square footage** will be established for field growing (seed and clones different); greenhouses and indoor grow situations (square footage).
- ▶ Growing, possessing, transporting, collecting, processing hemp, etc., **without a license** from OISC or in a manner not in conformance with rules is the **same as growing marijuana**.

Hemp Seed and Genetics

- ▶ Vast Majority of hemp seed not tested and labeled in 2019 - nationwide
- ▶ **Seed Control Officials will start to enforce the Federal Seed Act and state seed labeling laws in 2020!**
- ▶ Document on how to get seed tests and label hemp seed is on OISC Hemp website
- ▶ Documented hemp seed sellers changing variety names to help “compete” with others in industry - **not legal.**
 - ▶ A variety name stays with the variety for life
 - ▶ Industry does not understand what it takes to create a new variety

Germination Tests on Hemp

- ▶ 50+ Germination Tests in 2019
- ▶ Average germination rate? **52%**
 - ▶ **As low as 26%**
- ▶ Some was part of a three year study of what holds germ and what doesn't.
- ▶ First year seed? **Around 70%** germination.
 - ▶ Playing with pre-chill on a study for AOSA - Association of Official Seed Analysts

Hemp in Indiana - Growing data -partial data

- ▶ **OUTDOOR - 72% of crop**

- ▶ 5300 acres planned **31 acres average**
- ▶ 3223 acres planted
- ▶ 2357 acres harvested
- ▶ Destruction due to high thc, bad stand or weed pressure make up the difference in planted and harvested
- ▶ Compare to over 11,000 acres planned in 2020 from same growers

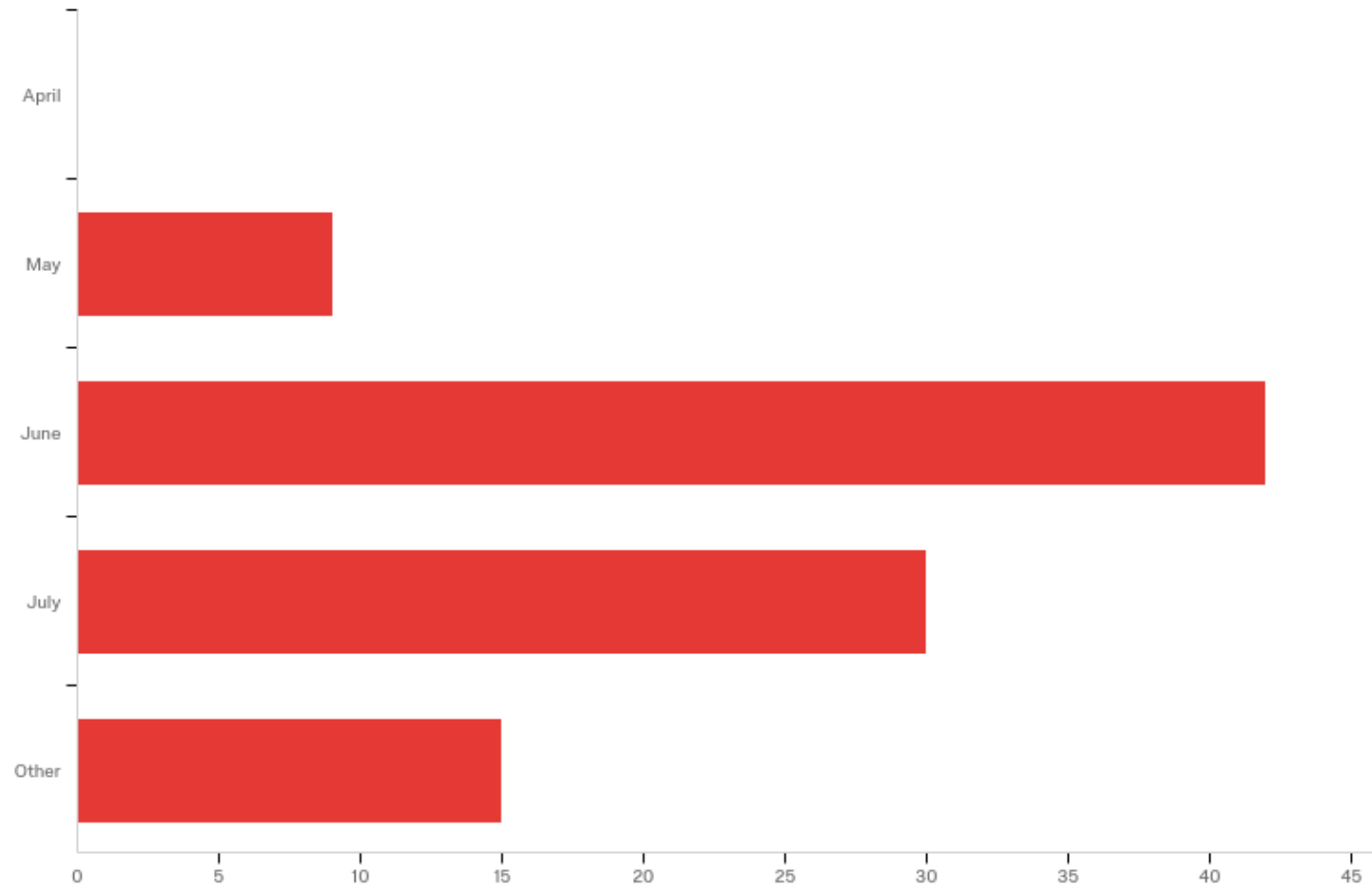
- ▶ **INDOOR - 28% of crop**

- ▶ planted 177,482 square feet **4300 ft2 average**
- ▶ 80,332 square feet harvested

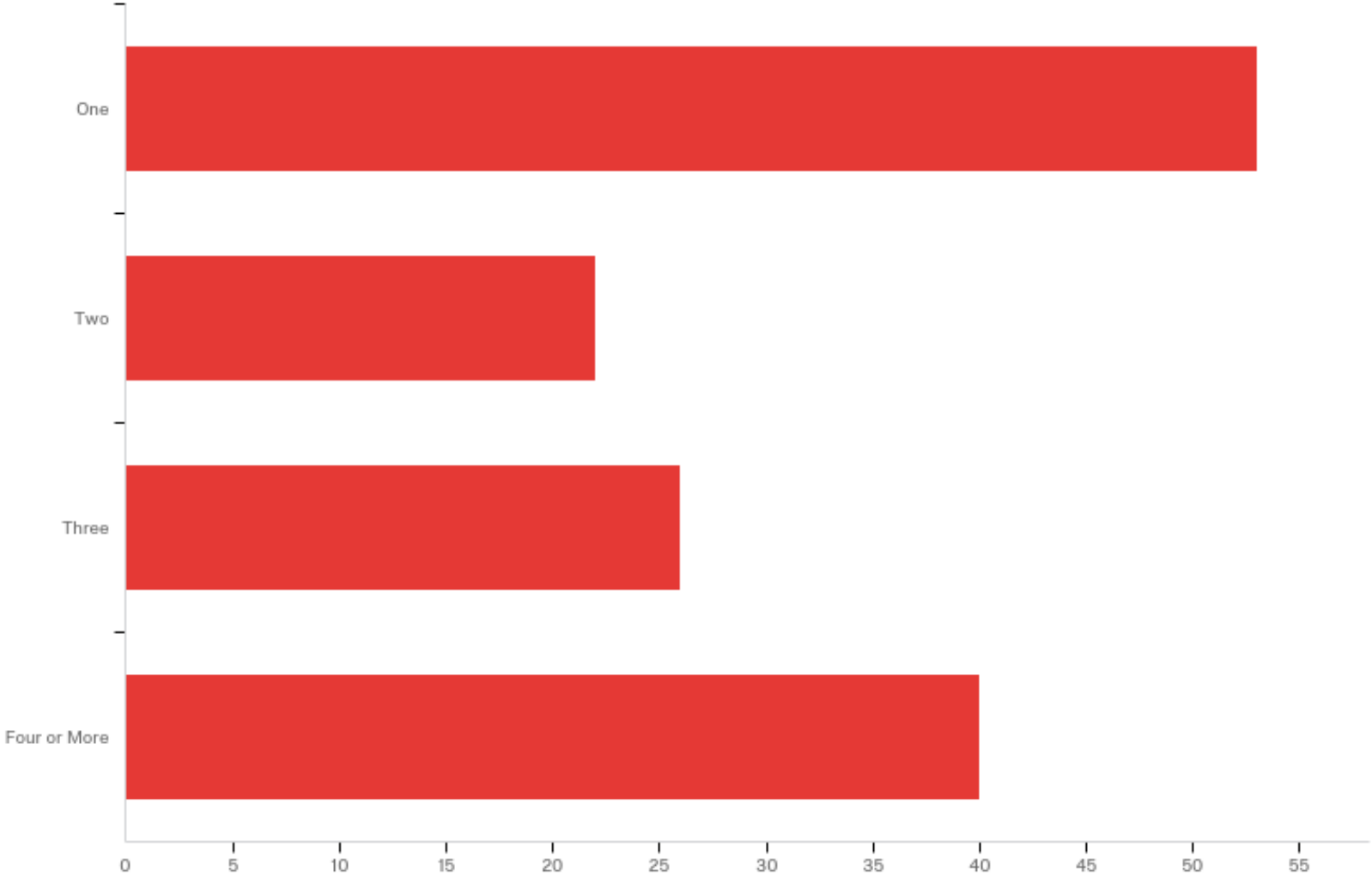
Researchers Involved

- ▶ Nearly 50 professors, extension educators
- ▶ 8 universities
- ▶ Adviser Roles
 - ▶ Help write research proposals
 - ▶ Help identify agronomic, economic, equipment issues
 - ▶ Help write year end research report

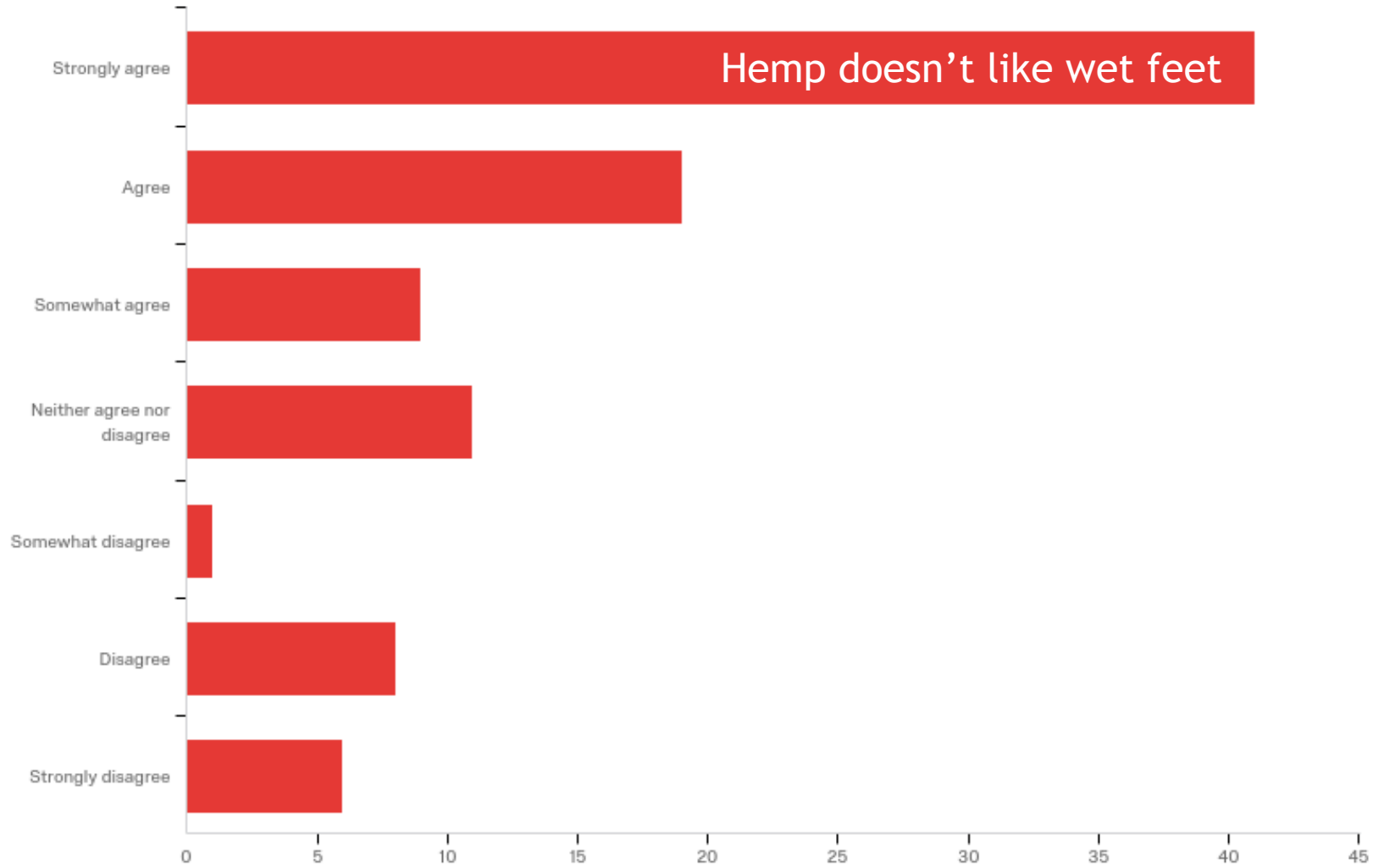
Planting Dates - 2019



Q5 - How Many Varieties of Hemp Did You Plant?



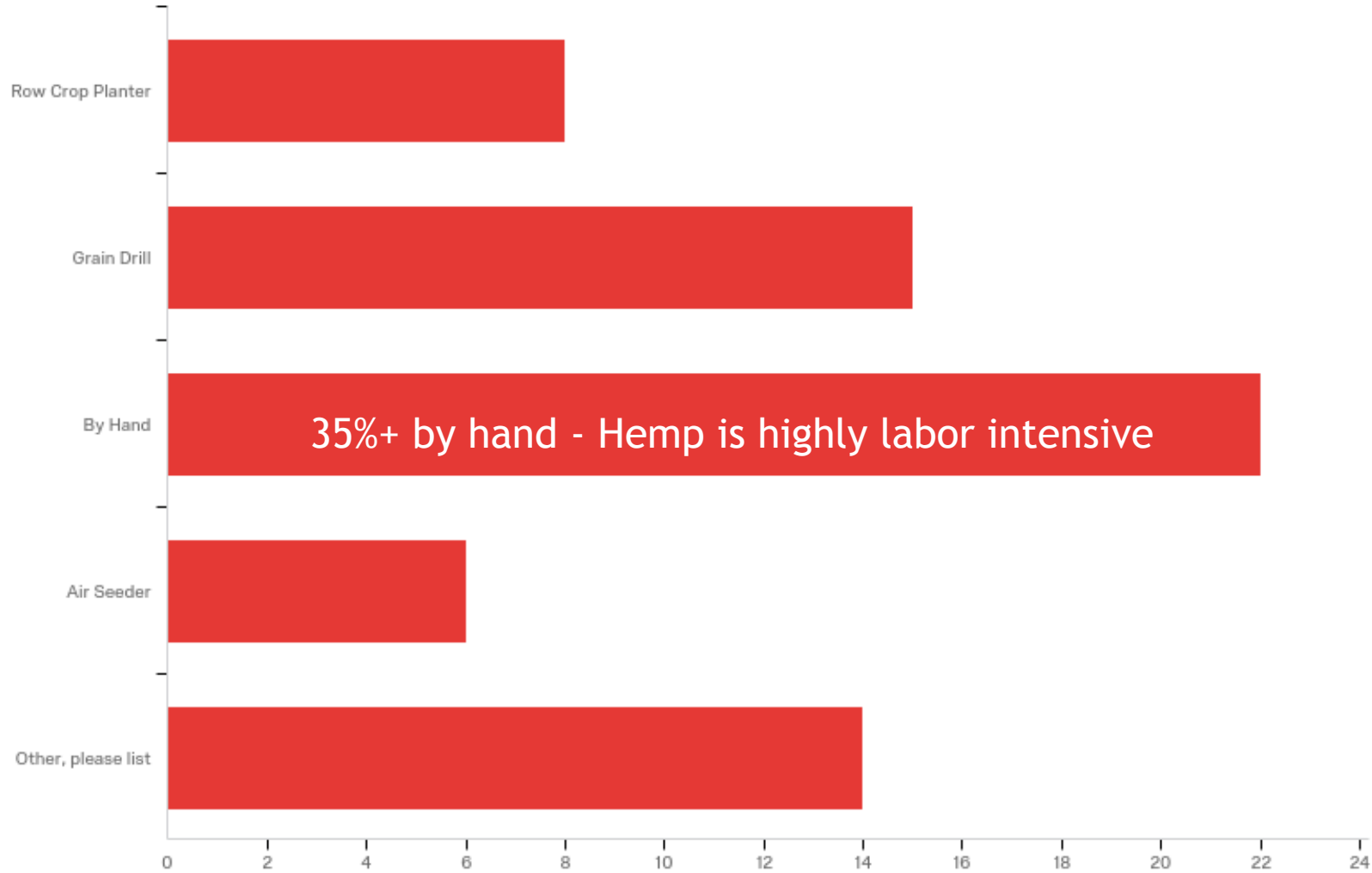
Q6 - I had problems planting due to weather



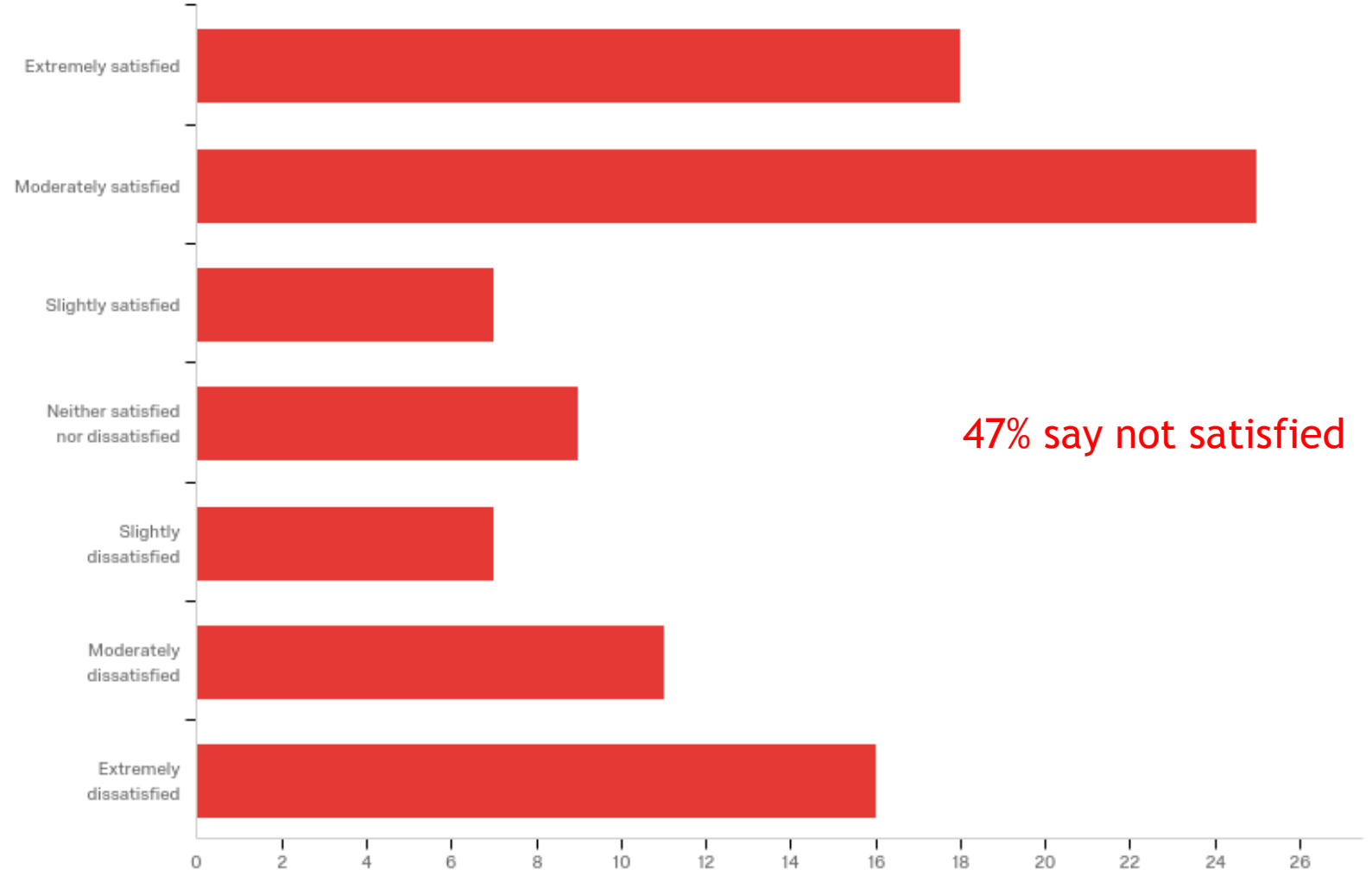
Sources of hemp in 2019

- ▶ Seed 48%
- ▶ Clones/cuttings 36%
- ▶ Seedlings 11%
- ▶ Other???? 4%

Q18 - If You Planted Using Seed, Which Kind of Equipment Did you Use? Select all that apply



Q27 - How Satisfied Were You With Your Source of Hemp Seed, Transplants or Starts?



Interesting agronomic information

- ▶ Average Fertility program? 88 N - 62 P - 80 K with 40 units of micros/secondary
- ▶ 61% of crop was irrigated
 - ▶ 43% drip tape
- ▶ #1 weed problem? Other... a lot of cocklebur, giant foxtail, morning glory, Waterhemp, Johnson grass, marestail

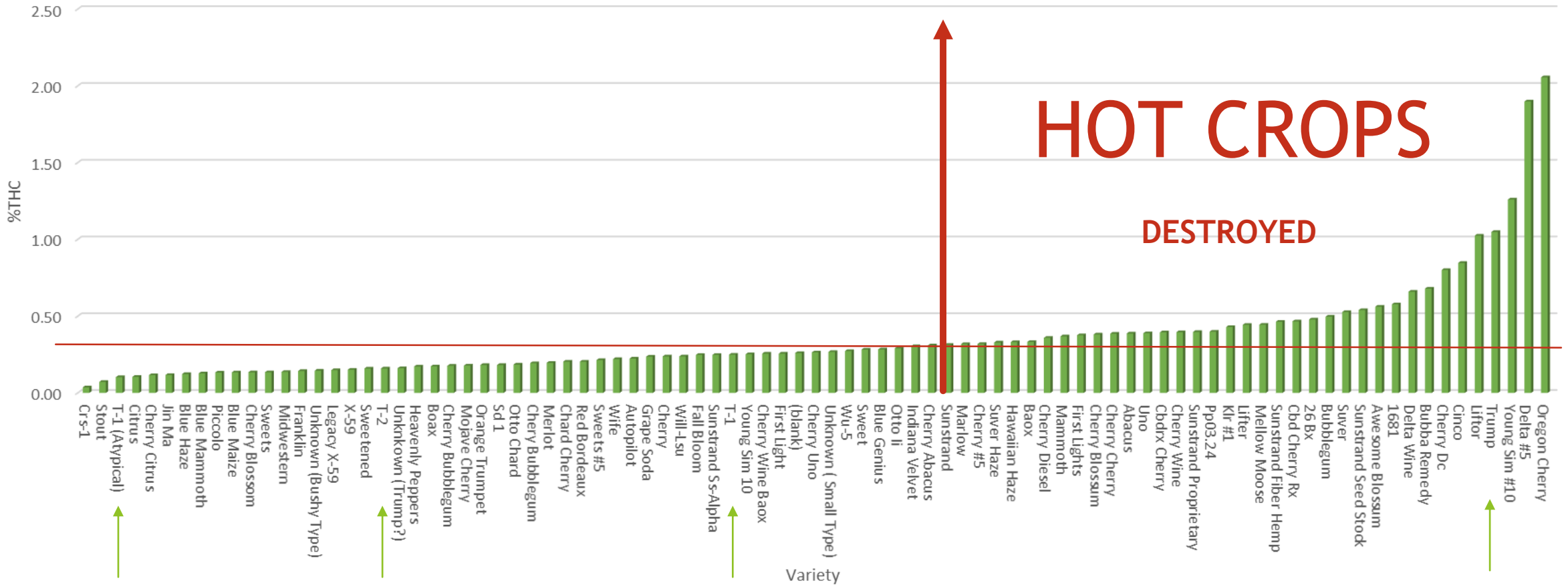
THC Testing Methods? Why Two?

- ▶ As law says.. Post Decarboxylation...
- ▶ Gas Chromatography (GC)- Post Decarboxylation
- ▶ Liquid Chromatography (UPLC) - Pre-Decarboxylation - Add THC and THC-A
 - ▶ This is the “similarly reliable method” described in 15-15-13-12 (3)
 - ▶ First test is GC, Second test is UPLC and add THC and THC-A together* Report lower of the two.
 - ▶ Passing %? <0.300%
 - ▶ Failing %? >0.310%

THC Testing Results?

- ▶ First... GENETICS, GENETICS, GENETICS... they matter!
- ▶ 63 Varieties (as of October 23, 2019)
 - ▶ 254 Tests - 78 failed counting GC and UPLC results
 - ▶ Avg of all that passed?- **.214% Low? 0.036%**
 - ▶ Avg of all that didn't pass? **.708% High? 4.44%**
 - ▶ **39% failure rate! Similar to other Midwest states**
 - ▶ Growers had a 32% failure rate from independent labs
- ▶ 2200 acres of hemp tested
- ▶ 74% say they had their own hemp crop tested
 - ▶ **Of those 34% had high THC results**

Average % THC by Variety

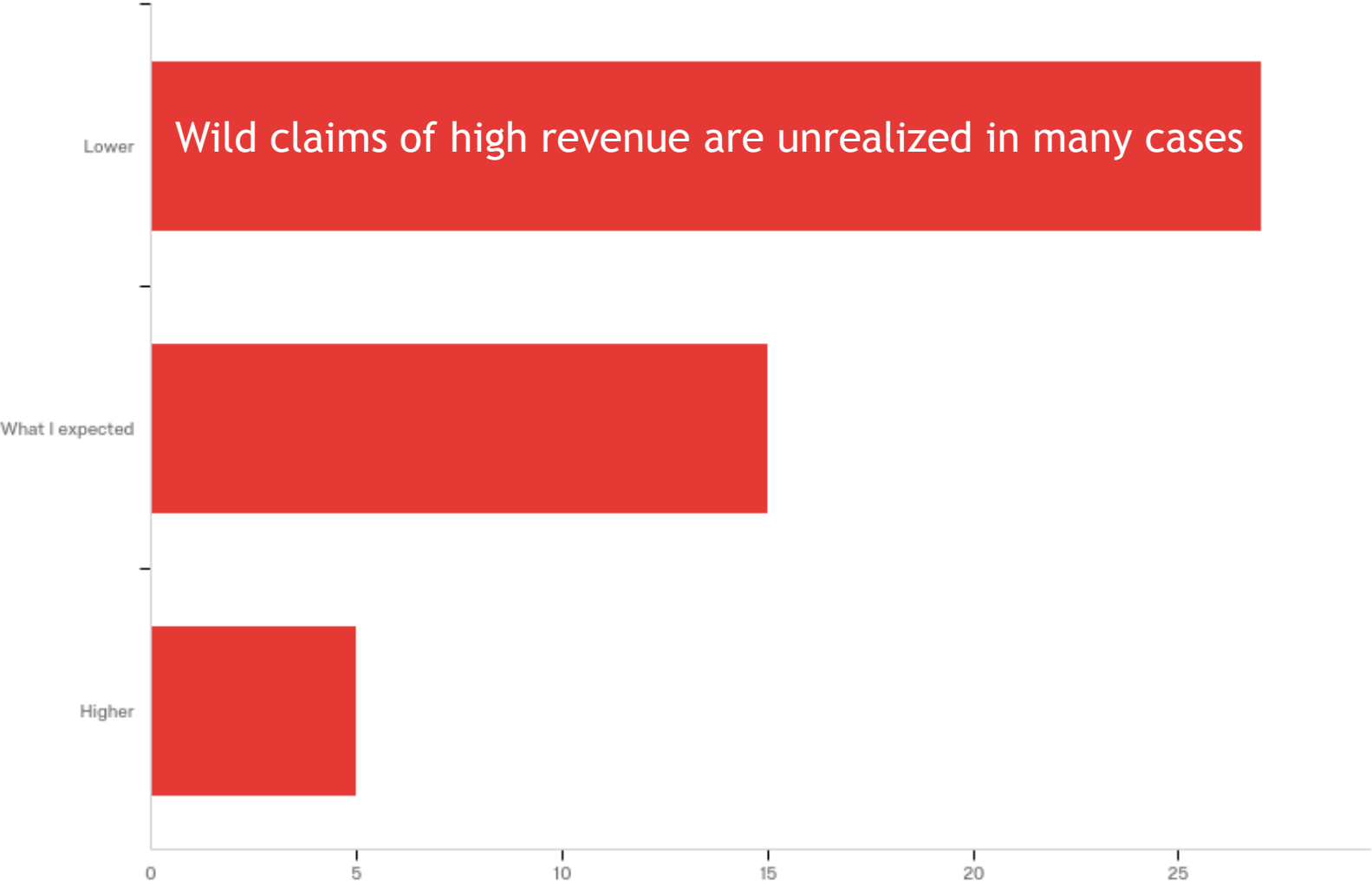


Canada Market? 21 Years Old

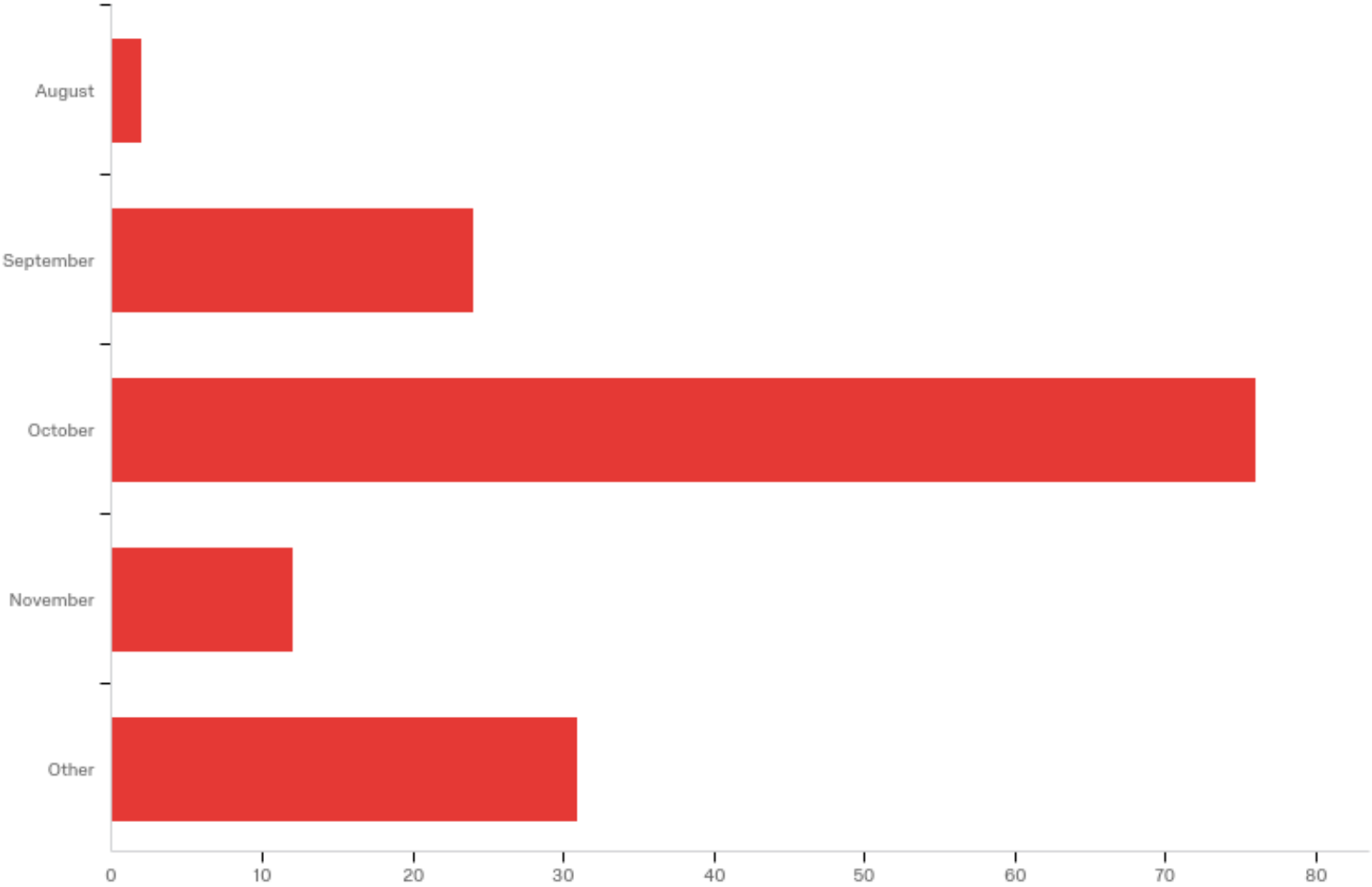
- ▶ 170,000 acres nationwide
- ▶ “you need known genetics!”
- ▶ “Very few hot crops in Canada Eh”

- ▶ 80% of whether a crop goes hot or not is genetics, not weather, not stress, etc.

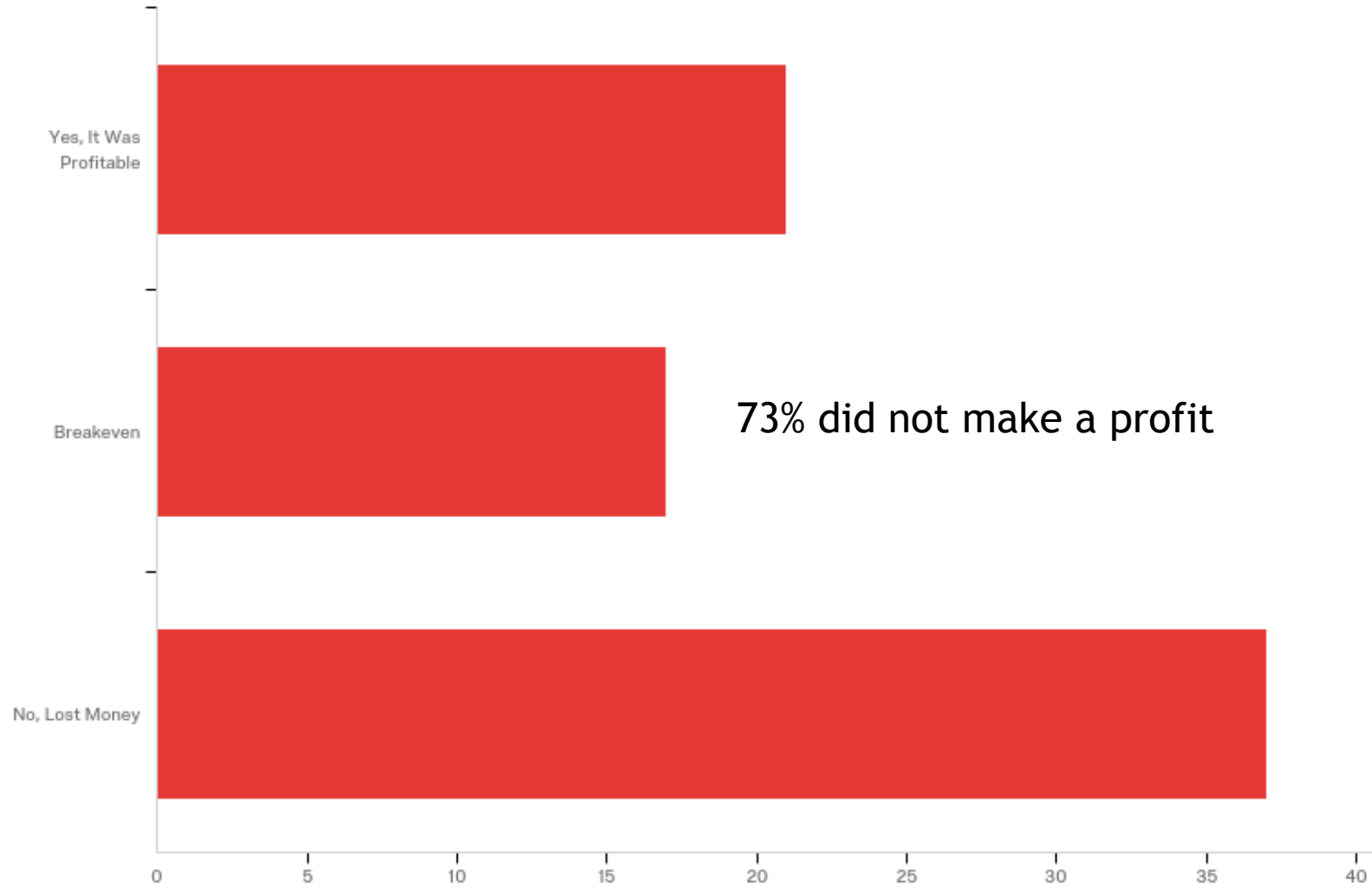
Q54 - Was your gross revenue higher or lower than expected?



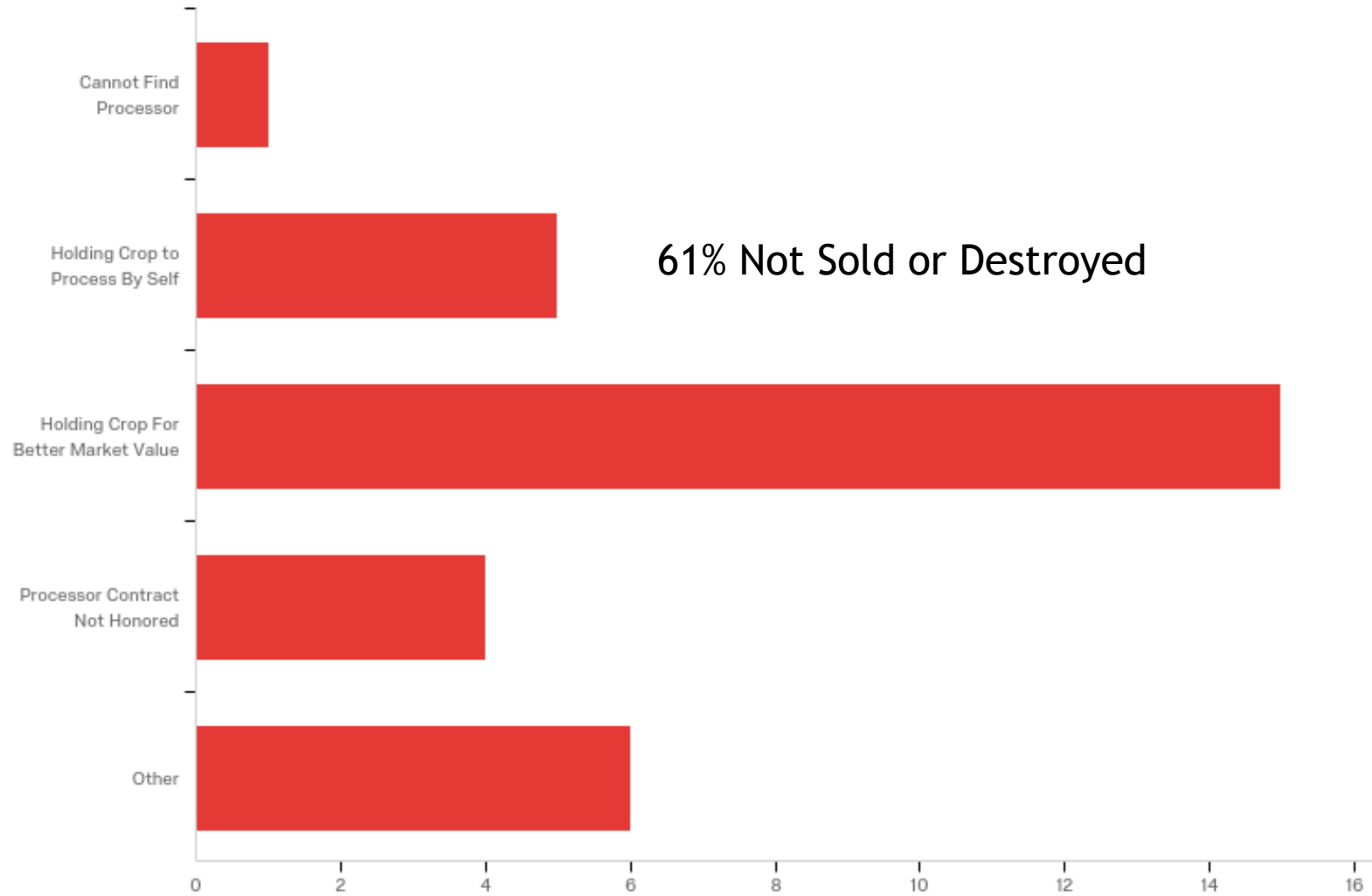
Q4 - In what month did you harvest most of your crop?



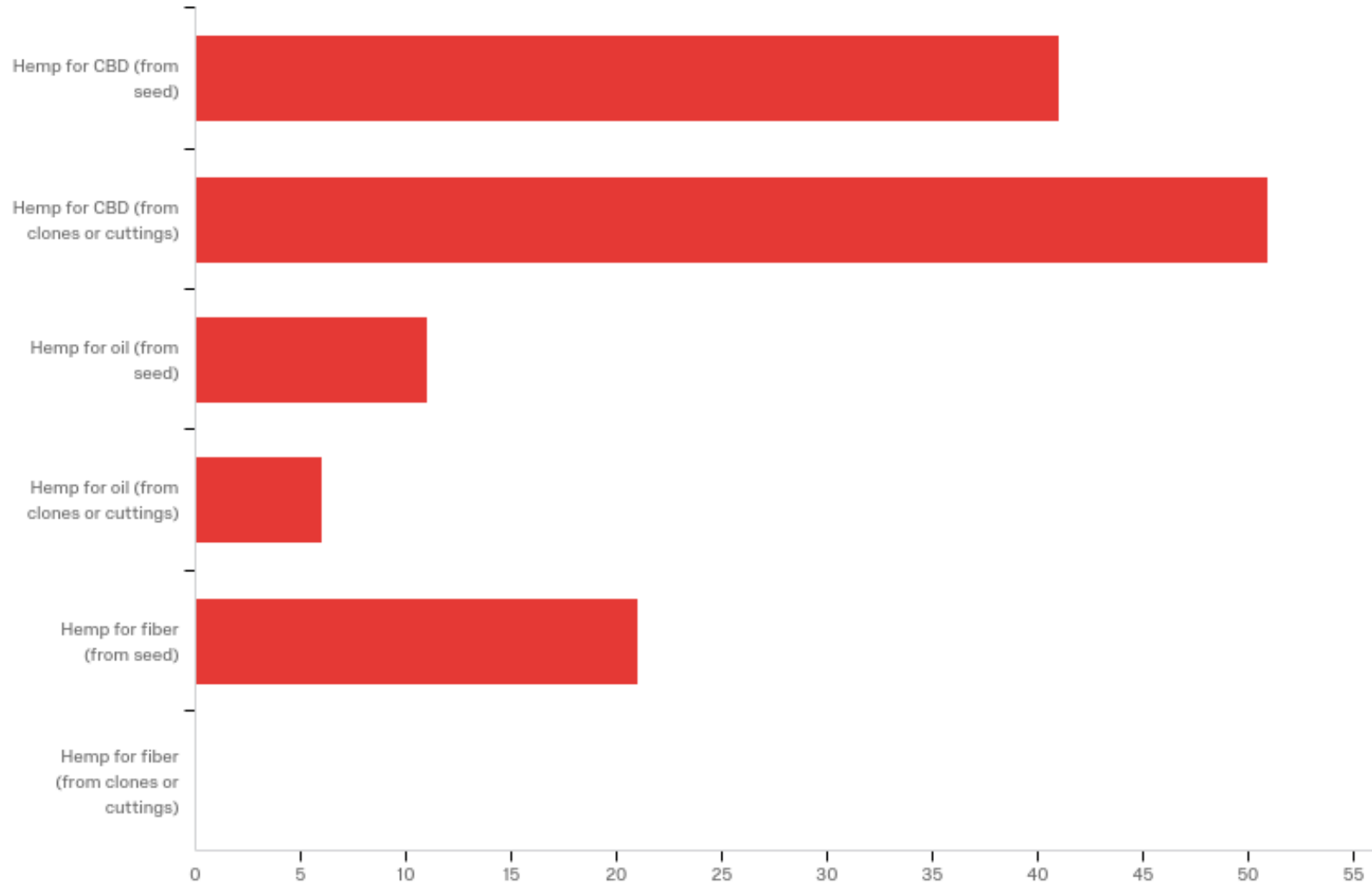
Q41 - Was 2019 a Profitable Hemp Crop For You?



Q47 - If Your Crop Is Not Sold, What is the Reason?



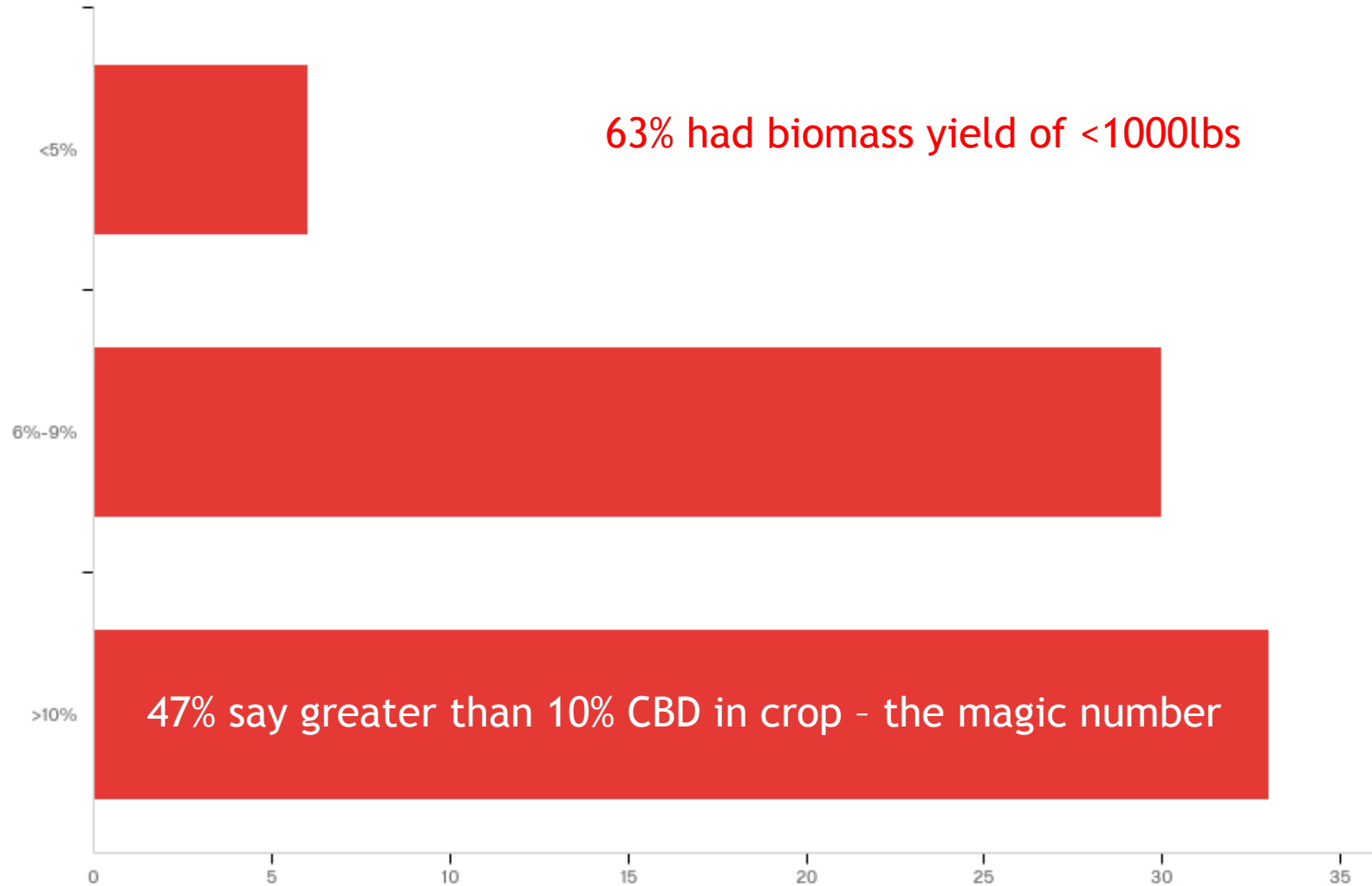
Q72 - What crop was grown? Select all that apply



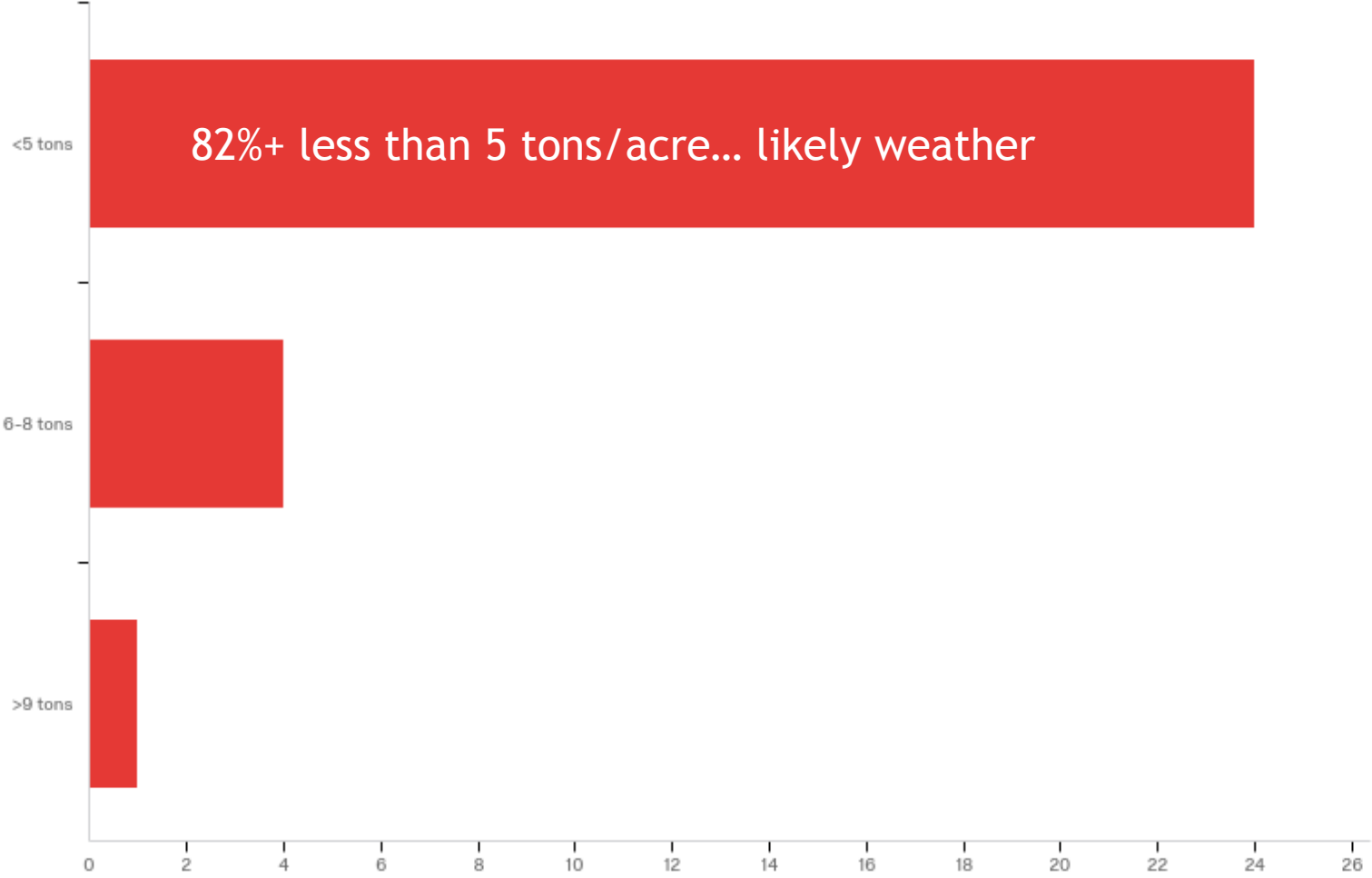
More interesting results

- ▶ 74% of grain harvest was NOT done with a combine
- ▶ For fiber 58% of harvest was completed with a sickle bar mower
- ▶ 89% of CBD harvest was done by hand!
 - ▶ **Only 3% used existing equipment to harvest CBD crop**

Q32 - For CBD Crops, What Percentage of CBD Did You Average Crop Wide?



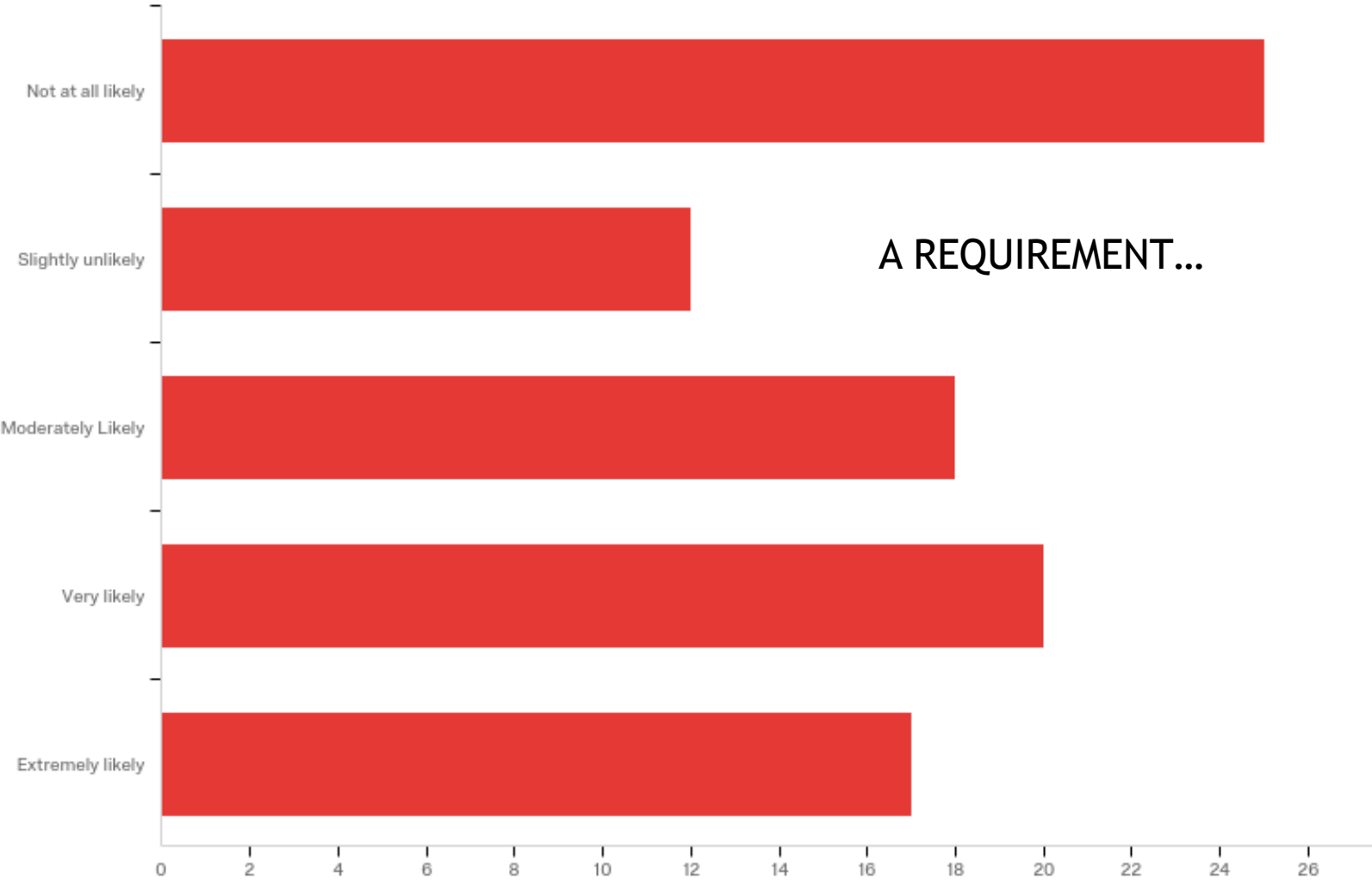
Q31 - For Fiber Crops, How Many Pounds of Biomass Did You Average Per Acre?



Q42 - For Grain Crops, What Was Your Average Yield?

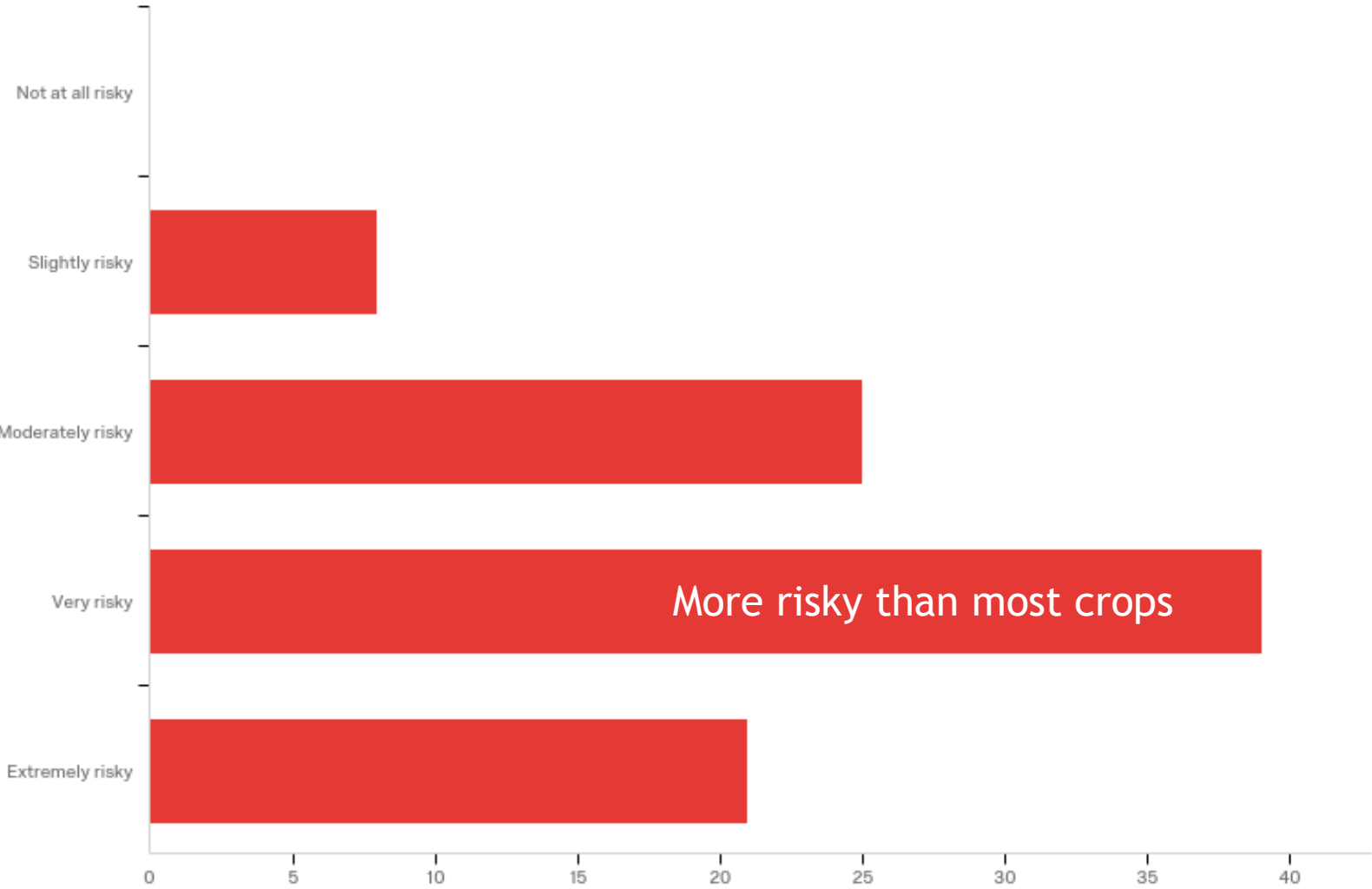


Q59 - How likely are you to enter into a production contract next year?

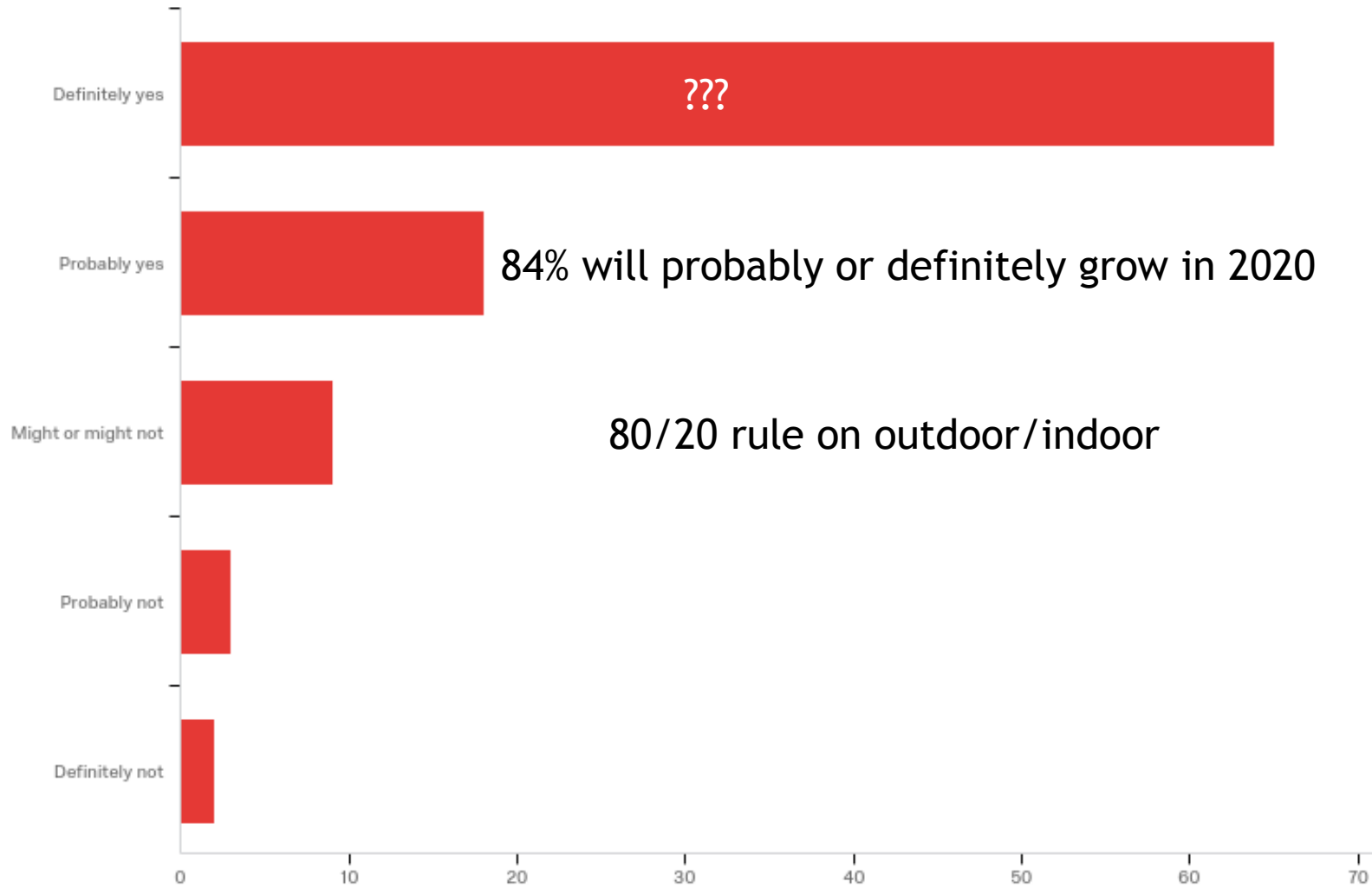


A REQUIREMENT...

Q61 - To what extent do you think the hemp market is risky



Q35 - Do You Plan on Growing Hemp in 2020?



Q36 - If You Will Grow Hemp Outdoors In 2020, Which of the Following Will You Grow?
Select all that apply

#	Answer	%	Count
1	Fiber?	21.21%	42
2	CBD?	52.02%	103
3	Grain?	9.60%	19
4	Seed?	12.12%	24
5	Other	5.05%	10
	Total	100%	198

2020 Proposed Acres - from '19 licensees

- ▶ Fiber 2206
- ▶ CBD **7524**
- ▶ Grain 975
- ▶ Seed 825
- ▶ **Total 11,230 compared to 3200 acres in 2019**

How 2020 hemp licensing will work

- ▶ Same basically as in 2019 - **2020 is a research year**
- ▶ Growers must be linked to an **approved research project**.
- ▶ Research advisors on research projects may include county extension educators or university professors, if they have the interest and the expertise to assist. (CCA trainings/certificate, etc.)
- ▶ Licenses must be issued by our office. If a proposed out of state cooperator contacts you:
 - ▶ Out of state licenses do not authorize work or possession of hemp in Indiana.
 - ▶ Growers/processors: You should have a clearly written contract and know the ramifications. See next slide)

How 2020 will work?

- ▶ Need to have completed your homework - know what you need and how much crop, sources, buyers, and how you will grow and process the crop (equipment).
- ▶ Apply for a hemp license OISC January 6 open date is proposed
- ▶ Background check - be sure to have your personal information in good order
- ▶ Payment of fee (TBD). Receipt of license. **research proposal?, or researcher cooperator?**
- ▶ Produce the crop you signed up for... have accurate gps coordinates and acres

2020?

- ▶ Research Only Again
- ▶ **USDA Interim Final Rules are out**
 - ▶ Currently in a 60 day comment period
 - ▶ Indiana Plan Submitted by End of 2019 - USDA has 60 days to approve
 - ▶ **Total THC, Test 15 days prior to harvest, test all fields,**
 - ▶ Could be March before Indiana Plan is approved, or later
 - ▶ Must sample every planting of every variety, not fiscally possible
 - ▶ **Only DEA Approved and ISO 17025 Labs can test the crop, there is not capacity in US**
 - ▶ Many areas that conflict with Indiana State Law 15-15-13
 - ▶ Why we went with research only again in 2020

What to look for in a Contracting process (the same as for corn and soybeans)

- ▶ Do your homework. **Know with whom you are working.** Know where to find seed and get a hold on supply. Have a contract that you clearly understand. Your banker may not be able to support your activity in funding a project. Get your Indiana paperwork and background check before you receive seed or clones, or receive raw material.
- ▶ Know your price guarantees, and penalties.
- ▶ Clear instruction on the varieties to be grown, and the form in which they are to be delivered (may require some processing \$\$).
- ▶ Acreage/production guarantees. If you are contracted for 20 acres, but you grow 10 - what happens? Do you get paid for only the 10? Or are you required by the contract to find 10 more acres of the variety?

Bankers

- ▶ Pertinent changes affecting banking perspectives:
 - ▶ Legal to conduct commerce in hemp across state lines
 - ▶ Hemp is added to the federal crop insurance list of accepted crops
 - ▶ Lists hemp as an agricultural commodity
 - ▶ Federal grant funding available for research
 - ▶ Removes hemp from schedule 1 drug status
- ▶ **Banking laws were not changed.** The crop is no longer prohibited by law, but.....
 - ▶ Some reports of banks closing payment processor accounts
 - ▶ Hemp accounts reportedly are still high risk in the banking world
- ▶ **Banks are still working out solutions**

Animal Feeds

- ▶ **The 2018 Farm Bill did not change the Food Drug and Cosmetic act.**
 - ▶ Animal Feeds require definitions of terms for use as a feed ingredient (AAFCO)
 - ▶ None have been submitted to AAFCO. There are no ingredient definitions related to animal feeds.
 - ▶ AAFCO and FDA must approve feed ingredients before they can be used.
 - ▶ Nutrient values (what is available in the hemp form that is used) Different hemp forms can have very different nutrient profiles.
 - ▶ Proper feeding (form, ration), nutrient uptake, THC, CBD, CBN carry through? These and other matters must be determined for each term defined, for each target species considered.
- ▶ **CBD can not be pre mixed and distributed or advertised in a feed or pet food.**

A few General Observations on the USDA Interim Final Rule

- ▶ **Crop destruction** must be processed according to strict DEA requirements - **same as those used for marijuana**. Must have a DEA Schedule 1/ reverse distributor registration. **Growers of “hot” crops must be reported to DEA.**
- ▶ **USDA Background checks** - appear to be **federal** - not just state... will require fingerprints and reporting to a designated facility to do this. Costs are paid by the applicant. Reporting goes to OISC. Takes several weeks - Like a TSA Check.
- ▶ The USDA Interim Final Rule does not address processing of hemp.

CBD Advisories for 2020

- ▶ Watch for FDA clarification of federal policy on CBD. Drug? Human Food Supplement? Approved for use in animals and pets?*
- ▶ Watch for EPA clarification of federal policy on pesticide use and thresholds. *
- ▶ Until federal clarification is made known. CBD products and products for use by humans as ointments, creams, salves, or food additives, etc., do not have FDA oversight and do not have standards for acceptable levels of contaminants (pesticides, metals, mycotoxins, processing residues, etc.), nor are there defined acceptable product levels of THC (if any) or CBD.
- ▶ * Personal comment: **If the USDA interim rule is any indicator of the administration's viewpoints, we may anticipate a more stringent regulatory environment.**

Take Homes from 2019

- ▶ There is much to learned about growing hemp in Indiana.
- ▶ **Learning can be very expensive.** Need to see this crop as a cautious investment, nothing about hemp is guaranteed.
- ▶ We are learning about farming hemp, about performance of hemp varieties, we are learning from other states, we are learning from each other.
- ▶ **We NEED more infrastructure** - and it must be balanced with production. Buyers and sellers need to make purposeful contractual understandings to make this system grow into a thriving enterprise.
- ▶ We need to closely manage every part of hemp from growing, to monitoring, to processing, to marketing, to investing -

Helps

- ▶ Office of Indiana State Chemist FAQ: https://www.oisc.purdue.edu/hemp/pdf/hemp_faq.pdf
- ▶ Twitter updates @IndianaChemist
- ▶ OISC Hemp Website: <https://www.oisc.purdue.edu/hemp/index.html>
- ▶ Purdue Hemp website www.Purduehemp.org
- ▶ Indiana State Department of Agriculture: <https://www.in.gov/isda/>
- ▶ AAFCO statement on animal feeds and hemp: https://www.aafco.org/Portals/0/SiteContent/Announcements/AAFCO_Guidelines_on_Hemp_in_Animal_Food_2.pdf?v2

Questions??

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