



# Performance-Based Sampling In Minnesota

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# Compliance in Regulatory Programs: Random and Targeted Inspections

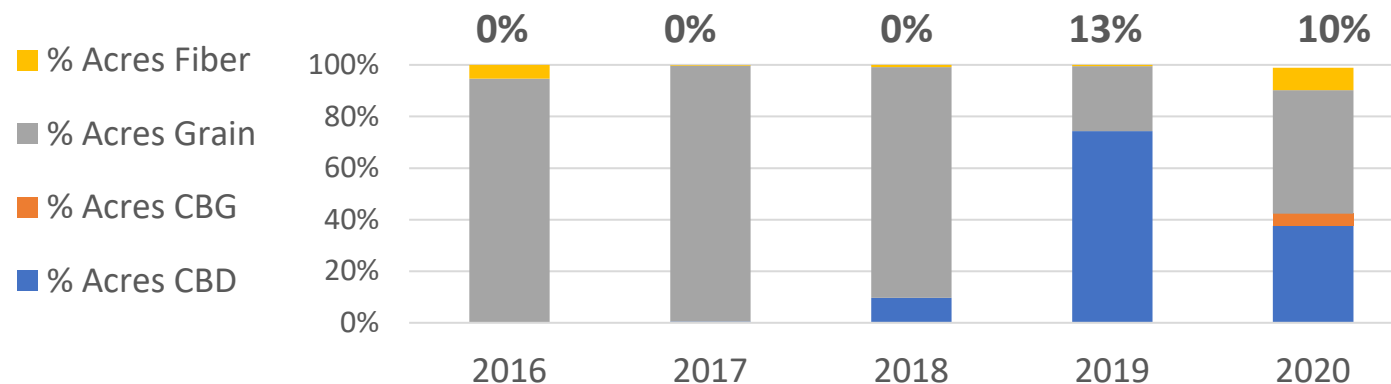


# Operating under the Pilot Program 2016-2020

**Table 1. Minnesota Licensing and Acreage Statistics 2016-2020**

Statistic	2016	2017	2018	2019	2020
<b>Applicants</b>	7	47	65	505	586
<b>Licensed Growers</b>	6	33	43	353	461
<b>Licensed Processors<sup>3</sup></b>	0	5	21	214	232
<b>Outdoor Acreage Planted</b>	38	1,202	709	7,353	4,690
<b>Indoor Square Footage Planted</b>	0	0	54,618	403,304	282,790

Type of Hemp Planted and Failure Rate



# Operating under the USDA Plan

- Performance-based sampling to achieve compliance with 95% confidence
  - Within a given lot
  - Across all lots in production
- Minnesota's sampling plan for all lots includes
  - Targeted sampling of lots based on **RISK**
  - **Random** sample of lots
  - Sample a minimum of **80%** of the lots in production
- Sampling Plan is included in [Minnesota's State Plan](#) under USDA

# Selecting GROWERS for inspection and sampling:

## Risk Factors

- Growers most at risk for failures will always be inspected:
  - New growers
  - Growers operating under a Corrective Action Plan
  - Growers licensed to grow for the Medical Cannabis Program
- Growers **may** not be **inspected** if
  - A grower has been licensed for two years and has no history of growing non-compliant hemp
  - A grower has a sound quality assurance program to test their hemp lots during production

# Selecting LOTS for inspection and sampling: Risk Factors

- Every lot that is produced from a **variety** that meets one of the following criteria will be inspected and sampled:
  - New variety in Minnesota
  - Variety that has had >5% failure rate based on historical data
  - Variety is not approved by an official seed certification agency including Health Canada, AOSCA, or OECD
  - [https://www.aosca.org/wp-content/uploads/2021/09/Hemp.VarietiesOrigin\\_Updated\\_23Sep2021.pdf](https://www.aosca.org/wp-content/uploads/2021/09/Hemp.VarietiesOrigin_Updated_23Sep2021.pdf)



## Variety performance characteristics:

- Published annually
- Type of production
- Variety name
- # of lots tested
- Average THC
- % of samples >0.30% THC
- Mandatory Testing
- Only 39 of 344 varieties would not require mandatory testing

	A	B	C	D	E	F	G	H	I	J	K	L
1	Type	Variety / Cultivar	Total Lots/Samples by the MDA 2016-2021	Average THC across all samples	# Results ≤0.300% THC	# Results 0.301 - 0.500% THC	# Results 0.501 - 0.999%	# Results ≥ 1.000%	Minimum Recorded % THC	Maximum Recorded % THC	% of Samples Above 0.30% THC	Mandatory Testing in 2021
68	CBD	Cherry	41	0.331%	30	6	1	4	0.017%	2.050%	27%	Yes
69	CBD	Cherry 1	2	0.213%	2	0	0	0	0.213%	0.213%	0%	Yes
70	CBD	Cherry 2.0	3	0.183%	3	0	0	0	0.070%	0.239%	0%	Yes
71	CBD	Cherry 304	1	0.115%	1	0	0	0	0.115%	0.115%	0%	Yes
72	CBD	Cherry 308	5	0.184%	4	1	0	0	0.076%	0.306%	20%	Yes
73	CBD	Cherry 45	1	0.316%	0	1	0	0	0.316%	0.316%	100%	Yes
74	CBD	Cherry 5B	1	0.102%	1	0	0	0	0.102%	0.102%	0%	Yes
75	CBD	Cherry Abacus	12	0.183%	11	1	0	0	0.107%	0.311%	8%	Yes
76	CBD	Cherry Berry	2	0.159%	2	0	0	0	0.098%	0.220%	0%	Yes
77	CBD	Cherry Blossom	77	0.170%	71	5	1	0	0.034%	0.990%	8%	Yes
78	CBD	Cherry Blossom x BaOx	1	0.092%	1	0	0	0	0.092%	0.092%	0%	Yes
79	CBD	Cherry Blossom x Lifter	1	0.058%	1	0	0	0	0.058%	0.058%	0%	Yes
80	CBD	Cherry Bubble Gum	6	0.162%	5	1	0	0	0.099%	0.332%	17%	Yes
81	CBD	Cherry Butter	1	0.073%	1	0	0	0	0.073%	0.073%	0%	Yes
82	CBD	Cherry C1	1	0.134%	1	0	0	0	0.134%	0.134%	0%	Yes
83	CBD	Cherry C2	1	0.223%	1	0	0	0	0.223%	0.223%	0%	Yes
84	CBD	Cherry Candy	3	0.108%	3	0	0	0	0.084%	0.115%	0%	Yes
85	CBD	Cherry Cross	3	0.155%	3	0	0	0	0.090%	0.242%	0%	Yes
86	CBD	Cherry Diesel	3	0.284%	1	2	0	0	0.153%	0.362%	67%	Yes
87	CBD	Cherry Hybrid	1	0.128%	1	0	0	0	0.128%	0.128%	0%	Yes
88	CBD	Cherry O	3	1.031%	1	0	1	1	0.239%	2.080%	67%	Yes
89	CBD	Cherry Pheno 1	1	2.250%	0	0	0	1	2.250%	2.250%	100%	Yes
90	CBD	Cherry Pheno 2	1	0.317%	0	1	0	0	0.317%	0.317%	100%	Yes
91	CBD	Cherry S1	1	0.131%	1	0	0	0	0.131%	0.131%	0%	Yes
92	CBD	Cherry Trump	3	0.300%	2	1	0	0	0.121%	0.469%	33%	Yes
93	CBD	Cherry Wine	122	0.290%	86	20	13	3	0.050%	3.240%	30%	Yes
94	CBD	Cherry Wine x Cherry Wine	5	0.264%	2	3	0	0	0.069%	0.412%	60%	Yes
95	CBD	Cherry X	2	0.346%	0	2	0	0	0.321%	0.370%	100%	Yes
96	CBD	Cherry x Cherry Abacus	1	0.146%	1	0	0	0	0.146%	0.146%	0%	Yes

# Variety Performance

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133	Grain	FINOLA	84	0.120%	81	2	1	0	0.018%	0.665%	4%	No
174	Grain	Joey	13	0.034%	13	0	0	0	0.011%	0.061%	0%	No
175	CBD	Juicy Fruit	4	0.187%	4	0	0	0	0.153%	0.257%	0%	Yes
176	CBD	Jupiter Midwest	23	0.220%	18	3	2	0	0.071%	0.568%	22%	Yes
177	CBD	Jupiter x Lifter	1	0.055%	1	0	0	0	0.055%	0.055%	0%	Yes
178	Grain	Katani	16	0.081%	16	0	0	0	0.013%	0.213%	0%	No



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**Hemp Varieties Eligible for Seed Certification**

This list contains Hemp varieties reported to AOSCA as being eligible for seed certification, however, AOSCA makes no claims as to the accuracy of the list.			
<u>Variety</u>	<u>Origin</u>	<u>Variety</u>	<u>Origin</u>
Altair	Canada	Joey	Canada
Alyssa	Canada	Judy	Canada
Angie	Canada	Jutta	Canada
Anka	Canada	K1 Auto	AOSCA*
Auto Blues	AOSCA*	Katani	Canada
Auto Blunami	AOSCA*	Kompolti	Hungary
Auto Tsunami	AOSCA*	Kompolti Hibrid TC	Hungary
AV1	USA/Colorado	Kompolti Sargaszaru	Hungary
B11	USA/Colorado	Laura Secord	Canada
B12	USA/Colorado	Lovrin 110	Romania
Beniko	Poland	Martha	Canada
Bialobrzeskie	Poland	Matterhorn CBG	AOSCA*
Canda	Canada	Medicine Mother	USA/Colorado
CanMa	Canada	MS77	Australia
Carmagnola	Italy	NWG 331	USA/Colorado
Carmagnola Selezionata	Italy	NWG 2463	AOSCA*
Carmanecta	Netherlands	NWG 2730	AOSCA*
Carmen	Canada	NWG 4000	AOSCA*
CBF1	Canada	NWG 4113	AOSCA*
CFX-1	Canada	Olympus	USA/Georgia
CFX-2	Canada	Peach Goliath	USA/Georgia
Cherry Soda	AOSCA*	Petera	Canada
CHG	Australia	Piccolo	Canada
CHY	Australia	Potomac	AOSCA*
CJ2	USA/Colorado	Princess Diana	AOSCA*

# Selecting LOTS for inspection and sampling: Risk Factors

- Every lot that meets these additional risk factors will be sampled:
- Lots produced
  - from OPEN pollinated seed saved for replanting
  - Next to Recreational Marijuana fields if it becomes legal in Minnesota

# Random Selection of Lots

- After the risk-based decisions have been completed, the remaining lots will be randomly selected until 80% of the lots are selected
- Why 80%?
- Ensure that a large percentage of the lots are inspected until the industry and the genetics selected reduce the percentage of failing lots

# Sampling in 2021

<b>HIGH RISK LOTS</b>	<b>#</b>	<b>Cumulative #</b>	<b>%</b>	<b>Cumulative %</b>
New grower	13	13	2.91%	2.91%
Grower with Corrective Action Plan	0	13	0.00%	2.91%
New variety in MN	196	209	43.95%	46.86%
Variety performance	176	385	39.46%	86.32%
Variety performance (n<5)	28	413	6.28%	<b>92.60%</b>
*Grower had low risk and high risk lots	30	443	6.73%	99.33%
Total # of lots sampled	443		99.33%	

<b>LOW RISK LOTS</b>	33		<b>7.40%</b>	
Random selection	0		0.00%	
Not sampled	3		<b>0.67%</b>	

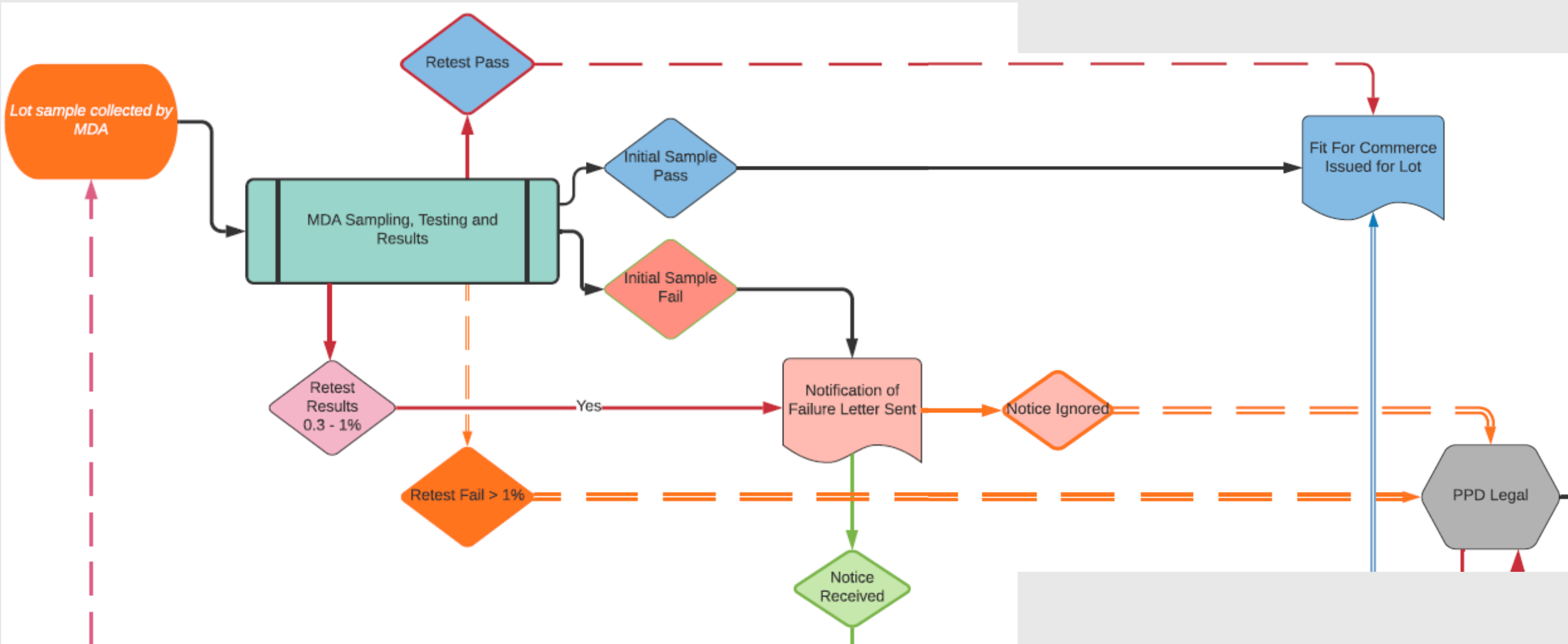
<b>TOTAL # LOTS</b>	446			
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# Total THC Compliance in 2021

- 13% of the lots failed (69 of 520) lots have failed
- 100% of the failing lots were for CBD production
- Comparable to 2020 season when 10% (77 of 762) lots failed where 94% of the failures were for CBD production
- Retest-only 1 lot passed on retest
- Remediation allowed up to 1%
- 17 lots attempted remediation
- 11 lots remediated successfully
- 23% of the lots were greater than 1% Total THC
- Lot destruction required when >1% Total THC
- Negligent Violations: Grower will be operating under a corrective action plan for 2022

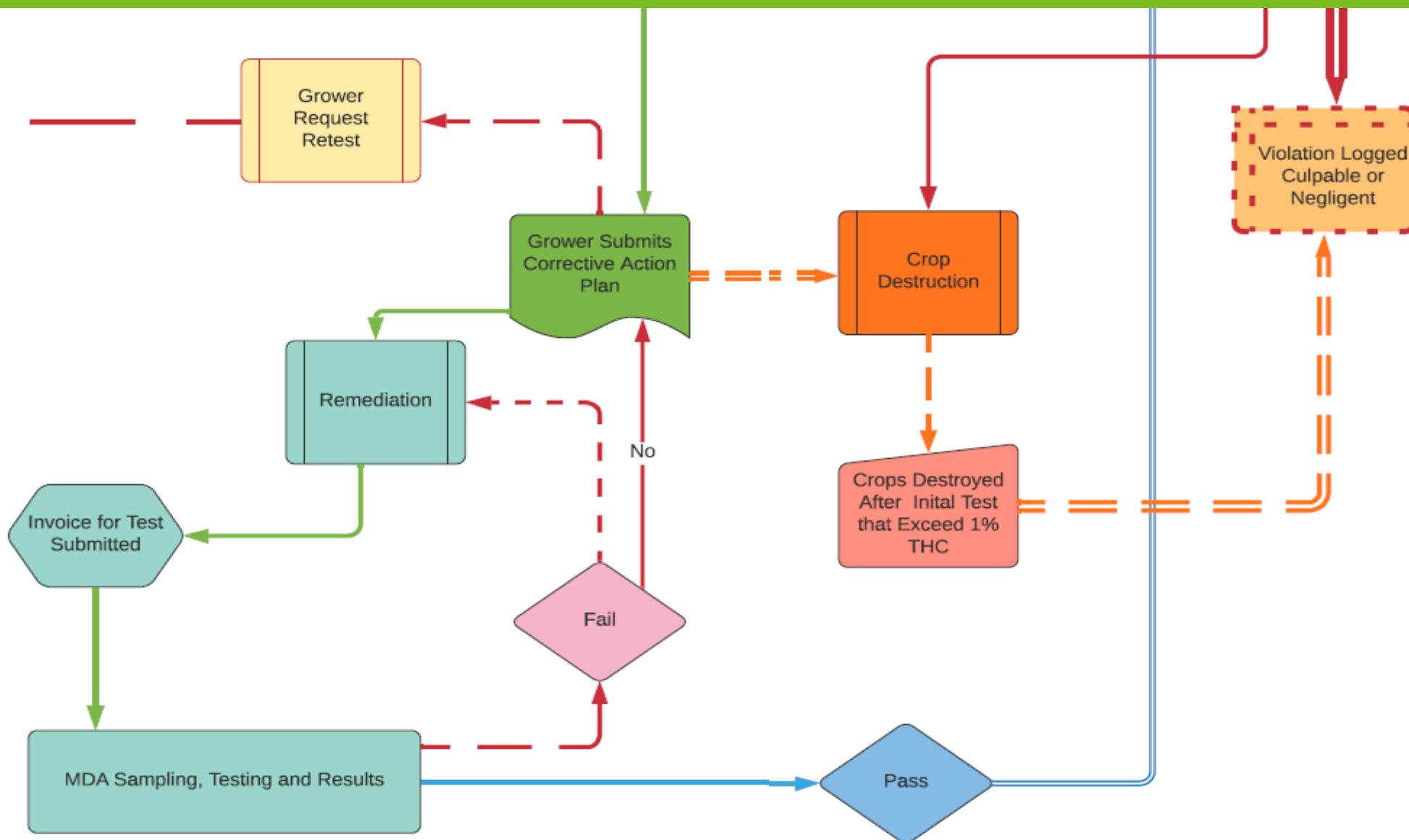
THC Range	#	Percent
0.40-0.49	18	26.09%
0.50-0.59	14	20.29%
0.60-0.69	11	15.94%
0.70-0.79	7	10.14%
0.80-0.89	1	1.45%
0.90-0.99	2	2.90%
1.00-1.99	11	15.94%
>2.0	5	7.25%
Total	69	100.00%

# Regulatory Process-Initial Test





# Regulatory Process-Retest and Remediation



# Role of Performance-based Sampling in Regulatory Compliance

- Performance-based sampling will continue to require a high percentage of lots to be sampled until
  - The industry matures –growers with experience and quality assurance programs
  - The genetics for CBD varieties offered for sale are stable with regard to THC
  - Or if the industry shifts to more grain or fiber production where varieties are already stable
- Minnesota's Hemp program will need to continue to dedicate significant resources to maintaining a team of inspectors

# What can growers do to moderate risk?

- Buy seed from established companies that have sound breeding programs
- Select varieties based on performance
- Establish a quality assurance program to monitor Total THC in production so that lot can be tested and harvested at the appropriate time
- Only accept seed that is labeled as required by the Minnesota Seed Law and the Federal Seed Act
- Maintain records for
  - Seed label
  - Invoices
  - Certificate of Analysis provided by the seed supplier for that variety

Brand: Best Bred™		
Kind: Hemp		
Variety: Sweet Dreams	Pure Seed: 98.50%	Germination: 94%
Lot Number: 13-1AZ	Other Crop: 0.50%	Dormant Seed: 5%
Net Weight: 100 grams	Weed Seed: 0.50%	Germination + Dormant: 99%
Origin: Colorado	Inert Matter: 0.50%	Test Date: 12/2020
	Noxious Weed Seeds: None Found	
Labeler's Name: John's Seed Co.		
Labeler's Address: P.O. Box 10, Denver, CO 55555		

## Agricultural Seed Label

# How is MDA working increase compliance?

- Hemp and Seed Programs are working together when lots exceed 1% Total THC
- Seed Program inspects available records to determine if
  - the labeler operating with the required seed permit?
  - the seed completely labeled as required?
  - a COA for the parent generation provided to the grower?
- Warning letters are sent to companies selling seed that resulted in negligent violations

# Thank you!

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