FARMER FREEMAN

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202-697-7640 support@farmerfreeman.com
www.farmerfreeman.com

Pathogen Diagnostic Report

Intake Panel

CUSTOMER NAME
Sample Customer

COMPANY / ORGANIZATION
Green Valley Nursery

EMAIL
sample@greenvalleynursery.com

REPORT DATE
November 04, 2026

RUN DATE
November 04, 2026

DATE OF LAB RECEIPT
November 01, 2026

Diagnostic Results

Sample ID	Strain	Sample Type	HLVd	Pan-Fusarium	Pan-Pythium	Botrytis	Powdery Mildew	Russet Mites	IC
IN001	Blue Dream	Root + Leaf	NOT DETECTED	NOT DETECTED	NOT DETECTED	NOT DETECTED	NOT DETECTED	NOT DETECTED	PASS 28.30
IN002	Gelato #41	Root + Leaf	DETECTED 22.10	NOT DETECTED	NOT DETECTED	NOT DETECTED	NOT DETECTED	NOT DETECTED	PASS 27.90
IN003	Wedding Cake	Root	NOT DETECTED	DETECTED 25.60	DETECTED 29.40	NOT DETECTED	NOT DETECTED	NOT DETECTED	PASS 26.10
IN004	OG Kush	Root + Leaf	NOT DETECTED	NOT DETECTED	NOT DETECTED	NOT DETECTED	NOT DETECTED	DETECTED 36.80	PASS 27.50
IN005	Chem D	3x Leaf	NOT DETECTED	NOT DETECTED	NOT DETECTED	DETECTED 31.20	DETECTED 24.80	NOT DETECTED	PASS 25.40
IN006	MAC 1	Root + Leaf	NOT DETECTED	NOT DETECTED	NOT DETECTED	NOT DETECTED	NOT DETECTED	NOT DETECTED	PASS 29.10
IN007	Runtz	Root + Leaf	DETECTED 18.30	NOT DETECTED	NOT DETECTED	NOT DETECTED	NOT DETECTED	NOT DETECTED	PASS 26.80
IN008	Zkittlez	Root + Leaf	NOT DETECTED	NOT DETECTED	NOT DETECTED	NOT DETECTED	NOT DETECTED	NOT DETECTED	PASS 30.20

- DETECTED — Pathogen signal confirmed in this sample
- NOT DETECTED — No pathogen signal detected; reaction confirmed valid
- RETEST — Borderline signal detected; retest recommended to confirm
- UNDER ANALYSIS — Inconclusive result; sample is being retested, ready in 1–2 business days
- Lower Cq values (shown under each result) typically indicate a higher pathogen concentration.

Interpretation Summary

Pathogen Detected

One or more samples tested positive for: **PM, BOT, PYTH, RM, HLVd, PFUS**. Immediate action is recommended. Isolate affected plants and equipment. Do not take cuttings from positive plants. Sanitize tools between plants. Contact a cultivation advisor to develop a remediation plan.

About the Pathogens Tested

Hop Latent Viroid (HLVd)

Channel: FAM **Type:** Viroid **Threshold:** Cq < 35

Hop Latent Viroid (HLVd) is the most economically damaging pathogen in cannabis cultivation, causing 'dudding disease.' Infected plants exhibit stunted growth, reduced trichome density, and significantly lower cannabinoid yields. HLVd spreads through contaminated cutting tools, clones, and plant-to-plant contact.

Pan-Fusarium (PFUS)

Channel: FAM **Type:** Fungus **Threshold:** Cq < 35

Pan-Fusarium detects a broad range of Fusarium species responsible for vascular wilt and root rot in cannabis, including: F. oxysporum, F. solani, F. avenaceum, F. equisiti, F. falciforme, F. graminearum, F. lichenicola, F. proliferatum, F. sporotrichioides, and F. brachygibbosum. Fusarium colonizes root tissue and blocks water and nutrient transport, causing yellowing, wilting, and plant death. A positive result warrants immediate quarantine of affected material and implementation of sanitation protocols to prevent further spread.

Pan-Pythium (PYTH)

Channel: FAM **Type:** Oomycete **Threshold:** Cq < 35

The Pan-Pythium Detection Test screens for a broad range of Pythium oomycetes responsible for damping-off and root rot in cannabis. This assay detects the following species: P. aphanidermatum, P. catenulatum, P. dissotocum, P. myriotylum, and P. ultimum. Pythium thrives in wet, poorly drained conditions and spreads through water, contaminated tools, and growing media. A positive result warrants immediate review of irrigation practices and sanitation protocols.

Botrytis cinerea (BOT)

Channel: FAM **Type:** Fungus **Threshold:** Cq < 35

Botrytis cinerea causes bud rot (gray mold), one of the most common and destructive cannabis diseases, particularly during flowering. It produces gray, fuzzy sporulation on buds, stems, and leaves under high humidity conditions, as well as seedling damping-off and leaf blight. Infected material must be removed immediately to prevent rapid spread through the canopy.

Powdery Mildew (PM)

Channel: FAM **Type:** Fungus **Threshold:** Cq < 40

Powdery Mildew is caused by Golovinomyces cichoracearum, G. ambrosiae, and G. spadiceus. It appears as white, powdery patches on leaf surfaces and reduces photosynthetic capacity, trichome development, and cannabinoid yields. Unlike most fungi, powdery mildew thrives in dry conditions with moderate temperatures.

Russet Mites (RM)

Channel: FAM **Type:** Pest **Threshold:** Cq < 40

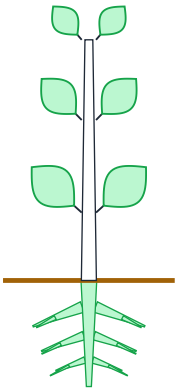
Russet Mites (RM) detects hemp russet mite (Aculops cannabicola) DNA from live or dead mites and mite eggs present on plant tissue. Russet mites are microscopic and difficult to identify visually; infestations cause leaf curling, russeting, and significant yield loss if left unmanaged. A positive result warrants immediate quarantine of affected material and targeted miticide intervention.

Methodology

This report utilizes quantitative reverse transcription PCR (RT-qPCR) for viral/viroid targets and quantitative PCR (qPCR) for DNA-based targets performed on an Agilent AriaMX Real-Time PCR instrument. Nucleic acids and DNA are extracted from plant tissue using a validated extraction protocol. Each reaction includes an internal extraction and amplification control (IC) to verify that the test ran correctly. A Cq threshold of 35 cycles is applied for most targets (40 cycles for Powdery Mildew and Russet Mite). A signal at or below this threshold is reported as Detected regardless of IC result. Signals in the borderline range of 35–40 cycles are reported as Detected when the internal control also amplified, confirming the PCR reaction ran. Wells with no detectable signal and a failed IC are placed Under Analysis and will be retested at no charge.

Questions? Contact support@farmerfreeman.com or call 202-697-7640. Submit new samples at www.farmerfreeman.com.

IN001
Blue Dream



- No pathogen detected
- Pathogen detected
- Not tested

PANEL
Intake Panel

SAMPLE TYPE
Root + Leaf

DATE OF RECEIPT
November 01, 2026

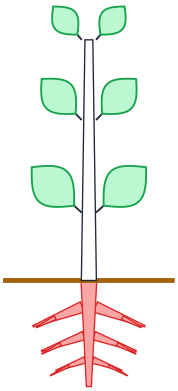
RUN DATE
November 04, 2026

Results

HLVd	**NOT DETECTED**	No Cq
Pan-Fusarium	**NOT DETECTED**	No Cq
Pan-Pythium	**NOT DETECTED**	No Cq
Botrytis	**NOT DETECTED**	No Cq
Powdery Mildew	**NOT DETECTED**	No Cq
Russet Mites	**NOT DETECTED**	No Cq
Internal Control (IC)	**PASS**	Cq 28.30

IN002

Gelato #41



- No pathogen detected
- Pathogen detected
- Not tested

PANEL

Intake Panel

SAMPLE TYPE

Root + Leaf

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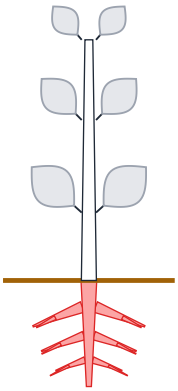
RUN DATE

November 04, 2026

Results

HLVd	**DETECTED**	Cq 22.10
Pan-Fusarium	**NOT DETECTED**	No Cq
Pan-Pythium	**NOT DETECTED**	No Cq
Botrytis	**NOT DETECTED**	No Cq
Powdery Mildew	**NOT DETECTED**	No Cq
Russet Mites	**NOT DETECTED**	No Cq
Internal Control (IC)	**PASS**	Cq 27.90

IN003
Wedding Cake



- No pathogen detected
- Pathogen detected
- Not tested

PANEL
Intake Panel

SAMPLE TYPE
Root

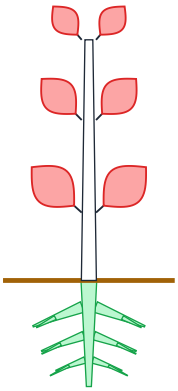
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Results

HLVd	**NOT DETECTED**	No Cq
Pan-Fusarium	**DETECTED**	Cq 25.60
Pan-Pythium	**DETECTED**	Cq 29.40
Botrytis	**NOT DETECTED**	No Cq
Powdery Mildew	**NOT DETECTED**	No Cq
Russet Mites	**NOT DETECTED**	No Cq
Internal Control (IC)	**PASS**	Cq 26.10

IN004
OG Kush



- No pathogen detected
- Pathogen detected
- Not tested

PANEL
Intake Panel

SAMPLE TYPE
Root + Leaf

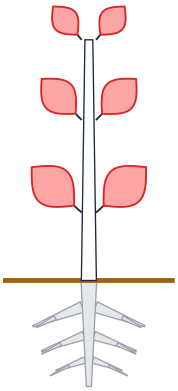
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RUN DATE
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Results

HLVd	**NOT DETECTED**	No Cq
Pan-Fusarium	**NOT DETECTED**	No Cq
Pan-Pythium	**NOT DETECTED**	No Cq
Botrytis	**NOT DETECTED**	No Cq
Powdery Mildew	**NOT DETECTED**	No Cq
Russet Mites	**DETECTED**	Cq 36.80
Internal Control (IC)	**PASS**	Cq 27.50

IN005
Chem D



- No pathogen detected
- Pathogen detected
- Not tested

PANEL

Intake Panel

SAMPLE TYPE

3x Leaf

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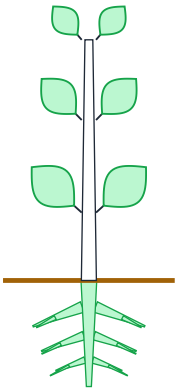
RUN DATE

November 04, 2026

Results

HLVd	**NOT DETECTED**	No Cq
Pan-Fusarium	**NOT DETECTED**	No Cq
Pan-Pythium	**NOT DETECTED**	No Cq
Botrytis	**DETECTED**	Cq 31.20
Powdery Mildew	**DETECTED**	Cq 24.80
Russet Mites	**NOT DETECTED**	No Cq
Internal Control (IC)	**PASS**	Cq 25.40

IN006
MAC 1



- No pathogen detected
- Pathogen detected
- Not tested

PANEL

Intake Panel

SAMPLE TYPE

Root + Leaf

DATE OF RECEIPT

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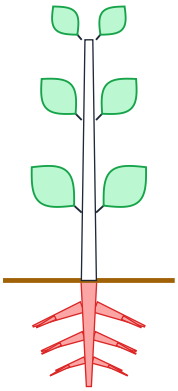
RUN DATE

November 04, 2026

Results

HLVd	**NOT DETECTED**	No Cq
Pan-Fusarium	**NOT DETECTED**	No Cq
Pan-Pythium	**NOT DETECTED**	No Cq
Botrytis	**NOT DETECTED**	No Cq
Powdery Mildew	**NOT DETECTED**	No Cq
Russet Mites	**NOT DETECTED**	No Cq
Internal Control (IC)	**PASS**	Cq 29.10

IN007
Runtz



- No pathogen detected
- Pathogen detected
- Not tested

PANEL
Intake Panel

SAMPLE TYPE
Root + Leaf

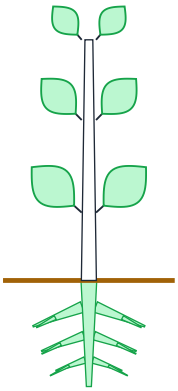
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Results

HLVd	**DETECTED**	Cq 18.30
Pan-Fusarium	**NOT DETECTED**	No Cq
Pan-Pythium	**NOT DETECTED**	No Cq
Botrytis	**NOT DETECTED**	No Cq
Powdery Mildew	**NOT DETECTED**	No Cq
Russet Mites	**NOT DETECTED**	No Cq
Internal Control (IC)	**PASS**	Cq 26.80

IN008
Zkittlez



- No pathogen detected
- Pathogen detected
- Not tested

PANEL

Intake Panel

SAMPLE TYPE

Root + Leaf

DATE OF RECEIPT

November 01, 2026

RUN DATE

November 04, 2026

Results

HLVd	**NOT DETECTED**	No Cq
Pan-Fusarium	**NOT DETECTED**	No Cq
Pan-Pythium	**NOT DETECTED**	No Cq
Botrytis	**NOT DETECTED**	No Cq
Powdery Mildew	**NOT DETECTED**	No Cq
Russet Mites	**NOT DETECTED**	No Cq
Internal Control (IC)	**PASS**	Cq 30.20