FARMER FREEMAN

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Pathogen Diagnostic Report

Full Panel

CUSTOMER NAME
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REPORT DATE
October 15, 2026

RUN DATE
October 15, 2026

DATE OF LAB RECEIPT
October 14, 2026

Diagnostic Results

Sample ID	Strain	Nickname	Sample Type	HLVd	LCV	CCV	TMV	BCTv	Pan-Fusarium	Pan-Pythium	Botrytis	Russet Mites	Powdery Mildew	IC
VT00001	Blue Dream	BD-A01	Root + Leaf	DETECTED 23.60	NOT DETECTED	NOT DETECTED	NOT DETECTED	NOT DETECTED	NOT DETECTED	NOT DETECTED	NOT DETECTED	NOT DETECTED	NOT DETECTED	N/A 24.80
VT00002	Wedding Cake	WC-B02	Root + Leaf	NOT DETECTED	NOT DETECTED	NOT DETECTED	NOT DETECTED	DETECTED 21.40	NOT DETECTED	NOT DETECTED	NOT DETECTED	NOT DETECTED	NOT DETECTED	N/A 25.20
VT00003	Gelato 41	G41-C03	Root + Leaf	NOT DETECTED	DETECTED 26.80	NOT DETECTED	NOT DETECTED	NOT DETECTED	NOT DETECTED	NOT DETECTED	DETECTED 24.20	NOT DETECTED	NOT DETECTED	N/A 24.10
VT00004	OG Kush	OGK-D04	Root + Leaf	NOT DETECTED	NOT DETECTED	NOT DETECTED	NOT DETECTED	NOT DETECTED	NOT DETECTED	NOT DETECTED	NOT DETECTED	NOT DETECTED	NOT DETECTED	PASS 25.50
VT00005	Gorilla Glue #4	GG4-E05	Root + Leaf	NOT DETECTED	NOT DETECTED	NOT DETECTED	DETECTED 27.30	NOT DETECTED	DETECTED 29.10	NOT DETECTED	NOT DETECTED	NOT DETECTED	DETECTED 22.70	N/A 24.60

- DETECTED — Pathogen present; IC not required for detection
- NOT DETECTED — No pathogen signal; IC valid
- UNDER ANALYSIS — IC failed; being retested, ready in 1–2 business days
- Lower Cq values typically correlate with a greater pathogen load in the sample.

Interpretation Summary

Pathogen Detected

One or more samples tested positive for: **TMV, HLVd, PM, BCTv, LCV, PFUS, BOT**. 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.

Lettuce Chlorosis Virus (LCV)

Channel: ROX **Type:** Virus **Threshold:** Cq < 35

Lettuce Chlorosis Virus (LCV) is a crinivirus transmitted by whiteflies. It causes interveinal chlorosis, leaf curling, and reduced plant vigor. While less studied in cannabis than HLVd, LCV can reduce plant health and yield.

Cannabis Cryptic Virus (CCV)

Channel: CY5 **Type:** Virus **Threshold:** Cq < 35

Cannabis Cryptic Virus (CCV) is a partitivirus commonly found in cannabis. It is generally considered latent with minimal symptoms in most cultivars, though its interaction with other pathogens may compound disease effects.

Tobacco Mosaic Virus (TMV)

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

Tobacco Mosaic Virus (TMV) is a highly stable tobamovirus that can infect cannabis, causing mosaic discoloration, leaf distortion, and chlorosis. TMV spreads readily through mechanical contact — contaminated hands, tools, and clothing — and can persist on surfaces for extended periods.

Beet Curly Top Virus (BCTv)

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

Beet Curly Top Virus (BCTv) is a curtovirus transmitted by the beet leafhopper (Circulifer tenellus). Infected cannabis plants display severe stunting, upward leaf curling, and darkening of veins. There is no cure once a plant is infected; management relies on controlling leafhopper populations.

Pan-Fusarium (PFUS)

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

The Pan-Fusarium Detection Test is your frontline defense against a wide range of Fusarium pathogens. This assay detects the following species: F. oxysporum, F. solani, F. avenaceum, F. equisiti, F. falciforme, F. graminearum, F. lichenicola, F. proliferatum, F. sporotrichioides, and F. brachygibbosum. 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 (gray mold) is one of the most common and destructive cannabis pathogens, particularly during flowering. It produces gray, fuzzy sporulation on buds, stems, and leaves under high humidity conditions. Infected material must be removed immediately to prevent rapid spread through the canopy.

Russet Mites (RMT)

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

Russet Mites (RMT) 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.

Powdery Mildew (PM)

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

Powdery Mildew is caused by Golovinomyces cichoracearum and related species. 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.

Methodology

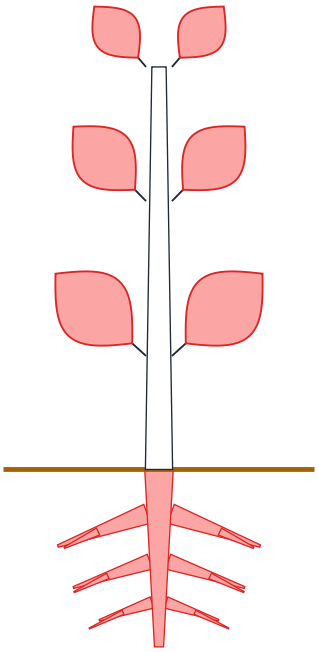
This report utilizes quantitative reverse transcription PCR (RT-qPCR) for viral/viroid targets and quantitative PCR (qPCR) for DNA-based targets performed on an Agilent AriaMX Real-Time PCR instrument. Nucleic acids and DNA are extracted from plant tissue using a validated extraction protocol. Each reaction includes an internal extraction and amplification control (IC/HEX channel) to confirm assay validity. A Cq threshold of 35 cycles is applied for most targets (40 cycles for Russet Mite): samples with Cq at or below threshold are reported as Detected. Samples with Cq between 35 and 40 cycles are also reported as Detected when the IC Cq is below 35, confirming assay validity. A positive target result is reported as Detected regardless of IC status. Wells with no target signal and a failed IC are reported as Under Analysis and will be retested by the laboratory.

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

VT00001

Blue Dream

BD-A01



- No pathogen detected
- Pathogen detected
- Not tested

PANEL

Full Panel

SAMPLE TYPE

Root + Leaf

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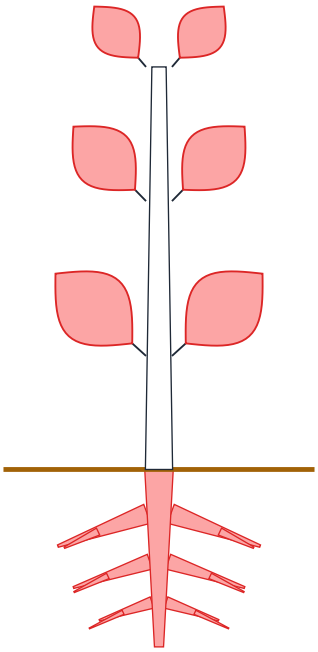
Results

HLVd	**DETECTED**	Cq 23.60
LCV	**NOT DETECTED**	No Cq
CCV	**NOT DETECTED**	No Cq
TMV	**NOT DETECTED**	No Cq
BCTv	**NOT DETECTED**	No Cq
Pan-Fusarium	**NOT DETECTED**	No Cq
Pan-Pythium	**NOT DETECTED**	No Cq
Botrytis	**NOT DETECTED**	No Cq
Russet Mites	**NOT DETECTED**	No Cq
Powdery Mildew	**NOT DETECTED**	No Cq
Internal Control (IC)	**PASS**	Cq 24.80

VT00002

Wedding Cake

WC-B02



- No pathogen detected
- Pathogen detected
- Not tested

PANEL

Full Panel

SAMPLE TYPE

Root + Leaf

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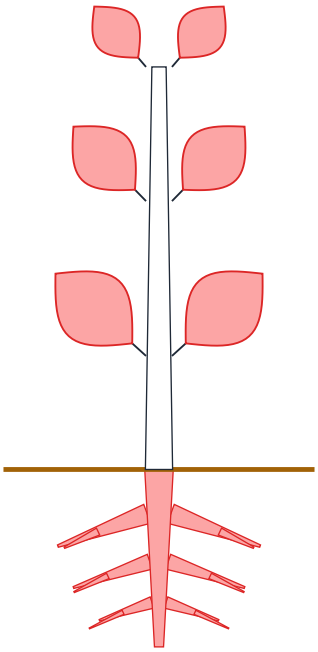
Results

HLVd	**NOT DETECTED**	No Cq
LCV	**NOT DETECTED**	No Cq
CCV	**NOT DETECTED**	No Cq
TMV	**NOT DETECTED**	No Cq
BCTv	**DETECTED**	Cq 21.40
Pan-Fusarium	**NOT DETECTED**	No Cq
Pan-Pythium	**NOT DETECTED**	No Cq
Botrytis	**NOT DETECTED**	No Cq
Russet Mites	**NOT DETECTED**	No Cq
Powdery Mildew	**NOT DETECTED**	No Cq
Internal Control (IC)	**PASS**	Cq 25.20

VT00003

Gelato 41

G41-C03



- No pathogen detected
- Pathogen detected
- Not tested

PANEL

Full Panel

SAMPLE TYPE

Root + Leaf

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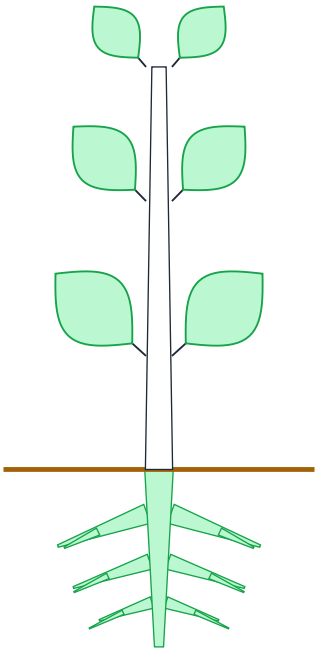
October 15, 2026

Results

HLVd	**NOT DETECTED**	No Cq
LCV	**DETECTED**	Cq 26.80
CCV	**NOT DETECTED**	No Cq
TMV	**NOT DETECTED**	No Cq
BCTv	**NOT DETECTED**	No Cq
Pan-Fusarium	**NOT DETECTED**	No Cq
Pan-Pythium	**NOT DETECTED**	No Cq
Botrytis	**DETECTED**	Cq 24.20
Russet Mites	**NOT DETECTED**	No Cq
Powdery Mildew	**NOT DETECTED**	No Cq
Internal Control (IC)	**PASS**	Cq 24.10

VT00004

OG Kush
OGK-D04



No pathogen detected
Pathogen detected
Not tested

PANEL
Full Panel

SAMPLE TYPE
Root + Leaf

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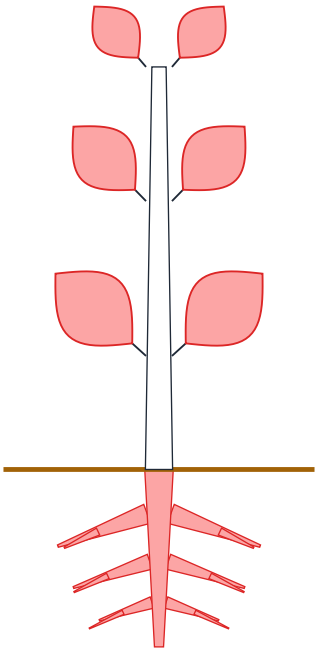
Results

HLVd	**NOT DETECTED**	No Cq
LCV	**NOT DETECTED**	No Cq
CCV	**NOT DETECTED**	No Cq
TMV	**NOT DETECTED**	No Cq
BCTv	**NOT DETECTED**	No Cq
Pan-Fusarium	**NOT DETECTED**	No Cq
Pan-Pythium	**NOT DETECTED**	No Cq
Botrytis	**NOT DETECTED**	No Cq
Russet Mites	**NOT DETECTED**	No Cq
Powdery Mildew	**NOT DETECTED**	No Cq
Internal Control (IC)	**PASS**	Cq 25.50

VT00005

Gorilla Glue #4

GG4-E05



- No pathogen detected
- Pathogen detected
- Not tested

PANEL
Full Panel

SAMPLE TYPE
Root + Leaf

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Results

HLVd	**NOT DETECTED**	No Cq
LCV	**NOT DETECTED**	No Cq
CCV	**NOT DETECTED**	No Cq
TMV	**DETECTED**	Cq 27.30
BCTv	**NOT DETECTED**	No Cq
Pan-Fusarium	**DETECTED**	Cq 29.10
Pan-Pythium	**NOT DETECTED**	No Cq
Botrytis	**NOT DETECTED**	No Cq
Russet Mites	**NOT DETECTED**	No Cq
Powdery Mildew	**DETECTED**	Cq 22.70
Internal Control (IC)	**PASS**	Cq 24.60