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## **Simplified and Rapid Diagnosis of Gender ID and HLVD Infection in Cannabis Plants**

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**Abstract:** Rapid testing for cultivation are needed to meet the unique challenges for cannabis production quality from both public health and agricultural. To support these needs, here is a novel, streamlined leaf-punch sample preparation methodology for two new testing solutions – GENE-UP GenderID to quickly discriminate male and female plants, and GENE-UP HLVD for the rapid detection of Hop Latent Viroid.

To examine performance of the GENE-UP streamlined cannabis leaf preparation, seven leaf samples were sourced for sex determination based on phenotypic (visual) expression of gender; 15 leaf samples were independently sourced from both suspected HLVD infected and healthy plants. Each sample was punched with a 1.2 mm leaf punch and leaf samples were directly introduced into GENE-UP Lysis tubes for mechanical extraction and PCR(Polymerase Chain Reaction) conditioning. After a five minute vortex, 5.0 uL of each lysate was transferred to a GENE-UP PRO GenderID or HLVD assay for analysis. Samples were amplified under each test's requisite PCR program, and analyzed on the GENE-UP thermal cycler software. Each sample tested for the GENDER ID and HLVD matched expected results (observed female or male phenotype and suspected HLVD), with an assay turnaround time of less than three hours. Each internal assay control, monitoring for DNA extraction efficiency, polymerase and reverse transcriptase function, demonstrated successful assay performance in each sample. The data supports the robust performance of this streamlined, five minute mechanical lysis sample preparation procedure for the rapid analysis of sex determination and HLVD in cannabis plants.