



## Test Characteristics

<b>Test Name</b>	Melon severe mosaic virus	<b>Capture Antibody</b>	Polyclonal (Rabbit)
<b>Catalog Number</b>	13900	<b>Detection Antibody</b>	Polyclonal (Rabbit)
<b>Acronym</b>	MeSMV	<b>Format</b>	Lateral Flow Device
<b>Genus</b>	Orthospovirus	<b>Diluents</b>	SEB1
<b>Binomial Name</b>	Orthospovirus melotessellati	<b>Sample Dilution</b>	1:20

## Summary

The Melon severe mosaic virus (MeSMV) ImmunoStrip is used to detect the presence of MeSMV in cucurbit crops. MeSMV is a member of the Orthospovirus genus known for their enveloped, spherical-shaped virus particles. ImmunoStrips® are the perfect screening tool for use in the field, greenhouse, and the lab.

## Diagnostic Sensitivity

<b>True Positives</b>	49
<b>Correct Diagnoses</b>	49
<b>Percent</b>	100%

## Analytical Sensitivity

<b>Analytical Sensitivity:</b>	The assay is 75% sensitive between 25 fg/μL and 100 fg/μL. (n=16)
<b>Limit of Detection:</b>	The assay has a 100% detection rate at 100 fg/μL with purified virus. (n=10)
	The assay has a 50% detection rate at 25 fg/μL with purified virus. (n=6)

## Analytical Specificity

### Inclusivity:

This assay was designed to detect all strains and isolates of MeSMV. Forty-nine distinct samples of MeSMV have been experimentally proven to be detected.

### Exclusivity:

#### Cross-reacts With:

Virus Name	Species Name
None Known	

#### Does Not Cross-react With:

Virus Name	Species Name
Alstroemeria necrotic streak virus (ANSV)	Orthospovirus alstroemerinecrosis
Capsicum chlorosis virus (CaCV)	Orthospovirus capsiciflavi
Chrysanthemum stem necrosis virus (CNSV)	Orthospovirus chrysanthinecrocaulis
Cucumber green mottle mosaic virus (CGMMV)	Tobamovirus viridimaculae
Cucumber mosaic virus (CMV)	Cucumovirus CMV
Groundnut bud necrosis virus (GBNV)	Orthospovirus arachinecrosis
Groundnut ringspot virus (GRSV)	Orthospovirus arachianuli
Impatiens necrotic spot virus (INSV)	Orthospovirus impatiensnecromaculae
Iris yellow spot virus (IYSV)	Orthospovirus iridimaculaflavi
Melon necrotic spot virus (MNSV)	Gammacarmovirus melonis
Papaya ringspot virus (PRSV)	Potyvirus papayanuli

**Does Not Cross-react With:**

Virus Name	Species Name
Soybean vein necrosis virus (SVNV)	Orthospovirus glycininecrovenae
Squash mosaic virus (SqMV)	Comovirus cucurbitae
Squash vein yellowing virus (SqVYV)	Ipomovirus cucurbitavenaflavi
Tobacco streak virus (TSV)	Iarvirus TSV
Tomato chlorotic spot virus (TCSV)	Orthospovirus tomatoflavi
Tomato leaf curl New Delhi virus (ToLCNDV)1	Begomovirus solanumdelhiense
Tomato spotted wilt virus (TSWV)	Orthospovirus tomatomaculae
Tomato yellow ring virus (TYRV)	Orthospovirus tomatanuli
Watermelon mosaic virus (WMV)	Potyvirus citrulli
Watermelon silver mottle virus (WSMoV)	Orthospovirus citrullomaculosi
Zucchini yellow mosaic virus (ZYMV)	Potyvirus cucurbitaflaviteselati

**Diagnostic Specificity**

True Negatives 62  
 Correct Diagnoses 62  
 Percent 100%

**Selectivity:**

No Matrix Effect Observed With:			
Bitter gourd leaves	Bottle gourd leaves	Cantaloupe fruit	Cantaloupe leaves
Cucumber fruit	Cucumber leaves	Honeydew leaves	Melon fruit
Melon leaves	Muskmelon leaves	Pumpkin leaves	Squash fruit
Squash leaves	Watermelon fruit	Watermelon leaves	Zucchini fruit
Zucchini leaves			

The hosts on the above list have been chosen to represent those which historically cause a range of matrix effects, in addition to those expected to be screened for this pathogen. Not all plant species susceptible to this pathogen have been screened, but may still be used with this assay unless otherwise noted below. As with all diagnostic tools, Agdia recommends confirming all results with a secondary detection method before making any economic decisions (ex: discarding plants due to positive test results, etc.).

Matrix Effect Observed With:			
None Known			

**Repeatability**

Number of Samples 111  
 Replicates per Sample 2 - 4  
 Total Replicates 273  
 Replicates in Agreement 273  
 Percent Agreement 100%

**Reproducibility**

Number of Samples 45  
 Replicates per Sample 3  
 Number of Operators 3  
 Total Replicates 405  
 Replicates in Agreement 404  
 Percent Agreement 99.8%

## Robustness

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### Planned deviation analysis:

No deviations from the user guide protocol were validated.

### Stability:

	1-year stability (accelerated)	Real-time Stability Verification
Positive Sample (High)	Pass	Monitoring
Positive Sample (High)	Pass	Monitoring
Positive Sample (Low)	Pass	Monitoring
Positive Sample (Low)	Pass	Monitoring
Positive Sample (Low)	Pass	Monitoring
Negative Sample	Pass	Monitoring
Negative Sample	Pass	Monitoring
Negative Sample	Pass	Monitoring

## Glossary

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- Diagnostic sensitivity<sup>1</sup>:** The percentage of positive samples correctly identified in an experiment with known positive controls.
- Diagnostic specificity<sup>1</sup>:** The percentage of negative samples correctly identified in an experiment with known negative controls.
- Analytical sensitivity<sup>2</sup>:** The smallest amount of target that can be detected reliably (this is sometimes referred to as the 'limit of detection')
- Analytical specificity<sup>2</sup>:** (comprises inclusivity and exclusivity)
- Inclusivity<sup>3</sup>:** The performance of a test with a range of target isolates covering genetic diversity, different geographical origin and/or hosts associated with the target organism.
- Exclusivity<sup>3</sup>:** The performance of a test with a range of non-targets (e.g. cross-reaction with closely related organisms, contaminants)
- Selectivity<sup>2</sup>:** The level of effect that matrices and relevant plant parts have on the performance of the assay.
- Repeatability<sup>2</sup>:** The agreement between test replicates of the same sample tested by the same operator.
- Reproducibility<sup>3</sup>:** The ability of a test to provide consistent results when applied to aliquots of the same sample tested under different conditions (e.g. time, users, equipment, location)
- Robustness<sup>1,3</sup>:** The extent to which varying test conditions (e.g. temperature, volume, change of buffers) affect the established test performance values. May also be referred to as planned deviation analysis.
- Stability<sup>1</sup>:** The performance of test reagents or controls over time.

### References:

- <sup>1</sup>Groth-Helms, D., Rivera, Y., Martin, F. N., Arif, M., Sharma, P., Castlebury, L. A. (in press). Terminology and Guidelines for Diagnostic Assay Development and Validation: Best Practices for Molecular Tests. *PhytoFrontiers*.
- <sup>2</sup>Eads, A., Groth-Helms, D., Davenport, B., Cha, X., Li, R., Walsh, C., Schuetz, K., (in press). The Commercial Validation of Three Tomato Brown Rugose Fruit Virus Assays. *PhytoFrontiers*.
- <sup>3</sup>EPPO (2018) PM 7/76 (5) Use of EPPO Diagnostic Standards, *EPPO Bulletin* 48, 373– 377.