



# ImmunoStrip® Validation Report

## On-site Plant Pathogen Testing

### *Impatiens necrotic spot virus (INSV)*

#### ISK/STX 20501

# ImmunoStrip®

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## Test Characteristics

Test Name	Impatiens necrotic spot virus	Capture Antibody	Monoclonal (Mouse)
Catalog Number	20501	Detection Antibody	Monoclonal (Mouse)
Acronym	INSV	Format	Lateral Flow Device
Genus	Orthospovirus	Diluents	SEB1
Binomial Name	Orthospovirus impatiensnecromaculae	Sample Dilution	1:20

## Summary

The Impatiens necrotic spot virus (INSV) ImmunoStrip is used to detect the presence of INSV in ornamental and vegetable crops. INSV 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

True Positives	12
Correct Diagnoses	12
Percent	100%

## Analytical Sensitivity

Limit of Detection: 1:20,480 dilution of infected tissue (pathogen titer unknown)

## Analytical Specificity

### Inclusivity:

#### Isolates and Geographic Regions Detected:

INSV-1 (NC, USA) <sup>1</sup>	INSV California isolate
INSV Oregon isolate	
<sup>1</sup> INSV-1 has been <a href="#">reported</a> to be detected.	

### Exclusivity:

#### Cross-reacts With:

None Known	
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#### Does Not Cross-react With:

Virus Name	Species Name
Capsicum chlorosis virus (CaCV)	Orthospovirus capsiciflavi
Chrysanthemum stem necrosis virus (CNSV)	Orthospovirus chrysanthinecrocaulis
Groundnut ringspot virus (GRSV)	Orthospovirus arachianuli
Iris yellow spot virus (IYSV)	Orthospovirus iridimaculaflavi
Melon yellow spot virus (MYSV)	Orthospovirus meloflavi
Tomato chlorotic spot virus (TCSV)	Orthospovirus tomatoflavi
Tomato spotted wilt virus (TSWV)	Orthospovirus tomatomaculae

**Does Not Cross-react With:**

Virus Name	Species Name
Tomato zonate spot virus (TZSV) <sup>1</sup>	Orthotospovirus tomatosonae
Watermelon silver mottle virus (WSMoV)	Orthotospovirus citrullumaculosis
Groundnut bud necrosis virus (GBNV)	Orthotospovirus arachidnecrosis
Soybean vein necrosis virus (SVNV)	Orthotospovirus glycininecrosis
<sup>1</sup> Reported to not cross-react with Tomato zonate spot virus (TZSV)	

**Diagnostic Specificity**

True Negatives 148  
Correct Diagnoses 148  
Percent 100%

**Selectivity:**

No Matrix Effect Observed With:			
Alstroemeria leaves	Alternanthera leaves	Anemone leaves	Angelonia leaves
Antirrhinum Snapdragon leaves	Argyranthemum leaves	Aster leaves	Bacopa leaves
Bean leaves	Beet roots	Begonia leaves	Blueberry leaves
Browallia leaves	Buddleia leaves	Calibrachoa leaves	Campanula leaves
Chrysanthemum leaves	Cleome leaves	Coleus leaves	Coreopsis leaves
Cucumber leaves	Cyclamen leaves	Cymbidium leaves	Dahlia leaves
Dianthus leaves	Diascia leaves	Fuchsia leaves	Gaillardia leaves
Garlic leaves	Gerbera leaves	Helichrysum leaves	Hosta leaves
Impatiens leaves	Indigo leaves	Ipomoea leaves	Kalanchoe leaves
Limonium Statice leaves	Lobelia leaves	Mimulus Monkey Flower leaves	Nandina leaves
Nemesia leaves	Nepeta Catmint leaves	Nepeta Catnip leaves	Osteospermum leaves
Papaya leaves	Penstemon leaves	Pepper leaves	Persicum leaves
Petunia leaves	Phlox leaves	Portulaca leaves	Primrose leaves
Ranunculus leaves	Raspberry leaves	Salvia leaves	Scabiosa leaves
Scaevola leaves	Soybean leaves	Strawberry leaves	Strawflower leaves
Sutera leaves	Tobacco leaves	Tomato leaves	Torenia leaves
Verbascum leaves	Verbena leaves	Veronica leaves	Watermelon 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			
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## Glossary

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<b>Diagnostic sensitivity<sup>1</sup>:</b>	The percentage of positive samples correctly identified in an experiment with known positive controls.
<b>Diagnostic specificity<sup>1</sup>:</b>	The percentage of negative samples correctly identified in an experiment with known negative controls.
<b>Analytical sensitivity<sup>2</sup>:</b>	The smallest amount of target that can be detected reliably (this is sometimes referred to as the 'limit of detection')
<b>Analytical specificity<sup>3</sup>:</b>	(comprises inclusivity and exclusivity)
<b>Inclusivity<sup>3</sup>:</b>	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.
<b>Exclusivity<sup>3</sup>:</b>	The performance of a test with a range of non-targets (e.g. cross-reaction with closely related organisms, contaminants)
<b>Selectivity<sup>2</sup>:</b>	The level of effect that matrices and relevant plant parts have on the performance of the assay.
<b>Repeatability<sup>2</sup>:</b>	The agreement between test replicates of the same sample tested by the same operator.
<b>Reproducibility<sup>3</sup>:</b>	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)
<b>Robustness<sup>1,3</sup>:</b>	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.
<b>Stability<sup>1</sup>:</b>	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.