

List of Plant Species & Viruses Covered under National Certification System for Tissue Culture Plants.

S. No	Plant Species		®Viruses/Viroids/phytoplasmas/bacteria covered under NCS-TCP	Test protocol*			
	Common Name	Scientific Name		ELISA	DIBA	RT-PCR /PCR	NASH
Fruit Plant Species							
1	Apple*	<i>Malus domestica</i>	Apple chlorotic leaf spot virus (ACLSV); Trichovirus; Flexiviridae.	+		+	
			Apple mosaic virus (ApMV); Ilarvirus; Bromoviridae.	+		+	
			Apple stem grooving virus (ASGV); Capillovirus; Flexiviridae.	+	+	+	
			Apple stem pitting virus (ASPV); Foveavirus; Flexiviridae.	+		+ ^{IC}	
2	Banana*	<i>Musa spp</i>	Banana bract mosaic virus (BBrMV); Potyvirus; Potyviridae.	+		+	
			Banana bunchy top virus (BBTV); Babuvirus; Nanoviridae.	+		+	+
			Banana streak virus-Mysore strain (BSMyV); Badnavirus; Caulimoviridae.	+		+	+
			Cucumber mosaic virus (CMV); Cucumovirus; Bromoviridae.	+		+	
3.	Citrus*	<i>Citrus spp</i>	Citrus greening (<i>Liberobacter asiaticum</i>)	+		+	
			¹ Citrus exocortis viroid (CEVd); Pospiviroid; Pospiviroidae.			+	
			Citrus tristeza virus (CTV); Closterovirus; Closteroviridae.	+	+	+	
			Citrus mosaic virus (CMBV); Badnavirus; Caulimoviridae.			+	+
			Indian citrus ringspot virus (ICRSV); Mandarivirus; Flexiviridae.	+		+	
4.	Strawberry	<i>Fragaria spp</i>	[§] Raspberry ringspot virus (RpRSV); Nepovirus; Comoviridae.	+		+	+
			[§] Strawberry crinkle virus (SCV); Cytorhabdovirus; Rhabdoviridae.	+			
			[§] Strawberry latent ringspot virus (SLRSV); Sadwavirus; unassigned.	+		+	
			[§] Strawberry mild yellow edge virus (SMYEV); Potexvirus; Flexiviridae.	+			
			Strawberry mottle virus (SMoV); Sadwavirus; unassigned.	+			
			Strawberry pseudo mild yellow edge virus (SPMYEV); Carlavirus; Flexiviridae.	+		+	
			[§] Strawberry vein banding virus (SVBV); Caulimovirus;	+		+	

			Caulimoviridae.				
			Tomato black ring virus (ToBRV); Nepovirus; Comoviridae.	+		+	+
Spices							
6	Black Pepper*	<i>Piper nigrum</i>	Cucumber mosaic virus (CMV); Cucumovirus; Bromoviridae.	+		+	
			Piper yellow mottle virus (PYMOV); Badnavirus; Caulimoviridae.	+		+	
			Piper little leaf (phytoplasmas).	+		+	
7.	Cardamom, large	<i>Amomum subulatum</i>	Cardamom mosaic virus (CdMV); Macluravirus; Potyviridae.	+		+	
8.	Cardamom, small	<i>Elettaria cardamomum</i>	Cardamom mosaic virus (CdMV); Macluravirus; Potyviridae.	+		+	
9.	Vanilla*	<i>Vanilla</i> spp.	Vanilla mosaic virus (VanMV); Potyvirus; Potyviridae.	+		+	
			Vanilla necrosis virus (Watermelon mosaic virus (WMV)); Potyvirus; Potyviridae.	+		+	
			Cymbidium mosaic virus (CYMMV); Potexvirus; Flexiviridae.	+	+	+	+
			Odontoglossum ring spot virus (ORSV); Tobamovirus; unassigned.	+	+	+	+
Commercial Crops							
10.	Potato*	<i>Solanum tuberosum</i>	Potato leaf roll virus (PLRV); Polorovirus; Luteoviridae.	+ ^{DAS}	+	+	+
			Potato virus M (PVM); Carlavirus; Flexiviridae.	+ ^{DAS}	+	+	
			Potato virus S (PVS); Carlavirus; Flexiviridae.	+	+	+	+
			Potato virus X (PVX); Potexvirus; Flexiviridae.	+ ^{DAS}		+	+
			Potato virus Y (PVY); Potyvirus; Potyviridae.	+	+	+ ^{IC}	+
			Potato apical leaf curl virus (Tomato leaf curl virus (TICV)); Begomovirus; Geminiviridae	+		+	
11.	Sugarcane*	<i>Saccharum officinarum</i>	Sugarcane mosaic virus (SCMV); Potyvirus; Potyviridae.	+	+	+	
			Sugarcane yellow leaf virus (ScYLV); Polorovirus; Luteoviridae			+	
			Sugarcane bacilliform Mor virus (SCBMV); Badnavirus; Caulimoviridae.			+	
Ornamental Plant Species							
12.	Alocassia	<i>Alocassia</i> spp	Dasheen mosaic virus (DsMV); Potyvirus; Potyviridae.	+	+	+	
13.	Alstromeria	<i>(Alstromeria</i> spp)	Cucumber mosaic virus (CMV); Cucumovirus; Bromoviridae.	+		+	
			Alstroemeria mosaic virus (AIMV); Potyvirus; Potyviridae.	+		+	
			Alstroemeria streak virus (Alstroemeria mosaic virus);	+		+	

			Potyvirus; Potyviridae.				
			[§] Alstroemeria carlavirus (Lily symptomless virus); Carlavirus; Flexiviridae.	+	+	+	
			[§] Tomato spotted wilt (TSWV); Tospovirus; Bunyaviridae.	+		+	+
14.	Anthurium	<i>Anthurium spp</i>	Dasheen mosaic virus (DsMV); Potyvirus; Potyviridae.	+	+	+	
15.	Asparagus	<i>Asparagus spp</i>	Asparagus virus-1 (AV-1); Potyvirus; Potyviridae.	+		+	
			Asparagus virus-2 (AV-2); Ilarvirus; Bromoviridae	+		+	
			Asparagus virus-3 (AV-3); Potexvirus; Flexiviridae	+		+	
16.	Caladium	<i>Caladium spp</i>	Dasheen mosaic virus (DsMV); Potyvirus; Potyviridae.	+	+	+	
17.	Calla Lily	<i>Zantedeschia aethiopica</i>	Cucumber mosaic virus (CMV); Cucumovirus; Bromoviridae.	+		+	
			Dasheen mosaic virus (DsMV); Potyvirus; Potyviridae.	+	+	+	
			[§] Tomato spotted wilt (TSWV); Tospovirus; Bunyaviridae	+		+	+
18.	Carnation	<i>Dianthus caryophyllus</i>	Carnation etched ring virus (CERV); Caulimovirus; Caulimoviridae.	+		+	
			[§] Carnation Italian ringspot virus (CIRV); Tombusvirus; Tombusviridae.	+		+	
			Carnation latent virus (CLV); Carlavirus; Flexiviridae.	+		+	
			Carnation mottle virus (CarMV); Carmovirus; Tombusviridae.	+		+	
			Carnation necrotic fleck virus (CNFV); Closterovirus; Closteroviridae.	+		+	
			Carnation ringspot virus (CRSV); Dianthovirus; Tombusviridae.	+		+	
			Carnation vein mottle virus (CVMV); Potyvirus; Potyviridae.	+		+	
19.	Chrysanthemum	<i>Dendranthema morifolium</i>	Chrysanthemum virus B (CVB); Carlavirus; Flexiviridae.	+ ^{DAS}		+	
			Chrysanthemum aspermy virus (Tomato aspermy virus); Cucumovirus; Bromoviridae.	+		+	
			Cucumber mosaic virus (CMV); Cucumovirus; Bromoviridae.	+		+	
			[§] Chrysanthemum stem necrosis virus (CSNV); Tospovirus; Bunyaviridae.	+		+	+
			² Chrysanthemum stunt viroid (CSVd); Pospiviroid; Pospiviroidae.			+	+
20.	Colocasia	<i>Colocasia spp.</i>	Dasheen mosaic virus (DsMV); Potyvirus; Potyviridae.	+	+	+	
21.	Cordyline	<i>Cordyline spp</i>	Impatiens necrotic spot virus (INSV); Tospovirus; Bunyaviridae	+		+	
			[§] Tomato spotted wilt (TSWV); Tospovirus; Bunyaviridae.	+		+	+
22.	Geranium	<i>Geranium spp</i>	[§] Tomato spotted wilt (TSWV); Tospovirus; Bunyaviridae.	+		+	+

			[§] Pelargonium flower break virus (PFBV); Carmovirus; Tombusviridae.	+		+	
			[§] Pelargonium vein clearing virus (PVCV); Eggplant mottled dwarf virus; Nucleorhabdovirus; Rhabdoviridae.	+		+	
			[§] Pelargonium leaf curl virus (PLCV); Tombusvirus; Tombusviridae	+		+	
			[§] Arabis mosaic virus (ArMV); Nepovirus; Comoviridae.	+		+ ^{IC}	
			[§] Tomato ring spot virus (ToRSV); Nepovirus; Comoviridae.	+		+	
			Tomato black ring virus (ToBRV); Nepovirus; Comoviridae.	+		+	+
23.	Gerbera	<i>Gerbera jamesonii</i> .	Tobacco rattle virus (TRV); Tobravirus; un assigned.	+		+	
			Gerbera mosaic virus (Tobacco mosaic virus (TMV)); Tobamovirus; unassigned.	+	+	+	+
			Gerbera symptomless virus (GeSLV); unassigned; Rhabdoviridae.	+		+	
			Gerbera phyllody (Phytoplasma).	+		+	
24.	Ginger	<i>Zinziber spp</i>	Cucumber mosaic virus (CMV); <u>Cucumovirus</u> ; Bromoviridae.	+		+	
			Ginger chlorotic fleckvirus (GCFV); Sobemovirus; unassigned	+		+	
25.	Lily (Asiatic/ Oriental lily)	<i>Lilium longifolium</i>	Cucumber mosaic virus (CMV); Cucumovirus; Bromoviridae.	+		+	
			Lily symptomless virus (LSV); Carlavirus; Flexiviridae.	+	+	+	
			Lily mottle virus (LMoV); Potyvirus; Potyviridae.	+		+	
			[§] Lily virus X (LVX); Potexvirus; Flexiviridae.	+		+	
			[§] Strawberry latent ring spot virus (SLRSV); Sadwavirus; unassigned.	+			
			[§] Tomato spotted wilt (TSWV); Tospovirus; Bunyaviridae.	+		+	+
			Tulip breaking virus (TuBV); Potyvirus; Potyviridae.	+		+	
26	Limonium	<i>Limonium spp</i>	Impatiens necrotic spot virus (INSV); Tospovirus; Bunyaviridae.	+		+	
			Cucumber mosaic virus (CMV); Cucumovirus; Bromoviridae.	+		+	
			[§] Clover yellow vein virus (CIYV); Potyvirus; Potyviridae	+ ^{DAS}		+	
			Tobacco rattle virus (TRV); Tobravirus; un assigned.	+		+	
27.	Orchids	<i>Cymbidium spp</i> ; <i>Dendrobium spp</i> ; <i>Cattelya spp</i> ; <i>Phalenopsis spp. Etc.</i>	Cymbidium mosaic virus (CYMMV); Potexvirus; Flexiviridae.	+	+	+	+
			Cymbidium ringspot virus (CymRSV); Tombusvirus; Tombusviridae.	+		+	
			Impatiens necrotic spot virus (INSV); Tospovirus; Bunyaviridae.	+		+	

			Odontoglossum ring spot virus (ORSV); Tobamovirus; unassigned.	+	+	+	+
			[§] Tomato spotted wilt (TSWV); Tospovirus; Bunyaviridae	+		+	+
27.	Philodendron	<i>Philodendron spp</i>	Dasheen mosaic virus (DsMV); Potyvirus; Potyviridae	+	+	+	
28.	Spathyphyllum	<i>Spathyphyllum spp</i>	Dasheen mosaic virus (DsMV); Potyvirus; Potyviridae.	+	+	+	
29.	Syngonium	<i>Syngonium spp</i>	Impatiens necrotic spot virus (INSV); Tospovirus; Bunyaviridae	+		+	
			[§] Tomato spotted wilt (TSWV); Tospovirus; Bunyaviridae.	+		+	+
30.	Weeping fig	<i>Ficus benjamina</i>	Ficus chlorosis virus (Fig leaf chlorosis virus) (FigLCV); Potyvirus; Potyviridae.	+		+	
			Cucumber mosaic virus (CMV); Cucumovirus; Bromoviridae	+		+	
Forest plant species							
31.	Bamboo	<i>Bambusa vulgaris</i>	Bamboo mosaic virus (BaMV); Potexvirus; Flexiviridae.	+		+	

[§] not known to occur in India and or/ restricted distribution in India;

¹Citrus exocortis also can be detected by **sPAGE** (sequential polyacrylamide gel electrophoresis);

²Chrysanthemum stunt viroid, Potato spindle tuber viroid also can be detected by **R-PAGE** (return gel PAGE);

+: Detection of virus by specified test; +^{DAS}: Detection of virus by double antibody sandwich-ELISA; +^{IC}: Detection of virus by Immunocapture-RT-PCR); +^{dsRNA}: Detection by dsRNA;

***ELISA**: Enzyme-linked Immunosorbent Assay; **DIBA**: Dot-immunobinding Assay; **RT-PCR**: Reverse transcription polymerase chain reaction; **NASH**: Nucleic Acid Spot Hybridization;

@Viruses/viroids nomenclature is as per the International Taxonomy Committee for Viruses.

* Covered under certification standards established by the Department of Biotechnology in accordance with provisions of Seeds Act, 1966.