



VIRUSES WITH INSECT VECTORS

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Vector taxa	Vector group	Icosahedral particles RNA genome	Rod-shaped particles RNA genome	DNA genome	Enveloped particles RNA genome	Total	%
Hemiptera	Aphids	26	153 ^a	13	5	197	28
	Whiteflies	–	13	115 ^b	–	128	18
	Leafhoppers	8	–	15	3	26	4
	Planthoppers	10	4 ^c	–	4	18	3
	Other hemiptera	–	8	5	–	13	2
Thysanoptera	Thrips	2	–	–	14	16	2
Coleoptera	Beetles	50	1	–	–	51	7
Acari	Mites	10	9	–	–	10	1
Nematoda	Nematodes	45	3	–	–	48	7
Mycota	Fungi	8	16	–	–	24	3
	No identified vectors	84	60	19	3 ^d	166	24
	Total	233	268	167	30	<u>697</u>	

Viruses in same genus

- same vector taxon (usually)
(aphid, fungus, whitefly, etc)**

- same mode of transmission
(np, p,)**

Transmission characteristics and timing of plant viruses transmitted by hemipteran insects

Biological characteristic	Nonpersistent stylet-borne	Semipersistent foregut-borne^b	Persistent circulative	Persistent propagative
AAP and IAP ^a	Seconds, minutes ^c	Minutes, hours ^d	Hours, days ^d	Hours, days ^d
Latent period	None	None	Hours, days	Days, weeks
Retention time in vector	Minutes, lost after molting	Hours, lost after molting	Days, weeks	Lifespan of insect
Presence in vector's hemolymph	No	No	Yes	Yes
Multiplication in vector	No	No	No ^e	Yes
Transovarial transmission	No	No	No	Often



Nonpersistent / Semipersistent

Nonpersistent

Cucumo

Alfalfa mosaic

Poty

Caulimo

Semipersistent

Caulimo

Clostero

Crini

Others

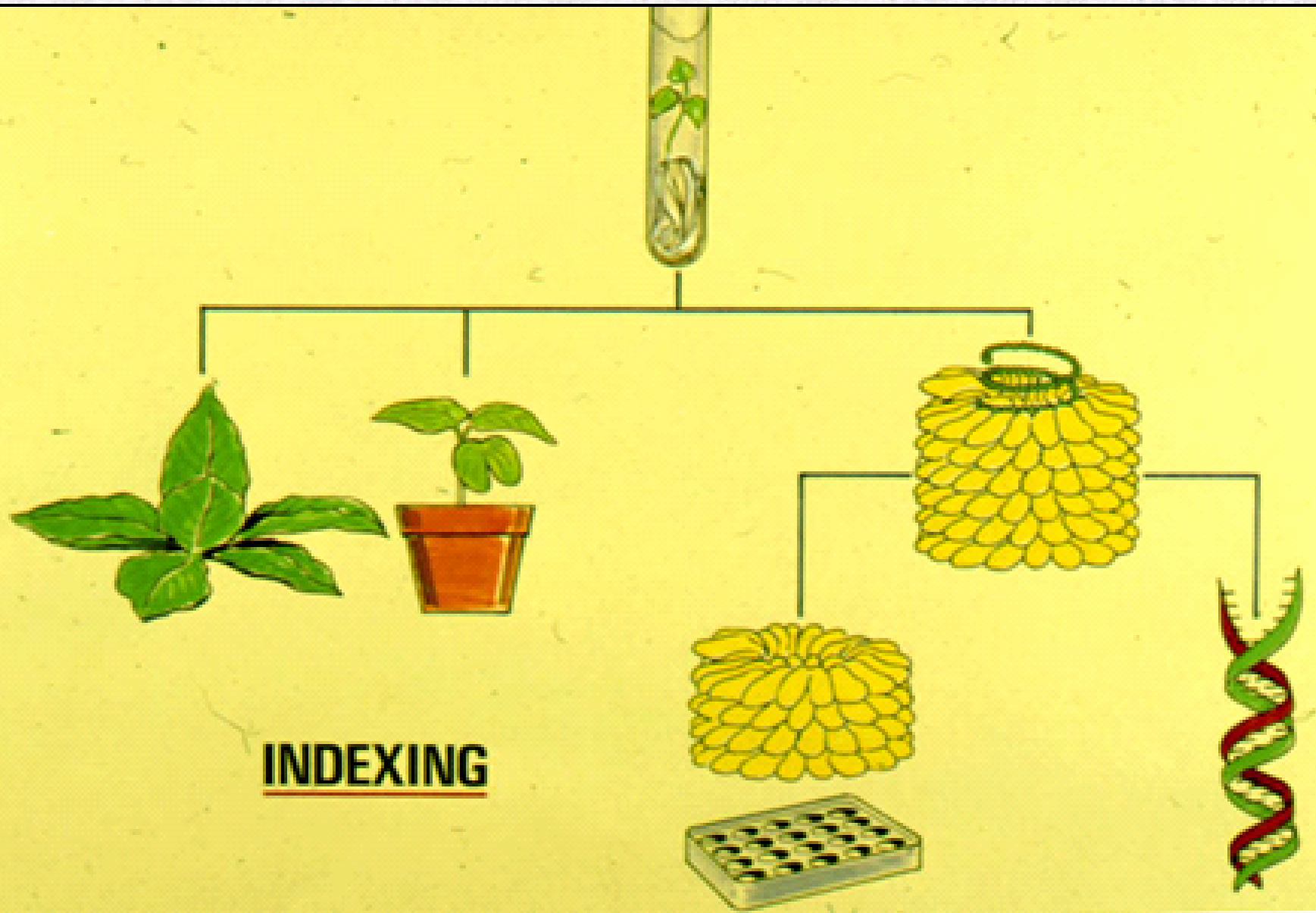
Persistent Non-Propagative

Virus family	Virus genus	Number ^a	Hemiptera			
			Aphids	Leafhopper	Whiteflies	Treehopper ^a
<i>Luteo</i>	<i>Enamovirus</i>	1	1	–	–	–
	<i>Luteovirus</i>	2	2	–	–	–
	<i>Polerovirus</i>	5	5	–	–	–
<i>Gemini</i>	<i>Mastrevirus</i>	10	–	10	–	–
	<i>Curtovirus</i>	3	–	3	–	–
	<i>Begomovirus</i>	115	–	–	115	–
	<i>Topocuvirus</i>	1	–	–	–	1
<i>Nano</i>	<i>Nanovirus</i>	3	3	–	–	–
	<i>Babuvirus</i>	1	1	–	–	–
TOTALS		141	12	13	115	1

Persistent - Propagative

Virus family	Virus genus	Number	Aphids	Leafhoppers	Planthoppers	Thrips
<i>Bunyaviridae</i>	<i>Tospovirus^a</i>	14	–	–	–	14
<i>Rhabdoviridae</i>	<i>Cytorhabdovirus^a</i>	8 ^b	3	1	2	–
	<i>Nucleorhabdovirus^a</i>	11 ^{b,c}	2	3	2	–
	Unassigned ^a	1 ^c	–	–	–	–
<i>Reoviridae</i>	<i>Fijivirus</i>	8	–	–	8	–
	<i>Oryzavirus</i>	2	–	–	2	–
	<i>Phytoreovirus</i>	3	–	3	–	–
<i>Tymoviridae</i>	<i>Marafivirus</i>	3	–	3	–	–
Unassigned	<i>Tenuivirus^c</i>	4	–	–	4	–
TOTALS		41	5	10	18	14

DIAGNOSIS / INDEXING



Control Options

Removal of Initial Inoculum

**Propagation & Maintenance of Pathogen-tested
stock**

Quarantine

Resistant cultivars

Cultural practices

Vector control

Biological Control

Chemical control

Vector Control

Insecticides have not been effective

Low economic threshold

Need rapid knock down vectors of NP
transmitted viruses

Limited effectiveness for Persistent trans.

Oil Sprays

Reflective mulches

Trap crops

Fumigation for soilborne vectors- high value crops