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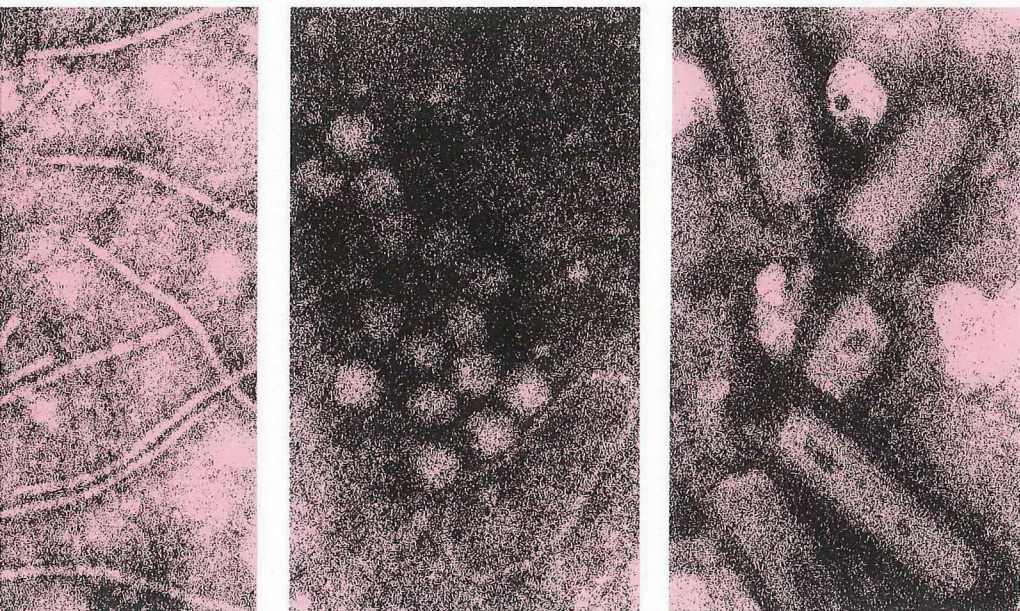
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Technical Bulletin

**Virus, viroid, mycoplasma and
rickettsial diseases of plants in
Western Australia**

No. 68



G.D. McLean
L.K. Price

Virus, viroid, mycoplasma and rickettsial diseases of plants in Western Australia

By: G. D. McLean and L. K. Price

Editor: D. A. W. Johnston

This bulletin provides details of the virus, viroid, mycoplasma and rickettsial diseases recorded on plants in Western Australia.

To establish these records, a range of tests have been used including sap transmission; leaf dip electron microscopy; aphid transmission and serology.

The authenticity for each record is noted in the list of pathogens.

Summary

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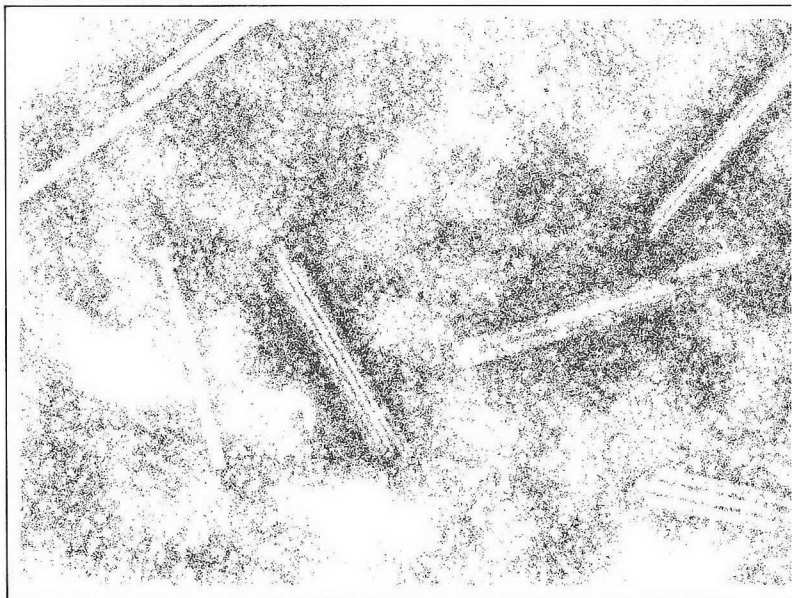
Virus, viroid, mycoplasma and rickettsial diseases of plants in Western Australia.

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Introduction

An authentic set of records of plant virus and viroid diseases is an invaluable aid when quarantine decisions are to be made, on either a State or national basis, for the approval of plant material for export or import. Records aid future identifications and provide information for plant breeders. Such lists have been compiled for Tasmania by Sampson and Walker (1982) and for South Australia by Warup and Talbot (1981).

It is important that disease lists are accurate and regularly revised. This list is a complete revision of the virus records for Western Australia. The majority of the records listed in Part I are for the period 1973 to 1984 and most were made using electron microscopy or serological tests. Identifications without serological tests are less definitive. Part II is a host index for virus, virus-like and viroid diseases. Part III contains the mycoplasma and rickettsial records, most of these being based only on symptoms.

The first record of a virus disease in Western Australia was made by Despeissis in 1901 who described woodiness in passionfruit. Some of the more important historic references from 1901 to the 1960s are listed below, but validating tests were not generally available until the 1950s.

1901 Despeissis—Woodiness in passionfruit (possibly cucumber mosaic)

1923 Carne—Spotted wilt of tomatoes

1927 Carne—Mosaic and leafroll of potatoes

1934 Pitman—Potato virus diseases

1943 Cass Smith—Mosaic of peas and broad beans

1952 Harvey—Lettuce mosaic

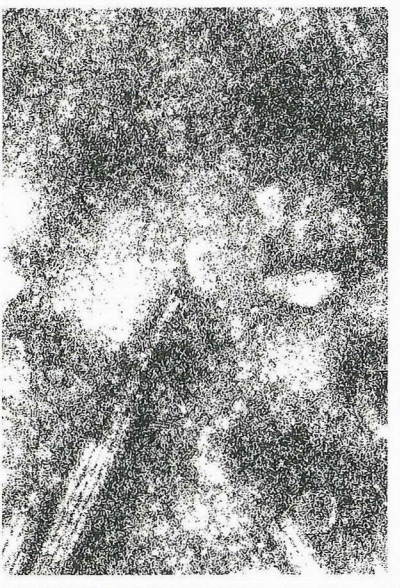
1956 Harvey—Bean yellow mosaic on beans, subterranean clover and lupins

1957 Harvey—Stony pit of pears, apple mosaic

1962 Harvey—Yellow dwarf of cereals

Full details of the particular publications are to be found in the references.

This bulletin is intended to fulfil the needs of virologists, quarantine authorities and plant breeders while at the same time updating the disease record since the last list was compiled by MacNish (1967).



Methodology

Methods of diagnosis, characterization and identification of viruses are continually improving. In the past, diagnosis of a virus disease was based solely on host symptoms, but since the 1960s the demonstration of a virus particle has become a requirement for suggesting that a particular disease is caused by a virus. Matthews (1982) provides data on the classification and nomenclature of viruses while Hamilton *et al.* (1981) discussed guidelines for the identification and characterization of viruses; including a full discussion of the techniques used.

In this compilation, we have referred to the publication by the Commonwealth Mycological Institute and Association of Applied Biologists: "Descriptions of Plant Viruses", as our basic reference.

Part I

Virus diseases recorded in Western Australia

Virus

Alfalfa mosaic
 Apple chlorotic leaf spot
 Apple mosaic
 Barley yellow dwarf
 Bean yellow mosaic
 Bean summer death
 Beet western yellows
 Cactus virus X
 Carnation latent
 Carnation mottle
 Carrot motley dwarf
 Celery mosaic
 Chrysanthemum B
 Citrus tristeza
 Cucumber mosaic
 Cymbidium mosaic
 Garlic mosaic
 Garlic yellow streak
 Hippeastrum mosaic
 Iris mild mosaic
 Lettuce mosaic
 Lettuce necrotic yellows
 Lily symptomless
 Sugarcane mosaic
 Narcissus latent
 Narcissus mosaic
 Narcissus yellow stripe
 Odontoglossum ringspot
 Onion yellow dwarf
 Orchid fleck
 Passionfruit woodiness
 Potato leafroll
 Potato virus S
 Potato virus X
 Potato virus Y
 Prune dwarf
 Prunus necrotic ringspot
 Subterranean clover mottle
 Subterranean clover red leaf
 Tobamoviruses:
 Tomato mosaic
 Tobacco mosaic
 Tomato spotted wilt
 Tulip breaking
 White clover mosaic
 Zucchini yellow mosaic

Basis of record

Electron microscopy, sap transmission
 Graft transmission
 Host symptoms
 Aphid transmission
 Electron microscopy, sap transmission
 Serology
 Aphid transmission
 Electron microscopy
 Electron microscopy
 Electron microscopy
 Aphid transmission
 Electron microscopy
 Electron microscopy
 Electron microscopy
 Serology, sap transmission
 Electron microscopy
 Electron microscopy
 Electron microscopy
 Electron microscopy
 Electron microscopy
 Electron microscopy
 Electron microscopy, sap transmission
 Electron microscopy
 Electron microscopy, sap transmission
 Electron microscopy
 Electron microscopy
 Electron microscopy
 Electron microscopy
 Electron microscopy
 Electron microscopy, sap transmission
 Aphid transmission
 Electron microscopy
 Electron microscopy
 Electron microscopy
 Graft transmission
 Sap transmission
 Sap transmission, electron microscopy
 Aphid transmission
 Electron microscopy, sap transmission
 Electron microscopy, sap transmission
 Sap transmission
 Electron microscopy
 Electron microscopy, serology
 Electron microscopy, serology

Diseases attributed to a virus;

(No causal organism isolated)

Virus

Apple green crinkle
 Citrus psorosis
 Citrus crinkly leaf
 Citrus shell bark
 Citrus woody gall
 Fig mosaic
 Grapevine leafroll
 Grapevine yellow speckle
 Grapevine corky bark
 Grapevine vein mosaic
 Lettuce big vein
 Pear stony pit
 Subterranean clover stunt

Basis of record

Host symptoms
 Host symptoms
 Host symptoms
 Host symptoms
 Host symptoms
 Host symptoms
 Vine indicator
 Vine indicator
 Vine indicator
 Vine indicator
 Host symptoms
 Field symptoms
 Aphid transmission

Part II

Host index of virus, virus-like and viroid diseases recorded in Western Australia.

Host generic and common name	Disease agent†	First record*
<i>Allium sativum</i> Garlic	(a) 750-1000 nm flexuous rod, leaf dip electron microscopy, possibly onion yellow dwarf. CMI/AAB 158	1979, Harvey
	(b) 700-800 nm flexuous rod, leaf dip electron microscopy, possibly garlic yellow streak	1979, Harvey
	(c) 670 nm flexuous rod, leaf dip electron microscopy, possibly garlic mosaic.	1983, Manjimup
<i>Amaryllis</i> sp. Hippeastrum	730 nm flexuous rod, leaf dip electron microscopy, possibly hippeastrum mosaic. CMI/AAB 117	1983, Fremantle
<i>Apium graveolens</i> Celery	(a) Cucumber mosaic CMI/AAB 213	1959, Balcatta, (Goss, 1961)
	(b) 750 nm flexuous rod, leaf dip electron microscopy, possibly celery mosaic. CMI/AAB 50	1981, Perth
<i>Avena sativa</i> Oats	Barley yellow dwarf CMI/AAB 32	1961, Bridgetown, (MacNish, 1964)
<i>Begonia</i> sp. Begonia	Tomato spotted wilt CMI/AAB 39	1950, Metropolitan, (Goss, 1964)
<i>Beta vulgaris</i> var. <i>cicla</i> Silver beet	Cucumber mosaic virus CMI/AAB 213	1945, Osborne Park, and 1955 (Chambers, 1959)
<i>Brassica oleracea</i> var. <i>botrytis</i> Cauliflower	Cauliflower mosaic	1943, Nedlands, (Chambers, 1959)

†Institution which identified the pathogen indicated in parenthesis if not the Western Australian Department of Agriculture.

*The year of first record represents the year the disease was first recognized, in some instances additional confirmatory tests have been carried out at a later date. The location of the first record is shown. The record is indicated, where known, in parenthesis.

Host generic and common name	Disease agent	First record
<i>Cactaceae</i> sp. Cactus	450-660 nm flexuous rods, leaf dip electron microscopy, possibly cactus virus X. CMI/AAB 58	1978, Perth
<i>Brassica oleracea</i> var. <i>capitata</i> Cabbage	Cabbage black ringspot	1956 Bedfordale, (Chambers, 1959)
<i>Capsicum annum</i> Pepper	Cucumber mosaic CMI/AAB 213 (Waite Agricultural Research Institute, Adelaide)	1979, Carnarvon
<i>Cassia</i> sp. Cassia	Pea mosaic	1943, Nedlands, (Goss, 1964)
<i>Centaurea cyanus</i> Cornflower	Tomato spotted wilt CMI/AAB 39	1959, Hollywood (Goss, 1964)
<i>Chrysanthemum morifolium</i> Chrysanthemum	(a) Tomato spotted wilt CMI/AAB 39 550-660 nm flexuous rods, leaf dip electron microscopy (b) possibly chrysanthemum B CMI/AAB 110	1958, Geraldton, (Goss, 1964) 1982, Wanneroo
<i>Citrullus vulgaris</i> Watermelon	(a) Initially diagnosed as watermelon mosaic CMI/AAB 63, 760 nm flexuous rod, leaf dip electron microscopy, however, in 1984 by serological tests: Zucchini yellow mosaic (Department of Primary Industries, Brisbane) (b) Cucumber mosaic CMI/AAB 213, (Plant Research Institute, Burnley, Victoria)	1973, Carnarvon 1973, Carnarvon
<i>Citrus limon</i> Lemon	(a) Crinkly leaf (b) Shellbark (c) Woody gall	1956, Gosnells, (Doepel, 1964) 1955, Gosnells, (Doepel, 1964) 1963, South Guildford, (MacNish, 1967)

Host generic and common name	Disease agent	First record
<i>Citrus paradisi</i> Grapefruit	Citrus tristeza CMI/ AAB 33 Initially host symptoms, and later by leaf dip electron microscopy 2000 nm flexuous rod	1955, Gosnells (Doepel, 1964) and 1978, Carnarvon
<i>Citrus sinensis</i> Orange	Psorosis	1930 (Doepel, 1964)
<i>Cucumis melo</i> Rockmelon	(a) Cucumber mosaic CMI/ AAB 213 (Plant Research Institute, Burnley, Victoria) (b) Initially diagnosed as watermelon mosaic. CMI/ AAB 63, however in 1984: serological tests: Zucchini yellow mosaic (Department of Primary Industries, Brisbane)	1952, Balcatta, (Chambers, 1955) 1973
<i>Cucumis myriocarpus</i> Wild paddy melon	760 nm flexuous rod leaf dip electron microscopy, possibly zucchini yellow mosaic	1976, Carnarvon
<i>Cucumis sativus</i> Cucumber	(a) Cucumber mosaic CMI/ AAB 213 (Plant Research Institute, Burnley, Victoria) (b) Initially diagnosed as watermelon mosaic CMI/ AAB 63 1984: serological tests: Zucchini yellow mosaic 600 nm flexuous rod, leaf dip electron microscopy	1952, Balcatta, 1973, Carnarvon 1973, Carnarvon
<i>Cucurbita pepo</i> var. <i>ovifera</i> Pumpkin	(a) Initially diagnosed as watermelon mosaic CMI/ AAB 63, however, in 1984 by serological tests: Zucchini yellow mosaic (b) Cucumber mosaic CMI/ AAB, 213 (Plant Research Institute, Burnley, Victoria)	1976, Carnarvon 1973, Carnarvon

Host generic and common name	Disease agent	First record
<i>Cucurbita moschata</i> Vegetable marrow	Cucumber mosaic CMI/AAB 213	1953, Perth, (Chambers, 1959)
<i>Dahlia</i> sp. Dahlia	(a) Dahlia mosaic CMI/AAB 51 (b) Tomato spotted wilt CMI/AAB 39	1930, Fremantle, (Goss, 1964) 1955, Armadale, (Goss, 1964)
<i>Daucus carota</i> Carrot	Carrot motley dwarf. Presumably carrot mottle CMI/AAB 137 and carrot redleaf CMI/AAB 249. Aphid transmission 1982. (Plant Research Institute, Burnley, Victoria.)	1944, Osborne Park, (Chambers, 1956)
<i>Delphinium ajacis</i> Larkspur	Cucumber mosaic CMI/AAB 213	1952, Buckingham, (Goss, 1964)
<i>Delphinium cultorum</i> Delphinium	(a) Cucumber mosaic virus CMI/AAB 213 (b) Tomato spotted wilt CMI/AAB 39	1959, Victoria Park, (Goss, 1964) 1952 (Goss, 1964)
<i>Ficus carica</i> Fig	Fig mosaic	1924 (Doepel, 1964)
<i>Fragaria</i> sp. Strawberry	(a) Strawberry crinkle (b) Strawberry yellow edge	1957, Manning, (Doepel, 1964) 1959, Rivervale, (Doepel, 1964)
<i>Gladiolus</i> sp. Gladiolus	Bean yellow mosaic CMI/AAB 40	1927 and 1956, (Goss, 1964)
<i>Glycine max</i> Soybean	700 nm flexuous rod leaf dip electron microscopy, (potyvirus)	1983, Kununurra
<i>Hordeum vulgare</i> Barley	Barley yellow dwarf CMI/AAB 32	1961, Donnybrook, (MacNish, 1964)
<i>Hyacinth</i> sp. Hyacinth	Narcissus mosaic CMI/AAB 45	1955, Perth, (Chambers, 1958)

Host generic and common name	Disease agent	First record
<i>Iris</i> sp. Iris	(a) mosaic	1927, Swan View, (Goss, 1964)
	(b) 770 nm rod, leaf dip electron microscopy possibly iris mild mosaic CMI/AAB 116	1977, Pickering Brook
	(c) 660 nm flexuous rod, leaf dip electron microscopy possibly narcissus latent CMI/AAB 170	1980, Greenmount
	(d) 550 nm flexuous rod, leaf dip electron microscopy possibly narcissus mosaic CMI/AAB 45	1980, Greenmount
	(e) 780 nm flexuous rod, leaf dip electron microscopy possibly lily symptomless CMI/AAB 96	1980, Greenmount
<i>Kennedia coccinea</i> Kennedia	770 nm flexuous rod leaf dip electron microscopy potyvirus	1979, Lowden
<i>Lactuca sativa</i> Lettuce	(a) 660 nm flexuous rod leaf dip electron microscopy possibly lettuce mosaic CMI/AAB 9	1952 (Chambers, 1959) and 1979, Medina
	(b) Tomato spotted wilt CMI/AAB 39	1937, Kalgoorlie, (Chambers, 1959)
	(c) Lettuce necrotic yellows CMI/AAB 26 Rhabdovirus, leaf dip electron microscopy	1975, Kalgoorlie
	(d) Cucumber mosaic CMI/AAB 213	1964, Osborne Park (MacNish, 1967)
	(e) Big vein disease, Host symptoms	1975, Kalgoorlie
<i>Lilium</i> sp. Lily	(a) Cucumber mosaic CMI/AAB 213	1955, South Perth, (Goss, 1964)
	(b) 600 nm rod, leaf dip electron microscopy, possibly lily symptomless CMI/AAB 96	1976, South Perth
	(c) 750 nm rod, leaf dip electron microscopy, possibly tulip breaking CMI/AAB 71	1976, South Perth

Host generic and common name	Disease agent	First record
<i>Lupinus</i> sp. Lupin	(a) Bean yellow mosaic CMI/AAB 40. 780 nm flexuous rod, leaf dip electron microscopy 1974. Complementary DNA analysis (Waite Agricultural Research Institute, Adelaide) (b) Tomato spotted wilt CMI/AAB 39 (c) Cucumber mosaic CMI/AAB 213	1955, Perth, (Goss, 1964) and 1974, Williams 1952 (Goss, 1964) 1979, Badgingarra
<i>Lycopersicon esculentum</i> Tomato	(a) Tobamovirus. CMI/AAB 151, 156 leaf dip electron microscopy (b) Tomato spotted wilt CMI/AAB 39 (c) Cucumber mosaic CMI/AAB 213	1928, Geraldton and 1975 1923 and 1934, (Chambers, 1959) 1952, Guildford, (Chambers, 1959)
<i>Matthiola incana</i> Stock	Stock mosaic	1957, Narrogin, (Goss, 1964)
<i>Medicago sativa</i> Lucerne	(a) Alfalfa mosaic. CMI/AAB 229 leaf dip electron microscopy, sap transmission to french bean (b) White clover mosaic. CMI/AAB 41 sap transmission, systemic symptoms on bean	1981, Muchea 1982, Harvey
<i>Narcissus</i> sp. Narcissus	Narcissus mosaic CMI/AAB	1933, Mt. Lawley, (Goss, 1964)
<i>Nerine</i> sp. Daffodil	(a) 650-700 nm rod leaf dip electron microscopy, possibly narcissus yellow stripe CMI/AAB 76 (b) 650 nm flexuous rod leaf dip electron microscopy possibly narcissus latent CMI/AAB 170 (c) 550 nm rod, leaf dip electron microscopy, possibly narcissus mosaic CMI/AAB 45	1976, Balcatta 1978, Victoria Park 1976, Mundaring

Host generic and common name	Disease agent	First record
<i>Nicotiana tabacum</i> Tobacco	(a) Tobacco mosaic CMI/AAB 151	1931, Perth, (MacNish, 1963)
	(b) Tobacco ringspot	1953, Manjimup, (MacNish, 1963)
	(c) Tomato spotted wilt CMI/AAB 39	1931, Perth, (MacNish, 1963)
	(d) Tobacco yellow dwarf	1956, Manjimup, (MacNish, 1963)
<i>Cymbidim</i> sp. (and others) Orchid	(a) 425 nm flexuous rod leaf dip electron microscopy, presumably cymbidium mosaic CMI/AAB 27	1975, Hillarys
	(b) 320 nm rod leaf dip electron microscopy, presumably odontoglossum ringspot CMI/AAB 155	1975, Hillarys
	(c) rhabdovirus by leaf dip electron microscopy possibly orchid fleck CMI/AAB 183	1983, Riverton
<i>Papaver nudicaule</i> Iceland poppy	Tomato spotted wilt CMI/AAB 39	1952 (Goss, 1964)
<i>Passiflora edulis</i> Passion fruit	(a) Cucumber mosaic CMI/AAB 213	1901 (Doepel, 1974)
	(b) Passionfruit woodiness CMI/AAB 122 (Plant Research Institute, Burnley Victoria.)	1973, Carnarvon
<i>Passiflora foetida</i> Wild passion fruit	Cucumber mosaic CMI/AAB 213	1973, Carnarvon
<i>Persea americana</i> Avocado	Avocado sunblotch viroid (Host symptoms only)	1961, Bedforddale, (MacNish, 1964)
<i>Petunia hybrida</i> Petunia	(a) Cucumber mosaic CMI/AAB 213	1953
	(b) Tobacco mosaic CMI/AAB 151	1956, Perth, (Goss, 1964)
	(c) Tomato spotted wilt CMI/AAB 39	1953, North Beach, (Goss, 1974)

Host generic and common name	Disease agent	First record
<i>Phaseolus vulgaris</i> French bean	(a) Bean mosaic	1944, Balcatta, (Chambers, 1959)
	(b) Bean yellow mosaic CMI/AAB 40	1954, Balcatta
	(c) Summer death. ELISA (Department of Primary Industries, Brisbane)	1970, Manjimup and 1982
<i>Pisum sativum</i> Pea	Pea mosaic	1929, Geraldton, and 1943, (Chambers, 1959)
<i>Prunus avium</i> Cherry	(a) Prunus necrotic ringspot CMI/AAB 5. ELISA (Plant Research Institute, Burnley, Victoria.)	1961 and 1982 Donnybrook
	(b) Prune dwarf CMI/AAB 19. (Plant Research Institute, Burnley, Victoria.)	1982, Donnybrook
<i>Prunus domestica</i> Plum	Plum line pattern, presumably prunus necrotic ringspot CMI/AAB 5	1954, Canning Mills, (Doepel, 1964)
<i>Prunus persica</i> Peach	(a) Apple chlorotic leafspot (dark green sunken mottle) CMI/AAB 30. (Plant Research Institute, Burnley, Victoria)	1982, Pickering Brook
	(b) Prune dwarf CMI/AAB 19. (Plant Research Institute, Burnley, Victoria)	1980, Pickering Brook
<i>Pyrus communis</i> Pear	Pear stony pit	1945, Argyle, (Doepel, 1964)
<i>Pyrus malus</i> Apple	(a) Apple mosaic CMI/AAB 83	1926, Mundaring, (Doepel, 1964)
	(b) Apple green crinkle	1955, Manjimup, (Doepel, 1964)
	(c) Apple ringspot	1960, Greenbushes, (Doepel, 1964)
	(d) Apple russet ring	1961, Stoneville, (Doepel, 1964)

Host generic and common name	Disease agent	First record
<i>Ranunculus</i> sp. Ranunculus	Tomato spotted wilt CMI/AAB 39	1952 (Goss, 1964)
<i>Rosa</i> sp. Rose	(a) Rose mosaic (Prunus necrotic ringspot). CMI/AAB 5 (b) 660-750 nm flexuous rod leaf dip electron microscopy potyvirus	1953, Maddington (Goss, 1964) 1981, Perth
<i>Salpiglossus</i> sp. Painted tongue	Tomato spotted wilt CMI/AAB 39	1952 (Goss, 1964)
<i>Solanum tuberosum</i> Potato	(a) Potato leafroll CMI/AAB 36 Aphid transmission, immunosorbent electron microscopy. (Plant Research Institute, Burnley, Victoria.) (b) Potato virus S CMI/AAB 60 (Plant Research Institute, Burnley, Victoria.) (c) Potato virus X CMI/AAB 4 (Further characterized by the Plant Research Institute, Burnley, Victoria.) (d) Potato virus Y CMI/AAB 242 (Further characterized by the Plant Research Institute, Burnley, Victoria.) (e) Tomato spotted wilt CMI/AAB 39 (f) Purple top wilt	1927, 1971 1971 1926, 1938, 1971 1928, Gosnells, and 1971 (Chambers, 1958) 1930, and 1937, North Perth, (Chambers, 1958) 1956, Esperance, (Chambers, 1958)
<i>Sorghum vulgare</i> var. <i>technicum</i> Sorghum	Sugarcane mosaic CMI/AAB 88 leaf dip electron microscopy 750-800 flexuous rod.	1975, Kununurra

Host generic and common name	Disease agent	First record
<i>Trifolium fragiferum</i> Strawberry clover	White clover mosaic 500-550 nm flexuous rod. CMI/AAB 41 Sap transmission and immunosorbent electron microscopy	1982, Gingin
<i>Trifolium repens</i> White clover	(a) Alfalfa mosaic CMI/AAB 229 leaf dip electron microscopy and sap transmission	1981, Harvey
	(b) White clover mosaic 500-550 nm flexuous rod CMI/AAB 41. Immunosorbent electron microscopy	1982, Harvey
	(c) 820 nm flexuous rod leaf dip electron microscopy	1982, Harvey
<i>Trifolium subterraneum</i> Subterranean clover	(a) 780 nm flexuous rod, leaf dip electron microscopy possibly bean yellow mosaic CMI/AAB 40	1979, Bramley
	(b) Beet western yellows CMI/AAB 89, (Department of Agriculture, Tasmania.)	1981, Capel
	(c) Subterranean clover mottle (Waite, Agricultural Research Institute, Adelaide)	1979, Karridale (Francki <i>et al.</i> , 1983)
	(d) Subterranean clover red leaf (Plant Research Institute, Burnley, Victoria.)	1973, Burekup
	(e) Cucumber mosaic CMI/AAB 213 (Waite Agricultural Research Institute, Adelaide.)	1983, Denmark
	(f) Subterranean clover stunt (No particle isolated.)	1958
<i>Triticum aestivum</i> Wheat	Barley yellow dwarf CMI/AAB 32	1961, Forest Grove, (MacNish, 1964)
<i>Tropaeolum majus</i> Nasturtium	Tomato spotted wilt CMI/AAB 39	1952 (Goss, 1964)

Host generic and common name	Disease agent	First record
<i>Tulip</i> sp. Tulip	780 nm flexuous rod, leaf dip electron microscopy possibly tulip breaking CMI/AAB 71	1979, Perth
<i>Vallota</i> sp. Scarborough-lily	Tomato spotted wilt CMI/AAB 39	1955, Rivervale, (Goss, 1964)
<i>Vicia faba</i> Tick or broad bean	(a) Bean yellow mosaic CMI/AAB 40	1956 (Chambers, 1959)
	(b) Pea mosaic	1959, Metropolitan, (Chambers, 1961)
	(c) Bean vascular wilt	1962, Leederville, (MacNish, 1964)
	(d) Bean wilt virus	1962, North Perth, (MacNish, 1964)
<i>Vitis vinifera</i> Grape	(a) Corky bark; Host symptoms and vine indicators	1979, Upper Swan
	(b) Leafroll; Host symptoms and vine indicators	1956 (Doepel, 1964)
	(c) Yellow speckle; Host symptoms and vine indicators	1976, Upper Swan
	(d) Vein mosaic, vine indicators	1984, Upper Swan
<i>Zea mays</i> Maize	670-780 nm flexuous rod leaf	1983, Kununurra

Part III

Mycoplasma and rickettsial diseases

The majority of these records are based on symptoms; described as tomato big bud, witches broom or aster yellows.

Host generic and common name	Disease agent	First record
<i>Alysicarpus rugosus</i>	Bacteria-like organisms by electron microscopy	1977, Kununurra.
<i>Antirrhinum majus</i> Snapdragon		1951, Kojonup, (Goss, 1964)
<i>Apium graveolens</i> Celery		1955, Balcatta, (Chambers, 1959)
<i>Aster novae-angliae</i> Michaelmas daisy		1961, Floreat Park, (Goss, 1964)
<i>Calendula officinalis</i> Marigold		1950, Perth, (Goss, 1964)
<i>Callistephus chinensis</i> Aster		1947, Perth, (Goss, 1964)
<i>Carica papaya</i> Papaw		1962, Carnarvon (MacNish, 1964)
<i>Chrysanthemum maximum</i> Shasta daisy		1958, Perth, (Goss, 1964)
<i>Dahlia</i> sp. Dahlia		1958, Perth, (Goss, 1964)
<i>Daucus carota</i> Carrot		1955, Mount Lawley, (Goss, 1964)
<i>Delphinium ajacis</i> Larkspur		1955, Mordalup, (Goss, 1964)
<i>Gerbera jamesoni</i> Bolus		1948, Fremantle, (Goss, 1964)
<i>Godetia</i> sp. Godetia		1959, Swanbourne

Host generic and common name	Disease agent	First record
<i>Hibiscus cannabinus</i> Kenaf	Bacteria-like organisms by electron microscopy	1977, Kununurra
<i>Lactuca sativa</i> Lettuce		1926, Bullsbrook, (Chambers, 1958)
<i>Medicago sativa</i> Lucerne	Bacteria-like organisms by electron microscopy	1977, Upper Swan
<i>Pelargonium</i> sp. Geranium		1958, Perth (Goss, 1964)
<i>Petunia hybrida</i> Petunia		1956, Belmont (Goss, 1964)
<i>Phlox drummondii</i> Phlox		1958, West Perth (Goss, 1964)
<i>Physalis peruviana</i> Cape gooseberry		1926, Mardella, (Doepel, 1964)
<i>Poinciana gilliesii</i> Bird of paradise		1954, Albion Downs (Goss, 1964)
<i>Solanum tuberosum</i> Potato		1956, (Doepel, 1964)
<i>Vinca</i> sp. Periwinkle		1952, North Beach (Goss, 1964)

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