Import Health Standard Schedule for *Fragaria*

Issued pursuant to Section 22 of the Biosecurity Act 1993.

IMPORTANT

The importation of permitted species of this genus must be undertaken in accordance with the additional entry conditions specified within this schedule AND the Basic conditions contained within the Import Health Standard 'Nursery Stock from All Countries'

Index

General Conditions:

Specific Requirements: Sourcing Material from Offshore MAF-Accredited Facilities

Specific Requirements: Sourcing Material from Non MAF-Accredited Facilities

Regulated Pests:

Inspection, Testing and Treatment Requirements for *Fragaria*:

General Conditions:

Import Permit Required: Yes

Phytosanitary Certificate Required: Yes

Permitted Countries: All

Permitted Commodity classes: Cuttings [runner tips, stem cuttings only], Plants *in vitro*

Permitted Species: Refer Plants Biosecurity Index

Entry Conditions:

All consignments must comply with the Basic Conditions for all nursery stock as well as additional conditions as specified within this schedule. This schedule is divided into two sections: Material sourced from Offshore MAF-Accredited Facilities and material sourced from Non-MAF Accredited Facilities.

Specific Requirements: Sourcing Material from Offshore MAF-Accredited Facilities

Cuttings and Plants *in vitro*

PEQ: L2
Minimum PEQ Period: 6 months
PEQ Conditions:
A minimum post entry quarantine period of 6 months (active continuous growth) is required to complete inspections and/or indexing to detect regulated pests. The quarantine period may be extended if material is slow growing, pests are detected, or additional treatments/tests are required. The costs of all inspections, tests and treatments while the *Fragaria* nursery stock is in PEQ shall be borne by the importer.

Onshore Treatment Requirements:
On arrival, all cuttings must be dipped in 1% Sodium Hypochlorite for 2 minutes at an approved treatment facility [cuttings only].

Phytosanitary Requirements:
Before a phytosanitary certificate is to be issued, the exporting country NPPO must be satisfied that the following activities required by MAF have been undertaken.

The *Fragaria* cuttings / plants *in vitro* [choose ONE option] have been:
- inspected in accordance with appropriate official procedures and found to be free of any visually detectable regulated pests.

AND
- treated for regulated insects and mites as described in the basic conditions of the Import Health Standard Nursery Stock from All countries, within 7 days prior to shipment [cuttings only].

AND
- held and tested for/classified free from specified regulated pests as required in the agreement between MAF and the [name of the MAF-accredited facility].

AND
- held in a manner to ensure that infestation/reinfestation does not occur following inspection and testing at the accredited facility, and certification.

Additional Declarations to Record on the Phytosanitary Certificate:
If satisfied that the pre-shipment phytosanitary activities have been undertaken, the exporting country NPPO must confirm this by recording the treatments applied in the “Disinfestation and/or Disinfection Treatment” section [cuttings only] and by identifying the following additional declarations upon the accompanying phytosanitary certificate:

"The *Fragaria* cuttings / plants *in vitro* [choose ONE option] have been:
- held and tested for/classified free from specified regulated pests as required in the agreement between MAF and the [name of the MAF-accredited facility].

AND

- held in a manner to ensure infestation/reinfestation does not occur following inspection and testing at the accredited facility, and certification."

Specific Requirements: Sourcing Material from Non MAF-Accredited Facilities

Cuttings and Plants *in vitro*

PEQ: L3
Minimum PEQ Period: 16 months
PEQ Conditions:
A minimum post entry quarantine period of 16 months (active continuous growth) is required to complete inspections and/or indexing to detect regulated pests as per the Inspection, Testing and Treatment Requirements for *Fragaria*. The quarantine period may be extended if material is slow growing, pests are detected, or additional treatments/tests are required. The costs of all inspections, tests and treatments while the *Fragaria* nursery stock is in PEQ shall be borne by the importer.

Onshore Treatment Requirements:
On arrival, all cuttings must be dipped in 1% Sodium Hypochlorite for 2 minutes at an approved treatment facility [cuttings only].

Phytosanitary Requirements:
Before a phytosanitary certificate is to be issued, the exporting country NPPO must be satisfied that the following activities required by MAF have been undertaken:

The *Fragaria* cuttings / plants *in vitro* [choose ONE option] have been:

- inspected in accordance with appropriate official procedures and found to be free of any visually detectable regulated pests.

AND

- treated for regulated insects and mites as described in the basic conditions of the Import Health Standard Nursery Stock from All countries, within 7 days prior to shipment [cuttings only].

AND

- held in a manner to ensure that infestation/reinfestation does not occur following certification.

Additional Declarations to Record on the Phytosanitary Certificate:
If satisfied that the pre-shipment phytosanitary activities have been undertaken, the exporting country NPPO must confirm this by recording the treatments applied in the “Disinfestation and/or Disinfection Treatment” section [cuttings only]. No additional declarations are required

Regulated Pests:

Insects

Insecta

Coleoptera

Attelabidae	
Rhynchites germanicus	strawberry rhynchites
Bruchidae	
Zabrotes arenarius	strawberry weevil
Cantharidae	
Chauliognathus lugubris	soldier beetle
Carabidae	
Calathus fuscipes	ground beetle
Harpalus affinis	strawberry seed beetle
Harpalus rufipes	strawberry seed beetle
Nebria brevicollis	common black ground beetle
Pterostichus cupreus	strawberry ground beetle
Pterostichus madidus	strawberry ground beetle
Pterostichus melanarius	strawberry ground beetle
Chrysomelidae	
Altica caerulescens	leaf beetle
Chaetocnema concinna	leaf feeding beetle
Colaspis flavida	grape colaspis
Galeruca tanaceti	strawberry leaf beetle
Galerucella grisescens	strawberry leaf beetle
Galerucella tenella	strawberry leaf beetle
Haltica corrusca	fles beetle
Haltica pagana	flea beetle
Paria fragariae	strawberry rootworm
Systena frontalis	flea beetle
Curculionidae	
Anthonomus rubi	strawberry blossom weevil
Anthonomus signatus	strawberry bud weevil
Apirocalus spp.	weevils
Barypeithes pellucidus	strawberry weevil
Cleonus kirbyi	radish weevil
Conotrachelus nenuphar	plum weevil
Donus salviae	strawberry weevil
Dyslobus decoratus	decorated strawberry root weevil
Dyslobus ursinus	western strawberry root weevil
Dyslobus wilcoxi	Lacomb strawberry root weevil
Geoderces spp.	root weevil
Haplidia etrusca	root weevil
Hypera brunneipennis	Egyptian alfalfa weevil
Myllocerus undecimpustulatus	grey weevil
Nemocestes fragariae	strawberry root weevil
Nemocestes incomptus	woods weevil
Nemocestes longulus	strawberry root weevil
Nemocestes sordidus	strawberry root weevil
Orthorhinus aethops	weevil
Otiorhynchus armatus	strawberry root weevil
Otiorhynchus clavipes	red-legged weevil
Otiorhynchus cribricollis	cribrate weevil
Otiorhynchus meridionalis	strawberry root weevil
Otiorhynchus rotundatus	strawberry root weevil
Otiorhynchus rugifrons	strawberry root weevil
Otiorhynchus singularis	strawberry root weevil
Panscopus torpidus	root weevil
Peritelopsis globiventris	grey weevil

Plinthodes taeniatus	root weevil
Polydrusus cervinus	weevil
Polydrusus sericeus	green leaf weevil
Rhadinosomus lacordairei	thin strawberry weevil
Rhinaria perdix	strawberry weevil
Rhynchites germanicus	strawberry rhynchites
Sciaphilus asperatus	strawberry root weevil
Sciopithes obscurus	obscure root weevil
Sitona hispidulus	root weevil
Strophomorphus porcellus	weevil
Thricolepis inornata	root weevil
Trigonoscuta pilosa	root weevil
Tyloderma fragariae	strawberry crown borer
Elateridae	
Agriotes spp. (species not in New Zealand)	click beetles
Nitidulidae	
Carpophilus fumatus	sap beetle
Glischrochilus hortensis	sap beetle
Lobiopa insularis	strawberry borer
Stelidota spp.	sap beetles
Stelidota geminata	strawberry sap beetle
Scarabaeidae	
Anoplognathus porosus	Christmas beetle
Cetonia spp.	chafers
Cyclocephala borealis	northern masked chafer
Hoplia spp.	white grubs
Lepidiota frenchi	French's cane grub
Melolontha melolontha	cockchafer
Metanastes vulgivagus	black beetle
Phyllopertha horticola	garden chafer
Phyllophaga decimlineata	ten-lined June beetle
Phyllophaga perversa	western ten-lined June beetle
Popillia japonica	Japanese beetle
Repsimus aeneus	white grub
Rhopaea magnicornis	large pasture scarab
Serica spp.	white grubs
Sericesthis geminata	priunose scarab
Sericesthis nigrolineata	dusky pasture scarab
Scolytidae	
Poecilips cardamomi	bark beetle
Silphidae	
Heterosilpha aenescens	carrion beetle
Collembola	
Sminthuridae	
Bourletiella arvalis dorsobscura	garden springtail
Sminthurus multidentatus	garden springtail
Diptera	
Agromyzidae	
Agromyza fragariae	strawberry leafminer
Agromyza spiraeae	rose leafminer
Tipulidae	
Tipula spp	leatherjackets
Hemiptera	
Anthocoridae	
Orius laevigatus	plant bug
Lygaeidae	
Euander lacertosus	lygaeid bug
Nysius clevelandensis	grey cluster bug
Nysius spp.	bugs
Nysius vinitor	Rutherglen bug

Miridae	
Calocoris hobartensis	capsid
Lygocoris pabulinus	common green capsid
Lygus elisus	pale legume bug
Lygus hesperus	tarnished plant bug
Lygus lineolaris	tarnished plant bug
Lygus rugulipennis	tarnished plant bug
Plagiognathus arbustorum	stink bug
Plagiognathus chrysanthemi	stink bug
Scolopostethus spp.	plant bugs
Pentatomidae	
Acrosternum hilare	green stink bug
Dolycoris baccarum	stink bug
Pyrrhocoridae	
Dindymus versicolor	harlequin bug
Homoptera	
Aleyrodidae	
Aleyrodes lonicerae	strawberry whitefly
Trialeurodes fernaldi	whitefly
Trialeurodes packardi	strawberry whitefly
Trialeurodes ruborum	whitefly
Aphididae	
Acyrthosiphon malvae rogersii	strawberry aphid
Amphorophora agathonica	strawberry aphid
Aphis fabae	bean aphid
Aphis forbesi	strawberry root aphid
Aphis gossypii [vector]	cotton aphid
Aphis rubifolii	raspberry aphid
Aulacorthum solani [vector]	foxglove aphid
Chaetosiphon jacobi	strawberry aphid
Chaetosiphon minus	lesser strawberry aphid
Chaetosiphon tetrarhodum [vector]	strawberry aphid
Chaetosiphon thomasi	strawberry aphid
Fimbriaphis fimbriata	rose aphid
Fimbriaphis wakibae	rose aphid
Macrosiphum pelargonii	rose aphid
Macrosiphum rosae [vector]	rose aphid
Myzaphis rosarum [vector]	lesser rose aphid
Myzus ascalonicus [vector]	shallot aphid
Myzus ornatus [vector]	ornate aphid
Myzus persicae [vector]	green peach aphid
Rhodobium porosum	aphid
Aphrophoridae	
Aphrophora alni	spittlebug
Aphrophora permutata	rhubarb spittlebug
Cercopidae	
Cercopis vulnerata	red and black froghopper
Emelyanoviana mollicula	spittlebug
Evacanthus interruptus	spittlebug
Philaenus leucophthalmus	spittlebug
Cicadellidae	
Aphrodes bicinctus	strawberry leafhopper
Apogonalia grossa	leafhopper
Coelidia olitoria	leafhopper
Edwardsiana spp.	leafhoppers
Empoasca fabae	potato leafhopper
Erythroneura elegantula	western grape leafhopper
Euscelis spp.	leafhoppers
Macrosteles spp.	leafhoppers
Scaphytopius acutus	leafhopper

Zygina schneideri	leafhopper
Pseudococcidae	
Chorizococcus arecae	mealybug
Dysmicoccus brevipes	pineapple mealybug
Planococcus citri	citrus mealybug
Rhizoecus kondonis	Kondo mealybug
Hymenoptera	
Tenthredinidae	
Allantus calceatus	sawfly
Allantus cinctus	curled rose sawfly
Cladius pectinicornis	antler sawfly
Lepidoptera	
Gelechiidae	
Aristotelia fragariae	strawberry crown miner
Compsolechia fragariella	western strawberry leafroller
Geometridae	
Ascotis selenaria	mugwort looper
Hepialidae	
Hepialus lupulinus	swift moth
Noctuidae	
Agrotis spp. (species not in New Zealand)	cutworms
Agrotis munda	brown cutworm
Agrotis segetum	turnip moth
Amphipoea interoceanica	strawberry cutworm
Helicoverpa punctigera	oriental tobacco budworm
Helicoverpa zea	bollworm
Hydraecia interoceanica	noctuid moth
Noctua pronuba	large yellow underwing
Orthosia hibisci	speckled green fruitworm
Peridroma saucia	pearly underwing moth
Phlogophora meticulosa	angleshades moth
Spodoptera exigua	lesser armyworm
Spodoptera sunia	cluster caterpillar
Xestia c-nigrum	spotted cutworm
Psychidae	
Hyalarcta huebneri	leaf case moth
Pyralidae	
Loxostege spp.	pyralid moths
Udea rubigalis	celery leaftier
Sesiidae	
Synanthedon bibionipennis	strawberry crown moth
Tortricidae	
Acleris comariana	strawberry tortrix moth
Ancylis comptana	strawberry leafroller
Ancylis fragariae	strawberry leafroller
Argyrotaenia citrana	orange tortrix
Cacoecimorpha pronubana	carnation leafroller
Choristoneura lafauryana	strawberry leafroller
Choristoneura rosaceana	oblique-banded leafroller
Claremontia confusa	leafroller
Clepsis busckana	cyclamen leafroller
Clepsis spectrana	straw coloured tortrix
Cnephasia asseclana	leafroller
Cnephasia longana	omnivorous leaftier
Cnephasia stephensiana	leaftier
Compsolechia fragariella	western strawberry leafroller
Cryptoptila immersana	ivy leafroller
Epiphyas spp.	leafrollers
Lozotaenia forsterana	leafroller
Olethreutes lacunana	fruit tree tortrix

Olethreutes olivaceana	fruit tree tortrix
Pandemis dumetana	fruit tree tortrix
Platynota stultana	omnivorous leafroller
Ptycholoma peritana	garden tortrix
Sparganothis sulfureana	blueberry leafroller
Orthoptera	
Acrididae	
Phaulacridium vittatum	wingless grasshopper
Gryllotalpidae	
Gryllotalpa africana	African mole cricket
Gryllotalpa gryllotalpa	mole cricket
Scapteriscus acletus	southern mole cricket
Scapteriscus vicinus	tawny mole cricket
Pyrgomorphidae	
Atractomorpha crenaticeps	grasshopper
Thysanoptera	
Thripidae	
Scirtothrips dorsalis	chilli thrips
Scolothrips sexmaculatus	
Thrips atratus	carnation thrips
Thrips major	rose thrips

Mites

Arachnida	
Acarina	
Diptilomiopidae	
Diptacus fragarifoliae	false spider mite
Tetranychidae	
Tetranychus kanzawai	kanzawaii mite
Tetranychus lobustus	strawberry spider mite
Tetranychus neocalendonicus	Mexican spider mite
Tetranychus pacificus	Pacific spider mite

Nematodes

Adenophorea	
Dorylaimida	
Longidoridae	
Longidorus elongatus [vector]	-
Longidorus sylphus	needle nematode
Paralongidorus maximus	needle nematode
Xiphinema americanum [Vector]	dagger nematode
Xiphinema chambersi	dagger nematode
Xiphinema diversicaudatum [vector]	dagger nematode
Secernentea	
Tylenchida	
Aphelenchoididae	
Aphelenchoides besseyi	rice white-tip nematode
Belonolaimidae	
Belonolaimus gracilis	sting nematode
Criconematidae	
Criconemoides curvatum	ring nematode
Criconemoides lobatum	ring nematode
Dolichodoridae	
Tylenchorhynchus claytoni	tobacco stunt nematode
Heteroderidae	
Heterodera spp.	cyst nematode
Hoplolaimidae	
Hoplolaimus spp.	crown-headed lance nematode
Helicotylenchus microlobus	spiral nematode
Rotylenchulus buxophilus	reniform nematode

Rotylenchulus goodeyi	reniform nematode
Scutellonema brachyurus	spiral nematode
Paratylenchidae	
Paratylenchus macrophallus	pin nematode
Pratylenchidae	
Pratylenchus brachyurus	root lesion nematode
Pratylenchus coffeae	coffee root lesion nematode
Pratylenchus loosi	root lesion nematode
Pratylenchus scribneri	Scribner's root lesion nematode
Pratylenchus zeae	corn root lesion nematode
Radopholus similis	burrowing nematode

Myriapod

Diplopoda	
Polydesmida	
Xystodesmidae	
Pleuroloma flavipes	millipede

Molluscs

Gastropoda	
Stylommatophora	
Helicidae	
Trichia striolata	strawberry snail

Fungi

Ascomycota	
Dothideales	
Mycosphaerellaceae	
Mycosphaerella louisianae	purple leaf spot
Eurotiales	
Trichocomaceae	
Byssochlamys fulva	byssochlamys rot
Hypocreales	
Hypocreaceae	
Schizoparme straminea (anamorph *Coniella castaneicola*)	schizoparme fruit rot
Leotiales	
Leotiaceae	
Discohainesia oenotherae (anamorph *Hainesia lythri*)	leaf spot
Basidiomycota: Basidiomycetes	
Agaricales	
Tricholomataceae	
Armillaria bulbosa	armillaria root rot
Armillaria mellea (anamorph *Rhizomorpha subcorticalis*)	armillaria root rot
Armillaria tabescens	armillaria root rot
Ceratobasidiales	
Ceratobasidiaceae	
Ceratobasidium anceps (anamorph *Sclerotium deciduum*)	leaf rot
Rhizoctonia fragariae	black root rot
Chytridiomycota	
Chytridiales	
Olpidiaceae	
Olpidium brassicae [vector]	Black root
Basidiomycota: Teliomycetes	
Uredinales	
Pucciniaceae	
Phragmidium mexicana	
Phragmidium potentiallae	leaf rust
Chytridiomycota	
Chytridiales	
Synchytriaceae	
Synchytrium fragariae	root gall

Mitosporic Fungi (Agonomycetes)	
Agonomycetales	
Unknown Agonomycetales	
Rhizoctonia fragariae	fruit and root rot
Mitosporic Fungi (Coelomycetes)	
Sphaeropsidales	
Leptostromataceae	
Kabatia fragariae	leaf spot
Sphaerioidaceae	
Coniella fragariae	flower spot
Phyllosticta fragaricola	phyllosticta leaf spot
Rhabdospora fragariae	leaf spot
Septoria fragariae	septoria spot
Septoria fragariaecola	septoria spot
Stagonospora fragariae	stagonospora
Unknown Coelomycetes	
Unknown Coelomycetes	
Colletotrichum spp. (species not in New Zealand)	
Glomerella cingulata (anamorph Colletotrichum gloeosporioides) (strains not in New Zealand)	strawberry anthracnose
Marssonina canadensis	leaf scorch
Marssonina pakistanica	leaf scorch
Marssonina potentillae	leaf scorch
Pestalotia longisetula	leaf spot
Pilidiella quercola	schizoparme fruit rot
Mitosporic Fungi (Hyphomycetes)	
Hyphomycetales	
Dematiaceae	
Cercospora fragariae	leaf spot
Cercospora vexans	cercospora leaf spot
Idriella lunata	root rot
Moniliaceae	
Ramularia fragariae	ramularia leaf spot
Verticillium albo-atrum [severe strain]	progressive wilt
Tuberculariales	
Tuberculariaceae	
Fusarium oxysporum f. sp. *fragariae*	stub wilt
Oomycota	
Peronosporales	
Peronosporaceae	
Peronospora fragariae	downy mildew
Pythiales	
Pythiaceae	
Pythium debaryanum	root rot
Pythium dissotocum	root rot
Pythium hypogynum	root rot
Pythium perniciosum	root and stem rot
Pythium sylvaticum	root rot
Zygomycota: Zygomycetes	
Mucorales	
Mucoraceae	
Mucor recurvus	mucor rot
Rhizopus spp.	

Bacteria

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-	
Ralstonia solanacearum (Race 2)	moko disease
Strawberry marginal chlorosis *['Candidatus* phlomobacter	

fragariae'*]*	
Strawberry rickettsia yellows	
Xanthomonas arboricola pv. fragariae	bacterial leaf blight
Xanthomonas fragariae	angular leaf spot
Xylella fastidiosa [F.vesca* only*]*	Pierce's disease

Viruses

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  -
    -

Fragaria chiloensis latent virus	-
Raspberry ringspot virus	-
Strawberry chlorotic fleck virus	-
Strawberry latent C virus	-
Strawberry latent ringspot virus [strains not in New Zealand]	
Strawberry mild yellow edge-associated virus	-
Strawberry mottle virus	-
Strawberry pallidosis associated virus	-
Strawberry pseudo mild yellow edge virus	-
Strawberry vein banding virus	-
Tobacco necrosis virus [strains not in New Zealand]	-
Tomato black ring virus	-
Tomato bushy stunt virus	-
Tomato ringspot virus [strains not in New Zealand]	-

Phytoplasmas

-
  -
    -

Aster yellows phytoplasma	-
Clover phyllody phytoplasma	-
Clover proliferation phytoplasma	-
Clover yellow edge phytoplasma	-
Stolbur phytoplasma	-
STRAWB1 phytoplasma	-
STRAWB2 phytoplasma	
Strawberry green petal phytoplasma	-
Strawberry leafy fruit phytoplasma	
Strawberry multicipita phytoplasma	
Strawberry multiplier phytoplasma	-
Strawberry phylloid fruit phytoplasma	
Strawberry yellows phytoplasma	

Diseases of unknown aetiology

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Strawberry feather leaf disease
Strawberry lethal decline disease

*For organisms intercepted that are not listed within this pest list refer to the Biosecurity Organisms Register for Imported Commodities to determine regulatory status.

Inspection, Testing and Treatment Requirements for Fragaria:

ORGANISM TYPES	**MAF-ACCEPTABLE METHODS**
Insects	Visual inspection AND approved insecticide treatments as described in the basic conditions of the Import Health Standard Nursery Stock from All countries [cuttings only]
Mites	Visual inspection AND approved miticide treatments as described in the basic conditions of the Import Health Standard Nursery Stock from All countries. [cuttings only] or binocular microscope inspection in PEQ [plants *in vitro* only]
Nematodes	Growing season inspection in PEQ for symptoms of foliar nematodes
Fungi	Growing season inspection in PEQ for symptom expression
Bacteria (and diseases caused by bacteria-like organisms)	
Ralstonia solanacearum (Race 2)	Growing season inspection for symptom expression.
Strawberry marginal chlorosis *('Candidatus* phlomobacter fragariae')	Growing season inspection for symptom expression AND PCR
Strawberry rickettsia yellows	Growing season inspection for symptom expression
Xanthomonas arboricola pv. fragariae	Growing season inspection for symptom expression AND real-time PCR (Weller *et al*., 2007)
Xanthomonas fragariae	Growing season inspection for symptom expression AND PCR (Pooler *et a*l., 1996) OR real-time PCR (Weller *et al*., 2007)
Xylella fastidiosa (Fragaria vesca only*)*	Growing season inspection in PEQ for disease symptom expression AND PCR (Minsavage *et al*., 1994).
Viruses	
Fragaria chiloensis latent virus	Herbaceous indicators (*Chenopodium quinoa* and *Cucumis sativus*)
Raspberry ringspot virus	Herbaceous indicator (*Chenopodium quinoa*) AND ELISA or PCR
Strawberry chlorotic fleck virus	Graft inoculation (*Fragaria vesca* cl. EMB or EMK)
Strawberry latent C virus	Graft inoculation (*Fragaria vesca* cl. EMC or UC5)
Strawberry latent ringspot virus (strains not in New Zealand)	Herbaceous indicators (*Chenopodium quinoa* and *Cucumis sativus*) AND ELISA or PCR
Strawberry mild yellow	Graft inoculation (2 indicators; *Fragaria vesca* cl.

edge-associated virus	UC4 or UC5, or cv. Alpine
Strawberry mottle virus	Graft inoculation (2 indicators *Fragaria vesca* cl.UC4 or UC5 or cv. Alpine) AND PCR
Strawberry pallidosis associated virus	Graft inoculation (*Fragaria virginiana* cl. UC10 or UC11)
Strawberry pseudo mild yellow edge virus	Graft inoculation (*Fragaria vesca* cl.UC4 or cv. Alpine. or *Fragaria virginiana* cl. UC12)
Strawberry vein banding virus	Graft inoculation (*Fragaria vesca* cl.UC5 or UC6, or cv. Alpine. or *Fragaria virginiana* cl. UC12) AND PCR
Tobacco necrosis virus [strains not in New Zealand]	Herbaceous indicators (*Chenopodium quinoa and Cucumis sativus*) AND ELISA
Tomato black ring virus	Herbaceous indicators (*Chenopodium quinoa and Cucumis sativus*) AND ELISA
Tomato bushy stunt virus	Herbaceous indicator (*Chenopodium quinoa)*
Tomato ringspot virus [strains not in New Zealand]	Herbaceous indicators (*Chenopodium quinoa and Cucumis sativus)* AND ELISA or PCR
Phytoplasmas	Growing season inspection AND nested PCR using the universal phytoplasma primers P1/P7 (Deng & Hiruki, 1991; Schneider *et al*., 1995) followed by R16F2/R16R2 (Lee *et al.*, 1995)
Diseases of unknown aetiology	
Strawberry feather leaf disease	Graft inoculation (*Fragaria vesca* cl. UC1 or UC4, or cv. Alpine)
Strawberry lethal decline disease	Graft inoculation (*Fragaria vesca* cv. Alpine)

Notes:

1. **Unit for testing** is an individual tissue culture plantlet for plants *in vitro* or an individual cutting. Each single plantlet and cutting must be labeled individually and tested separately.

2. **Plants *in vitro*:** all tissue culture plantlets must go through a period of dormancy before virus testing to increase the virus titre. Plantlets must also be potted up and grown in a MAFBNZ approved greenhouse and only material from the greenhouse is to be selected for testing.

3. **Virus testing** is to be conducted on new spring growth.

4. **Growing season** is defined as an extended period of plant growth that includes environmental conditions equivalent to spring (longer wetter days and colder temperatures), summer (longer dryer days and warm temperatures), and autumn (shorter wetter days and warm but cooling temperatures).

5. **Phytoplasma and bacteria testing** is to be conducted at the end of the summer growth period. Plants must be sampled from at least two positions on the apical crown region.

6. **Graft indexing hosts**: Each Fragaria plant must be tested by leaf-grafting onto two replicate indicator cultivars. The indicator plants must be maintained in a vigorous state of growth before and after grafting. Grafted plants are to be inspected regularly for symptoms of disease for at least 3 months.

7. **Herbaceous indicator hosts**: *Chenopodium quinoa* and *Cucumis sativus*. Two plants of each herbaceous indicator species must be used in each test. Herbaceous indicator plants must be grown at 18-25^{o}C before and after inoculation and must be shaded for 24 hrs prior to inoculation. Maintain post-inoculated indicator species under appropriate glasshouse conditions for at least 4 weeks. Inspect inoculated indicator plants at least twice per week for symptoms of virus infection.

8. **Enzyme linked immunosorbent assay (ELISA) tests**. All ELISA tests must be validated using both positive and negative controls prior to use in quarantine testing. Positive, negative, and buffer controls must be used in all tests.

9. **Polymerase chain reaction (PCR) tests**. All PCR tests must be validated using positive controls prior to use in quarantine testing. Positive and no template controls must be used in all tests. Positive internal control primers and a negative plant control should also be used in PCR tests.

10. **Inspection** of the *Fragaria* plants by the operator of the PEQ facility for signs of pest and disease must be at least twice per week during periods of active growth.

11. **Other internationally recognised testing methods** may be accepted by MAF with prior notification.

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