

Recommended Codes for Pest Organisms in Vegetable Crops

January 2022
Subject to annual review

Adopted by the ISF Expert Group Disease Resistance Terminology

CROPS

- [*Abelmoschus esculentus*](#) (Okra)
[*Allium ampeloprasum*](#) and [*A. cepa*](#) (Leek and Onion)
[*Apium graveolens*](#) (Celery and Celeriac)
[*Benincasa hispida*](#) (Wax gourd)
[*Beta vulgaris*](#) (Table beet and Swiss chard)
[*Brassicacae*](#) (Cabbage, Broccoli, Cauliflower, Chinese cabbage...)
[*Capsicum annuum*](#) (Pepper)
[*Citrullus lanatus*](#) (Watermelon)
[*Cucumis melo*](#) (Melon)
[*Cucumis sativus*](#) (Cucumber)
[*Cucurbita pepo*](#), [*C. maxima*](#), [*C. moschata*](#) (Squash and pumpkin)
[*Diplotaxis tenuifolia*](#) (Wild rocket)
[*Daucus carota*](#) var. [*sativa*](#) (Carrot)
[*Eruca vesicaria*](#) subsp. [*sativa*](#) (Arugula)
[*Lactuca sativa*](#) (Lettuce)
[*Lagenaria siceraria*](#) (Bottle gourd)
[*Luffa acutangula*](#) (Ridge gourd)
[*Luffa cylindrica*](#) (Sponge gourd)
[*Mormodica charantia*](#) (Bittergourd)
[*Ocimum basilicum*](#) (Basil)
[*Petroselinum crispum*](#) (Parsley)
[*Phaseolus vulgaris*](#) (Dwarf and climbing French bean)
[*Pisum sativum*](#) (Garden pea)
[*Raphanus sativus*](#) (Radish)
[*Solanum integrifolium*](#) (Eggplant/Aubergine rootstock)
[*Solanum lycopersicum*](#) (Ex *Lycopersicon esculentum*) (Tomato)
[*Solanum melongena*](#) (Eggplant/Aubergine)
[*Solanum torvum*](#) (Eggplant/Aubergine rootstock)
[*Spinacia oleracea*](#) (Spinach)
[*Valerianella locusta*](#) (Corn salad)
[*Zea mays*](#) (sweet corn)

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1. *Abelmoschus esculentus* (Okra)

Scientific name	English common name	Code
Viruses		
¹ <i>Okra yellow vein mosaic virus (now Bhendi yellow vein mosaic virus) /2026</i>	Okra yellow vein mosaic/Bhendi yellow vein mosaic virus	OYVMV (now BYVMV)
Insects		
<i>Amarasca biguttula</i>	Leaf hopper	Ab

2. *Alliums* - *A. ampeloprasum* and *A. cepa* (Leek and Onion)

Scientific name	English common name	Code
Viruses		
<i>Leek yellow stripe virus</i>	Leek yellow stripe	LYSV
Bacteria		
<i>Pseudomonas syringae</i> pv. <i>porri</i>	Pseudomonas leek blight	Psp
Fungi		
<i>Alternaria porri</i>	Purple blotch	Ap
<i>Botrytis allii</i>	Botrytis neck rot	Ba
<i>Botrytis squamosa (now Botryotinia squamosa) /2026</i>	Botrytis leaf blight	Bs
<i>Colletotrichum gloeosporioides</i>	Twister	Cg
<i>Fusarium oxysporum</i> f.sp. <i>cepae</i>	Basal rot	Foc
<i>Peronospora destructor</i>	Downy mildew	Pd
<i>Phytophthora nicotianae</i>	Phytophthora neck and bulb rot	Pn
<i>Phytophthora porri</i>	White tip of leek	Php
<i>Puccinia allii</i>	Rust	Pa
<i>Puccinia porri</i>	Rust	Pup
<i>Pyrenochaeta terrestris (now Setophoma terrestris)/2026</i>	Pink root	Pt (now St)
<i>Sclerotium cepivorum (now Stromatinia cepivora) /2026</i>	White rot	Sc
Insects		
<i>Thrips tabaci</i>	Onion thrips	Tt
Nematodes		
<i>Ditylenchus dipsaci</i>	Stem and bulb nematode	Dd

¹ **End of the transition period for the name change. The transition from one step to the next is three years to allow companies and their customers worldwide to become accustomed to the change.**

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3. *Apium graveolens* (Celery and Celeriac)

Scientific name	English common name	Code
Viruses		
<i>Celery mosaic virus</i>	Celery mosaic	CeMV
Fungi		
<i>Fusarium oxysporum</i> f.sp. <i>apii</i>	Fusarium yellows and wilt	Foa
<i>Septoria apiicola</i>	Late blight	Sa

4. *Benincasa hispida* (Wax gourd)

Scientific name	English common name	Code
Viruses		
<i>Cucurbit aphid-borne yellows virus</i>	Cucurbit aphid-borne yellows virus	CABYV
<i>Cucumber green mottle mosaic virus</i>	Cucumber green mottle mosaic virus	CGMMV
<i>Cucumber mosaic virus</i>	Cucumber virus 1	CMV
<i>Papaya ringspot virus</i>	Papaya ringspot virus	PRSV
<i>Tomato Leaf Curl New Delhi Virus</i>	Tomato leaf curl	ToLCNDV
<i>Watermelon silver mottle virus</i>	Watermelon silver mottle virus	WSMoV
<i>Zucchini yellow mosaic virus</i>	Zucchini yellow mosaic virus	ZYMV
Fungi		
<i>Fusarium oxysporum</i> f.sp. <i>lagenariae</i>	Fusarium wilt	Fol
<i>Fusarium oxysporum</i> f.sp. <i>niveum</i>	Fusarium wilt	Fon
<i>Fusarium oxysporum</i> f.sp. <i>radicis-cucumerinum</i>	Root and stem rot	For

5. *Beta vulgaris* (Table beet and Swiss chard)

Scientific name	English common name	Code
Viruses		
<i>Beet curly top virus</i>	Beet curly top	BCTV
<i>Beet necrotic yellow vein virus</i>	Rhizomania	BNYVV
Bacteria		
<i>Pseudomonas syringae</i> pv. <i>aptata</i>	Bacterial blight	Psa
<i>Streptomyces scabies</i>	Common scab	Ss
Fungi		
<i>Cercospora beticola</i>	Leaf spot	Cb
<i>Colletotrichum dematium</i> f.sp. <i>spinaciae</i> (now <i>Colletotrichum dematium</i>) / 2026	Anthracoise	Cds (now Cd)
<i>Fusarium oxysporum</i> f.sp. <i>betae</i>	Fusarium yellows	Fob

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<i>Pythium aphanidermatum</i>	Pythium root rot	Pa
<i>Phoma betae</i> (now <i>Pleospora bjoerlingii</i>)/2026	Phoma root rot, Leaf spot	Pb
<i>Peronospora farinosa</i> f.sp. <i>betae</i> (now <i>Peronospora schachtii</i>) / 2026	Downy mildew	Pfb (now Ps)
<i>Ramularia beticola</i>	Ramularia leaf spot	Ra
<i>Rhizoctonia solani</i>	Rhizoctonia root and crown rot	Rs
<i>Verticillium albo-atrum</i>	Verticillium wilt	Va
<i>Verticillium dahliae</i>	Verticillium wilt	Vd

6. Brassicas (Cabbage, Broccoli, Cauliflower, Chinese cabbage)

Scientific name	English common name	Code
Viruses		
<i>Cauliflower mosaic virus</i>	Cauliflower mosaic	CaMV
<i>Turnip mosaic virus</i>	Turnip mosaic	TuMV
Bacteria		
<i>Pseudomonas syringae</i> pv. <i>maculicola</i>	Bacterial leaf spot, Peppery leaf spot	Psm
<i>Xanthomonas campestris</i> pv. <i>campestris</i>	Black rot	Xcc
Fungi		
<i>Albugo candida</i>	White rust	Ac
<i>Albugo macrospora</i> (now <i>Albugo candida</i>) /2026	White rust	Am (now Ac)
<i>Alternaria brassicae</i>	Black spot	Abe
<i>Alternaria brassicicola</i>	Black spot	Aba
<i>Erysiphe cruciferarum</i>	Powdery mildew	Ec
<i>Fusarium oxysporum</i> f.sp. <i>conglutinans</i>	Fusarium yellows	Foc
<i>Fusarium oxysporum</i> f.sp. <i>rapae</i>	Fusarium yellows	Foa
² <i>Hyaloperonospora brassicae</i> (ex <i>Peronospora</i> / <i>Hyaloperonospora parasitica</i> subsp. <i>brassicae</i> /2023	Downy mildew	Hb (ex Pp/ Hp)
<i>Mycosphaerella brassicicola</i>	Ring spot	Mb
<i>Leptosphaeria maculans</i> (anamorph: <i>Phoma lingam</i>)	Black leg	Lm
<i>Plasmodiophora brassicae</i>	Clubroot	Pb
<i>Verticillium albo-atrum</i>	Verticillium wilt	Va
<i>Verticillium dahliae</i>	Verticillium wilt	Vd
<i>Verticillium longisporum</i>	Verticillium wilt	Vl
Insects		
<i>Brevicoryne brassicae</i>	Cabbage aphid	Bb
<i>Plutella xylostella</i>	Diamond back moth	Px
<i>Thrips tabaci</i>	Thrips	Tt

² *Hyaloperonospora parasitica* subs. *brassicae* is currently and widely known as *H. brassicae*. *H. parasitica* is a pathogen with a host range different to cultivated Brassicas.

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7. *Capsicum annuum* (Pepper)

Scientific name	English common name	Code
Viruses		
<i>Chili veinal mottle virus</i>	Chili veinal mottle	ChiVMV
<i>Cucumber mosaic virus</i>	Cucumber mosaic	CMV
<i>Paprika mild mottle virus</i>	Paprika mild mottle	PaMMV
<i>Pepper mild mottle virus</i>	Pepper mild mottle	PMMoV
<i>Pepper mottle virus</i>	Pepper mottle	PepMoV
<i>Pepper yellow mosaic virus</i>	Pepper yellow mosaic	PepYMV
<i>Potato virus Y</i>	Potato virus Y	PVY
<i>Tomato brown rugose fruit virus</i>	Tomato brown rugose fruit	ToBRFV
<i>Tobacco etch virus</i>	Tobacco etch	TEV
<i>Tobacco mild green mosaic virus</i>	Tobacco mild green mosaic	TMGMV
<i>Tobacco mosaic virus</i>	Tobacco mosaic	TMV
<i>Tomato mosaic virus</i>	Tomato mosaic	ToMV
<i>Tomato spotted wilt virus</i>	Tomato spotted wilt	TSWV
Bacteria		
³ <i>Ralstonia solanacearum</i>	Bacterial wilt	Rs
⁴ <i>Xanthomonas campestris</i> pv. <i>vesicatoria</i> (now <i>Xanthomonas</i> spp) /2026	Bacterial spot	Xcv (now X spp)
Fungi		
<i>Colletotrichum acutatum</i>	Anthracnose	Ca
<i>Colletotrichum capsici</i> (now <i>Colletotrichum truncatum</i>) / 2026	Anthracnose	Cc (now Ct)
<i>Colletotrichum gloeosporioides</i>	Anthracnose	Cg
<i>Fusarium oxysporum</i> f.sp. <i>capsici</i>	Fusarium wilt	Foc
<i>Leveillula taurica</i> (anamorph: <i>Oidiopsis sicula</i>)	Powdery mildew	Lt
<i>Phytophthora capsici</i>	Phytophthora blight	Pc
Nematodes		
<i>Meloidogyne arenaria</i>	Root-knot	Ma
<i>Meloidogyne incognita</i>	Root-knot	Mi
<i>Meloidogyne javanica</i>	Root-knot	Mj

8. *Citrullus lanatus* (Watermelon)

Scientific name	English common name	Code
Viruses		
<i>Cucumber vein yellowing virus</i>	Cucumber vein yellowing	CVYV
<i>Cucumber mosaic virus</i>	Cucumber mosaic	CMV
<i>Papaya ringspot virus</i>	Papaya ringspot	PRSV

³ *Ralstonia solanacearum* species complex comprises of three different species see Prior *et al.*, 2016.

⁴ Taxonomic studies on the bacteria causing bacterial spot on tomato and pepper have shown there are four different species (*Xanthomonas euvesicatoria*, *X. vesicatoria*, *X. perforans* and *X. gardneri*) that cannot be differentiated by pathogenicity as they all cause very similar symptoms. As resistance in tomato and pepper to bacterial spot is based on races that go across these species we proposed to not specify the species but to keep the general name-

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<i>Squash leaf curl virus</i>	Squash leaf curl	SLCV
<i>Watermelon mosaic virus</i>	Watermelon mosaic	WMV
<i>Zucchini yellow mosaic virus</i>	Zucchini yellow mosaic	ZYMV
Fungi		
<i>Colletotrichum orbiculare</i>	Anthraco-nose	Co
<i>Fusarium oxysporum</i> f.sp. <i>niveum</i>	Fusarium wilt	Fon
<i>Podosphaera xanthii</i>	Powdery mildew	Px

9. Cucumis melo (Melon)

Scientific name	English common name	Code
Viruses		
<i>Cucumber green mottle mosaic virus</i>	Cucumber green mottle	CGMMV
<i>Cucumber mosaic virus</i>	Cucumber mosaic	CMV
<i>Cucumber vein yellowing virus</i>	Cucumber vein yellowing	CVYV
<i>Cucurbit yellow stunting disorder virus</i>	Cucurbit yellow stunting disorder	CYSDV
<i>Melon necrotic spot virus</i>	Melon necrotic spot	MNSV
<i>Moroccan watermelon mosaic virus</i>	Moroccan watermelon mosaic	MWMV
<i>Papaya ringspot virus</i>	Papaya ringspot	PRSV
<i>Squash leaf curl virus</i>	Squash leaf curl	SLCV
<i>Squash mosaic virus</i>	Squash mosaic	SqMV
<i>Tomato leaf curl New Delhi virus</i>	Tomato leaf curl New Delhi	ToLCNDV
<i>Watermelon mosaic virus</i>	Watermelon mosaic	WMV
<i>Zucchini yellow mosaic virus</i>	Zucchini yellows	ZYMV
Fungi		
<i>Golovinomyces cichoracearum</i>	Powdery mildew	Gc
<i>Fusarium oxysporum</i> f.sp. <i>melonis</i>	Fusarium wilt	Fom
<i>Pseudoperonospora cubensis</i>	Downy mildew	Pcu
<i>Podosphaera xanthii</i>	Powdery mildew	Px
Insects		
<i>Aphis gossypii</i>	Cotton aphid	Ag

10. Cucumis sativus (Cucumber)

Scientific name	English common name	Code
Viruses		
<i>Beet pseudoyellows virus</i>	Beet pseudoyellows virus	BPYV
<i>Cucumber green mottle mosaic virus</i>	Cucumber green mottle	CGMMV
<i>Cucumber mosaic virus</i>	Cucumber mosaic	CMV
<i>Cucumber vein yellowing virus</i>	Cucumber vein yellowing	CVYV
<i>Cucurbit yellow stunting disorder virus</i>	Cucurbit yellow stunting disorder	CYSDV
<i>Kyuri green mottle mosaic virus</i>	Kyuri green mottle	KGMMV
<i>Papaya ringspot virus</i>	Papaya ringspot	PRSV
<i>Squash leaf curl virus</i>	Squash leaf curl	SLCV
<i>Tomato leaf curl New Delhi virus</i>		ToLCNDV
<i>Watermelon mosaic virus</i>	Watermelon mosaic	WMV

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<i>Zucchini yellow mosaic virus</i>	Zucchini yellows	ZYMV
Bacteria		
<i>Erwinia tracheiphila</i>	Bacterial wilt	Et
<i>Pseudomonas syringae</i> pv. <i>lachrymans</i>	Angular leaf spot	PsI
Fungi		
<i>Cladosporium cucumerinum</i>	Scab and gummosis	Ccu
<i>Colletotrichum orbiculare</i>	Anthracnose	Co
<i>Corynespora cassiicola</i>	Corynespora blight and target spot	Cca
<i>Golovinomyces cichoracearum</i>	Powdery mildew	Gc
<i>Fusarium oxysporum</i> f.sp. <i>cucumerinum</i>	Fusarium wilt	Foc
<i>Fusarium oxysporum</i> f.sp. <i>radicis-cucumerinum</i>	Fusarium crown and root rot	For
<i>Pythium aphanidermatum</i>	Damping off , Pythium fruit rot (cottony leak)	Pa
<i>Pseudoperonospora cubensis</i>	Downy mildew	Pcu
<i>Podosphaera xanthii</i>	Powdery mildew	Px

11. Cucurbita pepo, C. maxima, C. moschata (Squash and pumpkin)

Scientific name	English common name	Code
Viruses		
<i>Cucumber mosaic virus</i>	Cucumber mosaic	CMV
<i>Luffa yellow mosaic virus</i>	Luffa yellow mosaic	LYMV
<i>Papaya ringspot virus</i>	Papaya ringspot	PRSV
<i>Squash leaf curl virus</i>	Squash leaf curl	SLCV
<i>Squash mosaic virus</i>	Squash mosaic	SqMV
<i>Tomato leaf curl New Delhi virus</i>		ToLCNDV
<i>Watermelon mosaic virus</i>	Watermelon mosaic	WMV
<i>Moroccan watermelon mosaic virus</i>	Moroccan watermelon mosaic	MWMV
<i>Zucchini yellow mosaic virus</i>	Zucchini yellows	ZYMV
Fungi		
<i>Golovinomyces cichoracearum</i>	Powdery mildew	Gc
<i>Fusarium oxysporum</i> f.sp. <i>cucumerinum</i>	Fusarium wilt	Foc
<i>Fusarium oxysporum</i> f.sp. <i>lagenariae</i>	Fusarium wilt	Fol
<i>Fusarium oxysporum</i> f.sp. <i>melonis</i>	Fusarium wilt	Fom
<i>Fusarium oxysporum</i> f.sp. <i>niveum</i>	Fusarium wilt	Fon
<i>Fusarium oxysporum</i> f.sp. <i>radicis-cucumerinum</i>	Root and stem rot	For
<i>Fusarium solani</i> f.sp. <i>cucurbitae</i>	Crown and root rot	Fsc
<i>Phomopsis sclerotioides</i> (now <i>Diaporthe sclerotioides</i>) /2026	Black root rot	Ps (now Ds)
<i>Pythium aphanidermatum</i>	Damping off, Pythium fruit rot (cottony leak)	Pa
<i>Phytophthora capsici</i>	Phytophthora crown and root rot	Pc
<i>Pseudoperonospora cubensis</i>	Downy mildew	Pcu
<i>Podosphaera xanthii</i>	Powdery mildew	Px

12. Daucus carota var. sativa (Carrot)

Scientific name	English common name	Code
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Bacteria		
<i>Xanthomonas hortorum</i> pv. <i>carotae</i>	Bacterial leaf blight	Xhc
Fungi		
<i>Alternaria dauci</i>	Alternaria leaf blight	Ad
<i>Alternaria radicina</i>	Black rot	Ar
<i>Cercospora carotae</i>	Cercospora leaf blight	Cc
<i>Erysiphe heraclei</i>	Powdery mildew	Eh
<i>Pythium sulcatum</i>	Cavity spot	Ps
<i>Pythium ultimum</i> (now <i>Globisporangium ultimum</i>) /2026	Cavity spot	Pu (now Gu)
<i>Pythium violae</i> (now <i>Globisporangium violae</i>) / 2026	Cavity spot	Pv (now Gv)
Insects		
<i>Psila rosae</i>	Carrot fly	Pr
Nematodes		
<i>Meloidogyne incognita</i>	Root-knot	Mi
<i>Meloidogyne javanica</i>	Root-knot	Mj
Phytoplasmas		
<i>Aster yellows</i>	Aster yellows	Ay
13. <i>Diplotaxis tenuifolia</i> (Wild rocket)		
Scientific name	English common name	Code
Fungi		
<i>Hyaloperonospora parasitica</i>	Downy mildew	Hp
14. <i>Eruca vesicaria</i> subsp. <i>sativa</i> (Arugula)		
Scientific name	English common name	Code
Fungi		
<i>Hyaloperonospora parasitica</i>	Downy mildew	Hp
15. <i>Lactuca sativa</i> (Lettuce)		
Scientific name	English common name	Code
Viruses		
<i>Beet western yellows virus</i>	Yellows	BWYV
<i>Cucumber mosaic virus</i>	Cucumber mosaic	CMV
<i>Lettuce necrotic stunt virus</i> (now <i>Moroccan pepper virus</i>) /2027	Lettuce die-back	LNSV (now MPV)
<i>Lettuce mosaic virus</i>	Lettuce mosaic	LMV
<i>Mirafiori lettuce big-vein virus</i>	Lettuce big vein	MLBVV
<i>Tomato bushy stunt virus</i>	Lettuce die-back	TBSV
<i>Tomato spotted wilt virus</i>	Spotted wilt	TSWV
Bacteria		
<i>Pseudomonas cichorii</i>	Bacterial rot	Pc

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⁵ <i>Rhizorhapis suberifaciens</i> (ex <i>Sphingomonas suberifaciens</i>) /2025	Corky root	Ss (now Rs)
<i>Xanthomonas campestris</i> pv. <i>vitians</i> (now <i>Xanthomonas axonopodis</i> pv. <i>vitians</i>) /2026	Bacterial spot	Xcv (now Xav)
Fungi		
<i>Bremia lactucae</i>	Downy mildew	Bl
<i>Fusarium oxysporum</i> f.sp. <i>lactucae</i>	Fusarium wilt	Fol
<i>Microdochium panattonianum</i>	Anthraco-nose	Mpa
Insects		
<i>Macrosiphum euphorbiae</i>	Potato aphid	Me
<i>Myzus persicae</i>	Green peach aphid	Mpe
<i>Nasonovia ribisnigri</i>	Lettuce leaf aphid	Nr
<i>Pemphigus bursarius</i>	Lettuce root aphid	Pb

16. *Lagenaria siceraria* (Bottle gourd)

Scientific name	English common name	Code
Viruses		
<i>Cucumber green mottle mosaic virus</i>	Cucumber green mottle	CGMMV
Fungi		
<i>Fusarium oxysporum</i> f.sp. <i>lagenariae</i>	Fusarium wilt	Fol
<i>Fusarium oxysporum</i> f.sp. <i>niveum</i>	Fusarium wilt	Fon
<i>Fusarium oxysporum</i> f.sp. <i>radicis-cucumerinum</i>	Root and stem rot	For

17. *Luffa acutangula* (Ridge gourd)

Scientific name	English common name	Code
Viruses		
<i>Tomato Leaf Curl New Delhi Virus</i>	Tomato Leaf Curl	ToLCNDV
Bacteria		
⁶ <i>Ralstonia solanacearum</i> race 1, biovar 3	Bacterial wilt	Rs

18. *Luffa cylindrica* (Sponge gourd)

Scientific name	English common name	Code
Fungi		
<i>Fusarium oxysporum</i> f. sp. <i>luffae</i>	Fusarium wilt	Fol
<i>Pseudoperonospora cubensis</i>	Downy mildew	Pc
Bacteria		

⁵ A recent review article in 2015 uses the new genus name *Rhizorhapis* based on work published in 2014 on the reclassification of the pathogen causing lettuce corky root (<https://www.microbiologyresearch.org/content/journal/ijsem/10.1099/ijms.0.058909-0>, <http://apsjournals.apsnet.org/doi/pdf/10.1094/PDIS-09-14-0953-FE>).

⁶ *Ralstonia solanacearum* species complex comprises of three different species see Prior *et al.*, 2016.

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⁷ <i>Ralstonia solanacearum</i>	Bacterial wilt	Rs

19. *Momordica charantia* (Bittergourd)

Scientific name	English common name	Code
Viruses		
<i>Cucurbit aphid-borne yellows virus</i>	Cucurbit aphid-borne yellows virus	CABYV
<i>Cucumber mosaic virus</i>	Cucumber virus 1	CMV
<i>Papaya ring spot virus</i>	Papaya ringspot	PRSV
<i>Tomato Leaf Curl New Delhi Virus</i>	Tomato Leaf Curl	ToLCNDV
<i>Zucchini yellow mosaic virus</i>	Yellow mosaic	ZYMV
Fungi		
<i>Podosphaera xanthii</i>	Powdery Mildew	Px

20. *Ocimum basilicum* (Basil)

Scientific name	English common name	Code
Fungi		
<i>Fusarium oxysporum f.sp. basilicum (now Fusarium oxysporum f.sp. basilici) /2026</i>	Fusarium wilt	Fob
<i>Peronospora belbahrii</i>	Downy mildew	Pb

21. *Petroselinum crispum* (Parsley)

Scientific name	English common name	Code
Fungi		
<i>Plasmopara petroselini</i>	Downy mildew	Pp
<i>Septoria petroselini</i>	Septoria blight	Sp

22. *Phaseolus vulgaris* (Dwarf and climbing French bean)

Scientific name	English common name	Code
Viruses		
<i>Bean common mosaic virus</i>	Bean common mosaic	BCMV
<i>Bean common mosaic necrosis virus</i>	Bean common mosaic necrosis	BCMNV
<i>Beet curly top virus</i>	Beet curly top	BCTV
<i>Bean golden mosaic virus</i>	Bean golden mosaic	BGMV
<i>Bean golden yellow mosaic virus</i>	Bean golden yellow mosaic	BGYMV
<i>Beet mild curly top virus (now Beet curly top virus) /2026</i>	Beet curly top	BMCTV (now BCTV)
<i>Beet severe curly top virus (now Beet curly top virus) /2026</i>	Beet curly top	BSCTV (now BCTV)
<i>Bean yellow disorder virus</i>	Bean yellow disorder virus	BnYDV
<i>Bean yellow mosaic virus</i>	Bean yellow mosaic	BYMV
<i>Southern bean mosaic virus</i>	Bean southern virus	SBMV

⁷ *Ralstonia solanacearum* species complex comprises of three different species see Prior *et al.*, 2016.

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<i>Cucumber mosaic virus</i>	Cucumber virus	CMV
Bacteria		
<i>Pseudomonas savastanoi</i> pv. <i>phaseolicola</i>	Halo blight	Psp
<i>Pseudomonas syringae</i> pv. <i>syringae</i>	Bacterial brown spot	Pss
⁸ <i>Xanthomonas axonopodis</i> pv. <i>phaseoli</i>	Common or fuscous blight	Xap
Fungi		
<i>Aphanomyces euteiches</i>	Root rot	Ae
<i>Colletotrichum lindemuthianum</i>	Anthraxnose	Cl
<i>Fusarium oxysporum</i> f.sp. <i>phaseoli</i>	Fusarium wilt	Fop
<i>Fusarium solani</i> f.sp. <i>phaseoli</i>	Fusarium root rot	Fsp
<i>Sclerotinia sclerotiorum</i>	White mold	Ss
<i>Uromyces appendiculatus</i>	Rust	Ua

23. *Pisum sativum* (Garden pea)

Scientific name	English common name	Code
Viruses		
<i>Bean leafroll virus</i>	Pea leaf roll, pea top yellows	BLRV
<i>Bean yellow mosaic virus</i>	Bean yellow mosaic	BYMV
<i>Pea enation mosaic virus</i>	Pea enation mosaic	PEMV
<i>Pea seed-borne mosaic virus</i>	Pea seed-borne mosaic	PSbMV
Bacteria		
<i>Pseudomonas syringae</i> pv. <i>pisi</i>	Bacterial blight	Psp
Fungi		
<i>Aphanomyces euteiches</i>	Aphanomyces root rot	Ae
<i>Ascochyta pisi</i> (now <i>Didymella pisi</i>) /2026	Ascochyta leaf and pod spot	Aps (now Dp)
<i>Ascochyta pinodella</i> (now <i>Didymella pinodella</i>) /2026	Leaf spot and foot rot	Apn (now Dpn)
<i>Botrytis cinerea</i>	Grey mold	Bc
<i>Erysiphe pisi</i>	Powdery mildew	Ep
<i>Fusarium oxysporum</i> f.sp. <i>pisi</i>	Near wilt	Fop
<i>Fusarium solani</i> (now <i>Neocosmospora solani</i>) / 2026	Fusarium root rot	Fs (now Ns)
<i>Mycosphaerella pinodes</i> (now <i>Didymella pinodes</i>) /2026	Ascochyta blight	Mp (now Dp)
<i>Peronospora viciae</i>	Downy mildew	Pv

24. *Raphanus sativus* (Radish)

⁸ Although *Xanthomonas axonopodis* pv. *phaseoli* and *X. fuscans* subsp. *fuscans* (Xff) (formerly *X. axonopodis* pv. *phaseoli* var. *fuscans*) are taxonomically different bacterial species that are the causal agents of common bacterial blight, it is not possible to differentiate them based on symptoms under natural conditions and there is no evidence that resistance to these two species in bean differ.

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Scientific name	English common name	Code
Viruses		
<i>Turnip mosaic virus</i>	Turnip mosaic	TuMV
Bacteria		
<i>Pseudomonas syringae</i> pv. <i>maculicola</i>	Bacterial leaf spot, Peppery leaf spot	Psm
Fungi		
<i>Albugo candida</i>	White rust	Ac
<i>Aphanomyces raphani</i>	Black root	Ar
<i>Fusarium oxysporum</i> f.sp. <i>raphani</i>	Yellows	For
<i>Hyaloperonospora brassicae</i> (ex <i>Peronospora</i> / <i>Hyaloperonospora parasitica</i>) / 2027	Downy mildew	Hb (ex Pp/ Hp)
<i>Plasmodiophora brassicae</i>	Clubroot	Pb
<i>Rhizoctonia solani</i>	Rhizoctonia scurf	Rs
25. <i>Solanum integrifolium</i> (Eggplant rootstock)		
Scientific name	English common name	Code
Fungi		
<i>Fusarium oxysporum</i> f.sp. <i>melongenae</i>	Fusarium wilt	Fom
26. ⁹<i>Solanum lycopersicum</i> (ex <i>Lycopersicon esculentum</i>) (Tomato)		
Scientific name	English common name	Code
Viruses		
<i>Beet curly top virus</i>	Curly top	BCTV
<i>Cucumber mosaic virus</i>	Cucumber mosaic	CMV
<i>Groundnut ringspot virus</i>	Groundnut ringspot	GRSV
<i>Pepino mosaic virus</i>	Pepino mosaic	PepMV
<i>Tobacco mosaic virus</i>	Tobacco mosaic	TMV
<i>Tomato apex necrosis virus</i> (now <i>Tomato marchitez virus</i>) /2026	Tomato apex necrosis	ToANV (now ToMarV)
<i>Tomato brown rugose fruit virus</i>	Tomato brown rugose fruit	ToBRFV
<i>Tomato chlorotic spot virus</i>	Tomato chlorotic spot	TCSV
<i>Tomato mosaic virus</i>	Tomato mosaic	ToMV
<i>Tomato torrado virus</i>	Tomato torrado	ToTV
<i>Tomato spotted wilt virus</i>	Tomato spotted wilt	TSWV

⁹ Some of the codes also apply for tomato rootstocks.

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<i>Tomato yellow leaf curl virus</i>	Tomato yellow leaf curl	TYLCV ¹⁰
Bacteria		
<i>Clavibacter michiganensis</i> subsp. <i>michiganensis</i>	Bacterial canker	Cmm
<i>Pseudomonas corrugata</i>	Pith necrosis	Pc
<i>Pseudomonas syringae</i> pv. <i>tomato</i>	Bacterial speck	Pst
¹¹ <i>Ralstonia solanacearum</i>	Bacterial wilt	Rs
¹² <i>Xanthomonas campestris</i> pv. <i>vesicatoria</i> (now <i>Xanthomonas</i> spp) /2026	Bacterial spot	Xcv (now X spp)
Fungi		
<i>Alternaria alternata</i> f.sp. <i>lycopersici</i>	Alternaria stem canker	Aal
<i>Alternaria solani</i>	Early blight	As
<i>Corynespora cassiicola</i>	Target spot	Cc
¹³ <i>Passalora fulva</i> (ex <i>Fulvia fulva</i>) /2022	Leaf mold	Pf (ex Ff)
<i>Fusarium oxysporum</i> f.sp. <i>lycopersici</i>	Fusarium wilt	Fol
<i>Fusarium oxysporum</i> f.sp. <i>radicis-lycopersici</i>	Fusarium crown and root rot	For
<i>Leveillula taurica</i> (anamorph: <i>Oidiopsis sicula</i>)	Powdery mildew	Lt
<i>Oidium neolycopersici</i> (now <i>Pseudoidium neolycopersici</i>) /2026	Powdery mildew	On (now Pn)
<i>Phytophthora infestans</i>	Late blight	Pi
<i>Pyrenochaeta lycopersici</i> (now <i>Pseudopyrenochaeta lycopersici</i>) /2026	Corky root rot	PI
<i>Stemphylium botryosum</i> f.sp. <i>lycopersici</i>	Gray leaf spot	Sbl
<i>Stemphylium lycopersici</i>	Gray leaf spot	Sl
<i>Stemphylium solani</i>	Gray leaf spot	Ss
<i>Verticillium albo-atrum</i>	Verticillium wilt	Va
<i>Verticillium dahliae</i>	Verticillium wilt	Vd
Nematodes		
<i>Meloidogyne arenaria</i>	Root-knot	Ma
<i>Meloidogyne incognita</i>	Root-knot	Mi
<i>Meloidogyne javanica</i>	Root-knot	Mj
27. <i>Solanum melongena</i> (Eggplant/Aubergine)		
Scientific name	English common name	Code
Viruses		
<i>Tomato mosaic virus</i>	Tomato mosaic	ToMV
<i>Tomato spotted wilt virus</i>	Tomato spotted wilt	TSWV
Bacteria		
¹⁴ <i>Ralstonia solanacearum</i>	Bacterial wilt	Rs
Fungi		

¹⁰ [Explanatory note to clarify the situation of TYLCV and TYLCD associated viruses](#)

¹¹ *Ralstonia solanacearum* species complex comprises of three different species see Prior *et al.*, 2016.

¹² Taxonomic studies on the bacteria causing bacterial spot on tomato and pepper have shown there are four different species (*X. euvesicatoria*, *X. vesicatoria*, *X. perforans* and *X. gardneri*) that cannot be differentiated by pathogenicity as they all cause very similar symptoms. As resistance in tomato and pepper to bacterial spot is based on races that go across these species we proposed to not specify the species but to keep the general name.

¹³ Both *Cladosporium fulvum* and *Fulvia fulva* are still in use. The current name has changed from *Fulvia fulva* to *Passalora fulva* (See https://rvpadmin.cce.cornell.edu/uploads/doc_128.pdf).

¹⁴ *Ralstonia solanacearum* species complex comprises of three different species see Prior *et al.*, 2016.

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<i>Fusarium oxysporum</i> f.sp. <i>melongenae</i>	Fusarium wilt	Fom
<i>Verticillium albo-atrum</i>	Verticillium wilt	Va
<i>Verticillium dahliae</i>	Verticillium wilt	Vd

Nematodes

<i>Meloidogyne incognita</i>	Root-knot	Mi
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28. *Solanum torvum* (Eggplant rootstock)

Scientific name	English common name	Code
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Bacteria

¹⁵ <i>Ralstonia solanacearum</i>	Bacterial wilt	Rs
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Fungi

<i>Fusarium oxysporum</i> f.sp. <i>melongenae</i>	Fusarium wilt	Fom
<i>Verticillium albo-atrum</i>	Verticillium wilt	Va
<i>Verticillium dahliae</i>	Verticillium wilt	Vd

Nematodes

<i>Meloidogyne incognita</i>	Root knot	Mi
<i>Meloidogyne mayaguensis</i> (Syn. <i>M. enterolobii</i>)	Root knot	Me
<i>Meloidogyne arenaria</i>	Root knot	Ma
<i>Meloidogyne javanica</i>	Root knot	Mj

29. *Spinacia oleracea* (Spinach)

Scientific name	English common name	Code
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Viruses

<i>Cucumber mosaic virus</i>	Cucumber mosaic	CMV
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Fungi

<i>Albugo occidentalis</i> (now <i>Wilsoniana occidentalis</i>) /2026	White rust	Ao (now Wo)
<i>Cladosporium variabile</i>	Leaf spot	Cv
¹⁶ <i>Colletotrichum dematium</i>	Anthrachnose	Cd
<i>Fusarium oxysporum</i> f. sp. <i>spinaciae</i>	Fusarium wilt	Fos
<i>Peronospora effusa</i> (ex <i>Peronospora farinosa</i> f. sp. <i>spinaciae</i>) /2023	Downy mildew	Pe (ex Pfs)
¹⁷ <i>Stemphylium botryosum</i> (now <i>Stemphylium beticola</i>) /2027	Stemphylium leaf spot	Sb
¹⁸ <i>Stemphylium vesicarium</i>	Stemphylium leaf spot	Sv
<i>Verticillium dahliae</i>	Verticillium wilt	Vd

Insects

<i>Liriomyza langei</i>	Leaf miner	LI
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30. *Valerianella locusta* (Corn salad)

¹⁵ *Ralstonia solanacearum* species complex comprises of three different species see Prior *et al.*, 2016.

¹⁶ As per *Index Fungorum* this is the correct name for this pathogen, Syn. *Colletotrichum dematium* f. *spinaciae*; *Colletotrichum spinaciae*.

¹⁷ As per Woudenberg *et al.*, 2017 and Liu *et al.*, 2020 *Stemphylium botryosum* will be renamed as *Stemphylium beticola* based on ITS rDNA, gapdh and cmdA sequences.

¹⁸ *S. botryosum* isolates from WSU were analyzed as *S. beticola*. Majority of new isolates were analyzed as *S. vesicarium*. It is proposed to breeding companies to identify their isolates based on 'new' sequence analysis. Resistance is published for *S. vesicarium* (Liu *et al.*, 2020; du Toit, 2020).

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Scientific name	English common name	Code
Bacteria		
<i>Acidovorax valerianellae</i>	Bacterial spot	Av
Fungi		
<i>Thielaviopsis basicola</i> (now <i>Berkeleyomyces basicola</i>) /2026	Root rot	Tb (now Bb)

31. Zea mays (Sweet corn)

Scientific name	English common name	Code
Viruses		
<i>Maize dwarf mosaic virus</i>	Maize dwarf mosaic	MDMV
<i>Sugarcane mosaic virus</i>	Sugarcane mosaic	SCMV
Bacteria		
<i>Pantoea stewartii</i> subsp. <i>stewartii</i>	Stewart's wilt	Pst
Fungi		
<i>Bipolaris maydis</i>	Southern corn leaf blight	Bm
<i>Colletotrichum graminicola</i>	Anthracnose leaf blight	Cg
<i>Exserohilum turcicum</i>	Northern leaf blight	Et
<i>Puccinia polysora</i>	Southern rust	Pp
<i>Puccinia sorghi</i>	Common rust	Ps
<i>Ustilago maydis</i>	Common smut	Um



CONSULTED SOURCES FOR THE REVIEW

du Toit, 2020. Stemphylium leaf spot of spinach: Etiology & Management. Presentation at CSA spinach meeting

EPPO Global database: <https://gd.eppo.int/>

Francis, I. M., Jochimsen, K. N., De Vos, P., & van Bruggen, A. H. (2014). Reclassification of rhizosphere bacteria including strains causing corky root of lettuce and proposal of rhizorhapis suberifaciens gen. nov., comb. Nov., Sphingobium Mellinum sp. nov., Sphingobium Xanthum sp. nov. and Rhizorhabdus argentea gen. nov., sp. nov.. *International Journal of Systematic and Evolutionary Microbiology*, 64(Pt_4), 1340–1350.
<https://doi.org/10.1099/ijms.0.058909-0>

Van Bruggen, A. and Francis, I., 2015. Case Investigation and Forensic Evidence for a New Plant Disease: The Case of Lettuce Corky Root. *Plant Disease*, 99(3), pp.300-309.

International Committee on the Taxonomy of Viruses: <https://talk.ictvonline.org/taxonomy/>

Index Fungorum: <http://www.indexfungorum.org/Names/Names.asp>

Leaf mold on tomatoes - final - cornell university. (n.d.). Retrieved January 13, 2022, from
https://rvpadmin.cce.cornell.edu/uploads/doc_128.pdf

Liu, B., Stein, L., Cochran, K., du Toit, L. J., Feng, C., Dhillon, B., & Correll, J. C. (2020). Characterization of leaf spot pathogens from several spinach production areas in the United States. *Plant Disease*, 104(7), 1994–2004.
<https://doi.org/10.1094/pdis-11-19-2450-re>

Mycobank: <http://www.mycobank.org/>

Prior et al. *BMC Genomics* (2016) 17:90 DOI 10.1186/s12864-016-2413-z

W. M. Wintermantel and L. L. Hladky (2013) Complete Genome Sequence and Biological Characterization of Moroccan pepper virus (MPV) and Reclassification of Lettuce necrotic stunt virus as MPV, *Phytopathology* 103, 501-508

Woudenberg JHC, Hanse B, van Leeuwen GCM, Groenewald JZ, Crous PW. *Stemphylium revisited*. *Stud Mycol.* 2017;87:77-103. doi:10.1016/j.simyco.2017.06.001