

Seedborne Microorganisms of Common Vegetable Crops									
Crops	Crop Species	Disease	Pathogen	Microorganism Type	Disease Severity Classes	Seed Treatment	Notes		
Alliaceae									
Onion, Leek	<i>Allium sativa</i> , <i>A. ampeloprasum</i>	Neck rot	<i>Botrytis aclada</i>	Fungus	1				
		Black mold	<i>Aspergillus niger</i>	Fungus	2				
		Smudge	<i>Colletotrichum circinans</i>	Fungus	3				
		Botrytis blight	<i>Botrytis cinerea</i>	Fungus	3				
		Basal rot	<i>Fusarium oxysporum</i> f. sp. <i>cepae</i>	Fungus	3				
		Stemphylium leaf blight	<i>Stemphylium vesicarium</i>	Fungus	3				
		Purple blotch	<i>Alternaria porri</i>	Fungus	3				
Amaranthaceae									
Beet, Swiss Chard	<i>Beta vulgaris</i>	Phoma/Canker	<i>Phoma betae</i>	Fungus	2	20 min. at 125°F/52°C			
		Downy mildew	<i>Peronospora farinosa</i> f. sp. <i>betae</i>	Fungus	2	20 min. at 125°F/52°C			
		Bacterial leaf spot	<i>Pseudomonas syringae</i> pv. <i>aptata</i>	Bacteria	2				
		Cercospora leaf spot	<i>Cercospora beticola</i>	Fungus	2	20 min. at 125°F/52°C			
		Fusarium wilt	<i>Fusarium oxysporum</i> f. sp. <i>betae</i>	Fungus	3				
		Ramularia leaf spot	<i>Ramularia betae</i>	Fungus	3				
		Spinach	<i>Spinacia oleracea</i>	Downy mildew	<i>Peronospora farinosa</i> f. sp. <i>spinaciae</i>	Fungus	2	25 min. at 122°F/50°C	
		Fusarium wilt	<i>Fusarium oxysporum</i> f. sp. <i>spinaciae</i>	Fungus	2	25 min. at 122°F/50°C			
		Verticillium wilt	<i>Verticillium dahliae</i>	Fungus	2				
		Cucumber mosaic virus (CMV) subgroup II		Virus	2	25 min. at 122°F/50°C			
		Anthraxnose	<i>Colletotrichum dematium</i>	Fungus	2				
		Cladosporium leaf spot	<i>Cladosporium variabile</i>	Fungus	2				
		Stemphylium leaf spot	<i>Stemphylium botryosum</i>	Fungus	2				
		White rust	<i>Albugo occidentalis</i>	Fungus	2	25 min. at 122°F/50°C			
		Pseudomonas leaf spot	<i>Pseudomonas syringae</i> pv. <i>spinaciae</i>	Bacteria	2				
Apiaceae									
Carrot	<i>Daucus carota</i>	Bacterial leaf spot	<i>Xanthomonas campestris</i> pv. <i>carotae</i>	Bacteria	1	20 min. at 122°F/50°C			
		Black rot/Black crown	<i>Alternaria radicina</i>	Fungus	1				
		Alternaria leaf blight	<i>Alternaria dauci</i>	Fungus	1	20 min. at 122°F/50°C			
		Cercospora leaf blight	<i>Cercospora carotae</i>	Fungus	2	20 min. at 122°F/50°C			
		Itersonilia canker	<i>Itersonilia perplexans</i>	Fungus	3				
Celery, Celeriac	<i>Apium graveolens</i>	Northern bacterial blight	<i>Pseudomonas syringae</i> pv. <i>apii</i>	Bacteria	1				
		Cercospora (early) blight	<i>Cercospora apii</i>	Fungus	2				
		Septoria (late) blight	<i>Septoria apicola</i>	Fungus	1				
		Black rot/Black crown	<i>Alternaria radicina</i>	Fungus	1				
Cilantro	<i>Coriandrum sativum</i>	Bacterial leaf spot	<i>Pseudomonas syringae</i> pv. <i>coriandricola</i>	Bacteria	2				
		Parsley	<i>Petroselinum crispum</i>	Alternaria leaf blight	<i>Alternaria petroselini</i>	Fungus	2		
		Black rot/Black crown	<i>Alternaria radicina</i>	Fungus	2				
		Cercosporoid leaf blight	<i>Passalora punctum</i>	Fungus	3				
		Septoria blight	<i>Septoria petroselini</i>	Fungus	1				
		Itersonilia canker	<i>Itersonilia perplexans</i>	Fungus	3				
Parsnip	<i>Pastinaca sativa</i>	Itersonilia canker	<i>Itersonilia pastinaca</i>	Fungus	1				
		Black rot/Black crown	<i>Alternaria radicina</i>	Fungus	1				
		Phoma canker	<i>Phoma complanata</i>	Fungus	2				
		Cercosporoid leaf blight	<i>Passalora pastinacae</i>	Fungus	3				
Asteraceae									
Lettuce	<i>Lactuca sativa</i>	Lettuce drop	<i>Sclerotinia sclerotiorum</i> , <i>S. minor</i>	Fungus	2	30 min. at 118°F/48°C			
		Lettuce mosaic virus (LMV)		Virus	1	30 min. at 118°F/48°C			
		Septoria leaf spot	<i>Septoria lactucae</i>	Fungus	1	30 min. at 118°F/48°C			
		Bacterial leaf spot	<i>Xanthomonas campestris</i> pv. <i>vitiatis</i>	Bacteria	2				
		Gray mold	<i>Botrytis cinerea</i>	Fungus	3				
Endive, Escarole, Chicories	<i>Cichorium endivia</i> , <i>C. intybus</i>	Black leaf spot	<i>Alternaria cichorii</i>	Fungus	2				
		Gray mold	<i>Botrytis cinerea</i>	Fungus	3				
Brassicaceae									
Various	<i>Brassicacea</i> spp., <i>Raphanus sativus</i>	Black rot	<i>Xanthomonas campestris</i> pv. <i>campestris</i>	Bacteria	1	20 or 25* min. at 122°F/50°C			
		Xanthomonas leaf spot	<i>Xanthomonas campestris</i> pv. <i>armoraciae</i>	Bacteria	1				
		Xanthomonas leaf spot	<i>Xanthomonas campestris</i> pv. <i>raphani</i>	Bacteria	1				
		Black leg	<i>Phoma lingam</i>	Fungus	1	20 or 25* min. at 122°F/50°C			
		Black spot	<i>Alternaria brassicicola</i>	Fungus	1				
		Alternaria diseases	<i>Alternaria brassicae</i>	Fungus	1	20 or 25* min. at 122°F/50°C			
		Downy mildew	<i>Peronospora parasitica</i>	Fungus	3				
		Fusarium wilt	<i>Fusarium oxysporum</i> f. sp. <i>conglutinans</i>	Fungus	3				
		Peppery leaf spot	<i>Pseudomonas syringae</i> pv. <i>maculicola</i>	Bacteria	3				
		Verticillium wilt	<i>Verticillium dahliae</i>	Fungus	3				
		White rust/White blister	<i>Albugo candida</i>	Fungus	2				
		*20 min. for broccoli, cauliflower, kale, collards, kohlrabi, rutabaga, turnip; 25 min. for Brussels sprouts and cabbage							
		Cucurbitaceae							
		Cucumber, Squash, Melon	<i>Cucumis sativus</i> , <i>Cucurbita</i> spp., <i>Cucumis melo</i>	Fusarium crown and foot rot	<i>Fusarium solani</i> f. sp. <i>cucurbitae</i>	Fungus	2		
				Cucumber green mottle mosaic virus (CGMMV)		Virus	2		Cucumber only
Scab	<i>Cladosporium cucumerinum</i>			Fungus	3				
Fusarium wilt	<i>Fusarium oxysporum</i> f. sp. <i>cucurbitacearum</i>			Fungus	3				
Squash mosaic virus (SqMV)				Virus	1				
Gummy stem blight	<i>Didymella bryoniae</i>			Fungus	1				
Bacterial leaf spot	<i>Xanthomonas campestris</i> pv. <i>cucurbitae</i>			Bacteria	2				
Charcoal rot	<i>Macrophomina phaseolina</i>			Fungus	3		Melon only		
Melon necrotic spot virus (MNSV)				Virus	2		Melon only		
Anthraxnose	<i>Colletotrichum orbiculare</i>			Fungus	2				
Watermelon	<i>Citrullus lanatus</i>			Bacterial leaf spot	<i>Xanthomonas campestris</i> pv. <i>cucurbitae</i>	Bacteria	2		
				Bacterial fruit blotch	<i>Acidovorax avenae</i> subsp. <i>citrulli</i>	Bacteria	1		
				Fusarium wilt	<i>Fusarium oxysporum</i> f. sp. <i>niveum</i>	Fungus	2		
Fabaceae									
Bean	<i>Phaseolus</i> spp.	Bean common mosaic virus (BCMV)		Virus	1				
		Gray mold	<i>Botrytis cinerea</i>	Fungus	3				
		Alfalfa mosaic virus (AMV)		Virus	2				
		Southern bean mosaic virus (SBMV)		Virus	2				
		Anthraxnose	<i>Colletotrichum</i> spp.	Fungus	1				
		Cercospora leaf blotch	<i>Cercospora canescens</i>	Fungus	2				
		Bacterial wilt	<i>Curtobacterium flaccumfaciens</i> pv. <i>flaccumfaciens</i>	Bacteria	1				
		Charcoal rot/Ashy stem blight	<i>Macrophomina phaseolina</i>	Fungus	3				
		Angular leaf spot	<i>Phaeoisariopsis griseola</i>	Fungus	2				
		Bacterial brown spot	<i>Pseudomonas syringae</i> pv. <i>syringae</i>	Bacteria	1				
		Common bacterial blight	<i>Xanthomonas campestris</i> pv. <i>phaseoli</i>	Bacteria	1				
		Leaf and pod blight	<i>Phoma exigua</i> var. <i>exigua</i>	Fungus	2				
		Halo blight	<i>Pseudomonas syringae</i> pv. <i>phaseolicola</i>	Bacteria	1				
		Edamame	<i>Glycine max</i>	Anthraxnose	<i>Colletotrichum</i> spp.	Fungus	2		
				Bacterial blight	<i>Pseudomonas savastanoi</i> pv. <i>glycinea</i>	Bacteria	2		
Phomopsis seed decay	<i>Phomopsis longicola</i>			Fungus	3				
Septoria leaf spot	<i>Septoria glycines</i>			Fungus	3				
Pod and stem blight	<i>Diaporthe phaseolorum</i> var. <i>sojae</i>			Fungus	3				
Soybean mosaic virus (SMV)				Virus	1				
Garden Pea	<i>Pisum sativum</i>	Northern stem canker	<i>Diaporthe phaseolorum</i> var. <i>caullivora</i>	Fungus	3				
		Tobacco ringspot virus (TRSV)		Virus	1				
		Ascochyta blights	<i>Ascochyta</i> spp., <i>Mycosphaerella pinodes</i> , <i>Phoma medicaginis</i> var. <i>pinodella</i>	Fungus	1				
		Gray mold	<i>Botrytis cinerea</i>	Fungus	3				
		Anthraxnose	<i>Colletotrichum</i> spp.	Fungus	2				
		Fusarium wilt and root rot diseases	<i>Fusarium</i> spp.	Fungus	2				
		Pea early browning virus (PEBV)		Virus	2				
		Pea seedborne mosaic virus (PSBMV)		Virus	1				
		Downy mildew	<i>Peronospora viciae</i>	Fungus	3				
		Bacterial blight	<i>Pseudomonas syringae</i> pv. <i>pisii</i>	Bacteria	1				
Poaceae									
Sweet Corn	<i>Zea mays</i>	Black bundle disease	<i>Acremonium strictum</i>	Fungus	2				
		Southern leaf blight	<i>Helminthosporium maydis</i>	Fungus	3				
		Black kernel rot	<i>Botryodiplodia theobromae</i>	Fungus	3				
		Goss's bacterial blight and wilt	<i>Clavibacter michiganensis</i> subsp. <i>nebraskensis</i>	Bacteria	3				
		Anthraxnose	<i>Colletotrichum graminicola</i>	Fungus	3				
		Fusarium diseases	<i>Fusarium</i> spp.	Fungus	2				
		Northern corn leaf spot	<i>Helminthosporium carbonum</i>	Fungus	3				
		Charcoal rot	<i>Macrophomina phaseolina</i>	Fungus	3				
		Maize dwarf mosaic virus (MDMV)		Virus	3				
		Seedling blight	<i>Penicillium</i> spp.	Fungus	3				
		Downy mildew	<i>Peronosclerospora sorghi</i>	Fungus	3				
		Head smut	<i>Sporisorium holci-sorghii</i>	Fungus	3				
		Ear rot; stalk rot; seedling blight	<i>Stenocarpella macrospora</i> , <i>S. maydis</i>	Fungus	2				
		Solanaceae							
		Eggplant	<i>Solanum melongena</i>	Charcoal rot/Ashy stem blight	<i>Macrophomina phaseolina</i>	Fungus	3		
Anthraxnose	<i>Colletotrichum</i> spp.			Fungus	2				
Eggplant mosaic virus (EMV)				Virus	2				
Phomopsis fruit rot; blight	<i>Phomopsis vexans</i>			Fungus	2				
Phytophthora diseases	<i>Phytophthora capsici</i>			Fungus	3				
Bacterial wilt	<i>Pseudomonas solanacearum</i>			Bacteria	3				
Tomato mosaic virus (ToMV)				Virus	2				
Pepper	<i>Capsicum annuum</i>			Anthraxnose	<i>Colletotrichum</i> spp.	Fungus	2	25 min. at 122°F/50°C	
		Alfalfa mosaic virus (AMV)		Virus	2				
		Charcoal rot/Ashy stem blight	<i>Macrophomina phaseolina</i>	Fungus	3				
		Phytophthora diseases	<i>Phytophthora capsici</i>	Fungus	3				
		Bacterial wilt	<i>Pseudomonas solanacearum</i>	Bacteria	3				
		Tomato mosaic virus (ToMV)		Virus	2				
		Pepper mild mottle virus (PMMoV)		Virus	1				
		Bacterial spot	<i>Xanthomonas campestris</i> pv. <i>sycophanta</i>	Bacteria	1	25 min. at 122°F/50°C			
Tomato	<i>Solanum lycopersicum</i>	Anthraxnose	<i>Colletotrichum</i> spp.	Fungus	3	25 min. at 122°F/50°C			
		Alfalfa mosaic virus (AMV)		Virus	2				
		Bacterial spot	<i>Xanthomonas campestris</i> pv. <i>vesicatoria</i>	Bacteria	1	25 min. at 122°F/50°C			
		Early blight	<i>Alternaria solani</i>	Fungus	2	25 min. at 122°F/50°C			
		Bacterial canker	<i>Clavibacter michiganensis</i> subsp. <i>michiganensis</i>	Bacteria	1	25 min. at 122°F/50°C			
		Stem rot; stem canker	<i>Didymella lycopersici</i>	Fungus	3				
		Leaf mold	<i>Fulvia fulva</i>	Fungus	3	25 min. at 122°F/50°C			
		Fusarium wilt	<i>Fusarium oxysporum</i> f. sp. <i>lycopersici</i>	Fungus	2	25 min. at 122°F/50°C			
		Phytophthora diseases	<i>Phytophthora capsici</i>	Fungus	3				
		Bacterial wilt	<i>Pseudomonas solanacearum</i>	Bacteria	3				
		Bacterial speck	<i>Pseudomonas syringae</i> pv. <i>tomato</i>	Bacteria	1	25 min. at 122°F/50°C			
		Syringae leaf spot	<i>Pseudomonas syringae</i> pv. <i>syringae</i>	Bacteria	2				
		Tobacco mosaic virus (TMV)		Virus	2				
		Tomato mosaic virus (ToMV)		Virus	2				