National Onion Industry Biosecurity Plan

Appendix 1: Threat Summary Tables

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Invertebrates

Information provided below is a basic overview and may change given further research or if new information comes to hand.

Common name	Life form	Scientific name	Relevant host	Plant part affected	Distribution and Comments (quarantine risk)	Entry potential	Establishment potential	Spread potential	Economic impact	Risk
Dry bulb mite, Garlic mite, Onion mite, Wheat curl mite	Mite	*Aceria tulipae*	Onion, garlic and shallot	Foliage	Distribution: Africa, Central America, Canada, Europe, Fiji, Asia, NZ, UK, USA, former USSR. Present in NSW, SA, TAS and VIC. Possibly put in active control table.	High - Hard to detect, can remain on bulbs for extended periods	Medium	Low	Medium	**Low**
Allium leaf miner	Moth	*Acrolepia sapporensis*	Onion, shallot, Japanese bunching onion, welsh onion	Foliage	Distribution: Japan and Korea	High	Low	Low	Low	**Negligible**
Leek moth	Moth	*Acrolepiopsis assectella*	Onion, leek, garlic, shallot, chives	Bulb, foliage, flowering heads	Distribution: Europe, Russia, UK, USA (Hawaii only), former USSR, China, north Africa	Low	Low	Medium	Medium – Larvae mine stem inducing bulb rot.	**Extremely low**
	Thri	*Aeolothrips collaris*	Onion	Foliage	Distribution: Bulgaria, India	Medium			Low	

Common name	Life form	Scientific name	Relevant host	Plant part affected	Distribution and Comments (quarantine risk)	Entry potential	Establishment potential	Spread potential	Economic impact	Risk
Common click beetle, Elaterid beetle, Lined click beetle, Striped elaterid beetle, Wireworm	Btle	*Agriotes lineatus*	Onion, affects all *Allium* spp.	Seedling. Leaves, external feeding	Distribution: Europe, Canada, Iran, Israel, UK, USA	Medium	High - Hosted on a wide range of agricultural crops	Medium	Medium	**Low**
Heart and dart moth	Moth	*Agrostis exclamationis*	Onion		Uzbekistan, Bulgaria, Former USSR, Former Yugoslavia, Germany, Hungary, Italy, Poland, Romania, Spain, United Kingdom	Low	Medium	Medium	Low	**Negligible**
Black cutworm, Common cutworm, Dart moth, Tobacco cutworm, Turnip dart moth, Turnip moth	Moth	*Agrotis segetum*	Onion, leek, round headed garlic	Foliage, root	Distribution: Europe, Asia, Africa, UK, former USSR,	High - infested plant material or in soil contaminating shipments; both larvae and pupae can hide within infested bulbs	High - Hosted on a wide range of agricultural crops	High	Medium - Onions not a major host	**Medium**
Cutworm	Moth	*Agrotis tokionis*	Onion	Foliage	Distribution: China and Korea	Low				
Sting nematode	Nem	*Belonolaimus gracilis*	Onion	Root	Distribution: USA					

Common name	Life form	Scientific name	Relevant host	Plant part affected	Distribution and Comments (quarantine risk)	Entry potential	Establishment potential	Spread potential	Economic impact	Risk
Sting nematode	Nem	*Belonolaimus longicaudatus*	Onion	Root	North America	Low – Commonly arrives in shipments containing turf/soil	Medium – Large host range and conducive to Australian soils and climate.	Low – Not seed borne	Medium – Particularly harmful in young plants	**Extremely Low**
Black thrips; Onion thrips; Pea thrips	Thri	*Caliothrips indicus*	Onion	Foliage	Distribution: Africa, Bulgaria, India, Pakistan, Thailand	Medium	Low	Medium	Low	**Negligible**
	Bug	*Capsodes lineolatus*	Onion	Foliage	Distribution: Italy					
	Fly	*Ceroxys latiusculus*	Onion	Bulb	Distribution: Japan					
Onion weevil	Btle	*Ceuthorhynchus jakovlevi*	Onion, garlic	Foliage	Distribution: Korea, former USSR				Low	
Onion weevil	Btle	*Ceutorhynchus suturalis*	Onion	Foliage	Distribution: Hungary, Netherlands		Low		Medium	
Chrysanthemum leaf miner; Cruciferous leaf miner; Pea leaf miner	Fly	*Chromatomyia horticola*	Allium spp.	Leaf	Distribution: Europe, Africa, Asia, UK	Medium	Medium	Medium	Medium	**Low**
Cyclamen tortrix	Moth	*Clepsis spectrana*	Onion	Foliage	Distribution: Canada, Europe, UK		Low			

Common name	Life form	Scientific name	Relevant host	Plant part affected	Distribution and Comments (quarantine risk)	Entry potential	Establishment potential	Spread potential	Economic impact	Risk
	Btle	*Colaphellus alpinus*	Onion		Distribution: former USSR					
	Moth	*Copitarsia spp*	Onion	Foliage	Distribution: Chile, Mexico and Peru	Low			Medium	
	Btle	*Ctenicera strangulata*	Onion and garlic	Root	Distribution: NZ	Medium	Low	Low	Medium	**Extremely low**
Cassava root bug, Shield bug	Bug	*Cyrtomenus bergi*	Onion	Bulb	Distribution: Colombia, Costa Rica, Trinidad and Tobago.		Medium	Low	Negligible	
Onion fly, Onion maggot	Fly	*Delia antiqua*	Onion, shallot, Japanese bunching onion or Welsh onion, leek, garlic and chives	Bulb, foliage, root, seedling	A number of interceptions at border on garlic. Distribution: Europe, Canada, Asia, UK, USA	High – Larvae imported inside bulbs	Medium	High	High – particularly for crops establishin g.	**High**
Turnip maggot	Fly	*Delia floralis*	Onions and Leek		Asia, Europe and North America	Low	Medium	Medium	Low	**Extremely low**
Bean fly, Bean seed maggot, Potato maggot, Turnip maggot	Fly	*Delia florilega*	Onion, leek and garlic	Bulb, seedling	Distribution: North and South America, Canada, Europe, UK, former USSR. A number of detections made at the border.	High	Medium	High	High - High impact on seeds and seedlings	**High**
Onion maggot	Fly	*Delia hirticrura*	Allium spp.	Seedling	Distribution: Egypt, Mediterranean countries. A number of detections at the border	High	Medium	High		

Common name	Life form	Scientific name	Relevant host	Plant part affected	Distribution and Comments (quarantine risk)	Entry potential	Establishment potential	Spread potential	Economic impact	Risk
	Bug	*Dolycoris indicus*	Onion	Flower	Distribution: Africa, India and Pakistan	Low	Low	Medium	Low	**Negligible**
Garlic borer; Garlic moth	Moth	*Dyspessa ulula*	Onion and garlic	Bulb	Distribution: north Africa, Europe, Middle East	High	Low	High	High	**Medium**
Potato flea beetle	Btle	*Epitrix cucumeris*	Onions, leek, garlic		Canada, USA, Dominican Republic, Guadeloupe, Jamaica, Puerto Rico, Ecuador	Low	Medium	Low	Low	**Negligible**
Salt marsh caterpillar	Moth	*Estigmene acraea*	onion	Whole plant	Distribution: Colombia, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, USA	Unknown	Medium	Medium	Low	
Onion bulb fly; Mediterranean lesser bulb fly	Fly	*Eumerus amoenus*	Onion	Bulb	Distribution: Egypt; France; Israel	High - as there is a risk of the pupae adhering to the bulbs and larvae being present in damaged bulbs.	Medium – possible not well adapted to climatic conditions in growing regions	High - Capable of flight	High - Known to cause significant loss in Egypt	**Medium**
Lesser bulb fly, Onion bulb fly, Small narcissus fly.	Fly	*Eumerus strigatus*	Onion and garlic	Bulb	Distribution: China, Europe, Japan, NZ, Romania, UK, former USSR.	High - detections already made at border	High - suitable hosts are present	High - Adults capable of strong flight	High – pest of onions grown from seed	**High**
	Fly	*Euxesta anna*	Onion	Bulb	Distribution: Japan					

Common name	Life form	Scientific name	Relevant host	Plant part affected	Distribution and Comments (quarantine risk)	Entry potential	Establishment potential	Spread potential	Economic impact	Risk
Cherry worm, Root spotted fly	Fly	*Euxesta notata*	Onion	Bulb	Distribution: China, Japan, NZ and USA					
Army worm	Moth	*Euxoa tritici*	Onion	Foliage	Distribution: Chile, Mongolia, Uk			High	High	
Army worm	Moth	*Faronta spp*	Onion	Foliage	Distribution: Argentina, Canada, Chile, Uruguay			High	High	
Eastern flower thrips	Thri	*Frankliniella intonsa*	Onion	Foliage	Distribution: Europe, Canada, Asia, UK, USA, former USSR	High - tiny size, eggs inside plant.	High - wide host range, parthenogenesis	Medium – weak fliers	Medium - Potential vector of viruses	**Medium**
	Thri	*Frankliniella tenuicornis*	Onion, Japanese, bunching onion, welsh onion, garlic	Flowers, foliage	Distribution: Canada, China, former Czech Republic, Finland, Germany, Italy, Korea, Netherlands, Poland, Taiwan, Turkey, USA, former USSR	High - tiny size, eggs inside plant.	High - wide host range, parthenogenesis	Medium – weak fliers	Medium - Potential vectors of viruses	**Medium**
Stone leek leaf beetle	Btle	*Galeruca daurica*	Onion and wild onion	Foliage	Distribution: France, Mongolia, former USSR.					
	Btle	*Galeruca tanaceti*	Onion, chives, leek, garlic and shallot	Foliage	Distribution: Bulgaria, France, German, Sweden, UK, Ukraine					
	Btle	*Gronopus inaequalis*	Onion		Distribution: former USSR					
Double-striped Pug	Moth	*Gymnoscelis pumilata/ Gymnoscelis rufifasciata*	Onion	Flower, seed	Distribution: Egypt, Israel, Italy,Spain, Switzerland, former USSR		Medium	High		

Common name	Life form	Scientific name	Relevant host	Plant part affected	Distribution and Comments (quarantine risk)	Entry potential	Establishment potential	Spread potential	Economic impact	Risk
Clover cutworm	Moth	*Hadula trifolii*	Onions and Leek		Asia, Europe, Northern Africa and North America	Medium	Medium	High	Low	**Extremely low**
Cereal thrips; Grass thrips; Rice aculeates thrips; Rye thrips	Thri	*Haplothrips aculeatus*	Onion - does it regularly occur on onions?	Foliage, seed	Distribution: Asia, Europe, NZ, UK	High	Medium	High	Low	**Low**
Onion stem borer	Moth	*Hydraecia mongoliensis*	Onion	Stem	Distribution: Japan	Low	Low	High	High	**Low**
Bright-line brown-eye moth	Moth	*Lacanobia oleracea*	Onions		Israel and much of Europe	Low			Low	
Lily beetle	Btle	*Lilioceris lilii*	Onion and garlic	Foliage	Distribution: Europe, Asia, north Africa, North America	Medium - entry through lilies and bulb imports	Medium - Can establish in urban areas through lilies in gardens	High - Strong Flyers	Low - not a major pest of onions	**Extremely low**
Lily beetle	Btle	*Lilioceris merdigera*	Onion and garlic	Foliage	Distribution: Europe, Asia, north Africa, North America	Medium - entry through lilies and bulb imports	Medium - Can establish in urban areas through lilies in gardens	High - Strong Flyers	Low - not a major pest of onions	**Extremely low**
Onion plant bug	Bug	*Lindbergocapsus allii*	Onion	Foliage	Distribution: Canada, USA					

Common name	Life form	Scientific name	Relevant host	Plant part affected	Distribution and Comments (quarantine risk)	Entry potential	Establishment potential	Spread potential	Economic impact	Risk
Stone leek leafminer	Fly	*Liriomyza cepae*	Onion and garlic	Bulb, foliage	Distribution: Germany, Hungary, Italy, Netherlands and Taiwan	High	Medium	Medium - not strong flyers	High – Feed on bulb and foliage	**Medium**
Leaf miner	Fly	*Liriomyza chinensis*	Onion and leek	Foliage	Distribution: China (Taiwan), France, Japan, Korea, Malaysia	High	Medium	Medium - not strong flyers	Medium – Only feed on foliage	**Low**
Leaf miner, Pea leafminer, Serpentine leafminer	Fly	*Liriomyza huidobrensis*	Onion and garlic	Foliage	Distribution: Belgium, Netherlands, UK, Israel, North and South America, Hawaii	High	High	Medium - not strong flyers	Medium – Only feed on foliage	**Medium**
Leafminer	Fly	*Liriomyza nietzkei*	Onion, leek and garlic	Foliage	Distribution: France, Germany, Italy and Switzerland.	Medium	Medium	Medium - not strong flyers	Medium – Only feed on foliage	**Low**
American leafminer, Cabbage leaf miner, Serpentine leaf miner, Tomato leafminer, Vegetable leafminer	Fly	*Liriomyza sativae*	*Allium* sp.	Foliage	Distribution: Central America, Asia, North America, New Zealand, UK, Africa, Middle East, Samoa.	High	High	Medium - not strong flyers	High	**High**

Common name	Life form	Scientific name	Relevant host	Plant part affected	Distribution and Comments (quarantine risk)	Entry potential	Establishment potential	Spread potential	Economic impact	Risk
American serpentine leafminer, Chrysanthemum leaf miner, Serpentine leaf miner	Fly	*Liriomyza trifolii*	Onion, garlic and chives	Foliage	Distribution: Asia, Europe, Africa, Middle East, UK.	High	High	Medium - not strong flyers	Medium – Only feed on foliage	**Medium**
Bulb fly	Fly	*Lonchaea chorea*	Onion	Bulb	Distribution: Japan, Lithuania, NZ, UK, former USSR.	Medium				
Lance nematode, Needle nematode, Tomato black ring nematode	Nem	*Longidorus elongatus*	Onion	Root	Distribution: Belgium; Bulgaria; Canada; Europe; Italy; Pakistan; Poland; Sweden; UK; USA; former USSR.	Medium – Widespread however entry only likely through imports containing soil.	High – Large host and environmental range	Low - may be disseminated in soil, runoff or via transplanted plants and seedlings.	Medium - minor host on onions but can vector a range of virus'	**Low**
Lance nematode; Needle nematode	Nem	*Longidorus vineacola*	Onion	Root	Distribution: Belgium; Bulgaria; Israel; Middle East; Portugal; Spain; UK (British Isles); former USSR			Low		

Common name	Life form	Scientific name	Relevant host	Plant part affected	Distribution and Comments (quarantine risk)	Entry potential	Establishment potential	Spread potential	Economic impact	Risk
Colombia root-knot nematode, Root-knot nematode	Nem	*Meloidogyne chitwoodi*	Onion and garlic	Leaves, roots	Distribution: Argentina; Belgium; Germany; Mexico; Netherlands (rd); South Africa; USA	Medium – Widely distributed throughout the world	Medium	Low – Unable to distribute itself great distances	Low – Not a major pest of onions	**Negligible**
Rice root knot nematode	Nem	*Meloidogyne graminicola*	Onions		South Africa, USA, Brazil, Colombia, Bangladesh, India and South-eastern Asia.	Medium – Widely distributed throughout the world	Medium - hosted by a wide range of grassy species, prefers flood plane soils	Low - Unable to distribute itself great distances	Low – Not a major pest of onions	**Negligible**
Beet webworm, Meadow moth, sugarbeet webworm	Moth	*Loxostege sticticalis*	Onion	Foliage	Distribution: Bulgaria, Canada, China, Europe, Italy, Mongolia, Netherlands, Romania, Ukraine, USA, former USSR, Yugoslavia	High	High - wide range of hosts	High - migratory	Medium	**Medium**
Lucerne plant bug, Pale legume bug		*Lygus elisus*	Onion	Seedling	Distribution: Canada, USA					
	Bug	*Lygus gemellatus*	Onions		Finland, unconfirmed: Bulgaria, Hungary, Poland	Low			Low	
Western plant bug	Bug	*Lygus hesperus*	Onion	Seedling	Distribution: USA					
Aster leafhopper, Six-spotted leafhopper	Bug	*Macrosteles quadrilineatus*	Onion		Distribution: Canada, USA. Transmits Aster yellows			Medium	Medium	

Common name	Life form	Scientific name	Relevant host	Plant part affected	Distribution and Comments (quarantine risk)	Entry potential	Establishment potential	Spread potential	Economic impact	Risk
Cabbage armyworm, Cabbage moth	Moth	*Mamestra brassicae*	Onion, leek	Whole plant	Distribution: Africa, Europe, Asia, UK, former USSR		High	High	High	
Two striped grasshopper	Locu	*Melanoplus bivittatus*	Onions		Widespread in North America	Low	Medium	Medium	Low	**Extremely low**
Lesser migratory grasshopper	Locu	*Melanoplus sanguinipes*			Canada, USA	Low	High	High	High	**Medium**
Large narcissus fly	Fly	*Merodon equestris*	Onion		Europe, Canada, Japan, New Zealand and USA	High	High	Medium	Medium	**Medium**
	Btle	*Oxycetonia versicolor*	Onion	Flower		Low	Low	Low	Low	**Negligible**
Stubby root nematode	Nem	*Paratrichodorus allius*	Onion	Root	Distribution: Belgium; Chile; Germany; Hong Kong; Israel; Kenya; Portugal; South Africa; Tanzania; UK; USA		Medium – found in similar climatic regions throughout the world	Low– Unable to distribute itself great distances	Low – Onions are not a major host	
Pearly underwing moth, Variegated cutworm	Moth	*Peridroma saucia*	Onion	Whole plant	Distribution: Europe, UK, USA	Medium	High	High	Low	**Low**

Common name	Life form	Scientific name	Relevant host	Plant part affected	Distribution and Comments (quarantine risk)	Entry potential	Establishment potential	Spread potential	Economic impact	Risk
Allium leaf miner	Fly	*Phytomyza gymnostoma*	Onions, leek	Stalks and bulbs	Turkey, Turkmenistan, Austria, Croatia, Czech Republic, Denmark, France, Germany, Hungary, Italy, Poland, Serbia and Montenegro, Slovakia, Slovenia, Spain, Switzerland, Ukraine, UK	High	Medium	High	High	**High**
Bulb mite	Mite	*Rhizoglyphus setosus*	Onion, leek and garlic	Bulb	Distribution: China (Taiwan), Cuba and France	High	High	Medium	High	**High**
Bulb mite	Mite	*Rhizoglyphus callae*	Onion, shallot and garlic	Bulb	Distribution: Argentina, Chile, Egypt, Taiwan, Turkey, former USSR	High	High	Medium	High	**High**
	Moth	*Sarcopolia illoba*	Onion	Bulb	Distribution: Japan, Korea, former USSR					
	Nem	*Scutellonema clathricaudatum*	Onions		China, India, Thailand, Cuba, South Africa and Central Africa	Low – Would likely only come in on soil	Medium – Large host and climatic range	Low - Unable to distribute itself great distances	Low – No significant impacts on Onions recorded	**Negligible**
	Moth	*Spodoptera eridania*	Onions	Stalks	Widespread throughout the Americas	Medium	High	High	Low	**Low**
Fall armyworm	Moth	*Spodoptera frugiperda*	Allium - Onions, garlic, leek		Germany, North and South America	Medium	High	High	Low	**Low**

Common name	Life form	Scientific name	Relevant host	Plant part affected	Distribution and Comments (quarantine risk)	Entry potential	Establishment potential	Spread potential	Economic impact	Risk
Cotton leafworm	Moth	*Spodoptera littoralis*	Onions		Widely distributed in Africa, southwest Asia, and Mediterranean basin. To a lesser extent through northern Europe.	Low	High	High	Medium	**Low**
Garlic fly	Fly	*Suillia lurida*	Onion, leek and garlic	Bulb, leaf	Central Europe	Medium		Medium	Medium	
	Fly	*Syritta pipiens*	Onion	Bulb	Distribution: Romania, USA			Medium		
Spider mite	Mite	*Tetranychus urticae (red form)*	Onion	Bulb	Distribution: America, Africa, Europe and Asia	High	High	Low	Low	**Extremely low**
	Thri	*Thrips alliorum*	Onion	Foliage	Distribution: East Asia, Japan, Korea	High	High	Medium	Medium - Potential vector of viruses	**Medium**
Cabbage thrips, Field thrips	Thri	*Thrips angusticeps*	Onion, leek and garlic	Whole plant	Distribution: Europe, Africa, Middle East, UK	High	High	Medium	Medium - Potential vector of viruses	**Medium**
Cabbage looper	Moth	*Trichoplusia ni*	Onions		Asia, Europe, Africa, North and South Amerca	Medium	High	High	Low	**Low**
Jumping plant louse	Bug	*Trioza tremblayi*	Onion	Foliage	Distribution: Italy, Turkey and UK				Medium	
Black onion fly	Fly	*Tritoxa flexa*	Onion	Bulb	Distribution: USA			High	Medium	

Common name	Life form	Scientific name	Relevant host	Plant part affected	Distribution and Comments (quarantine risk)	Entry potential	Establishment potential	Spread potential	Economic impact	Risk
Spotted cutworm	Moth	*Xestia c-nigrum*	Onions		Much of Asia, Europe, and North America	Medium	High	Medium	Low	**Extremely low**
Dagger nematode	Nem	*Xiphinema diversicaudatum*	Onion, Leek	Root	Distribution: Europe, NZ, Russia, South Africa, UK, USA.	Medium	High	Low	Medium - can vector viruses	**Low**
Elegant grasshopper	Locu	*Zonocerus elegans*	Onions		Widespread in Central and Southern Africa	Low	Medium	Medium	Low	**Extremely low**
Variegated grasshopper	Locu	*Zonocerus variegatus*	Onions		Central Africa	Low	Medium	Medium	Low	**Extremely low**
	Nem	*Zygotylenchus guevarai*	Onions		Pakistan, Turkey, Uzbekistan, South Africa, Tunisia, and much of Europe	Medium	Medium	Low	Low	**Negligible**

Note: See end of following table for legend

Pathogens

Information provided below is a basic overview and may change given further research or if new information comes to hand.

Common name	Life form	Scientific name	Relevant host	Plant part affected	Distribution and Comments (quarantine risk)	Entry potential	Establishment potential	Spread potential	Economic impact	Risk
Dieback, Leaf tip blotch	Fun	*Aschochyta allii-cepae*	Onion	Leaf-tips causing leaf blotches and tip dieback	Distribution: UK.	Medium – seed borne	Medium	Medium	Low – Already manage a number of low or moderate pathogenic leaf pests	**Extremely low**
Leaf blight, Leaf rot/blast, Neck rot	Fun	*Botryotinia squamosa*	Onion, Japanese bunching onion, Welsh onion, leek, garlic	Leaf, seed	Seed borne - China, Japan, Korea, Europe, Mauritius, Americas, New Caledonia, New Zealand. Also recorded to have been picked up by Quarantine Tasmania in garlic shoots from China.	High – Detected a border on several occasions	Medium	High	High	**High**

Common name	Life form	Scientific name	Relevant host	Plant part affected	Distribution and Comments (quarantine risk)	Entry potential	Establishment potential	Spread potential	Economic impact	Risk
Withertip, Leaf spot of onion and garlic	Fun	*Cercospora duddiae*	Onions, garlic, leek	Foliage	Africa: Mauritius, Nigeria, Sierra Leone, Somalia, Uganda; Asia: Borneo, Brunei, Burma, India, Indonesia, Oman, The Yemen; Australasia: Papua New Guinea; North America: West Indies (Barbados, Jamaica). On onion symptoms range from slight chlorosis to death, young lesions appear as circular yellow chlorotic spots 3-5mm diam. Lesions coalesce to cause a mottled appearance.	Medium	Medium	High	Medium – Can cause significant damage however is susceptible to control by foliar fungicides	**Low**
	Fun	*Ciborinia allii*	Welsh onion, Onion, Japanese bunching onion	Leaf	Distribution: Taiwan	Low – Unlikely for sclerotia to survive transport and limited to Taiwan	Medium	Medium	Low – has not been recorded in the field on *Allium cepa*	**Negligible**

Common name	Life form	Scientific name	Relevant host	Plant part affected	Distribution and Comments (quarantine risk)	Entry potential	Establishment potential	Spread potential	Economic impact	Risk
Leaf spot, Leaf Blotch	Fun	*Cladosporium allii*	Onion, leek		UK, Brazil, China	High – Many *Cladosporium* species are frequently isolated in Onion seed	High – Australian conditions would favour this disease	High – potential to spread to all production areas	High - Disease has severe impact on the standing crop when it becomes prevalent, and it would be expected to establish particularly in southern growing area.	**Extremely low**
Basal rot - onion	Fun	*Fusarium oxysporum f.sp.cepae*	Onion, garlic		Distribution: India, Japan, Italy and US.	High – May enter undetected on bulb imports	Medium – Can live for a long time in the soil	Medium – Soil borne, would be spread through movement of commodity	Medium – effects bulbs in both field and storage environments	**Low**
		Leptotrichila porri								

Common name	Life form	Scientific name	Relevant host	Plant part affected	Distribution and Comments (quarantine risk)	Entry potential	Establishment potential	Spread potential	Economic impact	Risk
Onion mite-borne latent potexvirus	Vir	Onion mite-borne latent potexvirus	Onion, shallot, rakkyo, leek, crow garlic	Whole plant	Not seed-borne - France, the Netherlands, Spain, and countries of the former USSR	Low – may be imported in bulbs/plants for vegetative propagation	Medium – Several hosts established in Australia	Medium – Primary vector, *Aceria tulipae,* is established in Australia		
	Phyto	*Onion yellows phytoplasma*	Onion	Foliage	Japan, USA	Low				
Rhubarb crown rot	Bac	*Pectobacterium rhapontici*	Onions, garlic	Stalks and Bulbs	North America, Iran, Israel, Japan, Korea, Malaysia, Belgium, Czechoslovakia, France, Italy, Lithuania, Netherlands, Norway, Poland, Ukraine, UK.	High - Interception at the border has occurred	High – Suitable climate and hosts within Australia	Medium	Low– Onions are not a major host	**Low**
Pepper veinal mottle virus	Vir	Pepper veinal mottle virus	Onions		Cote d'Ivoire, Ghana, Kenya, Nigeria, and South Africa			Medium - Vectored by *Aphis gossypii, A spiraecola , Myzus persicae, Toxoptera citricidus*		
Pod and stem blight	Fun	*Phomopsis longicola*	Onion and garlic		Distribution: Asia, Europe, Africa, North America, South America and Central America.					

Common name	Life form	Scientific name	Relevant host	Plant part affected	Distribution and Comments (quarantine risk)	Entry potential	Establishment potential	Spread potential	Economic impact	Risk
Leaf blight	Fun	*Phyllosticta allii*	Onion	Foliage	Likely to be controlled with fungicide applications for downy mildew			Main discharge mechanism thought to be rain splash	In Japan, reduced onion weight by 70-80%	
Bacterial leaf spot	Bac	*Pseudomonas syringae pv porri (exotic strains)*	Onion, leek, spring onions, shallots and garlic	Leaves	Few records of the strains we have here. Would require further research.	Low – could possibly be air borne	Low	Low	Medium - seasonal	**Extremely low**
Puccinia spp.	Fun	*Puccinia* spp. *Puccinia allii , Puccinia allii-cepulae , Puccinia alliorum, Puccinia cylodontis, Puccinia mixta, Puccinia permixta, Puccinia porri, Puccinia schisma, Puccinia sessali.*	Alliums		20 species of *Puccinia* effect Alliums, of which 8 effect crop species. Uncertainty regarding rust species presence in Australia and those of significance is a major concern.[1]	High	High	High	Extreme	**Extreme**

[1] It is not clear which *Allium* infecting rusts are present in Australia, but it would be devastating to repeat the Californian experience (in the late 1990's the Californian garlic industry experienced a 90% decline in production due to an epidemic of rust disease) by having a new rust race introduced. There is an urgent need of a study to clarify which races of *Allium* rusts are present in Australia. The findings of these studies should be used to formulate Quarantine policy. It would be appropriate to recommend further work on this disease complex be undertaken through a Biosecurity Australia Exotic Diagnosticians Scholarship to resolve the confusion (per. comm. Dean Metcalf, 2007).

Common name	Life form	Scientific name	Relevant host	Plant part affected	Distribution and Comments (quarantine risk)	Entry potential	Establishment potential	Spread potential	Economic impact	Risk
Shallot latent carlavirus	Vir	Shallot latent carlavirus	Onion, shallot, leek, garlic	Whole plant	Korea, Denmark, France, United Kingdom, Canada	Low	Low – Identified vector not present in Australia	Low – Identified vector not present in Australia	Medium – Can cause moderate damage if vector present.	**Negligible**
Shallot mite-borne latent potexvirus	Vir	Shallot mite-borne latent potexvirus	Onion, shallot and crow garlic	Whole plant						
Shallot virus x	Vir	Shallot virus x								
Shallot yellow stripe potyvirus	Vir	Shallot yellow stripe potyvirus	Onion, various *Allium*	Whole plant	Asia	Low	Low		Medium	
Sint-Jan's onion latent carlavirus	Vir	Sint-Jan's onion latent carlavirus	Onion, various *Allium*	Whole plant	Indonesia, Netherlands				Low	
Tomato black ring nepovirus	Vir	Tomato black ring nepovirus	Onion, shallot, top onion, leek and chives	Whole plant, seed	China, India, Japan, Turkey, Europe, Kenya, Morocco, Seychelles, North America, Brazil, Chile	Medium – May be transmitted in seed, large host range	Low - Requires *Longidorus* nematodes as vectors	Low – Requires *Longidorus* nematodes as vectors	Low – No significant loss in onions has been recorded	**Negligible**

Common name	Life form	Scientific name	Relevant host	Plant part affected	Distribution and Comments (quarantine risk)	Entry potential	Establishment potential	Spread potential	Economic impact	Risk
Onion smut	Fun	*Urocystis cepulae*	Onion, spring onion, shallot, leek, garlic, crow garlic	Whole plant, effects plants while seedlings	Detected from time to time in South Australia through annual inspections – last detection in 2002. Upon detection it was eradicated.	High – Quarantine controls in place to prevent entry, however has entered Australia before	High – Has already shown to be able to established in SA, and is adaptable to proliferating in a diverse array of climate	High – Has the potential to spread to all production areas	High – Can have significant impacts on seedlings and reduce yield	**High**
Welsh onion yellow stripe potyvirus	Vir	Welsh onion yellow stripe potyvirus	Onion, rakkyo, Japanese bunching onion, Welsh onion, crow garlic	Whole plant		Medium			Medium	

Common name	Life form	Scientific name	Relevant host	Plant part affected	Distribution and Comments (quarantine risk)	Entry potential	Establishment potential	Spread potential	Economic impact	Risk
Xanthomonas leaf blight	Bac	*Xanthomonas axonopodis pv allii*	Onion, garlic, leek, chives, shallot, Welsh onion. Disease tends to be more severe on onions.	Leaves. Reduction of foliage leads to stunting of the plants and smaller bulbs. In severe outbreaks premature plant death is observed	Emerging disease. Distribution: Asia; Japan, Africa; Mauritius, Réunion, South Africa. North America; USA (California, Colorado, Georgia, Hawaii, Texas), Central America and Caribbean; Barbados, Cuba, South America; Brazil, Venezuela. No routine diagnostic test available for testing *Allium* seeds.	High - May be introduced on bulbs for planting from countries where bacteria occurs.	Medium - The disease is favoured by high temperatures (higher than 27 °C) and severe outbreaks usually occur shortly (7 to 10 days) after a period of humid, rainy weather. Can survive between crops on weeds and crops such as dry bean, alfalfa and other legumes.	High - Seed transmitted. Also spread by wind and irrigation. May be disseminated on plant material clothes etc.	Medium - In USA, yield red. of 20% or > are commonly observed in effected fields.	**Medium**

Life Form Legend

NEM	Nematode	**EWIG**	Earwigs (DERMAPTERA)
BAC	Bacteria	**FLY**	Flies and Midges (DIPTERA)
VIR	Virus	**LOCU**	Locusts and grasshoppers (ORTHOPTERA)
FUN	Fungus	**MITE**	Mites e.g. spider and gall mites (ACARI)
PLO	Phytoplasma like organism	**MOTH**	Butterflies and moths (LEPIDOPTERA)
BTLE	Beetles (weevils etc.) (COLEOPTERA)	**SLUG**	Slugs (GASTROPODA)
BUG	Stink bugs, aphids, mealybugs, scale, whiteflies and hoppers (HEMIPTERA)	**SNAI**	Snails (GASTROPODA)
BUT	Butterflies (LEPIDOPTERA)	**THRI**	Thrips (THYSANOPTERA)

Entry Potential

Negligible probability of entry is extremely low given the combination of factors including the distribution of the pest source, management practices applied, low probability of pest survival in transit.

Low probability of entry is low, but clearly possible given the expected combination of factors described above.

Medium pest entry is likely given the combination of factors described above.

High pest entry is very likely or certain given the combination of factors described above.

Unknown pest entry potential is unknown or very little of value is known.

Establishment Potential

Negligible the pest has no potential to survive and become established.

Low the pest has the potential to survive and become established in approximately one third or less of the range of hosts. Could have a low probability of contact with susceptible hosts.

Medium the pest has the potential to survive and become established in between approximately one-third and two thirds of the range of hosts.

High the pest has potential to survive and become established throughout most or all of the range of hosts. Distribution is not limited by environmental conditions that prevail in Australia. Based upon its current world distribution, and known conditions of survival, it is likely to survive in Australia wherever major hosts are grown.

Unknown the establishment potential of the pest is unknown or very little of value is known.

Spread Potential

Negligible	the pest has no potential for natural spread.
Low	the pest has potential for natural spread locally.
Medium	the pest has potential for natural spread throughout a physiographic region.
High	the pest has potential for natural spread to all production areas.
Unknown	spread potential is unknown or very little of value is known.

Economic Impact

Negligible	there is no impact on yield, host longevity, production costs or storage.
Low	there is minor impact on standing crop and little effect on stored product.
Medium	there is moderate impact on crops, but host mortality is rare, storage losses may occur.
High	there is severe impact on standing crop, with significant host mortality and/or storage losses.
Extreme	there is extreme impact on standing crop, with extreme host mortality and/or storage losses.
Unknown	the economic potential of the pest is unknown or very little of value is known.