

# Exotic pests of chickpeas



EXOTIC PEST – CALL THE EXOTIC PLANT PEST HOTLINE IF SUSPECTED

There are a number of exotic pests that exist overseas that would threaten chickpea crops in Australia, should they make it through border controls to establish here. Becoming familiar with these pests means you can keep an eye out for them on the farm.

Early detection is crucial to provide the best chance of eradicating new pest incursions, safeguarding production and market access.

## Chickpea cyst nematode

Chickpea cyst nematode (*Heterodera ciceri*) is a major pest of chickpea in countries overseas where it causes up to 100% yield loss. Chickpea is the main host, but it also damages a number of other legume species. Soil-borne nematodes attack the roots of plants, causing stunting and yellowing of crops.

Since eggs can survive in soil within the cyst for five to ten years without a host, the infestation is long term.

Cysts can spread in plant material or soil, so they can be carried by wind, water, farm machinery, vehicles, footwear and animals.

## What to look for

The first signs of cyst nematodes are small circular areas in the crop that appear water stressed or are undergoing early senescence (biological aging). Symptoms are most noticeable at flowering, with a reduction in flower and pod numbers and small or no seed in pods if severely infested. Symptoms spread outwards over time.

Plants are typically stunted and yellow, with roots lacking nodules. Lemon shaped cysts (that contain eggs) may be attached to the roots, but are easily detached into the surrounding soil.

## Exotic leaf miners

Leaf miners are small flies whose larvae feed internally on the tissues of a wide range of plant types. Infestations can cause significant damage and yield losses.

Exotic leaf miners of concern for chickpea production are chickpea leaf miner (*Liriomyza cicerina*), the American serpentine leaf miner (*Liriomyza trifolii*) and the pea leaf miner (*Liriomyza huidobrensis*).



Chickpea cyst nematodes cause yellowing and stunting of infested chickpea crops. Symptoms often start as small patches, eventually spreading out across the paddock

Nicola Greco, CABI



Female chickpea cyst nematodes on infested lentil roots. Cysts containing eggs indicated by arrows from the letter (f)

Nicola Greco, CABI



Leaf miner adults have a single pair of wings, many with a yellow spot between them. Image shows American serpentine leaf miner adult

Central Science Laboratory, Harpenden, British Crown, Bugwood.org

### What to look for

Leaf 'mines' from tunnelling is the most obvious symptom. Adult leaf miners are tiny, greyish black flies. They have a yellow and black body and are 1.3 – 2.3 mm in length.

The larval stage of the leaf miner is not usually seen because they remain inside the leaf tissue. Egg laying punctures can be seen as white speckles on leaves.

Unusual insect activity and failed spray applications should be reported and investigated further.

### Ascochyta blight (exotic strains)

Ascochyta blight is a fungal disease caused by *Phoma rabiei* (formerly known as *Ascochyta rabiei*). While one type of ascochyta blight is established in Australia it is limited to asexual reproduction unless a second mating type (required for sexual reproduction) also establishes here.

Sexual reproduction of the fungus would allow it to develop resistance to fungicides far more rapidly as well as get around the defences of chickpea varieties bred to tolerate the blight.

### What to look for

Symptoms differ depending on whether ascochyta blight is introduced to a paddock through infected seed or through airborne spores known as conidia from nearby infected plants. Infected seeds result in early plant death whereas infection from airborne conidia often develops symptoms later in the season. Small patches of blighted plants will appear through a crop, spreading into larger patches with cool, wet weather as rain splashes spread the spores further.

The asexual phase of ascochyta blight produces distinct dark fruiting bodies (pycnidia) which contain and release the conidia. Pycnidia are arranged in concentric circles that occur in the centre of lesions found on infected leaves, stems, pods and ultimately developing seed. Severe stem lesions can lead to girdling which can kill the upper part of the plant or result in stem breakage.



Leaf miner larvae tunnelling within a leaf. American serpentine leaf miner tunnels (shown in image) remain uniform in width, with black stripes of frass (excrement) visible on either side of the tunnel

Central Science Laboratory, Harpenden, British Crown, Bugwood.org



Note the concentric circles of brown–black dots in the centre of the lesions. These pycnidia (fruiting bodies) are unique to ascochyta blight

Mary Burrows, Montana State University, Bugwood.org



Stem lesions can cause girdling and stem breakage

Sam Markell, North Dakota State University, Bugwood.org

The sexual stage, not known to occur in Australia, uses chickpea stubble as a host, producing a different type of fruiting body and spores which could go unnoticed unless stubble is checked.

Report any unusual outbreaks of chickpea ascochyta blight, especially if they occur on known resistant varieties.

### Fusarium wilt of chickpea

Fusarium wilt of chickpea is caused by the soil-borne fungal pathogen *Fusarium oxysporum* f. sp. *ciceris*, which can survive in soil for many years without a host plant. Yield losses of up to 60% have been reported in countries overseas. Chickpea is the primary host of this disease, but other legumes such as pigeon peas, lentils and field peas can also be affected.

#### What to look for

Symptoms can develop at any stage of plant growth and vary depending on the strain. Symptoms may range from slow, progressive yellowing and late plant death to fast and severe chlorosis, wilting and early plant death.

Splitting the roots of infected plants vertically can reveal a brown discolouration of the internal tissue.

### Chickpea viruses

There are a number of exotic viruses of chickpeas that produce similar symptoms to some of the chickpea viruses that are present in Australia. The most important of these are chickpea chlorotic dwarf virus, which is spread by leafhoppers, and chickpea chlorotic stunt virus, spread by aphids.

#### What to look for

These viruses are not easily distinguished from other plant viruses already in Australia. Any significant disease outbreaks should be reported and investigated.

Symptoms common to all groups of viruses in chickpea include foliar yellowing in kabuli varieties and reddening in desi varieties, combined with leaf smalling, stunting, bunching and premature death.



Typical yellowing symptoms of a chickpea plant affected by fusarium wilt

Dr Bassam Bayaa, ICARDA Syria



Cross section of a chickpea tap-root showing internal discoloration

Kurt Lindbeck, NSW DPI

Other symptoms may include browning of the vascular system, internode shortening and shoot tip necrosis.

Protect your farm from exotic plant pests by checking crops frequently. Make sure you are familiar with the symptoms of common plant pests and diseases so you can tell if you see something different.

If you suspect soil borne diseases or nematodes in your chickpea crops, limit movement into and out of affected paddocks.

Pests, weeds, and diseases can severely affect your crops. It makes good business sense to take measures to improve biosecurity on your property.

If you see anything unusual, call the **Exotic Plant Pest Hotline** on **1800 084 881**.



Typical distribution of infected chickpea plants under field conditions

*Kurt Lindbeck, NSW DPI*



Chickpea plants showing leaf reddening

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## GRAINS FARM BIOSECURITY PROGRAM

An initiative of Plant Health Australia and Grain Producers Australia



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**1800 084 881**

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Chickpea plants showing leaf smalling; stunting and proliferation of axillary shoot

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