PestFacts WA

Issue: 8
Date: June 2026

Contents

Tips for diagnosing barley leaf spotting

Department of Primary Industries and Regional Development (DPIRD) plant pathologists are receiving queries from consultants about identification of barley leaf symptoms. Physiological leaf spotting (PLS) and herbicide damage can be confused with symptoms of foliar diseases like scald or spot-form net blotch. This season, accurately identifying scald has been challenging for some.

In certain cases, the similarity of lesions means a clear diagnosis cannot be determined without laboratory testing, although there are often some distinguishing features. Correct identification is critical to avoid unnecessary fungicide interventions. The location, shape and consistency of symptoms provide important diagnostic clues.

Visually assessing leaf spotting

When assessing barley leaf symptoms, it is important to distinguish between biotic (fungal leaf diseases) and abiotic (chemical, nutritional, physiological) causes. The following symptom groups can guide diagnoses.

Fungal leaf diseases

Lesion shape depends on the disease. Multiple lesions stages can occur on the same plant. Symptoms are progressive often with greater severity lower in canopy, can spread from stubble, seed or between plants, and favored by wet conditions and canopy humidity.

Scald

RGT Planet barley plants with scald lesions of different ages. Photo courtesy of DPIRD.

Scald symptoms first appear as oval bluish grey-green spots on leaves. These become elongated, often diamond-shaped and bleached, with a distinctive ragged, brown margin. Lesions commonly merge to form necrotic areas, causing the entire leaf to wither and die.

Barley scald is primarily stubble-borne but can also be seed-borne. Symptoms typically first appear in isolated patches during tillering or early stem elongation. The disease can spread rapidly under humid canopy conditions.

Net-form net blotch

Early net-form net blotch on barley plants. Photos courtesy of DPIRD.

Early net-form net blotch (NFNB) lesions are dark brown and appear as thin, rectangular ‘net-like’ streaks that can extend several centimetres in length.

Spot-form net blotch

Early spot-form net blotch on barley plants. Photos courtesy of DPIRD.

Spot-form net blotch (SFNB) lesions develop as small circular or oval dark brown spots, often with yellow edges. Infection occurs with approximately six hours of leaf wetness at 10-25°C.

Abiotic causes

Chemical damage

Neo CL barley plants with lesions from prosulfocarb damage. Photos courtesy of DPIRD.

Chemical damage in barley plants can result from spray drift or in-crop applications and may present a variety of symptoms.

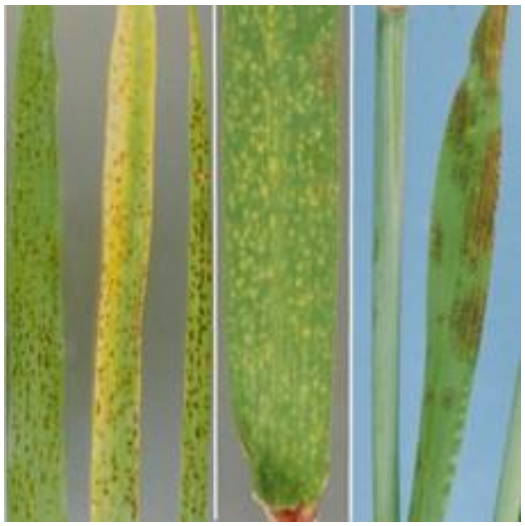
Drift from knockdown herbicides (e.g. paraquat) typically causes round, bleached lesions with a dark margin. As drift is usually a one-off event, the lesions appear suddenly, are not progressive and are confined to a single leaf layer.

LaTrobe barley plants with leaf scorching from carfentrazone-ethyl damage. Photo courtesy of DPIRD.

In-crop sprays such as diclofop-methyl, carfentrazone and prosulfocarb can also cause leaf scorching.

Physiological leaf spotting

Physiological leaf spotting on Rosalind barley (left) and Maximus CL barley (right). Photos courtesy of DPIRD.



Different physiological leaf spotting symptoms on barley leaves; dark and light speckling (left and centre) and "thumb print" of varieties such as RGT Planet (right). Photos courtesy of: DPIRD.

Physiological leaf spotting (PLS) is an abiotic stress response and is not associated with pathogens. It is not thought to affect yield.

PLS has variety-specific symptoms, which may include:

- Pinpricks
- Smudges or 'fingerprints'
- Dark speckled or diffuse blotches.

Lesions have limited structure or defined shape, may occasionally show a faint halo, and are non-progressive. Symptoms typically appear from stem elongation through to flag leaf.

PLS can be confused with Ramularia leaf spot, which is uncommon in WA, however, PLS does not respond to fungicides.

Boron toxicity

Barley leaf showing mixed symptoms of boron toxicity along the leaf margins and spot-form net blotch. Photo courtesy of DPIRD.

Boron toxicity is associated with alkaline subsoils and is often worse under moisture stress. Sensitivity to boron toxicity varies across barley varieties.

Key characteristics include:

- Leaf tip burn (chlorosis then necrosis) moving from leaf tip down the margins over time
- Often affects older leaves first
- May co-occur with disease symptoms.

Laboratory diagnosis

When there is any doubt about the cause of cereal leaf spotting on barley, confirm the presence of a fungal disease before applying foliar fungicides.

Assistance is available through the Department's Diagnostic Laboratory Services - Plant pathology services. There is a fee for this service, but this can help avoid unnecessary fungicide applications.

Growers can also use the PestFacts WA Reporter app to request a diagnosis of leaf symptoms.

More information

For more information on barley diseases and other causes of leaf spotting, see DPIRD's Barley leaf diseases and their management factsheet.

For foliar fungicide information, refer to the department's Fungicides page.

For more cereal disease information contact Senior Research Scientists Kithsiri Jayasena in Albany on +61 (0)8 9892 8477, Andrea Hills in Esperance on +61 (0)8 9083 1144, Ciara Beard in Geraldton on +61 (0)8 9956 8504 or Principal Research Scientist Geoff Thomas in Perth on +61 (0)428 947 287.

Article authors: Cindy Webster (DPIRD Narrogin), Andrea Hills (DPIRD Esperance) and Kithsiri Jayasena (DPIRD Albany).

Article input: Geoff Thomas (DPIRD Perth), Blakely Paynter (DPIRD Northam) and Harmohinder Dhammu (DPIRD Northam).

Black Portuguese millipedes

- Munglinup

A curled black Portuguese millipede. Photo courtesy of Quenten Knight (Agronomy Focus).

Quenten Knight (Agronomy Focus) reported black Portuguese millipedes, slaters and European earwigs in a 4-leaf canola crop near Munglinup. Less than 10% of the crop was damaged. He noted the millipedes are now more commonly found in paddocks in the Esperance port zone than they were 10 years ago.

Black Portuguese millipedes (*Ommatoiulus moreletii*) originate from Europe and have been accidentally introduced to several countries, including Australia. They are now common in South Australia, Australian Capital Territory, Victoria, Tasmania and Western Australia.

Increases in black Portuguese millipede populations are likely due to stubble retention, no-till practices and improvements in soil organic matter. These provide a favourable habitat for millipede survival and reproduction.

Identification

A black Portuguese millipede stretched out to full length. Photo courtesy of DPIRD.

The smooth, cylindrical body of the black Portuguese millipede distinguishes it from native species, which often have rougher, uneven bodies. They are dark grey to black in colour, and adults can grow up to up to 45 mm in length. Adult millipedes have up to 50 body segments, with each segment having two pairs of legs.

When disturbed, they curl into a tight spiral or thrash to escape.

Black Portuguese millipedes are easily transported between properties and regions through infested soil, plant material and in farm machinery. They are often observed congregating in large numbers around houses and sheds on farms. They are one of the few millipede species attracted to lights at night.

A temperature range of 17 to 21°C and high humidity favours their activity.

Life cycle

Black Portuguese millipedes typically start mating in March to April, with most eggs laid between April and May. Mature females lay about 200 yellowish-white eggs, the size of a pinhead, in the soil.

An immobile, legless stage hatches from each egg and develops into the first active stage after one week. This first stage has only three pairs of legs, but with each moult more legs and body segments are added. Millipedes grow through a series of moults. During moulting they are very fragile because the new cuticle is soft and easily damaged. The millipede usually eats the old cuticle.

A juvenile black Portuguese millipede. Photo courtesy of DPIRD.

After one year, immature millipedes are only about 1.5 cm long and are easily overlooked. It takes a further 12 months to reach sexual maturity. In their second year, millipedes moult twice a year, once in spring and once in summer. Black Portuguese millipedes can live for more than two years.

Habitat

Black Portuguese millipedes prefer to feed on leaf litter, damp and decaying wood, fungus and vegetable matter like tender roots, mosses or green leaves on the ground. They play a role in breaking down organic matter in the soil. However, in high numbers they can feed on green plant material, though this is uncommon.

Higher numbers of millipedes are found in undisturbed leaf litter and organic mulch and in areas where winter weeds form a continuous ground cover.

Millipedes generally are not numerous in cultivated areas or bare ground.

Crop damage and monitoring

Crop damage is uncommon as black Portuguese millipedes generally prefer to feed on decomposing organic matter. Large numbers can be present in paddocks without causing any crop damage.

Millipedes remove irregular sections from the leaves and can kill whole plants if the stem is chewed through. They have been recorded causing damage to canola, lupins and seedling lucerne. In cereals, millipedes have been recorded chewing the stems of young plants.

Crops are vulnerable at the establishment period. Once established, crops tend to outgrow feeding damage.

Millipedes are also usually found in paddocks with other pests such as slaters and European earwigs.

Millipedes are mostly active at night, so consider inspecting crops after dark. During the day millipedes are readily found under rocks, stubble residue and wood. Refuge traps such as carpet squares or tiles can also be used to detect millipedes.

Management

Control options for millipedes are limited, but several measures can help reduce populations.

A bait containing metaldehyde and fipronil is registered for controlling black Portuguese millipedes in canola. For more information, refer to DPIRD's 2026 Autumn Winter Insecticide Guide.

Cultural control options include reducing stubble levels in early autumn. Burning stubble can kill millipedes present on the soil surface and reduces available food sources and habitat, further lowering millipede numbers. Early sowing of high-vigour varieties at higher seeding rates can help compensate for seedling losses from pest damage.

Further information

For more information on this pest, refer to:

- Cesar Australia's Black Portuguese millipede PestNote
- Grains Research and Development Corporation's (GRDC's) Millipedes and slaters in no-till systems fact sheet
- GRDC's Black Portuguese Millipede Invertebrate Knowledge Card.

For more information contact Senior Research Scientist Svetlana Micic in Albany on +61 (0)8 9892 8591.

Article authors: Svetlana Micic (DPIRD Albany) and Cindy Webster (DPIRD Narrogin).

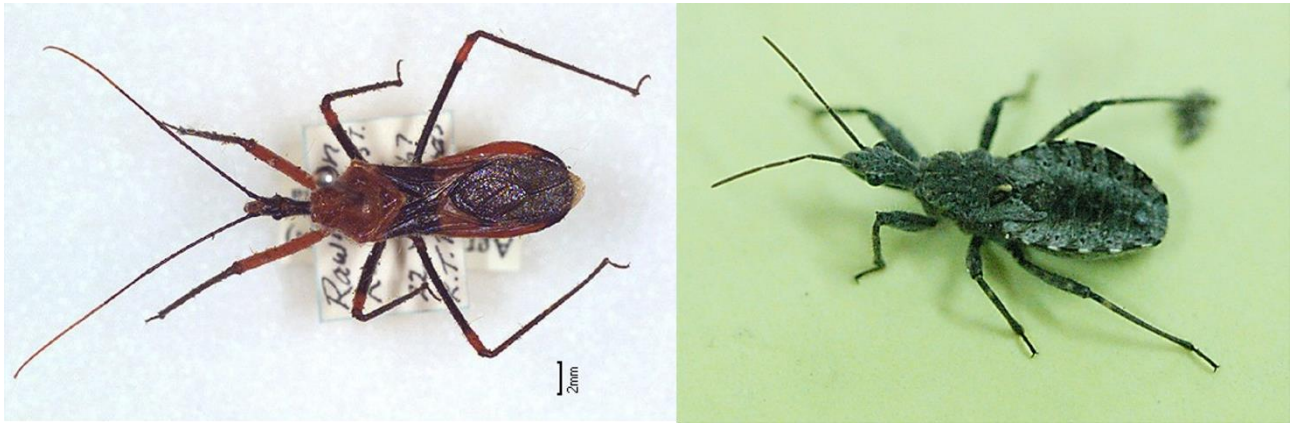
Predatory bugs

Continuing our theme of showcasing a beneficial invertebrate in each issue, this article explores the biology of predatory bugs and the important role they play in supporting invertebrate pest management.

Predatory bugs found in WA crops and pastures include the assassin bug, damsel bug and predatory shield bug.

It is important to identify these beneficial species and distinguish them from similar-looking pest bugs that feed on crops and pastures as they can decrease pest populations to levels where insecticide applications may not be required.

Assassin bug



An Assassin bug adult (left) and nymph (right). Photos courtesy of DPIRD.

Adult assassin bugs (family *Reduviidae*) are 10-30 mm long and have distinctly elongated heads with prominent eyes. They have long, slender hind legs and enlarged front legs used to grasp prey. Their bodies can vary in colour from brown to orange and/or black. Adults may live for 6 to 10 months and can lay up to 300 eggs.

Nymphs resemble smaller version of the adults but do not have wings.

They are found in broadleaf crops such as canola and pulses.

These predators mainly target caterpillars but will also feed on aphids and other soft-bodied insects. Their name comes from their stealthy hunting behaviour—they stalk or ambush prey and inject them with enzymes that break down their internal tissues.

Shield bug

There are a several species of shield bugs (family *Pentatomidae*) found in crop canopies across Australia, each with slightly different markings, spikes and body shapes.

A predator glossy shield bug adult (left) and nymph (right). Photos courtesy of DPIRD.

Shield bugs are stout, shiny, shield-shaped insects that grow up to 10-15 mm long as adults. Some species have prominent spikes behind the head. The glossy shield bug, a predatory species, is ovoid in shape, with a reddish-brown colour marked by numerous dark punctuations.

Nymphs are dark in colour with bright red markings on their backs, which disappear as they mature.

Predatory species prefer to feed on caterpillars but will also consume aphids and other soft bodied insects. Shield bugs have multiple generations each year, and adults typically live for several months.

A brown shield bug (pest) which can be confused with the predator glossy shield bug. Photo courtesy of DPIRD.

Some shield bug species are pests, such as the brown shield bug (also known as the brown stink bug), and they can look similar to predatory shield bug species. However, the brown shield bug can be differentiated from the glossy shield bug because it does not have a yellow marking on the triangular shield on its back (scutellum).

Damsel bug

An adult damsel bug. Photo courtesy of DPIRD.

Damsel bug (family *Nabidae*) adults are slender, pencil-shaped insects that grow up to 8-12 mm long. They have long antennae and a narrow head with piercing mouth parts (stylets) used to attack prey. Adults are commonly brown, grey, reddish or yellowish. Damsel bugs also have enlarged, muscular first front leg segments, which they use to move rapidly and to grasp and hold prey while feeding.

Nymphs closely resemble the adults but are smaller and wingless.

Damsel bugs are common throughout Australia and generally found in the canopy of crop plants.

As predators, damsel bugs primarily target caterpillars but also feed on aphids and a range of other soft bodied insects.

Conserving beneficial bugs

If beneficial bugs are present in a paddock, they should be correctly identified and protected where possible, as they help reduce pest levels. The following practices can be used to conserve beneficial bugs and beneficial insects in general:

- Spray only if necessary: Apply sprays only when pests reach threshold damage levels.
- Choose insecticides that are ‘soft’ on predators. For more information refer to Cesar Australia’s Beneficials Chemical Toxicity Table.
- Target spray applications: Apply sprays only to paddocks or portions of paddocks where damage is occurring. Pests such as weevils and aphids tend to colonise paddock edges, so a border spray may be sufficient.

Further Information

The PestFacts WA Reporter app can be used to request a diagnosis or report beneficial or pest insects.

To read about other beneficial invertebrates found in WA’s grainbelt, refer to the 2026 PestFacts WA articles in:

- Issue 7 Hoverfly larvae
- Issue 6 Predatory beetles
- Issue 5 Balancing sprays with biological control: the benefits of Parasitoids .

For more information on beneficial insects, refer to the Grains Research and Development Corporation (GRDC) Back Pocket Guide – Beneficial Insects .

For further details, contact Senior Research Scientist Svetlana Micic in Albany on +61 (0)8 9892 8591.

Article author: Cindy Webster (DPIRD Narrogin).