Department of Primary Industries and Regional Development
GOVERNMENT OF WESTERN AUSTRALIA
Protect Grow Innovate

PestFacts WA

Issue: 17
Date: September 2024

Contents

Aphid activity update

Bluegreen aphids on lucerne

- Dalyup

Image 1: Bluegreen aphids on a lucerne plant. Photo courtesy of: Quenten Knight (Agronomy Focus).

Quenten Knight (Agronomy Focus) has reported a heavy infestation of bluegreen aphids causing widespread damage to a well-established lucerne crop at Dalyup. Quenten noted that there was a high population of beneficial insects in the crop. The lucerne crop will be heavily grazed to manage the aphid infestation.

Bluegreen aphids are most prominent during spring and can attack lupins, lucerne, chickpeas, faba beans, medics and clovers. Heavy infestations on the upper part of the plant can cause leaves to deform and plants to wilt and turn yellow.

Bluegreen aphid adults grow up to 3 mm long, are oval shaped, with long legs and antennae. They have 2 large cornicles that extend beyond the base of the abdomen. Both the winged and wingless forms are a matte bluish-green colour.

For more information refer to Cesar Australia's Bluegreen aphid PestNote.

Canola aphids

Cabbage and turnip aphids

- Geraldton
- Northam
- South Stirlings
- Munglinup

Image 2: Cabbage aphids on a canola raceme at South Stirlings. Photo courtesy of: Daniel Malecki-Lee (DPIRD).

There have been recent reports of cabbage aphid infestations in moisture stressed late flowering and early podding canola crops at Geraldton, Northam, Munglinup and South Stirlings.

Joel Kidd, Department of Primary Industries and Regional Development (DPIRD) Technical Officer has found cabbage aphids on racemes on 55% of plants inspected in a podding canola crop at Munglinup. In the same crop, Joel found green peach aphid (GPA) on the underside of leaves in 85% of plants inspected.

Daniel Malecki-Lee, DPIRD Technical Officer has found both cabbage aphids and turnip aphids on 30% of plants inspected in a late flowering/early podding canola near South Stirlings.

Back Paddock users have reported cabbage aphids in canola crops near Geraldton.

Amber Balfour-Cunningham, UWA Research Scientist found evidence of fungus and mummies on cabbage aphids in her late flowering/early podding canola trial at Northam. Amber observed that the cabbage aphids that had been present on canola racemes in previous weeks were now gone, even those found on plants at the edge of the crop.

It is common for multiple aphid species to colonise canola at the same time.

Cabbage and turnip aphids can cause significant yield loss to canola in spring through feeding damage, especially in areas where plants are already moisture stressed and aborting flowers or pods given the plant limitations. Aphid infestations in moisture-stressed canola crops that are in the fully podded stage can result in lower seed production. It can also result in the development of shrivelled seed due to aphids preventing seed fill.

Green peach aphid

- Binnu
- Tenindewa
- Geraldton
- Carnamah

Image 3: Green peach aphids on canola. Photo courtesy of: Pia Scanlon (DPIRD).

Bill Campbell (Bill Campbell Consulting) reports high numbers of green peach aphid (GPA) on the undersides of leaves throughout a late flowering/pod ripening canola crop at Binnu. The crop is moisture stressed and leaf drop will not occur for a while.

Surya Dhakal, DPIRD Technical Officer has found GPA on the undersides of leaves in 85% of plants inspected in podding canola at Tenindewa, and on 70% of plants in podding canola at Carnamah.

Back Paddock users have also reported finding GPA in canola near Geraldton.

GPA feed on the underside of leaves and are not known to cause flower abortion.

DPIRD field trials in Geraldton have shown that GPA feeding damage to flowering canola did not cause yield loss. When aphids were introduced onto plants at the 8-10 leaf stage, and reached populations of 2,000 or more per leaf, in the absence of virus, they did not cause yield loss. For further information refer to DPIRD's Canola yield loss to green peach aphid, Geraldton 2016 trial report.

DPIRD field trials at Katanning have shown that if GPA colonise canola at the seedling stage and are not controlled leading to more than 600 aphids on leaves by 10% flowering canola, plants will incur a yield loss. For further information on this trial refer to the GRDC Update Paper Yield loss to canola from green peach aphid.

Management of aphids

Seasonal conditions have been conducive for aphid numbers to build up and cause significant stress to already stressed plants. This can seriously reduce yields.

Threshold for control

Lupins

Failure to control aphid feeding damage can result in yield losses of up to 90% in susceptible varieties and up to 30% in varieties with intermediate resistance (in the absence of virus infection). Controlling aphids when they reach the threshold, which is 30% of flowering buds with 30 or more aphids, will give a yield response.

Canola

If more than 20% of canola plants are infested with colonies of cabbage or turnip aphids, control measures should be considered to avoid yield losses. The risk of economic yield losses to aphids increases if canola crops are already under some degree of moisture stress or are experiencing poor finishing rains. If spraying is required, a border spray may suffice for cabbage aphids, which are most commonly found within 20 to 30 metres of the crop edge.

For a list of insecticides registered for use on aphids, see DPIRD's 2024 Winter Spring Insecticide Guide.

Remember that naturally occurring parasitoids and predators such as hoverflies, wasps, lacewings and ladybird beetles will also increase with warming weather. These predators can keep aphid populations below threshold levels, and unnecessary spraying of 'anti-feed' synthetic pyrethroid sprays will only counteract their benefits.

When spraying, consider spray options that are soft on predators (for example, pirimicarb). Growers need to check canola crops for fungal infections and parasitism in aphids before deciding whether to invest in an insecticide spray. For more information, refer to the department's Know what beneficials look like in your crop and Cesar Australia's Beneficial's chemical toxicity table page.

To read about prior canola aphid activity this season refer to DPIRD's 2024 PestFacts WA articles in:

- Issue 9 Turnip yellows virus and green peach aphid detected in yellow sticky traps and canola crops
- Issue 6 Canola aphid and virus update
- Issue 4 Turnip yellows virus detected in migrating cabbage aphids.

For more information on diagnosing and managing canola aphids refer to:

- DPIRD's Aphid management in canola crops page
- DPIRD's Diagnosing canola aphids page
- DPIRD's 2017 Protecting WA Crops Issue 3 newsletter Aphids – WA's insect problem children
- GRDC's Aphids in your crops YouTube video.

More information

For more information contact Svetlana Micic, Research Scientist in Albany on +61 8 9892 8591 or Dusty Severtson, Research Scientist in Northam on +61 8 9690 2160.

Article author: Bec Severtson (DPIRD Northam).

Check your crops for native budworm caterpillars

Caterpillars

- Binnu
- Ogilvie
- Nolba
- Yuna
- Tenindewa

Image 4: A native budworm caterpillar feeding on a canola pod. Photo courtesy of: DPIRD.

Belinda Eastough (Elders) reports finding more than 8 to15 native budworm caterpillars per 10 sweeps in canola crops near Yuna, Ogilvie and Nolba, and up to 10 caterpillars per 10 sweeps in some lupins crops near Yuna and Ogilvie. The caterpillars in the lupin crop were around 12 mm in length. Belinda also commented that some of the caterpillars had started feeding on the canola pods but not the lupin pods, as leaf drop hasn't yet started.

Bill Campbell (Bill Campbell Consulting) has found native budworm caterpillars above threshold in podding canola at Binnu.

Surya Dhakal, DPIRD Reseach Scientist found 4 to 12 native budworm caterpillars per 10 sweeps in a podding canola crop near Tenindewa.

It is likely these caterpillars will coincide with the lupin pods maturing and losing their green colouration which is when they are attractive to budworm caterpillars and feeding damage can results in crop losses. It is a similar story for canola, with canola pods becoming attractive as the crop nears maturity.

The feeding behaviour of native budworm caterpillars changes depending on the type of crop they are feeding on. Field pea, chickpea, lentil and faba bean crops are very susceptible to caterpillars of all sizes during pod formation and development. Tiny caterpillars can enter developing pods and damage the seed or devour the entire contents of the pod.

Narrow-leafed lupin pods and seeds will not usually be damaged by native budworm until they are close to maturity and the pods are losing their green colouration. Pod walls are not penetrated until the caterpillars are over 15 mm in length.

Canola is similar to narrow-leafed lupin in that its pods usually become more attractive to caterpillars as the crop nears maturity and begins to hay off. Caterpillars of all sizes will enter pods at this stage, with larger caterpillars doing the most damage. However, as the report above from Yuna demonstrates, this may not always be the case, highlighting the need for vigilance. Native budworm can also cause damage after a canola crop has been swathed, particularly if the crop is swathed when many pods are still green with soft seed. Seed damage from native budworm increases in swathed crops if drying is prolonged due to cool, damp conditions.

Native budworm moth activity

- Usual trapping locations

High numbers of native budworm moths have once again been recorded moving into grain growing areas over the past week.

The larger native budworm flights recorded by budworm trappers this week include: Bolgart (1119 moths), Maya (869), Tenindewa (528), South Stirling (340), Carnamah (238), Varley (173), Tincurrin (168), Cuballing N (130), Kellerberrin N (128), Cadoux (86), Dowerin (85), Kellerberrin S (85), Boyup Brook (70), Borden (49), Grass Patch (23) and Cunderdin (17).

A map showing the native budworm moth flights recorded so far this season is available at Cesar Australia's MothTrapVisWA page. The blue bar at the bottom of the map can be adjusted to show moth flights from the 1 June 2024 onwards.

Eggs laid by native budworm moths will take about 7 days to hatch, and a further 2 weeks to reach a detectable size (5 mm) in crops. These development times are based on average spring temperatures but given that some areas are experiencing higher than average spring temperatures, these development times will be reduced. As quite high

moth numbers have been recorded over the past 3 weeks in some areas, monitoring for caterpillars should commence now, particularly in highly susceptible crops such as field pea, chickpea, lentil and faba been.

Management

Growers and agronomists can access DPIRD's free MyPestGuide CropScout application and enter their results into the sweep net module to calculate native budworm spray thresholds quickly in the field.

Pesticide options for the control of native budworm can be found in DPIRD's 2024 Winter Spring Insecticide Guide.

Further information

Detailed information on this pest can be found at the department's Management and economic thresholds for native budworm.

To read about prior native budworm activity this season refer to the 2024 PestFacts WA articles in:

- Issue 16 Budworm moth activity update
- Issue 11 Native budworm caterpillars are active
- Issue 5 Native budworm moth flights have started.

For more information contact Alan Lord, Technical Officer in Perth on +61 409 689 468.

Article author: Alan Lord (DPIRD Perth).

Diamondback moth and other caterpillars found in crops

Diamondback moth

- Tenindewa
- Northam
- Southern agricultural region

Image 5: Diamondback moth caterpillars. Photo courtesy of: Amber Balfour-Cunningham (DPIRD).

Diamondback moth (DBM) caterpillar numbers have further increased in some canola crops in the northern and central agricultural region over the past fortnight, while remaining low in many canola crops in the southern agricultural region.

Caterpillar numbers can vary significantly from week to week within crops. Growers and agronomists are encouraged to inspect canola crops using an insect sweep net and to be prepared to act if numbers have reached thresholds that could lead to economic damage. The DBM control thresholds are 100 or more caterpillars per 10 sweeps at late flowering (without moisture stress), and 150 to 200 caterpillars per 10 sweeps at pod maturation.

Surya Dhakal, DPIRD Technical Officer has found a range of 0 to 480 DBM caterpillars per 10 sweeps (with an average of 238 per 10 sweeps) in podding canola at Tenindewa. This is double the number recorded 14 days earlier.

Danae Warden, DPIRD Technical Officer has found 300 DBM caterpillars per 10 sweeps in a canola research trial near Northam. The crop had been sprayed with alphacypermethrin and chlorpyrifos early in the season. The crop will now be sprayed with cyantraniliprole.

In the southern agricultural region below threshold DBM numbers have been reported in the past week. Joel Kidd, DPIRD Technical Officer has found below threshold DBM larvae numbers at Cascade, Neridup, Howick, Munglinup, Gibson and Dalyup. Daniel Malecki-Lee, DPIRD Technical Officer also found below threshold DBM larvae at Gnowellin, South Stirlings, Kendenup and Amelup.

Monitoring and managing diamondback moths

Growers and agronomists can access DPIRD's free MyPestGuide CropScout application and enter their results into the sweep net module to calculate insect spray thresholds quickly in the field.

Growers and agronomists are reminded that DPIRD research trials have shown that late season application of insecticide, especially multiple sprays, against DBM is less likely to result in a profitable outcome compared to early and mid-season pest control. For information on DBM monitoring and management, refer to the 2024 PestFacts WA Issue 14 article Diamondback moth activity is increasing in some crops.

For more information on DBM activity in the past month refer to the 2024 PestFacts WA Issue 15 article Increase in diamondback moth numbers.

Other caterpillars

- Watercarrin
- Kauring
- Northam

Some areas of the WA grainbelt are experiencing warmer and drier than average spring conditions, along with increased caterpillar pest activity in crops.

Amber Balfour-Cunningham, UWA Research Scientist recently found several less commonly seen caterpillar pests causing low level damage in a canola crop at Watercarrin, north of Cunderdin.

Image 6: Tabacco looper (Chrysodeixis sp.) found in canola crop at Watercarrin. Photo courtesy of: Amber Balfour-Cunningham (UWA).

A tobacco looper, *Chrysodeixis* sp., caused chewing damage to podding canola and Amber found 5 to 10 pods showing 50% damage on 3 to 4 stems of the plant.

Image 7: White-winged wedge-moth caterpillar in canola crop. Photo courtesy of: Amber Balfour-Cunningham (UWA).

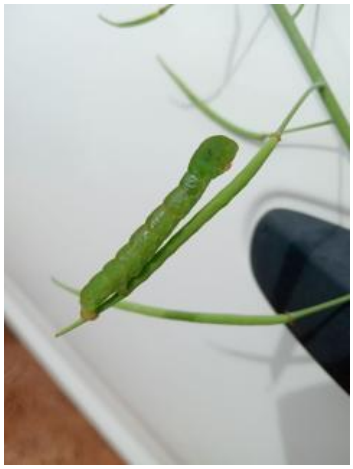

Image 8: White-winged wedge-moth caterpillar in canola crop. Photo courtesy of: Deb Donovan (DPIRD).

In the same canola crop at Watercarrin, Amber found white-winged wedge-moth caterpillars (*Capusa cuculloides*) chewing on canola stems and pods in various locations within the crop. Deb Donovan, DPIRD Technical Officer also found the same caterpillar species causing chewing damage in a crop near Kauring, east of York.

Image 9: Cabbage white butterfly (Pieris rapae) caterpillar on a canola leaf. Photo courtesy of: Amber Balfour-Cunningham (UWA).

Cabbage white butterfly (*Pieris rapae*) caterpillars have also been reported chewing canola pods at Northam by Amber Balfour-Cunningham.

Further Information

If you are finding any unusual caterpillars causing damage in your crop you can use the PestFacts WA Reporter app to report your findings and request an identification.

For more information contact Dustin Severtson, Research Scientist in Northam on +61 8 9690 2160, Alan Lord, Technical Officer in South Perth on +61 8 9368 3758 or Svetlana Micic, Research Scientist in Albany on +61 8 9892 8591.

Article author: Bec Severtson (DPIRD Northam).

Identifying and managing rusts in cereals

In last week's 2024 PestFacts WA newsletter we discussed stem and leaf rust being found in oat and wheat crops respectively at Wickepin, Highbury and Ravensthorpe. For more information refer to the 2024 PestFacts WA Issue 16 article Monitor oat and wheat crops for rusts.

It is important that growers check their crops, particularly susceptible varieties for rusts, now as moist, warm weather conditions encourage these diseases to develop.

When checking cereals, growers and consultants are also urged to investigate the canopy and full length of stems for the presence of other rusts that have not yet been reported this growing season such as stem rust and stripe rust in wheat, and leaf rust in barley

Wheat rust symptoms

Image 10: Wheat leaf rust pustules. Photo courtesy of: Quenten Knight (Agronomy Focus).

Leaf rust pustules are small, circular to oval and can vary in colour from orange to light brown. They usually appear on the upper surface of leaves and on leaf sheaths in cases of heavy infection. Leaf rust requires moisture (rain or heavy dew) or high humidity for spores to germinate and infect leaves. Usually, 4 to 6 hours of leaf wetness are required at optimum temperatures 15 to 25°C (warm days and dewy nights) for this polycyclic disease to spread rapidly. The primary risks for carryover of rusts are volunteer cereals at edges of paddocks or roadsides. This means that it is worth inspecting volunteer wheat/oats/barley as well as sown crops.

Image 11: Stem rust pustules. Photo courtesy of: DPIRD.

Stem rust pustules are a darker red-orange and are often found with ragged edges. Stem rust is favoured by warm spring conditions (20 to 35°C).

Stripe rust pustules are yellow-orange in colour. The pustules are initially small and circular but develop into yellow stripes along the leaf veins on upper leaf surfaces and leaf

sheaths. In severe cases the awns and inside glumes can also become infected. Stripe rust can be seen from a distance in hotspots/patches 1 to 10 metres in diameter.

Barley leaf rust symptoms

Leaf rust symptoms in barley are similar to those in wheat. That is, small, circular or oval pustules with light brown powdery spores on upper surface of leaves, and on leaf sheaths in cases of heavy infection. As the crop matures, pustules darken and produce black spores embedded in leaf tissue.

Oat rust symptoms

Oat stem rust and oat leaf rust (also known as crown rust) can impact the yield and quality of both hay and milling crops. Both rust types can affect the leaves, leaf sheaths and panicles of oats and can even infect the same plant.

Both oat leaf and stem rust species are oat specific and do not infect barley or wheat.

Image 12: Oat leaf rust pustules. Photo courtesy of: Kylie Chambers (DPIRD).

Oat leaf rust produces round- to oblong-shaped pustules, containing yellow-orange powdery spores. These pustules are most commonly found on the leaf surface. The leaf area surrounding the pustule can also turn pale green in colour.

Image 13: Oat stem rust pustules. Photo courtesy of: Kylie Chambers (DPIRD).

Oat stem rust pustules are darker in colour containing darker red-brown powdery spores and are larger in size.

The rust pustules can turn black in colour as the disease ages, and heavily infected leaves can senesce and die.

Management

Variety selection is the best defence against rust diseases in-crop. Varieties rated as moderately resistant to moderately susceptible (MRMS) or better will show significantly less rusting than a susceptible (S) and very susceptible (VS) variety. These varieties are unlikely to require a fungicide application to maintain grain yield except in exceptional years with very high disease pressure. For variety disease ratings, refer to DPIRD's 2024 WA Crop Sowing Guide.

If rust is detected in a susceptible variety (rated VS to S), fungicide is more likely to be needed to protect yield. In these cases, fungicide should be applied before the epidemic becomes severe, taking into consideration the stage of crop development. Spraying after crop flowering is normally not economically beneficial for leaf rust. However on the other hand, stem rust is more devastating than leaf rust and is favoured by warmer temperatures and may need prompt spraying in susceptible varieties, even into grain filling. As the season progresses and warmer, drier conditions occur, the likelihood of an economic favourable response to fungicide will diminish, but less so for stem rust. Spray decisions should consider the level of disease in the crop, varietal susceptibility, the time of the season and growth stage of the crop. Additionally, consider the chance of ongoing rainfall after spraying, as this is favourable for disease development. Use high rates of fungicide for longer duration of protection, for example, when season conditions favouring infection are likely to persist, or for more susceptible varieties. Ensure the cost of fungicide treatment is aligned with the crop's yield potential and the length of the growing season for optimal economic return.

For a list of registered fungicides to use as foliar sprays, visit DPIRD's Registered foliar fungicides for cereals in Western Australia page. It is important to follow fungicide label recommendations for application rates and withholding periods for fungicides.

Rusts predominantly spread via wind from infected plants, but spores can also be transported through the movement of people, machinery and plants. Growers are urged to adopt hygiene (biosecurity) measures during their paddock checks to reduce the risk of spreading the disease.

Rust pathotype testing

Growers and agronomists are encouraged to send samples of all rusts for pathotype testing at any time of the year to the Australian Rust Survey. This is a free testing service that identifies new rust strains. This information will assist wheat breeders in developing new resistant varieties as new strains could become problematic in existing varieties. Infected leaf samples should be mailed in paper envelopes (do not use plastic wrapping or plastic lined packages) along with your details and collection information (location, variety etc.) directly to:

University of Sydney
Australian Rust Survey
Reply Paid 88076
Narellan NSW 2567.

Optional free reply-paid envelopes can be ordered from the University of Sydney. For further details, refer to the University of Sydney's Australian Cereal Rust Survey page.

Further information

To read about earlier wheat and oat rust activity this season refer to the 2024 PestFacts WA Issue 16 article Monitor oat and wheat crops for rusts and Issue 8 article Leaf rust, powdery mildew, yellow spot/nodorum blotch and flag smut are appearing in wheat.

For more information on wheat rusts, refer to DPIRD's:

- Diagnosing leaf rust of wheat page
- Managing stem rust of wheat page
- Managing stripe rust and leaf rust in Western Australia page.

For further information on barley rusts visit DPIRD's Diagnosing barley leaf rust and Managing barley leaf diseases in WA pages.

For further information on oat rusts visit DPIRD's Diagnosing stem rust in oats or Oats: leaf diseases pages.

For more information on cereal diseases contact Plant Pathologists Kylie Chambers, Northam on +61 8 9690 2151, Kithsiri Jayasena in Albany on +61 8 9892 8477, Ciara Beard in Geraldton on +61 8 9956 8504, Geoff Thomas in Perth on +61 428 947 287 or Andrea Hills in Esperance on +61 8 9083 1144.

Article authors: Cindy Webster (DPIRD Narrogin), Ciara Beard (DPIRD Geraldton), Kylie Chambers (DPIRD Northam), Geoff Thomas (DPIRD Perth), Kithsiri Jayasena (DPIRD Albany) and Andrea Hills (DPIRD Esperance).

Diagnose patchy crops to form strategies for next season

- Muresk

Image 14: Rhizoctonia bare patches in oats at Muresk. Photo courtesy of: Kylie Chambers (DPIRD).

Kylie Chambers, DPIRD Research Scientist recently observed noticeable rhizoctonia patches occurring in barley and oats at Muresk. When the affected plants were dug up, the roots were displaying symptoms of rhizoctonia, root lesion nematodes, and take-all.

Patches occurring in cereal crops can be caused by numerous factors including soilborne diseases such as rhizoctonia and take-all, and root lesion nematode species, along with non-disease related factors. Patches can also contain a combination of the constraints listed above.

Growers that have observed poor patches in their crops this season are urged to diagnose and confirm the issue causing the patches in crops. This will help put the right management plan in place for 2025.

Rhizoctonia bare patch

Image 15: Distinct rhizoctonia bare patches in barley in a paddock in York. Photo courtesy of: Daniel Huberli (DPIRD).

Image 16: Plant roots affected by rhizoctonia. Photo courtesy of: Daniel Huberli (DPIRD).

Rhizoctonia root rot is a widespread root disease caused by a soilborne fungus *Rhizoctonia solani* AG8. In the paddock look for severely stunted plants that occur in patches and there is usually a distinct edge between diseased and healthy plants. Roots of affected plants are short with characteristic pinched ends: 'spear tips' (see photo above). Distinct patches are often evident when the primary roots of plants are infected early, while infection of the crown roots later in the season may cause an uneven crop. The patches can also contain a higher density of weeds due to the reduced crop competition in these areas.

Growers with paddocks confirmed to have rhizoctonia, and with large areas of the crop affected this year, should consider implementing a grass-free break crop such as canola, pulse or pasture in 2025. Canola has been shown to reduce the level of disease in the following cereal crop but it will become a problem again in the second year of cereals. Grass weeds are hosts, so it is important to make sure that they are controlled during the break crop and prior to sowing the next cereal.

Seed dressings and in-furrow fungicide treatments are also registered for use in cereals for the suppression or control of rhizoctonia.

For detailed information about management options for rhizoctonia, refer to:

- GRDC's Tips and Tactics Rhizoctonia factsheet.
- DPIRD's Diagnosing rhizoctonia root rot in cereals page
- DPIRD's Rhizoctonia in your paddocks YouTube video
- DPIRD's Root disease under intensive cereal production systems page
- DPIRD's Soil Quality: 5 Soil Biology e-book
- DPIRD's Registered seed dressing and furrow fungicides for cereals in WA page.

Root lesion nematodes

Nematodes are microscopic worm-like creatures that come in many forms and are important to soil biological structure. Plant parasitic nematodes naturally live and feed on the root systems of plants and most plants can tolerate low levels of plant parasitic nematodes without any ill thrift. Plant growth and yield is likely to be impacted when the levels of plant parasitic levels increase to damaging levels and there are environmental stresses such as a moisture stress or waterlogging.

Above-ground symptoms of plants infected with root lesion nematodes include:

- stunting
- poor growth
- less tillers
- plants prone to early wilting
- lower leaves turning yellow prematurely and dying back from the tips.

Image 17: Roots from a 2023 cereal crop in Broomehill severely impacted by P.quasitereoides feeding. Photo courtesy of: Sarah Collins (DPIRD).

Below-ground symptoms often include:

- poor root systems with sloughing of the root cortex
- fewer lateral roots or root hairs compared to nearby healthy plants
- brown/dark coloured lesions along the roots.

For more information, refer to DPIRD's Diagnosing root lesion nematodes in cereals page.

Unfortunately, our economical rotation options in WA are dominated by susceptible crops. Many growers are reducing the frequency of break crops (such as lupin), and instead are growing predominantly cereal-canola. Canola, wheat and barley are susceptible to root lesion nematode. This can cause plant parasitic nematode numbers to accumulate to high levels and result in significant yield reductions.

Four species of root lesion nematodes are commonly found in WA: *Pratylenchus neglectus*, *P. quasitereoides*, *P. thornei* and *P. penetrans*. Other plant parasitic nematodes that have the potential to cause yield loss in WA include the cereal cyst nematode and the burrowing nematode). Correct identification of nematode type and species is important because the different RLN species have different crop-feeding preferences. Therefore, the selection of a suitable crop and variety to mitigate future crop damage is dependent on knowing which plant parasitic nematode species are present.

Refer to DPIRD's 2024 WA Crop Sowing Guide for nematode resistance classifications for different varieties.

Management relies on reducing nematode numbers by growing less susceptible crop varieties, resistant break crops or a weed free fallow. With high nematode populations, a break of more than one season may be needed.

Common WA weeds can also be susceptible to nematodes. Control of summer weeds and keeping weeds under control in-season in infested paddocks are important management practices.

For more information on nematodes refer to:

- DPIRD's 2018 Protecting WA Crops Issue 12 Root lesion nematode newsletter.
- DPIRD's Root lesion and burrowing nematodes: diagnosis and management page.
- GRDC's Root lesion nematode fact sheet.

Take-all

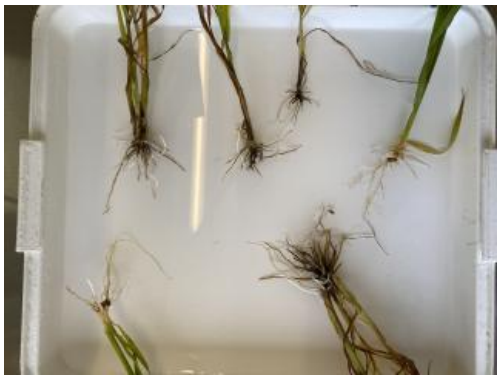

Image 18: Wheat plant roots from Lake Grace affected by take-all and rhizoctonia. Take-all causes black lesions on roots and when severe a black lesion on the stem as observed on some of these plants. Photo courtesy of: Daniel Huberli (DPIRD).

Take-all is a fungal root disease that can cause severe yield losses of wheat and barley especially in medium- to high-rainfall areas.

In the crop, look for patches (up to several metres in diameter and with indistinct and irregular edges) of white coloured tillers and heads containing shrivelled or no grain. Roots of affected plants are blackened and brittle and break easily and are black to the core not just on the outer surface. Severely infected plants will also have a black lesion (black socks) on the crown and stem.

For take-all, a grass-free non-cereal break will reduce the pathogen significantly. Grass weeds are hosts, so it is important to make sure that they are controlled during the break crop and prior to sowing the next cereal.

For more information on take-all refer to DPIRD's Diagnosing take-all in cereals and Root disease under intensive cereal production systems pages.

Root disease diagnostics

Patches caused by rhizoctonia or root lesion nematodes are difficult to distinguish from each other without close inspection of the plant roots. They require further laboratory tests to identify the primary cause of the issue.

In some cases, a combination of diseases and nematodes are responsible.

There is nothing that can be done in season to control root diseases.

For diagnosis of root disease or nematode problems in-crop, growers and consultants can carefully dig up symptomatic plants from the edge of the patch (not the centre) as well as

healthy plants from outside the patches. The department's YouTube video How to take a plant sample shows the correct method to use.

The DPIRD Diagnostic and Laboratory Services (DDLS) continue to be impacted by restricted access to the DPIRD site at 3 Baron-Hay Court, South Perth following asbestos testing results in June 2024.

For all testing enquiries and to submit plant specimens for testing to DDLS, please follow this process:

1. Email DDLS@dpird.wa.gov.au with details of the submission.
2. DDLS will triage your submission and you will receive email instructions. Please ONLY send samples to South Perth once DDLS have responded to you to ensure sample integrity is maintained and testing can be best facilitated.

Note: Email is preferred, but you can phone DDLS on +61 8 9368 3351 to speak to a Plant Pathologist before emailing if necessary.

More information

For more information contact Daniel Hüberli, Senior Plant Pathologist in Perth on +61 8 9368 3836, Sarah Collins, Senior Nematologist in Perth on +61 8 9368 3612 or Carla Wilkinson, Research Officer in Perth on +61 8 9368 3862.

Article authors: Cindy Webster (DPIRD Narrogin), Sarah Collins (DPIRD Perth) and Daniel Huberli (DPIRD South Perth), Carla Wilkinson (DPIRD Perth) and Kylie Chambers (DPIRD Northam).

Using automated spore trapping to track crop diseases in WA

Image 19: BioScout's SporeScout unit in a wheat crop. Photo courtesy of: BioScout.

Spore trapping involves capturing airborne biological particles such as plant disease spores from the air.

DPIRD, in partnership with the Grains Research and Development Corporation (GRDC) and BioScout, have begun a project called “Scaling commercial technology for disease spore trapping”. This project aims to evaluate advanced commercial technology for crop disease monitoring system, focusing on the use of automated SporeScout units produced and supplied by BioScout. The project’s primary objective is to enhance disease detection in crops, allowing for prompt interventions by growers that could protect yields and optimise resource use.

BioScout’s spore traps (SporeScout) work by using a fan to draw in air, which capture spores on a transparent sticky tape. Robotic imaging technology then takes high resolution pictures of the trapped spores. These images are sent to BioScout’s headquarters, where artificial intelligence (AI), and plant pathologists such as DPIRD’s Kithsiri Jayasena, identify and count the spores. The resulting data is shared with growers, enabling them to respond quickly to disease threats and minimise yield loss.

A total of 20 SporeScout units have been strategically installed across the Kwinana, Albany, and Esperance port zones, covering areas from Northam to Esperance. These units are capturing and counting spores for the following diseases: blackleg, botrytis, cereal powdery mildew, general Alternaria and general rusts. DPIRD staff will be checking nearby crops to verify the accuracy of the spore trapping result and provide additional surveillance data.

All WA growers and consultants are invited to check on the spore counts detected by the SporeScout units by registering and logging into the BioScout dashboard.

For more information about BioScout’s products and research, visit the BioScout page.

For more information on DPIRD’s involvement in the GRDC co-funded SporeScout project, contact Kithsiri Jayasena, Senior Research Scientist in Albany on +61 8 9892 8477.

For more information on BioScout products contact Project Officer and Science Liaison Officer Megan Deveson via email at megan@bioscout.com.au .

Article author(s): Cindy Webster (DPIRD Narrogin) and Kithsiri Jayasena (DPIRD Albany).

Article input: Megan Deveson (BioScout).

Important Disclaimer