PestFacts WA

Issue: 16
Date: September 2024

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Native budworm moth activity update

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- Usual trapping locations

Image 1: A pheromone native budworm trap in lupins. Photo courtesy of: Amber Balfour-Cunningham (DPIRD).

A pheromone native budworm trap in lupins. Photo courtesy of: Amber Balfour-Cunningham (DPIRD).

The succession of cold fronts that have rolled across the southwest of the state in recent weeks, along with their associated westerly or south westerly winds, have likely suppressed the western migration of native budworm moths to some degree.

Early in the year, some large moth flights were observed in the northern and eastern parts of the grainbelt, resulting in caterpillar numbers that required control measures. Although

budworm moth captures have been relatively low in recent months, some areas have experienced large increases in moth captures in the last few weeks.

The higher captures reported over the past few weeks include Maya (361 moths), Bindi Bindi (330), Nangetty (136), Kellerberrin N (126), Carnamah (116), Varley (108), Doodlakine (107), South Stirlings (60), York (53), Kellerberrin S (48), Alma (28), Nabawa (25), Dalwallinu (21), Dowerin (15), Bolgart (13), Grass Patch (13), Moonyoonooka (12), Cunderdin N (11), Northam (10) and Southern Cross (5).

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 1 June 2024 onwards.

Caterpillar activity

- Nangetty
- Tenindewa
- York
- Dalwallinu
- Alma
- Moonyoonooka
- Bindi Bindi

Image 2: A native budworm caterpillar chewing into a lupin pod. Photo courtesy of: Christiaan Valentine (DPIRD).

An average of 1 native budworm caterpillar per 10 sweeps has been reported in canola crops near Nangetty and Tenindewa. Less than 1 caterpillar per 10 sweeps was reported in a canola crop near York.

Less than 1 budworm caterpillar per 10 sweeps has been reported in a lupin crop near Dalwallinu and in canola crops at Alma, Moonyoonooka and Bindi Bindi.

Relevant information can be entered into Cesar Australia's Databug2 Native budworm lifecycle simulator webpage to get an estimate of when different sized caterpillars may be present in a crop. This can then be compared to the crop growth stages expected to coincide with the presence of these caterpillars.

Management

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 11 Native budworm caterpillars are active and in Issue 5 Native budworm moth flights have started.

For more information contact Technical Officer Alan Lord in Perth on +61 (0)409 689 468.

Article author: Alan Lord (DPIRD South Perth).

Protecting grain: ensure clean augers, field bins and silos against insects

Image 3: On farm grain silos. Photo courtesy of: Ben White (GRDC).

The Western Australian grains industry is focused on gas-tight sealable storage and fumigation to achieve the federally mandated 'nil tolerance' for live insects in exports.

Residual pest populations surviving in empty storages during winter will infest new season grain when it is put into the storages. If eradication of these pests is not undertaken, the residual population may undergo selection for resistance as a result of repeated exposure to fumigation.

Gas-tight sealable silos are the preferred system of grain storage and pressure testing silos should be part of the annual maintenance. It is good practice to pressure test sealed silos with a five-minute half-life pressure test when the silo is first erected, annually thereafter, and before fumigating. See the Grains Research and Development Corporation (GRDC) supported Stored grain information hub website for more details on pressure testing.

It is recommended that inspection and replacement, if necessary, of inlet and outlet seals occurs prior to harvest and grain storage. It is much easier to replace seals and carry out repairs when silos are empty. In addition, pressure relief oil valves should be checked and topped up with light hydraulic oil if needed.

Augers, field bins and silos should be thoroughly cleaned of grain residues and treated with a structural treatment, such as fenitrothion or diatomaceous earth. The ground around storages should be cleared of weeds and rubbish to prevent harbouring insects. Old grain residues should be burned or buried deep.

Be aware of withholding periods if you are treating the inside of an empty silo with a registered insecticide such as fenitrothion, to provide residual control before the grain is loaded.

Growers are reminded that the insecticide fenitrothion is not registered as a seed treatment and is a contaminant in exported grain. Growers using fenitrothion as a structural treatment in the weeks prior to harvest should leave the chemical in place for 2 to 3 days and then wash it off to prevent contamination of any grain that may come into contact with the sprayed surface.

Diatomaceous earth is preferred for in-silo structural treatments. Non-chemical products such as diatomaceous earth (that is, Dryacide) need at least 2 weeks before loading grain to be effective. Dryacide is a naturally-occurring insecticide and will provide good control for at least 12 months. Diatomaceous earth is non-toxic, but a dust mask and eye protection should be worn when applying it, as per the label's personal protective equipment requirements.

Nitrogen can be used on its own or in combination with other fumigants for effective insect control. However, note that it requires a very high level of sealing on the silo, and the silo must be initially purged along with very high levels of silo sealing to maintain an environment free of oxygen.

Phosphine is the cheapest form of insect control at around 40 c/tonne. However, growers need to ensure that their silo is a gas-tight sealable silo and meets Australian Standards AS2628-2010.

Phosphine inhalation is very serious and can be fatal. Always read the Label and Safety Data Sheets, wear protective clothing including chemically resistant gloves and a full-face respirator with an appropriate phosphine cartridge. Inform others (including putting up a phosphine warning sign) when a storage facility is under fumigation.

In order to kill grain pests at all stages of their life cycle (egg, larvae, pupae and adult), growers should refer to the phosphine label instructions regarding dosage, treatment, ventilation and withholding times.

Poor fumigation can result in only adult and larval insects being killed, giving the mistaken impression that the fumigation was successful. However, the immature eggs and pupae will not be killed and infestations will likely build up again quickly, selecting for resistant populations.

Fumigating in an unsealed silo or field bin is an off label use. It is not only ineffective (at best killing adults and larvae), but it will also lead to strong resistance developing on your farm.

Managing phosphine resistance

Insect populations with weak phosphine resistance have developed in all grain-growing states of Australia, largely as a result of poor fumigations. Strong resistance is widespread in the eastern states and has started to take hold in the west, so to help minimise the development of strong resistance to phosphine in WA, use well-maintained and gas-tight sealable silos.

Detecting phosphine resistant grain pests early will make eradication possible and will protect your income. To arrange a free resistance test for grain pests, contact DPIRD Technical Officers Ben Clarke on +61 418 387 010 or Sam Manning on +61 477 826 117.

Farmers keeping grain on farm for their own use with silos that are not sealed can use aeration as an alternative method to keep insects in low numbers.

Aeration cooling is an effective tool which can be used in combination after fumigation for maintaining insect population control. While aeration cooling will not kill insects, it will dramatically reduce reproduction provided aeration fans are used in combination with an aeration controller to selectively push cool dry air through the grain in the silo at a rate of 2 to3 litres per second per tonne.

Further information

For more information on stored grain management techniques visit;

- GRDC's supported website Stored grain information hub
- GRDC's Grain storage – Storage updates webinar video
- GRDC's Hygiene and structural treatments for grain storage factsheet
- DPIRD's Sealed silos make sense page
- DPIRD's Insect pests of stored grain page.

For more information, contact DPIRD Senior Biosecurity Officer Mike Jones in Geraldton on +61 427 997 146 or Ben White from GRDC grain storage extension team WA on 1800 WEEVIL (1800 933 845).

Authors: The original article was written by Dr Oonagh Byrne (DPIRD South Perth), Dave Cousins (DPIRD South Perth) and Ben White (GRDC) and has since undergone revisions.

Article input: Jeff Russell (DPIRD Northam), Ben White (GRDC), Michelle Christy (DPIRD Perth).

Monitor oat and wheat crops for rusts

- Wickepin (Oats)
- Highbury (Oats)
- York (Oats)
- Gairdner (Wheat)
- Munglinup (Wheat)
- Ravensthorpe (Wheat)

Image 4: Stem rust and septoria avenae blotch on Bilby oats. Photo courtesy of: Hilary Wittwer (Farmworks).

Stem rust has been reported in Bilby and Goldie oat crops at Wickepin and Highbury.

Image 5: Leaf rust on wheat. Photo courtesy of: Sophie Daw (South Coastal Agencies).

Oat leaf rust has been reported in oats near Highbury and York.

Wheat leaf rust has also been found on Brumby, Scepter and Denison wheat near Gairdner, Munglinup and Ravensthorpe.

Moist, warm weather encourages the development of leaf rust (15 to 25°C) and stem rust (20 to 30°C). As temperatures rise with the progression of spring, susceptible oat and wheat varieties should be monitored for rust infection.

More information on managing rust at this time of the season will be published in the next PestFacts WA newsletter issue.

Further information

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

For more information on wheat leaf rust, refer to DPIRD's Managing stripe rust and leaf rust in Western Australia and Diagnosing leaf rust of wheat pages.

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

For more information on cereal diseases contact Plant Pathologists Kylie Chambers in 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.

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Bean yellow mosaic virus and botrytis grey mould in lupins

Bean yellow mosaic virus

- Geraldton
- Moonyoonooka

Image 6: A lupin plant displaying bean yellow mosaic virus symptoms. Photo courtesy of: Zia Hoque (DPIRD).

Research Scientist Ciara Beard (DPIRD) has reported finding bean yellow mosaic virus (BYMV) in narrow leaf lupins at Geraldton and Moonyoonooka. Plants are at the pod filling stage. Infected plants are pale and displaying the characteristic 'shepherd's crook' appearance.

BYMV is an aphid transmitted virus that commonly causes necrotic symptoms that kills infected lupin plants before pod set (BYMV-early symptom). When plants are infected after pod set, black and flattened pods develop which produce very few or no seeds. It is commonly called black-pod syndrome (BPS).

BYMV is not seed borne in lupins (however it is in pastures such as clover) so there is no risk for the following season from sowing infected lupin seed.

Image 7: A lupin plant displaying advanced symptoms of bean yellow mosaic virus. Photo courtesy of: Geoff Thomas (DPIRD).

In narrow-leafed lupins, symptoms start with necrotic streaking from the youngest shoot, which bends over causing a characteristic shepherd's crook. The growing tip dies and the leaves become pale-yellow, wilt and fall off. Necrotic streaking and blackening then spread throughout the stem causing the plant to die. In later infections, the necrotic symptoms may remain restricted to sections of the plant close to the site of infection and may cause leaf yellowing, and BPS and shrivelled seed on the main stem and affected branches. Patches and holes in crops which attract aphids can often have affected plants. There is also a non-necrotic type that is commonly seen in south coastal areas, where plants develop symptoms, set negligible seed but do not die.

All narrow-leafed lupin varieties are susceptible, especially as younger plants under high pressure, but there are some varietal differences in the rate and incidence of necrotic response and expression of BPS with later infection.

The most common source of BYMV for lupin crops is volunteer clover species within and around crops. The management of BPS is best implemented through already established integrated disease management recommendations for BYMV. Given that the time of infection is critical for BPS, emphasis should be placed on maximising volunteer clover control within the lupin crop. It is also important to avoid planting next to or downwind of legume pastures and other narrow-leafed lupin crops as they can be sources of BYMV.

Virus spread can also be minimised by having a perimeter non-host barrier (for example, cereals) between adjacent pasture and the lupin crop. While the virus is transmitted by aphid species that colonise lupins, insecticides are ineffective at controlling BYMV.

For further reading refer to DPIRD’s Diagnosing bean yellow mosaic virus - early symptoms in narrow-leafed lupins and Bean yellow mosaic virus in lupins pages.

For more information contact Plant Virologist Benjamin Congdon in Perth via email at Benjamin.Congdon@dpird.wa.gov.au or Plant Pathologist Geoff Thomas in Perth on +61 428 947 287.

Botrytis grey mould

- Geraldton

Image 8: Botrytis grey mould on a lupin plant. Photo courtesy of: Anne Smith (DPIRD).

Technical Officer Anne Smith (DPIRD) recently found Botrytis grey mould (BGM) in narrow leaf lupins Geraldton.

Image 9: Botrytis grey mould on a chickpea plant. Photo courtesy of: Zia Hoque (DPIRD).

Research Scientist Zia Hoque (DPIRD) also recently found BGM on chickpea plants at Northam.

BGM is caused by Botrytis cinerea infection and is favoured by warm humid spring conditions or dense crop canopies.

Image 10: Botrytis grey mould on a chickpea pod. Photo courtesy of: Ciara Beard (DPIRD).

BGM can infect stems, branches and pods of grain legume plants. Affected plants display lesions on flowers and pods and stems. Mature lesions have a characteristic furry layer of grey mould.

Management options for this disease include widening rotations and isolating the crop from previous stubbles, using uninfected seed and reducing sowing rate.

For fungicide recommendations refer to DPIRD's Registered foliar fungicides for lupin and other pulse crops in WA page. Control of BGM is dependent on weather conditions and the varietal resistance levels. Sprays are best applied prior to canopy closure as it can be difficult to get sufficient penetration of droplets into dense canopies. Please observe all the conditions set out on labels and permits, especially for lentils as this market has strict standards for residue limits. BGM is not usually yield limiting in narrow leafed lupin and with dry hot weather (>25°C) in the forecast for the Geraldton region in the coming week, the disease is unlikely to progress.

For more BGM information refer to DPIRD's Diagnosing grey mould in narrow-leafed lupins page.

For more information contact Plant Pathologists Jean Galloway in Northam on +61 8 9690 2172, Andrea Hills in Esperance on +61 8 9083 1144 or Geoff Thomas in Perth on +61 428 947 287.

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