

Fall armyworm information and procedures for submitting samples

- Fall armyworm (FAW) is a major insect pest in a wide range of crops including cotton, maize, rice, sorghum, sugarcane and vegetables.
- In Eastern Australia It had previously not been detected south of Bundaberg, Qld before this detection between Moree and Boggabilla (by-passing the Darling Downs and Border Rivers)

Information about fall armyworm can be found at:

- <https://www.dpi.nsw.gov.au/biosecurity/plant/insect-pests-and-plant-diseases/fall-armyworm>

Host Range:

- FAW is reported to have a wide host range of more than 350 species, but the Queensland experience has shown that the fall armyworm present there have a preference for maize and to a lesser extent, sorghum crops when they are present.
- In WA and NT, FAW have been found on horticultural crops.

Life Cycle: Can be completed in around 4-6 weeks in warmer months

- Each female lays 100-200 eggs at a time, under a felt like layer of scales on the underside of leaves, but the hatch quickly and may not be obvious.
- 5-6 larval stages growing up to 3-4 cm long
- Pupate in leaves, cobs or on soil. **DO NOT OVERWINTER**, so will not survive colder winters, below 10-12 C.
- Adult moths are strong flyers and can move large distances
- We expect it will be a seasonal / migratory pest in most NSW regions (possibility of some establishment in the North Coast)

Damage:

- FAW produce similar damage to other noctuid moth larvae, such as *Helicoverpa* spp. and other armyworms.
- The damage is more likely to be seen before the larvae
- Younger plants: Look for 'skeletonising' or 'windowing' of leaf surface by very small larvae and 'shot holes in emerging leaves' by medium and larger larvae
- The larvae are often be found in the leaf whorl, with evidence of frass.
- Older plants, the larvae will make their way into developing heads and corn cobs. Once in the cob they are very difficult to control, and usually pupate there or on the soil.

Qld examples of damage in grains crops available at:

<https://thebeatsheet.com.au/key-pests/fall-armyworm/#dam>

Identification:

Small larvae will be difficult to identify in the field, they are often pale green to brown, with a dark head capsule.

Larger larvae have some characteristics that make identification easier, these include:

Similar colouration to other Noctuids, but they have

- a dark head capsule with a distinct upside down Y shape between the eyes,
- two dark dots with spines on each body segment
- 3 pale lines running the length of the body may be seen on larger larvae
- and four dark spots arranged in a square on the last abdominal segment.

Adult moths are difficult to distinguish from other noctuid moths in the field and will need to be sent to DPI for ID (contact exotic plant pest hotline or biosecurity email for assistance).

NSW DPI website has a fall armyworm page with good resources for identifying the larvae, including links to a webinar on diagnostics.

<https://www.dpi.nsw.gov.au/biosecurity/plant/insect-pests-and-plant-diseases/fall-armyworm>

Sending SAMPLES of larvae for diagnostics:

If growers or consultants are considering sending a sample of a small larvae for diagnostics, please consider the turn around time, which may be 7-10 days by the time a package is received in the mail and processed through the laboratory.

With the products available, treatment of small larvae is likely to provide the greatest efficacy, waiting for a diagnosis of a sample mailed in before treatments are applied may reduce efficacy.

The best option for identification of larvae is to SEND CLEAR PHOTOS, from the side and from above the larvae to the biosecurity email: biosecurity@dpi.nsw.gov.au

Larger larvae are easier to identify, to assist with diagnosis retain live larvae and rear them on a suitable food source (host crop leaves) in a take-away food container or similar placed in a warm spot. If you cannot identify the larger larvae, send in photographs for identification, if we cannot identify it from the photographs, we will request a sample.

NOTE: If samples of larvae need to be sent into OAI for diagnostics please ensure you have the necessary equipment available (LLS will need to have these available if assisting growers to submit samples):

- Small glass vials or plastic specimen jars
- Parafilm to place between jar and lid
- Ethanol
- Zip lock bags to double bag the sample jar
- Non crushable container (plastic / take-away food container) to place jars in
- Packing – tissues / Paper towel to stop jar moving in container
- Express post envelopes
- **Completed Sample submission form (attached to email) - no ID without one**
- Correct address for submission: **Biosecurity Collections Unit, Orange Agricultural Institute, 1447 Forest Road, Orange NSW 2800**

All suspect fall armyworm should be reported

Fall armyworm (*Spodoptera frugiperda*) is a notifiable plant pest in NSW.

All notifiable plant pests and diseases must be reported **within 1 working day**. You can report notifiable plant pests and diseases by one of the following methods:

- Call the Exotic Plant Pest Hotline 1800 084 881
- Email biosecurity@dpi.nsw.gov.au with a clear photo and your contact details
- Complete an [online form](#)

Guidance on treatment thresholds: (QDAF – beat sheet blog has a fall armyworm information)

<https://thebeatsheet.com.au/key-pests/fall-armyworm/#dis>

Available treatment options in NSW:

Consider thresholds, treatment options available, IPM and Resistance management before making an application decision.

A list of registered or permitted products can be found at:

<https://www.dpi.nsw.gov.au/biosecurity/plant/insect-pests-and-plant-diseases/fall-armyworm/chemical-management-options>

Resistance Management strategy (RMS):

Note – molecular testing of fall armyworm samples from interstate populations indicate genetic markers for resistance to some of the control options available.

NSW DPI have received FAW samples from Queensland, Western Australia and Northern Territory and consistently found mutations associated with organophosphate / carbamate but none of them carries mutations conferring resistance to pyrethroids and diamides.

Please bear in mind that we are screening target sites for resistant genes which is the most common mechanism of insecticide resistance. No mutation associated with pyrethroids and diamides does not mean there is no resistance to these chemical groups. Detoxification is also another mechanism of insecticide resistance.

Growers should consider the likelihood of organophosphate / carbamate resistance, especially they should alternate chemical groups between sprays to reduce resistance selection to any chemical insecticide group for fall armyworm control.

Consultants and growers should monitor the results of spray jobs to ensure adequate efficacy.

Next steps, NSW DPI are screening for different alleles/mutations associated with other chemical groups, including group 2B (Fipronil), Group 4A (Neonicotinoids), (Imidacloprid, thiamethoxam...); Spinosyns (Spinetoram, spinosad); and Avermectins / Milbemycins (Abamectin, Emamectin benzoate, Milbemectin).

Please follow the resistance management strategy.

<https://www.croplife.org.au/resources/programs/resistance-management/various-fall-armyworm-spodoptera-frugiperda/>

NSW Surveillance using pheromone traps (attract adult Male moths)

- Plant Biosecurity, in conjunction with LLS and Industry Collaborators have been establishing a network of around 45 pheromone traps across the north of the state to assist with early detection of the adult male moth
- Information on detections in the Northern parts of NSW will be shared through QDAF's 'Beatsheet Blog' at <https://thebeatsheet.com.au/key-pests/fall-armyworm/faw-pheromone-traps/>

Resources

- [Chemical management options](#)
- [Primefact: Fall armyworm \(PDF, 277.35 KB\)](#)
- [Poster: Fall armyworm \(PDF, 1446.53 KB\)](#)
- [Poster: Identifying Fall armyworm \(PDF, 1966.79 KB\)](#)
- [Queensland government information on fall armyworm](#)
- [The Beatsheet - Fall armyworm, should you be concerned?](#)
- [Australian government information on fall armyworm](#)
- [CottonInfo fall armyworm identification guide \(PDF, 652KB\)](#)