

# Factsheet

August 2020

## Fall armyworm (*Spodoptera frugiperda*)

### Summary

The fall armyworm moth is a plant pest that can damage a wide variety of crops. Fall armyworm poses a threat to many of Western Australia's agricultural industries. Early detection and reporting of fall armyworm will help protect Western Australian plant industries and the environment.



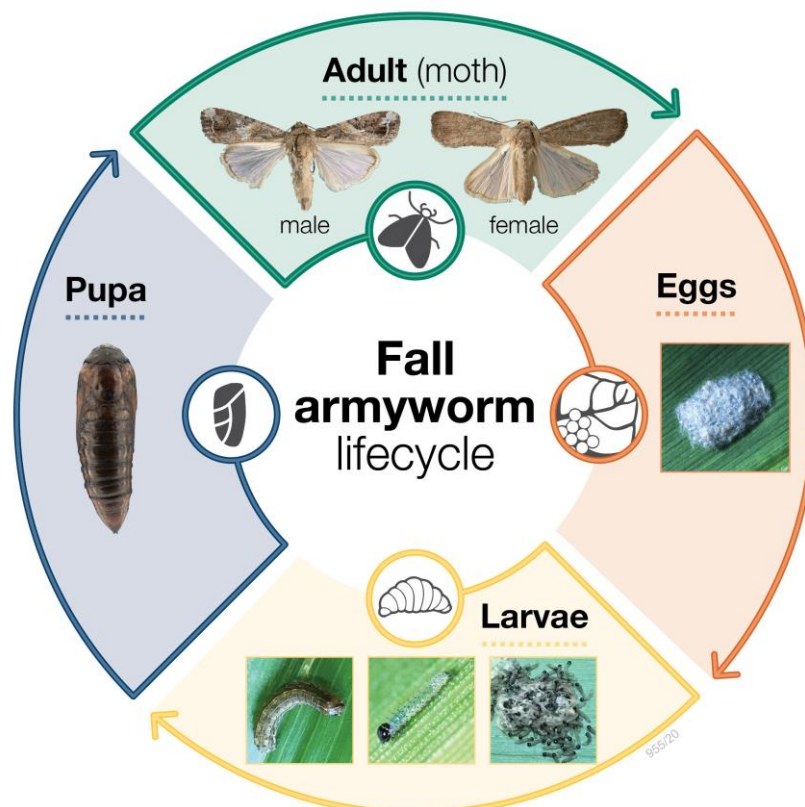
### Current situation

While fall armyworm is native to tropical and sub-tropical regions of the Americas, since 2016 it has rapidly spread to and throughout Africa, the Indian subcontinent and Southeast Asia.

Fall armyworm was first recorded in Australia in January 2020. The first detection in Western Australia was in Kununurra in the Kimberley region, in March 2020, and soon after in Broome. It has also been detected in key horticultural and other growing regions further south.

### Description

Fall armyworm has four life stages: egg, larva (caterpillar), pupa and adult (moth).



## Eggs

Fall armyworm eggs are pale yellow and laid as an egg mass of about 100 to 200 eggs. Egg masses are laid on leaves and covered with a layer of hairs and scales shed by the female moth.



## Larvae

Larval appearance changes with development throughout the life cycle. When larvae first hatch from eggs, they are light coloured with a relatively larger dark head compared to the rest of the body.

As larvae develop, the body becomes darker and white lengthwise stripes and dark spots with small setae (bristles) appear. The body colour can vary from light green to dark brown. The length of early instar larvae is about 1.5mm to 6.5mm.

Older larvae possess an inverted white 'Y' mark on the head between the eyes and the thin white lines down the length of the body become more prominent.

Four large black dots appear in a square on posterior upper body segment eight (the second last abdominal segment near the end of the caterpillar), while all other segments have four smaller dots in a trapeze arrangement.

Older larvae reach a length of about 35mm. Body colour can vary from light pink to very dark brown.



*Newly-hatched larvae (neonates)*



*Early instar (young) larva*



*Late instar (older) larva*

## Pupae

Pupae are coloured reddish-brown, are about 5mm wide and up to 18mm long. Pupation usually occurs in the soil under the host plant or in the host vegetation.



## Adults

Adult fall armyworm (moths) are 32-40mm in length from wing tip to wing tip, with a brown or grey forewing and a white hind wing. The wings of male fall armyworm moths are more patterned than those of the females. Males also have a distinct white spot on each of their forewings.



*Male fall armyworm moth*



*Female fall armyworm moth*

## Hosts

Fall armyworm is thought to feed on about 350 plant species hosts. The larvae predominantly feed on crops and pastures from the *Poaceae* (grass) family, in particular maize, but also sorghum, forage grasses, turf grasses, cereals and rice. The pest can also feed on non-grass crops such as cotton, peanuts, vegetables and some fruit crops.

## Impacts

Damage caused by fall armyworm can reduce plant growth, significantly reduce crop yield and cause plant death. A large number of fall armyworm can rapidly destroy crops.

## Dispersal and migration

Fall armyworm is known for its ability to disperse within a crop locally and migrate long distances, which enables it to exploit new habitats and expand its range. Adult moths are good flyers and can travel hundreds of kilometres in a short period of time.

Fall armyworm larvae also disperse. The neonates spin a silk thread they use to balloon away from the egg mass to nearby host plants. Larvae of all ages are able to quickly crawl from one host plant to another.

This means both adults and larvae are able to move quickly within crops and from one crop to another or to nearby host plants after harvest.

Fall armyworm can also be spread through the movement of people and commodities.

The Australia Government closely regulates approved imports of plant material and monitors for illegal plant movement.

## Monitoring

Inspect host crops regularly for the presence of fall armyworm.

To help identify symptoms of fall armyworm, examine plants for:

- Leaf damage, including pinholes, windowing and defoliation.
- Newly hatched larvae, which are more active at night, and eat pinholes and transparent windows in leaves.
- Bigger larvae grazing on leaves, stems and fruit, and leave frass (droppings), and
- Larvae in plant whorls, particularly in maize and sorghum.

Regularly monitor the crop, surveying sections on the edges of the crop and towards the middle to best determine whole crop damage and management requirements.

## Management

Fall armyworm management has been a challenge worldwide. The key to effective management is early detection of the pest in the crop and regular monitoring to assess population build up.

Host-plant resistance and variations in production practices have been successfully used in other parts of the world. Integrated Pest Management (IPM) that employs a variety of tactics will be essential to managing fall armyworm for the long-term.

Further research is needed to understand more about fall armyworm, how it is going to impact crops in Western Australia and even where and when it will become problematic. Management strategies will be an important research area for the Department of Primary Industries and Regional Development (DPIRD).

Fall armyworm will feed on crops where other lepidopteran pests, such as cluster caterpillar (*Spodoptera litura*), common armyworm (*Mythimna convecta*), cotton bollworm (*Helicoverpa armigera*) and others are already present and established. Many of the management strategies used for lepidopteran pests may also be effective for fall armyworm.

Permits are in place for fall armyworm control in horticulture and grains crops. More information is available from the Australian Pesticides and Veterinary Medicines Authority (APVMA) [Online Services Portal](https://portal.apvma.gov.au/permits) (<https://portal.apvma.gov.au/permits>). Search for 'fall armyworm'.

Where required, the APVMA permits should be read in conjunction with the relevant product label for information on withholding periods and other critical comments.

Pesticides are often the primary tool for management and many products are effective at reducing pest numbers. However, fall armyworm is reported to relatively quickly develop resistance to insecticides and their use for fall armyworm may also change the dynamics of other pests in the system. It is therefore important to use insecticides judiciously.

If pesticides are used for fall armyworm management, it is advised that beneficial-friendly products are applied.

Natural enemies are found suppressing fall armyworm populations around the world. There is a suite of natural enemies that attack pests similar to fall armyworm in the same crops in Western Australia and it is likely these natural enemies will also reduce fall armyworm numbers.

## Natural enemies

A number of natural enemies present in crops that attack the eggs, larvae and pupae of other lepidopteran pests are likely to also attack fall armyworm in the same crops.

Generalist predators, such as spiders, beetles, ants, sucking bugs and predatory wasps, will likely reduce the numbers of eggs, larvae and pupae. The adults and pupae may be fed on by birds and other animals.

A study conducted in Georgia, United States, demonstrated that 60 to 90 per cent of pupae were consumed by predators. Soil pathogens, such as nematodes, may infect pupae and drive numbers down.

Overseas, egg parasitoids are important for biological control. Parasitoids such as *Trichogramma pretiosum* have been shown to reduce the number of larvae hatching from egg masses, thereby reducing damage to the host plant. These parasitoids have been easily mass-reared and are available in Australia where they have been used for management of *Heliothis* and other lepidopteran pests.

Other parasitoids, such as *Telenomus remus*, reduce fall armyworm numbers overseas and are present in Australia.

Larval parasitoids have also reduced fall armyworm numbers overseas. *Cotesia marginiventris*, which is present in Australia, is an important natural enemy in several countries.

## Reporting

Report unfamiliar, problematic or potential exotic pests via the options below:

- Pest and Disease Information Service +61 (0)8 9368 3080, email [padis@dpird.wa.gov.au](mailto:padis@dpird.wa.gov.au) or
- [MyPestGuide™ Reporter](#) App or [mypestguide.agric.wa.gov.au](http://mypestguide.agric.wa.gov.au)

## More information

- More information on fall armyworm in Western Australia is available on the DPIRD website at: [agric.wa.gov.au/plant-biosecurity/fall-armyworm-in-western-australia](http://agric.wa.gov.au/plant-biosecurity/fall-armyworm-in-western-australia)

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