



Department of
Primary Industries



Local Land
Services

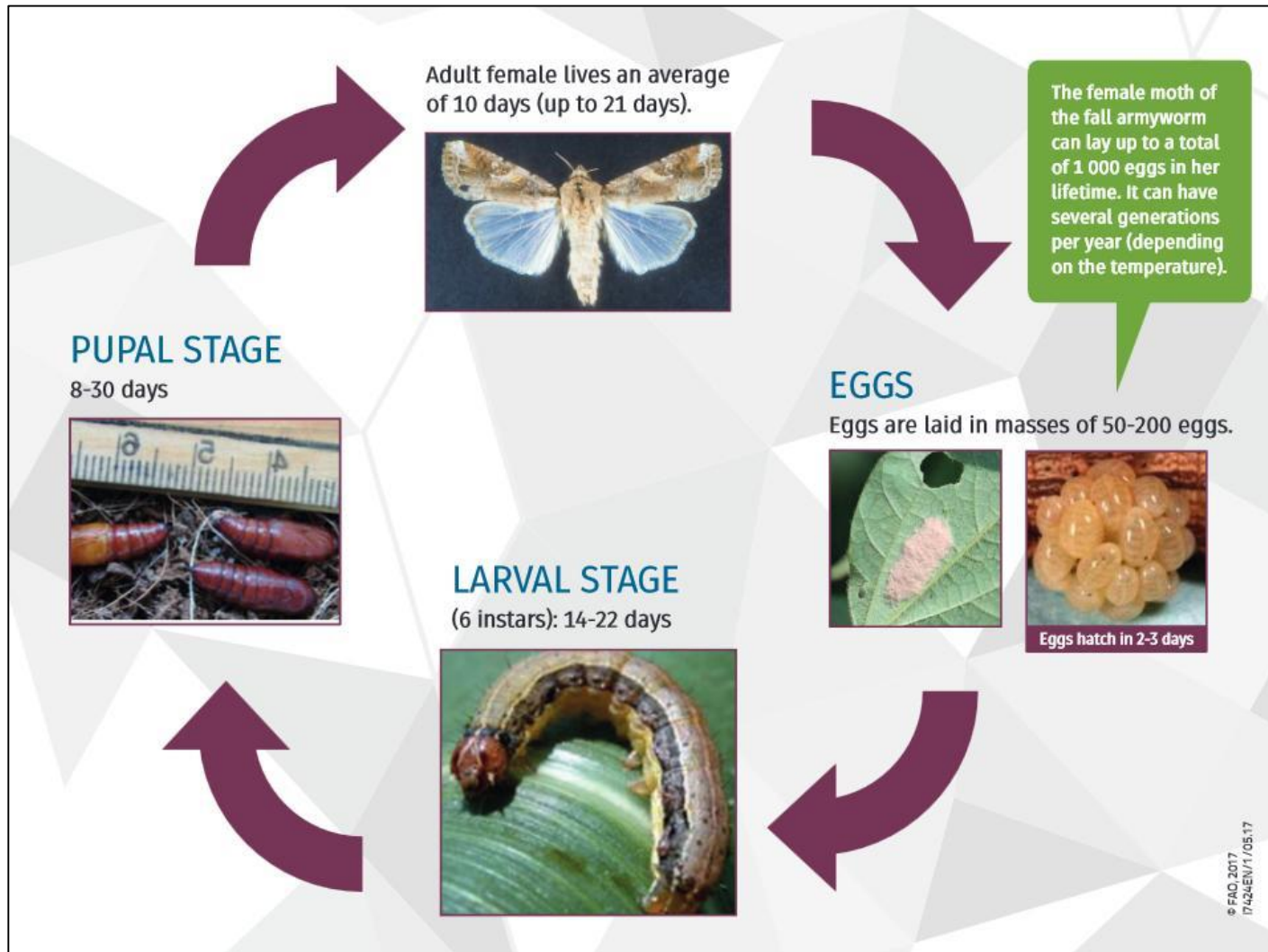


FALL ARMYWORM:

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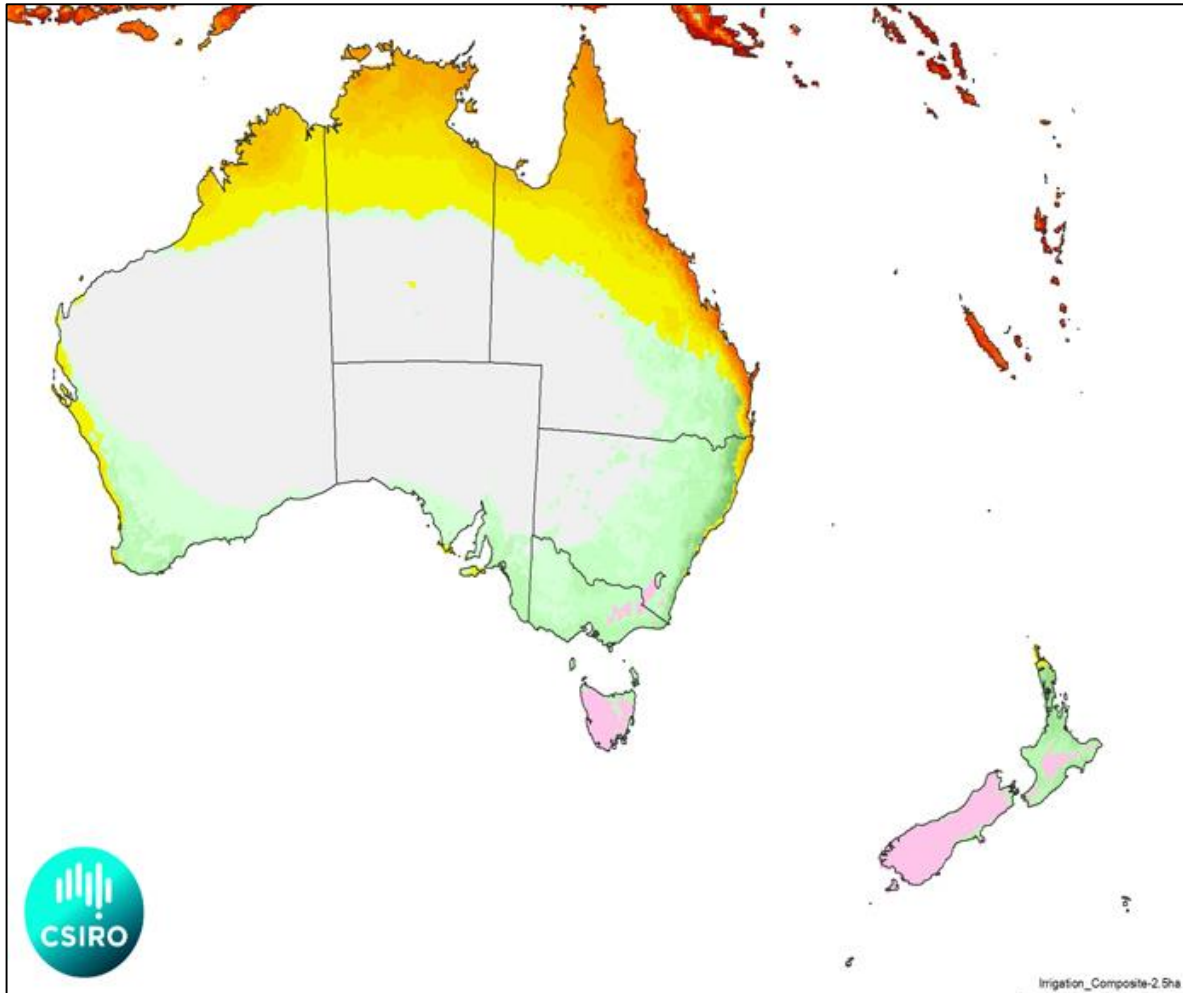
FAW life cycle



- Highly temperature dependent
- 24 – 55 days (egg to adult)
- Mature larvae ~35 mm
- Tropical to subtropical species
- Can survive mild winters only
- Cannot diapause in response to low temperatures
- Pupation generally occurs in the ground, but can occur within plants (especially in maize cobs)

Image: © FAO, via Vikaspedia

Potential FAW distribution in Australia – CLIMEX modelling



- White areas = no population growth
- Pink areas = populations cannot complete a full generation
- Green areas = populations may grow but not persist continuously
- Yellow through to red areas = increasing suitability for year-round persistence
- **Annual establishment in NSW cropping areas is likely to arise from adult moths dispersing from coastal areas of northern NSW and southern Queensland**

Image: © CSIRO, via GRDC

<https://thebeatsheet.com.au/key-pests/fall-armyworm/faw-pheromone-traps/>

Long distance and local dispersal



Adult FAW are very strong fliers, can travel several 100's km per day.

Images: D Visser, ARC-VOP Roodeplaat



Newly hatched larvae can 'balloon' on the wind on silk filaments.

Host plants affected

The host range of FAW includes more than 140 species of reported cultivated and wild plants within the Poaceae (grasses) family and non-grass hosts. While Australian research is ongoing, recent international research indicates that FAW tends to favour summer crops in this general order.



Damage – maize



Images: D Visser, ARC-VOP Roodeplaat

Helicoverpa damage



Discrete 'bullet holes', minor perforations or a few jagged holes – not extending to the leaf margin.

Damage in tip of cob predominantly.

FAW damage



Where repeated and continuous FAW infestation occurs, all leaves will show some evidence of feeding damage.



Under low FAW pressure, plants grow 'past' the early damage, but evidence of early infestation visible on lower leaves (windowing from high density of small FAW larvae, perhaps post emergence).

FAW damage



Ayr (16/11/2020) severe damage to sorghum and maize seedlings, at 10 days post emergence. Sustained egg lays with up to 14 larvae/plant (maize). Densities and damage in sorghum significantly less than in corn (4 larvae/plant). Large larvae under clods and burrowing into stems, killing plants.



FAW damage

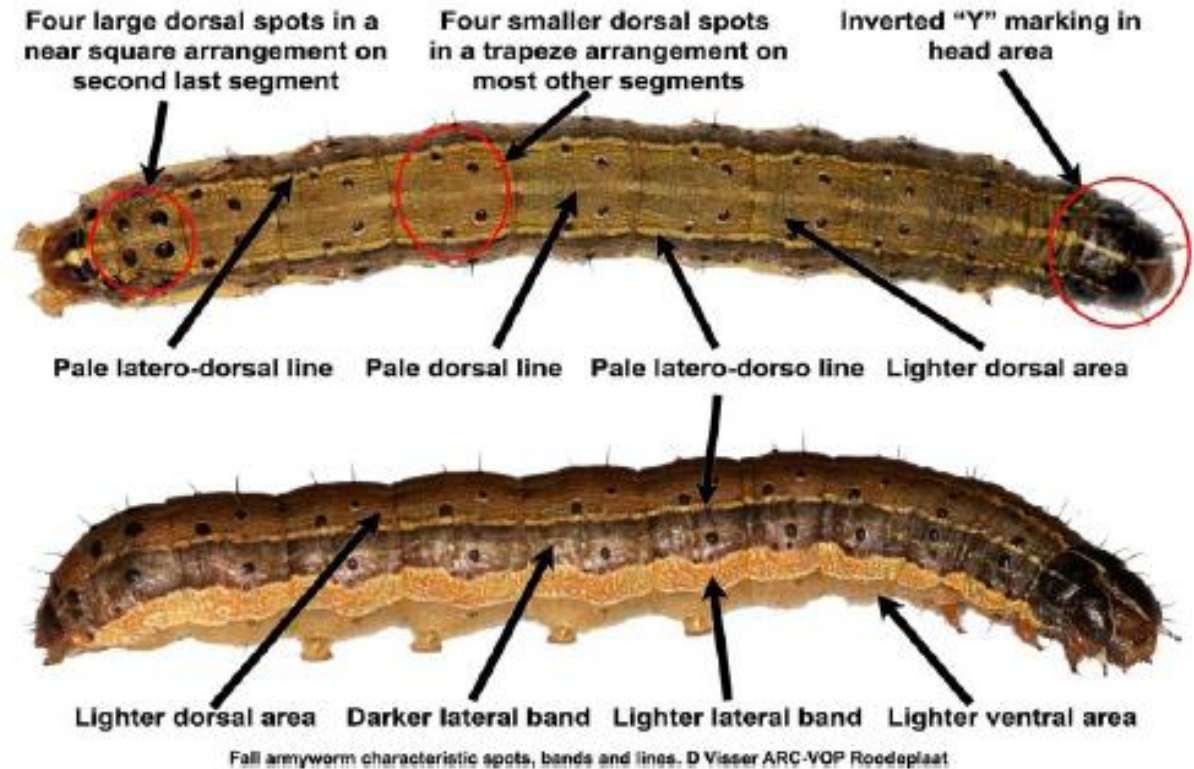


In the reproductive stages, tassels can be severely damaged. FAW larvae will establish in and damage numerous sites. Tip damage to cobs, side damage to cobs, cob stalk damage and larvae in leaf axils and under wrapper leaves, are common.

Diagnosis of FAW larvae



Fall armyworm characteristic marks. D Visser ARC-VOP Roodeplaat



Fall armyworm characteristic spots, bands and lines. D Visser ARC-VOP Roodeplaat

Diagnosis of larvae

- can be done with photos via email, once they are old enough.
- Keep the on food, watch how they grow, send pics when features easier to see.



Lots of other noctuids

-Based almost entirely on colour patterns, so try to photograph them while they're alive



Spodoptera frugiperda



Spodoptera eridiana



Spodoptera litura



Agrotis ipsilon



Agrotis infusa



Helicoverpa punctigera



Helicoverpa armigera



Achyra affinalis



Ostrinia nubilalis

Rule out other larvae

Flattened, “greasy”
appearance,
inconspicuous pinacula



Agrotis ipsilon



Agrotis infusa

Pale head,
dorsal
marmorations
or stripes



Helicoverpa punctigera



Helicoverpa armigera

Black triangular
markings on
dorsum



Spodoptera eridiana



Spodoptera litura

Confirmatory diagnosis: larvae

DARK BROWN head
and T1, with white
stripes and "inverted Y"



Prominent dorsal
pinacula (black
spots)

Crochets in a
mesoseries (not a
full circle)



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FALL ARMYWORM:

Control options and resistance

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

Summary of results to date from the NSW DPI study of baseline response to insecticides registered under permit for FAW in Australia:

- There is a similar level of toxicity (efficacy) of the Group 28 insecticide chlorantraniliprole (Altacor®) and emamectin benzoate (Affirm®) in both *H. armigera* and FAW.
- The toxicity of indoxacarb (Steward®) is significantly lower in FAW compared with susceptible *H. armigera* but this is unlikely to be due to resistance and probably represents a naturally higher tolerance to indoxacarb in FAW.
- FAW is 20-50 times less sensitive to alpha-cypermethrin, deltamethrin and gamma-cyhalothrin compared with susceptible *H. armigera*. Therefore, based on our experience with *H. armigera* with similar levels of SP resistance, it is highly likely that field rates of SP will not control FAW.
- There is strong evidence to support metabolic (not target site) resistance to SP in FAW.
- The results of carbamate toxicity in FAW are pending and will be known by the end of this week.
- Parasitic wasp species have been observed in the field to be very efficient natural enemies of FAW larvae. Therefore, use soft options (not SP or carbamate) to preserve beneficial insects which will help to suppress populations of FAW.

Adult Moth -Fall armyworm diagnostics



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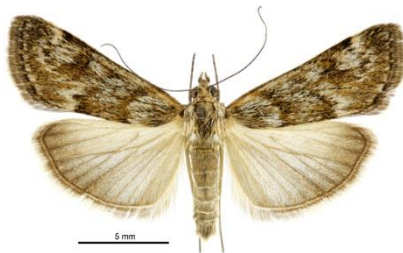
Prepared by Ainsley Seago, Catherine Phillips, and Peter Gillespie
Biosecurity Collections
Orange Agricultural Institute

Differential diagnosis: adults

- Rapid triage of bulk samples from pheromone traps:

1. Is it a **moth** in the family **Noctuidae**?

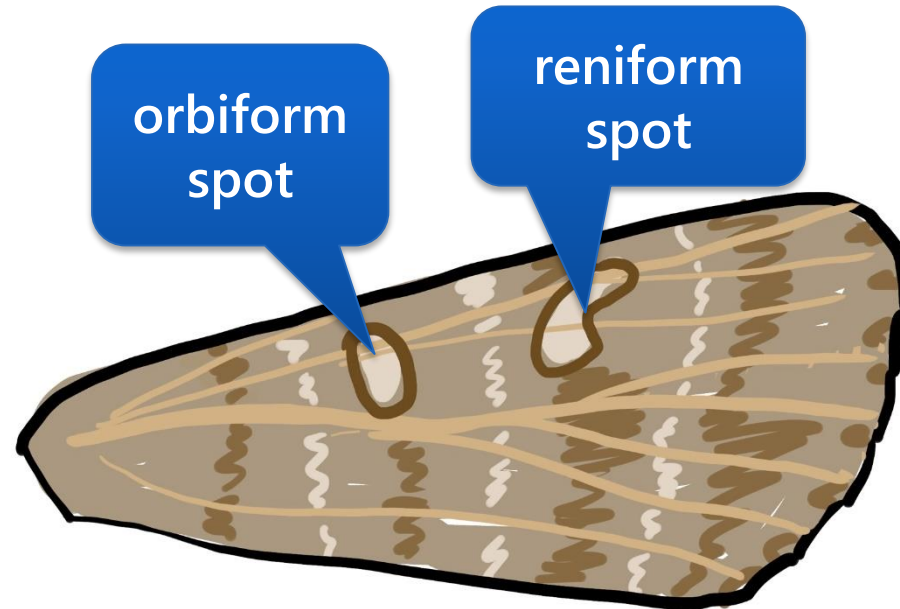
- No “snout”
- Slender antennae
- Triangular forewing AND differently colored hindwing
- Bulky, brown, tent-like posture



Differential diagnosis: adults

- Rapid triage of bulk samples from pheromone traps:

SECRET NOCTUID INSIGNIA: distinctive pair of forewing spots



Differential diagnosis: adults

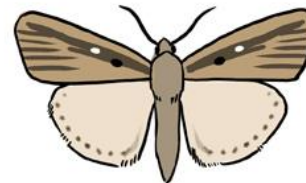
- Rapid triage of bulk samples from pheromone traps:

2. Is it in the genus *Spodoptera*?

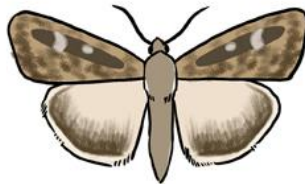
Pale, almost translucent hindwing with narrow submarginal stripe



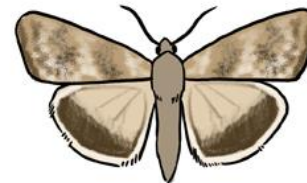
Spodoptera



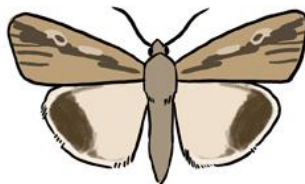
Leucania



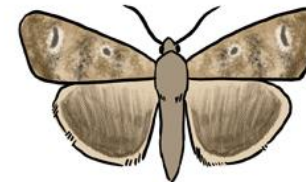
Agrotis



Helicoverpa



Persectania



Dasygaster

Source: The Beatsheet Blog – Qld DAF – guide to sorting traps



Reporting



- FAW is notifiable in NSW
- Please report to NSW DPI Biosecurity
 - biosecurity@dpi.nsw.gov.au – please include clear photos
 - Exotic Plant Pest Hotline 1800 084 881
 - NSW DPI online form
- Diagnostic support

**IF YOU SEE ANYTHING UNUSUAL,
CALL THE EXOTIC PLANT PEST HOTLINE**

☎ 1800 084 881