

# Detecting and assessing fall armyworm (FAW) infestations in winter cereals and pasture

Melina Miles & Trevor Volp. *Field Crops Entomology*. Queensland Department of Agriculture and Fisheries.

## Key messages:

- All winter cereals and some grass pasture species are at risk of FAW infestation and potential crop loss.
- Crops are highly susceptible to severe defoliation and plant death by FAW from crop emergence to tillering. Inspecting crops for damage and larval presence within a week of emergence is critical.

Oats and other winter forages are not usually checked for insect pests, but this autumn these crops should be monitored for fall armyworm (FAW). This season some oat crops across southern QLD/ northern NSW have been destroyed by FAW infestations. Damage to early crops has also occurred in Central Queensland.

**Crops at risk** include winter cereals (oats, barley, wheat) and pasture grasses such as establishing Rhodes grass and rye grass (particularly if sown in mixes with oats).

All at-risk crops should be checked for larvae (caterpillars) within a week of emergence. Unroll leaves and look for larvae, even if there are no signs of leaf damage. Don't wait until bare patches start to appear in the crop.

Egg masses are difficult to find and small larvae are typically concealed in the whorl of the plant. Small larvae cause only minor damage such as windowing. Large larvae do the majority of damage, including defoliation, stem cutting and below ground feeding that can result in plant death. They are often more active at night, so consider monitoring after dark if larvae cannot be found during the day. For information on FAW ID see [thebeatsheet.com.au/key-pests/fall-armyworm/faw-identification](http://thebeatsheet.com.au/key-pests/fall-armyworm/faw-identification)



**It is critical that plants are pulled apart to check for larvae.** Simply looking for damage will not allow you to gauge the extent of the infestation and the ongoing risk to the crop. Early windowing can be easily missed, leading to the perception of crops 'disappearing in a couple of days'.

## Management options

Almost no registrations or permits are currently available for winter cereals or pastures other than PER93481 (emamectin benzoate in wheat) and PER90820 & PER91477 (NPV products in cereal grains, fodder and forage). To be effective, NPV products need to be applied to very small larvae as they will not kill larger larvae, and larvae may take over a week to die in cool temperatures.

## In the absence of effective insecticide options, consider the following:

1. Established forage crops (tillering) are tolerant of some defoliation, given they are bred for their ability to regrow from grazing via compensatory growth and tillering.
2. Australian FAW populations are highly resistant to synthetic pyrethroids (Group 3A) and moderately resistant to carbamates (1A) and organophosphates (1B).
3. As temperatures decline, the rate at which FAW develop and feed will slow down, meaning larvae are exposed for longer to a range of factors that can kill them (e.g. rain, wind, predators, parasitoids, disease), reducing the risk of crop loss.
4. Delaying planting susceptible crops will reduce the risk of high-density infestations of FAW.
5. If crop loss has occurred and resowing is planned, FAW larvae may still be present in the soil or grass headlands and cause damage to the resown crop as it emerges. Check the soil and any remaining plants before resowing.
6. Where crops are severely defoliated by FAW, neighbouring fields are also at risk of infestation as large larvae move from the damaged crop looking for other food sources.



Left to right: egg mass, hatched larvae and windowing, unroll leaves to find small larvae, plants lopped by larger larvae.

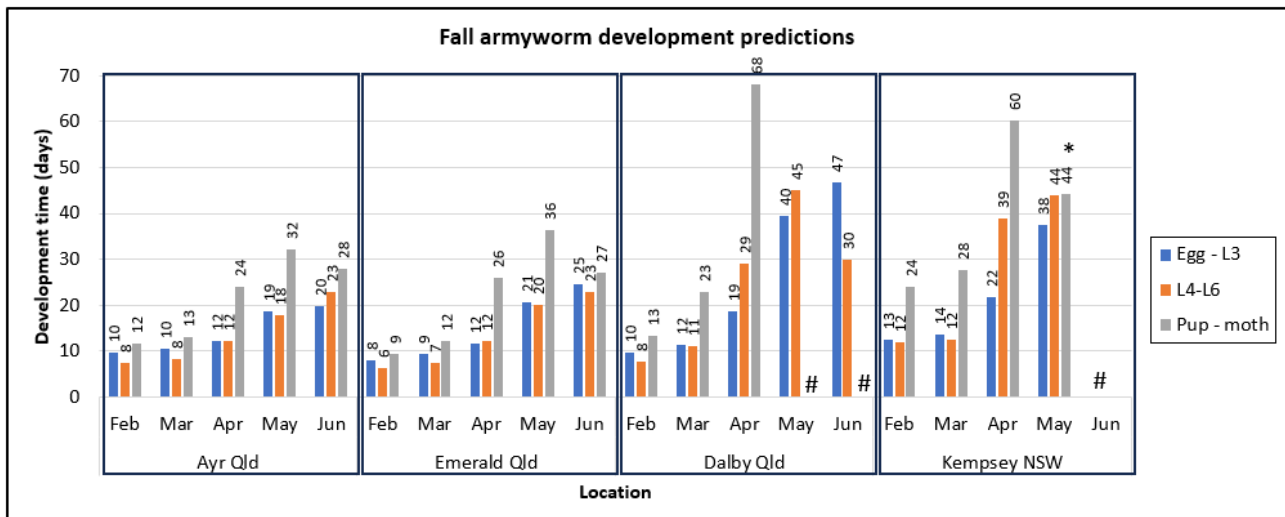
## Temperature and FAW activity

Importantly, FAW activity and rate of development will slow in most regions as temperatures cool. The graph below shows the predicted rate of development of FAW for four locations from north Queensland to the mid North Coast of NSW. The predictions are generated using the insect development model, DARABUG ([cesaraustralia.shinyapps.io/darabug2](http://cesaraustralia.shinyapps.io/darabug2)).

These data show that FAW can develop year-round in more northerly regions if suitable host plants are present. In more southerly regions, it is more likely that FAW populations will 'die' out or at least be reduced to very low levels over winter. The temperature threshold for successful FAW development is around 10°C.

US studies show that FAW larvae on plants can survive several hours of sub-zero temperatures (like occurs with a frost), but that moths are considerably less fit (poor emergence from pupae, low egg production) when they develop and emerge in cool temperatures.

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Predicted duration of FAW lifestages for Ayr, Emerald, Dalby in Qld and Kempsey in NSW. Egg-L3 are non-damaging stages (L3 = 3<sup>rd</sup> instar larva). Fourth – 6<sup>th</sup> instar larvae are damaging (L4-L6).

- # shows where data has been omitted as the model was unable to predict duration, likely because temperatures were lower than development thresholds.
- The pupal development for Kempsey NSW in May (indicated by \*) is shorter than for April because the extended larval development means that pupae are developing in warming spring temperatures.