

FALL ARMYWORM ON NORFOLK ISLAND IDENTIFICATION AND MANAGEMENT

Background

Fall armyworm (*Spodoptera frugiperda*, Lepidoptera: Noctuidae) (FAW) was reported in the Torres Strait in 2019 and in Papua New Guinea, New Caledonia, and mainland Australia in 2020. It on Norfolk Island in March 2021. The spread of FAW around the world, and the serious impact it has, is well documented. Chemical control of this pest is difficult because some strains are developing resistance, getting good coverage is difficult and there are adverse impacts on natural enemies, as well as environmental and human toxicity issues. Consequently, it is widely acknowledged that an integrated approach to the management of FAW is required.

Identification

A single female FAW moth can lay up to 2,000 eggs deposited in batches of 100-200. Eggs are covered with scales from the female's abdomen and are laid on the leaves and stem of the host plant at night (Figure 1).



Figure 1: Left: Fall armyworm egg batch. Right: Newly hatched larvae. Credit CIMMYT*.

Immature larvae look similar to other pest caterpillars but as they mature, they can be distinguished by an inverted 'Y' shape on the head capsule and four spots arranged in a square on the second last segment (Figure 2). Adult FAW look similar to other species of *Spodoptera* that occur on Norfolk Island except that the male has a pair of white patches on the tips of its forewings (Figure 3).



Figure 2: Late stage FAW larvae with inverted 'Y' on the head and four raised spots arranged in a square on the second last segment. Credit CIMMYT*.



Figure 3: Adult male FAW showing characteristic white wing spots. Credit A. Reago & C. McClarren.

Biology and life cycle

Fall armyworm has a wide host range including sorghum, chickpea, soybean, melon, green beans, capsicum and many grasses. Maize (common on Norfolk Island) is its favoured host and consequently is the plant that is likely to suffer most damage from FAW.

Larvae hatch within 2-3 days after eggs are laid. They begin feeding on the leaf. As the larvae mature, they increase feeding exponentially and can cause significant damage. They are more active at night. The subtropical climate on Norfolk Island means that FAW may be able to breed all year round.

Damage and symptoms

FAW feeding damage is similar to that caused by other pests on Norfolk Island, including corn earworm, cluster caterpillar, beet armyworm, and native budworm. The best way to see if you have FAW is to identification section above to distinguish inspect your plants and use the FAW leave.

Damage to maize includes chewing of leaves and the presence of frass (faeces). Young larvae create 'windows' in the leaves when they feed (Figure 4) while older larvae cause more obvious chewing damage (Figure 5).



Figure 4: Typical feeding 'windows' damage caused by small FAW larvae. Credit DAF QLD.



Figure 5: Damage to young maize plant from Fall armyworm larvae. Credit CIMMYT*.

Monitoring and management

Monitoring Weekly monitoring of FAW should be started in the early stages of your corn crop. Smaller FAW larvae are easier to control than larger larvae and FAW is difficult to control in mature corn plants. Look for FAW egg masses and, if feasible, remove by hand. FAW likes to feed on the top three to four leaves of developing maize plants, so this is the best place to look for damage. Check 10 to 20 per cent of your crop plants (depending on the size of your block) for damage and consider treatment if 20 per cent of younger plants or about 40 per cent of more mature (but not yet flowering) plants show signs of FAW.

Pheromone traps are available to catch male FAW moths. However, trap catches often don't give a good indication of oviposition (egg laying) and are of limited use in monitoring FAW.

Biological control. Treatment may not be necessary if you have good levels of natural enemies in your crop. There has been extensive research globally, and it is widely recognised that biological control from natural enemies is a key element to

practical management of FAW. Natural enemies of FAW include predatory insects such as ladybird beetles, lacewings and assassin bugs, as well as parasitoids (a type of parasite) that kill FAW by laying their eggs into FAW eggs and larvae.

With many species of endemic butterflies and moths, it is likely that there are predators and parasitoids present on Norfolk Island that help control but there is little information to confirm this. Parasitoids represent the most useful management tool for biological control of FAW and knowledge of parasitoid species present on Norfolk Island would help guide the development of an Integrated Pest Management (IPM) program.

There are some basic steps that can be taken to promote likely natural enemies of FAW on Norfolk Island. Most importantly, the use of broad-spectrum insecticides should be avoided. Any natural enemies in the crop are likely to be more susceptible to the pesticide than FAW, so surviving FAW caterpillars will have free rein, leading to a need for more pesticide application. Inter-planting with flowering plants like sweet alyssum, parsley, fennel, and yellow daisy can supplement the nutritional requirements of natural enemies and allow them to multiply and exert greater control.

Chemical control. When FAW arrived in Australia, permits were issued for the use of insecticides for crops likely to be affected. Several of them are highly targeted to caterpillars and are compatible with IPM principles with low toxicity to natural enemies. Check the Australian Pesticides and Veterinary Medicines Authority website for further information.

Useful links

<https://www.agrilinks.org/post/feed-future-tools-combat-fall-armyworm-africa>

https://www.usaid.gov/sites/default/files/documents/1867/Fall-Armyworm-IPM-Guide-for-Africa-Jan_30-2018.pdf



Australian Government

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