How to distinguish between armyworm pests

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Being an invasive insect species, the presence of the fall armyworm in Africa over the past few years has once again highlighted the importance of distinguishing between the different larval and worm species that attack maize. To make things a little easier, this article provides some useful information on these species.

The larval species all belong to the insect order *Lepidoptera*. This means that there is a larval/worm stage after the eggs have hatched. After that, the larva pupates and finally emerges as a moth or butterfly.

We are familiar with two armyworm species currently found in South Africa, namely the African armyworm (*Spodoptera exempta*) and the beet armyworm (*Spodoptera exigua*).

African armyworm (Spodoptera exempta). (Photo by A Erasmus)

African armyworm

The African armyworm is found throughout sub-Saharan Africa and is a serious pest in countries north of South Africa. Unexpected pest outbreaks are characteristic of the African armyworm. Large larval colonies rarely attack extensive grazing, lawns and grass crops (e.g. maize and sorghum) areas. Minor outbreaks occur frequently, especially in areas with high rainfall, such as Mpumalanga and KwaZulu-Natal, but large-scale outbreaks occur only every five to ten years. The worst outbreaks in South Africa occur in seasons with late summer rainfall following drought conditions.

The moth of the African armyworm is brown with white hindwings and distinctive darker patterns on the forewings. Moths can migrate across thousands of kilometres, especially during years marked by pest outbreaks. They migrate in the early evening and can reach heights of between 300 and 1 000m above ground level. Moths move downwind on air currents, usually from the warmer northern neighbouring states such as Zambia, Zimbabwe or Mozambique, to South Africa.

Moths lay eggs in groups of 100 to 400 and a single female can lay up to 1 000 eggs. Eggs hatch within three to six days, depending on temperature and humidity. Larvae grow in length to approximately 25mm. They have a black appearance with green/yellow stripes along the length of the body and have a characteristic V-shaped mark on the head capsule. Mature larvae pupate in the soil.

To effectively control the armyworm larvae, the pest must be spotted well in advance. If larvae are only sighted when almost mature, it is usually too late to control them chemically as the damage has already been done and there will not necessarily be a second generation. Where larvae are still moving from one field to another, a furrow can be ploughed to trap them. They can then either be buried in the soil or controlled chemically.

Beet armyworm (Spodoptera exigua). (Photo by D Visser)

Beet armyworm

The beet armyworm occurs all over the world and the larvae can also migrate en masse. Whether this phenomenon has been observed in South Africa has not yet been confirmed. The species can occur in two phases: a migratory or swarming phase (during which they are dark coloured), or a single phase. The single larvae are usually found in a C-shaped, curled position in the calyxes of maize seedlings. The larvae are green with a green-brown head and only grow to about 15mm. Although the colour of older larvae varies considerably during the migratory phase, they are usually dark coloured.

The moth of the beet armyworm is pale grey with brown marks on the forewings. The hindwings are white with dark veins. The moths can lay up to 600 eggs in groups of 30 to 100 on other plants;

Fall armyworm (Spodoptera frugiperda). *(Photo by A Erasmus)*

African bollworm (Helicoverpa armigera). *(Photo by A Erasmus)*

however, this is usually not the case on maize. The number of larvae found on maize is limited – single larvae usually occur. The larvae pupate in pupal cells in the soil and moths emerge roughly ten to twelve days later. This species rarely reaches pest status on maize.

Fall armyworm

The invasive fall armyworm species is usually the one that creates confusion. This species was first observed in South Africa in early 2017. The fall armyworm occurs widely in North and South America. This pest feeds on a large variety of plants but prefers grasses and grass crops. However, the worms can also cause great damage to groundnuts, soya beans, cowpeas and wheat.

The larvae are fast growing and eat large holes in leaves, or even the whole leaf. The larvae are green and change colour to greenish brown as they mature. The larva has a characteristic Y-shape on the head capsule. The larval stage can take between 16 and 30 days, depending on temperature and humidity. The mature larva pupates in a pupal cell in the soil. The moth hatches after about a week and lays eggs on vegetation around grasslands.

False bollworm

The false bollworm/false armyworm *(Leucania loreyi)* and the African bollworm *(Helicoverpa armigera)* are two other species that can occur in grasslands. These species can also cause confusion.

The false bollworm occurs sporadically, as opposed to the African bollworm. Moths lay up to 100 eggs in parcels between the leaf sheath and the stem; they hatch after about five days. Larvae also have the characteristic pale stripe on the sides like the African bollworm, but are usually dull in colour. Larvae may moult up to six times. There are a few generations a year.

False bollworm or false armyworm (Leucania loreyi). *(Photo by A Erasmus)*

Immature larvae can damage leaves to such an extent that only the veins remain, while mature larvae can consume the whole leaf. Damage can also be caused to maize cobs, which is similar to the damage caused by the African bollworm. Larvae usually feed at night. Larvae can occur in the calyx of younger maize plants as well as on maize cobs and suckers. This species can reach pest status on oats and wheat.

African bollworm

The African bollworm is considered to be one of the most important pests on agricultural crops in South Africa, as it attacks a wide variety of crops. Bollworm moths migrate at night and lay yellow-white eggs on maize cobs and leaves. The eggs take three to five days to hatch. Larvae moult five to six times, during which time they can change colour. A characteristic feature of the African bollworm is the pale white stripes on the sides of the larvae. The larval stage lasts about a month and occurs after flowering.

The larvae of the African bollworm that have infested maize fields will initially feed on the maize beard and later tunnel into the tips of the cobs. In maize fields where heavy infestation occurs on young cobs, the beard can be damaged to such an extent that it can lead to poor pollination. If young cob leaves are damaged during rainy periods and water penetrates the cobs, fungal growth may occur, which causes seeds to colour. In most cases, only the tips of maize cobs are damaged and crop losses are minimal.

Farmers should therefore be on the lookout for armyworm outbreaks. Places in a field or grazing where large flocks of birds gather is usually a good indication, as birds feed on the larvae. If there are any outbreaks, clear pictures can be taken and the ARC-GCI can be notified. During any outbreak, the species will be identified immediately.

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