At least 44 species in the insect order Lepidoptera (moths and butter-flies) attack vegetables in South Africa. Some occur as polyphagous species complexes, while others occur as single species that feed on specific crops or on crops in only one family. Nearly all lepidopteran pests are moths (only two butterfly species occur as minor pests), and all are indigenous or have been naturalised over the decades. However, two species, i.e. *Tuta absoluta* and the fall armyworm, were introduced recently. Below is a short description of seven of the most common and important lepidopteran vegetable pests, or pest complex groups, in South Africa (sorted alphabetical), with visuals on the next page. For a complete list of all vegetable pests, and for more information, see: Visser, D. 2009. A Complete Guide to Vegetable Pests in South Africa. ARC-Roodeplaat, Vegetable and Ornamental Plant Institute, Pretoria (available from the ARC-VOP).

**Common caterpillar complex**

Many caterpillars feed on the foliage of vegetables. The most common and important species are: African bollworm (*Helicoverpa armigera*), semi-loopers (most commonly the tomato semi-looper, *Chrysodeixis acuta*, and the plusia semi-looper, *Thysanoplusia orichalcea*), the lesser armyworm (*Spodoptera exigua*), and the tomato moth (*Spodoptera littoralis*). Crops attacked: Most vegetables. Damage: These caterpillars mostly feed openly on foliage, but sometimes tunnel into and feed inside the fruit. It is usually only when they occur in high numbers that significant damage is inflicted. Control: Several insecticides are available for caterpillar control on vegetables. In small plots, scouting, combined with the removal of caterpillars, is advised.

**Cutworm complex**

At least seven cutworm species attack vegetables in South Africa. The three most common species are: the common cutworm (*Agrotis segetum*), the brown cutworm (*Agrotis longidentifer*), and the black cutworm (*Agrotis ipsilon*). Crops attacked: Cutworms are polyphagous and will attack most crops. Damage: Damage is mostly by older individuals that emerge from their hiding places at soil level, or just below soil level, at dusk. Any plant part near soil level, including the stems of young plants, as well as tubers located shallowly below soil level, are vulnerable. Cutworms may “cut off” several seedlings at ground level, without consuming the rest of the toppled plantlets. Control: Insecticides are available for cutworm control, including bait granules that are scattered between plants. Cutworms readily feed on weeds - sanitation will therefore be important, usually well ahead of planting time.
**Diamond back moth**
The diamond back moth, *Plutella xylostella*, is a worldwide key pest of brassicas. Crops attacked: Only members of the cabbage family (Brassicaceae). Damage: The caterpillars have a characteristic way of feeding – they mostly strip the lower leaf area, leaving the upper epi-dermis intact. This results in window-like damage. However, larger larvae may chew irregular holes right through the leaf. The window-like areas also soon turn into large irregular holes as the leaf grows and expands. Although one larva consumes only a small amount of leaf surface, their occurrence in high numbers causes the serious damage for which they are known. Many larvae may feed on one plant, leaves may be skeletonised and head formation may be affected when young plants are attacked. When older, head-forming brassicas are attacked, damage may be less severe. Larvae are not known to tunnel into already formed heads (unlike some other pests), and such plants may still be usable. Control: Various insecticides are available for diamond-back moth control. Unfortunately, the diamond-back moth is notorious for developing resistance to most pesticides registered against it. Protection of young plants should be given priority, because if plants are not attacked during the first three weeks, head formation will be minimally influenced. Removal of brassica weeds in the vicinity of crops is recommended.

**Fall armyworm**
The fall armyworm, *Spodoptera frugiperda*, invaded South Africa from our northern neighbours in early 2017. It originated from the tropical Americas and was first detected in Africa in 2016. It is a tropical pest that does not survive in cold environments. It is suspected that it currently survives in “hotspots” in mild locations from where it re-infests new areas after winter. Crops attacked: Although the caterpillars will consume nearly all crops when given the opportunity, females mainly lay eggs on maize (including sweet corn), sorghum and a few grass species. Dispersal of the small first instar larvae by the wind is often observed, giving rise to their occasional occurrence on other nearby corps. Damage: The caterpillars hide in the whorls of maize and sorghum during the day, but at night feed on young leaves near the growth point. Fall armyworm infestations often are only noted at a later stage, when large holes, accompanied by larval droppings (excrement), are noticed in the whorls and on surrounding leaves. When dry, the excrement takes on a very characteristic appearance, that of sawdust. It is mainly young plants that are chosen by the females to lay their eggs; young plantations may be completely destroyed. Control: Many insecticides are available for fall armyworm control. Other control options include monitoring with pheromones, removal of egg packets by hand, and using resistant cultivars.
Potato tuber moth

The potato tuber moth, *Phthorimaea operculella*, is a major pest of potato worldwide. Crops attacked: Mainly potato, but other crops in the family Solanaceae, e.g. tomato and eggplant, are vulnerable. Damage: The potato tuber moth is a leaf miner that makes blotch (broad) leaf mines, and mine into potato tubers, both under field conditions and in stores. Infestations of tubers under field conditions are usually due to the very small first instar larvae that are actively searching for feeding sites when the foliage is dying down naturally near the end of the season. Small cracks in the soil that appear at this time, due to tuber bulking and the drying out of soils, contribute significantly to the ability of the small larvae to reach and infest tubers in soils. Damage to the foliage is insignificant compared to the high yield losses experienced when tubers are attacked at the end of the season. Control: Control is mainly with insecticides. Other integrated options include ridging, preventing or closing of cracks in the soil near harvest time, removing of cull piles (to eliminate breeding areas), and monitoring the occurrence in fields with pheromone traps.

Sweet potato hawk moth

The sweet potato hawkmoth, *Agrius convolvuli*, is a large and robust moth, occurring in most countries, but is absent in the Americas. Crops attacked: Only sweet potato. Alternative hosts include morning glory and a few species of bindweed. Damage: The caterpillars, especially the later instars, destroy considerable amounts of foliage. The larger caterpillars move down to the lower canopy where they rest during daytime, and are therefore not often seen. Control: Insecticides are available for control. In small plots, the caterpillars can be removed by hand when searching in the lower canopy.

*Tuta absoluta*

In South Africa, the tomato leafminer is better known by its scientific name, *Tuta absoluta*. It was first reported in 2016 in the eastern parts of the Mpumalanga Province, but is today widespread across the country. Crops attacked: Mainly tomato, but to a lesser extent, also other crops in the Solanaceae family, e.g. potato. Damage: Similar to the potato tuber moth, the larvae are blotch leafminers. However, they occur in much higher numbers, and may destroy entire tomato fields when insecticides are not used. Later instars also bore into tomato fruit. Although they also commonly occur in potato fields, they do not move down cracks to infest tubers, and they do not destroy the foliage, as is often the case in tomato fields. Control: Many insecticides are available for control. Because the moth disperses quickly, and because they occur in huge numbers, other control options are less effective.

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