



***Spodoptera frugiperda*: risks and control measures**

Spodoptera frugiperda (fall armyworm) is a polyphagous pest with more than 350 host plants. It is native to the tropical and subtropical regions of the Americas, but its geographical distribution has changed considerably in the last years with its introduction in the African continent and later in South and South-West Asia and Australia. Currently, the pest is not present in continental Europe, thus increasing preparedness of European countries is essential.



The objective of the FAW-Spedcom project (2019/07-2021/12) was to increase knowledge on *Spodoptera frugiperda*. The project activities aimed to study the cold hardiness of *Spodoptera frugiperda*, refine existing models and gather information on effective control measures that could be used in Europe.

Studies on the tolerance of *Spodoptera frugiperda* to low temperatures suggest ontogenetic differences amongst populations. Preliminary results of studies conducted by project partners in South Africa indicate that *Spodoptera frugiperda* could be tolerant to low temperatures due to temperature plasticity and that invasion of cooler areas may occur in the future. Studies conducted by project partners in Botswana show that stress associated to low temperatures is limited and that overwintering is possible. These results, together with information on the distribution of hosts will help to identify areas in Europe where *Spodoptera frugiperda* can establish.

The project partners started a review of all possible management strategies that could be used against *Spodoptera frugiperda* in Europe. In addition, specific studies to identify and validate management strategies focussed on insecticides and biological control. No resistance to insecticides (chlorantraniliprole, methomyl, indoxacarb, emamectin, benzoate, flubendiamide, pyridalyl, spinetoram, methoxyfenozide) was observed in the *Spodoptera frugiperda* populations used for this study. Larval feeding bioassays with *Bacillus thuringiensis* (Bt) maize showed moderate levels of survival (4-35%) on maize that produces the δ -endotoxin Cry1Ab. The Bt maize pyramid (that produces the δ -endotoxins



Cry1A.105 and Cry2Ab2), provides very high levels of mortality, demonstrating that effective control of the pest can be achieved.

Trichogramma brassicae, an egg parasitoid frequently used in maize fields in Europe against *Ostrinia nubilalis*, has been tested on *Spodoptera frugiperda* in the laboratory. The parasitoid can successfully develop in this new host but mainly the upper layer of the egg masses is parasitized. Other *Trichogramma* species are currently being studied. Two South American parasitoids i.e. *Chelonus insularis* and *Eiphosma laphygmae* were tested for their potential as classical biological control agents. *Eiphosoma laphygmae* appears specific to *Spodoptera frugiperda* whereas *Chelonus insularis* can attack and develop on various *Spodoptera* spp. These two species are among the most abundant parasitoids of *Spodoptera frugiperda* in the Americas. These insects are mainly found in the tropics, but *C. insularis* also occurs in several US States and it is thought that it could easily acclimatize in Southern Europe.

Project ID: *Spodoptera frugiperda*: spreading, establishment, damaging potential and control measures ([FAW-Spedcom](#))