

Unveiling the Fall Armyworm (*Spodoptera frugiperda*): A Threat to Maize and Agricultural Resilience

Kaushik Kumar Das*

Department of Entomology, CCS Haryana Agricultural University, Hisar, Haryana, India-125004

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Introduction

Fall Armyworms, or *Spodoptera frugiperda* (Lepidoptera: Noctuidae), is a destructive pest of several crops especially maize which is native to tropical and subtropical areas of the western hemisphere, extending from Argentina to the USA (FAO, 2019). Within just sixteen months, the rapid expansion to over 90% of India's maize-growing regions across a wide range of agro-ecologies poses a serious threat to the country's small-scale farmers, maize industry, food and nutritional security. The Indian government and agricultural authorities have been working on implementing various measures to manage the infestation and attack of the fall armyworm, including the application of pesticides and the promotion of integrated pest management practices (Suby *et al.*, 2020).

Distribution

FAW in India is continuing to expand, moving further north and east. Many Indian states have reported severe infestation of fall armyworm in the recent years. It was discovered for the first time at Shivamogga, Karnataka, in the middle of May, 2018. Thus far, Fall Armyworm (FAW) has been found in a number of Indian states, including Karnataka, Gujarat, Andhra Pradesh, Telangana, Maharashtra, and Tamil Nadu. This suggests that FAW is a widely distributed pest that poses a risk to maize crops in these regions (Naganna *et al.*, 2020).

Host preference

The fall armyworm is well-known for being polyphagous, since it consumes a broad variety of host plants and has been seen feed on 353 species of plants over 76 plant families. But it is mostly a grass pest, with a preference for maize (Montezano *et al.*, 2018). FAW is made up of two strains: rice strain "R," which mostly feed on rice and turf grass, and corn strain "C," which consumes mostly on maize, sorghum & cotton. In millet fields, including sorghum, the occurrence of FAW was closely observed (Suby *et al.*, 2020). Its attack was recently noticed

in the sugarcane field as well. Fall armyworms are a serious problem for Indian farmers since they can reproduce on a wide variety of crops

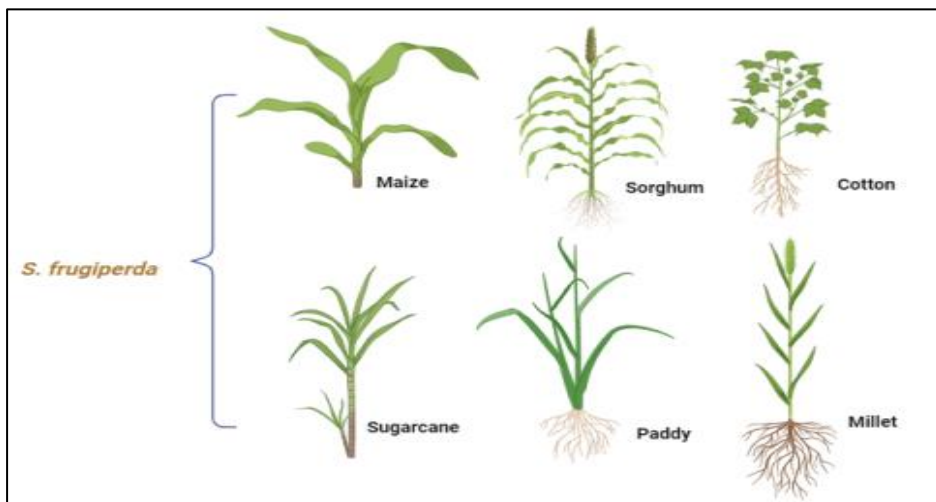


Fig. 1. Host range of *S. frugiperda*

Damage symptoms

The female lays one or more clusters of thousand eggs. The young instar produces silken thread upon hatching, which is carried away by the wind. From the third stage onwards, the larvae settle into a whorl, and as they eat, the unfurling leaves develop a number of perforations and faecal waste. The larvae in their sixth instar severely shed the foliage and leave behind a lot of feces in the plant whorl (Fig. 2). The growing leaves inside the whorl (the core of the plant) are typically the food source for older larvae and successive feeding results in "dead heart" symptoms. Tassel and emerging ears may also be attacked by the larvae (Suby et al., 2020).



Fig. 2. FAW damage in maize field

Integrated Pest Management (IPM)

- **Cultural Practices:** It has been reported that increased crop diversity, especially intercropping with pulses, reduces the incidence of FAW. It creates a more complex agroecosystem that can disrupt the life cycle and feeding patterns of FAW, thereby mitigating its impact on maize crops
- **Biological:** Parasitoids like *Telenomus* sp., *Trichogramma* sp. and Biopesticides (*Bt*, NPV etc.) were found effective against FAW larva on maize (Naganna *et al.*, 2020).
- **Chemical:** Chlorantraniliprole 18.5 SC @ 0.4 ml/l, spinetoram 11.7 % SC @ 0.5 ml/l etc. are mostly used for minimizing the damage in maize (Suby *et al.*, 2020). Early detection of FAW infestation is vital for effective chemical control.

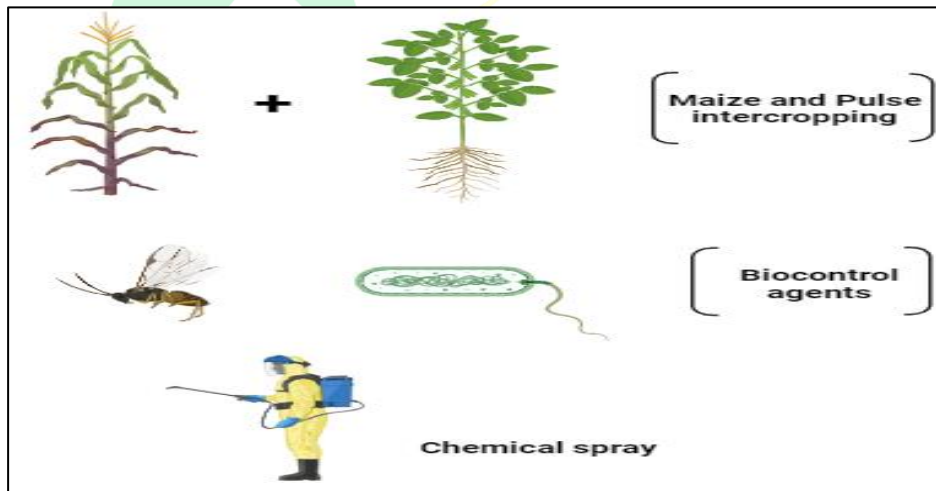


Fig. 3. IPM practices against FAW

Conclusion

The invasive pest is a serious risk to the safety of food supplies & economic stability, requiring urgent attention from researchers, policymakers, and farmers alike. Implementing integrated pest management strategies, fostering international collaboration, and investing in innovative solutions are crucial steps in mitigating the adverse effects of the Fall Armyworm. By addressing this menace collectively, we can safeguard maize production, enhance agricultural sustainability, and ensure a resilient future for global food systems.

References

FAO, CABI (2019). Community-Based Fall Armyworm (*Spodoptera frugiperda*) Monitoring, Early Warning and Management Training of Trainers Manual First Edition



- Montezano, D. G., Sosa-Gómez, D. R., Specht, A., Roque-Specht, V. F., Sousa-Silva, J. C., Paula-Moraes, S. D., & Hunt, T. E. (2018). Host plants of *Spodoptera frugiperda* (Lepidoptera: Noctuidae) in the Americas. *African entomology*, 26(2), 286-300.
- Naganna, R., Jethva, D. M., Bhut, J. B., Wadaskar, P. S., & Kachot, A. (2020). Present status of new invasive pest fall armyworm, *Spodoptera frugiperda* in India: A review. *Journal of Entomology and Zoology Studies*, 8, 150-156.
- Srikanth, J., Geetha, N., Singaravelu, B., Ramasubramanian, T., Mahesh, P., Saravanan, L., & Muthukumar, M. (2018). First report of occurrence of fall armyworm *Spodoptera frugiperda* in sugarcane from Tamil Nadu, India. *Journal of Sugarcane Research*, 8(2), 195-202.
- Suby, S. B., Soujanya, P. L., Yadava, P., Patil, J., Subaharan, K., Prasad, G. S. & Rakshit, S. (2020). Invasion of fall armyworm (*Spodoptera frugiperda*) in India: nature, distribution, management and potential impact.