



IPPC Webinar series

Fall Armyworm a global threat to prevent

1st Webinar on Fall Armyworm Prevention Programme 22 October 2021 Questions & Answers

This document compiles Questions & Answers from the first session of the webinar series "*Fall armyworm, a global threat to prevent*" held on the 22 October 2021 from 12 to 14 UTC GMT+1. One hundred and twenty (120) participants from Asia, Africa, Europe, and Pacific countries attended the webinar.

The webinar's agenda, the list of speakers, the record and presentations can be found at <https://www.ippc.int/es/news/workshops-events/webinars/fall-armyworm-faw-training-part-1-22-october-part-2-19-november-and-part-3-10-december/>

A board with resources on FAW prevention, preparedness and response is available at: <https://trello.com/b/EnupTMYx/fall-armyworm-prevention>

Questions are organized by technical topic: prevention; detection, diagnosis, and identification; establishment potential of FAW; and response.

Prevention

1. Are there any prevention tools for Fall Armyworm (FAW)? Is it possible to build research partnerships to control the management of this pest?

Answer: Depending on which prevention tools are needed, CSIRO is currently researching bio-pesticides, RNAi, DNA characterization of resistance gene profiles and assessing resistance responses to various insecticides. In Africa, research activities on push-pull technology and endemic/introduced parasitoids are also underway.

Another good example of research partnership is the Euphresco project "*Spodoptera frugiperda*: spreading, establishment, damaging potential and control measures for the European Union' (FAW-Spedcom project). The project aims to determine cold hardiness ability and climate limit of FAW performing laboratory assays on different populations established in different areas. The different measures available to control FAW (insecticides, larval parasitoids, resistant varieties, mating disruption, cultural control and finally IPM programmes) are considered and lessons learnt on the use of different control

measures in the various (African) countries will be performed. The most suitable approaches for the European and Mediterranean regions will be identified. Several European research institutions are involved.

2. *In case of early warning and depending on the government arrangement, NPPOs lack jurisdiction for preparedness. What advice do you give for such organization arrangement?*

Answer: It is important for the NPPOs to identify responsibilities, alert relevant bodies if needed (e.g. if Fall Armyworm is a risk), and technically support them if possible. If it is in the jurisdiction of another organization, the NPPO should liaise with that organization. If it is not in the jurisdiction of any organization in the country, a discussion is needed within the NPPO and with the relevant Ministry. Early warning is an essential and effective part of protection against emerging plant pests.

Detection, diagnosis, and identification

3. *Can FAW attack cucumber? And was FAW recorded on grapes?*

Answer: Cucumber has been reported as a host crop, and FAW has been reported on grapes in its native countries. Find all host plants at: <https://gd.eppo.int/taxon/LAPHFR/hosts>

4. *Is there a tool that can detect Fall Armyworm (FAW)?*

Answer: All stages of the pest can be detected visually. Specimens can be collected directly from infested plants or with the aid of light traps and pheromone baited traps. The species can be identified both morphologically and molecularly. Reliable morphological identification is best carried out in the adult stages. Morphological identification is less time-consuming than molecular identification, and in addition, it can be done with relatively simple equipment and very few chemicals. For morphological and molecular identification, see the EPPO Diagnostic protocol PM 7/124, which is available here: https://www.eppo.int/RESOURCES/eppo_standards/pm7_diagnostics

5. *How can we identify FAW specifically through molecular identification (DNA)?*

Answer: There are organizations and researchers in Africa that would be able to assist, as CSIRO. There are also rapid tests by LAMP technology developed for FAW identification. This will not require significant molecular training. For molecular identification, see the EPPO Diagnostic protocol PM 7/124, available here: https://www.eppo.int/RESOURCES/eppo_standards/pm7_diagnostics

6. *According to the FAW behavior, is it possible to detect it in one farm but not in other? And in such case what is the best action to be taken to prevent it from spreading?*

Answer: A combination of IPM measure seem the best possible solution. This comprises insecticide application and several types of crop specific cultural control to be applied to help minimize pest populations. See the recently released IPPC FAO Guidelines on FAW prevention, preparedness, and response, for a useful review of suppression methods to reduce FAW populations, see here: <https://www.fao.org/documents/card/en/c/cb5880en/>

Establishment potential of FAW

7. Is any model that includes climate change available to infer predictions for FAW establishment in Europe?

Answer: To the best of our knowledge, there is no study investigating the potential distribution of the species on the basis of climate change specific to Europe. We pass on some papers where the potential worldwide distribution of *S. frugiperda* is discussed based on climate scenarios¹. In particular, the paper by Ramasamy *et al.*, 2021² investigates the distribution of the species based on the most recent climate scenarios generated by the IPCC.

8. Which are the factors supporting the spread of FAW into different climate areas. What about their adaptation with different climatic conditions?

Answer: The Euphresco ‘FAW-Spedcom project’ studied the tolerance of FAW to low temperatures (<https://zenodo.org/record/3675404#.YYpUqGDMJPZ>). Differences amongst populations have been reported. Preliminary results in South Africa indicate that FAW could be tolerant to low temperatures due to temperature adaptability and that invasion in cooler areas may occur in the future. Studies conducted 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 try to identify areas in Europe where FAW can establish.

Response

9. Are there any successful experiences in containing or eradicating of FAW around the world?

Answer: Successful eradication is difficult especially if re-introduction (either by natural migration or by unintentional activities) can readily occur. Some countries e.g., Germany reported eradication of FAW but overwintering in this country is very unlikely therefore the pest can be considered only as a ‘transient’ pest in this situation.

10. In North Vietnam, we are successful to control FAW. We applied pheromone traps and after that using pesticide one time when 3-4 instar larvae presented on maize plant at 5-6 leaves stage with the density over 4 larvae/m². Could you share with us the good experiences of control FAW in your countries?

¹ Zacarias, D. A. (2020). Global bioclimatic suitability for the fall armyworm, *Spodoptera frugiperda* (Lepidoptera: Noctuidae), and potential co-occurrence with major host crops under climate change scenarios. *Climatic Change*, 161(4), 555-566. <https://link.springer.com/article/10.1007/s10584-020-02722-5>

L. Tianmeng, W. Jianming, H. Xiaokang, et al., Land-use change drives present and future distributions of Fall armyworm, *Spodoptera frugiperda* (J.E. Smith) (Lepidoptera: Noctuidae), *Science of the Total Environment* (2018), <https://doi.org/10.1016/j.scitotenv.2019.135872>

Tepa-Yotto, G. T., Tonnang, H. E., Goergen, G., Subramanian, S., Kimathi, E., Abdel-Rahman, E. M., ... & Sæthre, M. G. (2021). Global habitat suitability of *Spodoptera frugiperda* (J.E. Smith) (Lepidoptera, Noctuidae): key parasitoids considered for its biological control. *Insects*, 12(4), 273. <https://www.mdpi.com/2075-4450/12/4/273>

² Ramasamy, M., Das, B., & Ramesh, R. (2021). Predicting climate change impacts on potential worldwide distribution of fall armyworm based on CMIP6 projections. *Journal of Pest Science*, 1-14. <https://link.springer.com/article/10.1007/s10340-021-01411-1>

Answer: Pheromone traps laced with insecticides can be an option to reduce the pest population. However, as Vietnam is in a sub-continental region with a significant FAW population, it would be fair to anticipate arrivals of more FAW in times.

FAO resources on management available at: <https://www.fao.org/fall-armyworm/sustainablemanagement/en/>

Other Questions

11. Please, we need a webinar on "Pest Risk Analysis", if possible.

Answer: The IPPC Secretariat will soon release e-learning courses on Pest Risk Analysis and Export Certification. Two new e-learning courses will follow on surveillance and inspection. Please stay tuned with our activities and consult all our freely available training materials at:

<https://www.ippc.int/fr/core-activities/capacity-development/guides-and-training-materials/>

12. Please can you send us the video to share it in our network?

Answer: Here is the link to the FAW video: <https://youtu.be/T1QyHCP5-8Q> or <https://trello.com/c/8EgRL8cS/27-stop-fall-armyworm-now-before-it-is-too-late>
Please promote it widely!