

Report from Consultative Meeting on Fall Armyworm in Asia

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Purpose of the meeting

- Awareness raising of risks of having FAW spread into countries and within countries;
- Introduction of tools and guidance available that help the countries to monitor and sustainably manage FAW ;
- Exchange of experiences and lessons learnt from the recent invasion in Africa, and developing a community of experts to provide technical and policy advice;
- Fine-tuning the strategic framework for sustainable FAW management to the Asian context including actions that can be taken at regional and country level.

Overview of current situation in Asia

FAW is a pest that threatens food security, economy, domestic and international trade.

The Plant Protection Commission for Asia and the Pacific began raising awareness about the threat early 2018, sharing key information on the pest, its spread towards Asia, and how to manage it sustainably in case of infestation. Due to surveillance and

information ahead of time, the appearance of FAW in India July 2018 did not come as a surprise. By March 2019, FAW has spread throughout India, and is confirmed in Sri Lanka, Bangladesh, Myanmar, Thailand, Yunnan province of China and Laos (Figure 1). It is expected to spread to other countries in the region in coming months.

At this meeting, decision makers, experts and resource persons from different regions met to contribute to define best way forward in dealing with FAW in Asia, both the short and long terms. The participants represented national authorities, national and international research institutes and private sector from Afghanistan, Pakistan, India, Bangladesh, Nepal, Bhutan, Myanmar, Thailand, Vietnam, Sri Lanka, Cambodia, Laos, Malaysia, Indonesia, Philippines, Singapore, China, South-Korea, Timor-Leste and Australia.

Fall Armyworm spread 2016 - present

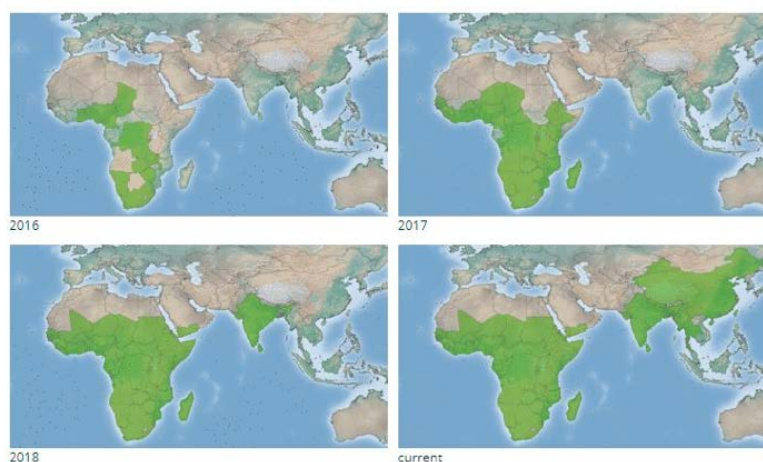


Figure 1. Overview of Fall Armyworm spread from 2016 to present. Screenshot from Power point presentation by Allan Hruska, FAO.

Introduction to FAW and lesson learned from FAO global programme

It is evident that once arrived, FAW cannot be eradicated, and management of a new pest in the area requires new management activities and resources to be spent and implemented. In the long run, successful management of FAW relies on sharing technologies, tools, information, experience and knowledge.

Host range

Although FAW is reported to have a wide range of host plants, yield losses are usually related to infestations in maize. In Africa, maize is preferred, even if rice is available. Sorghum and millet have been affected in areas with little production of maize. In Asia, feedback from the participants at the Bangkok meeting was that damage so far is restricted to maize.

Yield loss

The actual yield loss from FAW infestations are difficult to calculate and often overestimated, as maize plants are able to compensate for indirect foliar damage. It is also apparent that the farmer perception regarding yield loss tend to be higher than estimates from field trials. The variety and market can also affect the level of damage, i.e. FAW damage to sweet corn can reach > 80-90 % crop loss, while the grain production is not seriously damaged. Controlled studies in the Americas have shown 10-20 % yield reduction in maize at high levels of infestation. However, due to lack of knowledge of how to manage FAW, often farmers tend to panic and abandon fields with high level of infestations, hence resulting in total yield loss. Overall, there is a need to carry out research and controlled field trials in selected locations in Asia to determine the impact of FAW on maize yields in different regions under different conditions.

Awareness and communication

Awareness of FAW occurrence and knowledge on pest identification and management practices is crucial to keep the yield losses to a minimum and to establish sustainable management practices. The FAO FAW framework was established to facilitate exchange among partners to better coordinate actions with common objectives. This includes technical and policy guidance, such as early action policy guide, quick guide for management, guide for farmer field schools to promote IPM in FAW management, monitoring and early warning (FAMEWS mobile app and global platform).

Control measures

According to the participants, chemical control is a common practice, and in fact first reaction of farmers in most Asian countries. The problem is the lack of good quality chemicals and farmers that depend on the local markets end up buying cheap, out of date and poor-quality pesticides. Farmers also depend on the pesticide dealers for advice due which may not be helpful. This poses a risk for development of pesticide resistance problems and hazards to human health and environment. Efficient and sustainable management of FAW will depend on the combined effect of approaches such as pest monitoring, cultural control, biological control, host resistance and chemical control.

Experience from the Americas show that farmers manage to keep the populations at low levels using a combination of measures. Enhancing natural biological control and using agro-ecological approaches are low cost management strategies, with limited risks of disruption of the ecosystem and reduce harmful exposure to human health. For example, using certain plants repel FAW or camouflage maize. Plant diversity can also increase the populations of natural enemies. Smallholder measures include early planting, creation of public awareness, scouting and mechanical control,

conservation and attraction of predators and parasitoids, use of naturally occurring pathogens and substances (botanicals, ash, soil, soaps).

The cost of pest management and availability of efficient pesticides will affect the farmers ability to adopt sustainable management practices. Lower risk pesticides are generally expensive. Pesticides recommended by companies may not be efficient, and some pesticides on the market can be outdated or fake. Although chemical control should ideally be considered as a last resort, the use of chemical pesticides cannot be avoided, and there is a need for evaluation of mild synthetic pesticides.

The ultimate goal in management of FAW is to enable farmers to sustainably manage the pest in their cropping system with the help of local, national and international research, educational, extension and policy institutions and organisations through integrated pest management (IPM).

Fall Armyworm Monitoring and Early Warning System (FAMEWS)

Distribution of FAW is limited by host plants and temperature. FAW dies off at temperatures below 10-14 °C, but moves seasonally where it does not overwinter. Early detection of FAW is important to ensure correct timing of efficient management strategies. Pheromone traps are very efficient in detecting presence and monitoring FAW adult population levels, but have a very limited role in direct control. This practice is already established in some of the participating countries and will be used in most Asian countries within short time. Eggs and larvae can be monitored in the field.

Participants at the Consultative Meeting in Bangkok agreed that the FAMEWS platform could be useful and help in better management of the FAW. All data entered into FAMEWS can be visualized and analysed in the FAMEWS platform. FAMEWS can also provide advice and resources to farmers and make predictions. As part of the FAMEWS app, VIPS runs an offline predictive FAW model based on occurrence among neighbours and crop calendar. As a starting point, weather forecasts provided from yr.no is routed through VIPS to FAMEWS. Further details to provide better specification of the model is under development. The potential for use of VIPS as an integration with FAMEWS and other apps or systems in local use was presented during the meeting and in general there was a positive feedback from most partners.

The importance of shared information across national borders is apparent for a migrating pest such as FAW, and FAO encourages all countries to enter data on FAW observations into the FAMEWS database. The FAMEWS app is ready for use, and does not need local customization. It will be translated to local languages. The meeting participants were informed by FAO that funding for purchase of smartphones and pheromone traps is available if needed to get started with the FAW monitoring.

One apparent constraint to the common use of FAMEWS is that some institutes already have developed own apps for monitoring purposes, i.e. PRISM in the Philippines, PPD in Myanmar and the crop pest monitoring network in China. In such cases, it will be useful to investigate the potential for integration and data sharing between already established web services and apps to accommodate for local relevance and ownership to the systems. However, it is apparent that some countries are reluctant to share data with international agencies due to national regulations. This has to be immediately addressed, and the government representatives at the meeting were requested to take up the issue with respective ministries. **There is a need for international policies for sharing weather and pest occurrence data on migratory pests and invasive species.**

Monitoring and early warning of migratory insect pests in China (presented by Dr Wang, CAAS).

The Chinese approach on pest monitoring include the use of advanced technologies. The Chinese crop pest monitoring network include over 1000 monitoring stations for migratory insect pests. Monitoring is done by use of radar observation, searchlight traps and pheromone traps. China is expecting FAW to establish in the southern areas and seasonally migrate northwards. If FAW reaches the main cropping regions for corn in China, the yield losses are expected to be high. Monitoring for FAW includes the use of searchlight traps, black light traps and pheromone traps. Early warnings on migratory pests are provided through WeChat public number, CCTV weather forecast, radio broadcast, and web-site. A new control strategy is blocking migratory routes by establishment of a system which combines radar, air/ground light traps and moth food bait trap. It is not yet known how successful this blocking approach will be.

Sustainable management of FAW in Asia

The vast majority of farmers affected by FAW are smallholders – their context is very different from large-scale commercial farmers. Most smallholders receive low prices for maize and do not have access to risk-transfer mechanisms or international markets, thus their economically-rational for integrated pest management (IPM) is very constrained. Challenges related to management of FAW is related to lack of preparedness, panic, cost of pesticides, availability of products, and need for coordination.

To achieve sustainable management practices, technical and political guidance is needed on a short, medium and long term. One of the main elements of this meeting was to initiate planning of national action plans for FAW management. The role of FAO and organization such as NIBIO will be technical support and capacity building of the national institutions.

Critical policy gaps which affect development of FAW management were related to pesticide registration, sharing and registration of monitoring data and access to pest resistant seeds, non GM hybrids.

Management of FAW at a national level

All participating countries were advised to nominate one FAW national focal point/person in the respective national ministry or agency and ensure endorsement from the relevant national level. This person should designate activities and ensure communication flow between relevant partners in ministry, industry, advisors and farmers. This person will be contact point for FAO. The FAO office will have a counterpart.

Monitoring and early warning

Efficient monitoring need endorsement from national level. Each country needs to establish use of pheromone traps and routines for scouting. National surveillance usually works, but FAO and similar agencies are needed for coordination between countries. Use of the FAMEWS app was encouraging and positive. Training material and FAO project funding is available if needed for funding of smartphones and traps.

Public awareness and knowledge

It is important to create FAW awareness both in countries where FAW is established, and where it has not yet been seen, bridging the knowledge gap on pest identification and management practices.

Participants also felt that education should be provided at all levels: including advisors, farmers and pesticide dealers. Collaboration among agencies should be established for exchange of info. In Sri

Lanka, special task forces were already established, including pest control committees at village, regional and national level. Training of agricultural officers and farmers is needed, and farmer field schools (FFS) for FAW should be established. FFS curriculum for FAW is available from FAO. All countries have done FFS in the past, except Singapore. It was suggested to combine FFS and plant clinics (CABI). FFS training filmed: TV programmes can reach many.

Availability of bio-pesticides and chemical pesticides

There is a need for harmonisation of procedures for regulation of bio-pesticides (bacteria, fungi, viruses etc), and to speed up registration processes for national permits. One challenge is that risk assessments are often lacking. FAO aids in simplifying regulations for registration of bio-pesticides. Some of these products can be produced locally. One approach can be to support farmer community pest management center for production of bio-agents and use to control FAW.

Research priorities

Research institutions should be encouraged to find sustainable management options, focusing on identification and production of biocontrol agents and bio-pesticides, and to provide seed of resistant varieties. Collaboration nationally and internationally to benefit from previous experience from Africa should be initiated.

Strategic frameworks

Strong networks on plant protection and integrated pest management are in place in the region. Awareness raising in FAO Governing Bodies. Stakeholders consultation meeting on strategies for effective management etc. Development workshops.

FAO as a regional platform will support member countries to develop coordinated actions. RAP (Regional office for Asia and the Pacific) will immediately take action to support a regional TCP (technical cooperation programme) for follow up after this meeting

Main elements of importance for future priorities

- Encourage data and knowledge sharing across borders and regions.
- Capacity building, awareness and education on local levels
- International research collaboration for development of biopesticides.
- Harmonize national registration processes for biopesticides and mild synthetic pesticides.

