

## Indigenous Knowledge and Practices for the Management of Fall Army Worm (*Spodoptera frugiperda*)

Tumma Mounika

Research Scholar, Department of Agricultural Entomology, Uttar Banga Krishi Viswavidyalay, West Bengal, India

### SUMMARY

Fall army worm (*Spodoptera frugiperda*) is a major polyphagous pest attacking different kind of cereals. Due to its sporadic nature it is able to migrate with a high potential from country to country. At present the management of fall army worm mainly rely on synthetic insecticides. But their indiscriminate use leading to major problems like killing of natural enemies and predators of fall army worm. Thus the alternate method by applying different locally available knowledge such as handpicking, killing of larvae, destroying ratoon host crops, early planting, deep ploughing to kill pupae, placing sand or ash in the whorls, intercropping, push pull strategy, rotation of maize with non-host crops and using botanical pesticides. This work is to encourage subsistence farmers of developing countries to exchange their various local knowledge and experiences in the management of the notorious FAW especially in maize production.

### INTRODUCTION

Fall army worm (*Spodoptera frugiperda*) is a polyphagous pest which is native to regions of tropical and subtropical America (FAO, 2017). It is considered as one of the major pests of maize which belongs to family Noctuidae: Lepidoptera. This pest attacks 80 plant families, mainly poaceae, Asteraceae and Fabaceae (Pashley, 1986). Fall army worm caused a great economic loss in sub Saharan African countries where the maize is grown (Yigezu and Wakgari, 2020). Due to its natural distribution capacity, migratory behaviour, sporadic nature it can migrate from country to country with a high potential. In a single night moth can fly up to 100 km. So far this pest was reported in the states like Karnataka, Telangana, Andhra Pradesh, Maharashtra and Tamil Nadu. The larvae of fall army worm could attack the maize plant during vegetative and reproductive or flowering stage; it can bore into the ears, stem and cob of the maize (Dhar et al, 2019). It posed a major threat to nutrition, food security and livelihoods. At present the management of fall army worm mainly rely on synthetic insecticides. But their indiscriminate usage leading to major problems like killing of natural enemies, predators of fall army worm, insect's resurgence, affects human health, Natural enemies, environmental pollution and increasing cost of application. By keeping this in a view, a real need management is to be adopted for the effectively and efficient management of the fall army worm.

### Some Indigenous knowledge practices for management of fall army worm:

This method is normal cultural practice applied by farmers. Hand picking of the larvae which are feeding on the leaves at the early stage are collected and destroyed. Then placing the sand or ash in the whorl reduces the infestation of the fall army worm because the larvae enter into the whorl and stay there. Optimizing the time of planting of the crop helps the target crops to escape from the fall army worm. This practice will work when their will be a synchrony in between the pest and the critical crop growth stages. Burning of the crop residue or stubbles after the harvest could helps in destroying the un-hatched eggs larvae, pupae and adults. Presence of the plants such as nutsedge (*Cyperus esculentus*), neem (*Azadirachta indica*), tamarind (*Tamarindus indica*) and soybean (*Glycine max*) act as repellent plants of fall army worm. Presence of these plants near the maize field reported with low infestation. Push pull approach was practiced here in which plant may act as trap plant (Prassana, 2018). Implementing the Push-pull approach reduced FAW infestation and crop damage by 86%, with an increase in yield. This method provides a suitable environment for the proliferation of predators and parasitoids of FAW (Khan et al., 2010). Protection of maize is provided by semio-chemicals that are emitted by the intercropped crop that repel (push) FAW, while those released by the border crop attract (pull) them. The leaf area treated with the sugar syrup reduced the damage by 35% and its infestation rate by 18%. This is mainly

because the applied sugar attracts the natural enemies of the fall army worm population (Canas et al, 1998). The botanicals such as Neem leaves or seeds (*Azadirachta indica*), Vernonia leaves (*Vernonia amygdalina*), and Pepper (*Capsicum annum*) were used as botanical pesticides against fall army worm along with Soap water and detergent or petroleum products.

## CONCLUSION

Fall armyworm is a polyphagous insect pest that devastates mostly maize, sorghum, and rice. It caused both yield and economic losses. To tackle this problem, farmers should practice their local knowledge against this pest. Indigenous knowledge required integration methods of farmers for making it effective and efficient in application to ensure the sustainability of agricultural development. . Incorporating such important and safe practices in crop protection is the best option to minimize the hurdle posed by agrochemicals on health and environments.

## REFERENCES

- Canas, L.A., O'Neil, R.J. (1998). Applications of sugar solutions to maize, and the impact of natural enemies on Fall Armyworm. *International Journal of Pest Management*: 44(2):59-64.
- Dhar, T., Bhattacharya, S., Chatterjee, H., Senapati, S.K., Bhattacharya, P.M., Poddar, P. (2019). Occurrence of fall armyworm *Spodoptera frugiperda* (J. E. Smith) (Lepidoptera: Noctuidae) on maize in West Bengal, India and its field life table studies. *Journal of Entomology and Zoology Studies*: 7(4):869-875.
- FAO. (2017). FAO Advisory Note on Fall Armyworm (FAW) in Africa. Key messages in: FAO Advisory Note on Fall Armyworm (FAW) in Africa. Rome, Italy: pp: 1-30.
- Khan, Z. R., Midega, C.A.O., Bruce, T.J.A., Hooper, A.M., Pickett, J.A. (2010). Exploiting Phytochemicals for developing a 'push-pull' crop protection strategy for cereal farmers in Africa. *Journal of Experimental Botany*: 61:4185-4196.
- Pashley, D.P., (1986). Host associated genetic differentiation in fall armyworm (Lepidoptera: Noctuidae): A sibling species complex. *Annals of the Entomological Society of America*: 79:898-904.
- Prasanna, B.M., Huesing, J.E., Eddy, R., Peschke, V.M. (2018). Fall Armyworm in Africa: A Guide for Integrated Pest Management, 3rd ed.; CIMMYT: Mexico City, Mexico: pp. 11–106.
- Yigezu, G. and Wakgari, M. (2020). Local and indigenous knowledge of farmers management practice against fall armyworm (*Spodoptera frugiperda*) (J. E. Smith) (Lepidoptera: Noctuidae): A review. *Journal of Entomology and Zoology Studies*: 8(1): 765-770.